

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project ALD Stabilization of Nanoparticles Designed on the Atomic Scale

Project Identifier P/ANL2005-024

Principal Investigator Pellin, M.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$148600
Cumulative Total Project Cost:	\$401700

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Fundamental and Applied Science of Hybrid Ferroelectric/Piezoelectric-Diamond Heterostructures for High-Performance MEMS/NEMS Devices

Project Identifier P/ANL2005-028

Principal Investigator Auciello, O.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$137300
Cumulative Total Project Cost:	\$394500

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Investigating Ultra-Fast Catalysis and Electro-Catalysis Processes using Time-Resolved X-Ray Absorption Techniques

Project Identifier P/ANL2005-036

Principal Investigator Chen, L.-X.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$157800
Cumulative Total Project Cost:	\$441100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Shock-Wave Desorption of Large Organic Molecules

Project Identifier P/ANL2005-065

Principal Investigator Veryovkin, I.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$124500
Cumulative Total Project Cost:	\$342400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Enhancement of Battery and Ultracapacitor Performance through Novel Applications of Nanotechnology

Project Identifier P/ANL2005-092

Principal Investigator Abraham, Daniel

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$149400
Cumulative Total Project Cost:	\$443800

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Reducing Heavy Duty Vehicle Emissions through Coupling Diesel Reforming to Emissions Catalysts and Engine Control Devices

Project Identifier P/ANL2005-140

Principal Investigator Marshall, Christopher

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$81500
Cumulative Total Project Cost:	\$262100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Manipulation of Biomolecules using Metal Oxide Nanoparticles

Project Identifier P/ANL2005-147

Principal Investigator Rajh, T.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$98100
Cumulative Total Project Cost:	\$302000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Metalloproteomics and Metalloregulation of Signaling

Project Identifier P/ANL2005-150

Principal Investigator Rodi, D.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$176800
Cumulative Total Project Cost:	\$591400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Lateral and Molecular Spintronic Structures

Project Identifier P/ANL2005-168

Principal Investigator Jiang, J.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$149900
Cumulative Total Project Cost:	\$471400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Integrated Simulation Framework for National Security Decision Support

Project Identifier P/ANL2005-187

Principal Investigator Macal, Charles

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$195700
Cumulative Total Project Cost:	\$664200

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project PDQuest: Investigations into Applications, Software and Architectures for Enabling Petascale Science

Project Identifier P/ANL2005-193

Principal Investigator Stevens, R.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$854300
Cumulative Total Project Cost:	\$2422600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Universal Phylochip for Environmental Background Characterization and Monitoring

Project Identifier P/ANL2005-204

Principal Investigator Bavykin, Sergei

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$198900
Cumulative Total Project Cost:	\$632100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project High-Resolution Element-Selective Microscopy Using X-ray Enhanced Scanning Tunneling Microscopy

Project Identifier P/ANL2005-215

Principal Investigator Freeland, J.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$95400
Cumulative Total Project Cost:	\$283100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Quantum Critical Behavior in Nanostructured Materials

Project Identifier P/ANL2005-216

Principal Investigator Isaacs, E.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$104000
Cumulative Total Project Cost:	\$350300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Precision Measurement of Hadronic Showers

Project Identifier P/ANL2005-217

Principal Investigator Chekanov, S.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$100000
Cumulative Total Project Cost:	\$456300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Advancing Multidisciplinary Condensed Matter Theory

Project Identifier P/ANL2005-221

Principal Investigator Crabtree, G.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$145300
Cumulative Total Project Cost:	\$391200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project In-Situ Raman Spectroscopy of Catalysts

Project Identifier P/ANL2005-223

Principal Investigator Stair, P.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$283000
Cumulative Total Project Cost:	\$1080800

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Development of a New Concept for a Solenoid Spectrometer for Nuclear Structure Studies

Project Identifier P/ANL2006-015

Principal Investigator Back, B.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$158600
Cumulative Total Project Cost:	\$314300

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Ultra-Fast Phase-Enhanced X-Ray Imaging with Micrometer-Spatial and 150 Picosecond Temporal Resolutions

Project Identifier P/ANL2006-023

Principal Investigator Fezzaa, K.

Point of Contact Kaufmann, Elton

Type of Research

Development

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$143700
Cumulative Total Project Cost:	\$318300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Quantum Wire Interconnects

Project Identifier P/ANL2006-033

Principal Investigator Beloborodov, I.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$136900
Cumulative Total Project Cost:	\$273400

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Biocompatibility of Ultra-Nanocrystalline Diamond Thin Films

Project Identifier P/ANL2006-035

Principal Investigator Shi, B.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$144100
Cumulative Total Project Cost:	\$290000

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Large-Area Detectors with Pico-Second Time Resolution

Project Identifier P/ANL2006-075

Principal Investigator Byrum, K.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$111000
Cumulative Total Project Cost:	\$217800

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Time-Resolved Optical Sensors for Biological Molecules with Ultra-High Sensitivity and Specificity

Project Identifier P/ANL2006-088

Principal Investigator Wiederrecht, G.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$50200
Cumulative Total Project Cost:	\$177300

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Adopting Photonic Concepts to THz Generation

Project Identifier P/ANL2006-091

Principal Investigator Welp, U.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$124900
Cumulative Total Project Cost:	\$269900

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Nanoscale Engineered Superconducting RF Cavities as Novel Accelerating Elements

Project Identifier P/ANL2006-096

Principal Investigator Iavarone, M.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$159500
Cumulative Total Project Cost:	\$328900

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Uncharacterized Gene with Putative Function in Bone

Project Identifier P/ANL2006-105

Principal Investigator Bhattacharyya, M.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$178200
Cumulative Total Project Cost:	\$350000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Plasmon Scanner for High-Resolution Surface-Enhanced Raman Spectroscopy of Biological Nanosamples

Project Identifier P/ANL2006-118

Principal Investigator Vlasko-Vlasov, V.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$138700
Cumulative Total Project Cost:	\$285800

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project International Linear Collider R&D at Argonne: The Gamma-Ray Based Positron Source and Positron Emulator Study

Project Identifier P/ANL2006-123

Principal Investigator Gai, W.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$79900
Cumulative Total Project Cost:	\$278800

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Institutional Factors Analysis Tool for Energy Projects

Project Identifier P/ANL2006-126

Principal Investigator Gasper, John

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$19900
Cumulative Total Project Cost:	\$37800

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Characterization of the Transportation Sector for Input to the ENPEP Model

Project Identifier P/ANL2006-127

Principal Investigator Vyas, Anatrav

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$19800
Cumulative Total Project Cost:	\$44200

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Stationary Energy Demand: Characterization of Industrial, Residential, and Commercial Energy

Project Identifier P/ANL2006-128

Principal Investigator Thimapuram, Prakash

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$20000
Cumulative Total Project Cost:	\$37800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Developing a Financial Analysis Tool [previously Technology Assessment Financial Analysis Tool]

Project Identifier P/ANL2006-129

Principal Investigator Koritarov, Vladimir

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$34700
Cumulative Total Project Cost:	\$58600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Develop Electric Sector Characterization

Project Identifier P/ANL2006-132

Principal Investigator Koritarov, Vladimir

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$19600
Cumulative Total Project Cost:	\$37400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Enhanced Energy and Emissions Analysis: Linkage of GREET and ENPEP Models

Project Identifier P/ANL2006-134

Principal Investigator Wang, Michael

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$29800
Cumulative Total Project Cost:	\$66100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Development of an Integrated Site-Specific Environmental Assessment Tool

Project Identifier P/ANL2006-136

Principal Investigator Biber, Bruce

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$19900
Cumulative Total Project Cost:	\$50000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Plug-In Hybrid Electric (P-HEV) Vehicle Optimization

Project Identifier P/ANL2006-137

Principal Investigator Amine, Khalil

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$147600
Cumulative Total Project Cost:	\$340800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Development of Cost Engineering and Technology Verification Tools

Project Identifier P/ANL2006-139

Principal Investigator Gillette, Jerry

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$34700
Cumulative Total Project Cost:	\$58500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Renewable Bio-Fuel Combustion Characteristics in Automotive-Type Diesel Engines

Project Identifier P/ANL2006-141

Principal Investigator Miers, Scott

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$99300
Cumulative Total Project Cost:	\$170900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Methodology and Model for Evaluating Advanced Energy and Environmental Technology R&D Options
Considering Multiple Criteria and Multiple Perspectives under Conditions of Uncertainty

Project Identifier P/ANL2006-145

Principal Investigator Samsa, Michael

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$29300
Cumulative Total Project Cost:	\$59800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Advanced Beam Diagnostics Development and RF Photocathode Studies for Low Emittance Electron Beams: An International Linear Collider Study

Project Identifier P/ANL2006-146

Principal Investigator Power, J.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$268600
Cumulative Total Project Cost:	\$313700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Natural Gas Sector Characterization

Project Identifier P/ANL2006-147

Principal Investigator Folga, Stephen

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$19800
Cumulative Total Project Cost:	\$37600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Developing a Conventional Analysis Framework

Project Identifier P/ANL2006-148

Principal Investigator Conzelmann, Guenter

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$69700
Cumulative Total Project Cost:	\$141600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Novel Nano-Architectures for High-Efficiency Solar Cells

Project Identifier P/ANL2006-149

Principal Investigator Elam, Jeffrey

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$272400
Cumulative Total Project Cost:	\$419200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Design and Develop an Advanced Analysis Framework

Project Identifier P/ANL2006-150

Principal Investigator Macal, Charles

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$99300
Cumulative Total Project Cost:	\$158900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Fungible Fuels by Bioprocessing

Project Identifier P/ANL2006-151

Principal Investigator Snyder, Seth

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$326600
Cumulative Total Project Cost:	\$658500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Conversion of Solid Carbon Feedstocks into Liquid Hydrocarbons for Transportation Fuels through Gasification

Project Identifier P/ANL2006-152

Principal Investigator Marshall, Christopher

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$584100
Cumulative Total Project Cost:	\$1034400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Petroleum Sector Characterization

Project Identifier P/ANL2006-156

Principal Investigator Pharris, Chuck

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$17200
Cumulative Total Project Cost:	\$41100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project On-Vehicle Reforming of Ethanol/Water for Hydrogen-Fueled Vehicles and Auxiliary Power Units

Project Identifier P/ANL2006-165

Principal Investigator Ahmed, Shabbir

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$88200
Cumulative Total Project Cost:	\$278200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Development of Nuclear Energy Sector Characterization

Project Identifier P/ANL2006-166

Principal Investigator Yacout, A.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$20000
Cumulative Total Project Cost:	\$36600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Interparticle Coupling and High Frequency Dynamic Response in Magnetic Nanocrystal Colloids and Assemblies

Project Identifier P/ANL2006-168

Principal Investigator Lin, X.-M.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$153600
Cumulative Total Project Cost:	\$373700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Nanophotonics Materials and Devices

Project Identifier P/ANL2006-169

Principal Investigator Ocola, L.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$71500
Cumulative Total Project Cost:	\$197500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Functionalization of Polarizable Surfaces for Nanofluidic Control

Project Identifier P/ANL2006-170

Principal Investigator Ocola, L.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$79000
Cumulative Total Project Cost:	\$210400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Biomolecule Directed Assembly of Nanostructures

Project Identifier P/ANL2006-171

Principal Investigator Makowski, L.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$126700
Cumulative Total Project Cost:	\$379800

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Development and Spray Characterization of Micro-Orifice Diesel Injector Nozzles Fabricated using Electroless Nickel Coating

Project Identifier P/ANL2006-180

Principal Investigator El-Hannouny, E.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$96100
Cumulative Total Project Cost:	\$161800

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Design of a Low-Level RF Control System Utilizing Software Defined Radio and Digital Signal Processing Techniques and Hardware

Project Identifier P/ANL2006-181

Principal Investigator Horan, Doug

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$23100
Cumulative Total Project Cost:	\$64900

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Development and Demonstration of an Omnivorous Engine

Project Identifier P/ANL2006-183

Principal Investigator McConnell, S.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$179900
Cumulative Total Project Cost:	\$358400

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Liquid Metal Simulations for Fusion, Accelerator, and Astrophysical Applications

Project Identifier P/ANL2006-198

Principal Investigator Fischer, P.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$306300
Cumulative Total Project Cost:	\$449800

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Theoretical Investigations of Atomic and Molecular Interactions with Ultrafast/Ultraintense X-Ray Radiation

Project Identifier P/ANL2006-199

Principal Investigator Santra, R.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$336200
Cumulative Total Project Cost:	\$666500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Surface Discharge for ILC Fast Kicker

Project Identifier P/ANL2006-201

Principal Investigator Noonan, J.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$30700
Cumulative Total Project Cost:	\$46000

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Advanced Simulation of Nuclear Fuel Cycle

Project Identifier P/ANL2006-205

Principal Investigator Palmiotti, G.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$896900
Cumulative Total Project Cost:	\$1722500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Laser Spark Assisted HCCI

Project Identifier P/ANL2006-209

Principal Investigator Gupta, S.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$89600
Cumulative Total Project Cost:	\$150500

Description of Project

**United States Department of Energy
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Laboratory Argonne National Lab

Project Develop Renewable Energy Sector Characterization (Wind Energy, Bioenergy, and Solar Energy)

Project Identifier P/ANL2006-211

Principal Investigator Wu, M.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$19700
Cumulative Total Project Cost:	\$38000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Develop A Minimal-Organism Platform for Systems Biology

Project Identifier P/ANL2006-212

Principal Investigator Stevens, R.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$766300
Cumulative Total Project Cost:	\$1505200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Energy Conversion at Bio-Hybrid Interfaces

Project Identifier P/ANL2006-213

Principal Investigator Rajh, T.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$201300
Cumulative Total Project Cost:	\$534300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Characterization of the Candidate Damping Ring Designs of the International Linear Collider

Project Identifier P/ANL2006-214

Principal Investigator Emery, L.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$173000
Cumulative Total Project Cost:	\$225300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Advanced Electron Accelerator Simulation

Project Identifier P/ANL2006-216

Principal Investigator Borland, M.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$152800
Cumulative Total Project Cost:	\$449700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Large Solid Angle Multielement Fluorescence Detector

Project Identifier P/ANL2006-219

Principal Investigator Srajer, G.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$86700
Cumulative Total Project Cost:	\$149200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Condensed Matter Theory: Nanoscale Superconductivity and Magnetism Studies

Project Identifier P/ANL2006-220

Principal Investigator Vinokour, V.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$29700
Cumulative Total Project Cost:	\$250800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Secure Database Access Technologies for Large-Scale Data Management

Project Identifier P/ANL2006-223

Principal Investigator Vaniachine, A.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$134600
Cumulative Total Project Cost:	\$287200

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Development of High Intensity/Thermal Energy Positron Source Utilizing the Chemistry Division 20 MeV Electron Linac

Project Identifier P/ANL2006-224

Principal Investigator Chemerisov, S.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$51700
Cumulative Total Project Cost:	\$116500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Ultimate Limit for Hard X-Ray Focusing

Project Identifier P/ANL2006-225

Principal Investigator Maser, J.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$186400
Cumulative Total Project Cost:	\$423400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Nanomagnetism

Project Identifier P/ANL2006-226

Principal Investigator Bader, S.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$50100
Cumulative Total Project Cost:	\$142500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Towards A Model-Driven Accelerator

Project Identifier P/ANL2006-227

Principal Investigator Ostroumov, P.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$159600
Cumulative Total Project Cost:	\$321400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Gas Cell Development

Project Identifier P/ANL2006-228

Principal Investigator Savard, G.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$75600
Cumulative Total Project Cost:	\$212900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Demonstration of a Full Power Mass 238, 1+ RFQ for a Radioactive Beam Post-Accelerator

Project Identifier P/ANL2006-232

Principal Investigator Ostroumov, P.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$141100
Cumulative Total Project Cost:	\$269300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Demonstrate a Heavy Ion Driver Front End

Project Identifier P/ANL2006-233

Principal Investigator Ostroumov, P.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$117000
Cumulative Total Project Cost:	\$342900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Phase Control of High-Gradient Superconducting Spoke-Loaded Cavities

Project Identifier P/ANL2006-234

Principal Investigator Shepard, K.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$42700
Cumulative Total Project Cost:	\$258500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Develop Electropolishing Techniques for 1.3 GHz 9-Cell Elliptical-Cell Superconducting Cavities

Project Identifier P/ANL2006-235

Principal Investigator Shepard, K.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$52300
Cumulative Total Project Cost:	\$254200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Development of Diagnostics for Lithium Thin Film Strippers

Project Identifier P/ANL2006-236

Principal Investigator Reed, C.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$94700
Cumulative Total Project Cost:	\$202300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Parallel Computation for Laser Plasma Interactions at Relativistic Intensities

Project Identifier P/ANL2006-243

Principal Investigator Li, Y.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$111200
Cumulative Total Project Cost:	\$212500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Single-Molecule Interrogation of Photosynthetic Nano-Architectures

Project Identifier P/ANL2006-246

Principal Investigator Tiede, D.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$98300
Cumulative Total Project Cost:	\$258600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Beam Physics Topics for Compact Accelerators

Project Identifier P/ANL2006-248

Principal Investigator Kim, K.-J.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$88600
Cumulative Total Project Cost:	\$258800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project A Novel Hybrid Detection System for National Security to Counter Seaborne Container Terrorism

Project Identifier P/ANL2006-249

Principal Investigator Allain, J.-P.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$153800
Cumulative Total Project Cost:	\$333000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Coal Sector Characterization

Project Identifier P/ANL2006-256

Principal Investigator Graziano, D.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$20000
Cumulative Total Project Cost:	\$49900

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Nanoscale Studies of Metal/Oxide/Metal Tunnel Junction Structures: Development of Novel Characterization Tools

Project Identifier P/ANL2006-257

Principal Investigator Petford-Long, A.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$186900
Cumulative Total Project Cost:	\$369400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Nanoscience Theory

Project Identifier P/ANL2006-258

Principal Investigator Abrikosov, A.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$99600
Cumulative Total Project Cost:	\$212500

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Advancing Nuclear Theory for a Rare Isotope Accelerator: Nuclear Structure and Reactions by Astrophysics

Project Identifier P/ANL2006-260

Principal Investigator Nollett, K.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$109300
Cumulative Total Project Cost:	\$233300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Nuclear Theory for Supernovas

Project Identifier P/ANL2006-262

Principal Investigator Truran, J.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$227000
Cumulative Total Project Cost:	\$414300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Synthesis, Characterization, and Electrocatalytic Activity of Bimetallic Nanoclusters

Project Identifier P/ANL2006-263

Principal Investigator Markovic, N.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$186800
Cumulative Total Project Cost:	\$371600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Development and Applications of Theoretical and Computational Approaches for Biomolecular Systems

Project Identifier P/ANL2006-264

Principal Investigator Roux, B.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$361800
Cumulative Total Project Cost:	\$714700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Undulator for the ILC Positron Source

Project Identifier P/ANL2006-266

Principal Investigator Kim, S.-H.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$44000
Cumulative Total Project Cost:	\$77400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Beam Dynamics in High-Brightness Photoinjectors

Project Identifier P/ANL2006-267

Principal Investigator Wang, C.-X.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$40900
Cumulative Total Project Cost:	\$156200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Novel Hybrid Nanomaterials via Uniting Top-Down and Bottom-Up Assembly Methods

Project Identifier P/ANL2006-268

Principal Investigator Darling, S.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$99800
Cumulative Total Project Cost:	\$184600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Electron Encapsulation: Single-Molecule Capacitors

Project Identifier P/ANL2007-001

Principal Investigator Shkrob, I.A.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$75100
Cumulative Total Project Cost:	\$75100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Enzymes for Cellulosic Ethanol Production: Structure-Function Studies

Project Identifier P/ANL2007-007

Principal Investigator Pokkuluri, P.R.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$197800
Cumulative Total Project Cost:	\$197800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Astrochemical Studies of the Origins of Life using Circularly Polarized Synchrotron Radiation

Project Identifier P/ANL2007-008

Principal Investigator Rosenberg, Richard

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$135200
Cumulative Total Project Cost:	\$135200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Anti-Thrombogenic Coatings for Cardiovascular Implants

Project Identifier P/ANL2007-013

Principal Investigator Erdemir, A.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$181000
Cumulative Total Project Cost:	\$181000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Whole Cell-Based Biosensors and Bioelectronics

Project Identifier P/ANL2007-027

Principal Investigator Firestone, Millicent

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$133400
Cumulative Total Project Cost:	\$133400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Evaluation of a New Tool for High-Throughput Protein Production and Purification - Elastic-Like Polypeptides

Project Identifier P/ANL2007-040

Principal Investigator Londer, Y.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$160300
Cumulative Total Project Cost:	\$160300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Aligned Carbon Nanotube as Pt-Free Electrode Catalyst for Fuel Cell

Project Identifier P/ANL2007-044

Principal Investigator Liu, D.-J.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$135200
Cumulative Total Project Cost:	\$135200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Engineered Biodegradable Nanospheres for Targeted Medical Therapy

Project Identifier P/ANL2007-048

Principal Investigator Kaminski, M.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$199300
Cumulative Total Project Cost:	\$199300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Catalysis of the Bromine-Water Reaction

Project Identifier P/ANL2007-053

Principal Investigator Beitz, J.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$128700
Cumulative Total Project Cost:	\$128700

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Development of In Situ Non-Resonant X-Ray Scattering Technique and Its Application to Redox Reactions in Battery Materials

Project Identifier P/ANL2007-059

Principal Investigator Balasubramanian, M.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$118400
Cumulative Total Project Cost:	\$118400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Microporous Filters for Hydrogen Purification

Project Identifier P/ANL2007-060

Principal Investigator Schlueter, J.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$201700
Cumulative Total Project Cost:	\$201700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Optimizing Quantum Efficiency in Solid State Lighting Devices

Project Identifier P/ANL2007-064

Principal Investigator Liu, Guokui

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$91700
Cumulative Total Project Cost:	\$91700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Mesoscale Simulation of Bloodflow using Kinetic Theory

Project Identifier P/ANL2007-066

Principal Investigator Jung, J.-H.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$130500
Cumulative Total Project Cost:	\$130500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Sub-Millisecond Measurements of Structural Changes in Materials under Extreme Conditions

Project Identifier P/ANL2007-068

Principal Investigator Islam, Z.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$169900
Cumulative Total Project Cost:	\$169900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Design and Synthesis of New Nanocarbon Composites from Carbon Nanotubes and Ultrananocrystalline Diamond

Project Identifier P/ANL2007-071

Principal Investigator Curtiss, L.A.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$190000
Cumulative Total Project Cost:	\$190000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Magnetically Targeted Thermal Tumor Therapy using Designer Nanospheres

Project Identifier P/ANL2007-075

Principal Investigator Novosad, V.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$225500
Cumulative Total Project Cost:	\$225500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Identification and Characterization of Ovarian Cancer Stem Cells Towards Ultimate Cancer Treatment

Project Identifier P/ANL2007-080

Principal Investigator Jin, Q.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$98500
Cumulative Total Project Cost:	\$98500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Solar Thermoelectric Energy Conversion in Nanocomposites

Project Identifier P/ANL2007-088

Principal Investigator Welp, U.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$103200
Cumulative Total Project Cost:	\$103200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Super Solar Cell Efficiency using Up- and Down-Conversion in Fluorozirconate Glass Ceramics

Project Identifier P/ANL2007-091

Principal Investigator Johnson, J.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$75800
Cumulative Total Project Cost:	\$75800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Identification of Regulatory Elements in Bioenergy Organisms

Project Identifier P/ANL2007-094

Principal Investigator Collart, F.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$99100
Cumulative Total Project Cost:	\$99100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Imaging Polymer-Mediated Repair of the Neuronal Plasma Membrane at the Nanoscale Level

Project Identifier P/ANL2007-095

Principal Investigator Firestone, Millicent

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$61200
Cumulative Total Project Cost:	\$61200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Phase-Enhancement Micro-Computed Tomography

Project Identifier P/ANL2007-096

Principal Investigator De Carlo, Francesco

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$61100
Cumulative Total Project Cost:	\$61100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Development of a Laser Wakefield Accelerator Operating in the Bubble Regime

Project Identifier P/ANL2007-098

Principal Investigator Gai, W.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$280200
Cumulative Total Project Cost:	\$280200

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Development of High Spatial Resolution Area Detector for Protein Powder Diffraction

Project Identifier P/ANL2007-099

Principal Investigator Von Dreele, R.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$49600
Cumulative Total Project Cost:	\$49600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Transition Edge Sensors (TES)

Project Identifier P/ANL2007-100

Principal Investigator Novosad, V.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$614100
Cumulative Total Project Cost:	\$614100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Demonstration of the High Intensity Light Ion Driver Linac

Project Identifier P/ANL2007-104

Principal Investigator Ostroumov, P.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$128700
Cumulative Total Project Cost:	\$128700

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Development of Concepts for a Super Separator-Spectrometer

Project Identifier P/ANL2007-105

Principal Investigator Erdelyi, B.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$155800
Cumulative Total Project Cost:	\$155800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Heavy Ion Therapy with Radioactive Beams

Project Identifier P/ANL2007-106

Principal Investigator Nolen, J.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$81700
Cumulative Total Project Cost:	\$81700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Development of Unique Environmental Basic Research Capabilities for Sustainable Bioenergy Research

Project Identifier P/ANL2007-107

Principal Investigator Miller, R.M.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$99100
Cumulative Total Project Cost:	\$99100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Studies of Liquid Helium (He-II) Coolability of Cryogenic Moderators

Project Identifier P/ANL2007-108

Principal Investigator Micklich, B.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$29900
Cumulative Total Project Cost:	\$29900

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Development of Neutron Scattering Kernels for Deuterated Materials at Cryogenic Temperatures

Project Identifier P/ANL2007-109

Principal Investigator Micklich, B.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$700
Cumulative Total Project Cost:	\$700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Membrane Analysis and Simulation System (MASS)

Project Identifier P/ANL2007-110

Principal Investigator Faibish, R.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$171800
Cumulative Total Project Cost:	\$171800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Standoff Monitoring of Acoustic Signatures by MMW Modulated Scattering Technique

Project Identifier P/ANL2007-113

Principal Investigator Bakhtiari, S.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$149100
Cumulative Total Project Cost:	\$149100

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Highly Selective Catalytic Process for Producing Ethanol from Coal- or Bio-Derived Syn Gas

Project Identifier P/ANL2007-114

Principal Investigator Rathke, J.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$74900
Cumulative Total Project Cost:	\$74900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Synthesis and Characterization of Hybrid Diblock Copolymer Nanocomposites with Ordered Arrays of Inorganic Nanoparticles

Project Identifier P/ANL2007-126

Principal Investigator Thiyagarajan, P.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$88900
Cumulative Total Project Cost:	\$88900

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Development of Techniques for Neutron Microscopy using Very-Cold Neutrons

Project Identifier P/ANL2007-129

Principal Investigator Lal, J.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$78900
Cumulative Total Project Cost:	\$78900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Low-Friction, Barrier Coatings for Hydrogen Direct Injection Engines

Project Identifier P/ANL2007-130

Principal Investigator Erdemir, A.

Point of Contact Kaufmann, Elton

Type of Research

Development

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$98100
Cumulative Total Project Cost:	\$98100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Collection and Evaluation of Detailed Design Information on Russian Research Reactors

Project Identifier P/ANL2007-132

Principal Investigator Chamberlain, D.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$36400
Cumulative Total Project Cost:	\$36400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project An Ultra-Sensitive Detection Assay Based on DNA-Modulated Enzymatic Visualization

Project Identifier P/ANL2007-133

Principal Investigator Chen, L.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$118700
Cumulative Total Project Cost:	\$118700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Development of Digital Pixel Array X-Ray Detector Technology

Project Identifier P/ANL2007-135

Principal Investigator Ross, S.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$50016
Cumulative Total Project Cost:	\$50016

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Development of Advanced Earth System Modeling and Science Capability at Argonne

Project Identifier P/ANL2007-139

Principal Investigator Kotamarthi, Veerabhadra

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$58200
Cumulative Total Project Cost:	\$58200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Second-Sound Diagnostic Thermometry for ILC Cavities

Project Identifier P/ANL2007-142

Principal Investigator Shepard, K.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$71500
Cumulative Total Project Cost:	\$71500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project High-Performance Low-Velocity Superconducting Accelerating Structure

Project Identifier P/ANL2007-143

Principal Investigator Shepard, K.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$103700
Cumulative Total Project Cost:	\$103700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Characterization of Silicon Photomultiplier Sensors for Scientific Research Applications

Project Identifier P/ANL2007-145

Principal Investigator Drake, G.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$99900
Cumulative Total Project Cost:	\$99900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project A Systems Biology Approach to Directional Pathfinding

Project Identifier P/ANL2007-146

Principal Investigator Rodi, D.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$99200
Cumulative Total Project Cost:	\$99200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Metal and Semiconductor Nanoparticle Assemblies: Controlled Quantum Coupling on the Nanometer Scale

Project Identifier P/ANL2007-150

Principal Investigator Pelton, M.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$95700
Cumulative Total Project Cost:	\$95700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Direct Ethanol Fuel Cell with Transition Metal Decorated Carbon Nanotube Electrode Assembly

Project Identifier P/ANL2007-153

Principal Investigator Liu, D.-J.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$97600
Cumulative Total Project Cost:	\$97600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Solarplasmonics

Project Identifier P/ANL2007-154

Principal Investigator Gray, S.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$148100
Cumulative Total Project Cost:	\$148100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Rapidly Recomposable Simulations to Support Complex Adaptive System Comparative Analysis Dynamic Environment for Emerging Societies

Project Identifier P/ANL2007-156

Principal Investigator Hummel, J.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$124300
Cumulative Total Project Cost:	\$124300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Molecular Machines: The Visualization of Motions

Project Identifier P/ANL2007-157

Principal Investigator Attenkofer, K.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$93600
Cumulative Total Project Cost:	\$93600

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project An Integrated X-Ray/Neutron Approach to Magnetic Depth Profiling in Artificial Nanostructures

Project Identifier P/ANL2007-158

Principal Investigator Haskel, D.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$87800
Cumulative Total Project Cost:	\$87800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Fundamental Understanding Breakup Process during Injection of Alternative Fuels

Project Identifier P/ANL2007-160

Principal Investigator Wang, J.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$149543
Cumulative Total Project Cost:	\$149543

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Systems Biology for Enhanced Bioconversions

Project Identifier P/ANL2007-161

Principal Investigator White, K.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$385700
Cumulative Total Project Cost:	\$385700

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Metagenomics and Discovery for Biofuels

Project Identifier P/ANL2007-162

Principal Investigator White, K.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$512600
Cumulative Total Project Cost:	\$512600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project A Framework for Scalable Statistical Genomics

Project Identifier P/ANL2007-164

Principal Investigator Meyer, F.

Point of Contact Kaufmann, Elton

Type of Research Applied

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$71500
Cumulative Total Project Cost:	\$71500

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Real-Time Analysis of Advanced Photon Source Data

Project Identifier P/ANL2007-165

Principal Investigator von Laszewski, G.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$291500
Cumulative Total Project Cost:	\$291500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Developing Analysis Services for Petascale Computing

Project Identifier P/ANL2007-166

Principal Investigator Foster, I.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$192500
Cumulative Total Project Cost:	\$192500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Acquisition of Preliminary Data on the Influence of Radiation Fields on Separation Efficacy

Project Identifier P/ANL2007-168

Principal Investigator Soderholm, L.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$49800
Cumulative Total Project Cost:	\$49800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Ultrafast Dynamics of Magnetic Nanostructures

Project Identifier P/ANL2007-169

Principal Investigator Buchanan, K.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$93900
Cumulative Total Project Cost:	\$93900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Understanding Synthesis of High Efficiency Solid-State Lighting Materials

Project Identifier P/ANL2007-170

Principal Investigator Stephenson, G. Brian

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$94200
Cumulative Total Project Cost:	\$94200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Accelerator Chamber Optimization through Advanced Wakefield Simulation

Project Identifier P/ANL2007-171

Principal Investigator Chae, Y.-C.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$165200
Cumulative Total Project Cost:	\$165200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Activated Carbon Nanotubes for New Nanoarchitectures

Project Identifier P/ANL2007-175

Principal Investigator Zapol, P.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$98800
Cumulative Total Project Cost:	\$98800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project In Situ Synchrotron X-Ray and Density Functional Theory Studies of the Self-Assembly of Metal Nanoparticles

Project Identifier P/ANL2007-176

Principal Investigator Fong, Dillon

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$36200
Cumulative Total Project Cost:	\$36200

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Adaptation of the MISANS (Modulated Intensity Small Angle Neutron Scattering) Instrument to Very Cold Neutrons

Project Identifier P/ANL2007-179

Principal Investigator Lal, J.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$48600
Cumulative Total Project Cost:	\$48600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Astrophysics

Project Identifier P/ANL2007-180

Principal Investigator Kuhlmann, S.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$330100
Cumulative Total Project Cost:	\$330100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project HEIGHTS-3D Integrated Multi-Physics Simulation Package for Future Petascale Supercomputers

Project Identifier P/ANL2007-181

Principal Investigator Morozov, V.

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$153100
Cumulative Total Project Cost:	\$153100

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project Investigation of Continuous Wave (CW) Superconducting Accelerating and Deflecting RF Structures for High Average RF Power Accelerators

Project Identifier P/ANL2007-182

Principal Investigator Nassiri, A.

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$49300
Cumulative Total Project Cost:	\$49300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Beam Control for Energy Recovery Linacs: Dynamics and Diagnostics

Project Identifier P/ANL2007-185

Principal Investigator Borland, Michael

Type of Research Applied

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$82400
Cumulative Total Project Cost:	\$82400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Solid State Chemistry for Advanced Thermoelectric Materials

Project Identifier P/ANL2007-186

Principal Investigator Kanatzidis, M.

Type of Research Basic

Point of Contact Kaufmann, Elton

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$497400
Cumulative Total Project Cost:	\$497400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project High Brightness CW Injector for the Energy Recovery Linac

Project Identifier P/ANL2007-187

Principal Investigator Harkay, Katherine

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$50000
Cumulative Total Project Cost:	\$50000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Argonne National Lab

Project Multidisciplinary Theory Investigations

Project Identifier P/ANL2007-189

Principal Investigator Wagner, A.

Point of Contact Kaufmann, Elton

Type of Research Basic

POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$701300
Cumulative Total Project Cost:	\$701300

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Argonne National Lab

Project COGENT - Coherent Germanium Neutrino Technology

Project Identifier P/ANL2007-190

Principal Investigator Reyna, David

Point of Contact Kaufmann, Elton

Type of Research

Development
POC Phone 630-252-3606

FY 2007 Project Costs

Total:	\$68500
Cumulative Total Project Cost:	\$68500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Complex Thin Films and Nanomaterial Properties

Project Identifier 04-038

Principal Investigator Misewich, James

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$193935
Cumulative Total Project Cost:	\$755318

Description of Project

Create complex oxide/functional nanomaterial integrated structures to enhance our understanding of the transport and optical properties of nanomaterial systems

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Heavy Ion Physics with the ATLAS Detector

Project Identifier 05-006

Principal Investigator Takai, Helio

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$64333
Cumulative Total Project Cost:	\$194099

Description of Project

The ATLAS collaboration is exploring its detector potential to carry out a heavy ion physics program. Further simulation studies and heavy ion specific analysis tools need to be developed.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Behavior of Water on Chemically Modified Semiconductor Surfaces: Toward Photochemical Hydrogen Production

Project Identifier 05-028

Principal Investigator Fujita, Etsuko

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$40089
Cumulative Total Project Cost:	\$288941

Description of Project

Intend to study both the absorption of water on well-defined single crystal surfaces of TiO₂ and SrTiO₃ and the reaction of the adsorbed water with and without irradiation using photoemission, x-ray absorption spectroscopy, Scanning Tunneling Microscopy, time-resolved x-ray diffraction, and Density Functional Theory.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Multifunctional Nanomaterials for Biology

Project Identifier 05-041

Principal Investigator Wong, Stan

Point of Contact Fox, Kevin

Type of Research

Development
POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$24867
Cumulative Total Project Cost:	\$298539

Description of Project

Propose to synthesize nanomaterials with simultaneous biological and physical functions for application in life sciences. Will explore the use of carbon nanotubes as a platform for integrating biological specificity with physical function such as fluorescence or conductivity.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Intense THz Source & Application to Magnetization Dynamics

Project Identifier 05-044

Principal Investigator Carr, Larry

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$63908
Cumulative Total Project Cost:	\$245987

Description of Project

Recently, an order of magnitude more powerful accelerator-based ultrafast Terahertz (THz) source has been developed. The new source generates ultrafast (few ps) pulses with peak fields exceeding 1 MV/cm, and magnetic fields of several kilogauss. Propose to use these short magnetic field pulses to examine the magnetization dynamics of a range of hard ferromagnets, starting with Co-Pt alloys and multilayers.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Nano-Imaging of Whole Cells with Hard X-Ray Microscopy

Project Identifier 05-048

Principal Investigator Miller, Lisa

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$75631
Cumulative Total Project Cost:	\$186286

Description of Project

Develop 3-dimensional, high-resolution, hard x-ray imaging techniques for the study of whole living cells and the development of unique nanoscale probes with superior spatial resolution and penetration depth, which will be a strong complement to the existing imaging techniques at the NSLS.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Development of Methodologies for Analyzing Transcription Factor Binding in Whole Genomes

Project Identifier 05-058

Principal Investigator Anderson, Carl

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$71979
Cumulative Total Project Cost:	\$308653

Description of Project

Propose to combine Genome Signature Tags (GST) methodology with another technique called chromatin immunoprecipitation (ChIP) to identify the specific loci in human DNA to which the p53 transcription factor binds. Will validate and optimize this methodology using the human p53 tumor suppressor protein as an example. The technique should be applicable to characterizing the binding sites, and equally importantly, how transcription factor binding changes under different physiological conditions.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Positron Labeled Stem Cells for Non-Invasive PET Imaging Studies of In-Vivo Trafficking and Biodistribution

Project Identifier 05-068

Principal Investigator Srivastava, Suresh

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$150857
Cumulative Total Project Cost:	\$354831

Description of Project

Develop methods for radiolabeling progenitor stem cells for noninvasively tracking their behavior and fate in vivo through PET imaging, and thus help elucidate their overall role in organ and tissue regeneration in disease states. Evaluate and develop the monoclonal antibody approach for cell labeling, which will involve radiolabeling the cell-specific antibody first and then stably and irreversibly attach it to the progenitor stem cell under study.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Novel Multi-Modality MRI and Transcranial Magnetic Stimulation to Study Brain Connectivity

Project Identifier 05-070

Principal Investigator de Castro Caparelli, Elisabeth

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$17673
Cumulative Total Project Cost:	\$268641

Description of Project

Propose to develop a revolutionary methodology integrating transcranial magnetic stimulation (TMS) and simultaneous acquisition of functional MRI (fMRI), diffusion weighted imaging (DWI) and diffusion tensor imaging (DTI), using BNL's 4T MR scanner, so as to provide unique windows on brain function and connectivity. The novel combination of transcranial magnetic stimulation (TMS) and this multi-modality of MRI techniques in a high magnetic field will allow one to answer fundamental questions relating to brain behavior and its anatomical basis.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Feasibility of CZT for Next-Generation PET Performance

Project Identifier 05-072

Principal Investigator Vaska, Paul

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$146903
Cumulative Total Project Cost:	\$394112

Description of Project

Will evaluate cadmium zinc telluride (CZT) as a detector material for PET applications. The utilization of CZT has the potential to be the driving force for a new generation of high performance PET cameras.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Biology on Massively Parallel Computers

Project Identifier 05-074

Principal Investigator Davenport, James

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Develop new algorithmic approaches for computational biology on massively parallel computers. That makes effective use of machines such as the 10,000 processor Quantum Chromodynamics on Chip (QCDOC) and the 131,00 processor BlueGene/L (BG/L).

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Giant Proximity Effect in High-Temperature Superconductors

Project Identifier 05-104

Principal Investigator Bozovic, Ivan

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$253039
Cumulative Total Project Cost:	\$887629

Description of Project

Propose to investigate systematically the Giant Proximity Effect (GPE) in high-temperature superconductors (HTS). We will use a state-of-the-art atomic-layer-by-layer molecular beam epitaxy (All-MBE) system which allows us to synthesize atomically perfect HTS films and fabricate precise multilayers and super-lattices with one-unit cell thick HTS or spacer layers.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Computational Science

Project Identifier 05-110

Principal Investigator Davenport, James

Point of Contact Fox, Kevin

Type of Research Basic

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$58056
Cumulative Total Project Cost:	\$58056

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Study of High-Tc Nanostructures

Project Identifier 05-114

Principal Investigator Bozovic, Ivan

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$257238
Cumulative Total Project Cost:	\$890115

Description of Project

Propose to investigate systematically the effects of reduced dimensionality and confined geometries on high-temperature superconductors (HTS). Should allow us to attack some of the most basic questions in the HTS physics such as what are the spin and the charge of free carriers, what is the nature of superconducting transition - do Cooper pairs form and condense at T_c or else the pairs formed at some higher temperature T^* undergo Bose-Einstein condensation at T_c - and is the presence of dynamic stripes a necessary condition for HTS to occur. Will use a state-of-the-art atomic-layer-by-layer molecular beam epitaxy (ALL-MBE) system and synthesize atomically smooth HTS films, multilayers and superlattices that contain one-unit cell thick HTS layers.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Lattice Studies of QCD Thermodynamics on the QCDOC

Project Identifier 06-001

Principal Investigator Karsch, Frithjof

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$157655
Cumulative Total Project Cost:	\$316447

Description of Project

Two quantum chromodynamic on a chip (QCDOC) computers will allow significant progress in numerical studies of the QCD equation of state as well as in the study of in-medium modifications of hadron properties. It will, for the first time, allow the calculation of the QCD equation of state, the transition temperature, and General critical parameters with a realistic quark mass spectrum.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Detector Development for Very Long Baseline Neutrino Exp.

Project Identifier 06-004

Principal Investigator Diwan, Milind

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$101110
Cumulative Total Project Cost:	\$167340

Description of Project

Obtain simulations and development of new concepts for very large (500 kT) multipurpose detectors. Will be used for the very long baseline experiment using a wide band high energy super-neutrino beam from the BNL-AGS directed to a future Deep Underground Science and Engineering Laboratory located in the western U.S., possibly in the Homestake mine in South Dakota.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Detector for High Quality Images of Electron Microscopy

Project Identifier 06-012

Principal Investigator Rehak, Pavel

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$140791
Cumulative Total Project Cost:	\$210971

Description of Project

Develop an Active Pixel Imager (API) based detector for electron microscopy. Will establish the principles of a new detector for an electron microscope that will be capable of providing images of optimum quality at high enough rates for dynamic studies of biological objects of interest in nanoscience.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Transmission Photocathode Development

Project Identifier 06-017

Principal Investigator Smedley, John

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$134846
Cumulative Total Project Cost:	\$202316

Description of Project

Aims to address the need for high quantum efficiency cathodes that can be operated in transmission mode at cryogenic temperatures and deliver average currents in excess of 10mA.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Synthesis and Characterization of Band-Gap-Narrowed TiO₂ Thin Films and Nanoparticles for Solar Energy Conversion

Project Identifier 06-021

Principal Investigator Sutter, Eli

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$208731
Cumulative Total Project Cost:	\$278215

Description of Project

Propose to develop techniques for producing doped oxide focusing on one material system (TiO₂) and on two morphological modifications of doped TiO₂ that are of the highest relevance for basic research on photoelectrolysis: nanoparticles and single crystal films.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Multiscale Analysis of In Vivo Nanoparticle Exposure

Project Identifier 06-026

Principal Investigator Schiffer, Wynne

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$188164
Cumulative Total Project Cost:	\$380342

Description of Project

This proposal describes a unique multiscale approach to investigate the mechanism of nanoparticle biodistribution and response of the system in living rodents using: (1) In-vivo imaging to study nanoparticle transport localization and the effects on physiologic function over time; (2) Optical and electron microscopy analysis for organ and tissue nanoparticle localization as evidence of bioaccumulation, cell viability and intracellular alterations of organelles and membranes; and (3) Assessment of nanoparticle impact using transcriptome and DNA microarray analysis.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Development of Gadolinium-Loaded Liquid-Scintillators with Long-Term Chemical Stability for a New High-Precision Measurement of the Neutrino Mixing Angle, Theta-13

Project Identifier 06-030

Principal Investigator Hahn, Richard

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$190494
Cumulative Total Project Cost:	\$390440

Description of Project

Perform high-precision measurement with antineutrinos from a nuclear power reactor of theta-13, the only neutrino mixing-angle whose value is not known.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Electronic Properties of Carbon Nanotubes and Novel Multicomponent Nanomaterials

Project Identifier 06-037

Principal Investigator Hill, John

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$179435
Cumulative Total Project Cost:	\$225025

Description of Project

The promise of nanomaterials for electronic and photonic applications is many-fold and thus a range of sample preparation, characterization and theoretical tools will be brought to bear on carbon nanotubes.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Growth and Characterization of CdZnTe Crystals for Improved Nuclear Radiation Detectors

Project Identifier 06-038

Principal Investigator Gu, Genda

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$187698
Cumulative Total Project Cost:	\$250630

Description of Project

Detection of gamma rays, CdZnTe (CZT) is recognized as the best choice of material for room-temperature operation. Furthermore, it is quite challenging to grow crystals of CZT because of the high vapor pressures of the constituent elements and they must be thick. Producing such crystals thus becomes the thrust of this proposal.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Design, Synthesis and Characterization of a New Class of Hydrocarbon Polymers Containing Zwitter Ions and Nanostructured Composites for High Temperature Membrane in PEM Fuel Cells

Project Identifier 06-039

Principal Investigator Yang, Xiao-Qing

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$130812
Cumulative Total Project Cost:	\$264143

Description of Project

Focused on the design, synthesis, and characterization of a new class of hydrocarbon polymers for high temperature polymer electrolyte membrane fuel cell membranes by utilizing the unique hydrophilic nature of zwitter ions and the nano-porosity of the sol-gel nanocomposites.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Novel Materials for Hard X-Ray Optics

Project Identifier 06-046

Principal Investigator Evans-Lutterodt, Kenneth

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$157550
Cumulative Total Project Cost:	\$182359

Description of Project

Will fabricate single and compound diamond kinoform lenses for 10keV hard x-rays, and will compare their performance with theoretical expectation approval for the amount of \$10.5M for FY 2005. Planning was for approval of \$8.5M in projects with \$1M in reserves. Explore the need for high quality hard x-ray optics with sub-10nm resolution and with high efficiency, to enable the full range of hard x-ray microscopy and spectroscopy techniques that will benefit nanoscience.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Nano-Crystallography of Individual Nanotubes and Nanoparticles

Project Identifier 06-047

Principal Investigator Nelson, Christie

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$142182
Cumulative Total Project Cost:	\$204855

Description of Project

Will investigate the application of x-ray diffraction to the study of individual nanomaterials as they offer a potential for simultaneous in-situ nanomaterial functional and structural determination. Questions to address are: (1) Can x-ray diffraction patterns be obtained with useful statistics; (2) Can nano-samples survive the required high doses of x-ray radiation; (3) Would the diffraction patterns be completely blurred, e.g., by finite-size (Scherrer) broadening, or would they contain useful information; and (4) What tools are needed for the interpretation of those data.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project High-Temperature Superconducting Magnet Development

Project Identifier 06-052

Principal Investigator Tanabe, Toshiya

Point of Contact Fox, Kevin

Type of Research

Development
POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$209443
Cumulative Total Project Cost:	\$446289

Description of Project

Propose to develop High-Temperature Superconducting (HTS) accelerator magnets that could replace conventional synchrotron lattice and beam transport magnets to reduce operating cost and facilitate upgrades in machine performance.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Epigenetics: Methamphetamine (MAP)-Induced Brain Dysfunction and Methylation of DNA

Project Identifier 06-056

Principal Investigator Dunn, John

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$115760
Cumulative Total Project Cost:	\$192380

Description of Project

We propose combining our Genomic Signature Tag (GST) technology with anGeneral new technique called duplex-specific nuclease normalization to isolate and catalogue, in an unbiased manner, the subset of rat genes that are epigenetically modified by changes in DNA methylation following MAP treatment. Our approach will be unique as it will be able to identify changes at the whole genome level.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Molecular Mechanism of Chromosomal Replication Initiation in Eukaryotic System

Project Identifier 06-060

Principal Investigator Li, Hiulin

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$210492
Cumulative Total Project Cost:	\$312351

Description of Project

Long-term goal is to derive an understanding of the mechanism of DNA replication initiation through cryo-EM structural studies of the original recognition complex (ORC) and its further complexes with DNA and General essential replication initiation factors. Want to understand how the DNA is recognized and melted by ORC, and how the helicase is loaded onto the melted DNA by pre-RC, a complex formed by ORC and Cdc6.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Diversification of Isoflavonoid Biosynthesis

Project Identifier 06-061

Principal Investigator Liu, Chang-Jun

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$477915
Cumulative Total Project Cost:	\$915243

Description of Project

Propose to conduct directed enzyme evolution with isoflavone hydroxylases, a group of P450 enzymes, to create a set of novel biocatalysts. Long-range goal is to genetically diversify the isoflavonoid biosynthetic repertoire in plants by using the engineered biocatalysts and to explore the therapeutic value of the structurally diversified isoflavonoid chemical library with or without further semi-synthetic modification.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Metabolic Flux Analysis in Arabidopsis Thaliana

Project Identifier 06-065

Principal Investigator Schwender, Jorg

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$469343
Cumulative Total Project Cost:	\$894854

Description of Project

Initiate studies to quantitatively analyze seed metabolism in Arabidopsis thaliana. Established methods of in-vivo ¹³C-steady state metabolic flux analysis will be applied to developing seeds of Arabidopsis thaliana.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Transformation and Fate of Nanomaterials in the Environment

Project Identifier 06-066

Principal Investigator Fitts, Jeffrey

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$147694
Cumulative Total Project Cost:	\$287780

Description of Project

Propose to develop a molecular-level chemical understanding of the biogeochemical transformation in the natural environment of nanocrystals and nanoparticles functionalized with various organic molecules. Will determine the ultimate fate of nanoparticles (transport and persistence) and the path they take to humans. Will specifically explore the molecular-level processes that alter and breakdown both the organic coating and inorganic core of water-soluble nanoparticles.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Development of a Cloud Condensation Nucleus Separator

Project Identifier 06-071

Principal Investigator Wang, Jian

Point of Contact Fox, Kevin

Type of Research

Development
POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$139591
Cumulative Total Project Cost:	\$209252

Description of Project

Plan to develop a novel Cloud Condensation Nucleus Separator (CCN separator) that separates CCN and non-CCN under climatically important supersaturations.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Aluminum Hydride - An Ideal Hydrogen Source for Small Fuel Cells

Project Identifier 06-074

Principal Investigator Graetz, Jason

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$133579
Cumulative Total Project Cost:	\$266180

Description of Project

Involves the synthesis and fundamental characterization of the seven crystalline aluminum hydride (AlH₃) polymorphs: \acute{a} , \acute{a}' , \hat{a} , \tilde{a} , \grave{a} , \hat{a} , and \ae . The crystallographic structures and the thermodynamic properties of each of the phases will be determined and used to establish the relative stabilities of the different AlH₃ polymorph structures and how phase transitions occur between polymorphs.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Gamma Ray Imager for National Security Applications

Project Identifier 06-087

Principal Investigator Vanier, Peter

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$156670
Cumulative Total Project Cost:	\$267050

Description of Project

A next-generation coded-aperture gamma ray imager for nuclear materials detection will be developed by integrating expertise in national security technology, medical imaging physics, and electronics development. The gamma-ray detector portion of the imager is based on a similar device developed for Positron Emission Tomography applications, consisting of custom-designed application-specific integrated circuits for pixel-by-pixel readout of arrays of avalanche photodiodes that detect scintillation light from commercially available scintillator materials.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Neurogenomics: Collaboration Between the Biology Department and the Brookhaven Center for Translational Neuroimaging to Investigate Complex Disease States

Project Identifier 06-088

Principal Investigator Fowler, Joanna

Point of Contact Fox, Kevin

Type of Research

Development
POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$152363
Cumulative Total Project Cost:	\$302334

Description of Project

Establish vital tools that combine genetics and neuroimaging to find causes for human disease. Will target genotypes that encode different levels of the major neurotransmitters of Dopamine and serotonin (5-HTT), that are known to regulate brain functioning and may confer vulnerability to certain disease.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Nanoparticle Labeled Neural Stem Cell Tracking In Vivo by Magnetic Resonance Microscopy

Project Identifier 06-092

Principal Investigator Benveniste, Helene

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$69428
Cumulative Total Project Cost:	\$178450

Description of Project

Develop and implement new technology using stem cells, nanoparticles coated with organic moieties, and high-resolution magnetic resonance microscopy to track the fate of neuronal stem cells on a bio-systems level in vivo.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project MicroCT Methods of Quantitative Adipose Imaging: Development of a Long-Term Assessment Technique for Studying Obesity in a Rodent Model

Project Identifier 06-094

Principal Investigator Wang, Gene-Jack

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$197924
Cumulative Total Project Cost:	\$275067

Description of Project

Propose to use a state-of-the-art microCT system, for quantitative fat measurements in mouse and rat models of obesity at high resolution. Plan to explore the feasibility of using the microCT 9-µm pixel size, and its wide range of beam energies (stemming from the wide 20-to-100 kVp) of the tube's high voltage values, combined with four different beam-filtration options (ranging from no filter to a 0.5-mm Cu) to image adipose tissue.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Photocatalytic Reduction of CO₂ in Supercritical CO₂

Project Identifier 06-097

Principal Investigator Grills, David

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$155011
Cumulative Total Project Cost:	\$235109

Description of Project

Toward solar H₂ production, the proposed research will demonstrate or achieve the following that: (1) The activation barrier for hydrogen elimination from the catalyst is controlled by the chelate bite angle of the diphosphine ligand; (2) The positioning and nature of the proton relay provided by the bridging N atom of 2 is essential for fast catalytic activity with low overpotentials; (3) The mechanism for proton reduction to form H₂ can be elucidated in a coordinated effort in theory and experiments in homogeneous solutions; and (4) Optimized catalysts can be attached to suitable cathodes in combination with band-gap-narrowed semiconductor photoanodes for solar production of H₂.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project QCD Thermodynamics at Non-zero Temperature and Density

Project Identifier 07-001

Principal Investigator Karsch, Frithjof

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-9185

FY 2007 Project Costs

Total:	\$389374
Cumulative Total Project Cost:	\$389374

Description of Project

Explore properties of Quantum Chromo Dynamics (QCD) at non-zero baryon chemical potential using methods suitable for studies of the canonical and grand canonical partition function of QCD. Will use numerical computations to determine the coefficient in high order series expansions that allow to estimate the location of the critical point.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Lattice QCD Simulations on BlueGene/L

Project Identifier 07-002

Principal Investigator Karsch, Frithjof

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$147308
Cumulative Total Project Cost:	\$147308

Description of Project

Plan to implement and optimize lattice simulation programs on BlueGene/L (BG/L). Also develop new programs specific to the need of lattice studies of Quantum Chromo Dynamics (QCD) thermodynamics.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Proof-of-Principle Laser System for ILC Positron Source

Project Identifier 07-004

Principal Investigator Pogorelsky, Igor

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$30202
Cumulative Total Project Cost:	\$30202

Description of Project

Propose initial demonstration in developing a practical approach to a polarized gamma source for producing positrons for the International Linear Collider (ILC) and the Compact Electron Positron Collider (CLIC) PPS; this design requires convincing experimental proof of feasibility.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Sensitive Searches for CP-Violation in Hadronic Systems

Project Identifier 07-005

Principal Investigator Semertzidis, Yannis

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$22183
Cumulative Total Project Cost:	\$22183

Description of Project

Seek to investigate (P)-symmetry and (T)-symmetry violating interactions in two hadronic systems. This will involve the analysis of the STAR data and investigating CP-violation in hot matter in collisions of heavy ions at RHIC. An additional aspect involves the development of the storage ring deuteron EDM (dEDM) proposal searching for CP-violation in ordinary temperature matter.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Feasibility and Design Studies for a Detector for e+p, e+A, p+p, p+A, and A+A Collisions at BNL

Project Identifier 07-006

Principal Investigator Ullrich, Thomas

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$33626
Cumulative Total Project Cost:	\$33626

Description of Project

Investigate the possibility of designing a new quantum chromodynamics "QCD lab detector" that will allow the study of e+p, e+A, as well as p+p, p+A, and A+A collisions with unprecedented coverage and precision would allow the exploration of all aspects of QCD.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project A Novel and Compact Muon Telescope Detector for QCD Lab

Project Identifier 07-007

Principal Investigator Xu, Zhangbu

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$34591
Cumulative Total Project Cost:	\$34591

Description of Project

Propose an R&D research on a large-area and cost-effective muon telescope detector (MTD) for RHIC and for next generation detectors at future QCD Lab from state-of-art multi-gap resistive plate chamber (MRPC) and large module and long strips.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Design Optimization of a Reactor Neutrino Experiment

Project Identifier 07-010

Principal Investigator Jaffe, David

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$72262
Cumulative Total Project Cost:	\$72262

Description of Project

Develop simulation tools for reactor-based neutrino oscillation experiments. Wish to adapt and further develop the present GEANT4-based simulation program under development by the Daya Bay collaboration.

United States Department of Energy
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Laboratory Brookhaven National Lab

Project Development of Laser beam Shaper for Low Emittance Electron Beams

Project Identifier 07-019

Principal Investigator Rao, Triveni

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$148086
Cumulative Total Project Cost:	\$148086

Description of Project

Evaluate different temporal and spatial modulators to shape a train of ultrafast light pulses to the format desirable for RHIC II and eRHIC. Select a suitable scheme, design and construct a modulator to deliver rectangular and ellipsoidal shapes from a Ti:sapphire laser oscillator. Amplify the shaped light pulses in an existing amplifier to investigate the effect of the amplification on the pulse shape. Perform appropriate diagnostics and establish a feedback routine for optimization.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Surface Engineered and Core-Shell Nanowires: Nanoscale Building Blocks for Third Generation Photovoltaics

Project Identifier 07-023

Principal Investigator Sutter, Peter

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$39534
Cumulative Total Project Cost:	\$39534

Description of Project

Focuses on exploring the synthesis, electronic, and optoelectronic properties of semiconductor nanowires with controlled surface termination, and of nanowire-based core-shell structures.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Precision Assembly of Nano-Objects – Approaching Artificial Photosynthesis

Project Identifier 07-025

Principal Investigator Sherman, William

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$40443
Cumulative Total Project Cost:	\$40443

Description of Project

Develop approaches for the precise positioned control of nano-objects in DNA scaffolds down to the sub-nanometer scale by building DNA cages that will hold individual nanoparticles at their centers via multiple addressable links and that will pave the way for future work assembling artificial photosynthetic systems with positional and orientation control.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Photocatalytic Carbon Dioxide Reduction to Methanol using Metal Complexes with an NADH Model Ligand

Project Identifier 07-027

Principal Investigator Fujita, Etsuko

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$78581
Cumulative Total Project Cost:	\$78581

Description of Project

Explore CO₂ reduction to methanol employing a new methodology to photochemically produce hydride donors using functionalized metal complexes with a reduced nicotinamide adenine dinucleotide (NADH) model ligand. Seeks to emulate natural photosynthetic systems for catalytic hydrogenation/reduction of CO₂ beyond CO and HCOO⁻. A combination of experimental and theoretical approaches will be pursued to investigate the mechanism and kinetics of several promising transition-metal complexes with NADH-model ligands for the photocatalytic reduction of CO₂ to methanol.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Structure of Mass-Size Selected Nanoparticles by Scanning Transmission Electron Microscopy

Project Identifier 07-030

Principal Investigator White, Michael

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$96768
Cumulative Total Project Cost:	\$96768

Description of Project

Propose to combine the unique capabilities of a newly developed size-selective deposition apparatus and the BNL scanning electron microscope facility to study the atomic structure of metal compound nanoclusters that represent model systems for heterogeneous catalysis. Would allow the atomic structure of small, metallic nanoclusters to be determined through measurements of single-particle electron diffraction using scanning transmission electron microscopy (STEM). Would directly address the critical need to understand how the electronic structure and chemical activity of supported nanoparticles correlates with atomic structure as the particle size changes.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Synthesis of Conjugated Polymers for Fundamental Questions in Solar Energy

Project Identifier 07-032

Principal Investigator Miller, John

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$112702
Cumulative Total Project Cost:	\$112702

Description of Project

Aims to develop a multidisciplinary capability for innovative synthesis and spectroscopic characterization of soft matter in the form of conjugated polymers, which can help us to understand the fundamental approaches in increasing the efficiency of the polymer solar cells. This capability will be built from combining the expertise in polymer synthesis and the expertise in ultrafast spectroscopic studies of charge transfer.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Ultra-thin Graphite Analog Compounds

Project Identifier 07-035

Principal Investigator Valla, Tonica

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$86876
Cumulative Total Project Cost:	\$86876

Description of Project

Seeks to develop single layer control of planar materials based on sp² bonding to make novel compounds and heterostructures. Will explore monolayer graphite and its analogs deposited on single-crystal substrates with the A1B2 structure. Will use chemical vapor deposition in conjunction with the planned facility to be installed in the CFN, to make some monolayers. Intend to generate model samples for attacking basic issues in correlated electron phenomena, such as using spin to split electron levels, novel quantum-hall effects, ballistic transport, and high-temperature superconductivity.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Lipid-Coated Nanoparticles and Their Interactions with Lipid Membrane Surfaces

Project Identifier 07-036

Principal Investigator Fukuto, Masa

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$26982
Cumulative Total Project Cost:	\$26982

Description of Project

Objectives are: (a) to make use of lipid membrane coatings to render inorganic nanoparticles (NPs) both bio-compatible and bio-functional, via protein inclusion or binding; and (b) to study the interactions between such NPs and lipid membrane surfaces. Primary goals are: (i) to establish the expertise in coating NPs of various sizes with simple lipid bilayer membranes, and (ii) to investigate the interactions of lipid-coated NPs (LCNPs) with simple model lipid membrane surfaces and to identify the parameters that promote membrane fusion.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Genome Analysis of Endophytic Bacteria that Promote Growth of Poplar for Biomass Production

Project Identifier 07-040

Principal Investigator Taghavi, Safiyh

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$251949
Cumulative Total Project Cost:	\$251949

Description of Project

Aim is to identify genes used by endophytic bacteria to enter and stimulate the biomass production of their host in order to optimize this concept for improved poplar biomass production. Propose to assemble genomes of 4 bacteria, to set up a genome annotation platform, to annotate their genomes, to perform data mining in order to identify endophytic functions involved in plant colonization and stimulation of plant growth, and to use directed mutagenesis for confirmation of gene functions.

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Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Structural Features of the Oxygen Tolerant Hydrogenase from *Thermatoga neapolitana*

Project Identifier 07-041

Principal Investigator Van der Lelie, Daniel

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$268175
Cumulative Total Project Cost:	\$268175

Description of Project

This project aims at determining which features of the [FeFe]-hydrogenase complex are responsible for the observed oxygen tolerance. Obtain sufficient purified *T. neapolitana* [FeFe]-hydrogenase complex to perform a detailed study of its oxygen tolerance and to functionally overexpress the protein in *E. coli*.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Characterization of Enzymatic O-acylation to Facilitate Biomass and Bioenergy Production

Project Identifier 07-047

Principal Investigator Liu, Chang-Jun

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$8653
Cumulative Total Project Cost:	\$8653

Description of Project

Propose an integrated biochemical genomics approach of combining bioinformatics analysis, protein homology modeling-based functional prediction, transcriptional profiling, and in vitro enzymatic assay to systemically characterize poplar acyl-CoA dependent acyltransferases that are involved in O-acylation of cell-wall lignocelluloses and heartwood forming metabolites, and to further explore the catalytic mechanism of acyltransferase in modification of cell-wall structural components and non-structural metabolites.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Functional Neurochemistry

Project Identifier 07-048

Principal Investigator Tomasi, Dardo

Point of Contact Fox, Kevin

Type of Research

Development
POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$4185
Cumulative Total Project Cost:	\$4185

Description of Project

Aim to develop 1) novel radio frequency (RF) surface coils for high field MRI/MRS with enhanced sensitivity, 2) novel pulse sequences for localized 1H-fMRS with high temporal resolution, and 3) novel data analysis methods to dynamically explore brain neurochemistry and function. Will use brief as well as prolonged blocked visual stimulation to induce measurable changes of metabolite concentrations in primary visual cortices, while fMRI and fMRS will be acquired in an interleaved fashion.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Miniaturized RF Coil Arrays for MicroMRI

Project Identifier 07-054

Principal Investigator Smith, S. David

Point of Contact Fox, Kevin

Type of Research

Development
POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$85274
Cumulative Total Project Cost:	\$85274

Description of Project

Propose to develop novel, high performance radio frequency (RF) coil arrays for improved imaging on the Medical Department's 9.4 Tesla (400 mhz) micro MRI system. Will construct a variety of new coil arrays developed specifically for use in the 'parallel imaging' mode.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Neurocomputation at BCTN: Developing Novel Computational Techniques to Study Brain Function in Health and Disease

Project Identifier 07-055

Principal Investigator Goldstein, Rita

Point of Contact Fox, Kevin

Type of Research

Development
POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$150052
Cumulative Total Project Cost:	\$150052

Description of Project

Create a fully integrative PET-fMRI-ERP neurocomputational network, map of the cogent human brain at the chemical metabolic (PET), anatomical and psychologically functional (fMRI, ERP) domains. Will bridge PET, fMRI and ERP technologies to develop a state-of-the-art neurocomputational platform supporting multi-dimensional computational analysis of the human brain (chemical, metabolic, anatomical and psychologically functional).

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project A Non-Fermentation Route to Convert Biomass to Bioalcohols

Project Identifier 07-059

Principal Investigator Mahajan, Devinder

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$91924
Cumulative Total Project Cost:	\$91924

Description of Project

Propose a novel non-fermentation approach to ethanol synthesis that will utilize syngas produced by gasification (“thermochemical route”) of low-moisture content biomass such as wood chips or switchgrass. The first step involves design of a metal catalyst that can deliver high turnover numbers for syngas to methanol transformation under mild conditions of temperature (100o – 130oC) and pressure (2-5 MPa). The second step requires efficient and selective catalyzed homologation of methanol to ethanol with base activated nanosized Ni-Ru catalyst at T < 200oC to promote dehydration.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Fate and Reactivity of Carbon Nanoparticles (CNPs) Exposed to Aqueous Environmental Conditions

Project Identifier 07-062

Principal Investigator Panessa-Warren, Barbara

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$93987
Cumulative Total Project Cost:	\$93987

Description of Project

Electron diffraction will be used to study nanoscale changes in carbon nanoparticles (CNPs) morphology, surface charge, and chemical functionality to elucidate the nature and mechanisms of environmentally-induced CNP alterations and reactivity; revealing the potential risks of discarded CNPs.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Development of Room-temperature CdMnTe Gamma-ray Detectors

Project Identifier 07-073

Principal Investigator Cui, Yonggang

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$93736
Cumulative Total Project Cost:	\$93736

Description of Project

Develop new detectors based on CdMnTe (CMT) which has the requirements for a low-cost, good-resolution room-temperature gamma-ray detector. These are demands not yet covered by General compact room-temperature semiconductor detectors.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Developing a New Framework for Investigating Earth's Climate and Climate Change

Project Identifier 07-075

Principal Investigator Liu, Yangang

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$98260
Cumulative Total Project Cost:	\$98260

Description of Project

Develop a new framework for studying earth's climate and climate change by examining the role of entropy (budget) in shaping earth's climate and its change. The second objective is to seek simple guiding principles that govern earth's climate as a whole without knowing the microscopic details.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project A Novel Approach for Efficient Biofuel Generation

Project Identifier 07-080

Principal Investigator Chidambaram, Devicharan

Point of Contact Fox, Kevin

Type of Research

Development
POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$79625
Cumulative Total Project Cost:	\$79625

Description of Project

Propose to create for the first time a non-woven mat of microbe encapsulated polymer fibers that can be used in the fermentation process to harvest electron-accepting chemical species as useful current. Porous fibers will allow the organism to respire and communicate with the environment, thereby providing us with a fast and economical method to immobilize functionally-active bacteria in a non-reactive matrix.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Investigations of Hygroscopic Growth and Phase Transitions of Atmospheric Particles by Noncontact Atomic Force Microscopy

Project Identifier 07-084

Principal Investigator Schwartz, Stephen

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$26682
Cumulative Total Project Cost:	\$26682

Description of Project

Propose to conduct laboratory studies of the surface interaction of insoluble materials (graphite, silica) representative of atmospheric aerosols with atmospheric salts and acids thought to be responsible for the increasingly hydrophilic so-called "aging" process. Studies will consist of deposition of these species onto well-characterized surfaces and examination of the extent of wetting of the surfaces as indicated by the beading up versus spreading of the materials on the surface.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Chemical Imaging of Living Cells in Real Time

Project Identifier 07-089

Principal Investigator Miller, Laura

Type of Research Applied

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$43643
Cumulative Total Project Cost:	\$43643

Description of Project

Develop methods for high-resolution, chemical (infrared) imaging of living cells in real time. Propose to develop a specialized incubator for living cells which will be coupled to an infrared microscope with a new focal plane array detector system, where a 16-pixel array is used to image large areas quickly.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Coherent Bragg Rod Analysis of High-Tc Superconducting Epitaxial Films

Project Identifier 07-090

Principal Investigator Pindak, Ronald

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$22691
Cumulative Total Project Cost:	\$22691

Description of Project

Propose to apply density maps that have enhanced our understanding of Gd₂O₃ passivation of a GaAs substrate and the ferroelectric polarization of a PbTiO₃ epitaxial layer on SrTiO₃ to measure the structure of high-temperature superconducting (HTS) thin films. Will utilize the state-of-the-art atomic-layer-by-layer molecular beam epitaxy system.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Development of a Planar Device Technology for Hyperpure Germanium X-ray Detectors.

Project Identifier 07-091

Principal Investigator Siddons, D. Peter

Point of Contact Fox, Kevin

Type of Research

Development
POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$8514
Cumulative Total Project Cost:	\$8514

Description of Project

Propose to investigate the basic components required to arrive at a way to fabricate the germanium analog of modern silicon X-ray detectors such as drift detector arrays, fully depleted CCDs, and fully depleted pixilated structures with simplified read-out.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project Study of Epigenetic Mechanisms in a Model of Depression

Project Identifier 07-096

Principal Investigator Henn, Fritz

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$321258
Cumulative Total Project Cost:	\$321258

Description of Project

Work out a method to examine the changes in gene expression due to early environmental stress in two lines of genetically defined rat strains.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Polarized Electron SRF Gun

Project Identifier 07-097

Principal Investigator Ben-Zvi, Ilan

Point of Contact Fox, Kevin

Type of Research

Development

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$149879
Cumulative Total Project Cost:	\$149879

Description of Project

"Propose to carry out research on the feasibility of using a superconducting, laser-photocathode RF electron gun (SRF photoinjector) for the production of polarized electrons. Will demonstrate that a SRF photoinjector can be used at the International Linear Collider (ILC) to eliminate the need for an electron damping ring. Such a gun would be at the heart of the linac for eRHIC and thus have a large impact on the future of the QCD laboratory strategic initiative at BNL.

"

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project New Approach to H Production, Stages and Use

Project Identifier 07-098

Principal Investigator Han, Weiqianq

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$384523
Cumulative Total Project Cost:	\$384523

Description of Project

Will consider several aspects of these problems, including theoretical studies of H production from water-splitting, H-storage through the development of novel boron nitride nanotubes (BNNT), and investigation of hydrogen oxidation catalysts in fuel cells.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Brookhaven National Lab

Project Increasing the Capability and Reliability of Small Diameter Direct Wind Multi-layer Coil Magnets

Project Identifier 07-100

Principal Investigator Escallier, John

Point of Contact Fox, Kevin

Type of Research

Development

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$346156
Cumulative Total Project Cost:	\$346156

Description of Project

Study the performance of small diameter superconducting magnets similar to those used to focus the beams of the high-energy colliders that are used in elementary particle physics experiments. Build a model magnet with a heater integrated into its windings. The heater will be powered to simulate heating by the beam.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Brookhaven National Lab

Project High End Scientific Computing

Project Identifier 07-101

Principal Investigator Davenport, James

Type of Research Basic

Point of Contact Fox, Kevin

POC Phone 631-344-6185

FY 2007 Project Costs

Total:	\$361016
Cumulative Total Project Cost:	\$361016

Description of Project

Establish a laboratory competence in the efficient and effective utilization of large-scale, high-end computers in support of the BNL multi-program research environment. The goal is to increase the number of applications which can take advantage of the new machines which are being deployed throughout the DOE complex.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Advanced Fuel Development

Project Identifier AE108

Principal Investigator Windes, William

Point of Contact Thelen, Mary Catherine

Type of Research Applied

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$246554
Cumulative Total Project Cost:	\$760655

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Investigation of Nanofluids for use in Nuclear Reactors

Project Identifier AE109

Principal Investigator Sharpe, John

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$402975
Cumulative Total Project Cost:	\$1220790

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Design of a High-Resolution Reactor Analysis Capability Using a Generic Transport Algorithm

Project Identifier AE110

Principal Investigator Martineau, Richard

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$468150
Cumulative Total Project Cost:	\$1202642

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Investigation of Core Flow Behavior During Loss of Coolant Transients for the Generation IV Gas Cooled Reactor Designs

Project Identifier AE111

Principal Investigator Marshall, Theron

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$239782
Cumulative Total Project Cost:	\$699536

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Reactor Physics Methods Development for Idaho National Laboratory Competitiveness in Next Generation Nuclear Plant (NGNP) Design

Project Identifier AE112

Principal Investigator Ougouag, Abderrafi

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$258661
Cumulative Total Project Cost:	\$516056

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project SESAME: Simulations Enabled Safeguards Assessment Methodology

Project Identifier AE114

Principal Investigator Bjornard, Trond

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$340435
Cumulative Total Project Cost:	\$905859

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project SINEMA: Simulation Institute for Nuclear Energy Modeling and Analyses

Project Identifier AE115

Principal Investigator Gougar, Marylou

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$239112
Cumulative Total Project Cost:	\$684678

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Optimization of Electrorefining of Spent Nuclear Fuel Using Ultrasonic Electrode Agitation

Project Identifier AE116

Principal Investigator Marsden, Kenneth

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$245594
Cumulative Total Project Cost:	\$426094

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Group Actinide Separation from Spent Nuclear Fuel Using a Modified Universal Solvent Extraction Process

Project Identifier AE117

Principal Investigator Law, Jack

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$202000
Cumulative Total Project Cost:	\$202000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Exploration of Electrolyte Complexation and Pulse Deposition for Production of Dense Uranium Rodlets

Project Identifier AE118

Principal Investigator Marsden, Kenneth

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$159134
Cumulative Total Project Cost:	\$159134

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Multi-reactor design and analysis platform

Project Identifier AE119

Principal Investigator Cogliati, Joshua

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$411718
Cumulative Total Project Cost:	\$411718

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Multi-physics Simulation Methods for Advanced Reactor Analysis

Project Identifier AE120

Principal Investigator Knoll, Dana

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$926762
Cumulative Total Project Cost:	\$926762

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Laser Acoustic In-situ Monitoring of Nuclear Reactor Material Mechanical Properties

Project Identifier AF100

Principal Investigator Hurley, David

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$451269
Cumulative Total Project Cost:	\$618335

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Influence of Grain Boundary Character on Microstructure and Properties of High Temperature Alloys

Project Identifier AF101

Principal Investigator Cole, James

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$150576
Cumulative Total Project Cost:	\$261574

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Thermal Conductivity in Complex Materials Systems

Project Identifier AF102

Principal Investigator Lillo, Thomas

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$132900
Cumulative Total Project Cost:	\$132900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Environmental Effects on Crack Growth in High-Temperature Alloys for Advanced Energy Systems

Project Identifier AF103

Principal Investigator Wright, Richard

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$201643
Cumulative Total Project Cost:	\$201643

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Fundamental Thermodynamics of Non-Ideal Systems for Advanced Radionuclide Separations

Project Identifier AS100

Principal Investigator Herbst, Ronald

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$311510
Cumulative Total Project Cost:	\$572235

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Synthesis, Characterization and Testing of Dithiophosphinic Acid Derivatives

Project Identifier AS101

Principal Investigator Klaehn, John

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$279622
Cumulative Total Project Cost:	\$541724

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Utility of Unusual Oxidation States of Americium for Separations

Project Identifier AS102

Principal Investigator Mincher, Bruce

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$234096
Cumulative Total Project Cost:	\$234096

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Actinide IR and Raman Spectroscopy

Project Identifier AS103

Principal Investigator Peterman, Dean

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$200437
Cumulative Total Project Cost:	\$200437

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Microstructural Evolution During Spark Plasma Sintering of High-Temperature Fuels and Coatings

Project Identifier CA104

Principal Investigator Windes, William

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$305656
Cumulative Total Project Cost:	\$305656

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Suitability of Layered Basalt as Targets for Industrial Carbon Dioxide Sequestration

Project Identifier CA105

Principal Investigator McLing, Travis

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$125016
Cumulative Total Project Cost:	\$125016

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Feasibility of Using Neutron Slowing-Down-Time Spectrometer for Fast Reactor Spent Fuel Assay

Project Identifier CA106

Principal Investigator Vaden, DeeEarl

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$27005
Cumulative Total Project Cost:	\$27005

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Oxygen Permeability of Perovskite Ceramics for Energy Applications

Project Identifier CA107

Principal Investigator Lillo, Thomas

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$10406
Cumulative Total Project Cost:	\$10406

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Understanding Apomixis: The Basis for a Robust Trait Delivery and Containment Platform for Bioenergy Crops

Project Identifier CA108

Principal Investigator Ulrich, Thomas

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$51877
Cumulative Total Project Cost:	\$51877

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Porosity Evolution during In Situ Oil Shale Retorting

Project Identifier CA109

Principal Investigator Hull, Laurence

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$35754
Cumulative Total Project Cost:	\$35754

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Risk Assessment Tools to Evaluate Next Generation Technical System

Project Identifier CA110

Principal Investigator Tran, Tuan

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$25644
Cumulative Total Project Cost:	\$25644

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Fabrication and Radiation Testing of Semiconductor Materials Useful as Photovoltaic and Nuclear Detection Devices

Project Identifier CA111

Principal Investigator Fox, Robert

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$13056
Cumulative Total Project Cost:	\$13056

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Consolidated Bioprocessing of Agricultural Wastewater Treatment and Bioenergy Production

Project Identifier CA112

Principal Investigator Barnes, Joan

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$24489
Cumulative Total Project Cost:	\$24489

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Development of Microbial Fuel Cell, Fueled by Domestic, Agricultural, and Food Processing Wastewaters

Project Identifier CA113

Principal Investigator Fujita, Yoshiko

Point of Contact Thelen, Mary Catherine

Type of Research

Development
POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$21112
Cumulative Total Project Cost:	\$21112

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Enhancement of Separation Methods in Nuclear Fuel Recycling

Project Identifier CA114

Principal Investigator Todd, Terry

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$174979
Cumulative Total Project Cost:	\$174979

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Investigation of Public Discourse Methods in Energy Policy Decision-making

Project Identifier CA115

Principal Investigator Piet, Steven

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$33270
Cumulative Total Project Cost:	\$33270

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Attack Graph Approach to Control System Vulnerability Analysis

Project Identifier CS127

Principal Investigator McQueen, Miles

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$98503
Cumulative Total Project Cost:	\$629242

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Next-Generation Neutron Generator

Project Identifier CS128

Principal Investigator Caffrey, Augustine

Point of Contact Thelen, Mary Catherine

Type of Research Applied

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$219688
Cumulative Total Project Cost:	\$598498

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Investigation of Integrated Systems for Electrical Generation, Carbon Sequestration, and Miscible Enhanced Oil Recovery

Project Identifier EI100

Principal Investigator Robertson, Eric

Point of Contact Thelen, Mary Catherine

Type of Research

Development

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$25040
Cumulative Total Project Cost:	\$25040

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Chemical Separations and Process Research to Enable Biorefinery Systems

Project Identifier EI101

Principal Investigator Stewart, Frederick

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$232363
Cumulative Total Project Cost:	\$232363

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Advanced Predictive Condition Monitoring and Control for Modern Energy Systems: Gasification-based Processes

Project Identifier EI102

Principal Investigator Garcia, Humberto

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$316842
Cumulative Total Project Cost:	\$316842

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Light Gas Separation Process

Project Identifier EI103

Principal Investigator McKellar, Michael

Point of Contact Thelen, Mary Catherine

Type of Research Applied

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$169639
Cumulative Total Project Cost:	\$169639

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project CFD-Based Simulation Capability of Fischer-Tropsch Reactors and Process Equipment

Project Identifier EI104

Principal Investigator Guillen, Donna

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$247806
Cumulative Total Project Cost:	\$247806

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Biomass Feedstock Assembly to Gasification Process Computational Interface Development

Project Identifier EI105

Principal Investigator Kenney, Kevin

Point of Contact Thelen, Mary Catherine

Type of Research

Development

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$204876
Cumulative Total Project Cost:	\$204876

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Attractiveness of Various Carbon and Energy Sources for Synfuels

Project Identifier EI106

Principal Investigator Cherry, Robert

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$29900
Cumulative Total Project Cost:	\$29900

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Modulating Drain Valve for Continuous Processing of High Temperature Molten Materials

Project Identifier ET132

Principal Investigator Roach, Jay

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$129365
Cumulative Total Project Cost:	\$415901

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Systematic Feasibility Analysis of Power Production from Unconventional Geothermal Resources

Project Identifier ET133

Principal Investigator Mines, Gregory

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$102317
Cumulative Total Project Cost:	\$285800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Investigation of Passive Film Performance on Hastelloy C22 in Structural Loading

Project Identifier ET134

Principal Investigator Pinhero, Patrick

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$148435
Cumulative Total Project Cost:	\$438202

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Dynamic Autonomy for Mobile Manipulation

Project Identifier ET135

Principal Investigator Bruemmer, David

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$275314
Cumulative Total Project Cost:	\$722980

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Development of Integrated Virtual Engineering Tools to Facilitate Unique High-Level Decision Making Capabilities

Project Identifier ET137

Principal Investigator Wright, Christopher

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$107678
Cumulative Total Project Cost:	\$280848

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project The Metabolic Capabilities of Acidithiobacillus caldus, a Ubiquitous Moderately Thermophilic Acidophile

Project Identifier FF100

Principal Investigator Apel, William

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$95082
Cumulative Total Project Cost:	\$219140

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Innovative Applications of Dissipative Particle Dynamics

Project Identifier FF101

Principal Investigator Meakin, Paul

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$112916
Cumulative Total Project Cost:	\$210755

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Ion Exchange Coatings for Analysis

Project Identifier FF102

Principal Investigator Delmore, James

Point of Contact Thelen, Mary Catherine

Type of Research Applied

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$99977
Cumulative Total Project Cost:	\$235078

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Hybrid Welding Process

Project Identifier FF103

Principal Investigator Smartt, Herschel

Point of Contact Thelen, Mary Catherine

Type of Research Applied

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$115846
Cumulative Total Project Cost:	\$245001

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project The Metabolomics of a Naturally Occurring Acidophilic Bacteria System

Project Identifier GB100

Principal Investigator Lee, Brady

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$108496
Cumulative Total Project Cost:	\$331893

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Development of an Autonomous Geophysical System for Quantitative Monitoring of Redox Zonation and Subsurface Flow

Project Identifier GB101

Principal Investigator Versteeg, Roelof

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$116862
Cumulative Total Project Cost:	\$280224

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project A Systems Biology Approach to Understanding Lignocellulose Derived Carbon Metabolism by
Alicyclobacillus acidocaldarius

Project Identifier GB103

Principal Investigator Apel, William

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$522284
Cumulative Total Project Cost:	\$522284

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Renewable Biomass Carbon for Synthetic Fuels to Support the Hydrogen Economy

Project Identifier HT106

Principal Investigator Ginosar, Daniel

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$188821
Cumulative Total Project Cost:	\$698456

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project H2O / CO2 Co-Electrolysis for Syngas Production

Project Identifier HT107

Principal Investigator Stoots, Carl

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$250091
Cumulative Total Project Cost:	\$686345

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Hybrid Heterogeneous Catalysts for Hydrogenation of Carbon Dioxide to Liquid Hydrocarbons

Project Identifier HT109

Principal Investigator Petkovic, Lucia

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$149970
Cumulative Total Project Cost:	\$464890

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Module-Based Gasification and Synfuels Processes Simulator

Project Identifier HT113

Principal Investigator Boardman, Richard

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$350511
Cumulative Total Project Cost:	\$791110

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Exploration and Development of Automated Differential Equation-Based System Identification

Project Identifier IC101

Principal Investigator Tolle, Charles

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$164927
Cumulative Total Project Cost:	\$164927

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project A Toolset for Proximal Human-Robot Interaction

Project Identifier IC102

Principal Investigator Few, Douglas

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$200338
Cumulative Total Project Cost:	\$200338

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Joint System Prognostics For Increased Efficiency And Risk Mitigation In Advanced Reactor Instrumentation And Control

Project Identifier NE141

Principal Investigator Dudenhoeffer, Donald

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$290037
Cumulative Total Project Cost:	\$940484

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Design of a High-Resolution Multiphase Reactor Analysis Capability

Project Identifier NE144

Principal Investigator Berry, Ray

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$412189
Cumulative Total Project Cost:	\$744323

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project On-line Symbolic Condition Monitoring of Advanced Energy Systems

Project Identifier NE145

Principal Investigator Garcia, Humberto

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$396365
Cumulative Total Project Cost:	\$547629

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Model-based Design and Evaluation of Advanced Safeguards and Proliferation Detection Systems

Project Identifier NN100

Principal Investigator Garcia, Humberto

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$212061
Cumulative Total Project Cost:	\$414828

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Ultratrace Plutonium Analysis and Standard Preparation

Project Identifier NN102

Principal Investigator Watrous, Matthew

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$90059
Cumulative Total Project Cost:	\$167713

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Realization of FTMS Potential for Accurate Measurement of Extreme Isotope Ratios

Project Identifier NN103

Principal Investigator Scott, Jill

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$199022
Cumulative Total Project Cost:	\$503378

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Development of In-situ Measurement Technology for On-line Monitoring of Actinide Concentrations in Molten Salt Electrolyte

Project Identifier NN104

Principal Investigator Li, Shelly

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$280582
Cumulative Total Project Cost:	\$402404

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Demonstration of a Proliferation Pathway in a Thorium Fuel Cycle Using Pyrochemical Processes

Project Identifier NN105

Principal Investigator Herrmann, Steven

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$198853
Cumulative Total Project Cost:	\$248761

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Non-proliferation Issues as Related to Advanced Fuel Cycle and Advanced Fast Reactor Development with Processing of Reactor Fuel

Project Identifier NN107

Principal Investigator Aryaeinejad, Rahmat

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$109219
Cumulative Total Project Cost:	\$479660

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Development of a Bayesian Estimation Method for the Detection of Nuclear Proliferation

Project Identifier NN108

Principal Investigator Smith, Curtis

Point of Contact Thelen, Mary Catherine

Type of Research

Development
POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$173512
Cumulative Total Project Cost:	\$371048

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Laser Induced Breakdown Spectroscopy: Development and Application of in-situ Elemental Analysis for Process Streams in Spent Fuel Reprocessing Facilities

Project Identifier NN109

Principal Investigator Phongikaroon, Supathorn

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$170682
Cumulative Total Project Cost:	\$170682

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Chemical Signatures of Nuclear Proliferation on Particles

Project Identifier NN110

Principal Investigator Groenewold, Gary

Point of Contact Thelen, Mary Catherine

Type of Research Applied

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$94066
Cumulative Total Project Cost:	\$94066

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Isotopically Pure 139LA for Lanthanum Halide Scintillators

Project Identifier NN111

Principal Investigator McGrath, Christopher

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$165474
Cumulative Total Project Cost:	\$165474

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Technetium Signature Analysis

Project Identifier NN112

Principal Investigator Tranter, Troy

Point of Contact Thelen, Mary Catherine

Type of Research Applied

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$142568
Cumulative Total Project Cost:	\$142568

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Proactive Designs of Self-Configuring Dynamic Sensor Networks for Wide Area Persistent Monitoring

Project Identifier NS144

Principal Investigator Garcia, Humberto

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$143192
Cumulative Total Project Cost:	\$508990

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Enhanced Explosives Testing Capability

Project Identifier NS147

Principal Investigator Clemens, Gregory

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$210014
Cumulative Total Project Cost:	\$1269553

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Investigation into the Preservation and Enhancement of Mobile Ad-Hoc Network Quality of Service

Project Identifier NS150

Principal Investigator Forsmann, Jennifer

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$80108
Cumulative Total Project Cost:	\$366707

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Sensor-Assisted Autonomous Precision Landings for Man-Portable UAVs

Project Identifier NS151

Principal Investigator Jones, Warren

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$102081
Cumulative Total Project Cost:	\$370144

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project A Fuzzy Approach for Bluetooth Intrusion Detection on Mobile Devices

Project Identifier NS152

Principal Investigator Derr, Kurt

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$249230
Cumulative Total Project Cost:	\$249230

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project TeraHertz Technology Development for Standoff Detection of Explosive Materials

Project Identifier NS153

Principal Investigator Deason, Vance

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$187190
Cumulative Total Project Cost:	\$187190

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Enhancing Critical Infrastructure Protection (CIP) through the Development of Integrated Testing and Simulation Capability.

Project Identifier NS154

Principal Investigator Johnson, Briam

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$218342
Cumulative Total Project Cost:	\$218342

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project NiCrFe Filler Metal for Cracking Resistance

Project Identifier RP105

Principal Investigator Clark, Denis

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$178987
Cumulative Total Project Cost:	\$482832

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Protective coating Development for Reactor Instrumentation

Project Identifier RP106

Principal Investigator Swank, William

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$299094
Cumulative Total Project Cost:	\$651494

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Analysis and Modernization of Radioanalytical Methods and Equipment used to Support ATR

Project Identifier RP109

Principal Investigator McGrath, Christopher

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$241271
Cumulative Total Project Cost:	\$526422

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project High Temperature In-Pile Instrumentation Enhancements

Project Identifier RP110

Principal Investigator Rempe, Joy

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$349474
Cumulative Total Project Cost:	\$349474

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project In Situ Laser-based Characterization of Fatigue Damage in High Temperature Environments

Project Identifier SC134

Principal Investigator Hurley, David

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$174458
Cumulative Total Project Cost:	\$647236

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Microbial Metabolic Systems Approach to the Evaluation of Hydrogenic Activity of Extremophilic Anaerobic Carboxydotrophs

Project Identifier SC137

Principal Investigator Newby, Deborah

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$219673
Cumulative Total Project Cost:	\$1435365

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Structure and Reactivity of Actinide Complexes and Clusters under Controlled Solvation Conditions

Project Identifier SC138

Principal Investigator Groenewold, Gary

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$277685
Cumulative Total Project Cost:	\$635095

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Optical Eddy Current Techniques for Harsh Environments

Project Identifier SC139

Principal Investigator Kunerth, Dennis

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$70668
Cumulative Total Project Cost:	\$293579

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Microstructure and Deformation Physics of Fission-Reactor Model Materials by Atomistically Informed Mesoscale Simulation

Project Identifier SH100

Principal Investigator Wolf, Dieter

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$613405
Cumulative Total Project Cost:	\$1006482

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Structural and Electronic Properties of Surfaces and Adsorbed Metal Particles: Applications to Catalysis, Corrosion, and Radiation Effects

Project Identifier SH101

Principal Investigator Meakin, Paul

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$335509
Cumulative Total Project Cost:	\$335509

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Novel Topologically Controlled Armor System

Project Identifier SH102

Principal Investigator Chu, Henry

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$599642
Cumulative Total Project Cost:	\$599642

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Adaptive Modeling of Geometrically Complex Fuel Rods with a posteriori Error Control

Project Identifier SH103

Principal Investigator Pernice, Michael

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$172480
Cumulative Total Project Cost:	\$172480

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Verification and Validation Methodologies Supporting Scientific Software for the Global Nuclear Energy Partnership

Project Identifier SH105

Principal Investigator Knoll, Dana

Point of Contact Thelen, Mary Catherine

Type of Research

Development

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$534422
Cumulative Total Project Cost:	\$534422

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Sodium Fast Reactor Design and Safety Analysis using SASSYS-1

Project Identifier SH106

Principal Investigator Wigeland, Roald

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$96536
Cumulative Total Project Cost:	\$96536

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Experimental Investigations of Application and Delivery Mechanisms for In Situ Stabilization of Sr-90 in the Alluvium and Interbed Sediments Underlying the INTEC Tank Farm

Project Identifier ST115

Principal Investigator Baker, Kristine

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$65081
Cumulative Total Project Cost:	\$572954

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Reduction of Biomass Sugar Costs through the use of Thermal and Acid Stable Xylanases and Reduced Severity Pretreatments

Project Identifier ST120

Principal Investigator Apel, William

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$230362
Cumulative Total Project Cost:	\$450755

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project High- and Multi-Rate Physics Modeling and Simulation

Project Identifier ST123

Principal Investigator Lacy, Jeffrey

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$219982
Cumulative Total Project Cost:	\$219982

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Structure/activity relationships in Multi-functional Nano-scale Catalysts for Synfuel Production

Project Identifier ST124

Principal Investigator Petkovic, Lucia

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$114609
Cumulative Total Project Cost:	\$114609

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Ultrafast Optical Probing of Nanometer Scale Electronic and Thermal Properties of Novel Solar Energy Materials

Project Identifier ST125

Principal Investigator Hurley, David

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$98145
Cumulative Total Project Cost:	\$98145

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Robotic Awareness and Assessment for Meaningful Human-Robot Teaming

Project Identifier ST126

Principal Investigator Few, Douglas

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$170422
Cumulative Total Project Cost:	\$170422

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Thermally Coupled Processes Affecting Oil Shale Water Quality

Project Identifier ST127

Principal Investigator Mattson, Earl

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$121028
Cumulative Total Project Cost:	\$121028

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Modeling of Environmentally Assisted Intergranular Stress Corrosion Cracking

Project Identifier ST128

Principal Investigator Van Siclen, Clinton

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$27250
Cumulative Total Project Cost:	\$27250

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Enhanced Three-Dimensional X-ray Computed Tomography Imaging Systems and Quantitative Analysis

Project Identifier ST129

Principal Investigator White, Timothy

Type of Research Applied

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$32024
Cumulative Total Project Cost:	\$32024

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Computational Modeling of Catalysts for the Reduction of Sulfur Trioxide in the Sulfur-Iodine (S-I) cycle for Hydrogen Production

Project Identifier TM100

Principal Investigator Farrell, Helen

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$178195
Cumulative Total Project Cost:	\$365382

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Mathematical Characterization and Synthetic Generation of Spatial Structures Across Multiple Scales Using Fractal Techniques

Project Identifier TM101

Principal Investigator Tolle, Charles

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$230753
Cumulative Total Project Cost:	\$417810

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Computational Actinide Chemistry

Project Identifier TM104

Principal Investigator Benson, Michael

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$198520
Cumulative Total Project Cost:	\$198520

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Idaho National Lab

Project Atomistic and First-Principles Modeling of Materials under Extreme Environments

Project Identifier TM105

Principal Investigator Meakin, Paul

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$2136
Cumulative Total Project Cost:	\$2136

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Idaho National Lab

Project Development of 3D Multiphase Flow and Reactive Transport Codes and their Applications to Reactive Flow in Porous Media and Fracture Apertures

Project Identifier TM106

Principal Investigator Huang, Hai

Type of Research Basic

Point of Contact Thelen, Mary Catherine

POC Phone 208-526-5209

FY 2007 Project Costs

Total:	\$241689
Cumulative Total Project Cost:	\$241689

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Atmospheric Plasma Deposition of DLC Coatings

Project Identifier KC06011-703627

Principal Investigator Ladwig, Angie

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$135876
Cumulative Total Project Cost:	\$324966

Description of Project

This project will research the use of an atmospheric diamond-like carbon coating process as an alternative to vacuum-based DLC's for low-pressure environments

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Firing System Modeling

Project Identifier KC06012-703628

Principal Investigator Powell, Curt

Point of Contact ODower, Caron

Type of Research Applied

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$115171
Cumulative Total Project Cost:	\$121554

Description of Project

This project is a reversal of traditional firing system modeling. This effort will yield an optimal fireset R-L-C output by reversing the flow of a traditional firing system electro-hydrodynamic model with input from a well-characterized detonator resulting in a predictive firing system model that provides a better understanding of fireset and detonator interaction.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Magneto-Resistive Detonator Safing Device

Project Identifier KC06013-703629

Principal Investigator Powell, Curt

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$123250
Cumulative Total Project Cost:	\$134525

Description of Project

In order to support the need for novel detonator safing devices in the continued evolution of miniature firesets for system reliability and safety, this project will investigate semiconductor/conductor devices employing extraordinary magneto-resistance (EMR) where a relatively weak magnetic field can redirect the flow of electron current, thus inducing a change in path resistivity.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Advanced RF Microelectronic Development

Project Identifier KC06023-703639

Principal Investigator Widmer, Maduri

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$166670
Cumulative Total Project Cost:	\$214686

Description of Project

This project will evaluate the DuPont Fodel process for high frequency/high density interconnect applications

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Situational Awareness

Project Identifier KCP07101-703643

Principal Investigator Baumgart, Chris

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$382331
Cumulative Total Project Cost:	\$382331

Description of Project

Develop machine vision and cognition methodologies to automatically acquire a visual target, track and identify it, and determine in real-time if the target is hostile or non-hostile, through a proof-of-concept prototype build.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Flexible Networks

Project Identifier KCP07181-703651

Principal Investigator Bloomer, Michael

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$186208
Cumulative Total Project Cost:	\$186208

Description of Project

Research flexible compartmentalization of networks to utilize a single enterprise network for all data compartments (UNC/SRD/TS etc.)

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Confocal Microscopy

Project Identifier KCP07242-703649

Principal Investigator Gehr, Russell

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$92521
Cumulative Total Project Cost:	\$92521

Description of Project

Investigate the use of confocal scanning optical microscope (CSOM) to inspect micromechanical parts with submicron accuracy for parts acceptance inspection.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Optical Transverter

Project Identifier KCP07243-703655

Principal Investigator Treu, Chuck

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$35694
Cumulative Total Project Cost:	\$35694

Description of Project

Explore and develop new transverter circuit topologies using high power optoelectronics to design optically isolated power converters for improved weapon safety.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Modified Carborane Materials

Project Identifier KCP07286-703665

Principal Investigator Bowen, Dan

Type of Research Basic

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$252754
Cumulative Total Project Cost:	\$252754

Description of Project

Research the use of chemically modified carboranes to serve as a filler material for the capturing of neutrons

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Spherical Lens Beam Splitter

Project Identifier KCP07289-703660

Principal Investigator Klingsporn, Paul

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$100001
Cumulative Total Project Cost:	\$100001

Description of Project

Design a spherical lens beam splitter that will combine the actions of focusing and splitting laser beams into a single optical element to improve the process for use in embedded sensor applications.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Flexible Mobile Communication

Project Identifier KCP07291-703652

Principal Investigator Bloomer, Michael

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$160980
Cumulative Total Project Cost:	\$160980

Description of Project

Investigate the expansion of wireless devices in the workplace to include mobile telephones and prototype a device for dual IP telephone/Cellular mobile communication that is acceptable for use in protected areas.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Non-metallic Passively Aligned Photocell Packaging

Project Identifier KCP07292-703668

Principal Investigator Humphries, Jeff

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$90474
Cumulative Total Project Cost:	\$90474

Description of Project

Incorporate passive alignment features from proven designs into creative new uses of ceramics or other non-metallic materials for packaging

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Flexible Desktops

Project Identifier KCP07294-703661

Principal Investigator Melton, Ryan

Point of Contact ODower, Caron

Type of Research Applied

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$5560
Cumulative Total Project Cost:	\$5560

Description of Project

Research feasibility of a workstation computing architecture based primarily on COTS technology that functions seamlessly under various operating systems with various security requirements

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Spline Contour Manipulation

Project Identifier KCP07295-703670

Principal Investigator Schuttler, Greg

Point of Contact ODower, Caron

Type of Research Applied

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$45480
Cumulative Total Project Cost:	\$45480

Description of Project

Analyze the methodology used and the resulting accuracy of model-based manufacturing techniques in cases where the part design utilizes Wilson Fowler splines as part of its geometrical definition and optimize and standardize these techniques

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Desktop Grid Computing

Project Identifier KCP07296-703664

Principal Investigator Buckholtz, Tim

Point of Contact ODower, Caron

Type of Research Applied

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$4549
Cumulative Total Project Cost:	\$4549

Description of Project

Research using spare CPU cycles on standard desktop computers to provide aggregated resources for High Performance Computing in order to find a more cost effective method for HPC

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Noisy CT Scan Processing

Project Identifier KCP07297-703659

Principal Investigator DeRego, Paul

Point of Contact ODower, Caron

Type of Research Applied

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$49737
Cumulative Total Project Cost:	\$49737

Description of Project

Research alternate methods for detecting voids in welds of precision parts using Computerized Tomography to address random floor noise in CT scans and improve efficiency of quality assurance procedures of WR parts.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project IVD and PVD Process Research

Project Identifier KCP07298-703556

Principal Investigator Scott, Paul

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$131322
Cumulative Total Project Cost:	\$131322

Description of Project

design an innovative surface process for environmentally benign corrosion protection of aluminum alloy surfaces that can replace surface finish processes that use chromate

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Alternate Material for Vehicle Transport

Project Identifier KCP07302-703677

Principal Investigator Valenta, Dan

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$121505
Cumulative Total Project Cost:	\$121505

Description of Project

Perform feasibility and proof of concept studies on various material products to identify suitable candidates for developing alternate materials that will reduce weight, increase payload and gas mileage and improve vehicle performance of transport vehicles

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Leak Test Sealing Methods

Project Identifier KCP07305-703671

Principal Investigator Hoffman, Scott

Point of Contact ODower, Caron

Type of Research Applied

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$29200
Cumulative Total Project Cost:	\$29200

Description of Project

Research design enhancement required to successfully leak test cavities with thin, serpentine complex surface boundaries in order to extend the range that complex assemblies can be leak tested.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Miniature Right Angle Connector

Project Identifier KCP07310-703673

Principal Investigator Abel, Phillip

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$91713
Cumulative Total Project Cost:	\$91713

Description of Project

Design, prototype and test a miniature right angle connector that can transmit low power or high power optical signals in a small, robust, multichannel device and can withstand temperature and shock vibration requirements to support future telemetry and sensor applications.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project CCS HV Switch and Miniaturization

Project Identifier KCP07313-703675

Principal Investigator Harms, Doug

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$106286
Cumulative Total Project Cost:	\$106286

Description of Project

Reduce size of Miniaturized CCS Switch while maintaining voltage and amp requirements for current applications

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project FPGA Data Acquisition

Project Identifier KCP07410-703641

Principal Investigator Santner, Shane

Point of Contact ODower, Caron

Type of Research Applied

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$94670
Cumulative Total Project Cost:	\$94670

Description of Project

Demonstrate proof of concept and ultimately replace current data acquisition methods on centrifuge testers with electronic module placed directly on beam to improve quality of data

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Kansas City Plant

Project Integrated Rapid Design Process

Project Identifier KCP0761-703645

Principal Investigator Van Bastian, Steven

Type of Research Applied

Point of Contact ODower, Caron

POC Phone 816-997-2645

FY 2007 Project Costs

Total:	\$37600
Cumulative Total Project Cost:	\$37600

Description of Project

Research leading edge 3D laser scanning technology to facilitate development of a Integrated Rapid Design Process(IRDP)to improve engineering design time and reduce mechanical design costs

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Advanced Monolithic Silicon Pixel Detectors

Project Identifier LB05002

Principal Investigator Battaglia, Marco

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$261380
Cumulative Total Project Cost:	\$729828

Description of Project

Particle physics is about to enter a new territory at the TeV frontier. We expect that the data collected in proton-proton collisions will provide evidence of the Higgs bosons and of Supersymmetry, or of other New Physics signals. To understand the new phenomena fully, however, will depend on the availability of large data sets, collected at high constituent energies. A high resolution Vertex Tracker is expected to provide the jet flavor identification capabilities and the accurate event reconstruction that make a proposed linear collider unique and allow its physics program. These developments need detailed simulations to define the optimal design and technology choices. The goal of this project is to examine the needed technologies.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Behavior and Impact of Nanoparticles in the Environment

Project Identifier LB05003

Principal Investigator Gilbert, Benjamin

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$160008
Cumulative Total Project Cost:	\$525248

Description of Project

This project will obtain geophysical and geochemical properties of nanoparticles that are known or anticipated to impact the environment. The model systems will include environmental nanoparticles with novel physical and chemical properties and man-made materials with potential for use in environmental remediation or that are potential contaminants. The results will be used to understand and model the environmental redox behavior, aggregation, and transport properties of nanoparticles. Models of nanoparticle behavior will be established and tested that can be used to predict the geochemistry of nanoparticles in the environment, and the lifetime and fate of natural and man-made nanoparticles.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Cryptographic Foundation for New Generation Distributed Systems

Project Identifier LB05008

Principal Investigator Chevassut, Olivier

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$79171
Cumulative Total Project Cost:	\$394904

Description of Project

New generation distributed systems (e.g., peer-to-peer and Grid Middleware) are networking technologies that enable complex interactions among computational and data resources. If these new systems are to be successful and widely deployed in production computing environments, they need to be enhanced with proper security mechanisms. Current security technologies cannot support the complex message exchange models (e.g., on-way, asynchronous, bilateral, multi-node paths) used by these state-of-the-art middleware. While the previous security notions are still valid, the message exchange models require new cryptographic foundations. This project will lay down these foundations.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Novel Imaging Detectors for Materials and Biology Research

Project Identifier LB05010

Principal Investigator Denes, Peter

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$437639
Cumulative Total Project Cost:	\$1442503

Description of Project

The purpose of this project is to advance the state of imaging detectors in synchrotron radiation research and electron microscopy by the use of microelectronic techniques. In both fields, a scintillator fiber-coupled to a CCD is currently used. One goal is thus to develop a column-parallel CCD: Instead of reading out through a single port, each column of the CCD would have its own readout channel. In this way, without sacrifice of performance in noise or dynamic range, a column parallel CCD should be able to readout out 1000 times faster than a conventional CCD detector. Another goal is to develop a direct detection electron microscopy detector with high speed and high quantum efficiency.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Micro-characterization and Chemical Micro-dynamics of Atmospheric Mineral Dust

Project Identifier LB05011

Principal Investigator DePaolo, Donald

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$138807
Cumulative Total Project Cost:	\$374707

Description of Project

Mineral dust is introduced to the atmosphere from ground sources and redistributed by winds over distances up to thousand of km. The long-range transport represents a means of global chemical and biological communication. The particles affect air quality, the atmospheric radiation balance and cloud formation, transport biological agents, and are an important component of soils. This project will (a) develop a new set of complementary tools to collect mineral dust, characterize the sources, mineralogy, geochemistry, and structure, (b) better understand and model the role of dust in heterogeneous chemical reactions, and (c) use this information in atmospheric models that can address their dispersion and effects.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Development and Application of Quantum Monte Carlo (QMC) Methods to Biological Systems

Project Identifier LB05020

Principal Investigator Lester, William

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$220310
Cumulative Total Project Cost:	\$540607

Description of Project

This project is to develop key algorithmic improvements to facilitate the calculation of electronic excitations in biological and other large molecular systems using the quantum Monte Carlo (QMC) method. The immediate application of these theoretical and computational developments would be to the study of singlet-excited states and their role in energy transfer in the xanthophylls cycle. The methodologies developed during this project will also enable new computational capabilities in the areas of nanotechnology, catalysis, and combustion, in addition to bioscience.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Enabling High Energy Density Physics

Project Identifier LB05022

Principal Investigator Logan, B. Grant

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$429018
Cumulative Total Project Cost:	\$1309636

Description of Project

High Energy Density Physics (HEDP) is an emerging field of science to understand the behavior of matter in extreme conditions of temperature and density. HEDP experiments offer us the potential to resolve fundamental questions about plasmas in several regimes important to our understanding of the universe. Our goal is to advance the technological basis of HEDP by developing computational tools and necessary laser and ion accelerator capabilities to conduct exciting high energy density plasma experiments. Our proposal is to a) study new directions in experiment, theory, computation, and engineering, b) conduct state of the art experimental science with collaborators, c) integrate cutting edge technology (for example, novel ion sources) with scientific exploration.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Left-Handed Nanoscale Meta-Materials: Towards the Optical Domain

Project Identifier LB05024

Principal Investigator Martin, Michael

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$202909
Cumulative Total Project Cost:	\$543064

Description of Project

The index of refraction of normal materials is positive, requiring curved surfaces or special structures to construct lenses which focus light. Recently, new artificial materials have been reported that have a negative index of refraction, which allows a homogeneous flat slab to behave as a perfect lens, possibly even creating sub-diffraction limited focusing. Numerous applications in science, technology, communications and medicine can be expected. Scaling these composite meta-materials to nano dimensions should increase the frequencies at which novel left-handed phenomena can be observed and exploited. The goal of his project is to fabricate and measure nanoscale meta-materials, leading ultimately to left-handed optics for visible wavelengths.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project New Directions for Theoretical Physics at the TeV-Scale

Project Identifier LB05027

Principal Investigator Murayama, Hitoshi

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$367032
Cumulative Total Project Cost:	\$982376

Description of Project

Particle physicists have known since the time of Fermi (1933) that the TeV-Scale is an important energy scale in physics. It is only the fundamental energy scale beside the energy scale of gravity, Newtons constant. Much of the development in particle physics revolved around how we may understand these two energy scales in nature. It is exciting that the high-energy experiments are finally reaching this energy scale after 70 years, at the dawn of Large Hadron Collider (LHC) at CERN. Physics Division is heavily involved in the ATLAS experiment at LHC to uncover physics at this important energy scale. The goal of this work is to develop a consistent theoretical framework that will be confronted with data anticipated at the TeV-Scale from Tevatron and LHC.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Enhancing Commodity Processors with Vector Components for Increased Scientific Productivity

Project Identifier LB05029

Principal Investigator Olikier, Leonid

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$263546
Cumulative Total Project Cost:	\$766308

Description of Project

The goal is to understand the impact and opportunities for improved scientific productivity by combining vector processing features with commodity processors, and to understand the potential of a vector-enhanced commodity scalar system. We plan to isolate the key architectural components of vector systems that could be tightly integrated with leading superscalar designs in a cost-effective manor. This study will provide insight into emerging architectural design and their potential effect on next generation HPC systems. Our study will analyze hybrid architectures to determine their applicability to strategic scientific computing applications. We will also identify the essential vector components critical in delivering high efficiency.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Improved Spectroscopy of Weakly Bound States in Nuclei

Project Identifier LB05030

Principal Investigator Phair, Larry

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$292676
Cumulative Total Project Cost:	\$698675

Description of Project

Future nuclear structure measurements will take place at the drip lines of very neutron- and proton- rich nuclei. These nuclei will be identified by detecting the last particle stable isotope and the spin and parity of its ground state and low excited states, if any. By studying states at high excitation energy now (i.e., the unpopulated drip line states), we can explore in a novel way the single particle and pairing properties of states more commonly studied near the Fermi surface in more ordinary nuclei. Our goal is to demonstrate the feasibility of studying the future drip line single particle states, by populating these states which lie about 6-7 MeV above the Fermi surface in ordinary nuclei.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Advanced Computational Tools for Electric Power Systems

Project Identifier LB05031

Principal Investigator Pinar, Ali

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$162251
Cumulative Total Project Cost:	\$798651

Description of Project

The blackout in the Northeast and the routine power outages in California undisputedly call for improved operational efficiency and reliability standard for electric power networks. Such attempts however, are hindered by the lack of advanced computational tools that provide better modeling capability to the engineers. The purpose of this project is to develop novel tools to address the computationally difficult problems in power system analysis within an interdisciplinary effort. We propose to devise effective computational tools for some important problems in electric power systems through research in discrete and continuous optimization, and the results of our work will provide system planners, market analysts, and operators the capability for more efficient and reliable operation.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Statistical Feature Modeling for Scientific Data Via Basis Decomposition

Project Identifier LB05032

Principal Investigator Romano, Raquel

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$117945
Cumulative Total Project Cost:	\$311171

Description of Project

Recent advances in computational visual routines have focused on geometric-based delineation of sub cellular compartments. While these techniques are useful when each sub compartment can be uniformly labeled and geometrically modeled, these assumptions break in the presence of complex geometric patterns, variable scale, and multispectral signal expression. This project addresses the need to represent and analyze protein expression patterns using texture-based signatures. We propose to model a signal as a texture pattern, construct a dictionary of texture patterns, and to learn parameters of each texture pattern in terms of classification, intensity, and deviation from the model.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project NanoARPES: A New Detector for Nanometer-scale Electronic Structure Measurements

Project Identifier LB05033

Principal Investigator Rotenberg, Eli

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$291950
Cumulative Total Project Cost:	\$661316

Description of Project

The goal is to build a Nanometer Angle Resolve PhotoEmission Spectrometer (nanoARPES), which can correlate electronic band structure and many body interactions with other microscopic material properties. This instrument will image complex materials with a variety of contrast mechanisms: 1) electronic structure via angle-resolved density of states, 2) atomic structure via photoelectron diffraction, 3) chemical structure via core level photoemission, and 4) magnetic contrast via circular dichroism. The first two aspects are unique and therefore this instrument can be expected to have a huge impact on the fields of correlated materials and electronic and magnetic heterostructures.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Biogeochemical Reaction Rates and Pathways in Porous Media

Project Identifier LB05036

Principal Investigator Steefel, Carl

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$88783
Cumulative Total Project Cost:	\$334014

Description of Project

The goal of this research project is to establish how laboratory-determined reaction rates in biogeochemical and inorganic geochemical systems relate to rates occurring in porous media under a variety of transport regimes. In addition, it is proposed to carry out the first measurements of mineral-water reaction rates at the pore scale in microfluidic reactive flow devices and to use this information in interpreting bulk rates in porous media. The data will be used to develop improved conceptual models for mineral reactivity in porous media. This understanding of the controls on rates in natural settings will improve our ability to predict important global elemental cycles, the migration and natural attenuation of contaminants, and the sequestration of CO₂ in deep saline formations.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project New Approach for the Catalytic Conversion of Methane and other Inert Hydrocarbons

Project Identifier LB05037

Principal Investigator Tilley, T. Don

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$114594
Cumulative Total Project Cost:	\$310097

Description of Project

The purpose of this project will be to develop a new class of homogeneous catalysts that allow conversions of normally inert hydrocarbons such as methane and other alkanes. This work should lead to new catalysts for the functionalization of methane, and for the addition of the C-H bond of methane (and other alkanes) to unsaturated compounds. We hope to develop methane as a cheap and convenient methylation reagent in chemical synthesis.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Low Energy Spread Electron Source

Project Identifier LB05039

Principal Investigator Zolotarev, Max

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$186950
Cumulative Total Project Cost:	\$490966

Description of Project

The purpose of this project is to explore a novel approach for an electron source that has the potential to eventually reach the quantum-limited brightness and lowering effective source temperature orders of magnitude. Such a source can open a wide range of novel applications that utilize very small scale spatial and energy resolution. Possible applications for this electron source include angstrom-scale resolution electron microscopy, electron holography, and investigations of dynamics on a picosecond time scale using pump-probe techniques. To achieve the ultimate performance will require significant advances in electronics. In this project we will demonstrate this proof of principle by constructing such a source and measuring its temperature to the achievable limit.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Statistical Dynamics of Protein Evolution

Project Identifier LB05044

Principal Investigator Crooks, Gavin

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$144984
Cumulative Total Project Cost:	\$410496

Description of Project

The quickest and most effective methods for characterizing unfamiliar proteins involve identifying evolutionarily related proteins whose structure or function has already been determined. Fundamentally, any such sequence alignment or other homology detection algorithm contains (often implicitly) a model of protein evolution. In principle, more accurate (yet computationally efficient) models of this evolutionary dynamics will lead to more accurate alignments, molecular phylogenies and gene annotations. The purpose of this project to investigate the nature of molecular protein evolution, and to use those insights to develop fast and effective algorithms for the reconstruction of protein phylogenies.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Microarray Technology for Fungal Identification

Project Identifier LB06001

Principal Investigator Andersen, Gary

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$146724
Cumulative Total Project Cost:	\$234672

Description of Project

This project will yield biomarker gene sequences from a unique collection of fungi (collected around Chernobyl over 15 years), will provide the nucleus for a web-based database of fungal biomarkers available to other researchers, and will result in the development of a prototype DNA microarray specific for fungal identification. Such a microarray has many uses, from environmental to medical applications and many advantages over current technologies. The database constructed through this work will be used to select DNA probe sets that will allow the detection and identification, to the level of genus of specie, of fungi from any source material. This microarray could greatly advance our knowledge of the role fungi play.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Investigation of the Microbial Processes Involved in Electron Transfer onto the Anode of a Biological Fuel Cell

Project Identifier LB06004

Principal Investigator Coates, John

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$278485
Cumulative Total Project Cost:	\$668482

Description of Project

Biological fuel (biofuel) cells offer an efficient conversion of chemical energy into electricity. Although biofuel cells offer great promise, they are limited by a true understanding of the microbiology of the technology and a full appreciation of how the individual microbes interact with electrodes. This project is to gain a better understanding of the microorganisms and biochemical mechanisms responsible for effective electron transfer onto electrodes in an energy generating ex-situ biofuel cell. This process will be investigated using both pure cultures and undefined microbial consortia biodegrading an assortment of compounds including know organic wasters. The overall goal is to provide a valuable new source of energy while providing waster biodegradation and attenuation.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Tailoring the Self Assembly of Functionalized Biomolecular Building Blocks

Project Identifier LB06005

Principal Investigator Francis, Matthew

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$204938
Cumulative Total Project Cost:	\$403359

Description of Project

Self-assembling biomolecules could provide powerful and efficient scaffolds for the construction of new materials. However, most scaffolds reported to date can only assemble into a limited number of geometric arrangements, and little is known about the long range order that these structures can establish. To explore these issues, a systematic and multidisciplinary approach will be used to elucidate the fundamental mechanisms that govern biomolecular self assembly on multiple length scales. These aspects will be explored through the development of a versatile viral capsid-based system for the preparation of ordered 2-dimensional materials.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Visible Light-driven Water Oxidation in Mesoporous Solids

Project Identifier LB06006

Principal Investigator Frei, Heinz

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$386573
Cumulative Total Project Cost:	\$575987

Description of Project

Direct visible light-driven splitting of water to hydrogen and oxygen, or reduction of CO₂ to H₂O to a C-based liquid fuel like methanol are currently only achieved through a sequence of half reactions, each requiring a sacrificial reagent. The main obstacles toward efficient visible light-induced water splitting of CO₂ reduction are: i) the coupling of efficient water oxidation catalysts to photon-driven electron transfer moieties on a heterogeneous support that serves the additional function of stabilizing and protecting the catalyst from any undesired chemistry, ii) the coupling of water oxidation and proton or CO₂ reduction in a 3-D assembly that affords overall fuel production without the need for sacrificial reagents. The purpose of this project is to address these issues.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Arsenic ElectroChemistry

Project Identifier LB06007

Principal Investigator Gadgil, Ashok

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$126055
Cumulative Total Project Cost:	\$230991

Description of Project

This project is to investigate accelerated formation of $\text{Fe}(\text{OH})_3$ and FeOOH for affordably removing arsenic from drinking water in Bangladesh. The questions we will answer are related to the effects on the electrochemical system of the specific ionic species in the raw water, the pH, dissolved oxygen and temperature effects on system performance, and the engineering design to make the system robust, fail safe, and most importantly, affordable to rural poor Bangladeshis.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Compositional and Functional Analysis of Cell Walls During Metal-bacterial Interactions

Project Identifier LB06009

Principal Investigator Holman, Hoi-Ying

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$173999
Cumulative Total Project Cost:	\$347010

Description of Project

This project is to initiate a Dual synchrotron radiation-based imaging technology to directly study the dynamics and reactivity of cell wall biomolecules interacting with metal ions in real-time. There is direct evidence that such bacteria are metal metal resistant, and that offer show extracellular exclusion of metals by a large quantity of exopolymer surrounding the cell walls. A fundamental yet unanswered question in bioremediation of heavy metals is: do different cell wall components regulate the transformation of metal ions and thus their long-term stability differently? This project will address the challenge to investigate the in situ metal-bacteria reactions at a biomolecular level and the long-term stability of metals transformed by these reactions.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Metagenomics-Enabled Analysis of Termite Hindgut Microbiota for Biomass Conversion and Cleaner Energy

Project Identifier LB06010

Principal Investigator Hugenholtz, Phillip

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$109443
Cumulative Total Project Cost:	\$202125

Description of Project

Termites efficiently transform the most recalcitrant of plant biomass, lignocellulose and humic acids, to valuable sugars and fuels (hydrogen, methane) by exploiting the metabolic capabilities of microbial symbionts inhabiting their hindguts. An understanding of the biochemical pathways used in the termite hindgut will therefore lead to more efficient strategies for converting biomass to fuels and chemicals. However, the mechanisms used to achieve these transformations remain elusive in the absence of molecular data. This project is to reconstruct the metabolic pathways responsible for biomass conversion in termites using a metagenomic approach, paving the way for industrial applications such as biological hydrogen production.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Terahertz-Frequency Conductivity and Ultrafast Optical Excitations in Single-Walled Carbon Nanotubes

Project Identifier LB06011

Principal Investigator Kaindl, Robert

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$95990
Cumulative Total Project Cost:	\$198957

Description of Project

This project is to study terahertz-frequency carrier transport and ultrafast electronic processes in single-walled carbon nanotubes, and can illuminate the influence of excitonic correlations and screening on the near-infrared resonances of semiconducting nanotubes. Moreover, the relative amounts of homogeneous and inhomogeneous broadening of near-infrared absorption lines can be investigated by following the irreversible decay of coherent polarizations. This will provide insight into the role of scattering with electrons, phonons, or excitons, and of higher order processes on the optical response. The insight gained here is critical of optoelectronic applications of nanotubes.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Software Application Infrastructure for Efficiently Managing Large-Scale Computational Biology Experiments

Project Identifier LB06012

Principal Investigator Konerding, David

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$138242
Cumulative Total Project Cost:	\$273239

Description of Project

We propose to develop a computation-based experimental infrastructure (C-BEI) to enable large-scale computational experiments designed to increase our understanding of gene regulation and genetic diseases in humans. Using a eukaryotic mRNA transcript surveillance mechanism called NMD, we will develop a computation-based experimental infrastructure to carry out efficient computational screens multi-genome datasets. The initial prototype developed will demonstrate the benefits of a high performance C-BEI.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Surface Plasmon-Enhanced Photovoltaic Device

Project Identifier LB06013

Principal Investigator Kostecki, Robert

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$107904
Cumulative Total Project Cost:	\$216491

Description of Project

Energy transfer from photo-excited surface plasmons (SPs) in silver to hot electrons can significantly enhance photoelectron emission at the nano-structured surfaces of Ag. We postulate that intense photoemission of hot electrons from nano-structured Ag can be used to design and develop new and innovative photovoltaic devices (PVs). This new concept offers an opportunity to create a completely new class of photovoltaic devices as compared to presently known PV systems. Our goals are to detect and quantify the plasmon-assisted electron emission at nano-patterned Schottky junctions and build a prototype photovoltaic device.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Measurement of Molecular Shape and Assembly Using X-ray Scattering

Project Identifier LB06014

Principal Investigator Marcus, Matthew

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$459849
Cumulative Total Project Cost:	\$887720

Description of Project

This work will establish a capability at the ALS for the measurement of the shape and assembly of complex molecules and polymers. In protein structure for example, it is often difficult or impossible to crystallize very large complexes. X-ray scattering from proteins in solution can be used to measure a low-resolution molecular envelope into which the atomic structures of sub-units can be docked, or to elucidate differences between a crystalline structure and a structure in solution. In the polymer nanostructure arena, many methods have been developed for synthesis of the basic building blocks, but engineering the chemistry of the self assembly of these units into useful structures requires knowledge of the assembly pathways. X-ray scattering allows one to measure these process.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Integrated Microbial Community Genomes Data Management System

Project Identifier LB06015

Principal Investigator Markowitz, Victor

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$433666
Cumulative Total Project Cost:	\$890411

Description of Project

The metagenome consists of the genomes of all organisms present in an environmental sample and the analysis encompasses the community rather than the species as the unit of study. Available microbial genome data repositories focus on individual microbial genomes and are not adequate for metagenome data analysis; they do not capture important dimensions of metagenome data, such as the environmental sample data context. The purpose of this project is to build an integrated data management system and develop tools that will support analysis of microbial community (meta) genomes with the goal of providing a comprehensive picture of the gene functions and metabolic capacity of both individual species populations as well as the microbial community as a whole.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Interrelation of Global Warming and Hydrate Dissociation in Oceanic Accumulations

Project Identifier LB06016

Principal Investigator Moridis, George

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$147811
Cumulative Total Project Cost:	\$293742

Description of Project

Vast amounts of hydrocarbons are trapped in hydrate deposits. Such deposits occur in two distinctly different geologic settings where the necessary low temperatures and high pressures exist for their formation and stability: in the permafrost, and in deep ocean sediments. We propose to investigate the effect of rising water temperatures on the stability of oceanic hydrate accumulations. Increasing temperatures are expected to lead to hydrate dissociation, resulting in the releases of very large quantities of hydrocarbons, mainly methane, that can travel through the water column and enter the atmosphere. Methane is also a very powerful greenhouse gas and its release from hydrates can further accelerate global warming.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project New Technology for Permeability Enhancement for Natural Gas Extraction in Tight Reservoirs

Project Identifier LB06017

Principal Investigator Nakagawa, Seiji

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$118286
Cumulative Total Project Cost:	\$234156

Description of Project

With the dwindling supply of foreign and domestic oil and the push to reduce CO₂ emissions, natural gas is destined to be one of the premier energy sources by the next decade. Currently, technically recoverable gas in the lower 48 states is believed to be trapped within very low-permeability, tight gas reservoirs. The primary objective of this project is to develop an entirely new approach for enhancing the production of natural gas in tight reservoirs. The approach employs a self-growing, high permeability slot that is driven from a borehole. The slot is advanced through a coupled hydro-mechanical process in which large stress concentrations around the borehole (or the advanced slot) in concert with high velocity fluid circulation combine to advance a permeable plane.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Coupled Modeling of Hydrology, Nutrient Cycling, and Vegetation: Applications to Water Quality and Water Balance

Project Identifier LB06018

Principal Investigator Oldenburg, Curtis

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$124966
Cumulative Total Project Cost:	\$244966

Description of Project

The immediate objective of this project is to develop and test numerical models capable of simulating the coupled processes of subsurface hydrology, vegetation, and associated nutrient cycling. We will subsequently use the developed coupled models for water quality and water balance investigations, such as to investigate how vegetation, hydrology, and nutrient cycling are impacted by land-use and climate change. The foci of the project will be the (1) development of an appropriate coupled simulation capability based on TOUGH2, CLM3 (Common Land Model), and other models as deemed appropriated, (2) identification of relevant data sets that provide constraints on coupled processes and rates, and (3) application of the model to problems of broad interest to the community.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Development of Cost Effective Sequence-Based Technologies to Identify Genomic Alterations in Cancer

Project Identifier LB06019

Principal Investigator Pennacchio, Len

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$213260
Cumulative Total Project Cost:	\$457198

Description of Project

Numerous historic studies in cancer development and progression have revealed recurrent somatic genomic aberrations as a principle cause of disease. Technology for identifying these aberrations has not been available and as a result the vast majority of such events remain to be defined. The recent availability of a complete reference human genome along with advances in DNA sequencing based technologies at continually decreasing costs have poised sequence driven approaches to significantly unravel the basis of cancer. In this application we propose to develop a cost-effective DNA sequence based method to define structural alterations in cancer as a proof-of-principle and to also identify the underlying gene(s) disrupted by the genomic aberrations.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Aging, Disease and the Mechanical Response of Biological Tissues, Specifically Human Bone

Project Identifier LB06020

Principal Investigator Ritchie, Robert

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$147823
Cumulative Total Project Cost:	\$278504

Description of Project

This work is based on the premise that many disease states, therapeutic treatments, and the aging of biological mineralized tissue, specifically human bone, can be related to definitive changes in the mechanical properties of that tissue. This is aimed at bridging the gap between the existing clinical understanding of bone fracture and the underlying micromechanical mechanisms of bone failure. Measurements at the nano and molecular scales (pico-force AFM, nanoindentation, and vibrational spectroscopies) and microscale (computed hard and soft x-ray tomography) will be related to structural behavior at the macroscale (characterized by fracture mechanics and fatigue testing).

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Photons to Fuels ? The Electrochemical Reduction of Carbon Dioxide to Methanol

Project Identifier LB06021

Principal Investigator Newman, John

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$357269
Cumulative Total Project Cost:	\$778173

Description of Project

This project is to develop an electrochemical route for the generation of fuels from electrons. We propose to achieve this goal using a two-step approach involving converting CO₂ to syngas and subsequently converting the syngas into methanol. While the former step will be achieved using an electrochemical route, we propose to evaluate both an enzymatic and an electrochemical route to achieve the latter. We expect to combine the two steps in the future to produce methanol directly via the electrochemical route.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Determining if PIR51 is a Potential Tumor Suppressor Gene Similar to BRCA2

Project Identifier LB06022

Principal Investigator Schild, David

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$116881
Cumulative Total Project Cost:	\$248820

Description of Project

We have recently identified human PIR51 (Protein Interacting with Rad51) as a new DNA repair gene. Our goal is to further characterize PIR51 and to obtain experimental data (i.e. proof of principle) to test our hypothesis that this gene functions in the same pathway as BRCA2, a tumor suppressor gene important in breast cancer. Cells partially depleted for PIR51 share some properties with BRCA2-defective cells, but differences do exist. These differences may be artifacts due to the transient and partial depletion or to the use of specific type (HeLa) of cells. Our aim to test the phenotype of: 1) stable depletion of PIR51 in near-normal human cells, and 2) a pir51 knockout in DT40 cells. We will also test functions relating to repairing radiation damage.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Electron Glow Generated by Gas Phase Exothermic Catalytic Reactions Using Metal-Semiconductor Nanodiodes

Project Identifier LB06023

Principal Investigator Somorjai, Gabor

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$147398
Cumulative Total Project Cost:	\$250228

Description of Project

Using a 5 nm platinum film deposited on a 150 nm titanium oxide film to produce a Schottky diode, we generated 40 microamp current in steady state during the platinum catalyzed oxidation of carbon monoxide. We propose to explore the mechanism of continuous hot electrons current generation by (1) systematically altering diode materials and their fabrication, (2) the type of metal and its structure used as both the catalyst and top electrode, (3) and by the type of exothermic catalytic reaction ranging from the oxidation of hydrogen and methanol to hydrocarbon hydrogenation and combustion. We shall explore the effects of current flow on catalyst selectivity, activity and stability. Ultimately we plan to explore CO₂ reduction and water dissociation induced by hot electrons.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Versatile Mini-Scanning Transmission X-ray Microscope (mSTXM)

Project Identifier LB06024

Principal Investigator Tyliczszak, Tolek

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$151876
Cumulative Total Project Cost:	\$240048

Description of Project

There is a timely opportunity to design and implement a revolutionary, compact, stand-alone, prototype STXM instrument that will provide additional STXM capacity for scientific investigations utilizing existing beamlines at synchrotron radiation sources such as the ALS without the high opportunity cost. A compact and relatively inexpensive STXM, while at the same time providing the experimental versatility with most of the current STXM performance characteristics, can likely be fabricated. The new microscope, the mini-STXM (mSTXM), is envisioned as a portable end station that could be attached to several existing ALS beamlines for experiments and will also serve as a developmental testbed for future STXM innovations.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Conceptual Study for a Novel Nuclear Astrophysics Accelerator Capability to Measure Nuclear Reactions That Power the Stars

Project Identifier LB06025

Principal Investigator Vetter, Paul

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$146000
Cumulative Total Project Cost:	\$262961

Description of Project

We intend to develop a novel nuclear astrophysics capability to measure rare processes that determine stellar evolution. This would eventually operate over several months to determine smallest cross sections with higher precision accuracy that presently achievable. The project includes the establishment of experimental requirements and a beamline layout for a high-intensity, low-energy, and high precision accelerator providing beam currents of one to several magnitudes higher than currently utilized by nuclear astrophysicists. This should ultimately lead to major improvements in our understanding of nuclear reactions that power the stars.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Extended First Order System Least Squares Finite Elements

Project Identifier LB06026

Principal Investigator Wilkening, Jon

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$54904
Cumulative Total Project Cost:	\$111106

Description of Project

This project is to develop numerical methods in the least squares finite element setting for adjoining special basis functions to the finite element space in order to capture features of the solution, which are not accurately represented by the usual basis functions. These methods can be applied to problems in solid mechanics involving stress singularities (e.g. crack propagation and grain boundary evolution), and to problems in fluid mechanics involving coupling with elastic or inertial bodies (e.g. blood flow in the heart), and to problems in electromigration in computer chips.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Properties of New Ionic Liquids for Electrochemical Applications and for Extraction of Heavy-Metal Cations from Wastewaters

Project Identifier LB06027

Principal Investigator Prausnitz, John

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$80717
Cumulative Total Project Cost:	\$153662

Description of Project

We want to improve performance of lithium batteries by using new ionic liquids. When a lithium salt is dissolved in one of these ionic liquids, we expect to attain superior conductivity, better stability over a large temperature range and, most important, we expect to prevent shortening out of the battery due to (undesired) formation of dendrites at the batteries electrodes. Further, we want to find an optimum extraction solvent for extracting dangerous cations (e.g. Hg, Sr, Cd and others) from aqueous wastewaters. We expect superior extraction performance from our new ionic liquids. We plan to synthesized and purify many new ionic liquids: cations that are derivatives of a pyridinium cation; anions anionjs are triflate, nonaflate, dicyanamide or bis imide.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Fabrication of Photovoltaic Devices Using Nanostructured Biomaterials

Project Identifier LB06031

Principal Investigator Lee, Seung-Wuk

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$192359
Cumulative Total Project Cost:	\$284860

Description of Project

A major goal of this proposal is to develop a biological method for the fabrication of virus-based photovoltaic nanomaterials and devices. We will exploit the evolution ability of genetically engineered viruses to identify specific peptide information for nucleation of target photovoltaic nanocrystals. Using these viruses, we will synthesize virus-based photovoltaic nanowires and vertically assemble them into heterojunction photovoltaic devices through a magnetic field induced photovoltaic cell fabrication process. We expect that the produced vertically oriented nanowire photovoltaic devices will result in an improved efficiency by enhancing the electron mobility of the devices.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Cellulose Degradation and Cellulosomes

Project Identifier LB06032

Principal Investigator Cate, Jamie

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$342672
Cumulative Total Project Cost:	\$484932

Description of Project

This project is to develop an experimental system to determine mechanistically how cellulosomes efficiently degrade cellulose. At present, it has not been possible to probe the structure and function of intact cellulosomes. This is due to their very large size and heterogeneous composition in many organisms. Furthermore, since the substrate for cellulosomes is a solid, the cellulosome is not easily studied by standard enzymological approaches. We propose to develop a model system of the cellulosome that will enable us to study its enzymatic properties at a fundamental level, and to determine its structure at atomic resolution. The long-term benefit of this work will further an important goal of the DOE, to improve conversion of cellulose into useful liquid fuels, or biofuels.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Computational and Experimental Testing of Methods for Binning Sequences from Metagenomic Data

Project Identifier LB06033

Principal Investigator Eisen, Jonathan

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$154122
Cumulative Total Project Cost:	\$217988

Description of Project

This project is to test and develop methods for taking DNA sequences generated from environmental samples and determine from what organism the DNA came. A major difficulty in analyzing DNA sequences from metagenomics projects is in the assigning sequences, or binning, to particular organisms or populations of related organisms. We and others have used a variety of methods of binning, but there has been almost no systematic work on determining how well these methods work. Therefore we will test known as well as new binning methods by generating metagenomic data sets where the origin of sequences is known. These data sets will come from three types of sources: simulations, artificial mixes of DNA, and real metagenomic projects.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Expression Profiling of Radiation and Cancer Susceptibility Genes

Project Identifier LB06035

Principal Investigator Wyrobek, Andrew

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$402996
Cumulative Total Project Cost:	\$590866

Description of Project

Overall, this research is to identify gene/pathway determinants of inter-individual variations in susceptibilities to radiation-induced clinical toxicity and radiation-inducible cancers. This project will evaluate the feasibility of using genomic polymorphisms, gene-expression profiles and cellular-damage responses in unirradiated cells and immediately after low and moderate doses of ionizing radiations to develop bio-indicators of subsequent radiation susceptibility. The proposed studies are designed to yield candidate protein targets for important applications: assays to prescreen patients who have abnormally high clinical sensitivities to radiotherapy to reduce treatment morbidity, and drug/treatment strategies to reduce radiation toxicity to normal tissue.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Integration of Synthetic Nano-materials for High Speed, Robust, and Flexible Circuitry

Project Identifier LB06038

Principal Investigator Javey, Ali

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$122980
Cumulative Total Project Cost:	\$170847

Description of Project

The ultimate purpose of this project is to achieve cheap and high performance electronics based on synthetic nanostructured channel materials, such as semiconductor nanowires, on bendable and wearable plastic substrates that are capable of operating in the UHF regime. Organic materials and amorphous Si are the two main materials that have been actively explored. However, they lack robustness and are poor semiconductors, resulting in low performance electronics. Recently, nanowire devices have been shown to operate at about 10 MHz on plastics. Through materials, device structure, and circuit design innovation and optimization, we plan to further enhance the performance by about two orders of magnitude in order to achieve truly high performance and flexible circuitry.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Development of Fast Switching Superconducting Magnets for Spectroscopy Applications

Project Identifier LB07002

Principal Investigator Arenholz, Elke

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$229902
Cumulative Total Project Cost:	\$229902

Description of Project

We propose to develop the core technology for a superconducting magnet providing a peak field of about five tesla with arbitrary field orientation and capable of full field reversal in about five seconds. Magnetic fields of this magnitude are needed to align the magnetic moments along the hard magnetization directions in many novel materials (molecular magnets, magnetic nanostructures, ferromagnetic semiconductor, functional oxides). Arbitrary field directions will make it possible to take full advantage of the strengths of soft x ray magnetic dichroism (XMD) measurements. Rapid field ramping suitable for point-by-point field reversal in spectroscopy experiments will provide much improved sensitivity enabling new insights into the magnetic properties of nanostructures impossible today.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Synthetic and Electrochemical Approaches to Metal-Metal Bonds in Actinides

Project Identifier LB07003

Principal Investigator Arnold, John

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$69800
Cumulative Total Project Cost:	\$69800

Description of Project

The isolation of complexes containing multiple actinide-actinide bonds remains an illusive goal. The recent emergence of computational studies suggesting that some species of interest should be stable, and that 5f orbitals are key components in the bonding of such species. In practical terms, however, these remain as tantalizing suggestions. We have a long-standing interest in using ligand design to influence and promote unusual structural motifs, and we believe that we can apply our chemistry to this important and chemically fascinating subject. Through design and application of new ligand systems, we intend to influence the structure of generated actinide complexes such that metal-metal bond formation between actinides is rendered energetically feasible.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Soft-collinear Effective Theories Applied to Collider Physics

Project Identifier LB07004

Principal Investigator Bauer, Christian

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$288401
Cumulative Total Project Cost:	\$288401

Description of Project

The start of data taking at the LHC in 2007 will mark the beginning of a new era in high energy physics. For the first time, a collider will have the capability to directly probe the mechanism of electroweak symmetry breaking at the scale of order a few hundred GeV. The energy at the LHC will be large enough to directly produce Beyond-the-Standard-Model (BSM) particles. The goal of the proposed work is to improve our understanding of the signatures expected at the LHC. One of the most important theoretical problems relating to the upcoming run of the LHC is to understand the production of multiple jets in the SM, which provides important backgrounds for many signals of BSM physics at the LHC.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Structured, Adaptive Mesh Refinement Method for Multiphase Reactive Transport in Groundwater

Project Identifier LB07005

Principal Investigator Bell, John

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$219636
Cumulative Total Project Cost:	\$219636

Description of Project

High-fidelity simulations of groundwater flow have the potential for providing valuable insights into long-term fate of contaminants. However, realizing this potential presents significant computational challenges. We propose to perform a proof of concept study to demonstrate the effectiveness of adaptive mesh refinement (AMR) for reactive subsurface transport. The project will develop a basic flow module for modeling multiphase, multicomponent non-isothermal flow with reactions. This methodology will include second-order discretization methods that provide a robust and accurate treatment of transport processes and the coupling of that integration scheme to parallel AMR methodology.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Conversion of Glycerol and Aromatic Compounds from Biomass to Major 3- and 6- Carbon Industrial Organic Compounds

Project Identifier LB07006

Principal Investigator Bergman, Robert

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$127626
Cumulative Total Project Cost:	\$127626

Description of Project

A large majority of essential industrial organic chemicals are produced from petrochemical feedstocks. With the present skyrocketing costs and ultimate depletion of petrochemicals, alternative, renewable feedstocks for the production of industrial chemicals must be developed for the future economic viability of the United States. The focus of this project is the efficient and practical conversion of glycerol, a major byproduct of bio-diesel production, into essential three-carbon industrial chemicals. We will also develop efficient catalysts for the selective hydrodeoxygenation of the highly oxygenated aromatic component of biomass into essential aromatic industrial chemicals.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project On-demand Overlays for Scientific Applications

Project Identifier LB07007

Principal Investigator Berket, Karlo

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$130429
Cumulative Total Project Cost:	\$130429

Description of Project

Scientific computations and collaborations increasingly rely on the network to provide high-speed data transfer, dissemination of results, access to instruments, support for computational steering, etc. Networks with redundant high-speed paths need algorithms to effectively allocate bandwidth across multiple paths for a single application. This capability is required for two important communication classes: large point-to-point transfers and periodic data dissemination from a single sender to multiple receivers. The overall goal of this project is to perform the research and development necessary to form the basis of a framework for creating on-demand overlays for scientific applications that make efficient and effective use of the available network resources.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Applications of Adjoint Field Methods and Time-Reversal Data Processing to Inverse Problems in Electromagnetic, Seismics, and Ultrasonics

Project Identifier LB07008

Principal Investigator Berryman, James

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$148050
Cumulative Total Project Cost:	\$148050

Description of Project

Research in complex geophysical imaging situations has shown that one robust method of attacking many imaging and target localization problems confronting geoscientists is the adjoint field method. In particular, the related method of time-reversal data processing has been developed for both diagnosis and treatment in biomedical problems and, also, for communications in underwater applications, as well as for more traditional ultrasonic imaging in NonDestructive Evaluation (NDE). Two areas of important applications to be pursued in the project are therefore ultrasonic/seismic imaging for laboratory/field applications and electromagnetic target location and identification.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Chemical Reactions at Liquid/Vapor Interfaces Probed by Photoemission Spectroscopy

Project Identifier LB07009

Principal Investigator Bluhm, Hendrik

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$146669
Cumulative Total Project Cost:	\$146669

Description of Project

We intend to build a novel instrument for the investigation of chemical reactions at liquid/vapor interfaces under atmospherically and environmentally relevant conditions. The properties of liquid/vapor interfaces strongly influence the abundance and reactivity of trace gas molecules that are important for many heterogeneous processes in atmospheric and environmental chemistry. We are planning to combine synchrotron-based ambient pressure photoemission spectroscopy and a liquid droplet train produced by a vibrating orifice aerosol generator in a single experimental setup. This instrument will provide quantitative information about the chemical nature of the liquid/vapor interface under varying conditions.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Functional Interactomics: Integrating Physical and Functional Interaction Networks

Project Identifier LB07010

Principal Investigator Butland, Gareth

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$352907
Cumulative Total Project Cost:	\$352907

Description of Project

Interactions define the molecular organization of the cell. Physical interactions, such as protein-protein interactions, help us understand how individual polypeptide chains come together to form protein complexes which perform many of the biochemical reactions in a cell. Other types of interactions, such as functional interactions, propose organizational relationships between gene products and protein complexes within the cell. This project to develop and implement a methodology capable of screening for functional interactions in E. coli on a genome wide scale.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project New Experimental Initiative to Deduce (n,f) Cross Sections for Advanced Fuel Studies

Project Identifier LB07012

Principal Investigator Clark, Roderick

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$147911
Cumulative Total Project Cost:	\$147911

Description of Project

This project is to determine basic nuclear physics data for Advanced Fuel Cycle (AFC) studies. Sustainable, safe nuclear energy has been identified as an important national need and the necessary basic research is part of the DOE mission. This is an innovative scientific effort to determine cross sections for neutron-induced fission of actinides involved in fast reactor fuel cycles. Existing data often show significant discrepancies and do not extend to the higher neutron energy range found in fast reactors. The goal is to develop novel surrogate reactions to deduce the relevant cross sections to unprecedented accuracy over a broad neutron energy range. These data are needed for proper fuel cycle assessment and the development of transmutation strategies.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Transcription CoFactor PC4 Interactions with RNA Polymerase and XPG in Transcription-Coupled Repair

Project Identifier LB07013

Principal Investigator Cooper, Priscilla

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$291994
Cumulative Total Project Cost:	\$291994

Description of Project

A major goal of both cancer and aging research is to understand cellular mechanisms for detection and repair of DNA damage that threatens genomic integrity, as well as coordination of these DNA repair processes with transcription, replication, DNA damage signaling, and mechanisms for determining cell fate. Cellular machinery for transcription-coupled repair (TCR) is critical for maintaining transcription by preferential removal of damage that blocks RNA polymerase (RNAP) elongation, and defects in this process result in hereditary disorders with severe clinical phenotypes and early death. This project will better characterize the mechanism of TCR through investigation of the proposed role of a novel player, the transcription cofactor PC4.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Understanding the Chemistry of Innovative Air Cleaning Technologies

Project Identifier LB07014

Principal Investigator Destailats, Hugo

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$107945
Cumulative Total Project Cost:	\$107945

Description of Project

We will investigate the combination of ozonation with photocatalytic oxidation and with reactive adsorption treatments for the removal of volatile organic compounds (VOCs) from indoor air. Recent reports suggest that air-cleaning technologies employing these combined approaches can achieve important pollutant removal enhancements while extending the lifetime of catalysts and sorbents, but the underlying chemical basis has not been well established. We intend to develop a tool that can be used to characterize the performance of innovative sorbents and catalysts designed with meso- and nanoscopically tailored materials.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project FEL Concepts for Multiple Independent X-ray Beamlines

Project Identifier LB07015

Principal Investigator Fawley, William

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$291655
Cumulative Total Project Cost:	\$291655

Description of Project

We propose to address fundamental issues and develop concepts for radically new FEL-based capabilities for implementation at LBNL. The goal of the project is to design concepts for flexible photon beam performance, based on a number of FEL configurations, fed by a low-energy electron accelerator. From the accelerator, electron beams will be switched each FEL in the array, in a time-sliced manner dependent on user needs. Each FEL will be independently tunable, and various configurations will be studied including regenerative amplifiers, oscillators, SASE, and seeded approaches, in order to provide a high degree of flexibility in providing for time-domain, high resolution, and high flux and brightness beamlines.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Building In-Situ Electronic Structure Study Capability with Photon-in/ Photon-out Soft X-ray Spectroscopy

Project Identifier LB07016

Principal Investigator Guo, Jinghua

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$251968
Cumulative Total Project Cost:	\$251968

Description of Project

Soft-x-ray spectroscopy has unique features that make it a powerful tool to extract information about electronic properties. In general, soft-x-ray absorption spectroscopy (XAS) probes the local unoccupied electronic structure; soft-x-ray emission spectroscopy (XES) probes the local occupied electronic structure; and resonant inelastic soft-x-ray scattering (RIXS) probes the low-energy excitations, such as charge transfer, proton energy transfer etc. This project is to build the chemical cells for in-situ photon-in and photon-out soft-x-ray spectroscopy studies of the chemical reactions in general. The goal is to demonstrate a unique way to handle the real systems (gas and liquid phases) under UHV condition for electronic structure studies.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Ultra-compact Field Desorption Neutron Source for Cancer Research

Project Identifier LB07017

Principal Investigator Ji, Qing

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$207909
Cumulative Total Project Cost:	\$207909

Description of Project

We will investigate the feasibility of using a novel neutron point-source device for the treatment of cancer, leading to a proof-of-principle experiment of a field desorption neutron generation, microfabrication of closely packed silicon field emitters, neutron yield measurements, and the development and fabrication of a prototype ultra-compact neutron generator. By powering on and off, the neutrons can be produced on-demand, thus eliminating expensive shielding for the protection of clinical personnel and patients when radioactive neutron sources are involved. The generator can be small enough to be housed in a catheter, which allows insertion of the neutron source into the human body and, by adding MRI capability, can be placed at the exact location of the tumors.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Soot in Ice: Does Smoot Enhance the Melting of Ice?

Project Identifier LB07019

Principal Investigator Kirchstetter, Thomas

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$162563
Cumulative Total Project Cost:	\$162563

Description of Project

The goal of this project is to experimentally determine the effect of soot contamination of snow and ice on the surface albedo and the rates of heating and melting of snow/ice/soot systems. Climate model simulations indicate that the black carbon (BC) radiative forcing due to snow/ice albedo reduction may be responsible for a quarter of the global warming of this past century, including thinning of Arctic sea ice and melting land ice. A number of studies have confirmed the presence of BC soot in surface snow/ice and precipitation. In contrast, there is almost no experimental or empirical data that support theoretical estimates of the effect of BC on snow/ice albedo and melt rate.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Physics Detector and Sensor Technologies Applied to Geological and Geophysical Applications at DUSEL

Project Identifier LB07020

Principal Investigator Lesko, Kevin

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$442018
Cumulative Total Project Cost:	\$442018

Description of Project

This project is for investigations of new opportunities provided by the Deep Underground Scientific and Engineering Laboratory (DUSEL). The problems include 1) investigate underground carbon remediation techniques, 2) understand heat flow and origins in the earth and research geothermal energy extraction, and 3) develop novel detector components and materials for underground research. The first researches carbon sequestration in underground sites, developing techniques for transporting, and monitoring CO₂. The second effort is aimed at understanding heat flow in the underground and the origins of terrestrial heat. The final topic will investigate new materials for underground detectors such as ultra-pure plastics and nano-wires.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Integrated Decision Support Tool for Joint Optimal Control of Energy and Water Systems

Project Identifier LB07021

Principal Investigator McMahon, James

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$213305
Cumulative Total Project Cost:	\$213305

Description of Project

The purpose is to develop robust decision support tools for optimal control of energy and water systems using a multi-disciplinary optimization framework for linked sub-systems. We will identify key common drivers as a means to develop an integrated decision support tool from existing energy and water models, use explicit characterizations of sources of uncertainties, and develop a ranking of key uncertainties as targets for further research. Finally, we will develop a clear path forward for transferring this technology to California agencies, U.S. agencies, and international programs. We hypothesize that optimal control of our proposed integrated system provides a better match between supply and demand for water and energy, fewer failures to meet demand and lower total costs to society.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Bio-oil Accumulation in Unicellular Green Algae: A Pilot Project

Project Identifier LB07022

Principal Investigator Melis, Anastasios

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$139984
Cumulative Total Project Cost:	\$139984

Description of Project

A variety of unicellular green algae naturally accumulate a large fraction of their biomass as lipids or hydrocarbons, products of the fatty acid and terpenoid biosynthetic pathways, respectively. An understanding of the molecular and cellular events that govern these processes may make it possible to generate large amounts of such bio-oils from mass-cultured photosynthetic organisms. These compounds could become important feedstock in the synthetic chemistry industry and serve as renewable biofuels. Elucidation of the associated metabolic processes will permit higher yields of bio-oils from these microalgae and also from terrestrial plants.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Cooperation of Biochemical and Mechanical Signals in Regulating Cell Fate Decision During Tissue Morphogenesis

Project Identifier LB07024

Principal Investigator Schaffer, David

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$235769
Cumulative Total Project Cost:	\$235769

Description of Project

We will study how cells interact with each other and their microenvironment during the processes of tissue regeneration and repair. This effort will bridge mathematical modeling, quantitative analytical biology, biomaterials development, and high impact biological systems in an integrated effort. Specifically, we will study how biochemical and mechanical signals cooperatively regulate cell fate decisions during the process of tissue morphogenesis in the breast and brain, work that will have implications for tissue regeneration and repair as well as cancer biology.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Baryon Oscillations and Dark Energy: Prototyping Instruments

Project Identifier LB07025

Principal Investigator Schlegel, David

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$140065
Cumulative Total Project Cost:	\$140065

Description of Project

Dark energy in the accelerating Universe can be characterized with the standard-ruler technique of baryon oscillations. This project is to investigate the necessary technology for a 1000-fiber spectrograph that is designed specifically for measuring baryon acoustic oscillations (BA)). This would potentially lead to new dedicated instrument capabilities as well as an experiment that could be employed on a larger telescope, such as Keck, for extending the BAO experiment to the higher-redshift universe. Research would also address calibrating the requirements for weak lensing measures of dark energy.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Laser-plasma Accelerator Driven Free-Electron Laser with High-Harmonic Seeding

Project Identifier LB07026

Principal Investigator Schroeder, Carl

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$146105
Cumulative Total Project Cost:	\$146105

Description of Project

This project is aimed at the development of a compact source of high peak flux, coherent, ultra-short pulse x-rays generated by a free-electron laser (FEL) driven by electron bunches from a laser wakefield accelerator (LWFA). The development of a high harmonic generation (HHG) source to seed the high-gain FEL instability in the EUV and soft x-ray regime (10-30 nm) will be explored. Self-amplified spontaneous emission (SASE) will be considered for production of energetic x-rays (4 nm). We propose to use theoretical and numerical modeling to perform a technical analysis and assessment of the applicability of a laser-plasma-accelerated electron beams for an FEL with the goal of designing a tunable, ultra-short (50 fs) light source in the x-ray regime.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Hyperons in Polarized Proton Collisions and the Origin of the Nucleon Spin

Project Identifier LB07027

Principal Investigator Schtermann, Ernst

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$150037
Cumulative Total Project Cost:	\$150037

Description of Project

Fundamental questions about the structure of the polarized nucleon concern the polarization of gluons and quarks. We intend to 1) make phenomenological studies of hyperon polarization in polarized proton collisions, 2) complete a proof-of-principle hyperon spin analysis with the STAR detector at RHIC, and 3) identify STAR experiment needs for promising future hyperon polarization measurements. If successful, hyperon polarization measurements may give new insights in strange quark and anti-quark polarization in the polarized nucleon, as well as provide a complementary path to the proposed weak-boson production measurements at RHIC, which give insight in the up and down quark and anti-quark polarization.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Power Efficiency Metrics for High Performance Computing

Project Identifier LB07028

Principal Investigator Shalf, John

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$121029
Cumulative Total Project Cost:	\$121029

Description of Project

The goal of our effort is to identify appropriate metrics for rigorously comparing the effective computational efficiency of radically different high performance computing (HPC) system architectures. Our effort is distinct from existing power efficient computing research activities because it provides a sharper focus on the computational requirements of large-scale scientific problems. To accomplish this, we will use NERSC workload analysis to establish throughput metric based on efficiency on an accurate model of a typical HPC workload, . define data collection procedures to establish common metrics for performance for strong and weak scaled scientific problems on different computational platforms, and Benchmark different existing HPC system deployments to refine the benchmarking process.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Integrated Performance Monitoring of Grid and HPC Workloads

Project Identifier LB07029

Principal Investigator Skinner, David

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$138520
Cumulative Total Project Cost:	\$138520

Description of Project

Parallel computers enable scientific research only insofar as they are able to realize their performance potential on scientific workloads. Performance monitoring of parallel applications is thus crucial to all involved in the use and management of high performance computing (HPC) resources. This project seeks to extend the degree to which Integrated Performance Monitoring (IPM) may be applied to diverse HPC applications and architectures. This project will address questions to increase the applicability of IPM to the segments of the HPC application space which are currently not covered, and improve the backend infrastructure of IPM so that it can be used for quantitative analysis of the center-wide workload.

United States Department of Energy
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Laboratory L. Berkeley National Lab

Project Studies of Quantum Antiferromagnetism in Two-dimensional Triangular Lattices Using Ultracold Atoms

Project Identifier LB07030

Principal Investigator Stamper-Kurn, Daniel

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$120791
Cumulative Total Project Cost:	\$120791

Description of Project

The new field of ultracold atomic physics now stands to contribute to the science of materials by creating high-fidelity physical realizations of many-body quantum models and studying them using a novel set of probes. Atomic systems can be used not only to mimic existing materials systems but also to represent entirely new ones and expand the space of many-body physics models that can be explored. We can study these atomic quantum systems far from equilibrium and undergoing long-term coherent dynamics. In particular, we propose to apply the resources of ultracold atomic physics toward addressing the open question of quantum magnetism, focusing specifically on antiferromagnetism in a two-dimensional anisotropic triangular lattice.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project High Brightness Cathodes as Electron Sources for FELs

Project Identifier LB07031

Principal Investigator Wan, Weishi

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$289998
Cumulative Total Project Cost:	\$289998

Description of Project

New x-ray capabilities drive the need for improvements in electron beam quality, in particular to provide a potential compact and flexible facility. One of the most critical issues is an FEL providing high average pulse rate, the generation of high brightness electron bunches with high quantum efficiency. This project is to address fundamental issues of generating high quality nano-Coulomb scale electron beams with repetition rate in the MHz range, and transverse emittance of less than 1 mm-mrad. Experimental and computational approaches will be taken to develop solutions for practical cathodes. We will develop cathodes with an integrated approach, addressing the illuminating laser system requirements as well as the physics of efficient, robust, and low emittance cathodes.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Hierarchically Nanostructures Systems for Solar Energy Hydrogen Production

Project Identifier LB07032

Principal Investigator Yang, Peidong

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$332215
Cumulative Total Project Cost:	\$332215

Description of Project

A sustainable hydrogen economy would require using renewable energy (solar energy) and a suitable feedstock (e.g., water). Energy from the sun will require the invention of new photoactive materials that accomplish the combined tasks of light harvesting, charge separation, and compartmentalized chemical transformations. These new materials are expected to incorporate many of the design principles that operate in biological photosynthetic systems. We propose to develop synthetic, photocatalytic materials based on nanostructures that allow the spatial arrangements of active components, and the traffic control of chemical reactants, intermediates, electrons and products. The ultimate goal of this effort is to design a multifunctional, multi-layer nanostructured membrane system.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Ultra-high Resolution Optics for Soft X-ray Inelastic Scattering

Project Identifier LB07033

Principal Investigator Yashchuk, Valeriy

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$142984
Cumulative Total Project Cost:	\$142984

Description of Project

The goal of this work is to establish and demonstrate the technology required for ultrahigh resolution Resonant Inelastic soft X-ray Scattering (RIXS). RIXS allows the measurement of the electronic structure of materials, in particular energy loss processes, in a manner that is free of the normal core hole lifetime broadening. RIXS is atom specific, and now recognized as one of the best methods for investigating excitations in correlated electronic systems. The main technical issue has always been achieving the high energy resolution needed at the high energies required to access relevant core levels. Here we propose a revolutionary new way to construct gratings to get to the extremely high resolving powers required.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Emittance Manipulation and Beam Conditioning for FELs

Project Identifier LB07034

Principal Investigator Zholents, Alexander

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$292366
Cumulative Total Project Cost:	\$292366

Description of Project

A limitation in FEL performance is in the production of small transverse emittance, required for overlap of electron and photon beams in the FEL process. A 'brute force' approach employing a large, expensive, high energy linac system has been used to date. The goal of the proposed activity is to design electron beam emittance control and manipulation techniques for application in a low-energy (one to few GeV scale) FEL facility. Implementation of anticipated manipulation and conditioning techniques would offer an accelerator with optimized electron beams allowing flexible photon beam performance from an FEL facility, with a small footprint and feeding several independent FEL beamlines.

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Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Research Tools for the Conversion of Cellulose to Ethanol: Structural Studies of Cellulose Synthesis

Project Identifier LB07035

Principal Investigator Adams, Paul

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$143816
Cumulative Total Project Cost:	\$143816

Description of Project

The goal of this work is to apply medium to high resolution imaging methods to determine the detailed mechanism of cellulose synthase (CESA); the molecular machine responsible for the synthesis of the cellulose component of the plant wall. Specifically, we will use x-ray crystallographic, electron microscopy, and tomographic methods to determine the stoichiometry of the CESA complex, its position in the cell membrane, its relationship to the nascent cellulose fibrils, and ultimately the atomic resolution structure of the CESA active site. The information generated will be critical to the development of modified plants as the source of cellulose for ethanol production.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Chinas Energy Future: Changes in Energy Intensity

Project Identifier LB07036

Principal Investigator Levine, Mark

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$90177
Cumulative Total Project Cost:	\$90177

Description of Project

The topic of Chinas energy system is receiving increasing attention around the world. In many quarters, this attention has turned to alarm. Coal consumption is growing at an enormous rate, power plants are being constructed at the fastest pace in history of any nation, and greenhouse gas emissions are growing apace. One-third to one-half of the world's incremental demand for oil has come from China in the past five years. After a long and successful experience in implementing energy efficiency, project will investigate the forces at work in China that have brought about this major change in its approach to energy in the effort to design ways out of the dilemma. It will also address energy supply issues that have resulted from China's inability to to reduce energy demand growth.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Berkeley National Lab

Project Tests of a Multilayer Hybrid Neutron Detector Concept for Nuclear Fuels Monitoring

Project Identifier LB07037

Principal Investigator Spieler, Helmuth

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$122418
Cumulative Total Project Cost:	\$122418

Description of Project

The development of new reactor technologies and fuel processing is tightly coupled with the development of advanced monitoring systems. The monitoring of fresh and spent fuel at reactors and safeguards for transmutation fuels or fuel recycling will require an ensemble of monitoring technologies to optimize the measured data to the specific application. In some systems neutrons and gammas can be separated by pulse-shape discrimination, but gamma rejection is imperfect with typical leakage in the percent range. This limits the neutron detection threshold, so new neutron detector system with improved gamma rejection would extend the sensitivity of the neutron measurement. The goal of this work is to demonstrate the feasibility of our multilayer hybrid detectors in a neutron beam.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project New Directions in Radionuclide Materials Characterization Using the ALS

Project Identifier LB07038

Principal Investigator Shuh, David

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$50621
Cumulative Total Project Cost:	\$50621

Description of Project

This project is for initiating two new avenues of research in radioactive materials. The first will be to examine the chemistry of the troublesome fission product technetium (Tc) with soft x-ray XES methods using the experience and the synthetic expertise with Tc materials that has been developed within the Actinide Chemistry Group (ACG) over the past decade. The second will be to inject a theoretical component into the actinide soft x-ray spectromicroscopy effort that is investigating the fundamental electronic structure of plutonium (Pu) complexes using the scanning transmission x-ray microscope (STXM) to better understand the coordination chemistry of Pu for improved separations.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Lithium Switchable Mirror Prototype Fabrication

Project Identifier LB07039

Principal Investigator Richardson, Thomas

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$19967
Cumulative Total Project Cost:	\$19967

Description of Project

Two different switchable mirror systems were discovered in earlier research. Exploratory work and development of devices using lithium alloys and a combination of the technologies have generated considerable interest from a wide variety of industrial firms from window glazing and automobile manufacturers to the aerospace and electronics sectors and solar energy developers. If self-contained, battery powered prototype devices were available for demonstration and distribution, this would greatly facilitate movement beyond mere interest to licensing other possible funding opportunities. We propose to produce the necessary components for assembly of at least twenty electrochromic lithium alloy switchable mirror devices that will serve as proof-of-principle studies for these technologies.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Berkeley National Lab

Project Quantifying the Quantum Backaction of a Non-Linear Dispersive Measurement

Project Identifier LB07040

Principal Investigator Siddiqi, Irfan

Type of Research Basic

Point of Contact Hansen, Todd

POC Phone 510-486-6105

FY 2007 Project Costs

Total:	\$56046
Cumulative Total Project Cost:	\$56046

Description of Project

This research will probe the effect of different types of dispersive measurement on a quantum system such as a single spin $\frac{1}{2}$ particle. A dispersive measurement can be realized by coupling the spin $\frac{1}{2}$ to an oscillator such that its resonant frequency depends on the state of the spin- up or down. The frequency of the oscillator can be determined by irradiating with an off resonance microwave pulse and studying the reflected or transmitted signal. The act of measurement generates backaction that dephases the quantum state of the spin. This work will focus on dispersive measurements with a non-linear oscillator. The goal is to determine if greater information can be extracted with a non-linear systems, and what quantum uncertainty relations apply in this scheme.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Multiprobe Investigation of Proteomic Structure of Pathogens

Project Identifier 04-ERD-002

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$145445
Cumulative Total Project Cost:	\$145445

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Livermore National Lab

Project Characterizing the Regulatory Genome: Transcription Factor Proteins and Gene Regulation Networks in Living Cells

Project Identifier 04-ERD-084

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$498797
Cumulative Total Project Cost:	\$498797

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project New Fragment Separation Technology for Superheavy Element Research

Project Identifier 04-ERD-085

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$154219
Cumulative Total Project Cost:	\$154219

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Electro-Thermal-Mechanical Simulation Capability

Project Identifier 04-ERD-086

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$307442
Cumulative Total Project Cost:	\$307442

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A New "Natural Neighbor" Meshless Method for Modeling Extreme Deformations and Failure

Project Identifier 04-ERD-088

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$203935
Cumulative Total Project Cost:	\$203935

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project An Integrated Laboratory for the Study of Interventional Device Dynamics

Project Identifier 04-ERD-093

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$169075
Cumulative Total Project Cost:	\$169075

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Internet Ballistics: Identifying Internet Adversaries Despite Falsified Source Addressing

Project Identifier 04-ERD-095

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$129897
Cumulative Total Project Cost:	\$129897

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Petascale Simulation Initiative

Project Identifier 04-ERD-102

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Applied

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$549947
Cumulative Total Project Cost:	\$549947

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Time-of-Flight, Secondary Ion Mass Spectrometry Measurement of Metabolites from Single Cells

Project Identifier 04-ERD-104

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$220405
Cumulative Total Project Cost:	\$220405

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Nonequilibrium Phase Transitions

Project Identifier 04-ERD-108

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Basic

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$295684
Cumulative Total Project Cost:	\$295684

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project The Structure and Properties of Nanoporous Materials

Project Identifier 05-ERD-003

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$507968
Cumulative Total Project Cost:	\$507968

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Developing Radiography for Advanced Radiography Capability at Future Large Fusion-Class Lasers

Project Identifier 05-ERD-006

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$266818
Cumulative Total Project Cost:	\$266818

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Physics from the MIPP Experiment

Project Identifier 05-ERD-007

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$291485
Cumulative Total Project Cost:	\$291485

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Emerging Contaminants: Application of Microarray Technology to the Detection of Mixtures of Endocrine-Active Agents

Project Identifier 05-ERD-008

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$256762
Cumulative Total Project Cost:	\$256762

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Neutron Capture Cross Section Measurements at DANCE

Project Identifier 05-ERD-011

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$274196
Cumulative Total Project Cost:	\$274196

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Catalyzing the Adoption of Software Components

Project Identifier 05-ERD-012

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$30127
Cumulative Total Project Cost:	\$30127

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Characterization and Control of Laser-Induced Modifications in KDP and DKDP Crystals

Project Identifier 05-ERD-016

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$286324
Cumulative Total Project Cost:	\$286324

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project LOCAL: Locality-Optimizing Caching Algorithms and Layouts

Project Identifier 05-ERD-018

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$352654
Cumulative Total Project Cost:	\$352654

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Heterogeneous Processes at the Intersection of Chemistry and Biology

Project Identifier 05-ERD-021

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$217518
Cumulative Total Project Cost:	\$217518

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Avoiding Surprise: Countering Novel Chem-Bio-Warfare Agent Threats

Project Identifier 05-ERD-025

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$477200
Cumulative Total Project Cost:	\$477200

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Innovative Copolymer Complex to Inhibit the Transport of Biological Aerosols

Project Identifier 05-ERD-027

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$24317
Cumulative Total Project Cost:	\$24317

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project CHEMTREAT: Accelerated Remediation of Contaminated Fine-Grained Sediments by a Chemical Clay Cracking and Co-Solvent Flushing Process

Project Identifier 05-ERD-028

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$305926
Cumulative Total Project Cost:	\$305926

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Decontamination of Terrorist-Dispersed Radionuclides from Surfaces in Urban Environments

Project Identifier 05-ERD-029

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$334331
Cumulative Total Project Cost:	\$334331

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Optical Properties as a Real-Time in-situ Materials Diagnostic at Extreme Conditions

Project Identifier 05-ERD-030

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$392105
Cumulative Total Project Cost:	\$392105

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Advanced Studies of Hydrogen at High Pressures and Temperatures

Project Identifier 05-ERD-036

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$394383
Cumulative Total Project Cost:	\$394383

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Ceramic Laser Materials

Project Identifier 05-ERD-037

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Applied

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$192374
Cumulative Total Project Cost:	\$192374

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Determination of the High-Pressure Melting Curve of Iron

Project Identifier 05-ERD-039

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$165158
Cumulative Total Project Cost:	\$165158

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Hydrodynamic, Atomic Kinetic, and Monte Carlo Radiation-Transfer Models of the X-Ray Spectra of Compact Binaries

Project Identifier 05-ERD-044

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$201011
Cumulative Total Project Cost:	\$201011

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project The Opacity of the Solar Interior

Project Identifier 05-ERD-045

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$544948
Cumulative Total Project Cost:	\$544948

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A Multiplexed Diagnostic Platform for Point-of-Care Pathogen Detection

Project Identifier 05-ERD-049

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$256913
Cumulative Total Project Cost:	\$256913

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Developing a Reactive Chemistry Capability for the NARAC Operational Model (LODI)

Project Identifier 05-ERD-050

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$262536
Cumulative Total Project Cost:	\$262536

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Livermore National Lab

Project Rapid Screening of Human Effluents with Single-Particle Mass Spectrometry for Early Detection of Respiratory Disease and Cancer

Project Identifier 05-ERD-053

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$510140
Cumulative Total Project Cost:	\$510140

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Probing Other Solar Systems with Current and Future Adaptive Optics

Project Identifier 05-ERD-055

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$594892
Cumulative Total Project Cost:	\$594892

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Split-Beam, Short-Pulse Final Optics and Characterization for High-Energy Short Pulses

Project Identifier 05-ERD-060

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$4780521
Cumulative Total Project Cost:	\$4780521

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Precision Split-Beam, Chirped-Pulse, Seed Laser Technology

Project Identifier 05-ERD-061

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$844800
Cumulative Total Project Cost:	\$844800

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Amplifier and Compressor Technology for Split-Beam, High-Energy Short-Pulse Generation

Project Identifier 05-ERD-062

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$3353426
Cumulative Total Project Cost:	\$3353426

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Characterizing Hypothetical Proteins

Project Identifier 05-ERD-064

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$300024
Cumulative Total Project Cost:	\$300024

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Comparative Analysis of Genome Composition with Respect to Metabolic Capabilities and Regulatory Mechanisms

Project Identifier 05-ERD-065

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$763983
Cumulative Total Project Cost:	\$763983

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Mitigation of Damage Sites on Ultraviolet Optics

Project Identifier 05-ERD-066

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$2086672
Cumulative Total Project Cost:	\$2086672

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Livermore National Lab

Project A Fracture Mechanics and Tribology Approach to Understanding Subsurface Damage on Fused Silica during Grinding and Polishing

Project Identifier 05-ERD-067

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$1965684
Cumulative Total Project Cost:	\$1965684

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Development of Hot, LTE-Tunable Radiation Sources for Material Science Studies and Simulating Radiation Transport in Dense Astrophysical Plasmas

Project Identifier 05-ERD-068

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$551853
Cumulative Total Project Cost:	\$551853

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Characterization of the Effect of Short Pulse Exposure on Laser Damage Size, Morphology, and Conditioning in Wide-Bandgap Materials

Project Identifier 05-ERD-071

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$1833785
Cumulative Total Project Cost:	\$1833785

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Leading the Quantum Limit Revolution

Project Identifier 05-ERD-073

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$316723
Cumulative Total Project Cost:	\$316723

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Terascope: THz Spectroscopic Imaging for Standoff Detection of High Explosives

Project Identifier 05-ERD-076

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$119638
Cumulative Total Project Cost:	\$119638

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Discovering the Folding Rules that Proteins Obey

Project Identifier 05-ERD-078

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$357718
Cumulative Total Project Cost:	\$357718

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A New Method for Wave Propagation in Elastic Media

Project Identifier 05-ERD-079

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$567225
Cumulative Total Project Cost:	\$567225

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Rapid Defense Against the Next-Generation Biothreat

Project Identifier 05-ERD-084

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$1021526
Cumulative Total Project Cost:	\$1021526

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Livermore National Lab

Project Developing the Physics Basis of Fast-Ignition Experiments at Future Large Fusion-Class Lasers

Project Identifier 05-ERI-001

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$416728
Cumulative Total Project Cost:	\$416728

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Livermore National Lab

Project Efficient and Reliable Data Exploration via Multiscale Morse Analysis and Combinatorial Information Visualization

Project Identifier 05-ERI-002

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$261954
Cumulative Total Project Cost:	\$261954

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Measuring Plasmon Density of States in Warm Dense Matter

Project Identifier 05-ERI-003

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$194666
Cumulative Total Project Cost:	\$194666

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Understanding the Nuclear Magnetic Fields

Project Identifier 05-LW-006

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$136709
Cumulative Total Project Cost:	\$136709

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Molecular Transport in One-Dimensional Lipid Bilayers: A Biological "Smoke Alarm"

Project Identifier 05-LW-040

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$129300
Cumulative Total Project Cost:	\$129300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Biological Imaging with Fourth-Generation Light Sources

Project Identifier 05-SI-003

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$2693566
Cumulative Total Project Cost:	\$2693566

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Target Fabrication Science and Technology: An Enabling Strategic Initiative

Project Identifier 05-SI-005

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$3441032
Cumulative Total Project Cost:	\$3441032

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Critical Materials Issues for Generation IV Reactors

Project Identifier 06-ERD-005

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$453873
Cumulative Total Project Cost:	\$453873

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Scalable Data Management for Massive Semantic Graphs

Project Identifier 06-ERD-009

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$356887
Cumulative Total Project Cost:	\$356887

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project The Physics of Recombining Plasmas in Celestial Sources

Project Identifier 06-ERD-010

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$349498
Cumulative Total Project Cost:	\$349498

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Conversion of Plutonium and Enriched Uranium

Project Identifier 06-ERD-012

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$462636
Cumulative Total Project Cost:	\$462636

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Biophysical Characterization of Pathogen Invasion

Project Identifier 06-ERD-013

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$212606
Cumulative Total Project Cost:	\$212606

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Separation of Carbon Dioxide from Flue Gas using Ion Pumping

Project Identifier 06-ERD-014

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$194167
Cumulative Total Project Cost:	\$194167

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Laser-Driven Dynamic Hohlräume

Project Identifier 06-ERD-017

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Applied

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$168187
Cumulative Total Project Cost:	\$168187

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Measurements to Facilitate Advanced Tokamak Science in Burning Plasma Experiments

Project Identifier 06-ERD-024

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$256708
Cumulative Total Project Cost:	\$256708

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Urban Atmospheric Turbulence: Improved Turbulence Closure Models through Observations and Simulations

Project Identifier 06-ERD-026

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$265713
Cumulative Total Project Cost:	\$265713

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Investigating New Regimes of Material Strength at Ultrahigh Strain Rates and Pressures

Project Identifier 06-ERD-027

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$557646
Cumulative Total Project Cost:	\$557646

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Atmospheric ¹⁴CO₂ Constraints on and Modeling of Net Carbon Fluxes

Project Identifier 06-ERD-031

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$258948
Cumulative Total Project Cost:	\$258948

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Fundamental Investigation of Laser-Induced Surface Damage in Optical Materials

Project Identifier 06-ERD-035

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$482397
Cumulative Total Project Cost:	\$482397

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A Predictive Model of Fragmentation using Adaptive Mesh Refinement and Hierarchical Material Model

Project Identifier 06-ERD-036

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$589948
Cumulative Total Project Cost:	\$589948

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Long-Time-Scale Shock Dynamics of Reactive Materials

Project Identifier 06-ERD-037

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$131751
Cumulative Total Project Cost:	\$131751

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Decomposition of Large-Scale Semantic Graphs via an Efficient Communities Algorithm

Project Identifier 06-ERD-038

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$341683
Cumulative Total Project Cost:	\$341683

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project The Properties of Confined Water and Fluid Flow at the Nanoscale

Project Identifier 06-ERD-039

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$305021
Cumulative Total Project Cost:	\$305021

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Thermal-Fluidic System for Manipulating Biomolecules and Viruses

Project Identifier 06-ERD-040

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$324054
Cumulative Total Project Cost:	\$324054

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Spheromak Energy Transport Studies via Neutral Beam Injection

Project Identifier 06-ERD-042

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$338825
Cumulative Total Project Cost:	\$338825

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Heavy Quark Jet Tomography of Compressed Nuclear Matter

Project Identifier 06-ERD-045

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$353857
Cumulative Total Project Cost:	\$353857

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Livermore National Lab

Project Development of Single-Cell Raman Spectroscopy for Cancer Screening and Therapy Monitoring

Project Identifier 06-ERD-051

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$481791
Cumulative Total Project Cost:	\$481791

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Foam-Walled Hohlräume for Increased X-Ray Conversion Efficiency

Project Identifier 06-ERD-053

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$152101
Cumulative Total Project Cost:	\$152101

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Large Aperture Optics Performance

Project Identifier 06-ERD-054

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$1968362
Cumulative Total Project Cost:	\$1968362

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Mitigation of Electromagnetic Pulse Effects from Short-Pulse Lasers and Fusion Neutrons

Project Identifier 06-ERD-055

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$201503
Cumulative Total Project Cost:	\$201503

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Laser Beam Propagation in High-Temperature Plasmas

Project Identifier 06-ERD-056

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$103595
Cumulative Total Project Cost:	\$103595

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Francisella Tularensis: Understanding the Host-Pathogen Interaction

Project Identifier 06-ERD-057

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$449562
Cumulative Total Project Cost:	\$449562

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A Novel Structure-Driven Approach to Sequence Pattern Definition for Remote Homology Detection

Project Identifier 06-ERD-059

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$470231
Cumulative Total Project Cost:	\$470231

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Characterization and Quantification of Dynamic Robustness in Biological Systems

Project Identifier 06-ERD-061

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$451095
Cumulative Total Project Cost:	\$451095

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Redox Proteins in Environmentally Relevant Bacteria

Project Identifier 06-ERD-063

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$525837
Cumulative Total Project Cost:	\$525837

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Viral Identification and Characterization (VICI)

Project Identifier 06-ERD-064

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$1050629
Cumulative Total Project Cost:	\$1050629

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Compact, High-Intensity Neutron Source Driven By Pyroelectric Crystals

Project Identifier 06-ERD-065

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$557278
Cumulative Total Project Cost:	\$557278

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Regional Climate

Project Identifier 06-ERD-066

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Basic

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$518904
Cumulative Total Project Cost:	\$518904

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Study of Transport Behavior and Conversion Efficiency in Pillar Structured Neutron Detectors

Project Identifier 06-ERD-067

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$399340
Cumulative Total Project Cost:	\$399340

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A Coupled, Multi-Physics Code for Accurate Modeling of Nuclear Reactors

Project Identifier 06-ERD-069

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$591160
Cumulative Total Project Cost:	\$591160

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Development of Integrated Microanalysis of Nanomaterials

Project Identifier 06-ERI-001

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$807734
Cumulative Total Project Cost:	\$807734

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project The Chemistry of Core Formation

Project Identifier 06-ERI-002

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$259214
Cumulative Total Project Cost:	\$259214

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Evidence for Stratospheric Downwelling Associated with High-Elevation Topography

Project Identifier 06-ERI-005

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$246904
Cumulative Total Project Cost:	\$246904

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Nuclear Physics the Monte Carlo Way

Project Identifier 06-LW-013

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$171590
Cumulative Total Project Cost:	\$171590

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Developing a New Accelerator Mass Spectrometry Assay for Quantitation of Platinum DNA Adducts for Response to Platinum-Based Chemotherapy

Project Identifier 06-LW-023

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$122533
Cumulative Total Project Cost:	\$122533

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Quantum Monte Carlo Assessment of the Relevance of Electronic Correlations in Defects and Equation of State in Metals

Project Identifier 06-LW-024

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$213713
Cumulative Total Project Cost:	\$213713

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Diffusion Monte Carlo without all the Hops

Project Identifier 06-LW-028

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$224508
Cumulative Total Project Cost:	\$224508

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Biologically Driven Fabrication of Complex Nanostructures at Nanoscale Chemical Templates

Project Identifier 06-LW-051

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$218528
Cumulative Total Project Cost:	\$218528

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Observation of Coherent Terahertz Frequency Emission from Shocked Polarizable Materials

Project Identifier 06-LW-063

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$208225
Cumulative Total Project Cost:	\$208225

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Analysis of the Mucin Membrane Protein by Cryo-Electron Microscopy and Computational Image Processing

Project Identifier 06-LW-064

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$224729
Cumulative Total Project Cost:	\$224729

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Understanding Shape Control in Nanoparticle Synthesis

Project Identifier 06-LW-090

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$225282
Cumulative Total Project Cost:	\$225282

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Novel High-Energy-Density Source

Project Identifier 06-SI-001

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$2068378
Cumulative Total Project Cost:	\$2068378

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Active Detection and Imaging of Nuclear Materials with High-Brightness Gamma Rays

Project Identifier 06-SI-002

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$2487530
Cumulative Total Project Cost:	\$2487530

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Developing and Integrating Novel Technologies for the Production and Characterization of Membrane Proteins

Project Identifier 06-SI-003

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$2398608
Cumulative Total Project Cost:	\$2398608

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project The Ultrafast Lattice Response of the Shocked Solid

Project Identifier 06-SI-004

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$1749723
Cumulative Total Project Cost:	\$1749723

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Transformational Materials Initiative

Project Identifier 06-SI-005

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Applied

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$7517826
Cumulative Total Project Cost:	\$7517826

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Predictive Knowledge Systems for Large Complex Data Sources

Project Identifier 06-SI-006

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$5508306
Cumulative Total Project Cost:	\$5508306

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Livermore National Lab

Project Multipulse, High-Energy Backlighting for a Compton-Radiography Ignition Diagnostic for High-Power Lasers

Project Identifier 07-ERD-004

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$130119
Cumulative Total Project Cost:	\$130119

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Cladding-Pumped Raman Fiber Lasers

Project Identifier 07-ERD-005

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$192553
Cumulative Total Project Cost:	\$192553

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Kinetics of Phase Evolution: Coupling Microstructure with Deformation

Project Identifier 07-ERD-007

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$726490
Cumulative Total Project Cost:	\$726490

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project GaTe Semiconductor Radiation Detector

Project Identifier 07-ERD-008

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$101784
Cumulative Total Project Cost:	\$101784

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Broad-Area Search for Proliferant Infrastructure

Project Identifier 07-ERD-011

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$138812
Cumulative Total Project Cost:	\$138812

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Development of a First Principles Computational Toolkit for Predicting the Structural, Electronic and Transport Properties of Semiconductor Radiation Detection Materials

Project Identifier 07-ERD-013

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$201760
Cumulative Total Project Cost:	\$201760

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Maximizing the Science from Astrophysical, Time-Domain Surveys: Targeted Follow-up

Project Identifier 07-ERD-014

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$251282
Cumulative Total Project Cost:	\$251282

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Discovery of a Light Higgs Boson with b Quarks

Project Identifier 07-ERD-015

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$304793
Cumulative Total Project Cost:	\$304793

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A New Approach to Simulating Inhomogeneous Plasmas for Inertial Fusion Energy and other Applications

Project Identifier 07-ERD-016

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$199822
Cumulative Total Project Cost:	\$199822

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Serrated Light Illumination for Deflection-Encoded Recording (SLIDER)

Project Identifier 07-ERD-017

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Applied

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$397446
Cumulative Total Project Cost:	\$397446

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A Novel Method for Extracting Signals from Noisy Broadband Data Using Poynting Vector Measurements

Project Identifier 07-ERD-018

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$150813
Cumulative Total Project Cost:	\$150813

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Detection, Classification, and Estimation of Radioactive Contraband from Uncertain, Low-Count Measurements

Project Identifier 07-ERD-019

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$204471
Cumulative Total Project Cost:	\$204471

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Dense Gas Transport in Complex Environments

Project Identifier 07-ERD-020

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$276488
Cumulative Total Project Cost:	\$276488

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Techniques for Supernova Cosmology with the Large Synoptic Survey Telescope

Project Identifier 07-ERD-023

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$604178
Cumulative Total Project Cost:	\$604178

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Livermore National Lab

Project Deformation of Low-Symmetry and Multiphase Materials

Project Identifier 07-ERD-024

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research

Development
POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$255213
Cumulative Total Project Cost:	\$255213

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Development of Novel Antimicrobial Proteins and Peptides Based on Bacteriophage Endolysins

Project Identifier 07-ERD-025

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$339637
Cumulative Total Project Cost:	\$339637

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Knowledge-Based Coreference Resolution

Project Identifier 07-ERD-027

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$530004
Cumulative Total Project Cost:	\$530004

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Advanced Computational Techniques for Uncertainty Quantification

Project Identifier 07-ERD-028

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$256858
Cumulative Total Project Cost:	\$256858

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Electronic Anomalies in Ordered and Disordered Cerium at High Pressures and Temperatures

Project Identifier 07-ERD-029

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$379882
Cumulative Total Project Cost:	\$379882

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Exploring Phase Transition Mechanisms using Ramp Compression

Project Identifier 07-ERD-032

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$276742
Cumulative Total Project Cost:	\$276742

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Plasticity at High Pressures and Strain Rates using Oblique-Impact Isentropic-Compression Experiments

Project Identifier 07-ERD-034

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$729280
Cumulative Total Project Cost:	\$729280

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project VidCharts: Real-Time Algorithms for Large-Scale Video Analysis, Compression, and Visualization

Project Identifier 07-ERD-035

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$498531
Cumulative Total Project Cost:	\$498531

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project The Development of Scaled Astrophysical Experiments for the Current and Future Lasers

Project Identifier 07-ERD-038

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$405167
Cumulative Total Project Cost:	\$405167

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Short Pulse Laser Applications Design

Project Identifier 07-ERD-040

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$481986
Cumulative Total Project Cost:	\$481986

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory L. Livermore National Lab

Project UV-Vis Resonance Raman Studies of High Explosives, Impurities, and Degradation Products for Enhanced Standoff Detection

Project Identifier 07-ERD-041

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research

Development
POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$299986
Cumulative Total Project Cost:	\$299986

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Standing Wave Probes for Micrometer Scale Metrology

Project Identifier 07-ERD-042

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$348376
Cumulative Total Project Cost:	\$348376

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Molecular Dynamics Simulations of Hot, Radiative Plasmas

Project Identifier 07-ERD-044

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$675684
Cumulative Total Project Cost:	\$675684

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Salicylic Acid Derivatives: A New Class of Scintillators for High-Energy Neutron Detection

Project Identifier 07-ERD-045

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$310869
Cumulative Total Project Cost:	\$310869

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Development of Novel Transgenic Technologies to Study Genome Regulation and Architecture

Project Identifier 07-ERD-046

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$497241
Cumulative Total Project Cost:	\$497241

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Investigation of the Double-C Behavior in the Pu-Ga Time-Temperature-Transformation Diagram

Project Identifier 07-ERD-047

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$180808
Cumulative Total Project Cost:	\$180808

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Quantum Properties of Pu and Pu-Compounds

Project Identifier 07-ERD-048

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$632955
Cumulative Total Project Cost:	\$632955

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Controlling the Structure of a Quantum Solid: Hydrogen

Project Identifier 07-ERD-049

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$226114
Cumulative Total Project Cost:	\$226114

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Novel Approach to Investigate the Mechanism of Yersinia Pestis Pathogenicity in Real-Time and at Single-Cell Level

Project Identifier 07-ERD-050

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$301743
Cumulative Total Project Cost:	\$301743

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Microarrays + NanoSIMS: Linking Microbial Identity and Function

Project Identifier 07-ERD-053

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research

Development
POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$305657
Cumulative Total Project Cost:	\$305657

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Ultrahigh-Velocity Railgun

Project Identifier 07-ERD-055

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Applied

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$472917
Cumulative Total Project Cost:	\$472917

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Finding and Characterizing Rare Events in Two Next-Generation Particle Astrophysics Experiments

Project Identifier 07-ERD-056

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$306794
Cumulative Total Project Cost:	\$306794

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Software Security Analysis

Project Identifier 07-ERD-057

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$456717
Cumulative Total Project Cost:	\$456717

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Fabrication Science for Thick Beryllium Films

Project Identifier 07-ERD-060

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$638736
Cumulative Total Project Cost:	\$638736

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Verification and Validation of Radiation Hydrodynamics for Astrophysical Applications

Project Identifier 07-ERD-061

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$52539
Cumulative Total Project Cost:	\$52539

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Storage-Intensive Supercomputing

Project Identifier 07-ERD-063

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Applied

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$984695
Cumulative Total Project Cost:	\$984695

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Fossil Fuel Emission Verification Capability

Project Identifier 07-ERD-064

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$247807
Cumulative Total Project Cost:	\$247807

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Identification of Pathways Critical to Quorum Sensing and Virulence Induction

Project Identifier 07-ERI-001

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$246985
Cumulative Total Project Cost:	\$246985

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Accelerator Mass Spectrometry of 90Sr for Biomonitoring and Human Health

Project Identifier 07-ERI-002

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research

Development
POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$222398
Cumulative Total Project Cost:	\$222398

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A Plasma Amplifier toward Zettawatt Laser Powers

Project Identifier 07-ERI-004

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Applied

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$150262
Cumulative Total Project Cost:	\$150262

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Cosmochemical Forensics

Project Identifier 07-ERI-005

Principal Investigator

Point of Contact Al-Ayat, Rokaya

Type of Research Basic

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$271043
Cumulative Total Project Cost:	\$271043

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Ultrafast Laser Synthesis of Nanopore Arrays in Silicon for Voltage-Controlled Biomolecule Separation and Detection

Project Identifier 07-FS-001

Principal Investigator

Type of Research Applied

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$64824
Cumulative Total Project Cost:	\$64824

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Helium Burning in Steady State and Explosive Nucleosynthesis

Project Identifier 07-LW-006

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$211636
Cumulative Total Project Cost:	\$211636

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Uncovering Supersymmetric Leptons at the LHC

Project Identifier 07-LW-037

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$183651
Cumulative Total Project Cost:	\$183651

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Magnetism in Semiconductor Nanocrystals: New Physics at the Nanoscale

Project Identifier 07-LW-041

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$181975
Cumulative Total Project Cost:	\$181975

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Quantification of Radiation-Induced Protein Expression

Project Identifier 07-LW-043

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$225324
Cumulative Total Project Cost:	\$225324

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Molecular to Extended-Solid Transformations in Compressed Carbon Dioxide: Sixfold Coordinated Carbon Dioxide

Project Identifier 07-LW-049

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$212254
Cumulative Total Project Cost:	\$212254

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project The Structure and Transport of Water and Hydrated Ions within Hydrophobic, Nanoscale Channels

Project Identifier 07-LW-056

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$227208
Cumulative Total Project Cost:	\$227208

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project A Proposal for First-Ever Measurement of Coherent Neutrino-Nucleus Scattering

Project Identifier 07-LW-062

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$222397
Cumulative Total Project Cost:	\$222397

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Fourier Transform Holography with Coded Apertures

Project Identifier 07-LW-086

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$223911
Cumulative Total Project Cost:	\$223911

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory L. Livermore National Lab

Project Stem Cell Fate Decisions

Project Identifier 07-LW-098

Principal Investigator

Type of Research Basic

Point of Contact Al-Ayat, Rokaya

POC Phone 925-422-8467

FY 2007 Project Costs

Total:	\$187890
Cumulative Total Project Cost:	\$187890

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Search for Variation of the Fine Structure Constant with Optical Frequency References

Project Identifier LANL-20040040DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1045205
Cumulative Total Project Cost:	\$1045205

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Understanding Electronic and Magnetic Communication Between f-Electrons in Actinide and Lanthanide Materials

Project Identifier LANL-20040093DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1737774
Cumulative Total Project Cost:	\$1737774

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Testing Time-Reversal Symmetry with Ultracold Neutrons and with Solid State Systems

Project Identifier LANL-20040104DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1686345
Cumulative Total Project Cost:	\$1686345

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project New Theoretical and Computational Approaches to Ultra-Relativistic Heavy Ion Collisions

Project Identifier LANL-20040909PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$114902
Cumulative Total Project Cost:	\$114902

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Dynamics of Quantum Phase Transitions

Project Identifier LANL-20041031PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$53608
Cumulative Total Project Cost:	\$53608

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Predictive Stellar Evolution

Project Identifier LANL-20041040PRD3

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Basic

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$38914
Cumulative Total Project Cost:	\$38914

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Gamma-Ray Bursts Afterglows in the Swift Era: Perspectives of New Major Discoveries

Project Identifier LANL-20041043PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$93484
Cumulative Total Project Cost:	\$93484

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Investigation of the Dynamics of Protein Misfolding and Aggregation

Project Identifier LANL-20041061PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$37340
Cumulative Total Project Cost:	\$37340

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nano-Scale Physics and Near-Contact Hydrodynamics

Project Identifier LANL-20041078ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$143705
Cumulative Total Project Cost:	\$143705

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nuclear Materials Detection Algorithm Development for Port-of-Entry Applications

Project Identifier LANL-20041086ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$105857
Cumulative Total Project Cost:	\$105857

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Ferroic Films for Multifunctional Devices

Project Identifier LANL-20041105PRD4

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$92243
Cumulative Total Project Cost:	\$92243

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Intercalated Nanocomposites - Innovative Fuel Cell Catalysts

Project Identifier LANL-20041118PRD4

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$39536
Cumulative Total Project Cost:	\$39536

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Quantum Simulations in Optical Lattices

Project Identifier LANL-20041131PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$31650
Cumulative Total Project Cost:	\$31650

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Ionic Liquids: A New Platform for Sensors

Project Identifier LANL-20041132PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$3930
Cumulative Total Project Cost:	\$3930

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Resolving the Aerosol-Climate-Water Puzzle: Predictive Science for Global Stability and Security

Project Identifier LANL-20050014DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1846396
Cumulative Total Project Cost:	\$1846396

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Coming Out of the Cosmic Dark Ages - The First Stars in the Universe

Project Identifier LANL-20050031DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1945193
Cumulative Total Project Cost:	\$1945193

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Pu-H Interactions: Studies of Plutonium Hydride Phenomena (U)

Project Identifier LANL-20050043DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1867724
Cumulative Total Project Cost:	\$1867724

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Procell Assembly

Project Identifier LANL-20050064DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1933424
Cumulative Total Project Cost:	\$1933424

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Lagrangian Measurements of Fluid Mixing

Project Identifier LANL-20050066DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1933002
Cumulative Total Project Cost:	\$1933002

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Cold Atom Quantum Simulators

Project Identifier LANL-20050076DR

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Basic

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1622245
Cumulative Total Project Cost:	\$1622245

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Material Response During Dynamic Loading at Subpicosecond Time and Nanometer Length Scales

Project Identifier LANL-20050107DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$2017722
Cumulative Total Project Cost:	\$2017722

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Metabolome Scale Characterization of the Biothreat Agent, Bacillus Anthracis

Project Identifier LANL-20050123DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1758405
Cumulative Total Project Cost:	\$1758405

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Be-Specific Human Immune Response and Development of Chronic Beryllium Disease

Project Identifier LANL-20050127DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1817776
Cumulative Total Project Cost:	\$1817776

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Rational Vaccine Design: Theory and Experimental Validation

Project Identifier LANL-20050155DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1898196
Cumulative Total Project Cost:	\$1898196

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Salient Anomaly Detection: In Search of the Unknown in Images and Signals

Project Identifier LANL-20050158ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$361581
Cumulative Total Project Cost:	\$361581

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Thinking Telescopes: Pursuing a New Paradigm for Discovery in Observational Science

Project Identifier LANL-20050161DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1675829
Cumulative Total Project Cost:	\$1675829

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Probing New Physics with Ultra-Cold Neutrons

Project Identifier LANL-20050164DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1253327
Cumulative Total Project Cost:	\$1253327

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project New Americium Delta-A Metric for Primary Certification (U)

Project Identifier LANL-20050184DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$2033385
Cumulative Total Project Cost:	\$2033385

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Processing and Properties of Bulk Nanostructured Alloys

Project Identifier LANL-20050199ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$351221
Cumulative Total Project Cost:	\$351221

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Gamma-Ray-Channeling Optics

Project Identifier LANL-20050246ER

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Applied

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$346911
Cumulative Total Project Cost:	\$346911

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project A System-Scale Theory for Fast Magnetic Reconnection

Project Identifier LANL-20050271ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$296347
Cumulative Total Project Cost:	\$296347

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Laser-Cooling Molecules to Millikelvins

Project Identifier LANL-20050277ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$291962
Cumulative Total Project Cost:	\$291962

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project A Microfabricated Single Molecule Sorter

Project Identifier LANL-20050290ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$301876
Cumulative Total Project Cost:	\$301876

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Redox Interplay Underpinning 4f-Element Metallocene-Based Magnetic Systems

Project Identifier LANL-20050304ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$340493
Cumulative Total Project Cost:	\$340493

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Exploration of the Role in Interfaces in Nanolayered Composites in Creating Radiation Damage Tolerant Materials.

Project Identifier LANL-20050306ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$338311
Cumulative Total Project Cost:	\$338311

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project HAWC: The Next Generation VHE All-Sky Gamma Ray Observatory

Project Identifier LANL-20050307ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$239038
Cumulative Total Project Cost:	\$239038

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Implicit Adaptive Mesh Refinement: A Magnetohydrodynamics Application

Project Identifier LANL-20050315ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$399872
Cumulative Total Project Cost:	\$399872

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Testing Embedded Model Assumptions of Stable Isotopic Dynamics with Continuous Sampling: Are Modelers' Assumptions of the Global Carbon Cycle Correct?

Project Identifier LANL-20050323ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$558848
Cumulative Total Project Cost:	\$558848

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Atomistic Studies of Fast Chemical Processes in Nano-Structured Metastable Composites

Project Identifier LANL-20050343ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$283605
Cumulative Total Project Cost:	\$283605

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Low-Threshold, Single-Exciton Nanocrystal Lasing Using Engineered Exciton-Exciton Interactions

Project Identifier LANL-20050360ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$372949
Cumulative Total Project Cost:	\$372949

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Combustion Enhancement Using Plasma

Project Identifier LANL-20050363ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$375280
Cumulative Total Project Cost:	\$375280

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Observing Individual Antibody-Antigen Encounters for Decades of Timescales

Project Identifier LANL-20050377ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$287420
Cumulative Total Project Cost:	\$287420

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Taming and Accelerating Particle-In-Cell

Project Identifier LANL-20050379ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$347174
Cumulative Total Project Cost:	\$347174

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Spatio-temporal Plasmonics: Controlling Plasmon Polaritons at the Nanoscale

Project Identifier LANL-20050388ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$381677
Cumulative Total Project Cost:	\$381677

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Eliminating PCR in Biothreat Detection: Highly Multiplexed Nucleic Acid Dipsticks for Rapid and Sensitive Pathogen Identification

Project Identifier LANL-20050400ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$368126
Cumulative Total Project Cost:	\$368126

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Immune Response to West Nile Virus in Birds

Project Identifier LANL-20050402ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$402911
Cumulative Total Project Cost:	\$402911

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Quantitative Modeling of Living Neuronal Networks in Vitro

Project Identifier LANL-20050411ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$372543
Cumulative Total Project Cost:	\$372543

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Computational Foundations for a New Class of Digital Filter Banks

Project Identifier LANL-20050425ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$396153
Cumulative Total Project Cost:	\$396153

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Fulde-Ferrell-Larkin-Ovchinnikov Inhomogeneous Superconducting State

Project Identifier LANL-20050430ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$405680
Cumulative Total Project Cost:	\$405680

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project The First Complete Classification Algorithm

Project Identifier LANL-20050480ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$358249
Cumulative Total Project Cost:	\$358249

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Novel High-Speed Electro-Optic Switches Based on Domain Microoptics Embedded in a Ferroelectric Chip

Project Identifier LANL-20050484ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$334509
Cumulative Total Project Cost:	\$334509

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Hierarchical Assembly of Porous Materials: Obeying Bio-Inspired Allometric Scaling Laws

Project Identifier LANL-20050506ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$311459
Cumulative Total Project Cost:	\$311459

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Neyman-Pearson Learning

Project Identifier LANL-20050531ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$316905
Cumulative Total Project Cost:	\$316905

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project A New Form of Secure Communication: Spatial Encryption Using Superluminal Sources

Project Identifier LANL-20050540ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$248585
Cumulative Total Project Cost:	\$248585

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Plasma Catalyzed Coal Gasification

Project Identifier LANL-20050559ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$330161
Cumulative Total Project Cost:	\$330161

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Ion Beam Synthesis of Ferromagnetic Semiconductors

Project Identifier LANL-20050566ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$314658
Cumulative Total Project Cost:	\$314658

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project High Efficiency Carrier Multiplication Using Impact Ionization in Semiconductor Quantum Dots

Project Identifier LANL-20050583ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$332992
Cumulative Total Project Cost:	\$332992

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project High-Valent Ruthenium Oxides on Tio2: Toward the Development of Light-Driven Oxidation Catalysts

Project Identifier LANL-20050626ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$224738
Cumulative Total Project Cost:	\$224738

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nonlinear Behavior in Complex Systems

Project Identifier LANL-20050631DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$641312
Cumulative Total Project Cost:	\$641312

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Cooperative Phenomena in Soft Matter

Project Identifier LANL-20050632DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$695002
Cumulative Total Project Cost:	\$695002

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Exploiting Emergent Materials Behavior on the Nanoscale

Project Identifier LANL-20050633DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1480399
Cumulative Total Project Cost:	\$1480399

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Antineutrino Monitoring of Reactors

Project Identifier LANL-20051087ER

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Applied

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$419107
Cumulative Total Project Cost:	\$419107

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Metallic Quantum Dot Superlattices

Project Identifier LANL-20051098PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$61189
Cumulative Total Project Cost:	\$61189

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Improving the Predictive Capabilities of Complex, Spatially Distributed Environmental Models

Project Identifier LANL-20051102PRD1

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$27839
Cumulative Total Project Cost:	\$27839

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Photovoltaics of Nanocrystalline TiO₂

Project Identifier LANL-20051122PRD1

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$44312
Cumulative Total Project Cost:	\$44312

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Tuning Plutonium Compounds Through the Localized/Itinerant Crossover

Project Identifier LANL-20051124PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$20578
Cumulative Total Project Cost:	\$20578

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project W-Band Photonic Band Gap Structure Research

Project Identifier LANL-20051125PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$76321
Cumulative Total Project Cost:	\$76321

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Exploration of Deformation Physics at Nanometer Scale

Project Identifier LANL-20051132PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$95691
Cumulative Total Project Cost:	\$95691

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Hydrogen Storage in Novel Molecular Compounds

Project Identifier LANL-20051143PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$160215
Cumulative Total Project Cost:	\$160215

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project New Paradigms for Modeling Communicable Diseases

Project Identifier LANL-20051148PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$67247
Cumulative Total Project Cost:	\$67247

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Cross sections for the Isomer of 235U

Project Identifier LANL-20051149DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$418592
Cumulative Total Project Cost:	\$418592

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nanoscale Fluctuations in Multifunctional Materials

Project Identifier LANL-20051164DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1132371
Cumulative Total Project Cost:	\$1132371

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Physics of Astrophysical Jets

Project Identifier LANL-20051169ER

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Basic

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$371776
Cumulative Total Project Cost:	\$371776

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Statistical Mechanics Approaches to Parallel Computing

Project Identifier LANL-20051194PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$162998
Cumulative Total Project Cost:	\$162998

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project High Energy Particles in Astrophysical Outflows

Project Identifier LANL-20051222PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$169089
Cumulative Total Project Cost:	\$169089

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Computer Simulations of Phase Stability and Microstructure Evolution in Alloys Using Hybrid Molecular Dynamics and Phase-Field Approaches

Project Identifier LANL-20051239PRD3

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$114125
Cumulative Total Project Cost:	\$114125

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project The Neutrino Matrix and Beyond

Project Identifier LANL-20051243PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$176455
Cumulative Total Project Cost:	\$176455

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Investigation of Fuel Cell Electrocatalysts for Improved Activity and Durability

Project Identifier LANL-20051257PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$143266
Cumulative Total Project Cost:	\$143266

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Three-dimensional Micro Architectures for Neural Interfaces

Project Identifier LANL-20051265PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$107218
Cumulative Total Project Cost:	\$107218

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Size Effects in Nanoscale Ferroelectric Thin Films

Project Identifier LANL-20051281PRD3

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$150850
Cumulative Total Project Cost:	\$150850

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Theory and Trapped Ion Quantum Simulations

Project Identifier LANL-20051282PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$100211
Cumulative Total Project Cost:	\$100211

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Interfacial Interactions in Hybrid Semiconductor-Metal Nanostructures

Project Identifier LANL-20051284PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$97400
Cumulative Total Project Cost:	\$97400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project A Multiscale Approach to Modeling Continental Rift Tectonics

Project Identifier LANL-20051286PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$130060
Cumulative Total Project Cost:	\$130060

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project From Actinide Electronic Structure to f-Element Molecular Photomagnets

Project Identifier LANL-20051320PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$24444
Cumulative Total Project Cost:	\$24444

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project The Formation of the First Stars and Their Feedback Effects on Cosmological Structure

Project Identifier LANL-20051325PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$140317
Cumulative Total Project Cost:	\$140317

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Defect- and Fault-Tolerant Nano-computing Architectures

Project Identifier LANL-20051330PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$124629
Cumulative Total Project Cost:	\$124629

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Effects of Length Scale on the Fracture Behavior of Ultra High Strength Nano-composite Materials

Project Identifier LANL-20051336PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$163732
Cumulative Total Project Cost:	\$163732

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Biological and Chemical Sensor Design Using Linearly-Scaled TD-DFT Methods

Project Identifier LANL-20051345PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$142759
Cumulative Total Project Cost:	\$142759

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Ultrafast Dynamics of Novel Magnetic Materials by Time Domain Spectroscopy

Project Identifier LANL-20051347PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$151257
Cumulative Total Project Cost:	\$151257

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Quantum Fluctuations of Event Horizons

Project Identifier LANL-20051348PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$170096
Cumulative Total Project Cost:	\$170096

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Structure and Bonding in Actinide Oxides

Project Identifier LANL-20060019DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1621828
Cumulative Total Project Cost:	\$1621828

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Dynamics of the Onset of Damage in Metals under Shock Loading

Project Identifier LANL-20060021DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1742969
Cumulative Total Project Cost:	\$1742969

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project New Approaches to Quantum Computing and the Dynamics of Quantum Phase Transitions

Project Identifier LANL-20060039DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1374076
Cumulative Total Project Cost:	\$1374076

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Pathogen Detection Based on Biomodulation

Project Identifier LANL-20060040DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1284189
Cumulative Total Project Cost:	\$1284189

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Strongly Correlated Electrons: Duality and Implications

Project Identifier LANL-20060043DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1439976
Cumulative Total Project Cost:	\$1439976

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Image Reconstruction with Time-Reversal Mirrors

Project Identifier LANL-20060046DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$881036
Cumulative Total Project Cost:	\$881036

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Heavy Quarks as a Probe of a New State of Matter

Project Identifier LANL-20060049DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1798875
Cumulative Total Project Cost:	\$1798875

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project DREAM: A Dynamic Radiation Environment Assimilation Model to Understand Acceleration, Transport, and Losses in Natural and HANE-Produced Radiation Belts

Project Identifier LANL-20060060DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1399649
Cumulative Total Project Cost:	\$1399649

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Science-Based Prediction and Control of Complex Manufacturing Processes

Project Identifier LANL-20060079DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1349710
Cumulative Total Project Cost:	\$1349710

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Mix Processes in Inertial Confinement Fusion

Project Identifier LANL-20060081DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1632811
Cumulative Total Project Cost:	\$1632811

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Advanced Actinide Separations in Alkaline Media for Spent Nuclear Fuel and Defense Materials Processing

Project Identifier LANL-20060088DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1180277
Cumulative Total Project Cost:	\$1180277

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Biological Effects of Molecularly Engineered Nanomaterials

Project Identifier LANL-20060097DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1150773
Cumulative Total Project Cost:	\$1150773

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project New Classes Of Materials For Gamma-Ray And Neutron Detection

Project Identifier LANL-20060136DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1453560
Cumulative Total Project Cost:	\$1453560

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Development of an Engineering Model for Rubber Elasticity

Project Identifier LANL-20060226ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$247571
Cumulative Total Project Cost:	\$247571

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Nascent Protein Folding Inside the Tunnel of the Ribosome: Cotranslational Folding

Project Identifier LANL-20060230ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$341595
Cumulative Total Project Cost:	\$341595

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Nanobiomaterials: Building New Nanoarchitectures Using Biomolecular Scaffolds

Project Identifier LANL-20060253ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$277174
Cumulative Total Project Cost:	\$277174

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Automatic Video Analysis Integrating Depth, Shape, Texture and Color

Project Identifier LANL-20060268ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$290533
Cumulative Total Project Cost:	\$290533

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Automated Induction of Templates for Extracting Information from Text

Project Identifier LANL-20060270ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$314852
Cumulative Total Project Cost:	\$314852

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Monte Carlo Estimation of Eigenvalues of Ultradimensional Matrices and Continuous Operators

Project Identifier LANL-20060272ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$239848
Cumulative Total Project Cost:	\$239848

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project New Method for Complex Contingency Analysis

Project Identifier LANL-20060302ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$441308
Cumulative Total Project Cost:	\$441308

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Energy Distributions in Granular Flows

Project Identifier LANL-20060305ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$262310
Cumulative Total Project Cost:	\$262310

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project MRI in Microtesla Magnetic Fields with Simultaneous MEG

Project Identifier LANL-20060312ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$338930
Cumulative Total Project Cost:	\$338930

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Understanding the Process of Intercalation Using Stable Isotope Labeled Polyaromatic Hydrocarbons (PAHs) and Oligomeric DNA; the Quantitation of Weak Bonding in DNA.

Project Identifier LANL-20060317ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$383300
Cumulative Total Project Cost:	\$383300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Seeing Undetectable Cancers with Time-Reversed Ultrasound

Project Identifier LANL-20060318ER

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Applied

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$355299
Cumulative Total Project Cost:	\$355299

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Chemical Thermoacoustics

Project Identifier LANL-20060321ER

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Basic

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$351967
Cumulative Total Project Cost:	\$351967

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Multigene Correlations and Their Implications for Cardiovascular Disease

Project Identifier LANL-20060340ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$267277
Cumulative Total Project Cost:	\$267277

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Development of Redox Affinity Materials for the Separation of Carbon

Nanotubes into Pure Chiral Fractions

Project Identifier LANL-20060346ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$465965
Cumulative Total Project Cost:	\$465965

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project A Faster Multipole Method

Project Identifier LANL-20060350ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$312798
Cumulative Total Project Cost:	\$312798

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project The S-Process in the Sm-Eu-Gd Region - A Probe for Stellar Mixing

Project Identifier LANL-20060357ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$341898
Cumulative Total Project Cost:	\$341898

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Quantifying the Role of the Cold Plasmasphere in the Loss of the Electron Radiation Belts

Project Identifier LANL-20060360ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$125928
Cumulative Total Project Cost:	\$125928

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Surface Enhanced Raman (SERS) Based Flow Cytometry Detection

Project Identifier LANL-20060386ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$376579
Cumulative Total Project Cost:	\$376579

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Processing of Ultra-High Strength Electrical Conductors using a Novel Nano-Twinned Structure

Project Identifier LANL-20060392ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$292918
Cumulative Total Project Cost:	\$292918

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nanocomposite Thin Films for Surface Assisted Mass Spectrometry

Project Identifier LANL-20060395ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$321899
Cumulative Total Project Cost:	\$321899

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Role of Electrostatic Forces in Space and Astrophysics

Project Identifier LANL-20060399ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$737680
Cumulative Total Project Cost:	\$737680

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Detecting Spinons with the Wiedemann-Franz Law

Project Identifier LANL-20060407ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$346101
Cumulative Total Project Cost:	\$346101

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Stabilization of Hydrogen Clathrates --- Engineering a Solution to Hydrogen Storage

Project Identifier LANL-20060416ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$292425
Cumulative Total Project Cost:	\$292425

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Functional Proteomics Studies of Bacillus anthracis

Project Identifier LANL-20060437ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$281647
Cumulative Total Project Cost:	\$281647

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Novel Physics Inspired Approach to Error-Correction

Project Identifier LANL-20060473ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$265530
Cumulative Total Project Cost:	\$265530

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Amplification of Surface Plasmons by Stimulated Emission from Semiconductor Nanocrystals

Project Identifier LANL-20060494ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$345851
Cumulative Total Project Cost:	\$345851

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Exploring the Darkness: Cosmic Voids

Project Identifier LANL-20060495ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$673954
Cumulative Total Project Cost:	\$673954

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Use of Strain Engineering to Tune the Physical Properties of Nanoscale Metal-Oxide Films

Project Identifier LANL-20060497ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$261555
Cumulative Total Project Cost:	\$261555

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Improved Molecular Catalysts for Water Splitting

Project Identifier LANL-20060518ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$296434
Cumulative Total Project Cost:	\$296434

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Generation, Detection, and Manipulation of a Single Magnetic Spin

Project Identifier LANL-20060542ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$326275
Cumulative Total Project Cost:	\$326275

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Simulation and Modeling of the Quantum Response

Project Identifier LANL-20060551ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$258748
Cumulative Total Project Cost:	\$258748

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Quantum Nondemolition Detection of Photons

Project Identifier LANL-20060558ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$290712
Cumulative Total Project Cost:	\$290712

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Non-blinking and Robust Quantum-Dot Fluorophores for Applications in Biology

Project Identifier LANL-20060581ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$312397
Cumulative Total Project Cost:	\$312397

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Manipulation and Control of Electron Spins in Semiconductors with Strain Engineering

Project Identifier LANL-20060589ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$320522
Cumulative Total Project Cost:	\$320522

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Shedding Light on the Mechanical Unfolding of Individual Proteins

Project Identifier LANL-20060593ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$306482
Cumulative Total Project Cost:	\$306482

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Acoustic Effects on Microscopic and Core-Scale Colloid Interactions and Porous Fluid Transport

Project Identifier LANL-20060607ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$310863
Cumulative Total Project Cost:	\$310863

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nanoscale Textured Composite Energetic Materials

Project Identifier LANL-20060617ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$383265
Cumulative Total Project Cost:	\$383265

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Structure and Evolution in Cosmology and Astrophysics

Project Identifier LANL-20060685ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$319709
Cumulative Total Project Cost:	\$319709

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Complex Dynamical Climate Systems Analysis

Project Identifier LANL-20060686ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$536181
Cumulative Total Project Cost:	\$536181

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Space Weather Processes and Mechanisms

Project Identifier LANL-20060687ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$837228
Cumulative Total Project Cost:	\$837228

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Solid Earth Geoscience: Transient & Steady-State Earth Processes

Project Identifier LANL-20060688ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$448162
Cumulative Total Project Cost:	\$448162

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Supersymmetry Breaking in Various Dimensions

Project Identifier LANL-20060694ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$148104
Cumulative Total Project Cost:	\$148104

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Statistics for the Engineering and Physical Sciences

Project Identifier LANL-20060697ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$177448
Cumulative Total Project Cost:	\$177448

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Investigating Coherent Flavor Evolution in Dense Neutrino Systems

Project Identifier LANL-20060698ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$92457
Cumulative Total Project Cost:	\$92457

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Computational Methods for Protein Function Inference

Project Identifier LANL-20060700DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$612511
Cumulative Total Project Cost:	\$612511

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project High P-T Synthesis of Superhard Carbon Nitride from Graphite-Like Precursors

Project Identifier LANL-20061378PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$153082
Cumulative Total Project Cost:	\$153082

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Lifting the Quantum Critical Conundrum

Project Identifier LANL-20061383PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$171122
Cumulative Total Project Cost:	\$171122

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Exploring the Membrane Penetration Machinery of Bacterial Toxins

Project Identifier LANL-20061387PRD1

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$153190
Cumulative Total Project Cost:	\$153190

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Numerical Techniques of Rifting and Passive Margin Formation: The Role of Mantle Plumes

Project Identifier LANL-20061388PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$153427
Cumulative Total Project Cost:	\$153427

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Synthesis of Molecular Actinide Nitrides

Project Identifier LANL-20061395PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$128000
Cumulative Total Project Cost:	\$128000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Studies of Sub-Micron Ferromagnetic Particles using Magnetic Resonance Force Microscopy

Project Identifier LANL-20061396PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$173601
Cumulative Total Project Cost:	\$173601

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Measurements of Absorption and Scattering by Aerosols: How do they Offset Global Warming?

Project Identifier LANL-20061397PRD1

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$156262
Cumulative Total Project Cost:	\$156262

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Main Group Hydride Chemistry for Hydrogen Storage

Project Identifier LANL-20061399PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$34406
Cumulative Total Project Cost:	\$34406

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project The Secret Life of Quasiparticles

Project Identifier LANL-20061402ER

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Basic

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$109980
Cumulative Total Project Cost:	\$109980

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Improved Length Scaling in Accelerated Molecular Dynamics Methods

Project Identifier LANL-20061423ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$318657
Cumulative Total Project Cost:	\$318657

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Experimental Study of

Driven Magnetic Relaxation in a Laboratory Plasma

Project Identifier LANL-20061435ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$366002
Cumulative Total Project Cost:	\$366002

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Interface-Governed Behavior of Nano-Layered Metallic Composites

Project Identifier LANL-20061438PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$165815
Cumulative Total Project Cost:	\$165815

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Ion Synthesis of Novel SiGe Structures

Project Identifier LANL-20061442PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$148617
Cumulative Total Project Cost:	\$148617

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Non-Equilibrium Stochastic Processes in Classical and Quantum Systems

Project Identifier LANL-20061449PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$129345
Cumulative Total Project Cost:	\$129345

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Searching for New Uranium Based Superconductors

Project Identifier LANL-20061456PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$168926
Cumulative Total Project Cost:	\$168926

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Fluorescence Lifetime Spectroscopy by Flow Cytometry

Project Identifier LANL-20061468PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$136722
Cumulative Total Project Cost:	\$136722

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Advancing the Chemistry Material Science and Theoretical Understanding of Actinides

Project Identifier LANL-20061471DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1036307
Cumulative Total Project Cost:	\$1036307

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Three-dimensional Magnetic Reconnection Experiments

Project Identifier LANL-20061475PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$173625
Cumulative Total Project Cost:	\$173625

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project High-Resolution Physically-Based Model of Semi-Arid River Basin Hydrology

Project Identifier LANL-20061493DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$710954
Cumulative Total Project Cost:	\$710954

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project A Strategy for Effective Antibiotic Delivery

Project Identifier LANL-20061494ER

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Applied

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$160576
Cumulative Total Project Cost:	\$160576

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Polyazido Precursors for Synthesis of Novel Drugs

Project Identifier LANL-20061515ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$104100
Cumulative Total Project Cost:	\$104100

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Trapping Rare Culture Mutations for Bioweapon Attribution and Forensics

Project Identifier LANL-20061517ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$219811
Cumulative Total Project Cost:	\$219811

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Aligned Crystalline Silicon Films for Solar Cells

Project Identifier LANL-20061522ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$311791
Cumulative Total Project Cost:	\$311791

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Accelerated Molecular Dynamics at Complex Interfaces

Project Identifier LANL-20061524PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$113631
Cumulative Total Project Cost:	\$113631

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Multiscale Modeling of Irradiation-induced Defect Processes in High-Cr Ferritic Steels

Project Identifier LANL-20061526PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$147105
Cumulative Total Project Cost:	\$147105

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project High Efficiency Carbon Nanotube-TiO₂ Nanostructured Solar Cells

Project Identifier LANL-20061528PRD3

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$135123
Cumulative Total Project Cost:	\$135123

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Theoretical Studies of Cold Atom Fermi-liquids and Bose-Einstein Condensates on Chips

Project Identifier LANL-20061558PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$142576
Cumulative Total Project Cost:	\$142576

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Fundamental Oxygen Reduction Reaction Studies at high pH

Project Identifier LANL-20061562PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$155594
Cumulative Total Project Cost:	\$155594

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Search for Temporal Variation of the Fine Structure Constant

Project Identifier LANL-20061563PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$138585
Cumulative Total Project Cost:	\$138585

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Visualization Applied to Electronic Properties of Novel Superconductors

Project Identifier LANL-20061585ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$287126
Cumulative Total Project Cost:	\$287126

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Ultrafast Phenomena: Short-Pulse laser Interactions with Atoms and Molecules

Project Identifier LANL-20061600PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$137057
Cumulative Total Project Cost:	\$137057

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project A Chemical Route to Integrate Carbon Nanotubes into Microelectromechanical Systems

Project Identifier LANL-20061615PRD4

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$64307
Cumulative Total Project Cost:	\$64307

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Self-Organizing Wireless Ad-Hoc and Sensor Networks with Functional Guarantees

Project Identifier LANL-20061624PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$156250
Cumulative Total Project Cost:	\$156250

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Flexible Plastic Electrodes for Cheap Solar Cells

Project Identifier LANL-20061630PRD4

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$164835
Cumulative Total Project Cost:	\$164835

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Ultrafast Plasmonics for Waveguide Nanophotonics

Project Identifier LANL-20061633PRD4

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$19622
Cumulative Total Project Cost:	\$19622

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Theoretical Investigations of Plastic Deformation in Energetic Materials

Project Identifier LANL-20061639PRD4

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$172935
Cumulative Total Project Cost:	\$172935

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Beyond the Neutrino Matrix

Project Identifier LANL-20070003DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1902057
Cumulative Total Project Cost:	\$1902057

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Dark Energy and the Cosmic Web

Project Identifier LANL-20070005DR

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Basic

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1545567
Cumulative Total Project Cost:	\$1545567

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Novel Inclusion Compounds for Hydrogen Storage

Project Identifier LANL-20070008DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1518774
Cumulative Total Project Cost:	\$1518774

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Rapid Iterative Detection Using Smart Pathogen Signatures

Project Identifier LANL-20070010DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1490795
Cumulative Total Project Cost:	\$1490795

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Correlations and Control of Properties of Metallic U and Pu

Project Identifier LANL-20070013DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$2296897
Cumulative Total Project Cost:	\$2296897

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project High-Current, High-Energy, Laser-Driven Ion Accelerators: An Enabling and Revolutionary Scientific Research Tool

Project Identifier LANL-20070023DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1411343
Cumulative Total Project Cost:	\$1411343

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Cold Atom Surface Imaging

Project Identifier LANL-20070028DR

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Basic

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1480416
Cumulative Total Project Cost:	\$1480416

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project A Systematic Strategy for Gene Function Discovery

Project Identifier LANL-20070029DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1455608
Cumulative Total Project Cost:	\$1455608

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Metamaterials for Threat Reduction Applications: Imaging, Signal Processing, and Cloaking

Project Identifier LANL-20070060DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1590532
Cumulative Total Project Cost:	\$1590532

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project The Physics of Algorithms

Project Identifier LANL-20070063DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1470121
Cumulative Total Project Cost:	\$1470121

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Coexistence of Magnetic and Superconducting Electrons in Strongly Correlated Matter

Project Identifier LANL-20070064DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1226507
Cumulative Total Project Cost:	\$1226507

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Physics of Helium Retention in Palladium/Tritium Systems

Project Identifier LANL-20070074DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1498764
Cumulative Total Project Cost:	\$1498764

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Quantum Control in Condensed Media for Studies of Direct Optical Initiation of Explosives

Project Identifier LANL-20070077DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1473537
Cumulative Total Project Cost:	\$1473537

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Biomimetic Hydrogen Production by Photoinitiated Transition Metal Catalysis

Project Identifier LANL-20070096DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1552122
Cumulative Total Project Cost:	\$1552122

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Host-Pathogen Interactions (Pathomics) in Avian Influenza

Project Identifier LANL-20070099DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1642801
Cumulative Total Project Cost:	\$1642801

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Drug Binding and Catalytic Mechanism in DHFR

Project Identifier LANL-20070131ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$333839
Cumulative Total Project Cost:	\$333839

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Cerium-Doped Glass Scintillators

Project Identifier LANL-20070134ER

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Applied

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$354603
Cumulative Total Project Cost:	\$354603

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Substrates for the Detection and Differentiation of Influenza Viridae

Project Identifier LANL-20070148ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$354721
Cumulative Total Project Cost:	\$354721

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Coulomb Mechanisms for Ion Damage in Insulators in the Electronic Stopping Regime

Project Identifier LANL-20070156ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$442298
Cumulative Total Project Cost:	\$442298

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Beta Decay of Polarized Radioactive Atoms in an Optical Tweezer

Project Identifier LANL-20070160ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$383193
Cumulative Total Project Cost:	\$383193

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nano-Engineered Casimir Forces

Project Identifier LANL-20070163ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$349015
Cumulative Total Project Cost:	\$349015

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Magnetic Turbulence and Kinetic Dissipation in Solar Wind and Solar Corona Plasmas

Project Identifier LANL-20070170ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$309320
Cumulative Total Project Cost:	\$309320

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Understanding Dynamical Diversity of Extrasolar Planets

Project Identifier LANL-20070171ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$143741
Cumulative Total Project Cost:	\$143741

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project New Approach to Bayesian Inference Under Modeling Uncertainty

Project Identifier LANL-20070172ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$359114
Cumulative Total Project Cost:	\$359114

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nano-Structured Foams for Hydrogen Storage

Project Identifier LANL-20070173ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$345815
Cumulative Total Project Cost:	\$345815

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nano-Composite Scintillator for Neutron Capture Measurements

Project Identifier LANL-20070176ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$333070
Cumulative Total Project Cost:	\$333070

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Understanding a Killer: A Predictive Model of Tumor Development

Project Identifier LANL-20070180ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$310935
Cumulative Total Project Cost:	\$310935

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Sharp characterization of minimizers (typically) involving interfaces in images

Project Identifier LANL-20070187ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$366769
Cumulative Total Project Cost:	\$366769

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Probing Correlated Electron Behavior via Direct Uranium-235 Nuclear Magnetic Resonance

Project Identifier LANL-20070188ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$312489
Cumulative Total Project Cost:	\$312489

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Instabilities Driven Turbulence and Mixing in Convergent Geometries

Project Identifier LANL-20070195ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$296215
Cumulative Total Project Cost:	\$296215

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Moment-Based Interface Tracking for Multi-Material Flows

Project Identifier LANL-20070202ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$338157
Cumulative Total Project Cost:	\$338157

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Synthesis of Nanowire Heterostructures for Strain-Controlled Bandgap Engineering

Project Identifier LANL-20070204ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$292935
Cumulative Total Project Cost:	\$292935

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Cold Atom Quantum Liquid Mixtures

Project Identifier LANL-20070234ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$310958
Cumulative Total Project Cost:	\$310958

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Investigation of Energetic Ion Generation and Transport in Ultra-Intense Laser-Matter Interaction

Project Identifier LANL-20070235ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$413857
Cumulative Total Project Cost:	\$413857

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Hyperbolic Polynomials Approach to Approximate Counting and Lower/Upper Bounds in Combinatorics,
Statistical Physics and Computational Geometry

Project Identifier LANL-20070243ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$298226
Cumulative Total Project Cost:	\$298226

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Excited States and Optical Response of Nanosized Molecules at Linear Scaling Numerical Cost

Project Identifier LANL-20070256ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$343367
Cumulative Total Project Cost:	\$343367

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project An Experimental and Theoretical Framework for Reactive Micromixing

Project Identifier LANL-20070267ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$256722
Cumulative Total Project Cost:	\$256722

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Synthetic Decoys for Biothreat Agents

Project Identifier LANL-20070270ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$265388
Cumulative Total Project Cost:	\$265388

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project New States of Matter in Stars, Nuclei and Cold Atoms

Project Identifier LANL-20070276ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$296682
Cumulative Total Project Cost:	\$296682

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Magnetic Resonance Force Microscopy Studies of Ferromagnets on a Nanometer Scale.

Project Identifier LANL-20070330ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$324520
Cumulative Total Project Cost:	\$324520

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project From Novel Principles to Novel Device Structures for High-Efficiency Generation of Solar Electricity

Project Identifier LANL-20070338ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$332049
Cumulative Total Project Cost:	\$332049

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Ultra-Low Field Resonant Absorption Magnetic Resonance Imaging of Neural Activity

Project Identifier LANL-20070349ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$348235
Cumulative Total Project Cost:	\$348235

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project X, Gamma, Alpha : Ultra-High Resolution Spectroscopy

Project Identifier LANL-20070367ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$341085
Cumulative Total Project Cost:	\$341085

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project A Novel Approach to Manufacturing Ultra-Tall Carbon Nanotube Forests

Project Identifier LANL-20070368ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$334744
Cumulative Total Project Cost:	\$334744

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Controlling Oxidation-States in Actinide-Oxides through Crystal Lattice Pinning

Project Identifier LANL-20070380ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$326344
Cumulative Total Project Cost:	\$326344

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Unique Observations of Nature's Largest Explosions

Project Identifier LANL-20070382ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$326961
Cumulative Total Project Cost:	\$326961

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Agent-Based Modeling and Simulation of Cellular Signaling Systems

Project Identifier LANL-20070416ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$311268
Cumulative Total Project Cost:	\$311268

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Fast Approximation Algorithms for Systems of Linear Inequalities

Project Identifier LANL-20070421ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$360404
Cumulative Total Project Cost:	\$360404

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Optical, Electronic, and Magnetic Doping of ENABLE Grown Semiconducting Films Using an Electrospray Ionization Dopant Source

Project Identifier LANL-20070436ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$388271
Cumulative Total Project Cost:	\$388271

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Subsurface Transport Parameter Estimation with Multiscale, Multiobjective Optimization

Project Identifier LANL-20070441ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$239197
Cumulative Total Project Cost:	\$239197

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Tunable Infra-Red Chromophores through N-Type Doping of Wide-Gap Semiconductor Nanocrystals

Project Identifier LANL-20070445ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$326855
Cumulative Total Project Cost:	\$326855

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Non-Precious Metal Nanocomposites for Fuel Cell Catalysis

Project Identifier LANL-20070451ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$326889
Cumulative Total Project Cost:	\$326889

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Minimal Description of Complex Shapes with Applications to Experiments and Validation

of Large-Scale Codes

Project Identifier LANL-20070483ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$240662
Cumulative Total Project Cost:	\$240662

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Electron-Neutrino Correlation in Neutron Beta Decay

Project Identifier LANL-20070488ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$273938
Cumulative Total Project Cost:	\$273938

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Nanofabrication of Electronic, Photonic, and Magnetic Thin Film Materials

Project Identifier LANL-20070497ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$66019
Cumulative Total Project Cost:	\$66019

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project High-Nitrogen Coordination Complexes for Lead Replacement

Project Identifier LANL-20070498ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$10692
Cumulative Total Project Cost:	\$10692

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Edge Basis Functions on Pyramid Elements for Magnetostatic Finite-Element Analysis

Project Identifier LANL-20070499ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$58595
Cumulative Total Project Cost:	\$58595

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Accelerated Scientific Visualization Capabilities in Large-Scale Data Environments Via Application of Advanced Hybrid Computing Technologies

Project Identifier LANL-20070500ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$57312
Cumulative Total Project Cost:	\$57312

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Compiling for Programmable Logic Processors

Project Identifier LANL-20070501ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$54783
Cumulative Total Project Cost:	\$54783

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Multiscale Modeling of Strongly Interacting Systems

Project Identifier LANL-20070505DR

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$512459
Cumulative Total Project Cost:	\$512459

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Experimental and computational studies of magnetic bubble expansion as a model for extra-galactic radio lobes

Project Identifier LANL-20070506ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$219606
Cumulative Total Project Cost:	\$219606

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Development of a Magnetically Driven Target for Thermo-Nuclear Burn Studies (*U)

Project Identifier LANL-20070518DR

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1012925
Cumulative Total Project Cost:	\$1012925

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Molecular Actinide Alkylidene Complexes

Project Identifier LANL-20070525PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$123047
Cumulative Total Project Cost:	\$123047

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Superconductivity in Non-Centrosymmetric Materials

Project Identifier LANL-20070541PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$68162
Cumulative Total Project Cost:	\$68162

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Creating a Mathematical Foundation for High-Dimensional Search and Optimization Algorithms to Solve Complex Nonlinear Models

Project Identifier LANL-20070560PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$132946
Cumulative Total Project Cost:	\$132946

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Structure and Function of Human Mineralised Tissue

Project Identifier LANL-20070565PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$5157
Cumulative Total Project Cost:	\$5157

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Quantum Fluctuations in Bose-Einstein Condensates

Project Identifier LANL-20070573PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$140175
Cumulative Total Project Cost:	\$140175

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Vibrational Features and Quantum Transport in Molecular Electronics

Project Identifier LANL-20070576PRD1

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$12740
Cumulative Total Project Cost:	\$12740

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Multifunctional Copper-Carbon Nanotube Nanocomposites

Project Identifier LANL-20070585PRD2

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$28389
Cumulative Total Project Cost:	\$28389

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Intelligent Wireless Ad-hoc and Sensor Networks with Functional Guarantees

Project Identifier LANL-20070592ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$96096
Cumulative Total Project Cost:	\$96096

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Controlled Synthesis of Nanostructured Metals for Chemical Detection

Project Identifier LANL-20070595ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$92288
Cumulative Total Project Cost:	\$92288

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Theoretical and Experimental Investigation of Relaxation Mechanisms in Ultra-low Field NMR for Magnetic Resonance Imaging

Project Identifier LANL-20070626PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$93182
Cumulative Total Project Cost:	\$93182

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Metagenomics Study of Rumen Microflora

Project Identifier LANL-20070629ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$63485
Cumulative Total Project Cost:	\$63485

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Multiscale Simulations for Cascade Overlap in Irradiated Materials

Project Identifier LANL-20070640PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$24567
Cumulative Total Project Cost:	\$24567

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Noise in Biochemical Networks: Rigorous Analysis with Field-Theoretic Tools

Project Identifier LANL-20070649PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$81238
Cumulative Total Project Cost:	\$81238

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Entanglement and Correlations in Complex Physical Systems

Project Identifier LANL-20070653PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$28272
Cumulative Total Project Cost:	\$28272

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Ultrafast Non-equilibrium Physics of the Fractional Quantum Hall System

Project Identifier LANL-20070654PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$5327
Cumulative Total Project Cost:	\$5327

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Detecting the Highest Energy Gamma-Rays and Neutrinos to Determine the Origin of Cosmic Rays

Project Identifier LANL-20070658PRD2

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$16723
Cumulative Total Project Cost:	\$16723

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Frequency Behavior of Piezoelectric Materials Under Radiation for Sensor Applications

Project Identifier LANL-20070670ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$29564
Cumulative Total Project Cost:	\$29564

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Direct Detection of Dark Matter

Project Identifier LANL-20070676DR

Principal Investigator

Point of Contact Harris, Lisa

Type of Research Basic

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$506866
Cumulative Total Project Cost:	\$506866

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Time-Dependent Density Functional Theory for Ultrafast Optical Phenomena in Strongly Correlated Electron Materials

Project Identifier LANL-20070690PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$23898
Cumulative Total Project Cost:	\$23898

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Anti-Neutrino Oscillation and Cross Section Measurements at MiniBooNE

Project Identifier LANL-20070701PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$30561
Cumulative Total Project Cost:	\$30561

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Phase Transitions in Quantum Systems and Quantum Information

Project Identifier LANL-20070705PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$1243
Cumulative Total Project Cost:	\$1243

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Lanthanide Main-Group Element Multiple Bonds

Project Identifier LANL-20070709PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$77727
Cumulative Total Project Cost:	\$77727

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Sensitization of Lanthanide Ion Fluorescence Using Nanocrystal Quantum Dots

Project Identifier LANL-20070722PRD3

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$36696
Cumulative Total Project Cost:	\$36696

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Los Alamos National Lab

Project Exploration of New Metal Compounds of High Nitrogen Ligands for the Development of Tunable Energetic Materials

Project Identifier LANL-20070741ER

Principal Investigator

Type of Research Basic

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$83153
Cumulative Total Project Cost:	\$83153

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Pilot Metagenomics Study of Complex Soil Microbial Communities using Highly Parallel Pyrosequencing

Project Identifier LANL-20070743ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$75903
Cumulative Total Project Cost:	\$75903

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Miniature Widely-Tunable High Power THz Source and Detector for Threat Reduction Applications

Project Identifier LANL-20070744ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$105661
Cumulative Total Project Cost:	\$105661

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Los Alamos National Lab

Project Feasibility of Monochromatic Gamma Generation with Electron Channeling in Carbon Nanotubes

Project Identifier LANL-20070745ER

Principal Investigator

Type of Research Applied

Point of Contact Harris, Lisa

POC Phone 505-667-1235

FY 2007 Project Costs

Total:	\$89732
Cumulative Total Project Cost:	\$89732

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Completed Projects

Project Identifier 06001000

Principal Investigator Hock, Susan

Point of Contact Terry, Sheila

Type of Research

Development

POC Phone 303-275-4604

FY 2007 Project Costs

Total:	\$7884
Cumulative Total Project Cost:	\$7884

Description of Project

Residual costs for projects completed in the prior fiscal year.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Design, Synthesis, and Characterization of Plasmonic Structures for Solar Energy Conversion and Solid-State Lighting

Project Identifier 06270701

Principal Investigator vandeLagemaat, Jao

Point of Contact

Type of Research

Development
POC Phone 303-384-6143

FY 2007 Project Costs

Total:	\$161298
Cumulative Total Project Cost:	\$161298

Description of Project

Study the design, synthesis, and characterization of plasmonic structures formed from nanoscaled conductors. These plasmonic structures, which use collective electronic excitations to focus and localize electromagnetic energy in one, two or three dimensions, are aimed at improving the efficiency of energy conversion systems where light is converted into electrical energy (i.e. solar cell) or vice-versa (i.e. light-emitting diode).

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Developing Next Generation Concepts for Consolidated Bioprocessing in Microorganisms Using Systems Biology

Project Identifier 06270702

Principal Investigator Himmel, Michael

Point of Contact

Type of Research

Development
POC Phone 303-384-7756

FY 2007 Project Costs

Total:	\$170071
Cumulative Total Project Cost:	\$170071

Description of Project

In this context, CBP refers to the development of a single microorganism capable of producing enzymes (cellulases) for biomass conversion to sugars and then fermenting those sugars to ethanol. This effort will pursue the concept that the filamentous fungi, *Trichoderma reesei*, typically used for commercial cellulase preparations, can be engineered to become an effective CBP strain using systems biology.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Two-Electron Catalysis Coupled to Excitonic Semiconductors: Nanostructured PhotoElectroCatalytic Systems

Project Identifier 06270703

Principal Investigator Gregg, Brian

Point of Contact

Type of Research

Development
POC Phone 303-384-6635

FY 2007 Project Costs

Total:	\$154896
Cumulative Total Project Cost:	\$154896

Description of Project

Explore a new approach to the photoproduction of fuels via novel PhotoElectroCatalytic (PECat) systems based on organic semiconductors coupled, through a ligand, to a 2-electron catalytic phase. The focus is on developing 2-electron catalysts, and photosystems in which they can be well-employed. The project will explore systems that can continuously produce photoproduct, in contrast to existing artificial photosynthetic systems that still rely on sacrificial reagents. With the synthesis of just two molecules, a large number of catalysts will be explored in three independent configurations: 1)a crystalline, yet nanostructured, film on an electrode; 2)a nanoporous, high surface area film, and 3)a micellar "PhotoOxidase". This proposed approach is quite unconventional.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Isolation and Separation of Single-Walled Carbon Nanotubes via Engineered Proteins

Project Identifier 06270704

Principal Investigator Rumbles, Garry

Type of Research Applied

Point of Contact

POC Phone 303-384-6502

FY 2007 Project Costs

Total:	\$62157
Cumulative Total Project Cost:	\$62157

Description of Project

This project seeks to understand the fundamental interactions between proteins and SWNTs. With this understanding and by using modern systems biology it will be possible to use specific proteins to extract and isolate SWNTs of a unique diameter and chirality.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Novel in vitro Hydrogenase-Dependent Production of H₂ Coupled Directly to Light-Induced Charge Separation Using Only Photosystem

Project Identifier 06270705

Principal Investigator Ghirardi, Maria

Type of Research Applied

Point of Contact

POC Phone 303-384-6312

FY 2007 Project Costs

Total:	\$85951
Cumulative Total Project Cost:	\$85951

Description of Project

Testing the feasibility of a novel concept for renewable photoproduction of hydrogen fuel in vitro, based on catalysts derived from biological organisms. If successful the approach has the potential for doubling the current quantum of hydrogen photoproduction.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Oriented Nanotube Arrays for Advanced Lithium-Ion Batteries

Project Identifier 06270801

Principal Investigator Frank, Arthur

Type of Research Applied

Point of Contact

POC Phone 303-384-6262

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

This team will develop and study oriented nanostructured architectures for high-power, high-energy, long-life lithium-ion battery electrodes. The aim of this research is to evaluate potentials and limitations of using oriented metal oxide NT arrays for lithium-ion battery electrodes.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Tailoring Carbon Nanotube and Hydrogenase Bio-Hybrids for Design of Novel H2 Electrodes

Project Identifier 06270802

Principal Investigator King, Paul

Point of Contact

Type of Research

Development
POC Phone 303-384-6277

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Development of nano- and bio-materials and methodologies for the fabrication of biocatalytic, hybrid electrodes for developing 2nd and 3rd generation electrochemical and photoelectrochemical hydrogen production devices.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Catalyst Improvement for Solar Biohydrogen Production

Project Identifier 06270803

Principal Investigator Maness, Pin-Ching

Type of Research Applied

Point of Contact

POC Phone 303-384-6114

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Proof of a hypothesis/principle that a NAD(P)-reducing cyanobacterial hydrogenase catalyst can be improved by removing its native accessory components dictating electron donor mediation. The outcome is a simplified [NiFe] hydrogenase that interacts with energetically more favorable electron mediator ferredoxin, for both photobiological H₂ production and biomimetic applications.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Understanding Plant Cell Wall Deconstruction Process in Biomass Decaying Community Using Proteomics and Bioimaging Approaches

Project Identifier 06270804

Principal Investigator Ding, Shi-You

Type of Research Basic

Point of Contact

POC Phone 303-384-7758

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Carry out the first comprehensive, dynamic survey of the hydrolytic enzymes produced during the natural microbial degradation of poplar wood chips by hot composting. Proteomics and bioinformatics approaches will be used to determine the enzyme composition and expression dynamics of this dy biomass decay community. In addition correlations between specific enzyme abundances and localization on biomass substrates will be developed, as well as changes in biomass ultrastructure during decomposition.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Transition Metal Catalysis: Experiment and Theory

Project Identifier 06510501

Principal Investigator Nimlos, Mark

Point of Contact

Type of Research

Development
POC Phone 303-384-7704

FY 2007 Project Costs

Total:	\$174389
Cumulative Total Project Cost:	\$174389

Description of Project

Develop hydrogenolysis catalysts that are capable of converting alcohols into alkanes. This novel chemical process is thermodynamically favored, but seldom observed. This reaction would be useful in upgrading the energy content of a variety of biomass derived materials. The focus of this project is to demonstrate that the catalytic hydrogenolysis of alcohols is feasible, and perhaps can be useful in guiding the development of these catalysts.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Consolidated Bioprocessing (CBP) of Cellulosic Biomass: Physiologically Paired Microbial Hosts and Cellulase Enzymes

Project Identifier 06510701

Principal Investigator Darzins, Al

Point of Contact

Type of Research

Development
POC Phone 303-384-7757

FY 2007 Project Costs

Total:	\$27816
Cumulative Total Project Cost:	\$27816

Description of Project

Determine the feasibility of tailoring both robust cellulase enzyme production and fermentation capabilities in a single organism. To test this hypothesis, two prokaryotic fermentation hosts will be paired with cellulase genes from not so distantly related microorganism. Project will investigate the production, localization, and activity of selected model glycosyl hydrolase enzymes in the fermentation hosts; focus on identifying preferred protein secretory components necessary for the targeted extracellular production of these enzymes in the given hosts; and identify and characterize new cellulase enzymes from novel cellulolytic microorganisms and their targeted expression in *Z. mobilis* and *Lactobacillus* hosts.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Obtaining Cell Wall Composition of a single Cell: Integration of Pulsed Sample Introduction with High Sensitivity Laser Ionization Mass Spectrometry

Project Identifier 06510801

Principal Investigator Davis, Mark

Type of Research Applied

Point of Contact

POC Phone 303-384-6140

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Integrate pulsed pyrolysis or laser ablation with new laser ionization techniques including single photon ionization time-of-flight mass spectrometry and resonance-enhanced multiphoton ionization TOF-MS to develop sub-tissue or cellular-level methodologies for fine-scale chemical analysis. The goal is to improve by several orders of magnitude the sensitivity of our existing plant and microorganism cell wall chemistry and metabolite profiling capabilities.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Nanoscale Materials for Thermal Storage

Project Identifier 06510802

Principal Investigator Blake, Dan

Type of Research Applied

Point of Contact

POC Phone 303-384-7701

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Discover new methods to calculate, from first principals, thermophysical properties of materials in nanoscale confinement. New methodology for design of thermal storage materials. New methods for synthesis of nano-encapsulated phase change storage materials. New capability for measurement of thermophysical properties of innovative thermal storage materials.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Development of Next Generation Biobutanol-Producing Microorganisms Using Systems Biology

Project Identifier 06510803

Principal Investigator Zhang, Min

Point of Contact

Type of Research

Development
POC Phone 303-384-7753

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

There is renewed interest in producing butanol biologically and there is evidence that it can be economically competitive with current technology. Much of the research reported to date has focused on improving butanol yield from glucose. However, to produce butanol in sufficient quantities needed for the fuel market, a radical expansion of the available feedstocks is required. Critical innovative research will be needed to develop technologies for producing butanol from lignocellulosic biomass feedstocks. The recent advances in "omics", metabolic engineering and high throughput technologies provide excellent tools and research opportunities to overcome the current biological limitations for producing butanol from the abundant lignocellulosic feedstocks economically.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Meso-Scale Computational Modeling of Polysaccharides in Plant Cell Walls

Project Identifier 06510804

Principal Investigator Nimlos, Mark

Point of Contact

Type of Research

Development
POC Phone 303-384-7704

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Development and testing of new coarse graining computational modeling approaches for investigating the deconstruction of plant cell walls and the use of these tools for studying cellulose/hemicellulose interactions.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Development of a Comprehensive High-Throughput Technique for Assessing Lipid Production in Algae

Project Identifier 06510805

Principal Investigator Wolfrum, Ed

Point of Contact

Type of Research

Development
POC Phone 303-384-7705

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Development of a high-throughput, data-rich technique for assessing lipid production in microalgae that will provide rich spectroscopic datasets amenable to multivariate analysis. At the conclusion of this project the team will have validated two high-throughput assays for algal lipid production that are able to provide far richer data sets than available with current assays, ideal for subsequent multivariate statistical analysis. We will also have demonstrated the related methods for collecting, organizing, storing, and analyzing the data generated from these techniques.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Hot-Wire Chemical Vapor Deposition of Metal Oxide Nanorods

Project Identifier 06520503

Principal Investigator Dillon, Anne

Type of Research Applied

Point of Contact

POC Phone 303-384-6607

FY 2007 Project Costs

Total:	\$107993
Cumulative Total Project Cost:	\$107993

Description of Project

Investigate production of metal oxide nanorods and nanoparticles for use in electrochromic windows and batteries.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Low Band-Gap Materials for Organic 3rd Generation Photovoltaics

Project Identifier 06520504

Principal Investigator Shaheen, Sean

Point of Contact

Type of Research

Development
POC Phone 303-384-6573

FY 2007 Project Costs

Total:	\$81802
Cumulative Total Project Cost:	\$81802

Description of Project

Develop a capability to fabricate organic semiconductor based photovoltaic devices. Develop low band gap materials that have optimized transport properties for the use in organic photovoltaic devices. Improve the scientific understanding of the structure-property relation of these materials. Improve the understanding of the physics of the operation of these devices and develop models to guide in their advancement.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Thin-Film Microelectronics for Rapid Gene Expression Analysis

Project Identifier 06520601

Principal Investigator Branz, Howard

Point of Contact

Type of Research

Development
POC Phone 303-384-6694

FY 2007 Project Costs

Total:	\$190755
Cumulative Total Project Cost:	\$190755

Description of Project

Develop a new type of DNA microarray based on thin-film microelectronics to accelerate gene expression studies. Research will address two problems crucial to rapid gene expression assays: 1) Understanding and control of rapid electric-field enhanced DNA binding and hybridization; and 2) development of techniques for E-field enhanced detection of complementary DNA hybridization in samples containing mixed DNA.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Unconventional Indium-Free Transparent Conductors

Project Identifier 06520602

Principal Investigator Perkins, John

Point of Contact

Type of Research

Development
POC Phone 303-384-6606

FY 2007 Project Costs

Total:	\$214660
Cumulative Total Project Cost:	\$214660

Description of Project

Targeted at finding In-free transparent conductors to replace Indium-Titanium-Oxide (ITO), the current industrial standard. Combinatorial high-throughput composition-spread techniques are being used to rapidly survey newly identified candidate TCOs outside the conventional TCO materials composition space. Subsequent single composition depositions will be used to focus on the identified candidates.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project A Critical Examination of the Intermediate Band Concepts for Ultra-High Efficiency Quantum Dot Solar Cells

Project Identifier 06520603

Principal Investigator Norman, Andrew

Type of Research Applied

Point of Contact

POC Phone 303-384-6483

FY 2007 Project Costs

Total:	\$220302
Cumulative Total Project Cost:	\$220302

Description of Project

The main goal is to critically examine the intermediate band concept for ultra high efficiency quantum dot (QD) solar cells. Other goals are to advance the MOCVD growth and the theoretical prediction and experimental determination of the properties of strain-balanced QD arrays.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Modified Inorganic Nanostructures for Organic Photovoltaics

Project Identifier 06520604

Principal Investigator Ginley, David

Point of Contact

Type of Research

Development
POC Phone 303-384-6573

FY 2007 Project Costs

Total:	\$214193
Cumulative Total Project Cost:	\$214193

Description of Project

This is a joint project between NREL and Sandia National Laboratories to develop the next generation of electron acceptors for organic photovoltaic cells. It combines SNL's expertise in the development of nanostructures with NREL expertise in OPV devices with the aim of significantly improving the state of the art in organic photovoltaic cells.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Photon Emission of Self-Assembled Semiconducting and Quantized Nanostructures by Scanning Tunneling Microscopy: Light from the Nanoworld

Project Identifier 06520605

Principal Investigator Romero, Manuel

Type of Research Applied

Point of Contact

POC Phone 303-384-6653

FY 2007 Project Costs

Total:	\$286392
Cumulative Total Project Cost:	\$286392

Description of Project

Advanced understanding of nanoscale optoelectronics in self-assembled semiconducting nanostructures. Supporting goals include: develop novel methods based on scanning probe microscopy (SPM) to investigate electron transport and recombination in individual quantum dots and interfaces in hybrid structures; synthesize QDs; investigate the effects of interfaces on the electron and hole injection in the dots

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Design and Development of Lattice-Matched InGaN

Project Identifier 06520701

Principal Investigator Ptak, Aaron

Point of Contact

Type of Research

Development
POC Phone 303-384-6660

FY 2007 Project Costs

Total:	\$221633
Cumulative Total Project Cost:	\$221633

Description of Project

Predict and design theoretically the formation energy and solubility of InN-GaN as a function of epitaxial strain and identify ideal substrates for growth in InGaN alloys. Develop the capability to grow high-quality $\text{In}_x\text{Ga}_{1-x}\text{N}$, and eliminate the phase-separation problem by employing growth on a lattice-matched substrate. Investigate the coherent, lattice-mismatched growth in $\text{In}_x\text{Ga}_{1-x}\text{N}$ on GaN templates to test the theoretical prediction of spontaneous ordering.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Semiconducting and Metallic Nanowire Networks for Transparent Electrical Contacts

Project Identifier 06520801

Principal Investigator Barnes, Teresa

Point of Contact

Type of Research

Development
POC Phone 303-384-6682

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

This team expects to develop a new translational research capability combining a program in nano-structured, primarily non-oxide, transparent conductors with an applied research effort to integrate these materials into photovoltaic devices. Most significantly, the team expects to develop several new materials as transparent electrodes that will serve as a springboard to new device technologies and new funding opportunities for continued study.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Integrated Rectenna Devices for Solar Energy Conversion

Project Identifier 06520802

Principal Investigator Parilla, Phil

Point of Contact

Type of Research

Development
POC Phone 303-384-6506

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

The team proposes to develop an integrated approach to demonstrate improved properties that takes advantage of nanoscience techniques to naturally synthesize devices at the proper length scale. Team also proposes developing a nano-scaled integrated MOM/antenna structure and characterizing its ability to adsorb/rectify monochromatic light with the main emphasis on improving the diode characteristics.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Study of Fundamental Protein/Protein Interactions Involved in Biological Energy Generation

Project Identifier 06530501

Principal Investigator Kim, Kwiseon

Point of Contact Terry, Sheila

Type of Research

Development
POC Phone 303-275-4122

FY 2007 Project Costs

Total:	\$144259
Cumulative Total Project Cost:	\$144259

Description of Project

Study the mechanisms governing competing protein/protein interactions involved in biological energy-generating processes and understand their impact on the rate of hydrogen production via computational modeling.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Development of Vehicle to Grid (V2G) Systems to Support Renewable Technologies

Project Identifier 06540801

Principal Investigator Markel, Tony

Point of Contact

Type of Research

Development
POC Phone 303-275-4478

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Develop and test advanced power electronics hardware and software that will allow EVs and PHEVs to be safely and effectively integrated with the electric power system in both residential and commercial settings and develop NREL capabilities to test, evaluate and analyze these applications. Evaluate the opportunity to increase penetration of wind and solar technologies through vehicles by using the vehicle's storage capability to buffer the intermittency of wind and solar technologies.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Development of Self-Learning Building Controls with Initial Application for Lighting Control

Project Identifier 06550701

Principal Investigator Torcellini, Paul

Point of Contact

Type of Research

Development
POC Phone 303-384-7528

FY 2007 Project Costs

Total:	\$70909
Cumulative Total Project Cost:	\$70909

Description of Project

Create a new generation of controllers that are robust, self-Learning and predictive in order to better match the building's potential for energy efficiency with actual performance. Techniques will be developed that involve self-learning hybrid controls. With proper lighting controls, daylighting could reduce lighting energy by 30%, or approximately 10% of the energy consumed by commercial buildings, including cooling savings. The goal is to create a generic controller that will respond to daylighting without any additional programming.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Prototype Renewable Planning Model (RPM)

Project Identifier 06560502

Principal Investigator Kroposki, Ben

Point of Contact

Type of Research

Development
POC Phone 303-275-2979

FY 2007 Project Costs

Total:	\$138321
Cumulative Total Project Cost:	\$138321

Description of Project

Develop a preliminary assessment tool to integrate basic resource availability (i.e. solar irradiation, wind resource, and biomass feedstocks) with infrastructure elements (i.e. power distribution system, roads) and constraint onto a single geographic interface. In the final year, the capability to assess the impact of renewables on the grid will be prototyped.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Solid Oxide Fuel Cells for Combined Tar Reforming and Electricity Production

Project Identifier 06560801

Principal Investigator Magrini, Kim

Type of Research Applied

Point of Contact

POC Phone 303-384-7755

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Project focuses on the dual use of a SOFC as a syngas cleanup and conditioning unit operation with high efficiency electrical power production. The research goals are to determine the extent of tar reforming in the SOFC and assess: 1) the upper limit of tars that can be input to a SOFC, 2) the potential of partially oxidizing hydrocarbons prior to the fuel cell, 3) assessing the technical feasibility of alternate anode materials and/or barrier layers on the anode to improve performance and increase impurity tolerance, and 4) the composition and quality of the (likely h₂-deficient) syngas at the exhaust of the SOFC for fuel synthesis processes.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Fundamental Properties and Applications of Novel Crystalline Inorganic-Organic Hybrid Semiconductor

Project Identifier 06590504

Principal Investigator Zhang, Yong

Type of Research Basic

Point of Contact

POC Phone 303-384-6617

FY 2007 Project Costs

Total:	\$249034
Cumulative Total Project Cost:	\$249034

Description of Project

Obtain and understand the basic structural, electronic and optical properties of the hybrid crystals.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Designing New Materials for Water Splitting from Solid Solutions of Semiconductor Compounds

Project Identifier 06590701

Principal Investigator Lany, Stephan

Type of Research Applied

Point of Contact

POC Phone 303-384-6652

FY 2007 Project Costs

Total:	\$155241
Cumulative Total Project Cost:	\$155241

Description of Project

Provide for the quaternary alloys GaN/InP and GaN/ZnO theoretical predictions of semiconductor properties that need to be optimized for the purpose of water-splitting: Will determine the change of the band edge energies as a function of alloy composition, and, at the same time, predict the range of experimentally accessible compositions. The team will further investigate the effect of atomic ordering on the band edge energies. For the GaN/ZnO we will predict the prospects of electrical doping (p- or n-type doping densities) as a function of experimentally accessible process parameters.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory National Renewable Energy Lab

Project Development of Novel Thin-Film Solar Energy Conversion Materials

Project Identifier 06590802

Principal Investigator Bhattacharya, Raghu

Point of Contact

Type of Research

Development
POC Phone 303-384-6477

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

Investigate promising new semiconductor materials, e.g., doped Bi₂-VI₃ (Bi₂S₃, Bi₂Se₃) and Sb₂Se₃. These materials have ideal bandgap energy (1 to 2eV) and can find their effective use only if thin-film semiconductor layers can be produced with p-type conductivity. These binary materials tend to be n-type with un-doped. Fundamental understanding of these materials along with basic research to dope them with proper cations or anions could make them p-type, making them very useful for fabricating PV devices in combination with n-type junction/window layer. This research work will develop new low-cost and non-toxic semiconductor materials for solar energy conversion.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Strategic Analysis Market Modeling Capability

Project Identifier 06640701

Principal Investigator Short, Walter

Point of Contact

Type of Research

Development

POC Phone 303-384-7368

FY 2007 Project Costs

Total:	\$134096
Cumulative Total Project Cost:	\$134096

Description of Project

Create a prototype model capable of analyzing the need for and benefit of storage for renewable electric technologies. A market penetration model that can address the specific resource, technology, and policy characteristics of renewable energy and energy storage technologies in much greater detail than that afforded by NEMS or other existing national energy models.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Properties of Refractory Metal Doped Transparent Conducting Oxides

Project Identifier 06RF0701

Principal Investigator Coutts, Tim

Type of Research Applied

Point of Contact

POC Phone

FY 2007 Project Costs

Total:	\$52859
Cumulative Total Project Cost:	\$52859

Description of Project

Development of novel transparent conducting oxides, doped with refractory metals. Several hypotheses will be tested to determine their importance to the design of new transparent conducting oxides. The work is applied by has a strong fundamental science component and we expect it to lead to many peer-reviewed publications.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Third Generation Direct Solar Photon Conversion to Fuels and Electricity

Project Identifier 06RF0702

Principal Investigator Nozik, Art

Point of Contact

Type of Research
Development
POC Phone

FY 2007 Project Costs

Total:	\$59219
Cumulative Total Project Cost:	\$59219

Description of Project

This project will conduct highly advanced non-linear spectroscopic experiments to search for clear evidence of coherence effects during Multiple Exciton Generation (MEG). These experiments include non-linear 4-wave mixing spectroscopy, 2-D spectroscopy, and photon-echo spectroscopy. The goal is to develop expertise in these advanced spectroscopies and lead the team in this new area of research.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project New Microbial Biohydrogen Research Approaches

Project Identifier 06RF0703

Principal Investigator Seibert, Mike

Point of Contact

Type of Research
Development
POC Phone

FY 2007 Project Costs

Total:	\$58037
Cumulative Total Project Cost:	\$58037

Description of Project

Develop a plan to take our algal, sulfur-deprived H₂-producing system from laboratory scale out to the greenhouse where higher solar levels of light can be investigated. Identify new research ideas and developments in the area of biohydrogen production and algal production of other fuels; and seek out new researchers/research in the U.S. or abroad for potential collaborations in innovative area of biohydrogen research.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory National Renewable Energy Lab

Project Exploration of Novel Optimization Techniques for Identifying Materials with Prescribed Physical Properties

Project Identifier 06RF0704

Principal Investigator Zunger, Alex

Type of Research

Point of Contact

Development
POC Phone

FY 2007 Project Costs

Total:	\$77631
Cumulative Total Project Cost:	\$77631

Description of Project

Development of a new technique for determination of the equilibrium crystal structure of a compound ApBq via Quantum-Mechanical total-energy minimization. Lamark's idea was that certain species can alter during their lifetime (i.e. without mating). Leading objective in FY08 is to combine Darwinian-style energy to explore a "Lamarkian-twist on Darwinian" Genetic Algorithm for searching which multi-component semiconductor has a desired target, optical band gap.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Line VISAR for Curved Surfaces

Project Identifier H1701016

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$56
Cumulative Total Project Cost:	\$56

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Coded Aperture Imaging for Location of Nuclear Materials

Project Identifier H1701026

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$10428
Cumulative Total Project Cost:	\$10428

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Diagnostic Shock Source

Project Identifier H1701056

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$9986
Cumulative Total Project Cost:	\$9986

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Variable Framing Camera

Project Identifier H1701057

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$109328
Cumulative Total Project Cost:	\$109328

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Optical Pin Measuring Machine

Project Identifier H1701067

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$228582
Cumulative Total Project Cost:	\$228582

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Nanosecond Single_photon Detection of Diffracted X-rays

Project Identifier H1701077

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$171035
Cumulative Total Project Cost:	\$171035

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Mach-Zehnder Velocimeter

Project Identifier H1701086

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$1755
Cumulative Total Project Cost:	\$1755

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Injector Design for a 10-picosecond Electron Accelerator

Project Identifier H1701107

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$178016
Cumulative Total Project Cost:	\$178016

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Noval Fiber Array Diagnostic Geometry

Project Identifier H1701116

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$2058
Cumulative Total Project Cost:	\$2058

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Slapper Simulator

Project Identifier H1701156

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$293
Cumulative Total Project Cost:	\$293

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Commercial Sensor-based Digital Framing Camera

Project Identifier H1701167

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$274733
Cumulative Total Project Cost:	\$274733

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Stereoscopic Borescope

Project Identifier H1701176

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$5567
Cumulative Total Project Cost:	\$5567

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Stereo Borescope

Project Identifier H1701187

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$153339
Cumulative Total Project Cost:	\$153339

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Time Frequency Analysis

Project Identifier H1701196

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$113
Cumulative Total Project Cost:	\$113

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Exploring Phase Transition/Shock Dynamics by THz Spectroscopy

Project Identifier H1701237

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$182543
Cumulative Total Project Cost:	\$182543

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Wide Range Sweep Circuit

Project Identifier H1702017

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$95484
Cumulative Total Project Cost:	\$95484

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project THz Time-Domain Spectroscopy (THz-TDS) and Imaging

Project Identifier H1702027

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$198758
Cumulative Total Project Cost:	\$198758

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Wide Range (20-500 nsec) Streak Sweep Circuits

Project Identifier H1702036

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$181
Cumulative Total Project Cost:	\$181

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Applications of semiconducting nanowire to phototube

Project Identifier H1702057

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$98779
Cumulative Total Project Cost:	\$98779

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project High-Speed Transient Waveform Recorder

Project Identifier H1702127

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$77031
Cumulative Total Project Cost:	\$77031

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project RadOptic Sensor Performance Enhancement and Product Development

Project Identifier H1702157

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$233264
Cumulative Total Project Cost:	\$233264

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Single pulse detection of infrared synchrotron light

Project Identifier H1703016

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$153
Cumulative Total Project Cost:	\$153

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Embedded Piezoelectric Microcantilever Array (EPMA)

Project Identifier H1703017

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$115330
Cumulative Total Project Cost:	\$115330

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Silver Chalcogenides: Unique megagauss field sensors

Project Identifier H1703046

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$3928
Cumulative Total Project Cost:	\$3928

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Zero Wind Plume Model

Project Identifier H1703057

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$100601
Cumulative Total Project Cost:	\$100601

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project 2 Bank DPFA Engineering Support

Project Identifier H170305E

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$65
Cumulative Total Project Cost:	\$65

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Single pulse detection of infrared synchrotron light

Project Identifier H1703077

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$101304
Cumulative Total Project Cost:	\$101304

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Fast Pulsed Assembly

Project Identifier H1703087

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$113958
Cumulative Total Project Cost:	\$113958

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Neutron Monochrometer

Project Identifier H1703106

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$819
Cumulative Total Project Cost:	\$819

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Dynamic Plasma Properties via spectrometry

Project Identifier H1703186

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$137
Cumulative Total Project Cost:	\$137

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Aerial Neutron Detection

Project Identifier H1704016

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$10680
Cumulative Total Project Cost:	\$10680

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Aerial Neutron Detection - Phase II

Project Identifier H1704037

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$139258
Cumulative Total Project Cost:	\$139258

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Concealed High Sensitivity Directional Detector

Project Identifier H1704087

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$89345
Cumulative Total Project Cost:	\$89345

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Networked UGV Based Data Acquisition

Project Identifier H1704157

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$177305
Cumulative Total Project Cost:	\$177305

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Quantum Wire Detector

Project Identifier H1704166

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$34313
Cumulative Total Project Cost:	\$34313

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Fissile Material Detection using Borated Paint

Project Identifier H1704197

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$117001
Cumulative Total Project Cost:	\$117001

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Tagged Photon Source for Energy-dependent Radiograph

Project Identifier H1704246

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$3653
Cumulative Total Project Cost:	\$3653

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Active Infrared (AIR) Sensor Investigation

Project Identifier H1704247

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$136750
Cumulative Total Project Cost:	\$136750

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Quantum Wire II

Project Identifier H1704287

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$133364
Cumulative Total Project Cost:	\$133364

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Prototyping Portable Detector with Multiple SPRT Options

Project Identifier H1704297

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$169423
Cumulative Total Project Cost:	\$169423

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Field Testing a Gamma-Ray Telescope for Search and CM Missions

Project Identifier H1704307

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$133742
Cumulative Total Project Cost:	\$133742

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project An Ultra-sensitive Neutron Spectrometer

Project Identifier H1704467

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$44558
Cumulative Total Project Cost:	\$44558

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Resonance Shadowgraphy

Project Identifier H1705026

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$4357
Cumulative Total Project Cost:	\$4357

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Pulse Discriminating MCP Beacon / Receiver

Project Identifier H1705047

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$65129
Cumulative Total Project Cost:	\$65129

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Resonance Shadowgraphy II

Project Identifier H1705057

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$61838
Cumulative Total Project Cost:	\$61838

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Frequency Modulated Detection of Phosphorescence on Surfaces

Project Identifier H1705087

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$171796
Cumulative Total Project Cost:	\$171796

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Repetitive Motion Imaging

Project Identifier H1705097

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$75189
Cumulative Total Project Cost:	\$75189

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Displacement Interferometry System

Project Identifier H1705136

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$109
Cumulative Total Project Cost:	\$109

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Uranium Visualization Chemistry

Project Identifier H1705167

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$122515
Cumulative Total Project Cost:	\$122515

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Conducting Polymers for Neutron Detection

Project Identifier H1705207

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$201323
Cumulative Total Project Cost:	\$201323

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project DNA Capture Materials

Project Identifier H1705227

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$158672
Cumulative Total Project Cost:	\$158672

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Pyroelectric Crystal Neutron Source

Project Identifier H1705256

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$2140
Cumulative Total Project Cost:	\$2140

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Zero Delay Velocimeter

Project Identifier H1705267

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$116562
Cumulative Total Project Cost:	\$116562

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Hybrid Electro-optic Links

Project Identifier H1705277

Principal Investigator Lewis, Wil

Point of Contact

Type of Research Applied

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$103825
Cumulative Total Project Cost:	\$103825

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Gel/Liquid Bubble Neutron Detector

Project Identifier H1705307

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$145894
Cumulative Total Project Cost:	\$145894

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Sintered Optical Materials for Shock Physics Experiments

Project Identifier H1705507

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$114698
Cumulative Total Project Cost:	\$114698

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Nevada Test Site

Project Room-Temperature, High-Resolution Spectroscopy on Nanostructures

Project Identifier H1705577

Principal Investigator Lewis, Wil

Type of Research Applied

Point of Contact

POC Phone 805-681-2278

FY 2007 Project Costs

Total:	\$111846
Cumulative Total Project Cost:	\$111846

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Alzheimer's Disease Detection via Nonlinear Analysis of EEG

Project Identifier 32102142

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$18136
Cumulative Total Project Cost:	\$119151

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Large-Area, Flexible, Heteroepitaxial, Single-Crystal-Like Diamond Films on Low-Cost Substrates for Wide-Ranging Electronic Applications

Project Identifier 32102159

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$26808
Cumulative Total Project Cost:	\$154042

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Scalable Surface-Enhanced Raman Spectroscopy for Single-Molecule Detection and Characterization

Project Identifier 32102174

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$45514
Cumulative Total Project Cost:	\$163801

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Smart Tunneling Barriers: A New Concept for Ferroelectric-Based Nonvolatile Random Access Memory

Project Identifier 32102179

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$51141
Cumulative Total Project Cost:	\$132888

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Identification of Protein-DNA and Protein-Protein Interactions in Single Living Cells Using Optical Nanosensors

Project Identifier 32102181

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$32445
Cumulative Total Project Cost:	\$162415

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Discrete Event-Based Simulation of Electromagnetic Wave Propagation in Highly Cluttered Environments

Project Identifier 32102185

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$38999
Cumulative Total Project Cost:	\$155981

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Generation of Mouse Embryonic Stem Cell Lines to Study MicroRNA Functions through Conditional and Cell Lineage-Specific shRNA Knockdown Approaches

Project Identifier 32102187

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$51286
Cumulative Total Project Cost:	\$155305

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Quasi-Electrostatic Carbon Orientation Processing for Lithium Ion Battery Anodes and Other Applications

Project Identifier 32102189

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$83664
Cumulative Total Project Cost:	\$160697

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Development of ZnO Light-Emitting Diodes Using Pulse Thermal Processing

Project Identifier 32102190

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$144145
Cumulative Total Project Cost:	\$163565

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Novel High-Resolution Micromechanical Gyroscope

Project Identifier 32102191

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$15045
Cumulative Total Project Cost:	\$145036

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Big Bang Cosmology and Online Simulation Suite

Project Identifier 32102192

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$51514
Cumulative Total Project Cost:	\$161590

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Demonstration of Intra-Reactor Diagnostics for Catalytic Fuel Reformers

Project Identifier 32102193

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$38764
Cumulative Total Project Cost:	\$127423

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Optical Monitoring of Delivery Methods for Therapeutic Agents to Neural Tissues

Project Identifier 32102194

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$93429
Cumulative Total Project Cost:	\$163065

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Genomic Analysis of Microbial-Mediated Metal Transformation

Project Identifier 32102195

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$55342
Cumulative Total Project Cost:	\$141297

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Exploring Layered Materials with Neutron and Photon Spectroscopy to Determine the Depth and Water Content in Subsurface Layers of Planets

Project Identifier 32102196

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$110640
Cumulative Total Project Cost:	\$162799

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Multivariate Statistical Analysis Technique to Locate Ecological Observation Sites within Regional Landscapes

Project Identifier 32102197

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$11516
Cumulative Total Project Cost:	\$24371

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Determining Relative Value of Ecosystem Services

Project Identifier 32102198

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$109035
Cumulative Total Project Cost:	\$161947

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Selective Electrochemical Oxidation of Water for Treatment of Ischemic Diseases and Other Applications

Project Identifier 32102199

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$51687
Cumulative Total Project Cost:	\$107044

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Novel Radio-Luminescent Glass for Safe User Applications

Project Identifier 32102200

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$9036
Cumulative Total Project Cost:	\$31126

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Effects of Groundwater Chemistry on the Distribution of Soil Microorganisms in Natural Media

Project Identifier 32102201

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$99694
Cumulative Total Project Cost:	\$133356

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project In Situ Monitoring of Realistic Catalyst Systems with High-Speed Electron Microscopy using a LaB6 Nanowire-Based Electron Source

Project Identifier 32102202

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$157621
Cumulative Total Project Cost:	\$157621

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Microstructure and Defects in Energetic Materials and Radioactive Alloys

Project Identifier 32102203

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$106894
Cumulative Total Project Cost:	\$163357

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Establishing a Targeted Mutagenesis System in Clostridium cellulolyticum

Project Identifier 32102204

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$19736
Cumulative Total Project Cost:	\$24921

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Carbonate Thermochemical Cycle for the Production of Hydrogen

Project Identifier 32102205

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$50523
Cumulative Total Project Cost:	\$68626

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Novel, Low-Cost, High-Mn-Containing Austenitic Stainless Steels and Alloys for High-Temperature Structural Applications

Project Identifier 32102206

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$129257
Cumulative Total Project Cost:	\$160049

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Laser-Interference Direct Structuring of Zirconia for Dental Materials

Project Identifier 32102207

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$17146
Cumulative Total Project Cost:	\$27380

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Live-Cell Microarrays for Genotypic Evaluation of Microbial Electron Transport

Project Identifier 32102210

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$143631
Cumulative Total Project Cost:	\$143631

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Synthesis of Polymeric Materials for Blue-Light Emitting Diodes

Project Identifier 32102211

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$144656
Cumulative Total Project Cost:	\$144656

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Land-Use Dynamics and Infectious Diseases: A Systems Approach to Defining the Causal Mechanism of Outbreak and Spread of Eastern equine encephalomyelitis

Project Identifier 32102212

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$27912
Cumulative Total Project Cost:	\$27912

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Taming Photosynthesis Regulation through Genomics for Direct Synthesis of Ethanol from Carbon Dioxide and Water

Project Identifier 32102213

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$174409
Cumulative Total Project Cost:	\$174409

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Development of an Advanced Surface-Enhanced Raman Spectroscopy for the Identification and Characterization of Pollen

Project Identifier 32102214

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$144503
Cumulative Total Project Cost:	\$144503

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Feasibility Study of Fuel-Pellet-Irradiation Capsules for Advanced Reactor Fuel Testing in the High Flux Isotope Reactor

Project Identifier 32102215

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$167933
Cumulative Total Project Cost:	\$167933

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Generalized Perturbation Methods for Transport Computations with Unstructured Meshes

Project Identifier 32102216

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$172768
Cumulative Total Project Cost:	\$172768

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Mapping Carrier Distributions and Photovoltaic Activity in Nanophase Materials by Electrical Dissipation Microscopy

Project Identifier 32102217

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$79999
Cumulative Total Project Cost:	\$79999

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Organic Magnets: Phenomenological and First-Principles Approaches to Layered Bimetallic Oxalates

Project Identifier 32102218

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$81938
Cumulative Total Project Cost:	\$81938

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Hybrid Diffusion Model Driven by Chemoattractants

Project Identifier 32102219

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$119993
Cumulative Total Project Cost:	\$119993

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Plasma Etching and Simulation of Electron Scattering in Nanoscale Copper Interconnects to Minimize Size Effects

Project Identifier 32102220

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$151660
Cumulative Total Project Cost:	\$151660

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Demonstration of an Electronic Colorimetric Filter Health Monitor

Project Identifier 32102221

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$23647
Cumulative Total Project Cost:	\$23647

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Proof-of-Concept Implementation for a USA National Phenology Network Cyberinfrastructure

Project Identifier 32102222

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$48289
Cumulative Total Project Cost:	\$48289

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Can the Quantum Confinement Effect Be Exploited for Spin Injection in Organic Spintronics?

Project Identifier 32102223

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$130080
Cumulative Total Project Cost:	\$130080

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project In Situ Nanopatterning of Single-Crystal Multiferroics by Strain for Terabit-Scale Data Storage

Project Identifier 32102224

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$74993
Cumulative Total Project Cost:	\$74993

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Probing the Molecular Interface of Cellulose and Lignin in Biomass

Project Identifier 32102225

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$128499
Cumulative Total Project Cost:	\$128499

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Quantitative Parametric Decay Simulation: A New Tool for Understanding Parasitic Radio-Frequency Power Losses in Heating Fusion Plasmas

Project Identifier 32102226

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$175249
Cumulative Total Project Cost:	\$175249

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Destroying Pathogenic Bacteria using Targeted Nanoparticles

Project Identifier 32102227

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$98346
Cumulative Total Project Cost:	\$98346

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Compact Chemical-to-Hydraulic Power Source

Project Identifier 32102228

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$27719
Cumulative Total Project Cost:	\$27719

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Photon-Assisted Thermoelectric Devices

Project Identifier 32102229

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$79420
Cumulative Total Project Cost:	\$79420

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Photocatalytic Conversion of CO₂: An Alternative to Storage-Based Sequestration

Project Identifier 32102230

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$130816
Cumulative Total Project Cost:	\$130816

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Intensified Continuous Production of Biodiesel

Project Identifier 32102231

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$27953
Cumulative Total Project Cost:	\$27953

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project In Situ Studies for Ductility Improvement of Bulk Metallic Glasses

Project Identifier 32102232

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$134865
Cumulative Total Project Cost:	\$134865

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Molecular Engineering of Core-Shell Interfaces? Toward Controllable Production of Brighter, Optically Tunable Quantum Dots

Project Identifier 32102233

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$90421
Cumulative Total Project Cost:	\$90421

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Assessment of Possible Exotic Magnetic Behavior in Anti-Perovskite Nitride

Project Identifier 32102234

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$26758
Cumulative Total Project Cost:	\$26758

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Monte Carlo Simulation of Ion Trajectories in Ion Mobility Spectrometry

Project Identifier 32102235

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$28837
Cumulative Total Project Cost:	\$28837

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Development of a Hybrid Computational Phantom Model

Project Identifier 32102236

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$94384
Cumulative Total Project Cost:	\$94384

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Fundamental Studies of CO₂-Coal Interactions using Novel, Neutron Scattering Techniques at Conditions Relevant to Subsurface Sequestration

Project Identifier 32102237

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$34642
Cumulative Total Project Cost:	\$34642

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Nanostructured, Three-Dimensional Electrodes for Enzyme Fuel Cells

Project Identifier 32102238

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$49920
Cumulative Total Project Cost:	\$49920

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project High-Strength, Ductile, Crystalline-Amorphous Multilayers

Project Identifier 32102239

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$27361
Cumulative Total Project Cost:	\$27361

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project An Innovative Low/High-Temperature, Repetitive Pressure-Pulse Apparatus for Cavitation Damage Research

Project Identifier 32102240

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$15976
Cumulative Total Project Cost:	\$15976

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Computing the Electric Dipole Moment of the Neutron and the Schiff Moment of the Nucleus

Project Identifier 32102241

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$23725
Cumulative Total Project Cost:	\$23725

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Turbopump Concentration of Heavy Atoms and Molecules

Project Identifier 32102242

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$39701
Cumulative Total Project Cost:	\$39701

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Deterministic Growth of Oxide Nanostructures by Pulsed-Laser Deposition

Project Identifier 32102243

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$19987
Cumulative Total Project Cost:	\$19987

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Applications of Ultrafast, Ultra-Intense Lasers to Radioactive Ion Beam Production and Diagnostics

Project Identifier 32112117

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$258113
Cumulative Total Project Cost:	\$832274

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project In-Situ, Time-Resolved, Neutron Diffraction Study of Materials Behavior Under Severe Thermomechanical Deformation

Project Identifier 32112130

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$40027
Cumulative Total Project Cost:	\$542380

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project High-Resolution Imaging of Biological Samples in a Wet Environment

Project Identifier 32112148

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$151003
Cumulative Total Project Cost:	\$441368

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Infrastructure Development for Neutron Scattering for Biomembranes and Biomimetic Membranes

Project Identifier 32112154

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$300539
Cumulative Total Project Cost:	\$599914

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Synthesis and Neutron-Scattering Characterization of Ordered Self-Assembled Polymer Nanostructures and Bio-Membranes

Project Identifier 32112155

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$272671
Cumulative Total Project Cost:	\$530803

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Biomass Ethanol from Clostridium thermocellum: Linking Bioprocessing with Systems Biology for Bioenergy

Project Identifier 32112156

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$401935
Cumulative Total Project Cost:	\$764508

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Model System for Analyzing Whole-Body Toxicity of TICs, TIMs, and Chemical Warfare Agents

Project Identifier 32112157

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$199780
Cumulative Total Project Cost:	\$408824

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Systems Biology of the Mammalian Cilium: A Cellular Organelle Essential for Human Health and Development

Project Identifier 32112158

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$251760
Cumulative Total Project Cost:	\$523088

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Taming Electronic Spins in Conjugated Polymers for Photovoltaic and Solid-State Lighting Applications

Project Identifier 32112159

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$313661
Cumulative Total Project Cost:	\$636229

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Small-Angle Neutron Scattering Investigations and Computational Modeling of Creep Cavitation in Nanoparticle-Strengthened Materials

Project Identifier 32112160

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$289492
Cumulative Total Project Cost:	\$642803

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Accelerated Domestication in Populus: Harnessing the Recently Sequenced Genome for Bioenergy Crop Production

Project Identifier 32112161

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$354866
Cumulative Total Project Cost:	\$727799

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Development of a Global Biogeochemistry Capability for Enhanced Climate Simulation and Earth System Modeling

Project Identifier 32112162

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$172726
Cumulative Total Project Cost:	\$290446

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Terascale Simulation Tools for Next-Generation Nuclear Energy Systems

Project Identifier 32112163

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$480637
Cumulative Total Project Cost:	\$866449

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Novel Carbon Materials for Advanced Energy Storage

Project Identifier 32112164

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$390245
Cumulative Total Project Cost:	\$797917

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Multi-Component Fuel Spray Simulation Tools for Alternative Fuels

Project Identifier 32112165

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$462714
Cumulative Total Project Cost:	\$918308

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Nanocomposite Dielectrics: New Smart Materials for Electric Power Applications and the Advanced Grid

Project Identifier 32112166

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$328533
Cumulative Total Project Cost:	\$644791

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Multiscale Modeling: Application to Hydrogen and Helium in Steel

Project Identifier 32112167

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$270333
Cumulative Total Project Cost:	\$537355

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Exploring Performance Tools for Petascale Systems with Lightweight Compute Node Kernels

Project Identifier 32112168

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$304984
Cumulative Total Project Cost:	\$564892

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Ensuring Dynamic Power Grid Stability: Integrated Electric and Information Grid Modeling

Project Identifier 32112169

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$463767
Cumulative Total Project Cost:	\$883654

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Nanocrystalline/Amorphous Silicon Thin-Film Composite for Stable, High-Efficiency Photovoltaic Application

Project Identifier 32112171

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$270200
Cumulative Total Project Cost:	\$530491

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Large-Scale Exploration of Protein Models for System Biology Applications

Project Identifier 32112172

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$209277
Cumulative Total Project Cost:	\$418182

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Disentangling Soil Respiration Using Genomic Techniques

Project Identifier 32112173

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$250072
Cumulative Total Project Cost:	\$594544

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Detection and Identification of Bacteria and Viruses Including Stealth and Genetically Modified Organisms

Project Identifier 32112174

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$347771
Cumulative Total Project Cost:	\$609083

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Design and Synthesis of Novel Infrared-Active Nanophosphors

Project Identifier 32112175

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$258181
Cumulative Total Project Cost:	\$485077

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Combustion of Nanostructured Metal Fuels: Towards Designing Optimized Combustion Chambers

Project Identifier 32112176

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$88336
Cumulative Total Project Cost:	\$287979

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Time-Resolved Analysis of Microstructure in Advanced Materials Under High Magnetic Fields using Neutrons

Project Identifier 32112177

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$356566
Cumulative Total Project Cost:	\$660435

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Enhanced Cognizance of Evolving Threat Situations via Knowledge Discovery from Disparate Data

Project Identifier 32112178

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$421625
Cumulative Total Project Cost:	\$810986

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Probing the Boundary Between Imaging Microscopy and Spectroscopy: Toward the Exploration of Single Particles by Nuclear Magnetic Resonance Spectroscopy

Project Identifier 32112179

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$258674
Cumulative Total Project Cost:	\$537341

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Photoregulated Peptide-Protein Interaction Systems for Bionanotechnology Applications

Project Identifier 32112180

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$450597
Cumulative Total Project Cost:	\$904732

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Experimental Optimization of Advanced Stellarator Confinement

Project Identifier 32112181

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$238098
Cumulative Total Project Cost:	\$588897

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Analysis of the Role of MicroRNAs: Profiling MicroRNA Expression Across BXD Recombinant Inbred Mouse Strains in Support of the Mouse Collaborative Cross Program

Project Identifier 32112182

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$149757
Cumulative Total Project Cost:	\$473809

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Exploring Reconfigurable Computing Programming Models to Accelerate High-Performance Computing Applications

Project Identifier 32112183

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$363616
Cumulative Total Project Cost:	\$634405

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Theoretical and Computational Methodologies and Tools for Second-Generation Integrated Fusion Simulation

Project Identifier 32112184

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$288732
Cumulative Total Project Cost:	\$464139

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Novel Approaches for Uncovering Total Environmental Gene Expression Patterns

Project Identifier 32112185

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$632198
Cumulative Total Project Cost:	\$864151

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Use of Small Angle Neutron Scattering to Study Complex Systems

Project Identifier 32112186

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$112747
Cumulative Total Project Cost:	\$116400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Predictive Simulation and Virtual Design of High-Speed, High-Density Molecular and Nanoscale Sensors and Devices

Project Identifier 32112187

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$402763
Cumulative Total Project Cost:	\$402763

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Storage Virtualization: An Integrated Approach to Machine-Room Storage Management

Project Identifier 32112188

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$292655
Cumulative Total Project Cost:	\$292655

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Virtualized System Environments for Petascale Computing and Beyond

Project Identifier 32112189

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$425247
Cumulative Total Project Cost:	\$425247

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Petascale Computing in Nanoscience on 100,000+ Cores

Project Identifier 32112190

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$401160
Cumulative Total Project Cost:	\$401160

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Modeling Cellular Mechanisms for Efficient Bioethanol Production through Petascale Comparative Analysis of Biological Networks

Project Identifier 32112191

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$415166
Cumulative Total Project Cost:	\$415166

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project High-Temperature, High-Pressure Studies of Dynamics of Fluids in Nanopores using the Spallation Neutron Source Backscattering Spectrometer

Project Identifier 32112192

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$189989
Cumulative Total Project Cost:	\$189989

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project An Evolutionary Framework for Porting Applications to Petascale Platforms

Project Identifier 32112193

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$302221
Cumulative Total Project Cost:	\$302221

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Robust Polymer Scaffold System for Bio-Inspired Membranes

Project Identifier 32112194

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$249485
Cumulative Total Project Cost:	\$249485

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Apertureless Near-Field Desorption/Ionization Mass Spectrometry for Nanoscale Chemical Imaging at Atmospheric Pressure

Project Identifier 32112195

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$291010
Cumulative Total Project Cost:	\$291010

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Probing Molecular Interaction Between Microbial-Cell Protein and Mineral Surfaces With Neutrons

Project Identifier 32112196

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$274053
Cumulative Total Project Cost:	\$274053

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Systemic Approaches in Recombinant *Zymomonas mobilis* to the Regulation of Ethanol Fermentation

Project Identifier 32112197

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$350022
Cumulative Total Project Cost:	\$350022

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Unraveling the Regulatory and Biosynthetic Genes that Control Cellulose Production in the Model Bioenergy Crop Populus

Project Identifier 32112198

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$265770
Cumulative Total Project Cost:	\$265770

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project High-Throughput Neutron Crystallography for Macromolecular Structure, Function, and Design

Project Identifier 32112199

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$315921
Cumulative Total Project Cost:	\$315921

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Magnetic Structure Under Simultaneous Ultrahigh-Pressure and High-Temperature Conditions: 200 kbar and 1500 K

Project Identifier 32112200

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$214483
Cumulative Total Project Cost:	\$214483

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project NanoPower - Nanocatalytic Direct-Fuel Thermoelectric Generator

Project Identifier 32112201

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$363489
Cumulative Total Project Cost:	\$363489

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Helicon Ion Source for the Spallation Neutron Source Power Upgrade

Project Identifier 32112202

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$231852
Cumulative Total Project Cost:	\$231852

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Waveguide Entangled Photon Sources for Quantum Information

Project Identifier 32112203

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$295850
Cumulative Total Project Cost:	\$295850

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Fundamental Mechanisms of Self-Assembly of Ordered Nanostructures in Heterogeneous Ceramic Materials

Project Identifier 32112204

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$218306
Cumulative Total Project Cost:	\$218306

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Novel Process of Thick Nanocomposite Surfaces for Defense Applications

Project Identifier 32112205

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$293676
Cumulative Total Project Cost:	\$293676

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Imaging Energy Materials in operandi with Atomic Resolution Scanning-Transmission Electron Microscopy

Project Identifier 32112206

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$272141
Cumulative Total Project Cost:	\$272141

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Energy Flow and Conversion on the Molecular Level: A View at Molecular Photoelectromechanical Machines

Project Identifier 32112207

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$272885
Cumulative Total Project Cost:	\$272885

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Three-Dimensional, Aberration-Corrected, Scanning Transmission Electron Microscopy for Studying Microbiological Systems

Project Identifier 32112208

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$124489
Cumulative Total Project Cost:	\$124489

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Advanced Nuclear Fuel Examination and Testing

Project Identifier 32112209

Principal Investigator

Point of Contact Sjoreen, Terrence

Type of Research

Development
POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$297425
Cumulative Total Project Cost:	\$297425

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Cognitive Radio for Transformational Logistics

Project Identifier 32112210

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$293816
Cumulative Total Project Cost:	\$293816

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project A Hybrid Hydrogen Storage-Generation System Based on Bi-Functional Nanostructured Photocatalysts

Project Identifier 32112211

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$300365
Cumulative Total Project Cost:	\$300365

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Modular Utility-Scale Power Converters and Controllers for the Next-Generation Grid

Project Identifier 32112212

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$330571
Cumulative Total Project Cost:	\$330571

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Alternative Feedstocks for the Petrochemical Industry from No-Sulfur-Added Biomass Lignins

Project Identifier 32112213

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$338264
Cumulative Total Project Cost:	\$338264

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Developing a Science Base for Fuel Reprocessing Separations in the Global Nuclear Energy Partnership

Project Identifier 32112214

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$343731
Cumulative Total Project Cost:	\$343731

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Electricity and Biohydrogen Production via a Systems-Level Understanding of Microbial Fuel Cells

Project Identifier 32112215

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$134910
Cumulative Total Project Cost:	\$134910

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Smart Materials Toward a New Paradigm of Super-Efficient Separations Using only Energy Input:
Conformational Switching Based on Magnetic Nanoparticles

Project Identifier 32112216

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$265061
Cumulative Total Project Cost:	\$265061

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Design of Point-Defect Trapping Centers in Nanostructured Nickel for Advanced Nuclear Applications

Project Identifier 32112217

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$261669
Cumulative Total Project Cost:	\$261669

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Nanostructured Surfaces from Drawn Materials

Project Identifier 32112218

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$258173
Cumulative Total Project Cost:	\$258173

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Nanoparticle Phase Change Materials: The Nanoscale Science Basis for Gigajoule Energy Storage

Project Identifier 32112219

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$272480
Cumulative Total Project Cost:	\$272480

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Antiferroelectric Thin-Film Capacitors for Ultrafast High-Power Energy Storage

Project Identifier 32112220

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$263863
Cumulative Total Project Cost:	\$263863

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Nanostructured Thermoelectrics for Power Generation: Smaller is Cooler

Project Identifier 32112221

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$264498
Cumulative Total Project Cost:	\$264498

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Microfluidic Platform for Individual Microbe Capture, Cultivation, and Selective Release

Project Identifier 32112222

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$408237
Cumulative Total Project Cost:	\$408237

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Methodological Development of Computer Simulation in Molecular Biophysics

Project Identifier 32112223

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$96865
Cumulative Total Project Cost:	\$96865

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Development of a Global Advanced Nuclear Fuel Rod Model

Project Identifier 32112224

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$322134
Cumulative Total Project Cost:	\$322134

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Temporal Geolocation

Project Identifier 32112225

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$63895
Cumulative Total Project Cost:	\$63895

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Molecular-Fragment Database for De Novo Structure-Based Design

Project Identifier 32112226

Principal Investigator

Point of Contact Sjoreen, Terrence

Type of Research Applied

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$149903
Cumulative Total Project Cost:	\$149903

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Oak Ridge National Lab

Project Transfer of Vertically-Aligned Carbon Nanotube Arrays for Sensors and Thermal Management

Project Identifier 32112227

Principal Investigator

Type of Research Applied

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$50166
Cumulative Total Project Cost:	\$50166

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Oak Ridge National Lab

Project Structure of Fluids Confined in Nanoporous Materials using Neutron Scattering

Project Identifier 32112228

Principal Investigator

Type of Research Basic

Point of Contact Sjoreen, Terrence

POC Phone 865-574-4174

FY 2007 Project Costs

Total:	\$56702
Cumulative Total Project Cost:	\$56702

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Sonoluminescence Following Acoustically Driven Bubble Collapse

Project Identifier PN03085/1748

Principal Investigator Greenwood, Lawrence

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$90436
Cumulative Total Project Cost:	\$509878

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project A Novel Carbon Dioxide Capture Process Using Organometallic Clathrates

Project Identifier PN05004/1832

Principal Investigator McGrail, Bernard

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$184471
Cumulative Total Project Cost:	\$443061

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Analysis of Protein Function in Living Cells

Project Identifier PN05008/1836

Principal Investigator Stenoién, David

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$255823
Cumulative Total Project Cost:	\$721629

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Biophotolytic Production of Hydrogen from Water

Project Identifier PN05012/1840

Principal Investigator Huesemann, Michael

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$104162
Cumulative Total Project Cost:	\$336567

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Chemical Printing of Complex Electrode Structures

Project Identifier PN05017/1845

Principal Investigator Holbery, James

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$115001
Cumulative Total Project Cost:	\$377175

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Complex Queries

Project Identifier PN05018/1846

Principal Investigator Taylor, Ronald

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$99838
Cumulative Total Project Cost:	\$474629

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Computational Biology and Bioinformatics Tools for Understanding the Role of Membrane Proteins in Diurnal and Circadian Processes of Prokaryotes

Project Identifier PN05019/1847

Principal Investigator Oehmen, Christopher

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$171606
Cumulative Total Project Cost:	\$386561

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Controlled Cultivation, Molecular Biology, and Advanced Imaging of Microbial Biofilms

Project Identifier PN05022/1850

Principal Investigator Mclean, Jeffrey

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$101046
Cumulative Total Project Cost:	\$502273

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Controlled Modification of Surfaces with Peptide Ions

Project Identifier PN05023/1851

Principal Investigator Futrell, Jean

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$65741
Cumulative Total Project Cost:	\$279579

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Crosstalk Between Receptor Signaling Pathways

Project Identifier PN05024/1852

Principal Investigator Resat, Haluk

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$213425
Cumulative Total Project Cost:	\$620712

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Systems Analysis of the Dynamics of Membrane Architecture, Composition, and Function -- Proteomic, Metabolomic, and Metallomic Characterization

Project Identifier PN05025/1853

Principal Investigator Jacobs, Jon

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$351021
Cumulative Total Project Cost:	\$803730

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Cytochrome and Whole Cell Interactions With Iron Oxides

Project Identifier PN05026/1854

Principal Investigator Zachara, John

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$119044
Cumulative Total Project Cost:	\$544293

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Data Assimilation, Visualization, and Mining

Project Identifier PN05027/1855

Principal Investigator Peterson, Elena

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$124597
Cumulative Total Project Cost:	\$339037

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Data Integration and Pattern Recognition

Project Identifier PN05028/1856

Principal Investigator Waters, Katrina

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$218016
Cumulative Total Project Cost:	\$502458

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Detecting Biomarkers in High-Dimensional Data in the Presence of Unobserved Confounding Variables

Project Identifier PN05031/1859

Principal Investigator Willse, Alan

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$54661
Cumulative Total Project Cost:	\$185491

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Discovery of a Biomarker Signature in Response to Nanoparticle Exposure

Project Identifier PN05034/1862

Principal Investigator Waters, Katrina

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$170201
Cumulative Total Project Cost:	\$360550

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Discovery of Novel Volatile Organic Metabolic Signatures for Early Immune Response or Inflammatory Conditions

Project Identifier PN05035/1863

Principal Investigator Wahl, Jon

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$128941
Cumulative Total Project Cost:	\$386699

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Early, Validated Biomarkers of Infectious Diseases in Humans

Project Identifier PN05037/1865

Principal Investigator Straub, Timothy

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$168330
Cumulative Total Project Cost:	\$465329

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Ecophysiological Investigation of Cyanobacteria Using Controlled Cultivation

Project Identifier PN05038/1866

Principal Investigator Scholten, Johannes CM

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$129309
Cumulative Total Project Cost:	\$275432

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Experimental Assessment of the Causes of Spectral Peak Broadening

Project Identifier PN05043/1871

Principal Investigator Seifert, Carolyn

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$94628
Cumulative Total Project Cost:	\$362945

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Fundamental Investigations for Novel Acousto-Optics

Project Identifier PN05045/1873

Principal Investigator Stenkamp, Victoria

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$126271
Cumulative Total Project Cost:	\$349420

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Fundamental Investigations of Heterogeneous Catalysis Using Steady-State Isotopic Transient Kinetic Analysis

Project Identifier PN05046/1874

Principal Investigator Disselkamp, Robert

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$437249
Cumulative Total Project Cost:	\$1044635

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Fundamental Understanding of Catalytic Depolymerization of Cellulose

Project Identifier PN05047/1875

Principal Investigator Zhang, Zongchao

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$232178
Cumulative Total Project Cost:	\$696045

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project High Throughput Screening of Protein Localization

Project Identifier PN05050/1878

Principal Investigator Opresko, Lee

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$345905
Cumulative Total Project Cost:	\$946510

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Low Cost Small-Scale Hydrogen Production from Natural Gas

Project Identifier PN05058/1886

Principal Investigator Wang, Yong

Point of Contact Hughes, Pamela

Type of Research

Development

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$135585
Cumulative Total Project Cost:	\$350903

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Magnetic Resonance Imaging for Understanding Water Management in Proton Exchange Membrane Fuel Cells

Project Identifier PN05060/1888

Principal Investigator Wang, Li-Qiong

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$81070
Cumulative Total Project Cost:	\$313683

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Modeling of Energy Transfer and Associated Variance in Gamma Ray Detector Materials

Project Identifier PN05064/1892

Principal Investigator Gao, Fei

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$271654
Cumulative Total Project Cost:	\$688012

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Molecular Modeling of Cytochromes, Surfaces, and Organisms

Project Identifier PN05067/1895

Principal Investigator Rosso, Kevin

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$87823
Cumulative Total Project Cost:	\$449174

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Morphological, Functional and Redox Studies of Synechocystis 6803 and Cyanothece 51135 Bacterial Membrane Complexes by Methods of Electron Microscopy

Project Identifier PN05068/1896

Principal Investigator Dohnalkova, Alice

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$111601
Cumulative Total Project Cost:	\$238178

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Mutagenesis and Functional Characterization of Shewanella oneidensis Genes Involved in Fe(III) and Mn(IV) Oxide Reduction

Project Identifier PN05071/1899

Principal Investigator Beliaev, Alex

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$92440
Cumulative Total Project Cost:	\$438354

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Non-Invasive Real-Time In Situ Spectroscopic Monitoring of Macrophage-Particulate Matter Interactions to Define Biological Pathways

Project Identifier PN05075/1903

Principal Investigator Sundaram, S Kamakshi

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$175255
Cumulative Total Project Cost:	\$379337

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Particulate Matter Exposure and Respiratory Effects Biosignature Discovery

Project Identifier PN05080/1908

Principal Investigator Teegarden, Justin

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$178606
Cumulative Total Project Cost:	\$452658

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Predictive Proteomics for Biosignature Discovery

Project Identifier PN05083/1911

Principal Investigator Waters, Katrina

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$50564
Cumulative Total Project Cost:	\$204738

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Purification and Biophysical Characterization of MR-1 Redox Proteins

Project Identifier PN05085/1913

Principal Investigator Shi, Liang

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$90656
Cumulative Total Project Cost:	\$528321

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Raising Computational Efficiencies of Massively Parallel Software

Project Identifier PN05087/1915

Principal Investigator De Jong, Wibe

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$163919
Cumulative Total Project Cost:	\$573275

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Rapid Risk Assessment Integration and Feedback Research

Project Identifier PN05088/1916

Principal Investigator Gelston, Gariann

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$50503
Cumulative Total Project Cost:	\$259235

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Rfr-Domain Protein Family Characterization in Cyanothece 51142

Project Identifier PN05091/1919

Principal Investigator Buchko, Garry

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$158614
Cumulative Total Project Cost:	\$389265

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project The Dynamic Changes in the Molecular Interactions Along the Circadian Rhythm

Project Identifier PN05097/1925

Principal Investigator Orr, Galya

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$101227
Cumulative Total Project Cost:	\$230309

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Theoretical Assessment of the Causes of Spectral Peak Broadening

Project Identifier PN05098/1926

Principal Investigator Jordan, David

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$139180
Cumulative Total Project Cost:	\$272886

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Accelerating Information Analytics Using High Performance Computing

Project Identifier PN06001/1930

Principal Investigator Bohn, Shawn

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$152886
Cumulative Total Project Cost:	\$439098

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Explosive Detection Using Terahertz Spectroscopy and Millimeter-Wave Imaging

Project Identifier PN06002A/1931

Principal Investigator Sheen, David

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$102899
Cumulative Total Project Cost:	\$102899

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Molecularly Imprinted Polymer-Based Detection of Explosives

Project Identifier PN06002B/1931

Principal Investigator Harvey, Scott

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$111500
Cumulative Total Project Cost:	\$111500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Differential Spectroscopic Imaging of Trace Particulate Explosives Residue

Project Identifier PN06002C/1931

Principal Investigator Bernacki, Bruce

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$112402
Cumulative Total Project Cost:	\$112402

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Advanced Gasifier Modeling

Project Identifier PN06003/1932

Principal Investigator Korolev, Vladimir

Point of Contact Hughes, Pamela

Type of Research

Development

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$99528
Cumulative Total Project Cost:	\$212936

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Advanced Particle Fuel Element Feasibility Study

Project Identifier PN06004/1933

Principal Investigator Senor, David

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$341937
Cumulative Total Project Cost:	\$684666

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Advanced Ultrasonic Methodology for Enhanced Imaging and Material Property Measurements in Challenging Engineering Materials

Project Identifier PN06005/1934

Principal Investigator Tucker, Brian

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$108174
Cumulative Total Project Cost:	\$287654

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Affinity Reagents Based on Novel Molecular Scaffolds

Project Identifier PN06007/1936

Principal Investigator Baird, Cheryl

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$281399
Cumulative Total Project Cost:	\$549357

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Biomaterials as Sequestering Agents for Radionuclides and Toxic Metals

Project Identifier PN06010/1939

Principal Investigator Levitskaia, Tatiana

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$139631
Cumulative Total Project Cost:	\$259832

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Bringing Water into an Integrated Assessment Framework

Project Identifier PN06011/1940

Principal Investigator Izaurralde, Roberto

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$69966
Cumulative Total Project Cost:	\$158447

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Combinatorial Operando Catalyst Research

Project Identifier PN06014/1943

Principal Investigator Zhang, Zongchao

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$278355
Cumulative Total Project Cost:	\$399689

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Community-Based Biosignatures of Exposure and Functional Response in the Sediment-Water Interface of the Hyporheic Zone and Periphyton Community in River Systems

Project Identifier PN06015/1944

Principal Investigator Bunn, Amoret

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$179406
Cumulative Total Project Cost:	\$435046

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Cooperative Assembly of Active Nanomaterials and Devices

Project Identifier PN06018/1947

Principal Investigator Liu, Jun

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$167926
Cumulative Total Project Cost:	\$275263

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Data Intensive Machine Learning for Real-Time Decision Analysis

Project Identifier PN06019/1948

Principal Investigator Webb-Robertson, Bobbie-Jo

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$159876
Cumulative Total Project Cost:	\$383452

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Development of a Rapid Murine Igg Selection and Production Platform to Generate Reagents for Diagnostic and Detection Assays

Project Identifier PN06022/1951

Principal Investigator Pefaur, Noah

Point of Contact Hughes, Pamela

Type of Research

Development
POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$49578
Cumulative Total Project Cost:	\$173393

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Development of a Scaleable Water Resources Management System

Project Identifier PN06023/1952

Principal Investigator Wigmosta, Mark

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$79511
Cumulative Total Project Cost:	\$268776

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Development of Novel Measurement and Modeling Capabilities for Secondary Organic Aerosols

Project Identifier PN06026/1955

Principal Investigator Zaveri, Rahul

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$101160
Cumulative Total Project Cost:	\$202681

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Dynamics and Spatial Expression of Signal Proteins in the *Desulfovibrio vulgaris* Biofilm and Its Implication to Iron Corrosion

Project Identifier PN06028/1957

Principal Investigator Zhang, Weiwen

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$160891
Cumulative Total Project Cost:	\$347223

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Effects of Soot Aerosol on Snow and Water Resource in the Western United States

Project Identifier PN06029/1958

Principal Investigator Qian, Yun

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$44988
Cumulative Total Project Cost:	\$99861

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Evaluating Multithreaded Architectures for Irregular Data Intensive Applications

Project Identifier PN06032/1961

Principal Investigator Nieplocha, Jaroslaw

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$487584
Cumulative Total Project Cost:	\$736479

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Fuel Chemistry Relationship to Fuel System Wear

Project Identifier PN06033/1962

Principal Investigator Gallant, Thomas

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$74874
Cumulative Total Project Cost:	\$132837

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Functional Genomic Analysis of the Regulation of Bone Cells by a Bioactive Lipid

Project Identifier PN06034/1963

Principal Investigator Karin, Norman

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$340518
Cumulative Total Project Cost:	\$667965

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Functional Nanostructured Taggants

Project Identifier PN06035/1964

Principal Investigator Addleman, Raymond

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$121452
Cumulative Total Project Cost:	\$291666

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Fundamental Investigations of Heterogeneous Catalysis Using Computational Methods

Project Identifier PN06036/1965

Principal Investigator Mei, Donghai

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$299972
Cumulative Total Project Cost:	\$419788

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Hybrid Algorithms for Networked Systems Analysis

Project Identifier PN06040/1969

Principal Investigator Chavarria, Daniel

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$160602
Cumulative Total Project Cost:	\$325201

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Identification of Proteomic Profiles and Biosignatures in Complex Microbial Systems Absent of Genomic Sequence Data

Project Identifier PN06042/1971

Principal Investigator Baker, Scott

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$213249
Cumulative Total Project Cost:	\$308885

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Information Physics Methods and Applications

Project Identifier PN06044/1973

Principal Investigator Oliveira, Joseph

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$488020
Cumulative Total Project Cost:	\$910193

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Integrated Demonstrations of Biological Workflows to Support Threat Detection and Biomarker Discovery

Project Identifier PN06045/1974

Principal Investigator Waters, Katrina

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$218971
Cumulative Total Project Cost:	\$547723

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Interrogation of Glucose Metabolism by Oral Biofilms Using Combined Nuclear Magnetic Resonance/Optical Spectroscopy and Stable Isotope Labeling

Project Identifier PN06047/1976

Principal Investigator Majors, Paul

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$311350
Cumulative Total Project Cost:	\$639020

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Liquid Core Optical Waveguide Detection on a Bioassay Column

Project Identifier PN06049/1978

Principal Investigator Edberg, Heather

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$119512
Cumulative Total Project Cost:	\$263438

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Metabolomics Measurement and Validation Development for Renewable Energy Research

Project Identifier PN06050/1979

Principal Investigator Majors, Paul

Point of Contact Hughes, Pamela

Type of Research

Development

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$144246
Cumulative Total Project Cost:	\$249284

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Multiscale Computational Model of the Heart to Predict Airborne Particulate Matter Cardiovascular Disease

Project Identifier PN06052/1981

Principal Investigator Einstein, Daniel

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$80051
Cumulative Total Project Cost:	\$166527

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Nanoporous Metal Phosphates as Sorbents for Metals and Radionuclides

Project Identifier PN06053/1982

Principal Investigator Wellman, Dawn

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$59839
Cumulative Total Project Cost:	\$104922

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Nanoscale Characterization of Nanomaterial-Cell Membrane Interactions

Project Identifier PN06054/1983

Principal Investigator Orr, Galya

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$147966
Cumulative Total Project Cost:	\$265771

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Nanostructured Catalyst Synthesis and Applications

Project Identifier PN06055/1984

Principal Investigator Liu, Jun

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$433568
Cumulative Total Project Cost:	\$872977

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Nanostructured Heterogeneous Photocatalysts

Project Identifier PN06056/1985

Principal Investigator Fryxell, Glen

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$277601
Cumulative Total Project Cost:	\$534617

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Near Real-time Situation Awareness from Massive Sensor Data

Project Identifier PN06057/1986

Principal Investigator Nelson, Robert

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$216401
Cumulative Total Project Cost:	\$435495

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Ni-Based Molecular Electrocatalysts for Hydrogen Production/Oxidation

Project Identifier PN06058/1987

Principal Investigator DuBois, Daniel

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$105187
Cumulative Total Project Cost:	\$263668

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Power Systems Computational Advancements

Project Identifier PN06062/1991

Principal Investigator Huang, Zhenyu

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$340306
Cumulative Total Project Cost:	\$556643

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Preparation and Characterization of Peptide Arrays Using Soft Landing

Project Identifier PN06063/1992

Principal Investigator Laskin, Julia

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$130650
Cumulative Total Project Cost:	\$242282

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Probabilistic Design and Optimization of Advanced Thermoelectric/Piezoelectric Systems

Project Identifier PN06064/1993

Principal Investigator Hendricks, Terry

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$79047
Cumulative Total Project Cost:	\$192450

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Protein-Protein Interaction Network Prediction

Project Identifier PN06065/1994

Principal Investigator Singhal, Mudita

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$104531
Cumulative Total Project Cost:	\$197549

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Quantitative Characterization of Post-Translational Protein Modifications Using Mass Spectrometry

Project Identifier PN06066/1995

Principal Investigator Qian, Weijun

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$353053
Cumulative Total Project Cost:	\$575975

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Radiological Forensics

Project Identifier PN06067/1996

Principal Investigator Friese, Judah

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$429925
Cumulative Total Project Cost:	\$841429

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Regulation of Cell Surface Ligand Dynamics

Project Identifier PN06068/1997

Principal Investigator Wiley, H Steven

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$398784
Cumulative Total Project Cost:	\$705855

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Response of Radiation Detector Materials to Ions

Project Identifier PN06069/1998

Principal Investigator Zhang, Yanwen

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$126073
Cumulative Total Project Cost:	\$240193

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Secretome Analysis of Nanomaterial Induced Biomarkers

Project Identifier PN06070/1999

Principal Investigator Jacobs, Jon

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$169417
Cumulative Total Project Cost:	\$287645

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Selective Heterogeneous Catalysts

Project Identifier PN06071/2000

Principal Investigator Bays, John

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$123404
Cumulative Total Project Cost:	\$228835

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Sensor Platforms for Biomarkers of Response to Biological Agents - Immuno-PCR Bead Assays for Detecting Early Biomarkers

Project Identifier PN06072/2001

Principal Investigator Varnum, Susan

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$72703
Cumulative Total Project Cost:	\$130913

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Sensor Platforms for Biomarkers of Response to Biological Agents - Nanoparticle Immunoassays for Detecting Protein Biomarkers

Project Identifier PN06073/2002

Principal Investigator Lin, Yuehe

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$76953
Cumulative Total Project Cost:	\$149571

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Signal Analysis for Nuclear Resonance Fluorescence

Project Identifier PN06074/2003

Principal Investigator Warren, Glen

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$71647
Cumulative Total Project Cost:	\$127417

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Single Enzyme Nanoparticles for Biofuel Cells

Project Identifier PN06077/2006

Principal Investigator Kim, Jungbae

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$93440
Cumulative Total Project Cost:	\$201675

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Synthesis and Characterization of Thin Films for Rapidly Screening Detector Materials

Project Identifier PN06078/2007

Principal Investigator Olsen, Larry

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$317435
Cumulative Total Project Cost:	\$610281

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project The Tree-of-Life Chip for Examination of Ecosystem Structure and Function

Project Identifier PN06080/2009

Principal Investigator Magnuson, Jon

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$169141
Cumulative Total Project Cost:	\$239558

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Using Subtractive Hybridization to Identify Biosignatures of Perturbed Microbial Communities

Project Identifier PN06083/2012

Principal Investigator Bailey, Vanessa

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$113320
Cumulative Total Project Cost:	\$176338

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Validation of Biomarkers that Transcend Individual Genetic Polymorphisms: Application to Radio-Protectant Therapies

Project Identifier PN06084/2013

Principal Investigator Murphy, Mark

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$50139
Cumulative Total Project Cost:	\$127474

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Visualizing Heterogeneous Data for Improved Network Security

Project Identifier PN06085/2014

Principal Investigator Hadley, Mark

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$149500
Cumulative Total Project Cost:	\$242600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project A Data Virtualization Architecture

Project Identifier PN07001/2015

Principal Investigator Stephan, Eric

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$273897
Cumulative Total Project Cost:	\$273897

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project A Geometric Framework for Multimodal Analysis of Cardiac Tissue Using Magnetic Resonance Imaging, Histopathology, and Proteomics for the Identification of Biomarkers

Project Identifier PN07002/2016

Principal Investigator Carson, James

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$50001
Cumulative Total Project Cost:	\$50001

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project A Multidisciplinary Approach to Engineer Xylose and Arabinose Utilization for Ethanol Production by *Saccharomyces cerevisiae*

Project Identifier PN07003/2017

Principal Investigator Baker, Scott

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$98949
Cumulative Total Project Cost:	\$98949

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Accelerated Fuel-Cladding Test Methods and Tools

Project Identifier PN07004/2018

Principal Investigator Henager, Charles

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$158829
Cumulative Total Project Cost:	\$158829

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Adaptive Composite Analysis for Complex Systems

Project Identifier PN07005/2019

Principal Investigator Posse, Christian

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$224131
Cumulative Total Project Cost:	\$224131

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Adaptive Network Traffic Analysis on Advanced Multi-Core Processors

Project Identifier PN07006/2020

Principal Investigator Petrini, Fabrizio

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$88422
Cumulative Total Project Cost:	\$88422

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Adaptive Workflow in Data Intensive Environments

Project Identifier PN07007/2021

Principal Investigator Chappell, Alan

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$244852
Cumulative Total Project Cost:	\$244852

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Advanced Gas Separations Based on Highly Efficient Microchannel Component Technology

Project Identifier PN07008/2022

Principal Investigator Hayes, James

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$116514
Cumulative Total Project Cost:	\$116514

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project An Innovative Risk-Based Methodology for Assessing Security Risks of Emerging Technologies:
Application to Synthetic Biology Proliferation

Project Identifier PN07009/2023

Principal Investigator Unwin, Stephen

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$45887
Cumulative Total Project Cost:	\$45887

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Analysis of Functional Diversity in Microbial Communities for Organic Carbon Transformations

Project Identifier PN07010/2024

Principal Investigator Konopka, Allan

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$154715
Cumulative Total Project Cost:	\$154715

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Aqueous Extraction of Actinides from Spent Nuclear Fuel for Transmutation

Project Identifier PN07011/2025

Principal Investigator Arm, Stuart

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$75154
Cumulative Total Project Cost:	\$75154

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Barrier Coatings for Thin Film Solar Cells

Project Identifier PN07012/2026

Principal Investigator Olsen, Larry

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$74904
Cumulative Total Project Cost:	\$74904

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Benchmark Modeling of the Microphysical Aspects of Cloud-Aerosol Interactions

Project Identifier PN07013/2027

Principal Investigator Ovtchinnikov, Mikhail

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$60082
Cumulative Total Project Cost:	\$60082

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Biosignature Discovery in Respiratory Exposure to Model Biological Agent Systems Using H-NMR

Project Identifier PN07014/2028

Principal Investigator Hu, Jian Zhi

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$131075
Cumulative Total Project Cost:	\$131075

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Biosignature Integration for Inference of Biomarkers from Complex Systems

Project Identifier PN07015/2029

Principal Investigator Webb-Robertson, Bobbie-Jo

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$130726
Cumulative Total Project Cost:	\$130726

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Carbon Nanotube Materials for Preconcentration

Project Identifier PN07016/2030

Principal Investigator Grate, Jay

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$113966
Cumulative Total Project Cost:	\$113966

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Catalytic Chemistry of the Weak Links in Lignins and Lingintes

Project Identifier PN07017/2031

Principal Investigator Zhang, Zongchao

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$96355
Cumulative Total Project Cost:	\$96355

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Cationic Ionic Hydrogenations: Developing Concepts and New Catalytic Processes that Substitute Inexpensive Metals for Precious Metals

Project Identifier PN07018/2032

Principal Investigator Bullock, Ronald

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$260216
Cumulative Total Project Cost:	\$260216

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Characterization of the Local Order of Organic Thin Film Material by Combined Atomic Force Microscopy and Optical Microscopy

Project Identifier PN07019/2033

Principal Investigator Hu, Dehong

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$90163
Cumulative Total Project Cost:	\$90163

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Cloud Resolving Model with Size Resolved Microphysics for Aerosol and Cloud Research

Project Identifier PN07020/2034

Principal Investigator Comstock, Jennifer

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$115809
Cumulative Total Project Cost:	\$115809

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Complex Adaptive Agent Resilient Cores

Project Identifier PN07021/2035

Principal Investigator Woodworth, Bradley

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$109963
Cumulative Total Project Cost:	\$109963

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Complex Adaptive Sensor Systems

Project Identifier PN07022/2036

Principal Investigator Peterson, Mary

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$208245
Cumulative Total Project Cost:	\$208245

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Counter-Current Solvent Extraction Behavior of Neptunium

Project Identifier PN07023/2037

Principal Investigator Arm, Stuart

Point of Contact Hughes, Pamela

Type of Research

Development

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$122158
Cumulative Total Project Cost:	\$122158

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Data Network and Policy Modeling: A Methodology for Modeling and Application of Network Policy

Project Identifier PN07024/2038

Principal Investigator Goranson, Craig

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$106051
Cumulative Total Project Cost:	\$106051

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Deep Desulphurization of Hot-Coal Gas for Production of Liquid Fuels

Project Identifier PN07025/2039

Principal Investigator Li, Liyu

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$125004
Cumulative Total Project Cost:	\$125004

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Design, Synthesis and Testing of Novel High Temperature Sorbents for Removing Mercury Species from Coal to Liquids Process Streams

Project Identifier PN07026/2040

Principal Investigator Fryxell, Glen

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$239691
Cumulative Total Project Cost:	\$239691

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Develop an Expert Elicitation Process for Use in Evaluation of Proliferation Resistance of Nuclear Energy Systems

Project Identifier PN07027/2041

Principal Investigator Zentner, Michael

Point of Contact Hughes, Pamela

Type of Research

Development

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$36411
Cumulative Total Project Cost:	\$36411

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Developing a Knowledge-Centric "Simulation Backplane" for Multi-Physics Simulation with Nuclear Energy Applications

Project Identifier PN07028/2042

Principal Investigator Butner, Robert

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$93592
Cumulative Total Project Cost:	\$93592

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Development and Evaluation of a Benchmark Aerosol Chemistry, Dynamics, and Microphysics Model

Project Identifier PN07029/2043

Principal Investigator Zaveri, Rahul

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$96520
Cumulative Total Project Cost:	\$96520

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Development of a Novel Cross-Linking Reagent for High-Throughput Global Analysis of Protein Interactions

Project Identifier PN07030/2044

Principal Investigator Adkins, Joshua

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$62491
Cumulative Total Project Cost:	\$62491

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Development of a UF6 Cylinder Integrated Portal Monitoring Capability

Project Identifier PN07031/2045

Principal Investigator Pitts, William

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$34377
Cumulative Total Project Cost:	\$34377

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Development of Petascale Algorithms for Molecular Modeling

Project Identifier PN07032/2046

Principal Investigator Bylaska, Eric

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$296098
Cumulative Total Project Cost:	\$296098

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Direct Coal Liquefaction

Project Identifier PN07033/2047

Principal Investigator Linehan, John

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$149692
Cumulative Total Project Cost:	\$149692

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Efficient and Practical Simulation of Transport and Dispersion of Contaminants from Within the Marine Environment

Project Identifier PN07034/2048

Principal Investigator Khangaonkar, Tarang

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$69702
Cumulative Total Project Cost:	\$69702

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Electrochemical Separations for Enhanced Safeguards Analysis

Project Identifier PN07035/2049

Principal Investigator Duckworth, Douglas

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$71432
Cumulative Total Project Cost:	\$71432

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Enhanced Detection of Peroxide Based Explosives

Project Identifier PN07036/2050

Principal Investigator Atkinson, David

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$119896
Cumulative Total Project Cost:	\$119896

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Enhanced Explosive Signature Capture via Selective Collection and Preconcentration Chemistries

Project Identifier PN07037/2051

Principal Investigator Addleman, Raymond

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$75017
Cumulative Total Project Cost:	\$75017

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Enhanced Isotope Ratio Measurement Capability

Project Identifier PN07038/2052

Principal Investigator Kreuzer, Helen

Point of Contact Hughes, Pamela

Type of Research

Development
POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$138797
Cumulative Total Project Cost:	\$138797

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Fate and Transport of Titanium Dioxide Through Freshwater Ecosystems

Project Identifier PN07039/2053

Principal Investigator Miracle, Ann

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$59749
Cumulative Total Project Cost:	\$59749

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Field-Deployable Nanoparticle Biosensor

Project Identifier PN07040/2054

Principal Investigator Schultz, Irvin

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$98847
Cumulative Total Project Cost:	\$98847

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Forming Prediction of Lightweight Alloys Using an Inverse Approach

Project Identifier PN07041/2055

Principal Investigator Nguyen, Ba Nghiep

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$49974
Cumulative Total Project Cost:	\$49974

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Genetically Engineered Yeast for the Direct Production of Ethanol from Cellulosic Materials

Project Identifier PN07042/2056

Principal Investigator Miller, Keith

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$105047
Cumulative Total Project Cost:	\$105047

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Human Factors for Situational Awareness in Power Grid Operations

Project Identifier PN07043/2057

Principal Investigator Guttromson, Ross

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$119849
Cumulative Total Project Cost:	\$119849

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Image Processing Methods Applied to the Detection of Highly Concealed Explosives

Project Identifier PN07044/2058

Principal Investigator Trease, Harold

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$94041
Cumulative Total Project Cost:	\$94041

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Improved Selectivity for Explosives Detection by Ion Mobility Spectrometry

Project Identifier PN07045/2059

Principal Investigator Ewing, Robert

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$177812
Cumulative Total Project Cost:	\$177812

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Information-Driven Discovery of Radiation Detection Materials

Project Identifier PN07046/2060

Principal Investigator Ferris, Kim

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$254510
Cumulative Total Project Cost:	\$254510

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Integrated Assessment of the Origins of Scintillator Nonlinearity

Project Identifier PN07047/2061

Principal Investigator Cannon, Bret

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$94425
Cumulative Total Project Cost:	\$94425

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Liquid Carbon Dioxide Coal Slurry Research

Project Identifier PN07048/2062

Principal Investigator Robertus, Robert

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$98925
Cumulative Total Project Cost:	\$98925

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Liquid Fuel Synthesis Modeling

Project Identifier PN07049/2063

Principal Investigator Rector, David

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$99959
Cumulative Total Project Cost:	\$99959

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Mathematical/Computational Modeling of Biofilms

Project Identifier PN07050/2064

Principal Investigator Kuprat, Andrew

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$30041
Cumulative Total Project Cost:	\$30041

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Measurement and Modeling of Slag Critical Viscosity, Optimization of Slag Chemistry, and Refractory Degradation in Coal Gasifiers

Project Identifier PN07051/2065

Principal Investigator Sundaram, S Kamakshi

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$327561
Cumulative Total Project Cost:	\$327561

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project MeDICI - Middleware for Data Intensive Computing

Project Identifier PN07052/2066

Principal Investigator Gorton, Ian

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$326726
Cumulative Total Project Cost:	\$326726

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Micro-Scale Two-Phase Flow Simulation to Support Carbon Sequestration by Injection Into Deep Aquifers

Project Identifier PN07053/2067

Principal Investigator Stewart, Mark

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$70076
Cumulative Total Project Cost:	\$70076

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Modeling Nonlinearity in Inorganic Scintillators and Semiconductors

Project Identifier PN07054/2068

Principal Investigator Rosso, Kevin

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$206929
Cumulative Total Project Cost:	\$206929

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Multiscale Computational Continuum Physics Solver

Project Identifier PN07055/2069

Principal Investigator Richmond, Marshall

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$99955
Cumulative Total Project Cost:	\$99955

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Nanoporous Metal Phosphates as Alternative Cathode Materials for Batteries

Project Identifier PN07056/2070

Principal Investigator Wellman, Dawn

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$89975
Cumulative Total Project Cost:	\$89975

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project New High Performance Thin Film Thermoelectric Devices for Energy Conversion

Project Identifier PN07057/2071

Principal Investigator Zhou, Xiao-Dong

Point of Contact Hughes, Pamela

Type of Research

Development
POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$49673
Cumulative Total Project Cost:	\$49673

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Novel Emitter Materials for Organic Thin Film Electroluminescence

Project Identifier PN07058/2072

Principal Investigator Padmaperuma, Asanga

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$74963
Cumulative Total Project Cost:	\$74963

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Phase Contrast X-Ray Imaging For Enhanced Explosives Detection

Project Identifier PN07059/2073

Principal Investigator Miller, Erin

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$112760
Cumulative Total Project Cost:	\$112760

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Predictive Adaptive Classification Model for Analysis and Notification: Internal Threat

Project Identifier PN07060/2074

Principal Investigator Greitzer, Frank

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$124937
Cumulative Total Project Cost:	\$124937

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Protein and Peptide Markers of Infection

Project Identifier PN07061/2075

Principal Investigator Wunschel, David

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$136907
Cumulative Total Project Cost:	\$136907

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Reagent Selection Methodology for a Novel Explosives Detection Immunoassay Approach

Project Identifier PN07062/2076

Principal Investigator Warner, Marvin

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$113922
Cumulative Total Project Cost:	\$113922

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Real-Time In Situ Millimeter Wave Sensors for Gasifiers

Project Identifier PN07063/2077

Principal Investigator Sundaram, S Kamakshi

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$195769
Cumulative Total Project Cost:	\$195769

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Sensitive and Specific Detection of Explosives Using a Multiplexed Two-Dimensional Field Asymmetric Waveform Ion Mobility Spectrometry (FAIMS)/Ion Mobility Spectrometry System

Project Identifier PN07064/2078

Principal Investigator Shvartsburg, Alexandre

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$91021
Cumulative Total Project Cost:	\$91021

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Sensitive Detection of Biological Stress Response

Project Identifier PN07065/2079

Principal Investigator Bigelow, Diana

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$85472
Cumulative Total Project Cost:	\$85472

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Soil Desiccation for Deep Vadose Zone Remediation

Project Identifier PN07066/2080

Principal Investigator Oostrom, Martinus

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$51901
Cumulative Total Project Cost:	\$51901

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Tactical Deployment and Management of Adaptive Agents

Project Identifier PN07067/2081

Principal Investigator Fink, Glenn

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$94996
Cumulative Total Project Cost:	\$94996

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Tailoring of Fischer-Tropsch Synthesis Product Distribution Using Monolith Catalysts

Project Identifier PN07068/2082

Principal Investigator Wang, Yong

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$120622
Cumulative Total Project Cost:	\$120622

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Pacific Northwest National Lab

Project Textual Signatures for Predictive Analytics

Project Identifier PN07069/2083

Principal Investigator Gregory, Michelle

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$62402
Cumulative Total Project Cost:	\$62402

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project The Aerosol Modeling Testbed

Project Identifier PN07070/2084

Principal Investigator Fast, Jerome

Point of Contact Hughes, Pamela

Type of Research Basic

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$190149
Cumulative Total Project Cost:	\$190149

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Ultrapure Organic Materials for Thin Film Energy Conversion

Project Identifier PN07071/2085

Principal Investigator Sapochak, Linda

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$100033
Cumulative Total Project Cost:	\$100033

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Ultratrace Uranium Isotopic Analysis without a Mass Spectrometer

Project Identifier PN07072/2086

Principal Investigator Ziegler, Summer

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$113777
Cumulative Total Project Cost:	\$113777

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Understanding Adaptation to Sudden Climate Change Impacts

Project Identifier PN07073/2087

Principal Investigator Janetos, Anthony

Type of Research Basic

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$69680
Cumulative Total Project Cost:	\$69680

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Using Ionic Liquids to Enable Catalytic Transformations

Project Identifier PN07074/2088

Principal Investigator Zhang, Zongchao

Point of Contact Hughes, Pamela

Type of Research Applied

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$60875
Cumulative Total Project Cost:	\$60875

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Pacific Northwest National Lab

Project Waste Form Development for Global Nuclear Energy Process Streams

Project Identifier PN07075/2089

Principal Investigator Vienna, John

Type of Research Applied

Point of Contact Hughes, Pamela

POC Phone 509-375-2619

FY 2007 Project Costs

Total:	\$69949
Cumulative Total Project Cost:	\$69949

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Pantex Plant

Project Formation and Detection of Pores in Polymeric Materials

Project Identifier PX03004

Principal Investigator Russell, Bobby

Type of Research Applied

Point of Contact Faubion, Bill

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$28078
Cumulative Total Project Cost:	\$852040

Description of Project

All weapon systems contain some polymers, and therefore all have the potential to form pores. In particular, polysiloxanes have a greater propensity to form pores than other polymeric systems. It is thought that this is primarily related to the processing methods in the formulation of the material. This proposed work will examine the size, distribution, and volume of pores formed by various polymer-processing methods. These pore parameters will be evaluated by x-ray CT and the best processing technique will be recommended for implementation into weapon assembly.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Neutron Non-Destructive Imaging of Weapons Materials

Project Identifier PX03008

Principal Investigator Moddeman, Bill

Type of Research Applied

Point of Contact Faubion, Bill

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$15192
Cumulative Total Project Cost:	\$912378

Description of Project

This work will use surrogate phantoms provided by Pantex, to demonstrate the fundamental technology for non-destructive imaging and inspection using neutrons to image materials and material combinations of interest to Pantex.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Pantex Plant

Project Characterization of Corrosion Mechanisms

Project Identifier PX04003

Principal Investigator Moddeman, Bill

Type of Research Applied

Point of Contact Faubion, Bill

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$4538
Cumulative Total Project Cost:	\$447742

Description of Project

This project will use existing gas composition data and data obtained on various weapon-related materials. The data and other pertinent information and properties related to the proposed STS limits within the weapon system will then be fitted to a chemical interaction and fluid flow model. For example, it is anticipated that the gas analysis will give us insights as to the integrity of the environment within the sealed part of the weapon and therefore offer some insight into the potential for oxidation or corrosion of the component piece parts or degradation of polymers.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Advanced Radiation Alarm Monitoring System (ARAMS)

Project Identifier PX04005

Principal Investigator Laurent, Shane

Type of Research Applied

Point of Contact Faubion, Bill

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$17215
Cumulative Total Project Cost:	\$179626

Description of Project

The objective of this project is to design and develop a state of the art Radiation Alarm Monitoring System (RAMS). The new monitoring system will be microprocessor based and be able to detect a contamination release faster. The entire alarm system will be networked together and tied to a main computer at the Operations Center. By having two different brands of microprocessors in the system each would use a different coding language. So if one microprocessor failed or had a bug the other would still continue to function and send out an alarm that the other had failed.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Supercritical Fluid Extraction of DMF from HNS

Project Identifier PX04029

Principal Investigator Quinlin, Tim

Type of Research Applied

Point of Contact Faubion, Billy D.

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$18625
Cumulative Total Project Cost:	\$65137

Description of Project

The objective of this work is to remove the unwanted residual DMF from fine particle HNS without a major loss in surface area of the HNS. This work would be done in conjunction with the Naval Surface Warfare Center at Indian Head who has the Super Critical Fluid Extraction equipment and experience to operate it. Pantex would do the product evaluation.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Development of A Method to Melt/Disfigure (Sanitize) Weapon Components Using Microwave Technology

Project Identifier PX05001

Principal Investigator Hoopes, Chris

Type of Research Applied

Point of Contact Faubion, Billy

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$317193
Cumulative Total Project Cost:	\$935829

Description of Project

Demonstrate the feasibility of using microwave technology to effectively melt/disfigure (sanitize) scrap unclassified weapon components containing various types of materials. If feasible, develop a design for a self-contained, mobile microwave unit that can sanitize classified, complex weapon components, reclaim precious metal plated on components, remove radioactive contamination or materials from components, and reuse certain materials for new weapon components.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Measurement of Physical Constants for Various Crystalline High Explosives

Project Identifier PX05006

Principal Investigator Quinlin, Tim

Type of Research Applied

Point of Contact Faubion, Billy D.

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$91597
Cumulative Total Project Cost:	\$165162

Description of Project

This project will develop measurement techniques to determine physical constants of crystalline high explosives such as solubility, enthalpy of solution, growth rate and nucleation rate constants. The study will primarily deal with HNS and HMX due to their importance in Pantex Plant's high explosives mission

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Pantex Plant

Project Explosive Component Electrostatic Discharge Response Model

Project Identifier PX06004

Principal Investigator Combs, Bret

Point of Contact Faubion, Billy

Type of Research

Development
POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$139251
Cumulative Total Project Cost:	\$139251

Description of Project

This project will expand the existing limited capability to perform electrostatic discharge testing of explosive materials and components. To validate the current controls a much better understanding of the ignition mechanism, DDT region and limiting factors of different explosive component designs is needed. This can then be used to establish probabilistic models for determining realistic threat levels and identifying vulnerable components that will provide a solid basis for future control implementation in explosive component operations.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Spectroscopic and Infrared Imaging Studies of Pressing Effects on Explosives

Project Identifier PX06005

Principal Investigator Holy, John

Type of Research Applied

Point of Contact Faubion, Billy D

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$118429
Cumulative Total Project Cost:	\$198790

Description of Project

The Raman spectra of different explosives, such as HMX, PBX 9501, PETN, and HNS will be measured while they are being pressed into pellets. Comparisons of the spectra will be used to characterize the explosives in the pressed state. An infrared camera used with a pulsed heat source or ultrasonic excitation will be used to record infrared movies of explosives or mock at different densities. This project will assess the feasibility of using the infrared camera as a non-contact method of determining densities and thermal properties and non-destructively evaluate defect detection. Some effort on spectral interpretation and computer modeling will be required to gain maximum information from the data.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Evaluation of Non-Equipotential Floors

Project Identifier PX06006

Principal Investigator Koone, Neil

Type of Research Applied

Point of Contact Faubion, Billy D.

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$14869
Cumulative Total Project Cost:	\$70344

Description of Project

This task will evaluate effects of non-equipotential flooring in Pantex Plant bays and cells. The Pantex Plant Authorization Basis assumes that walls, ceiling, and their appurtenances are at the maximum postulated voltage calculated for the facility and that the floor is at ground (zero potential). Questions have arisen about the effects of non-equipotential floors for conventional concrete floors as well as static dissipative floors used to reduce the severity of electrostatic discharge. Pantex Plant bay/cell floors will be modeled for facilities struck by lightning using FEMLAB and other analytical approaches. High voltage laboratory tests will be designed, performed, and test results compared to model results. The model may be refined and validated based on laboratory testing.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Pantex Plant

Project Desktop Virtual Reality Training System

Project Identifier PX06007

Principal Investigator Thompson, Judy

Type of Research Applied

Point of Contact Faubion, Billy D

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$42233
Cumulative Total Project Cost:	\$144770

Description of Project

This project will develop a pilot virtual training system to allow a person to perform a radiation safety operation. This will be accomplished by developing a desktop, science-based virtual reality training module. The system will allow a technician to be immersed within the training system and obtain a full 3D interaction with the process. Radiological Worker training is proposed because this training affects over 2000 Pantex Plant employees per year. The environment will track the worker's ability to follow radiological controls, follow ALARA guidance, and will calculate the dose and contamination levels from the operation.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Mechanical Impact Sensitivity of Uncased HE on Actual Work Area Floor Covering

Project Identifier PX06010

Principal Investigator Vickers, Lisa

Type of Research Applied

Point of Contact Faubion, Billy D.

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$160738
Cumulative Total Project Cost:	\$292321

Description of Project

This project will provide more accurate 50% drop height data for uncased high explosives that are currently being handled and processed at Pantex Plant applicable to actual work area seamless epoxy floor covering. Safety controls designed to prevent/mitigate a high consequence event that directly affects personnel facilities, the public and the environment will be reviewed. The data will be used to establish the lowest drop height with HE reaction on work area floor covering in HE facilities and bays/cells at Pantex Plant.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Precision Control of Agglomeration and Coating of Explosive Powders

Project Identifier PX06011

Principal Investigator Cates, Monty

Type of Research Applied

Point of Contact Faubion, Billy D

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$33724
Cumulative Total Project Cost:	\$75094

Description of Project

This project will develop a new method of manufacturing Plastic Bonded Explosives (PBX) by using precision control of agglomeration and coating of explosives powders based on processes currently used in the pharmaceutical industry. By using a high velocity air stream to pneumatically convey the explosive powders and droplets of lacquer, the explosive powders will be efficiently wetted and agglomerate drying will begin almost immediately. The intended result is a PBX with a high bulk density suitable for pressing.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Pantex Plant

Project High Explosives Operations Safety Controls Validation

Project Identifier PX07001

Principal Investigator Patterson, Ed

Point of Contact Faubion, Billy

Type of Research

Development

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$442289
Cumulative Total Project Cost:	\$442289

Description of Project

This project will implement the capability to provide science-based validation of controls protecting against various high explosive events in production areas through empirical and experimental methods. Additionally, the project will establish probabilistic models for determining the impact of HE events.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Pantex Plant

Project Lightning and Power Distribution System Fault Modeling

Project Identifier PX07003

Principal Investigator Rodriguez, Juan

Point of Contact Faubion, Billy

Type of Research

Development

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$68121
Cumulative Total Project Cost:	\$68121

Description of Project

This project will provide Pantex the science-based technology to qualify safety for the plant and for manufacturing based operations in the nuclear explosive (NE) facilities. The project entails analysis and detailed modeling of lightning, electrical transients, and power losses at Pantex and in nuclear explosive (NE) facilities. A combination of training and commercial industrial software for an electrical power system will bring into realization the paradigm of detailed modeling of lightning and electrical transients at Pantex.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Pantex Plant

Project Reactions of Hydrofluoroethers

Project Identifier PX07007

Principal Investigator Birkbeck, Jan

Point of Contact Faubion, Billy

Type of Research

Development
POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$91422
Cumulative Total Project Cost:	\$91422

Description of Project

This project will study the reactions of hydrofluoroethers with water where the hydrofluoroether contains various concentrations of isopropyl alcohol. Kinetic and thermodynamic data will be generated at different temperatures. The reaction mechanism will then be established and the data will be fitted to a model such that the maximum amount of reaction products caused by hydrolysis can be determined.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Pantex Plant

Project Seismic Qualification Analytical Solutions

Project Identifier PX07009

Principal Investigator Tidds, Gregg

Point of Contact Faubion, Billy

Type of Research

Development

POC Phone 806-477-3514

FY 2007 Project Costs

Total:	\$14163
Cumulative Total Project Cost:	\$14163

Description of Project

This project will attempt to analyze 3-D models of complex facilities for dynamic and frequency response to seismically qualify the facilities.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Princeton Plasma Physics Lab

Project FRC Sustainment and Stability Studies Utilizing an Ohmic Solenoid

Project Identifier PPPL-001

Principal Investigator Yamada, Masaaki

Type of Research Basic

Point of Contact Iseicz, Marie

POC Phone 609-243-2456

FY 2007 Project Costs

Total:	\$114412
Cumulative Total Project Cost:	\$114412

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Princeton Plasma Physics Lab

Project Ultrasonic/Infrared Navigation System for Micro Aviation

Project Identifier PPPL-002

Principal Investigator Meixler, Lewis

Point of Contact Iseicz, Marie

Type of Research Applied

POC Phone 609-243-3456

FY 2007 Project Costs

Total:	\$32151
Cumulative Total Project Cost:	\$32151

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Princeton Plasma Physics Lab

Project Theory and Simulations of Auroral Phenomena

Project Identifier PPPL-003

Principal Investigator Johnson, Jay

Point of Contact Iseicz, Marie

Type of Research Basic

POC Phone 609-243-2456

FY 2007 Project Costs

Total:	\$72728
Cumulative Total Project Cost:	\$72728

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Princeton Plasma Physics Lab

Project Laboratory Study of Magnetorotational Instability in Plasma by Helicon Waves and Electron Cyclotron Resonance

Project Identifier PPPL-004

Principal Investigator Ji, Hantao

Type of Research Basic

Point of Contact Iseicz, Marie

POC Phone 609-243-2456

FY 2007 Project Costs

Total:	\$125877
Cumulative Total Project Cost:	\$125877

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Princeton Plasma Physics Lab

Project A High Power Density Electron Beam Facility

Project Identifier PPPL-005

Principal Investigator Majeski, Richard

Point of Contact Iseicz, Marie

Type of Research Basic

POC Phone 609-243-3532

FY 2007 Project Costs

Total:	\$244006
Cumulative Total Project Cost:	\$244006

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Princeton Plasma Physics Lab

Project Exploratory Engineering Assessment of a National High-power advanced Tours Experiment (NHTX)

Project Identifier PPPL-006

Principal Investigator Neumeyer, Charles

Point of Contact Iseicz, Marie

Type of Research

Development
POC Phone 609-243-2456

FY 2007 Project Costs

Total:	\$214842
Cumulative Total Project Cost:	\$214842

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Princeton Plasma Physics Lab

Project Plasma Cathode with Secondary Emission

Project Identifier PPPL-007

Principal Investigator Fisch, Nathaniel

Type of Research Basic

Point of Contact Iseicz, Marie

POC Phone 609-243-2456

FY 2007 Project Costs

Total:	\$66357
Cumulative Total Project Cost:	\$66357

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Accommodating Complexity and Human Behaviors in Decision Analysis

Project Identifier 100337

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$101139
Cumulative Total Project Cost:	\$101139

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Back-End Verification of SOC Devices

Project Identifier 100738

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$400199
Cumulative Total Project Cost:	\$400199

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanoengineering for Solid State Lighting

Project Identifier 102600

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$614624
Cumulative Total Project Cost:	\$614624

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Miniature Vibrational Energy Harvester: Improved Modeling and Simulation Through Experimental Validation

Project Identifier 102602

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$312138
Cumulative Total Project Cost:	\$312138

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Understanding the Materials Physics for an Alternative for PZT 95/5

Project Identifier 102608

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$128180
Cumulative Total Project Cost:	\$128180

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Optical Microswitching Foundations

Project Identifier 102609

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$676146
Cumulative Total Project Cost:	\$676146

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Phase Imprint Lithography for Large Area 3D Nanostructures

Project Identifier 102613

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$504774
Cumulative Total Project Cost:	\$504774

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Mid-Infrared Quantum Dot Emitters Utilizing Planar Photonic Crystal Technology

Project Identifier 102615

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$223843
Cumulative Total Project Cost:	\$223843

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project "Bottom-up" Meets "Top-down:" Self-assembly to Direct Manipulation of Nanostructures on Length Scales from Atoms to Microns

Project Identifier 102660

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$488060
Cumulative Total Project Cost:	\$488060

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Creation of Water-Treatment Membrane Technologies with Reduced Biofouling

Project Identifier 102737

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$603162
Cumulative Total Project Cost:	\$603162

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Modeling and Simulation of Spectra Expected from Radiation Sensors Made from Arrays of MEMS Scale Capillaries

Project Identifier 103004

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$90520
Cumulative Total Project Cost:	\$90520

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Ultrafast NanoLaser Device for Detecting Cancer in a Single Live Cell

Project Identifier 103005

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$180910
Cumulative Total Project Cost:	\$180910

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Very-high Repetition Rate High-Power Microwave Source Development

Project Identifier 104480

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$31636
Cumulative Total Project Cost:	\$31636

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Hollow and Other Infrared Waveguides for Instrumentation in Intense Radiation Environments

Project Identifier 104949

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$49992
Cumulative Total Project Cost:	\$49992

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanoporous Films for Epitaxial Growth of Single Crystal Semiconductor Materials

Project Identifier 104953

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$146092
Cumulative Total Project Cost:	\$146092

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A MEMS-based Thermoacoustic Engine

Project Identifier 104955

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$120045
Cumulative Total Project Cost:	\$120045

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of Sample Preparation Methods for CHIPMA-based Imaging Mass Spectrometry of Tissue Samples

Project Identifier 104973

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$15510
Cumulative Total Project Cost:	\$15510

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Pareto Optimization Techniques

Project Identifier 105185

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project An Examination into the Chemical Properties of Supercritical Water

Project Identifier 105187

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Data Collecting, Analysis, and Modeling to Better Understand Supercritical Water (SCW) Reactor Safety Technologies

Project Identifier 105188

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Precise Distributed Control and State/Parameter Estimation for Multi-body Satellites and Satellite Formations

Project Identifier 105189

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$21040
Cumulative Total Project Cost:	\$21040

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Modeling and Design of Microstructures with Tailored Adhesive Properties

Project Identifier 105190

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$28368
Cumulative Total Project Cost:	\$28368

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Fourier Analysis and Synthesis Tomography

Project Identifier 105191

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$28147
Cumulative Total Project Cost:	\$28147

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Neural Correlates of Attention and Intention in Decision-Making of Macaques and Humans: Selective Lesioning of Posterior Parietal Areas during Electrophysiology and fMRI

Project Identifier 105193

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Application of Advanced Laser Diagnostics to Hypersonic Wind Tunnels and Combustion Systems

Project Identifier 105213

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$22976
Cumulative Total Project Cost:	\$22976

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project On the Role of Numerical Error in Turbulence Simulations

Project Identifier 105672

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$57973
Cumulative Total Project Cost:	\$57973

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Discovery, Integration, and Interrogation of Biotic/Abiotic Materials and Systems

Project Identifier 105722

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$540931
Cumulative Total Project Cost:	\$540931

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Filtering and Ranking Millions of Terrorist Scenarios using Adversary/Defender Modeling and Risk-Based Linguistic Approximate Reasoning with Belief and Plausibility Measures for Uncertainty

Project Identifier 105723

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$93979
Cumulative Total Project Cost:	\$93979

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Systems Analysis and Futuristic Designs of Advanced Biofuel Factory Concepts

Project Identifier 105724

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$95326
Cumulative Total Project Cost:	\$95326

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project High-temperature mid-IR Focal Plane Arrays

Project Identifier 105725

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$452633
Cumulative Total Project Cost:	\$452633

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Radiation Hardened Components for Space Qualified Point-of-Load Power Conversion

Project Identifier 105726

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$422096
Cumulative Total Project Cost:	\$422096

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Modeling and Design of High Speed Networks for Satellite Applications

Project Identifier 105727

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$438049
Cumulative Total Project Cost:	\$438049

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Examination of the Optical Mechanical Interface for Advanced Systems to Improve Performance

Project Identifier 105728

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$155803
Cumulative Total Project Cost:	\$155803

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Thermo-Optic Focal Plane Array (TO-FPA) for High Sensitivity Room Temperature Infrared Imaging

Project Identifier 105729

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$447985
Cumulative Total Project Cost:	\$447985

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Tuned Micro-Cavity Magnetometer / Quantum Computation Device

Project Identifier 105730

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$251139
Cumulative Total Project Cost:	\$251139

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Application Specific Compression

Project Identifier 105731

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$477154
Cumulative Total Project Cost:	\$477154

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project MESA ASML Scanner Based Reticle Field-Stitch Capability Enabling Wafer Scale Integration with Direct Impact on Mega-Pixel Focal Plane Array Synthesis

Project Identifier 105732

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$367922
Cumulative Total Project Cost:	\$367922

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Direct Write Nanoscale Methods for Chalcogenide Memory

Project Identifier 105733

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$155054
Cumulative Total Project Cost:	\$155054

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Novel Method to Construct Software

Project Identifier 105734

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$244373
Cumulative Total Project Cost:	\$244373

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Damage Remediation of Optical Media via Novel Chemical Tagging

Project Identifier 105735

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$86560
Cumulative Total Project Cost:	\$86560

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Ultra-Thin Packaging of Electronic Assemblies

Project Identifier 105736

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$301843
Cumulative Total Project Cost:	\$301843

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Graph-Based Informatics for Nonproliferation and Counterterrorism

Project Identifier 105737

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$300303
Cumulative Total Project Cost:	\$300303

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Line of Sight Stabilization Experiment

Project Identifier 105738

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$355683
Cumulative Total Project Cost:	\$355683

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Scannerless Range Imaging for Autonomous Rendezvous and Capture

Project Identifier 105739

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$275513
Cumulative Total Project Cost:	\$275513

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Characterizing and Improving Distributed Intrusion Detection Systems

Project Identifier 105740

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$26559
Cumulative Total Project Cost:	\$26559

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Ultra-Low Phase-Noise Phase-Locked Loop (PLL)

Project Identifier 105741

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$96149
Cumulative Total Project Cost:	\$96149

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Managing Thermal Emission: Subwavelength Diffractive Optics Technology in Support of SOF

Project Identifier 105742

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$421369
Cumulative Total Project Cost:	\$421369

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Enhanced Inverse SAR

Project Identifier 105743

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$188118
Cumulative Total Project Cost:	\$188118

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Heterogeneous Microsystem Integration as Applied to the Practicality of a Small Caliber Guided Bullet

Project Identifier 105744

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$294581
Cumulative Total Project Cost:	\$294581

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Detecting Ideologically-based Global Terrorist Networks

Project Identifier 105745

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$82206
Cumulative Total Project Cost:	\$82206

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Autonomous Intelligent Assembly Systems

Project Identifier 105746

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$362238
Cumulative Total Project Cost:	\$362238

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project MEMS Sensors, Telemetry, and Power Generation for Prognostics and Health Monitoring

Project Identifier 105747

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$306394
Cumulative Total Project Cost:	\$306394

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Building a Live/Virtual/Constructive Experimental Testbed

Project Identifier 105748

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$409980
Cumulative Total Project Cost:	\$409980

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Plasmonic Antireflection Coatings (PARC)

Project Identifier 105749

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$275380
Cumulative Total Project Cost:	\$275380

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Data Fusion and Communications for Global Strike Weapon-Deployed Sensor Systems

Project Identifier 105750

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$712165
Cumulative Total Project Cost:	\$712165

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Missile Defense Discrimination

Project Identifier 105751

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$397772
Cumulative Total Project Cost:	\$397772

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Electromagnetic Gun Simulation Tool

Project Identifier 105754

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$300067
Cumulative Total Project Cost:	\$300067

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Reverse Engineering Countermeasures for Hardware and Software

Project Identifier 105756

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$366286
Cumulative Total Project Cost:	\$366286

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Software and Information Systems Analysis Techniques

Project Identifier 105773

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$299980
Cumulative Total Project Cost:	\$299980

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Cyber TTL: Tagging, Tracking, and Locating Network Assets

Project Identifier 105794

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$450143
Cumulative Total Project Cost:	\$450143

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Lightweight Storage and Overlay Networks for Fault Tolerance

Project Identifier 105799

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$300988
Cumulative Total Project Cost:	\$300988

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Microstructure-based Approach for Predicting Crack Initiation and Early Growth in Metals

Project Identifier 105800

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$498971
Cumulative Total Project Cost:	\$498971

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Hybrid Plasma Modeling

Project Identifier 105801

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$260390
Cumulative Total Project Cost:	\$260390

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Diagnostics for Full-Scale Fire Experiments: Closure of the Radiation Source Term and Spectral Fire Signatures

Project Identifier 105804

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$577023
Cumulative Total Project Cost:	\$577023

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanomechanics of Films on Compliant Substrates to Enable New Flexible MEMS and NEMS Devices

Project Identifier 105805

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$497249
Cumulative Total Project Cost:	\$497249

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Crossing the Mesoscale No-Man's Land: Massively Parallel Kinetic Monte Carlo

Project Identifier 105806

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$443715
Cumulative Total Project Cost:	\$443715

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Predictive Modeling of Microenergetics

Project Identifier 105808

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$990085
Cumulative Total Project Cost:	\$990085

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Building More Powerful Less Expensive Supercomputers Using Processing-In-Memory (PIM)

Project Identifier 105809

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$318970
Cumulative Total Project Cost:	\$318970

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Reduced Order Modeling of Fluid-Structure Interaction

Project Identifier 105810

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$332093
Cumulative Total Project Cost:	\$332093

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Experimental Assessment and Theoretical Stability Analysis of Unvalidated Assumptions in Generalized Plasticity Theory

Project Identifier 105811

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$148861
Cumulative Total Project Cost:	\$148861

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Highly Scalable Linear Solvers for Large Science Simulations on Thousands of Processors

Project Identifier 105812

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$347613
Cumulative Total Project Cost:	\$347613

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Massive Multithreading Applied to National Infrastructure and Informatics

Project Identifier 105813

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$329220
Cumulative Total Project Cost:	\$329220

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Practical Reliability and Uncertainty Quantification for Complex Hierarchical Systems

Project Identifier 105814

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$418500
Cumulative Total Project Cost:	\$418500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project HPC Application Performance Analysis and Prediction

Project Identifier 105815

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$384240
Cumulative Total Project Cost:	\$384240

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Model Reduction of Large Dynamic Systems with Localized Nonlinearities

Project Identifier 105816

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$494444
Cumulative Total Project Cost:	\$494444

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Development of Advanced Continuum Models that Incorporate Nanomechanical Deformation into Engineering Analysis

Project Identifier 105818

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$352484
Cumulative Total Project Cost:	\$352484

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Availability Analysis of Fuel Conversion Technologies

Project Identifier 105821

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$229982
Cumulative Total Project Cost:	\$229982

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Geophysical Remote Sensing of Water Reservoirs Suitable for Desalination

Project Identifier 105824

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$293431
Cumulative Total Project Cost:	\$293431

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Fuel Chemistry for Advanced Engines

Project Identifier 105825

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$332870
Cumulative Total Project Cost:	\$332870

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Supercritical CO2 Brayton Cycle Test-Loop Development, Controls, Testing, and Model Validation

Project Identifier 105829

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$412589
Cumulative Total Project Cost:	\$412589

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Foundational Development of an Advanced Burner Reactor Integrated Safety Code

Project Identifier 105833

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$557571
Cumulative Total Project Cost:	\$557571

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of Direct Energy Conversion Fission Electric Cells

Project Identifier 105850

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$467355
Cumulative Total Project Cost:	\$467355

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Biofilm Biogenesis and Control in Membrane-based Water Treatment Systems

Project Identifier 105858

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$411068
Cumulative Total Project Cost:	\$411068

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nuclear Facility Counterproliferation

Project Identifier 105863

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$388042
Cumulative Total Project Cost:	\$388042

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Tracking Nuclear Materials Processing: Metabonomics of Indigenous Species

Project Identifier 105864

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$308520
Cumulative Total Project Cost:	\$308520

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Innovative Control of a Flexible, Adaptive Energy Grid

Project Identifier 105865

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$369366
Cumulative Total Project Cost:	\$369366

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Direct Approaches for Recycling Carbon Dioxide into Synthetic Fuel

Project Identifier 105866

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$406704
Cumulative Total Project Cost:	\$406704

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Decision Support for Integrated Water-Energy Planning

Project Identifier 105867

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$432395
Cumulative Total Project Cost:	\$432395

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Creation of a Lab-Wide Total Risk Analysis Capability

Project Identifier 105868

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$564994
Cumulative Total Project Cost:	\$564994

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Border Tunnel Detection

Project Identifier 105869

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$517185
Cumulative Total Project Cost:	\$517185

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Enabling All-Threat Analysis Through Intelligent Filtering of Network Traffic

Project Identifier 105870

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$460263
Cumulative Total Project Cost:	\$460263

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project New Methods for Development of Broad Spectrum Drugs Against Biowarfare Agents

Project Identifier 105871

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$596083
Cumulative Total Project Cost:	\$596083

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Enhanced Simulation for Homeland Security Training

Project Identifier 105872

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$599361
Cumulative Total Project Cost:	\$599361

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Research on Micro-sized Acoustic Bandgap Structures

Project Identifier 105873

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$494546
Cumulative Total Project Cost:	\$494546

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Intelligent Front-end Sample Preparation Tool using Acoustic Streaming

Project Identifier 105874

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$481063
Cumulative Total Project Cost:	\$481063

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of a Multivariate Electrochemical Tool (MET)

Project Identifier 105875

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$314638
Cumulative Total Project Cost:	\$314638

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project RF/Microwave Properties of Nanotubes and Nanowires

Project Identifier 105876

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$385483
Cumulative Total Project Cost:	\$385483

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Novel Diagnostic for Advanced Measurements of Semiconductor Devices Exposed to Adverse Environments

Project Identifier 105877

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$301719
Cumulative Total Project Cost:	\$301719

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Irradiation for the Novel Radiolytic Formation of Superalloy Nanoparticles

Project Identifier 105878

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$373728
Cumulative Total Project Cost:	\$373728

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project MicroKelvin Molecule Production

Project Identifier 105879

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$337808
Cumulative Total Project Cost:	\$337808

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project An Accurate Method for Electronic Structure Calculations

Project Identifier 105886

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$98330
Cumulative Total Project Cost:	\$98330

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Compositional Ordering and Stability in Nanostructured, Bulk Thermoelectric Alloys

Project Identifier 105893

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$447040
Cumulative Total Project Cost:	\$447040

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Infrared to Visible Photon Up-conversion using a Compact Semiconductor Device

Project Identifier 105899

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$264076
Cumulative Total Project Cost:	\$264076

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Electrostatically Gated Silicon Qubits formed in Two Dimensional Electron Gasses for Quantum Computing

Project Identifier 105903

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$503873
Cumulative Total Project Cost:	\$503873

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Phonon Engineering for Nanostructures

Project Identifier 105906

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$619283
Cumulative Total Project Cost:	\$619283

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project The Many Mechanisms for Strain Relaxation in III-Nitride Heterostructures: How, When and Why?

Project Identifier 105914

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$411737
Cumulative Total Project Cost:	\$411737

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Modeling the Geologic Catastrophe that Caused the Great Dying

Project Identifier 105916

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$103232
Cumulative Total Project Cost:	\$103232

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Enhanced Spontaneous Emission Rates in Visible III-Nitride LEDs Using 3D Photonic Crystal Cavities

Project Identifier 105917

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$519234
Cumulative Total Project Cost:	\$519234

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Optical Measurements and Novel Microsystems for Characterizing Photophysical Properties of Single Nanoparticles

Project Identifier 105922

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$403609
Cumulative Total Project Cost:	\$403609

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Controlling the Nanoscale Chemistry of Carbon on Surfaces

Project Identifier 105928

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$299134
Cumulative Total Project Cost:	\$299134

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Theory and Exploration of Quantum-dot Optical Nonlinearities and Coherences

Project Identifier 105930

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$139722
Cumulative Total Project Cost:	\$139722

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Science at the Interface: Grain Boundaries in Nanocrystalline Metals

Project Identifier 105931

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$512717
Cumulative Total Project Cost:	\$512717

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Pumping Up CO2 and Its Conversion into Synthetic Fuels and Other Useful Molecules

Project Identifier 105932

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$399440
Cumulative Total Project Cost:	\$399440

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanoengineering of Active Interfaces for Organic-Inorganic Optoelectronics

Project Identifier 105933

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$681108
Cumulative Total Project Cost:	\$681108

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project The Physics of 1D and 2D Electron Gases in III-Nitride Heterostructure Nanowires

Project Identifier 105935

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$449912
Cumulative Total Project Cost:	\$449912

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Neural Assembly Models Derived through Nano-Scale Measurements

Project Identifier 105936

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$436577
Cumulative Total Project Cost:	\$436577

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Improving Human Effectiveness for Extreme Scale Problem Solving

Project Identifier 105937

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$196618
Cumulative Total Project Cost:	\$196618

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Modeling Aspects of Human Memory and Reasoning for Scientific Study

Project Identifier 105938

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$437468
Cumulative Total Project Cost:	\$437468

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Psychologically Plausible Learning Mechanisms for Sandia's Cognitive Framework

Project Identifier 105939

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$329859
Cumulative Total Project Cost:	\$329859

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Resolving Dynamics of Cell Signaling via Real-Time Imaging of the Immunological Synapse

Project Identifier 105940

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$424164
Cumulative Total Project Cost:	\$424164

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Societal Evolution Simulations for Long-Term National Security Insight

Project Identifier 105941

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$365229
Cumulative Total Project Cost:	\$365229

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project In Vivo Collection of Rare Proteins Using Kinesin-based "Nano-harvesters"

Project Identifier 105942

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$414887
Cumulative Total Project Cost:	\$414887

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Microalgal Biodiesel, Feedstock Improvement by Metabolic Engineering

Project Identifier 105943

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$507015
Cumulative Total Project Cost:	\$507015

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Synthetic Biology of Novel Thermophilic Bacteria For Enhanced Production Of Ethanol From 5-Carbon Sugars

Project Identifier 105944

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$424626
Cumulative Total Project Cost:	\$424626

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Efficient Breakdown of Lignocellulose Using Mixed-microbe Population for Bioethanol Production

Project Identifier 105946

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$462564
Cumulative Total Project Cost:	\$462564

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanolaminate Thin Film Heat Sources for Advanced Weapon Components

Project Identifier 105948

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$423970
Cumulative Total Project Cost:	\$423970

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Multifunctional and Hybrid Energetic Components

Project Identifier 105950

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$453692
Cumulative Total Project Cost:	\$453692

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Active Polymer Composites for Detecting Abnormal Thermal and Optical Environments

Project Identifier 105951

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$340797
Cumulative Total Project Cost:	\$340797

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Optical Gaseous Atmosphere Sensing and Monitoring Using Surface Plasmon Resonance Spectroscopy and Custom Optic Coatings

Project Identifier 105953

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$368618
Cumulative Total Project Cost:	\$368618

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Exploration of an Architecture for a Small Dynamically Reconfigurable Responsive Weapon

Project Identifier 105954

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$352332
Cumulative Total Project Cost:	\$352332

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Mechanical Weak Link for DP Weapon Systems

Project Identifier 105963

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$92402
Cumulative Total Project Cost:	\$92402

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Multilayer Coextrusion Techniques for Developing High Energy Density Organic Devices

Project Identifier 105964

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$447634
Cumulative Total Project Cost:	\$447634

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Radiation Microscope for SEE Testing Using >10 GeV Ions

Project Identifier 105966

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$327714
Cumulative Total Project Cost:	\$327714

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Exploring the Increase in GaAs Photodiode Responsivity with Increased Neutron Fluence

Project Identifier 105967

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$258135
Cumulative Total Project Cost:	\$258135

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Microfabricated Wire Arrays for Z-Pinch

Project Identifier 105968

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$318387
Cumulative Total Project Cost:	\$318387

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Electromagnetic Properties of Plumes and Plasma Jets for High-Power Microwave Applications

Project Identifier 105969

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$405719
Cumulative Total Project Cost:	\$405719

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project High Power Density X-ray Sources

Project Identifier 105970

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$461012
Cumulative Total Project Cost:	\$461012

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Automated Monte Carlo Biasing for Photon-Generated Electrons Near Surfaces

Project Identifier 105971

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$415449
Cumulative Total Project Cost:	\$415449

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Ferroelectric Opening Switches for Large-Scale Pulsed Power Drivers

Project Identifier 105972

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$224243
Cumulative Total Project Cost:	\$224243

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Cryogenic Liquid Spark Gaps

Project Identifier 105973

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Basic

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$199449
Cumulative Total Project Cost:	\$199449

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Equation of State and Transport Property Measurements of Warm Dense Matter

Project Identifier 105975

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$323063
Cumulative Total Project Cost:	\$323063

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Low Impedance Z-Pinch Drivers Without Post-Hole Convolute Current Adders

Project Identifier 105976

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$224478
Cumulative Total Project Cost:	\$224478

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Innovative High Pressure Gas MEMS Based Neutron Detector

Project Identifier 105977

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$90378
Cumulative Total Project Cost:	\$90378

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Expansion of QMD Materials Modeling to Surface Phenomena of Importance to Electrical Breakdown in Pulsed Power Systems

Project Identifier 105979

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$221812
Cumulative Total Project Cost:	\$221812

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Evaluation of New Testbeds for Hostile Environment Testing of Micromachines, Optoelectronics, and Electronics

Project Identifier 105985

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$215412
Cumulative Total Project Cost:	\$215412

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Understanding Surface Breakdown in Electronegative Gases

Project Identifier 105987

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$460337
Cumulative Total Project Cost:	\$460337

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Multi-Mode Energy Scavenging from the Environment

Project Identifier 106397

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$52600
Cumulative Total Project Cost:	\$52600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Atomistic Mechanisms of Semiconductor Nanowire Growth

Project Identifier 106399

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$56505
Cumulative Total Project Cost:	\$56505

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Nutrient Cycle Model for the Middle Rio Grande, New Mexico

Project Identifier 106400

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$29117
Cumulative Total Project Cost:	\$29117

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Passive and Active Electromagnetic Frequency Selective Surfaces for High-Power Beam Applications

Project Identifier 106401

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$245080
Cumulative Total Project Cost:	\$245080

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Effect of Pressure and Particle Size on Microstructure and Properties of Vacuum-Plasma-Sprayed Yttria-Stabilized-Zirconia Solid Oxide Fuel Cell Electrolytes

Project Identifier 106403

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$26300
Cumulative Total Project Cost:	\$26300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Active Control of Periodic Disturbances

Project Identifier 106405

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$28944
Cumulative Total Project Cost:	\$28944

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Modeling Non-Market Value of Water

Project Identifier 106407

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$29000
Cumulative Total Project Cost:	\$29000

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Robot Perception and Localization

Project Identifier 106408

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$53275
Cumulative Total Project Cost:	\$53275

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Volumetric Plasma Source Development and Characterization

Project Identifier 107009

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$248788
Cumulative Total Project Cost:	\$248788

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Creation of a First Principles Simulation of Weapons Generated Electromagnetic Pulse

Project Identifier 107441

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$198848
Cumulative Total Project Cost:	\$198848

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Quasi-spherical Direct Drive Fusion with Single Shells

Project Identifier 107442

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$100448
Cumulative Total Project Cost:	\$100448

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Network Design Optimization of Fuel Cell Systems and Distributed Energy Devices

Project Identifier 110404

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$161589
Cumulative Total Project Cost:	\$161589

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Microrheology of Polymeric Materials at High Strain Rates

Project Identifier 110405

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$26300
Cumulative Total Project Cost:	\$26300

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Diffusion-Based Sensing of Membrane Proteins in Solid Support Platforms

Project Identifier 110406

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$26300
Cumulative Total Project Cost:	\$26300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Materials for Water Treatment Membranes: Enhanced Rejection Performance and Surface Properties

Project Identifier 110407

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$29006
Cumulative Total Project Cost:	\$29006

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Bright, Spectrally-encoded, Microlensed Optical Tag

Project Identifier 110408

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$206328
Cumulative Total Project Cost:	\$206328

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Low-Bandwidth Authentication

Project Identifier 110409

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$248966
Cumulative Total Project Cost:	\$248966

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Human and Small Vehicle Classification Signature Study for Embedded Unattended Ground Sensors

Project Identifier 112382

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$84912
Cumulative Total Project Cost:	\$84912

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Cooperative Robotic System for At-Sea Detection of Nuclear Materials

Project Identifier 112383

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$70041
Cumulative Total Project Cost:	\$70041

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Systems Studies for Nonproliferation for the 21st Century

Project Identifier 112384

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$55081
Cumulative Total Project Cost:	\$55081

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Internet Mining Toolkit

Project Identifier 112385

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$69943
Cumulative Total Project Cost:	\$69943

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Integrated Modeling of Technology and Economic Factors to Optimize Alternative Fuel Production

Project Identifier 112388

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$50977
Cumulative Total Project Cost:	\$50977

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Liquid Transportation Fuels Futures Simulation Model

Project Identifier 113083

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$124280
Cumulative Total Project Cost:	\$124280

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Architectural Design for a National Scale Decision Support Model

Project Identifier 113197

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$82640
Cumulative Total Project Cost:	\$82640

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Planar Wire Array Performance Scaling at 6 to 10 MA

Project Identifier 113211

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$98983
Cumulative Total Project Cost:	\$98983

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Fusion Yield, Containment, and Repetition Rate for Pulsed Fusion Power Plant Concepts

Project Identifier 113213

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$79529
Cumulative Total Project Cost:	\$79529

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Implantable MEMS Sensor Capsule for Measuring Muscle Contractions

Project Identifier 113214

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$86368
Cumulative Total Project Cost:	\$86368

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Prompt Detonation of Explosive Actuators Using Optical Sources

Project Identifier 113215

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$94697
Cumulative Total Project Cost:	\$94697

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project IHE Response in Lightning Environments

Project Identifier 113216

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$70578
Cumulative Total Project Cost:	\$70578

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project MEMS Lubrication by In Situ Tribochemical Reactions from the Vapor Phase

Project Identifier 113217

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$110069
Cumulative Total Project Cost:	\$110069

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Catalytic Diodes for Micropower Applications

Project Identifier 113218

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$96630
Cumulative Total Project Cost:	\$96630

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Block-Mediated Control of Flux in Ion Channels

Project Identifier 113219

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$86782
Cumulative Total Project Cost:	\$86782

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Integrated Optical Phase-Locked Loop for Attosecond Timing in Microwave Oscillators

Project Identifier 113220

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$102947
Cumulative Total Project Cost:	\$102947

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Methodologies for Evaluating Neurotechnology for Detection of Emotional States

Project Identifier 113223

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$102754
Cumulative Total Project Cost:	\$102754

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Ultrawideband (UWB) Based Mesh-Network

Project Identifier 113225

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$79809
Cumulative Total Project Cost:	\$79809

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project High-Volume Preconcentrator Coatings for Volatile Explosive Species from Homemade Explosives

Project Identifier 113228

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$98686
Cumulative Total Project Cost:	\$98686

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced TRU Fuel Performance Modeling

Project Identifier 113229

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$99641
Cumulative Total Project Cost:	\$99641

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Soluble Polytantalate Clusters

Project Identifier 113230

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$99283
Cumulative Total Project Cost:	\$99283

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Metal Fires and Their Implications for Advanced Reactors

Project Identifier 113231

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$90020
Cumulative Total Project Cost:	\$90020

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Atomically Engineering Cu/Ta Interfaces

Project Identifier 113236

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$87068
Cumulative Total Project Cost:	\$87068

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Behavior-Aware Decision Support System

Project Identifier 113237

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$98406
Cumulative Total Project Cost:	\$98406

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Hermetic Encapsulation of Nanoenabled Batteries for Discrete Microelectronics Sensor Systems

Project Identifier 113238

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$93039
Cumulative Total Project Cost:	\$93039

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Enhanced Beaming of Light Using Plasmon Optics

Project Identifier 113239

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$79104
Cumulative Total Project Cost:	\$79104

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Signatures

Project Identifier 113240

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$96996
Cumulative Total Project Cost:	\$96996

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Vista

Project Identifier 113241

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$101949
Cumulative Total Project Cost:	\$101949

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Interfacial Property Control of Elastomeric Nanocomposites

Project Identifier 113483

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$456368
Cumulative Total Project Cost:	\$456368

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Improving Electronic Structure Calculations to Predict Nano-optoelectronics and Nanocatalyst Functions

Project Identifier 113484

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$300104
Cumulative Total Project Cost:	\$300104

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Developing a Thermal Microscopy Platform for In-Situ Thermal/Thermoelectric Structure-Property Studies of Individual Nanotubes and Nanowires

Project Identifier 113485

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$300877
Cumulative Total Project Cost:	\$300877

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Fundamentals of Synthetic Conversion of CO2 to Simple Hydrocarbon Fuels

Project Identifier 113486

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$224703
Cumulative Total Project Cost:	\$224703

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Electrostatic Microvalves Utilizing Conductive Nanoparticles for Improved Speed, Lower Power, and Higher Force Actuation

Project Identifier 113487

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$347762
Cumulative Total Project Cost:	\$347762

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanoengineering by Optically Directed Self Assembly

Project Identifier 113488

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$423498
Cumulative Total Project Cost:	\$423498

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Optimized Nanoporous Materials

Project Identifier 113489

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$348632
Cumulative Total Project Cost:	\$348632

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project CO2 Reduction Using Biomimetic Photocatalytic Nanodevices

Project Identifier 113490

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$205663
Cumulative Total Project Cost:	\$205663

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Stress-Induced Chemical Detection Using Flexible Coordination Polymers

Project Identifier 113491

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$200764
Cumulative Total Project Cost:	\$200764

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Traumatic Brain Injury

Project Identifier 113675

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Basic

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$94219
Cumulative Total Project Cost:	\$94219

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Perception via Dynamic Generative Models

Project Identifier 114428

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$111132
Cumulative Total Project Cost:	\$111132

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Information Security Improvement (Chaperone)

Project Identifier 114975

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$295927
Cumulative Total Project Cost:	\$295927

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Discontinuous Galerkin Methods for Generalized Continuum Models for Inelasticity

Project Identifier 114976

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$59329
Cumulative Total Project Cost:	\$59329

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Numerical Characterization of Fundamental Interactions in Electrically-Steerable Parasitic Antenna Arrays

Project Identifier 114978

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Robust Analysis of Large-Scale Combinatorial Applications

Project Identifier 114979

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$99064
Cumulative Total Project Cost:	\$99064

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Using Infrared Video to Detect Humans and to Improve Nuisance Alarm Rejection

Project Identifier 115234

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$101428
Cumulative Total Project Cost:	\$101428

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project MEMS Solar Energy Harvesting

Project Identifier 115235

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$85737
Cumulative Total Project Cost:	\$85737

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Integrating Safety, Security and Safeguards for GNEP Facilities

Project Identifier 115446

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$85509
Cumulative Total Project Cost:	\$85509

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanofluidic Chromatography for Label-free Biomolecule Detection

Project Identifier 115447

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$98828
Cumulative Total Project Cost:	\$98828

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Microstructural Modeling of Piezoceramics

Project Identifier 116003

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$89891
Cumulative Total Project Cost:	\$89891

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Biodiesel Production from Vegetable Oils Using a Microreactor

Project Identifier 116709

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$95158
Cumulative Total Project Cost:	\$95158

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Photophysical Investigations of Interfacial Supramolecular Self-Assembly

Project Identifier 116918

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$99136
Cumulative Total Project Cost:	\$99136

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project UAV Payloads and Interfaces for Surveillance and Reconnaissance

Project Identifier 117390

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$73839
Cumulative Total Project Cost:	\$73839

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Low-Altitude Airbursts and the Impact Threat

Project Identifier 118452

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$50368
Cumulative Total Project Cost:	\$50368

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Adaptable Software for Advanced Human/Computer Systems

Project Identifier 79738

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$474893
Cumulative Total Project Cost:	\$474893

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of a Manufacturing Capability for Production of Ceramic Laser Materials

Project Identifier 79742

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$384369
Cumulative Total Project Cost:	\$384369

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Tools for Characterizing Membrane Rafts and Toxin Interactions

Project Identifier 79746

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$175998
Cumulative Total Project Cost:	\$175998

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Integrated Nanosystems for Monitoring Cell-Signaling Proteins

Project Identifier 79747

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$631428
Cumulative Total Project Cost:	\$631428

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project DNA-Based Intelligent Microsensors for Genetically Modified Organisms (GMO)

Project Identifier 79749

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$355436
Cumulative Total Project Cost:	\$355436

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Reverse-time Seismic and Acoustic Wave Propagation: High-fidelity Subsurface Imaging and Location of Energy Sources

Project Identifier 79750

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$316761
Cumulative Total Project Cost:	\$316761

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Multi-Spectral Detection of Microfluidic Separation Products

Project Identifier 79751

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$281967
Cumulative Total Project Cost:	\$281967

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Mathematical Framework for Multiscale Science and Engineering: The Variational Multiscale Method and Interscale Transfer Operators

Project Identifier 79752

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$419592
Cumulative Total Project Cost:	\$419592

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Microprocessor Extensions to Accelerate Scientific Applications

Project Identifier 79753

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$187575
Cumulative Total Project Cost:	\$187575

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Data Mining on Attributed Relationship Graphs

Project Identifier 79754

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$444283
Cumulative Total Project Cost:	\$444283

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Multi-Physics Coupling for Robust Simulation

Project Identifier 79755

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$293458
Cumulative Total Project Cost:	\$293458

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Simulation of Neutron Radiation Damage in Silicon Semiconductor Devices

Project Identifier 79756

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$364703
Cumulative Total Project Cost:	\$364703

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Data Pipelining for Heterogeneous Data Fusion

Project Identifier 79757

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$355339
Cumulative Total Project Cost:	\$355339

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Novel Photonic Crystal Cavities and Related Structures

Project Identifier 79760

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$141390
Cumulative Total Project Cost:	\$141390

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Integrated NEMS and Optoelectronics for Sensor Applications

Project Identifier 79761

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$443793
Cumulative Total Project Cost:	\$443793

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of Advanced UV Light Emitters and Biological Agent Detection Strategies

Project Identifier 79762

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$492648
Cumulative Total Project Cost:	\$492648

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project SMART Micro-Preconcentrator for Integrated Preconcentration and Detection of Chemical Agents and Explosives

Project Identifier 79763

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$505430
Cumulative Total Project Cost:	\$505430

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Investigation of Liquid Jet Break-up and Dispersion

Project Identifier 79764

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$275090
Cumulative Total Project Cost:	\$275090

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nano/Micro-Engineered Interfaces for Improved Performance and Reliability

Project Identifier 79767

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$393019
Cumulative Total Project Cost:	\$393019

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Atomic-Scale Modeling of Phonon-Mediated Thermal Transport in Microsystems

Project Identifier 79773

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$344426
Cumulative Total Project Cost:	\$344426

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Multiphase Dynamics of Soft Biological Tissues

Project Identifier 79774

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$297187
Cumulative Total Project Cost:	\$297187

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Use of Composite Materials to Refurbish Our Civil and Military Infrastructure

Project Identifier 79778

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$373757
Cumulative Total Project Cost:	\$373757

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Desalination Utilizing Clathrate Hydrates

Project Identifier 79779

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$341042
Cumulative Total Project Cost:	\$341042

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development and Application of the Dynamic System Doctor to Nuclear Reactor Probabilistic Risk Assessments

Project Identifier 79780

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$176387
Cumulative Total Project Cost:	\$176387

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Innovative Solar Thermochemical Water Splitting

Project Identifier 79781

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$493094
Cumulative Total Project Cost:	\$493094

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Novel System for Zero-Emission Electricity and Hydrogen Production from Coal and Biomass

Project Identifier 79801

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$406179
Cumulative Total Project Cost:	\$406179

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Risk-informed, Decision-making Methodologies for Robust Control of Complex Infrastructures

Project Identifier 79807

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$506038
Cumulative Total Project Cost:	\$506038

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of Miniaturized Photomultiplier Detectors

Project Identifier 79818

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$5977
Cumulative Total Project Cost:	\$5977

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Portable Medical Diagnostic System for Detection of Presymptomatic Biomarkers of Chem/Bio-agent Exposure

Project Identifier 79820

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$473928
Cumulative Total Project Cost:	\$473928

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Diatoms as Molecular Architects

Project Identifier 79821

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$424837
Cumulative Total Project Cost:	\$424837

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Novel Mechanisms of Nanomechanical and Transmembrane Actuation

Project Identifier 79823

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$471152
Cumulative Total Project Cost:	\$471152

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Carbon Nanotube Sorting via DNA-Directed Self-Assembly

Project Identifier 79824

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$405342
Cumulative Total Project Cost:	\$405342

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Next-Generation Contact Materials for High-Reliability Microsystems Devices

Project Identifier 79825

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$454734
Cumulative Total Project Cost:	\$454734

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Controlled Fabrication of Nanowire Sensors

Project Identifier 79826

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$470810
Cumulative Total Project Cost:	\$470810

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Fundamental Enabling Issues in Nanotechnology: Stress at the Atomic Level

Project Identifier 79827

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$364094
Cumulative Total Project Cost:	\$364094

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Knowledge Discovery via Sensor Fusion in Structures and Ad-Hoc Networks

Project Identifier 79832

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$404500
Cumulative Total Project Cost:	\$404500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Large-Area Metallic Photonic Lattices for Military Applications

Project Identifier 79838

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$399978
Cumulative Total Project Cost:	\$399978

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Laser-Induced Breakdown Spectroscopy for Remote Explosives Detection

Project Identifier 79852

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$242389
Cumulative Total Project Cost:	\$242389

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Integrated Optical MEMS using Through-Wafer Vias and Bump-Bonding

Project Identifier 79856

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$234397
Cumulative Total Project Cost:	\$234397

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Terahertz Quantum Cascade Lasers for Standoff Molecule Detection

Project Identifier 79861

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$496675
Cumulative Total Project Cost:	\$496675

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Technologies for National Security Applications

Project Identifier 79862

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$805812
Cumulative Total Project Cost:	\$805812

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Next Generation High-Voltage Switches for Capacitive Discharge Firing Systems

Project Identifier 79868

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$216151
Cumulative Total Project Cost:	\$216151

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A New, Cost-Effective Solution to Provide Radiation-Hardened Materials for Nuclear Weapons

Project Identifier 79870

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$465400
Cumulative Total Project Cost:	\$465400

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Micro- and Mesoscale Detonics of Explosives

Project Identifier 79871

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$355722
Cumulative Total Project Cost:	\$355722

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Material Applications of Precision-Deposited and Free-Form-Fabricated Energetic Materials

Project Identifier 79876

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$406864
Cumulative Total Project Cost:	\$406864

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Characterizing the Emissivity of Materials Under Dynamic Compression

Project Identifier 79877

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$308611
Cumulative Total Project Cost:	\$308611

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Triggered Low-inductance Gas Switching

Project Identifier 79881

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$402618
Cumulative Total Project Cost:	\$402618

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Achieving a New Paradigm in Software Technology

Project Identifier 79883

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$465722
Cumulative Total Project Cost:	\$465722

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Development of Design and Simulation Models for Large-Scale Hydrogen Production Plant Using Nuclear Power

Project Identifier 80568

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$603402
Cumulative Total Project Cost:	\$603402

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Mobile Agent Abstractions, Methods, and Infrastructure for Efficient Sensor Network Tasking Over Heterogeneous Networks

Project Identifier 80591

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$26300
Cumulative Total Project Cost:	\$26300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Ultra-fast Low-voltage MEMS Switches for Optics and RF Applications

Project Identifier 80592

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$259754
Cumulative Total Project Cost:	\$259754

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Reliability of Materials in MEMS: Residual Stress and Adhesion in a Micro Power Generation System

Project Identifier 80595

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$26930
Cumulative Total Project Cost:	\$26930

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Modeling River-Aquifer Interaction with Application to the Rio Grande

Project Identifier 80596

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$29230
Cumulative Total Project Cost:	\$29230

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Kinetics and Mechanisms of Nanowire Synthesis

Project Identifier 80598

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$28958
Cumulative Total Project Cost:	\$28958

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Bayesian Inference for Inverse Problems, Model Structure, and Uncertainties

Project Identifier 80603

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$249499
Cumulative Total Project Cost:	\$249499

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Design, Analysis and Control of MEMS Devices for Micromanipulation Tasks

Project Identifier 80667

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$29026
Cumulative Total Project Cost:	\$29026

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Integrated Fiber Lasers for Efficient High-Power Generation

Project Identifier 81752

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$4507091
Cumulative Total Project Cost:	\$4507091

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Fusion Concepts: Neutrons for Testing and Energy

Project Identifier 81753

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$4581218
Cumulative Total Project Cost:	\$4581218

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Developing Novel Scaffolds for Biological Molecules by Solving the I-QSAR Problem Using the Signature Molecular Descriptor

Project Identifier 82854

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$57008
Cumulative Total Project Cost:	\$57008

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Effective Dispersion of Nanoparticles by Polymers

Project Identifier 84266

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$311024
Cumulative Total Project Cost:	\$311024

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Bead-based Multiplexed, Orthogonal, BW/ID (BioWarfare/Infectious Disease) Detection Microsystem and Technologies

Project Identifier 84267

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$596423
Cumulative Total Project Cost:	\$596423

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Terahertz Detectors for Long Wavelength Multi-Spectral Imaging

Project Identifier 84271

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$462440
Cumulative Total Project Cost:	\$462440

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project File System Performance Optimization for Supercomputing Applications

Project Identifier 85512

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$26300
Cumulative Total Project Cost:	\$26300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project PCSS/Fiber-Optic Trigger System for Pulsed Power Switches

Project Identifier 86362

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$470695
Cumulative Total Project Cost:	\$470695

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Capture and Utilization of Prosody in Disambiguating Spoken Speech

Project Identifier 86801

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$28771
Cumulative Total Project Cost:	\$28771

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Exploiting Interfacial Water Properties for Desalination and Purification Applications

Project Identifier 90493

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$1222922
Cumulative Total Project Cost:	\$1222922

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of a Universal Fuel Processor

Project Identifier 90497

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$297703
Cumulative Total Project Cost:	\$297703

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Rapid Updating of Stochastic Models Using Sensor Information

Project Identifier 90501

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$196440
Cumulative Total Project Cost:	\$196440

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Merging Spatially Variant Physical Process Models Under an Optimized Systems Dynamics Framework

Project Identifier 90730

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$323212
Cumulative Total Project Cost:	\$323212

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Fundamentals of Embossing Nanoimprint Lithography in Polymer Substrates

Project Identifier 93361

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$60407
Cumulative Total Project Cost:	\$60407

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Rational Understanding and Control of the Magnetic Behavior of Nanoparticles

Project Identifier 93362

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$6663
Cumulative Total Project Cost:	\$6663

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project MEMS Dual Backplate Capacitive Microphone

Project Identifier 93364

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$949
Cumulative Total Project Cost:	\$949

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Process Science and Engineering for Thermomechanical Nano-manufacturing

Project Identifier 93366

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$0
Cumulative Total Project Cost:	\$0

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Fabrication and Device Applications of Aligned Mesoporous Architectures

Project Identifier 93369

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$57645
Cumulative Total Project Cost:	\$57645

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Minimally-Invasive Instrumentation of JTA End-Event

Project Identifier 93414

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$400310
Cumulative Total Project Cost:	\$400310

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Modern Nuclear Weapon Communications Architecture

Project Identifier 93415

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$518290
Cumulative Total Project Cost:	\$518290

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Improved Power Source for Doubling the Exchange Time Interval of LLC

Project Identifier 93416

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$355061
Cumulative Total Project Cost:	\$355061

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Optical Trigger Systems for Firing Sets in Nuclear Weapons

Project Identifier 93417

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$473162
Cumulative Total Project Cost:	\$473162

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Increasing the Accuracy of Vision-Based Dimensional Metrology

Project Identifier 93418

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$187892
Cumulative Total Project Cost:	\$187892

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Surety Concepts

Project Identifier 93419

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development

POC Phone 505-844-9092

FY 2007 Project Costs

Total: \$514823

Cumulative Total Project Cost: \$514823

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project High Kinetic Energy Ion Source

Project Identifier 93421

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$196068
Cumulative Total Project Cost:	\$196068

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Mentor/PAL

Project Identifier 93422

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$240839
Cumulative Total Project Cost:	\$240839

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Identification of Threats Using Linguistics-Based Knowledge Extraction

Project Identifier 93423

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$356230
Cumulative Total Project Cost:	\$356230

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Large Scale Manufacturing of Integrated Nanostructures for Sensing

Project Identifier 93426

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$448870
Cumulative Total Project Cost:	\$448870

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development and Optimization of Thermal Protection Materials for Hypersonic Vehicles

Project Identifier 93427

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$990209
Cumulative Total Project Cost:	\$990209

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Titanium Cholla - Optimized, Lightweight, High Strength Structures for Aerospace Applications

Project Identifier 93491

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$292382
Cumulative Total Project Cost:	\$292382

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project In Situ Optical Diagnostics of Neutron Generator Target Films

Project Identifier 93492

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$298035
Cumulative Total Project Cost:	\$298035

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Low Cost, Meso-Scale Parts Fabricated from Nanocrystalline Metals

Project Identifier 93493

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$434052
Cumulative Total Project Cost:	\$434052

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project New Low Cost Material Development Technique For Advancing Rapid Prototyping Manufacturing Technology

Project Identifier 93494

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$208435
Cumulative Total Project Cost:	\$208435

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Manufacturing of a Novel Functional Material

Project Identifier 93495

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$367044
Cumulative Total Project Cost:	\$367044

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Interface Physics in Microporous Media

Project Identifier 93496

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$402542
Cumulative Total Project Cost:	\$402542

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Creating a Discovery Platform for Defined-space Chemistry and Materials: Metal Organic Frameworks

Project Identifier 93497

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$483415
Cumulative Total Project Cost:	\$483415

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Virulence Membrane Protein Organization and Complex Formation in Francisella novicida

Project Identifier 93498

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$400939
Cumulative Total Project Cost:	\$400939

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Cell Modeling with Heterogeneous, Dynamic Cell Membranes

Project Identifier 93499

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$393749
Cumulative Total Project Cost:	\$393749

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Shotgun Protein Sequencing

Project Identifier 93501

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$298961
Cumulative Total Project Cost:	\$298961

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Numerical And Experimental Characterization Of Decontaminating Water Distribution Networks

Project Identifier 93503

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$460101
Cumulative Total Project Cost:	\$460101

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Distributed Micro-releases of Bioterror Pathogens: Threat Characterization and Epidemiology from Uncertain Patient Observables

Project Identifier 93505

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$296817
Cumulative Total Project Cost:	\$296817

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Large Scale Simulation for Human Behavior Modeling

Project Identifier 93506

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$574743
Cumulative Total Project Cost:	\$574743

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Network Architecture Design for Next Generation Supercomputers

Project Identifier 93507

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$510170
Cumulative Total Project Cost:	\$510170

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Quantum Computer Architecture, Software, and Applications

Project Identifier 93508

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$666898
Cumulative Total Project Cost:	\$666898

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Robust Tunable Multifunction Amplifiers Using GaN and RF MEMS Technology

Project Identifier 93510

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$391590
Cumulative Total Project Cost:	\$391590

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Bloch Oscillations in Two-Dimensional Nanostructure Arrays for High Frequency Applications

Project Identifier 93511

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$408857
Cumulative Total Project Cost:	\$408857

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Inverted Monolithic Interconnected Module (MIM) Thermophotovoltaics (TPV) for Remote Power Generation

Project Identifier 93512

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$373005
Cumulative Total Project Cost:	\$373005

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Discovery Platform for Nanowire Electronics and Photonics

Project Identifier 93513

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$407159
Cumulative Total Project Cost:	\$407159

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Miniature Flow Cytometer for Medical Diagnostics and Pathogen Detection

Project Identifier 93515

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$428698
Cumulative Total Project Cost:	\$428698

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Just in Time Jamming of Enemy Detonation Signals

Project Identifier 93516

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$455356
Cumulative Total Project Cost:	\$455356

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Ultrasensitive Directional Microphone Arrays for Military Operations in Urban Terrain and Future Combat Systems

Project Identifier 93518

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$350005
Cumulative Total Project Cost:	\$350005

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Si-rich Silicon Nitride Films for Reliable Low Write Voltage Anti-fuses

Project Identifier 93520

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$123695
Cumulative Total Project Cost:	\$123695

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Rapid Spectroscopy for Gas Cloud Analysis

Project Identifier 93521

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$314727
Cumulative Total Project Cost:	\$314727

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Developing Key Capabilities for Quantum Computing

Project Identifier 93522

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$725060
Cumulative Total Project Cost:	\$725060

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Multi-Length Scale Algorithms for Failure Modeling in Solid Mechanics

Project Identifier 93525

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$336861
Cumulative Total Project Cost:	\$336861

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanocrystalline Aluminum Alloys for Structural Applications

Project Identifier 93528

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$471951
Cumulative Total Project Cost:	\$471951

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanoparticle Flow, Ordering and Self-Assembly

Project Identifier 93529

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$522584
Cumulative Total Project Cost:	\$522584

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of Simulation and Validation Techniques for the Dynamic Behavior of Metals at the Grain Scale

Project Identifier 93530

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$220012
Cumulative Total Project Cost:	\$220012

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Dynamic Compression of Synthetic Diamond Windows

Project Identifier 93531

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$236941
Cumulative Total Project Cost:	\$236941

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Fast High Voltage Spark Gap Switch With a Phase Changing Dielectric

Project Identifier 93532

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$505032
Cumulative Total Project Cost:	\$505032

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Development of a Physics Understanding of Pulsed Power Closing Switches for Multiple LTD Applications

Project Identifier 93533

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$372288
Cumulative Total Project Cost:	\$372288

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Precision Electron Flow Measurements in a Disk Transmission Line

Project Identifier 93535

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$212164
Cumulative Total Project Cost:	\$212164

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Energy Infrastructure Surety for Military Applications - Phase II

Project Identifier 93552

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$265144
Cumulative Total Project Cost:	\$265144

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Hybrid Inorganic-organic Polymer Composites for Improved Performance in Polymer-electrolyte Fuel Cells

Project Identifier 93554

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$284272
Cumulative Total Project Cost:	\$284272

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Enhanced Biomass to Bioenergy Interconversion through Protein and Metabolic Engineering

Project Identifier 93555

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$645355
Cumulative Total Project Cost:	\$645355

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Joint Physical and Numerical Modeling of Water Distribution Networks

Project Identifier 93556

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$470217
Cumulative Total Project Cost:	\$470217

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Computational and Experimental Study of Nanoporous Membranes for Water Desalination and Decontamination

Project Identifier 93558

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$562018
Cumulative Total Project Cost:	\$562018

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Novel Virus Coagulants for Water Treatment and Biomolecular Structural Science

Project Identifier 93559

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$355461
Cumulative Total Project Cost:	\$355461

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Demonstration of Advanced Transparency At The Monju Fast Breeder Reactor

Project Identifier 93561

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$415352
Cumulative Total Project Cost:	\$415352

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Reliability of Passive Safety Systems

Project Identifier 93562

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$233450
Cumulative Total Project Cost:	\$233450

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Water-splitting Nanodevices for Solar Hydrogen Production

Project Identifier 93563

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$453604
Cumulative Total Project Cost:	\$453604

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of Nanostructured and Surface Modified Semiconductors for Hybrid Organic-Inorganic Solar Cells

Project Identifier 93564

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$561464
Cumulative Total Project Cost:	\$561464

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Cognitive Modeling of Human Behaviors

Project Identifier 93565

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$500708
Cumulative Total Project Cost:	\$500708

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Massive Graph Visualization

Project Identifier 93566

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$231600
Cumulative Total Project Cost:	\$231600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project A Dual Neutron+Gamma Source for the Fissmat Inspection for Nuclear Detection (FIND) System

Project Identifier 93567

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$370398
Cumulative Total Project Cost:	\$370398

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Parallel Computing in Enterprise Modeling: A Hybrid Approach

Project Identifier 93569

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$419130
Cumulative Total Project Cost:	\$419130

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Enhanced NaI Scintillation Detectors

Project Identifier 93581

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$300690
Cumulative Total Project Cost:	\$300690

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Portable Devices for Pen-Side Disease Diagnostics

Project Identifier 93582

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$403794
Cumulative Total Project Cost:	\$403794

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Plastic Neutron Detectors

Project Identifier 93583

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$268952
Cumulative Total Project Cost:	\$268952

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Scintillating Nanomaterials for New Radiation Detection Devices

Project Identifier 93584

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$413046
Cumulative Total Project Cost:	\$413046

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Explosives Detection by Photo-Ionization Ion Mobility Spectrometry

Project Identifier 93585

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$391873
Cumulative Total Project Cost:	\$391873

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Detection of Cell Phone and Wireless Systems

Project Identifier 93586

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$150257
Cumulative Total Project Cost:	\$150257

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Time-Frequency Enhanced Radar Processing for Foliage Penetration

Project Identifier 93589

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$83586
Cumulative Total Project Cost:	\$83586

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Secure Portal

Project Identifier 93590

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$235898
Cumulative Total Project Cost:	\$235898

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Human Perceptory Augmentation

Project Identifier 93592

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$741667
Cumulative Total Project Cost:	\$741667

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Advanced Hard Target Warhead

Project Identifier 93593

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$744031
Cumulative Total Project Cost:	\$744031

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Information System Situational Awareness

Project Identifier 93594

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$185548
Cumulative Total Project Cost:	\$185548

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Human Performance Modeling for System of Systems Analytics

Project Identifier 93595

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$378505
Cumulative Total Project Cost:	\$378505

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Enabling Immersive Simulation for Complex Systems Analysis and Training

Project Identifier 93596

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$402127
Cumulative Total Project Cost:	\$402127

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Pulse Power Integration for Advanced Electric Weapons Platform

Project Identifier 93597

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$199196
Cumulative Total Project Cost:	\$199196

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Void Sensor for Penetrators

Project Identifier 93600

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$412964
Cumulative Total Project Cost:	\$412964

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project High Energy Density for Electric Weapons Platforms

Project Identifier 93601

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$296463
Cumulative Total Project Cost:	\$296463

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Tracking Moving People With Radar Using High-Range-Resolution and Clutter Attenuation

Project Identifier 93602

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$231577
Cumulative Total Project Cost:	\$231577

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Miniature Air-Deliverable Guided Sensor System

Project Identifier 93603

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$406667
Cumulative Total Project Cost:	\$406667

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project The Physics of Threat/Target Interaction for Advanced Armor Development

Project Identifier 93605

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$402071
Cumulative Total Project Cost:	\$402071

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development of Nonproliferation and Assessment Scenarios

Project Identifier 93607

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$250009
Cumulative Total Project Cost:	\$250009

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Photonics for Ultrawideband Intrasatellite Communications

Project Identifier 93608

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$518726
Cumulative Total Project Cost:	\$518726

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Building Trusted Systems from Untrusted Components

Project Identifier 93609

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$474770
Cumulative Total Project Cost:	\$474770

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Micromechanical Resonators Applied to Shock Hardened, Covert Communications

Project Identifier 93611

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$462284
Cumulative Total Project Cost:	\$462284

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Infrared Detection and Power Generation Using Self-Assembled Quantum Dots

Project Identifier 93612

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$419314
Cumulative Total Project Cost:	\$419314

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Ultra-Thin Ultra-High-Efficiency Heterostructure Micro-Cooler for Satellite Sensing Applications

Project Identifier 93613

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$411814
Cumulative Total Project Cost:	\$411814

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Monolithically Integrated, Backside-Illuminated Photo Diode Array

Project Identifier 93615

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$400158
Cumulative Total Project Cost:	\$400158

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Shear Horizontal Surface Acoustic Wave Microsensors for Class A Viral and Bacterial Detection

Project Identifier 93617

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$358888
Cumulative Total Project Cost:	\$358888

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Post-CMOS Compatible Aluminum Nitride Resonant Accelerometers

Project Identifier 93618

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$322796
Cumulative Total Project Cost:	\$322796

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Hand Miniaturized BW Agent Detector for Real-time Detection of Concealed Agent Production

Project Identifier 93619

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$390042
Cumulative Total Project Cost:	\$390042

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Development and Application of Quantitative Proliferation Resistance Methodologies for Reprocessing Scenarios

Project Identifier 93622

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$276788
Cumulative Total Project Cost:	\$276788

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Collaborative Situational Awareness in Network-Centric Warfare

Project Identifier 93623

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$280672
Cumulative Total Project Cost:	\$280672

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Strategic Concepts for Information Superiority

Project Identifier 93625

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$575415
Cumulative Total Project Cost:	\$575415

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Ultra Low Power Management Circuit Design

Project Identifier 93626

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$255452
Cumulative Total Project Cost:	\$255452

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Multispectral Fusion for Beyond the Fence Intruder Detection and Assessment

Project Identifier 93628

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$289575
Cumulative Total Project Cost:	\$289575

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Novel Design for Improved Nuclear EMP Detection

Project Identifier 93629

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$178364
Cumulative Total Project Cost:	\$178364

Description of Project

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Sandia National Lab

Project Adaptive Antenna Tuning for Miniaturized Tag Transceivers

Project Identifier 93630

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$185500
Cumulative Total Project Cost:	\$185500

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project New Hash Function for Data Protection

Project Identifier 93633

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$302177
Cumulative Total Project Cost:	\$302177

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Software Evaluation in Virtualized Environment

Project Identifier 93635

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$435162
Cumulative Total Project Cost:	\$435162

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Borazine Precursors for Boron Nitride anti Friction Coatings for MEMS

Project Identifier 93636

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$376759
Cumulative Total Project Cost:	\$376759

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Multi-Scale Behavioral Analyses of Integrated Surety Designs

Project Identifier 93637

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$342498
Cumulative Total Project Cost:	\$342498

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Remotely Interrogated Passive Polarizing Dosimeter (RIPPeD)

Project Identifier 93639

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$331330
Cumulative Total Project Cost:	\$331330

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project New Approaches to Addressing the New Design Basis Threat

Project Identifier 93641

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$388830
Cumulative Total Project Cost:	\$388830

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Atmospheric Aerosols

Project Identifier 93652

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$21921
Cumulative Total Project Cost:	\$21921

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Process and Infrastructure Development for Integrated Three-Dimensional Mesomanufacturing

Project Identifier 94809

Principal Investigator

Point of Contact Westrich, Henry

Type of Research

Development
POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$53726
Cumulative Total Project Cost:	\$53726

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Reliable and Secure Communication in Wireless Sensor Networks

Project Identifier 94810

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$52600
Cumulative Total Project Cost:	\$52600

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Nanostructured Electrocatalyst for Fuel Cells: Silica Templated Synthesis of Pt/C Composites

Project Identifier 94811

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$27592
Cumulative Total Project Cost:	\$27592

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Piezoelectric Properties of Arrayed Nanostructures of Zinc Oxide for Sensor Applications

Project Identifier 94812

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$247499
Cumulative Total Project Cost:	\$247499

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Three-dimensional Analysis for Nanoscale Materials Science

Project Identifier 94814

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$248743
Cumulative Total Project Cost:	\$248743

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Tribological Studies of Microelectromechanical Systems

Project Identifier 94830

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$42080
Cumulative Total Project Cost:	\$42080

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Highly Pixelated Hypertemporal Sensors for Global Awareness

Project Identifier 95211

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$3746186
Cumulative Total Project Cost:	\$3746186

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Terahertz Microelectronic Transceiver (T μ T) System

Project Identifier 95214

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$3032101
Cumulative Total Project Cost:	\$3032101

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Microscale Immune Study Laboratory (MISL)

Project Identifier 95215

Principal Investigator

Point of Contact Westrich, Henry

Type of Research Applied

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$5570043
Cumulative Total Project Cost:	\$5570043

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Tunnel Gap Modulation Spectroscopy: An Ultrasensitive Technique for Measuring Small Mass Change

Project Identifier 96088

Principal Investigator

Type of Research Basic

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$28989
Cumulative Total Project Cost:	\$28989

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Optical Properties of Plasmonic Metal-dielectric Composites

Project Identifier 96299

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$26300
Cumulative Total Project Cost:	\$26300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Sandia National Lab

Project Dynamics of Propagating Shock Waves and Phase Fronts

Project Identifier 98105

Principal Investigator

Type of Research Applied

Point of Contact Westrich, Henry

POC Phone 505-844-9092

FY 2007 Project Costs

Total:	\$26300
Cumulative Total Project Cost:	\$26300

Description of Project

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Savannah River Plant

Project Electrical Heat Standards for Calorimetry

Project Identifier SR05020

Principal Investigator Collins, Susan

Type of Research Applied

Point of Contact Rabun, Robert

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$582
Cumulative Total Project Cost:	\$97800

Description of Project

Develop and demonstrate that electrical heat standards (EHS) that can be used to check calorimetry performance instead of calibrated plutonium sources. This system would need to be able to accommodate the various wattage ranges of calorimeters in the lab. Also, the electrical heating portion of the system must be designed such that it can be placed into many geometric configurations as an actual standard.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Savannah River Plant

Project Modeling of Pressure Swing Adsorption Separation Process

Project Identifier SR05023

Principal Investigator Becnel, James

Type of Research Applied

Point of Contact Rabun, Robert

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$38761
Cumulative Total Project Cost:	\$194424

Description of Project

This project will revise and expand a Pressure Swing Absorption model developed in a prior scoping study to handle isotopic separations while incorporating the most recent advances in PSA process design.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Savannah River Plant

Project Low Cost, High Flux Ni-Ti-Nb Hydrogen Purification/Separation Membrane Development

Project Identifier SR05027

Principal Investigator Adams, Thad

Type of Research Applied

Point of Contact Rabun, Robert

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$95409
Cumulative Total Project Cost:	\$313950

Description of Project

This research is focused on the fabrication and testing of a model Ni-Ti-5A (5A=Nb, Ta, V) alloy system namely, Ni-Ti-Nb alloys for hydrogen purification/separation membrane applications. The central point of this research will be to evaluate the microstructural affects on permeation and mechanical stability.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Savannah River Plant

Project Synthesis of Metal Hydrides by Mechanical Alloying at Elevated Temperatures in a High Speed Attritor

Project Identifier SR05029

Principal Investigator Fox, Kevin

Type of Research Applied

Point of Contact Rabun, Robert

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$75218
Cumulative Total Project Cost:	\$242328

Description of Project

This task will develop a process to produce the metal hydrides required for tritium processing on-site and for R&D. Alloys will be produced by mechanically alloying at elevated temperatures in a high speed attritor mill under a controlled atmosphere.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Savannah River Plant

Project Permeation-resistant Coated Gloves for Gloveboxes

Project Identifier SR05041

Principal Investigator Korinko, Paul

Type of Research Applied

Point of Contact Rabun, Robert

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$30317
Cumulative Total Project Cost:	\$141948

Description of Project

A scoping study conducted previously indicated that a coating exists that would reduce oxygen and moisture permeation into gloveboxes. In this followon project, the coating adhesion and stability will be studied to determine the coating failure mechanism. The tritium compatibility will be determined using a life storage methodology, and gloves will be selectively placed into service.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Savannah River Plant

Project Demonstration of Pressure Swing Adsorption (PSA) Separation Processes

Project Identifier SR05047

Principal Investigator Sessions, Henry

Type of Research Applied

Point of Contact Rabun, Robert

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$197753
Cumulative Total Project Cost:	\$590739

Description of Project

This project will build, operate, and demonstrate a Pressure Swing Adsorption apparatus at essentially full-plant-scale. The equipment will be full-scale because full scale throughput is so compact that there is little incentive to scaling it down. Phase I will demonstrate the PSA process for separating hydrogen from "inerts". This Phase will serve 2 purposes: 1) validation and verification of the scoping study model, and 2) demonstration of a "real-world" process which could replace the separation systems in the Tritium Facilities. Phase 2 will use the same apparatus to demonstrate PSA hydrogen isotopic separation using a feed mixture of protium and deuterium.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Savannah River Plant

Project Compact ExB Mass Spectrometer for Hydroden Isotopic Analysis

Project Identifier SR07002

Principal Investigator Spencer, William

Type of Research Applied

Point of Contact Rabun, Robert

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$142748
Cumulative Total Project Cost:	\$142748

Description of Project

Design and build a compact, crossed field, electrostatic and magnetic sector, double focusing mass spectrometer for hydrogen isotopic analyses support.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Savannah River Plant

Project Stainless Steel Surface Treatments for Mass Spectroscopy Systems

Project Identifier SR07005

Principal Investigator Clark, Elliot

Point of Contact Rabun, Robert

Type of Research

Development
POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$175081
Cumulative Total Project Cost:	\$175081

Description of Project

Evaluate the performance of 6 to 8 commercially available surface coatings and surface treatments in maintaining chemical and isotopic purity of deuterium-tritium gas mixtures in stainless steel containers.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Savannah River Plant

Project Short Range Wireless Sensor Network for Hot Tritium Cell

Project Identifier SR07006

Principal Investigator Cordaro, Joseph

Point of Contact Rabun, Robert

Type of Research

Development
POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$220933
Cumulative Total Project Cost:	\$220933

Description of Project

Develop temperature and oxygen sensors with wireless transmission capability for use in the harsh, high-radiation environment of the Target Rod Preparation Module. Special requirements include the ability to transmit through 5 foot concrete shielding but be undetectable outside of the building and the ability to be installed or replaced remotely.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Savannah River Plant

Project Safe Analysis of Tritiated Water from Glovebox Atmospheres and Solidification of the Tritiated Water for SRS Disposal

Project Identifier SR07010

Principal Investigator Sigg, Ray

Point of Contact Rabun, Robert

Type of Research

Development

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$255097
Cumulative Total Project Cost:	\$255097

Description of Project

Develop a method for the safe determination of tritium concentration in water collected in tritium processes and develop an approved disposal path for the water with tritium concentrations below levels that would be beneficial to recover.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Savannah River Plant

Project Hydrogen Isotope Recovery Using a Proton Exchange Membrane (PEM) Electrolyzer

Project Identifier SR07011

Principal Investigator Ekechukwu, Amy

Point of Contact Rabun, Robert

Type of Research

Development

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$263604
Cumulative Total Project Cost:	\$263604

Description of Project

Develop and demonstrate low-temperature PEM electrolysis to “crack” water vapor to support tritium recovery as a replacement of the existing magnesium beds. Determine tritium compatibility of electrolyzer materials and expected component life.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Savannah River Plant

Project Modeling the IR Transitions of the Isotopologues of Ammonia, Methane, and Water

Project Identifier SR07033

Principal Investigator Lascola, Robert

Type of Research Applied

Point of Contact Rabun, Robert

POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$53167
Cumulative Total Project Cost:	\$53167

Description of Project

Calculate the vibrational frequencies of the heavier isotopes of known trace/impurity gases and generate data for species which are difficult to synthesize or isolate. The model will be validated against measured known values for protiated species of methane and ammonia and then used to calculate frequencies for deuterated and tritiated species in support development of detectors.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Savannah River Plant

Project Development of Multi-component Isotherms and Thermodynamic Models for Palladium

Project Identifier SR07047

Principal Investigator Scogin, John

Point of Contact Rabun, Robert

Type of Research

Development
POC Phone 803-208-8755

FY 2007 Project Costs

Total:	\$290185
Cumulative Total Project Cost:	\$290185

Description of Project

Determine the multi-isotope Pressure-Composition-Temperature (PCT) data for palladium and the hydrogen isotopes. Develop a thermodynamic model to accurately describe the data.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Savannah River National Lab

Project Advanced RNA and protein-based tools that enable use of microbial systems as in situ sensors

Project Identifier LD06-EM02-014

Principal Investigator Bagwell, Christopher

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$174467
Cumulative Total Project Cost:	\$193167

Description of Project

The innate ability of bacteria to survive, grow, and thrive in the environment is encoded in DNA. Coordinated biochemical expression of DNA allows bacteria to sense their environment and respond quickly to favorable and unfavorable conditions. The environment, therefore, constrains the expression of genes and proteins in bacteria. Consequently, tools that describe these biochemical responses would provide an accurate and sensitive measure of local environmental conditions and of bacterial activities. The focus of this LDRD project is to expand the application of molecular biological techs to provide comprehensive and diagnostic information about intact, whole bacterial systems, thereby enabling their use as in situ and real-time sensors of environmental conditions and bio-processes.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Savannah River National Lab

Project Advanced Spent Fuel Recycling Technology: Ionic Liquid Electrochemical Extraction

Project Identifier LD06-EM04-076

Principal Investigator Adams, Thad

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$303155
Cumulative Total Project Cost:	\$362083

Description of Project

The dev. of a novel spent fuel reprocessing tech making use of a novel class of electrolytes (Ionic Liquids (ILs)) combined with electrorefining offers the unique possibility for a single step process to effectively dissolve commercial spent fuel (cladding and pellets) and actinide species (U, Pu) from the electrolyte that can be used in the production of "fresh" fuels for future power production. The dev of this tech will focus on several major areas: 1) evaluation of the solubilizing characteristics of several diff. commercially available ILs for select metallic species—temperature, reaction kinetics, 2) measurement of reduction potentials using cyclic voltammetry for electrowinning of dissolved metallic species onto a working electrode, and 3) long term radiochemical stability of ILs.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project Low Temperature Waste Forms and Containment: Geopolymers vs. Hydroceramics vs. Steam Reformed Materials

Project Identifier LD06-EM05-092

Principal Investigator Jantzen, Carol M.

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$151185
Cumulative Total Project Cost:	\$175259

Description of Project

The geopolymer research proposed examine the anion and radionuclide retention of aluminosilicates that are formed at ambient temp and compare their retention to hydroceramic and/or steam reformed mineral waste forms. The gellation time and fluidity properties will be examined and the radiolytic stability of the geopolymers assessed in terms of H2 generation. Geopolymers are unique in that they are inorganic and amorphous while hydroceramics (zeolites) and steam reformer minerals (feldspathoids) are crystalline. The amorphous and crystalline waste forms all use metakaolin as the polymerizing/mineralizing agent in conjunction with a source of alkali and/or steam which activates the reactions.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Savannah River National Lab

Project Application of Strategic Glass Formulation and Heat Treatment Effects to Control Pore Size and Pore Size Distribution of HGMs

Project Identifier LD06-ES01-008

Principal Investigator Peeler, David

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$190478
Cumulative Total Project Cost:	\$230814

Description of Project

SRNL has recently developed hollow glass microspheres (HGMs) with porous glass walls. Although hydrogen storage potential in the porous walled HGMs has been demonstrated, the glass composition and resulting porosity has not been optimized, nor has a fundamental understanding been achieved of the compositional and kinetic effects that ultimately control the pore morphology, size and distribution of the HGMs. The primary objective of this proposal is to obtain a fundamental understanding of the parameters that control pore morphology, size and/or pore distribution so that porous walled HGM's can be tailored and optimized to meet multiple applications which require different end-state physical characteristics.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project Systematic Evaluation of Hydrogen Production by Diverse Cyanobacterial and Green Algal Strains

Project Identifier LD06-ES02-054

Principal Investigator Yeager, Chris M.

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$162074
Cumulative Total Project Cost:	\$181098

Description of Project

The goal of this project is to develop a systematic approach for evaluating the H₂-producing characteristics of phototrophic microorganisms. We will test and develop optimal culture conditions for H₂ production using diverse cyanobacteria and green algae (~30 strains). The effects of diel cycle, O₂ tension, nutrients, and temperature on culture growth and H₂ production will be evaluated. DNA-based molecular probes will be developed to characterize the diversity of hydrogenases and nitrogenases in cultured strains and directly from the environment. This research will generate basic knowledge concerning the diversity and function of bacterial and green algal H₂-producing enzymes and a robust, systematic method of evaluating H₂-producing potential of different cyanobacteria and green algae.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project Advanced Titanium-Based Sorbents and Applications for Their Use

Project Identifier LD06-GEN-018

Principal Investigator Hobbs, David

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$266766
Cumulative Total Project Cost:	\$280109

Description of Project

This project will explore synthetic methods to modify particle morphology and surface characteristics of titanium-based sorbents and conduct proof of principle tests with these materials for the separation of metal ions in a variety of applications including radiochemical separations, medical isotope production, treatment of commercial waste waters and dialysis. Testing will also investigate incorporating the sorbents into membranes or other engineered forms for deployment in filtration and continuous treatment systems.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project Artificial Nose Technology: Fluorescent Labeled DNA Optical Sensor Arrays with Enhanced Sensitivity and Selectivity for Detection of Biological Agents

Project Identifier LD06-NS04-030

Principal Investigator McWhorter, Scott

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$295004
Cumulative Total Project Cost:	\$309099

Description of Project

This project utilizes a novel application of DNA tech coupled with highly sensitive LIF detection (dtxn) to selectively bind and detect trace levels of biological agents (BAs) while being easily adaptable to agents of unknown or RMT. The advantages of such an approach are the ability to exert rational control over design, development, and deployment of sensing materials that can be uniquely specified, mass produced, have large combinatorial potential, and can be screened using high-throughput methods. This tech has been successfully demonstrated for vapor phase dtxn of toxic chemicals and explosives at trace levels, and may be easily applied to aerosol phase detection of BAs.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Savannah River National Lab

Project Detection of viral-size particles and nanomaterials in aerosols as surrogates for biological and chemical weapons.

Project Identifier LD06-NS04-052

Principal Investigator Brigmon, Robin L.

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$164916
Cumulative Total Project Cost:	\$195232

Description of Project

The ability to detect and defend against nanomaterials developed into Weapons of Mass Destruction (WMD) is critical to our National Defense. Potential WMD agents include the viruses Ebola, Marburg, Small pox, and various encephalitis strains. These viruses are all generally <100 nm in size and could be disseminated in aerosols and may survive in the environment for days. Some nanomaterials can be dangerous in themselves as carbon nanotubes have been demonstrated to accumulate in the lungs. In this project we will use commercially available particles as surrogates for WMD agents. We will use the SRNL developed ALPES, ACE, and/or SOLACE systems for detecting nano-scale particles in aerosols.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project Development of Nano-Scale, High-Efficiency Proportional Counters

Project Identifier LD06-NS04-080

Principal Investigator Serkiz, Steven

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$188520
Cumulative Total Project Cost:	\$224853

Description of Project

The proposed research is to utilize the unique properties (both physicochemical and scale) of metal-doped carbon nanotubes (CNTs) to develop a low-voltage gas proportional counter (PC) capable of radiation energy discrimination. There are three primary technical issues: scale effect; radiation stability; and the ability to fabricate oriented, nanoscale carbon electrodes. Each of these technical issues will be addressed in the subject work. If successful, the work could result in the development of a new generation of low-cost, robust, field deployable, radiation detectors that could be utilized by NNSA for border monitoring and EM for inexpensive field monitoring.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Savannah River National Lab

Project Radiotracer Method for Measuring Hydraulic Conductivity of Cementitious Materials

Project Identifier LDRD070079

Principal Investigator Langton, Christine

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$59847
Cumulative Total Project Cost:	\$59847

Description of Project

The objective of this task was to collect data to support the concept of measuring mass transport and mass flux of water and chemical species through cementitious materials using radiotracer. This work was intended to provide proof of principle for the concepts outlined in invention disclosure, SRS 07-003, Radiotracer Method for measuring permeability of cementitious materials. Researcher collaborated is expected to result in a method and prototype device for the radiotracer method.

The expected results include: 1) Data on transport properties of water and chemical species through cementitious materials, 2) Demonstration of the radiotracer method, 3) Radiotracer test method suitable for laboratory measurements, and 4) Platform for extending the concept to an in-situ field test method.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project In situ Generation of Oxygen Releasing Metal Peroxides

Project Identifier LDRD070081

Principal Investigator Denham, Miles Edwin Jr.

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$35632
Cumulative Total Project Cost:	\$35632

Description of Project

In 1997 a field demonstration was conducted that injected Fenton's Reagent into the subsurface to destroy non-aqueous phase solvents. Monitoring of the site showed elevated levels of dissolved oxygen in groundwater for more than 3 years, possibly the result of thermodynamically favored solid peroxides precipitated during the injection. To test this, 3 oxidant solutions were reacted with water saturated with gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) in the presence and absence of soil. The solutions without soils were filtered, the filters dried, re-hydrated and analyzed for dissolved oxygen. Another set of filters were examined with SEM to look for evidence of peroxide precipitation. The samples with soils were dried, re-hydrated and analyzed for dissolved oxygen.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project Feasibility of Perfluorinated Liquids as Collection Media for Biodetection

Project Identifier LDRD070158

Principal Investigator Kingsley, Mark

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$44317
Cumulative Total Project Cost:	\$44317

Description of Project

A strong need exists for liquid-based biocollection technologies that preserve the viability of collected microorganisms and the integrity of their nucleic acid signatures. Current dry particle collectors do not maintain viability of collected vegetative microbes. SRNL particle collection device, such as ALPES, (Aerosol-to-Liquid Particle Extraction System) provide a liquid-based particle collection platform that may be optimized for vegetative cell biocollection. Although aqueous media preserve viability of microorganisms better than dry particle collectors, there is still a chance for secondary microbial growth or loss during long intervals of operation or at remote locations where refrigeration of collected samples is problematic.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Savannah River National Lab

Project Neutron-Capture-Induced Irradiation of Polymers

Project Identifier LDRD070161

Principal Investigator Hoffman, Elizabeth

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$49515
Cumulative Total Project Cost:	\$49515

Description of Project

Degree of cross-linking strongly affects the mechanical strength and chemical, thermal, radiation, and permeation resistance in polymers. Boron containing polystyrene and poly(methyl methacrylate) samples were synthesized and irradiated at the University of Missouri at a flux rate of 1×10^{14} . Irradiation resulted in significant changes of optical properties. Fourier transform infrared spectroscopy found no measurable change in chemical surface termination and functional groups between the irradiated and non-irradiated materials. The results confirm theoretical models that propose the reaction between a neutron and boron atom yields an alpha particle, leading to cross-linked polymers with improved properties. Further research into irradiation time and flux rate is necessary.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project Evaluation of potential side-effects of sequestering agents used for in-situ remediation of contaminants

Project Identifier LDRD070177

Principal Investigator Paller, Michael H.

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$48751
Cumulative Total Project Cost:	\$48751

Description of Project

This project determined whether amendments used to immobilize metals in soil and submerged sediments have potentially harmful effects on aquatic organisms. The amendments included phosphates, organoclays, and biopolymers used to construct novel "active" caps that prevent the migration of sediment contaminants into water. Sand, which is often used to construct conventional passive caps, was also tested. Amendment toxicity was evaluated with freshwater and saltwater 10-day sediment toxicity tests using *Hyalloella* or *Leptocheirus*. Most materials including sand were associated with significant mortality of test organisms unless diluted with natural sediment. Mortality may have been associated with particle size, texture, viscosity, or salinity rather than toxic impurities.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project Characterization of Volatile Components in Zircalloy Fuel Hulls

Project Identifier LDRD070181

Principal Investigator Crowder, Mark L.

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$51713
Cumulative Total Project Cost:	\$51713

Description of Project

Zircalloy fuel hulls make up about 25% of the spent nuclear fuel in the United States. Leading treatment options – recycle and waste alloy processing – require heating, which causes release of tritium. This study demonstrated a simple method to evaluate the tritium content of hulls via oxidation of the hull and capture of the volatilized tritium in liquids. Prior to testing, the oxidation time for zircalloy hulls was calculated based on literature data to be two hours at 1000 °C. Hull portions were heated to 1000 °C in air inside a thermogravimetric analyzer (TGA). The TGA off-gas was bubbled through traps containing water, 5% nitric acid/10% hydrogen peroxide, or ethylene glycol.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Laboratory Savannah River National Lab

Project Carbon Nanotube Electrodes for Ultracapacitors

Project Identifier LDRD070183

Principal Investigator Zidan, Ragaiy

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$40673
Cumulative Total Project Cost:	\$40673

Description of Project

The goal of this research is to synthesize carbon nanotube samples for evaluation as potential ultracapacitor materials. We have experience with creating unsupported nanotubes, and nanotubes supported on insulating substrates. We will develop and optimize conditions for creating carbon nanotube materials on conductive substrates. Based on our previous research and experience the nanotubes will be doped with Fe alone, or Fe combined with Ti (or other metals) to promote branching of the nanotubes[3-6].

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Savannah River National Lab

Project Local Structural Environment Analysis of Plutonium and Neutron Absorbers in a Lanthanide Borosilicate Glass

Project Identifier LDRD070211

Principal Investigator Marra, James C.

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$36180
Cumulative Total Project Cost:	\$36180

Description of Project

A lanthanide borosilicate (LaBS) glass is a candidate for long-term immobilization of plutonium. There is currently no experimental data to facilitate understanding of how plutonium is incorporated into the vitreous matrix and its role in the glass structure. The “clustering” of Pu within the glass was discovered from microstructural analyses at SRNL. Researchers at the SIA Radon institute performed X-ray Absorption Near Edge Spectroscopy (XANES), Extended X-ray Absorption Fine Structure Spectroscopy (EXAFS), and Infrared Spectroscopy (IR) on actual Pu containing glass samples to determine valence state, coordination number, and bond lengths of species of interest in the glass.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Laboratory Savannah River National Lab

Project Optical modeling for proof of concept of a high finesse hemispherical lens cavity for use as a portable, hand-held, monolithic cavity ring-down spectrometer

Project Identifier LDRD070220

Principal Investigator Mcwhorter, Christopher S.

Type of Research Basic

Point of Contact French, Thomas

POC Phone 803-725-3711

FY 2007 Project Costs

Total:	\$33278
Cumulative Total Project Cost:	\$33278

Description of Project

Cavity ring-down spectroscopy (CRDS) is a highly sensitive technique for detecting trace amounts of analytes (i.e., sub-ppb levels). Typical CRDS cavities consist of two mirrors of ~99.99% reflectivity separated by 0.1 to 1m. A pulse of light is introduced into the cavity and makes thousands of trips in the cavity and depending on the gas present in the cavity; a measure of the loss of light over time is dependent on the mirror reflectivity, length of the cavity, and concentration of the absorbing species within the cavity.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project UNCC Hole Plate

Project Identifier Y1202105

Principal Investigator Moor, Pamela

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$126396
Cumulative Total Project Cost:	\$516006

Description of Project

This task seeks to evaluate a commercial hole-plate artifact for potential use as a tool for monitoring the contribution of machine geometry errors to the overall measurement uncertainty. It will provide a useful software tool for shop workers to estimate the uncertainty of measurements taken with Coordinate Measuring Machines (CMMs).

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project High Accuracy, High Density

Project Identifier Y1203014

Principal Investigator Rasnik, Bill

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$5980
Cumulative Total Project Cost:	\$337275

Description of Project

This project seeks to demonstrate a calibrated uncertainty artifact and data analysis technique that meets the appropriate characterization requirements as requested by National Laboratory physicists. An assessment of current and likely future requirements for characterizing Y-12 components including data density, location, and measurement uncertainty will be made. A prototype artifact(s) will be designed and acquired. Development and demonstration of prototype calibration and analysis techniques will be performed.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Advanced SDOR

Project Identifier Y1203039

Principal Investigator Morrell, Jonathan

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$131780
Cumulative Total Project Cost:	\$1256133

Description of Project

This project will determine if a uranium button can be produced by using a modified Saltless Direct Oxide Reduction (SDOR) technology.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Cone Beam X-ray CAT scan

Project Identifier Y1204006

Principal Investigator Arrowood, Lloyd

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$72810
Cumulative Total Project Cost:	\$801620

Description of Project

The project will seek to demonstrate the efficacy of computed tomography (CT) to produce volumetric images of stockpile components with sufficient spatial resolution to permit metrology measurements; quantify the effects of noisy, missing or limited-angle data on the quality of these volumetric images and their metrology; and produce calibration tools that would accommodate a rapid setup and teardown of a CT system in one of our multi-use radiography facilities by radiographers.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Process Radiation Detector System

Project Identifier Y1204037

Principal Investigator Mooney, Larry

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 865-574-1821

FY 2007 Project Costs

Total:	\$22639
Cumulative Total Project Cost:	\$429980

Description of Project

This project will develop a radiation detector system capable of in process assay of special nuclear material. The system will be comprised of a variety of radiation detectors whose use and capability are selected to match the application and its requirements. Each detector and support hardware will be remotely accessible via a secure communications network which will provide the capability to configure and control each detector. This project will result in the design and development a prototype of a radiation detector system that will automate measurements used in inventory determination. The system will monitor radioactive material in situ via remote workstations and will result in the capability to perform continuous monitoring of process equipment and material inventory.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Slag Reprocessing

Project Identifier Y1204041

Principal Investigator Morrell, Jonathan

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$106201
Cumulative Total Project Cost:	\$313251

Description of Project

Current production of uranium buttons from sealed bomb reductions requires the by-product slag (fluoride salts) to be stored prior to further processing because it contains a small amount of enriched uranium that must be recovered. The goal of this project is to develop a means to separate uranium from existing slag inventory by a eutectic slag approach and thus eliminate the need to process it through the waste recovery facility. If successful, the legacy slag that is currently being stored can be processed and disposed of without having to start the aluminum nitrate recovery facility. In turn, this will lower the amount of waste that enters primary extraction.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Next Generation MW

Project Identifier Y1204045

Principal Investigator Ripley, Ed

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$756235
Cumulative Total Project Cost:	\$3416420

Description of Project

This project will develop and prove new and advanced techniques and equipment for microwave melting of metals. This will result in a simple, robust and repairable/maintainable system that will be capable of melting, casting and cooling the cast part at a rate that ensures the best mechanical and material properties. Techniques and designs to control final product quality in the microwave will be developed and conceptually proven. This includes separate heating and cooling control of components of the melt stack to control material properties to meet material specifications. The approach will be twofold: material property control methods in the current microwave design, plus radical new multi-chamber concepts allowing leap-ahead discoveries in metals processing using microwave energy.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Crucible Materials Thermo Modeling

Project Identifier Y1204110

Principal Investigator Bullock, Jon

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$59165
Cumulative Total Project Cost:	\$184016

Description of Project

Currently-used metal-oxide-coated graphite crucibles impose a temperature limitation on our casting operations, and are the source of performance-degrading carbon impurities. This project will use a combination of computational and experimental resources to search for new crucible materials appropriate for all casting charges of interest to Y-12 and its clients. Our technical goal is to identify a number of crucible materials that, either as free-standing structures or coatings on a backbone, are stable toward uranium and its NWC-related alloys well above the temperatures associated with metal-oxide-coated graphite. By relying heavily upon numerical modeling, we are following Y-12 Technology Roadmap guidance.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project UM - Optimet

Project Identifier Y1204135

Principal Investigator Babelay, Ed

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$176745
Cumulative Total Project Cost:	\$332271

Description of Project

This project will establish a research activity at the University of Michigan (UM) to provide technology that may help Y-12 meet challenging dimensional inspection needs while acquainting faculty and students with the challenges and career opportunities available at Y-12. UM will perform the initial work to make use of available equipment and staff expertise. Prototype equipment will be purchased for installation at Y-12 so that Y-12 can gain experience with the system and provide additional guidance to the UM optimization activities. A prototype system will be developed that is capable of performing profile measurement on hemispherical work pieces in less time than with conventional gauging systems. It will be demonstrated with a profile measurement accuracy target of 1.25 microns.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Machining Uranium and Uranium Alloys

Project Identifier Y1204138

Principal Investigator Morrell, Johnathan

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$214917
Cumulative Total Project Cost:	\$449632

Description of Project

A new generation of titanium-based cutting tool coatings have been introduced to the machining world but not yet successfully tested on uranium and its alloys. This project will develop a superior tool and evaluate it. New coatings will be designed in conjunction with Purdue University and deposited on tool materials using conventional methods. The tools will be subjected to materials mimicking uranium (e.g., stainless steel) and its alloys to evaluate tool life, process parameters, and part effects. The work will include the ranking of coated tools for specific metals and machining operations and investigate the wear of these tools in terms of mechanical and thermal factors encountered during machining.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Ultrasonic Vibration of Molten Metals

Project Identifier Y1204141

Principal Investigator Holt, Jerrid

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$99194
Cumulative Total Project Cost:	\$216551

Description of Project

This project will observe the behavior of unalloyed uranium when subjected to high-power ultrasonics to determine whether or not this process will aid in the purification of uranium as well as reduce the grain size. The behavior of a sample ingot of uranium-niobium alloy will be observed when subjected to high-power ultrasonics to fully homogenize the melt and refine the grain structure as a proof of principle. This is a known technology that has been prominent in the aluminum alloy industry for a number of years both in purification and homogenization.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Inventory Verification Using Time-of-Flight Measurements with Surface Acoustic Wave Transponders

Project Identifier Y1205008

Principal Investigator Stinson, Brad

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$395312
Cumulative Total Project Cost:	\$395312

Description of Project

The project aims to employ surface acoustic wave (SAW) transponders attached to material storage containers to provide both active seals and active location monitoring. Each SAW transponder consists of a crystalline structure that produces a unique response when excited by a radio frequency (RF) signal. The unique response and the time-of-flight (TOF) of the RF signals can be used to determine spatial location information for each transponder relative to an antenna. Software and hardware will be developed.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Metallographic Digital Image Control

Project Identifier Y1205014

Principal Investigator Dekanich, Steve

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$103627
Cumulative Total Project Cost:	\$103627

Description of Project

ASTM Committee E04 has jurisdiction over metallography standard methods, practices, nomenclature, definitions, and procedures for presenting data. In previous meetings, the committee recognized the need for digital image control and is setting the need for digital image control as a priority topic for future meetings. There is a handful of professionals serving on the E04 Committee. Significant interest from Y-12 and the design labs would give us the opportunity to have the majority vote on metallographic digital image control standardization not only for Y-12 but also for the nation. This endeavor is addressed in the scope of the ASTM Committee E04 on Metallography that encourages liaison with other ASTM committees and with national and international groups for standardization.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Methyl Chloroform Replacement

Project Identifier Y1205024

Principal Investigator Brown, Sam

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 865-574-1821

FY 2007 Project Costs

Total:	\$72327
Cumulative Total Project Cost:	\$72327

Description of Project

The current supply of methyl chloroform is limited and its availability is uncertain. As such, an alternative must be found before the current supply is exhausted. Lithium hydride/deuteride is also highly reactive material and potential cleaning agents compatible with it are limited. The project will identify a number of potential replacements and determine their incompatibilities and potential application problems. From that list, candidate materials will be selected and a series of experimental prove-in tests will be conducted. Based upon the experimental results, a recommended replacement material will be selected.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Y-12 Plant

Project Microcantilever Transducers: Next Generation of Gas Diagnostics

Project Identifier Y1205032

Principal Investigator DeVault, Gerald

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$225768
Cumulative Total Project Cost:	\$655594

Description of Project

A microcantilever (MC)-based gas sensor will be designed and developed with the goal of simultaneous detection of a select group of gas species. In Phase I, the prototype MC sensor will be designed and tested for its sensitivity, selectivity, and dynamic range. It will be configured in spatially-dense arrays for sensing of four or five species. The prototype will be a small device that would connect through a stainless-steel fitting. Data will be collected remotely through a laptop computer. Phase II will evaluate the MC sensor in a series of experiments that will be designed to simulate the conditions potentially found in the stockpile. Phase III, will demonstrate proof-of-principal that the technology will work at Y-12 under actual surveillance conditions.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Enhancing Inductively-Coupled Plasma Mass Spectrometry with Ion Mobility

Project Identifier Y1205033

Principal Investigator Schaaf, Thomas

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$30710
Cumulative Total Project Cost:	\$354081

Description of Project

This project will develop ion mobility (IM) technology for quantitative trace element determination by ICP-MS. An IM cell will be constructed and coupled to an existing mass spectrometer with an ICP ionization source. Experiments will lead to incorporation of IM technology into state-of-the-art ICP-MS instrumentation and enable direct comparison to current analytical capabilities on similar types of samples. Following efforts will incorporate IM technology in high-precision isotope ratio measurements providing preferred resolution and stability for adequate statistics. An ICP source and ion mobility cell will be incorporated into an existing magnetic sector instrument which will be tested using industry isotope ratio standards and compared with currently utilized technology.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Large Alpha-Uranium Single Crystals

Project Identifier Y1205040

Principal Investigator Bullock, Jon

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$136254
Cumulative Total Project Cost:	\$249569

Description of Project

The rationale for this project and the intended direction of effort is laid out in the report Y/DZ-2420, "Proposed Process for Growing Large Alpha-Uranium Single Crystals". Once a uranium rod has been subjected to extended grain growth in the high-gamma region, it will be taken through the gamma-beta and beta-alpha solid-state transitions using a Bridgeman-type crystal-growth process. The alpha-uranium single-crystal rod will then be machined into desired shapes and characterized.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Purification by Drip Casting

Project Identifier Y1205047

Principal Investigator Cecala, David

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$51477
Cumulative Total Project Cost:	\$51477

Description of Project

A previous PDRD investigation performed several experiments using drip casting of briquetted chips in non-carbon crucibles. Experimental results showed a significant carbon decrease which was higher than that observed in flotation experiments. Given the limited number of experiments a substantiated explanation to this phenomena could not be given. It is the goal of this project to reproduce the results of the previous study and to determine if significant reductions can be obtained at higher contamination levels. The experimental plan of this project will involve a study that will consist of 24-30 runs with the following parameters: initial carbon content of the chips (two levels of impurity), heat source (microwave, VIM, resistance furnace), and heating times (3 times to be determined).

**United States Department of Energy
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Production Plant Y-12 Plant

Project Purification of Uranium by Electrorefining

Project Identifier Y1205048

Principal Investigator Cecala, David

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$338707
Cumulative Total Project Cost:	\$870985

Description of Project

Electrorefining is a metallurgical separation technique that has successfully been used to recover uranium from fission products and other components of spent fuel from the Experimental Breeder Reactor II. Consequently, this technique may work for separating pure uranium from other elements or impurities. This technique has the potential of greater throughput and greater purity than any of the other alternative techniques that are being assessed. Depleted uranium with various levels of impurities will be shipped to Argonne National Lab for electrorefining. Electrorefined metal would be shipped back to Y-12 for evaluation.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Pin Extensions

Project Identifier Y1205064

Principal Investigator Yearwood, Cecil

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$109929
Cumulative Total Project Cost:	\$296933

Description of Project

This project will evaluate alternate joining processes for welding extensions. Various resistance welding processes appear well suited to this application. Factors to be considered are design of the extension, metallurgical compatibility of the materials with the process, process repeatability relative to weld size and strength as well as the potential for adverse effects to the assembly. Laser welding would be an alternate process that will be considered since electron beam welding, the other high energy beam process was successful in this application.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Personal Radiation Detection Instrumentation (PRDI) Alternatives

Project Identifier Y1205069

Principal Investigator Angelo, Peter

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$11926
Cumulative Total Project Cost:	\$867016

Description of Project

This project presents a new approach to compensatory CAAS annunciation that seeks to eliminate frequent and costly OSR/TSR violations associated with the current use of PRDIs. The focus will be on technologies that enable a non-nuclear mobile emergency notification system specific to CAAS annunciation. The system is envisioned as a personal annunciation device or a functionally equivalent device that is unique for an individual and is integrated with actuation of the existing CAAS system.

The project will: 1) identify root cause of violations with PRDI usage, 2) establish criteria for compensatory annunciation, 3) design a prototype device/system to replace PRDIs, 4) verify proof of principle prototype, and 5) qualify prototype with representative facility CAAS testing.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Nanostructured Super Material Machine Tools

Project Identifier Y1205072

Principal Investigator Seals, Roland

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$192789
Cumulative Total Project Cost:	\$684730

Description of Project

This project will develop and demonstrate an optimized nanostructured tool and its fabrication and evaluation, and lay the foundation for new approaches to efficiently fabricate ceramic and metal alloy components. Two manufacturing approaches will be tried. In the first, raw materials would be milled into powder, blended into a slurry with single-wall, carbon nanohorns, and/or multi-wall carbon nanotubes, consolidated by hot pressing into net shapes, densified by (reactive) sintering, finished by polishing to form tool edges, and evaluated by machining metal and ceramic coupons. In the second approach, carbon-nanocarbon-metal composite structures would be developed for evaluation. Aluminum coupons would be machined to determine tool wear performance relative to other industrial tools.

United States Department of Energy
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Production Plant Y-12 Plant

Project Mechanical Properties of Uranium at Very High Temperatures

Project Identifier Y1205086

Principal Investigator Smith, Ben

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$278524
Cumulative Total Project Cost:	\$278524

Description of Project

High temperature testing of uranium must be done in a vacuum furnace. This complicates measuring Young's Modulus and Poisson's Ratio since they rely on very accurate extension readings. A means of attaching an extensometer to a specimen through the furnace wall without affecting readings must be devised. A load frame and vacuum furnace are available but, the furnace does not appear to have provisions for attaching an extensometer to the specimen, nor does the load frame have electronics for extensometer signal conditioning. The first of the project will involve analyzing and, possibly, modifying the furnace with newer technology to allow using an extensometer. Heating element configuration will probably prohibit this. If so, the second phase of acquiring new equipment will begin.

United States Department of Energy
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Production Plant Y-12 Plant

Project Advanced Hydrogen-Getter Analysis

Project Identifier Y1205089

Principal Investigator Gerald, DeVault

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$10912
Cumulative Total Project Cost:	\$227234

Description of Project

A Gas Chromatograph Flame Ionization Detector (GC/FID) will be modified to measure hydrogen uptake and hydrogen-to-deuterium ratio directly by GC/FID Cavity Ringdown Spectrometer (CRDS). A modified analysis will enable deuterium measurement by analyzing exhaust from the FID detector. A prototype CRDS designed as a GC will be purchased to make rapid measurements of hydrogen-oxygen-deuterium (HOD) vapor down to low concentrations. The instrument needs to be interfaced with a GC/FID and the analytical figures of merit need to be determined. Envisioned is a traditional GC/FID scan with enough information to calculate the percentage of the maximum hydrogen capacity and the HOD profile scan showing corresponding peaks with any elevated amount of deuterium that is present.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Material Cleaning Alternatives

Project Identifier Y1205092

Principal Investigator Simandl, Ron

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$126293
Cumulative Total Project Cost:	\$396745

Description of Project

Cleaning methods to remove contamination from materials will be explored. New cleaning approaches and new cleaning solvents must be evaluated to ensure part decontamination. Ultrasonic aqueous cleaning will be explored for decontaminating metal components. Enclosed pressurized spray cleaning using inert fluorinated solvents will be explored for decontaminating non-metal materials. For pressurized spray cleaning, a glovebox will be required. This glovebox will have solvent recycle and ultra filter capabilities. The initial approach will provide an indication of the potential of these decontamination approaches. Future considerations must include more comprehensive systems approaches that include material handling, storage, worker protection, and safeguards and security issues.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Primary Extraction System Improvements

Project Identifier Y1205095

Principal Investigator Bullock, Jon

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$180295
Cumulative Total Project Cost:	\$601959

Description of Project

Centrifugal contactors (CC) are being considered for primary extraction (PX). Other chemical processing technologies will be considered as alternate approaches. CC have limitations on their application and performance parameters. Research using a representative PX feed stream simulant is essential to confirm the alternate technology viability for improving the purification processes. Collected information will be used to formulate a simulant using existing process and ORNL facilities. Solids and surfactant mitigation technologies will be selected. The treated stream will be transferred to an existing multi-stage CC system, where uranium recovery and contaminant removal capabilities of the contactor-based process will be confirmed. Equipment evaluation will be initiated.

United States Department of Energy
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Production Plant Y-12 Plant

Project Novel Approaches for Be Sample Analysis

Project Identifier Y1205096

Principal Investigator Schaaf, Thomas

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$179062
Cumulative Total Project Cost:	\$384982

Description of Project

The uranium trioxide (UO₃) process stream's output is the required input for production of U metal. The process for reduction to metal could be saltless direct oxide reduction (SDOR) or an SDOR alternatives. The project will define the preferred characteristics of the metal reduction input stream from the perspective of the reduction step and available process technologies. A comprehensive characterization of the process stream leading into the denitration step will establish a scientific basis for modeling the output product. Denitration technologies in the weapons complex and private industry will be characterized. Product and operating data will be collected as feasible. Sites with denitration equipment may be solicited to run experiments as proof of concept to fill data gaps.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Bioassay Analysis by ICP-MS

Project Identifier Y1205099

Principal Investigator Mann, Darrin

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$90891
Cumulative Total Project Cost:	\$433276

Description of Project

Initial efforts will concentrate on providing proof-of-principle experimentation to develop Inductively Coupled Plasma Mass Spectrometry (ICP-MS) technology for meeting or exceeding the required detection limits required for screening samples for isotopes of uranium in urine.

The system will then be optimized to produce the best detection limit. Once the system is optimized comparison testing will be performed against the existing standard and regulatory samples.

Continuing efforts will focus on the analysis of both urine and fecal samples for nonuranium isotopes using Collision Cell Technology (CCT).

Final work will focus on the incorporation of this instrument into the structure of the Bioassay program itself.

**United States Department of Energy
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Production Plant Y-12 Plant

Project High Quality Radiographic Film Digitization

Project Identifier Y1206001

Principal Investigator Moyers, Richard

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 865-574-1821

FY 2007 Project Costs

Total:	\$67332
Cumulative Total Project Cost:	\$207812

Description of Project

We propose to investigate the role that small film grain plays in producing undesirable artifacts in high resolution digitized radiographs. In addition, this project will produce an improved primary light source to couple 10 to 100 times the light onto the detector to allow digitization of dense film. The project will require the assembly and testing of a prototype film digitization platform. Also, we will perform design, specification for fabrication, and characterization of a well-corrected optical light projection system to illuminate the film. Equipment procured by an Enhanced Surveillance task will be leveraged to perform the work in this project.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Light Beam Grid Network Safeguards Surveillance System

Project Identifier Y1206003

Principal Investigator Bzorgi, Fariborz

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$238407
Cumulative Total Project Cost:	\$432198

Description of Project

The Grid Network Light Beam Safeguards Surveillance System design will be based on a previous study. Storage areas will be protected by a matrix of crossing upper and lower light beams. Cannister removal or insertion will be detected by evaluating which beam was broken first. The data will be recorded to keep a history of each canister. The connection will be established automatically and instantly after movement. The system will track inventory and label the movement as "entered" or "removed". The system also checks and records unexpected beam interruptions. There will be internal operating checks in the light system. A sequencer shall control light pulse timing and send a synchronization signal to the receiver logic board to check for proper light pulse synchronization.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Advanced Modeling of Microwave Processes

Project Identifier Y1206004

Principal Investigator Warren, Brian

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$348770
Cumulative Total Project Cost:	\$557491

Description of Project

A desktop immersive virtual reality environment tool will be created to enable rapid analysis techniques and trouble shooting processes. Secondly a virtual, realistic microwave model lab environment, and operator control panel will be created. Capabilities to import and export material and parameter data for difference analysis processes will be included. The user will simulate set up of the microwave run. Configuration of the stack and extraction of data from the model by selecting which data to visualize will be enabled. The cave environment will simulate sound, touch, and metal property visualization. The models will be validated. A study of heat transfer and metallurgical characteristics of the models will be made. Temperature measuring devices and other items will be simulated.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Investigation of Welding and Weld Quality Issues of Uranium Components

Project Identifier Y1206011

Principal Investigator Ripley, Ed

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$163739
Cumulative Total Project Cost:	\$352884

Description of Project

- We will:
- 1) Conduct a literature review of uranium welding.
 - 2) Conduct a literature review of laboratory analytical techniques and limitations for qualification of material and post processing analysis of uranium welds.
 - 3) Design an experimental plan to perform a series of weld experiments.
 - 4) Perform welding study.
 - 5) Analyze welds to determine cause and effects of various process parameters.
 - 6) Compile data.
 - 7) Write report.

United States Department of Energy
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Production Plant Y-12 Plant

Project Lithium Technologies

Project Identifier Y1206019

Principal Investigator Brown, Sam

Point of Contact Bob, Bonner

Type of Research Applied

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$777256
Cumulative Total Project Cost:	\$1450086

Description of Project

LiCl crystal formation parameters will be determined and drying techniques investigated. Humidity level effects on product quality will be determined. Studies will be performed on replacement cleaning agents. Reactions and breaches will be modeled computationally. Humidity control effects on product quality will be evaluated. Remote sampling methods will be developed. Automated shim break-out methods will be demonstrated. Gas purification will be evaluated and production design upgrades suggested. Alternate lithium chemistry reactions will be accomplished to establish hazards and control methods, product conversion to lithium metal and adjusted stoichiometry. Separation methods will be examined. Metal chemistry will be characterized. Scale-up and capacity recommendations will be given.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Agile Machining Process Development

Project Identifier Y1206025

Principal Investigator Moor, Pamela

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$1027039
Cumulative Total Project Cost:	\$1333791

Description of Project

A process assurance capability using on-machine probing and a flexible fixture for agile machines will be implemented on an agile machine tool. The machining process will be characterized and an error budget tabulated. Probing hardware and software will be evaluated and technology gaps identified. A calibrated artifact will be identified and machined to capture workpiece thermal growth characteristics. A measurement protocol will be created and tested. Programs and procedures for on-machine probing will be developed. Data transfer and analysis techniques will be developed. Statistical process controls will be developed. Conceptual flexible part fixture designs will be considered before a design is selected. A prototype will be created, tested, evaluated, and design iterations completed.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Be Swipe Analyzer

Project Identifier Y1206027

Principal Investigator Raj, Tilak

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$75101
Cumulative Total Project Cost:	\$242253

Description of Project

An instrument based on secondary ion mass spectrometry has been partially assembled with the capability of pumping a small analysis chamber in 5 to 10 minutes. Filter paper swipes with beryllium contamination will be placed in the analysis chamber for secondary ion measurement of the beryllium. A precise method is to be developed for inspection parameters that will result in quantitative results despite the irregularity of sampling that is generally found on samples of this type. Maintaining electric field parameters and overcoming charging to produce uniform collection of beryllium ions from the filter paper are additional challenges.

United States Department of Energy
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Production Plant Y-12 Plant

Project Portable Carbon in Uranium Analyzer

Project Identifier Y1206028

Principal Investigator Raj, Tilak

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$204241
Cumulative Total Project Cost:	\$517471

Description of Project

Basic research will be performed to find a method capable of measuring carbon in uranium and develop a portable instrument capable of making the measurement on uranium parts or scrap pieces without cutting or drilling. Analytical methods exist but most require pieces to be cut for dissolution or entry into a large instrument. A portable shop floor instrument has not been demonstrated. The challenges are to make the instrument small, capable of cleaning the surface well enough to get a bulk measurement, to analyze a standing part without cutting or drilling, and make a quantitative measurement. Most methods require a vacuum which presents a challenge for generation on the part. Adapting any method chosen to the requirements of in-situ portable sampling will be a great challenge.

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Laboratory, Plant or Site Directed Research and Development Report

Production Plant Y-12 Plant

Project Advanced Methods to Nondestructively Sense for Stress Corrosion Cracking Sites on Uranium Parts Using a Thermoelectric Power (Seebeck) Coefficient Surface Contact Probe

Project Identifier Y1206031

Principal Investigator Evans, Ken

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$336364
Cumulative Total Project Cost:	\$519076

Description of Project

Long-term project goals are: to increase our knowledge of stress corrosion cracking in uranium and uranium alloys, develop stress corrosion cracking testing methodology best suited for uranium and its alloys, more specifically establish the role of pit composition variation on stress corrosion cracking initiation, assess the stress state (applied, residual, and both) and correlate the understanding of the stress state to testing methodology and predictability of stress corrosion cracking in uranium and uranium alloys.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Physics-Based Systems Integration for Y-12 Modernization

Project Identifier Y1206032

Principal Investigator Beckerman, Martin

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$41607
Cumulative Total Project Cost:	\$251462

Description of Project

Quantitative acoustic, electromagnetic, and nuclear signaling emission and transmission source data will be acquired. Signal type-specific physics-based models will be built. Physical facility design criteria, and communications control and safety systems data will be acquired. Emerging communication and control technology will be acquired and assessed. 3-D visualization tools will be incorporated. A simulation toolkit which will show signal source location and intensity, interface locations and control and communications network physical layout will be developed. Software tools will be developed. The system will be made available to other teams for planning and performing tests and exploring design alternatives. An integrated design will be generated and a final report prepared.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Interface UT 3-D Imaging Technology with LC-SEM

Project Identifier Y1206033

Principal Investigator Dekanich, Steve

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$182910
Cumulative Total Project Cost:	\$272834

Description of Project

A better understanding of weapon component aging characteristics has been recognized. The large chamber SEM has the ability to evaluate surface anomalies on full size specimens utilizing surface characterization instruments (Energy Dispersive X-ray Spectrometer, Electron Backscatter Diffraction, Fourier Transform Infrared Spectrometer, and Focused Ion Beam). The Imaging, Robotics, and Intelligent Systems Laboratory at the University of Tennessee is equipped to conduct research in the fields of 3D computer vision, data visualization, image processing, robot vision and sensing, data fusion, evidential reasoning, and pattern recognition. A cooperative collaboration will establish a method to generate 3D reconstructions of surface anomalies to provide morphological and chemical profiling.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Agile Machine Chip Monitor

Project Identifier Y1206035

Principal Investigator Mee, David

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$24113
Cumulative Total Project Cost:	\$107856

Description of Project

The task will begin with development of requirements for the task. Various types of measurements (chip velocity, percent solids, density, gamma detectors, coolant velocity, ultrasonic noise) will be considered as possible indicators of chip accumulation in the line. Additionally, known parameters like expected chip mass over a time interval will also be considered for use in the scheme. The market will be surveyed to identify the instrumentation suitable to the application. A prototype will be assembled on an existing testbed to evaluate the technique(s).

United States Department of Energy
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Production Plant Y-12 Plant

Project Casting Mold Temperature Measurement

Project Identifier Y1206036

Principal Investigator Mee, David

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$376951
Cumulative Total Project Cost:	\$556363

Description of Project

A survey of measurement techniques will be made to locate candidate techniques. High risk components of one or more candidate techniques will be tested in the laboratory to determine their suitability to the mold temperature application. A specific technique will be recommended. If no suitable candidates proved viable, the work will be discontinued.

The measurement will be installed on Furnace E, which is currently inoperable, after a small amount of work is performed to make the furnace functional.

Carbon runs used for baking out of stack components will be made. Operational issues with loading and unloading the furnaces will be tested without risk of spilling a stack with metal. Thermocouples will be used to estimate measurement uncertainty.

United States Department of Energy
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Production Plant Y-12 Plant

Project Improving Beryllium Analysis Through Computational Deconvolution

Project Identifier Y1206038

Principal Investigator Larson, George

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$39848
Cumulative Total Project Cost:	\$220756

Description of Project

This project will be performed in three phases. The first two phases will evaluate the scientific feasibility and demonstrate proof of concept. The third will evaluate the non-production prototype. In phase one, a state-of-the-art ICP emission spectrometer will be used to evaluate the magnitude of error on the beryllium result caused by spectral interferences. In phase two, spectral deconvolution software will be developed and evaluated. Using advanced modeling capabilities, deconvolution software will be developed that corrects the beryllium result for a range of uranium isotopic compositions, as well as other interferences. In phase three, the new method (non-production prototype) will be run in parallel with the established method to evaluate the deconvolution software effectiveness.

**United States Department of Energy
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Production Plant Y-12 Plant

Project RFID and Automated Barcode Evaluation for NMC&A Modernized Facility

Project Identifier Y1206054

Principal Investigator Ellis, Mike

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$96154
Cumulative Total Project Cost:	\$330916

Description of Project

The approach is to first partner with IdentiTrak Technologies to aid in RFID testing. IdentiTrak offers a facility housing a great number of different RFID solutions. Several scenarios can be tested at IdentiTrak's facility. After testing at IdentiTrak has been completed, the most suitable RFID system and set of tags will be chosen to be part of an integrated NMC&A test bed. A barcoding system will also be obtained and tested for situations where RFID tracking is not practical. If successful, these systems will then be deployed as a part of a modernized facility. Challenges to be addressed include: obtaining approvals to use needed frequencies in facilities and finding RFID tags which will not be affected greatly by metallic objects and can still be easily attached to the container.

**United States Department of Energy
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Production Plant Y-12 Plant

Project In-Process Monitoring for NMC&A Modernized Facility

Project Identifier Y1206055

Principal Investigator Ellis, Mike

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$103007
Cumulative Total Project Cost:	\$177085

Description of Project

Facility and system monitoring requirements will be defined and monitoring systems procured. Combined motion detection and video monitoring systems will be first. The second system will use infrared technology to detect personnel in an in-process storage area. The final system will be a software package designed to model facilities and integrate multiple video cameras into one system. The software package is able to create a virtual world based on sensors placed in a facility. It can recognize personnel in several different manners. This software will use multiple video cameras to model a room or facility, track personnel and materials, and integrate the entire system. Software to tie the integrated monitoring system into an NMC&A test bed for a modernized facility will be created.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Advanced Infrared (IR) Heating Techniques for Materials Processing

Project Identifier Y1206057

Principal Investigator Seals, Roland

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$516642
Cumulative Total Project Cost:	\$1199415

Description of Project

This project will develop, design, determine, and demonstrate the proof-of-principle for infrared (IR) furnaces for foundry heating operations. Processes include: stress-relieving and annealing rolled and formed product, vacuum outgassing of depleted uranium, develop crucible and mold materials and designs for processing uranium materials, develop techniques for demilitarization and sanitization of high melting point materials and chip management and processing, removal of coolant contamination, melting of chips, and ingot consolidation, evaluate the feasibility of IR to zone refine metal alloys, purify uranium, surface treat materials, and heat treat metal and uranium alloy systems, and evaluate high heat flux IR as the controlling heat source for alloying, melting and casting operations.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Recovery of Materials

Project Identifier Y1206060

Principal Investigator Churnetski, Ed

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$5931
Cumulative Total Project Cost:	\$133177

Description of Project

The project will focus on fabrication of components from 3 classes of materials. For optimal infrastructure reduction all processes will rely on agile machining techniques. Previous fabrication expertise will be recovered. Numerous forming and machining methods will be evaluated.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Total Oxygen Analysis

Project Identifier Y1206075

Principal Investigator Leckey, John

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$86509
Cumulative Total Project Cost:	\$106485

Description of Project

This joint project between Technology Development and Analytical Chemistry involves surveying a number of techniques to perform the analysis, testing the most desirable methods, and determining all necessary parameters required to perform an accredited analysis. Initial efforts will likely include evaluation of some combination of wet chemistry, thermal evolution, and spectrometric analysis. Other than the current method, which uses expensive and unreliable equipment, there is no known technique to perform the analysis at the required levels on LiH/D. The unique chemistry of the lithium-hydrogen bond will likely make development of the method challenging and non-trivial.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Uranium Laser Welding Protocol for Laser Repair of Parts

Project Identifier Y1207002

Principal Investigator Ripley, Ed

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$195292
Cumulative Total Project Cost:	\$195292

Description of Project

Equipment will be purchased. Work packages and training will be performed. A series of test welds on depleted uranium will be performed at varying power levels, weld rates, and shielding gas flow rates, surface preparation techniques, etc. Weld samples will be evaluated. A weld protocol to laser repair cosmetic defects will be developed. Concurrence that weld repair is acceptable from a performance and product certification standpoint will be obtained from the design laboratories. Criticality Safety approval to transport and process material in this equipment will be gained. Technology will be transferred to the Plant customer.

United States Department of Energy
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Production Plant Y-12 Plant

Project Time resolved thermal profiling of the machining chip forming process

Project Identifier Y1207003

Principal Investigator Miller, Art

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$62001
Cumulative Total Project Cost:	\$62001

Description of Project

Quality control and safety issues produced by poor chip management can be improved by a better understanding of the time resolved thermal profile of the machining process. This project will analyze thermal aspects of the chip forming process using an infrared imaging detector. This high-speed device will capture in-situ the relative temperature distribution of thermal processes involved in forming the machining chip. Other parameters of the machining process such as coolants, tool wear, and part chemistry will be thermally studied as they interact with the micro environment around the tool and work interface. In addition, methods for improved chip management will be tested based on findings from thermal measurements.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Tantalum-Tungsten (Ta-W) Alloy Spray Form Manufacturing

Project Identifier Y1207004

Principal Investigator Seals, Roland

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$20764
Cumulative Total Project Cost:	\$20764

Description of Project

The goals of the project are to develop and demonstrate spray forming to produce net-shape or near net-shape parts and to compare material properties to electron beam melted and formed parts. The developed vacuum spray forming of net-shape components would offer a faster, more cost-effective, environmental compliant, uniform, low residual stress, durable, tailored, quality controlled process.

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Project Dry Vacuum Holdup Monitor

Project Identifier Y1207018

Principal Investigator Cochran, Joe

Point of Contact Bob, Bonner

Type of Research Applied

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$123327
Cumulative Total Project Cost:	\$123327

Description of Project

A radiation detection system will be designed and implemented that will accurately estimate the material in vacuum traps. Trap geometry is difficult to monitor accurately so a detector system will be designed for this specific situation. Special data analysis methods will be produced that convert the raw data into uranium mass estimates.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Agile Machine Accountability System

Project Identifier Y1207019

Principal Investigator Cochran, Joe

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$219512
Cumulative Total Project Cost:	\$219512

Description of Project

Holdup points will be identified then methods for monitoring them will be developed. A method of measuring the mass of chips that leave the system will be developed. These techniques and measurements will be integrated into an accountability system for the agile machine as a mini-balance area.

**United States Department of Energy
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Project Alternative Forming Methods

Project Identifier Y1207025

Principal Investigator Churnetski, Ed

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$129391
Cumulative Total Project Cost:	\$129391

Description of Project

Two nontraditional machining techniques will be developed for disassembly purposes. Both will be based on conventional designs which will be modified for safety considerations.

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Production Plant Y-12 Plant

Project Uranium Impurity Removal

Project Identifier Y1207028

Principal Investigator Ripley, Ed

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$131284
Cumulative Total Project Cost:	\$131284

Description of Project

A technique for impurity removal will be evaluated. Elemental analysis will be conducted to determine impurity levels will be made.

Another phase of the project will perform a homogeneity study of cast uranium materials. Castings will be performed to facilitate statistical analysis of casting impurities. Results will determine any necessary changes to current sampling plans. Once an appropriate sampling method is determined and validated the project will recommend creation of a standard to calibrate analytical methods. This standard may be cast in the form of solid uranium and/or it may also be created in the form of an aliquot. This standard(s) will be used to calibrate analytical methods necessary to characterize solid uranium metal products which are manufactured at Y-12.

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Project Wrought-like Cast Uranium

Project Identifier Y1207030

Principal Investigator Carpenter, Don

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$190259
Cumulative Total Project Cost:	\$190259

Description of Project

This project will investigate the possibility of inducing a uniform distribution of twins in a cast uranium object at room temperature and then determine if a refined microstructure can be obtained by a subsequent alpha-phase annealing. We will study the process by which twins evolve into small grains and develop an appropriate heat treatment. In the first year we will induce twinning in small laboratory samples using rapid cooling techniques. If the twin-refinement approach proves feasible, then we will investigate the use of a sonic technique for inducing a twinned microstructure at room temperature. This approach is unique and, if successful, it can readily be adapted to production.

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Project Dimensional Metrology Process Development

Project Identifier Y1207037

Principal Investigator Moor, Pamela

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$336282
Cumulative Total Project Cost:	\$336282

Description of Project

A scanning Coordinate Measuring Machine (CMM)-based surface finish and waviness measurement capability will be developed. Temperature variation effects on part family measurement uncertainty will be determined. Methods for articulated arm CMM use to make surface plate and on-machine measurements will be established. Soft functional gauging test cases will be developed. The certification procedure for CMMs will be evaluated and improved. Future requirements for dual yz machine use and determine what capabilities must be maintained or established and develop the new capabilities will be studied. A fiber optic probe and calibration process for nano-scale optical measurement standards will be developed. A method of automating dimensional metrology equipment process control will be piloted.

United States Department of Energy
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Project Non-Destructive Evaluation (NDE) of Grain Structure

Project Identifier Y1207043

Principal Investigator Belvin, Anthony

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$117263
Cumulative Total Project Cost:	\$117263

Description of Project

A non-destructive acoustic scanning technique, using frequency-modulated signal waveforms (chirp), will be developed to quantify average grain size and grain size variation throughout the entire volume of a cast metal (uranium and other materials of interest). The proposed system will evaluate the use of six scanning techniques: pitch-catch, pulse-echo, through transmission, off-axis scattering, synthetic aperture, and phased array. Challenges to be addressed are identification of proper frequency range (bandwidth) in order to propagate the signal through the material and determination of a cutoff frequency (a limiting frequency in which attenuation is not observed).

**United States Department of Energy
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Project Mercury Free Catalyst for Dissolution

Project Identifier Y1207044

Principal Investigator Cecala, David

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$110889
Cumulative Total Project Cost:	\$110889

Description of Project

This project will examine the ability to recover mercuric ion out of highly acidic nitric acid solutions directly using an absorbant or reverse amalgamation. Other tests will look into the ability to use mercury-free catalysts that will not affect waste operations and not decrease the rate at which the mercuric catalysts dissolve the aluminium/uranium metal.

**United States Department of Energy
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Project Atomic Force Microscopy Study

Project Identifier Y1207045

Principal Investigator Moor, Pamela

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$182200
Cumulative Total Project Cost:	\$182200

Description of Project

Atomic Force Microscopy (AFM)/Scanning Probe Microscopy (SPM) will be evaluated. This project will analyze machined and cast parts for details (corrosion/voids/pits) and surface finish/roughness. Parts will be machined using various types of cutting tools that are common in the weapons complex. Different materials will be analyzed to obtain friction, stiffness and thermal conductivity properties along with surface topography. Materials will be heated in controlled environments and subjected to different levels of humidity. Data will be obtained on a real-time basis showing where corrosion occurs and giving insight into why/how it happens.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Micro-Kjeldahl Digestion

Project Identifier Y1207046

Principal Investigator Beach, David

Point of Contact Bob, Bonner

Type of Research Applied

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$92850
Cumulative Total Project Cost:	\$92850

Description of Project

This project will develop a method to isolate and identify the amounts of uranium metal contamination present as nonmetallic compounds (inclusions) compared to interstitial species. The proposed method will utilize two different micro-Kjeldahl ester-halogen digestion techniques along with elemental analyzers. Feedstock for the analysis will be from repetitive runs of nontraditional casting methods. Elemental analysis will be conducted on the material before and after digestion, with ICP analysis for metal content. Chips from cutting tests will also be analyzed.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Compatibility Study of Crucible Materials with Uranium

Project Identifier Y1207047

Principal Investigator Brasfield, Daniel

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$312938
Cumulative Total Project Cost:	\$312938

Description of Project

Studies will be conducted with new types of materials (metal nitrides, oxides, etc.) to solve thermal shock, wetting and reactivity problems between crucible materials and uranium metal. Reactivity/stability, solubility, wetting properties, thermal shock resistance and reusability evaluations will be conducted. Next, small-scale crucibles will be manufactured or ordered and tests will be conducted in microwave, infrared, and induction furnaces to determine feasibility. Crucibles developed at MSTI will be used with uranium.

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Production Plant Y-12 Plant

Project Optical Detection of Alpha Radiation

Project Identifier Y1207049

Principal Investigator Moyers, Richard

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$32252
Cumulative Total Project Cost:	\$32252

Description of Project

A solar-blind ultraviolet/visible (UV/VIS) hyperspectral imager developed by the U.S. Air Force Arnold Engineering Development Center (AEDC) to detect UV emission from air molecules exposed to ionizing radiation will be evaluated. Imaging of the light emitted by the ionized molecules in the solar-blind region could indicate the presence of alpha emitters, and could also give a visual indication of the extent of a contamination field. The sensor should be capable of producing an image showing where the material producing the radiation is located. If the evaluations indicate this type of sensor shows promise, the second year of the project will procure the parts necessary to modify, build and characterize a dedicated hyperspectral imager to detect alpha contamination.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Enhancing and Maintaining the Ability to Roll and Form U Metal Alloys

Project Identifier Y1207056

Principal Investigator Gooch, Jack

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$64018
Cumulative Total Project Cost:	\$64018

Description of Project

A specialized computer controlled rolling mill will be used to produce fuel elements with both a side to side and an end to end thickness variaton (taper).

**United States Department of Energy
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Production Plant Y-12 Plant

Project Optimization of Welding Through Computer Modeling and Simulation

Project Identifier Y1207058

Principal Investigator Lamberti, Vincent

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$141336
Cumulative Total Project Cost:	\$141336

Description of Project

A quantitative understanding of how weld quality depends on material, beam, geometric, and environmental factors will be developed using finite-element analysis. SysWeld, a commercial welding simulator, will be evaluated for addressing our unique problems. If SysWeld is found to be inadequate, a more sophisticated treatment will be made using FEMLAB, a general-purpose finite-element code. Once the modeling software is selected, welding simulations will investigate how weld parameters, alone and in combination, influence the structure of the weld. We will attempt to reproduce, and generate process modifications to eliminate specific defects observed in welds. Predictions will be experimentally validated. Recommendations for optimized welding procedures will be developed.

**United States Department of Energy
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Project Advanced Registration and Segmentation of Computed Tomographic Data

Project Identifier Y1207065

Principal Investigator Arrowood, Lloyd

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$182847
Cumulative Total Project Cost:	\$182847

Description of Project

Research and development of registration and segmentation algorithms for industrial computed tomography (CT) to address specific Y12 needs, building on research in the biological CT area, will be performed. This project will develop: registration algorithms and software for alignment of projection data to three-dimensional (3D) data from previous CT reconstructions or from computer-aided-design (CAD) information, registration algorithms and software for alignment of two or more projection data sets, registration tools for alignment of two 3D data sets and subtraction of these sets to perform defect detection, region of interest reconstruction capabilities for iterative reconstruction, and segmentation algorithms and software to enable complex 3D measurements.

**United States Department of Energy
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Project Enhanced Defect Measurement

Project Identifier Y1207068

Principal Investigator Babelay, Ed

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$285208
Cumulative Total Project Cost:	\$285208

Description of Project

This project will enhance the multi-image 3D microscope technique for characterization and inspection of surface defects. A combination of image analysis software development and a modified microscope optics system with structured lighting will be utilized to meet the goal of robust, accurate characterization of surface defects. Initial work will encompass software algorithm development and a proof-of-principle demonstration of a structured lighting microscope. Secondly, a collaboration with a microscope manufacturer to incorporate the technology into a production prototype system will be sought. New software algorithms developed may have direct application to the current production systems. Improvements will be directed toward a quicker production implementation.

**United States Department of Energy
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Project Radioactive Contamination Visual Identification & Control

Project Identifier Y1207071

Principal Investigator Bzorgi, Lee

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$146219
Cumulative Total Project Cost:	\$146219

Description of Project

A chemical will be developed for application to areas suspected of having radioactive contamination and, if contamination is present, the chemical would physically bond to it and change color. Bonding to the contamination would minimize the re-suspension of the material and the color change would aid in cordoning off the area and clean-up. The chemical must cause a readily identifiable and relatively long-term color change on radioactive materials. The chemical needs to be relatively benign, not having adverse environmental impacts and economical enough to support its production and use. Having a visible indicator of where the contamination exists can be beneficial in alerting officials of where contamination exists and alleviating concern over the threat from potential contamination.

**United States Department of Energy
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Project Ion Exchange Resin Selection

Project Identifier Y1207073

Principal Investigator Cecala, David

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$6916
Cumulative Total Project Cost:	\$6916

Description of Project

A survey of literature will be conducted and several candidates will be identified based upon uranium removal potential. Waste management and operations will be consulted to identify potential issues associated with each resin. Experiments will be conducted and an optimal resin will be recommended based upon the three criteria listed in the problem statement.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Science Based Bomb Reduction

Project Identifier Y1207075

Principal Investigator Cecala, David

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$31767
Cumulative Total Project Cost:	\$31767

Description of Project

Simultaneous thermal analysis (STA) will be conducted on materials being introduced into the bomb reduction vessel to determine appropriate bake-out and storage conditions. The effect of altering reagent ratios on overall product quality and yield will be studied on full scale bomb reductions using depleted uranium and if possible enriched uranium in Enriched Uranium Operation. The effect of the UO₂F₂ concentration in green salt on the overall yield will also be studied.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Dense, Interim Uranium Storage Forms

Project Identifier Y1207076

Principal Investigator Churnetski, Ed

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$44152
Cumulative Total Project Cost:	\$44152

Description of Project

A survey of reasonable concepts for "denser" fissile storage will be performed with nuclear criticality safety (NCS) as the key concern and unknown. Safe-Secure storage is assumed. Processes requiring new facilities are considered unlikely candidates. A modification of current storage form casting incorporating neutronic poisoning is proposed. Refractory compounds of uranium which are chemically- and high temperature thermally-stable and provide neutronic poisoning and spectrum softening will be attempted. Evaluation of storage forms will consist of an NCS component and one with depleted uranium of the potential for producing desired material forms in current casting equipment or by other simple, proven, and available methods.

United States Department of Energy
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Project Recovery of Uranium Via Electrosorption & Ionic Exchange

Project Identifier Y1207082

Principal Investigator Holland, Justin

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$191598
Cumulative Total Project Cost:	\$191598

Description of Project

Removal of trace uranium quantities from aqueous streams by ion exchange resins and electrosorption on carbon nanofibers (CNFs) will be investigated.

Resin literature will be surveyed and candidate resins identified. Potential issues associated with each resin will be identified. Experiments will be conducted and an optimal resin recommended. A small-scale study will be performed to determine whether electrosorption is a desirable uranium recovery technology. Uranium removal efficiency will be measured and the precipitated product stripped from the CNFs and analyzed. Modifications may be made to improve process selectivity, removal efficiency and/or purity of the electrosorbed UO₃. The process will be scaled-up to production-scale.

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Project Small Volume Calibration Method and Apparatus

Project Identifier Y1207085

Principal Investigator King, Leif

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$94633
Cumulative Total Project Cost:	\$94633

Description of Project

Extensive research and development with consultations with Sandia National Laboratory and the National Institutes of Science and Technology will aid in the creation of a method around the use of the Double Expansion Technique to replace the leaking and inefficient Piston Prover method. Other methods may also be evaluated.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project In-place Surveillance

Project Identifier Y1207101

Principal Investigator Parrott, Jeff

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$88186
Cumulative Total Project Cost:	\$88186

Description of Project

The approach to this project will investigate the combination of sensor installation in door frames, switching interfaces, and real time status condition displays. This will prove the effectiveness to have facility status instantly at anytime during normal or off-shift times. This system will have the capability to complement any existing monitoring system already in place. Due to the large areas of needed coverage, number of entry/exit points, and other constraints, it is not trivial or cost effective to install conduit for these applications. Therefore, a wireless solution will be investigated as a combination of hardwired solutions.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Thermo-Physical Property Measurement

Project Identifier Y1207111

Principal Investigator Warren, Brian

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$202936
Cumulative Total Project Cost:	\$202936

Description of Project

The project will involve measuring the specific heat, conductivity and density of materials at temperatures up to 1000 degrees C. The samples will be cut at the Y-12NSC in sizes up to 25 cm length and 1cm diameter. The samples will be transported University of Tennessee for material characterization where the material properties will be measured using a calorimeter, conductivity tester and design a methodology to measure density based upon a frequency change in the material as a function of density, temperature and time. Measurements will be compared to other methods for similar materials.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Repair of casting defects

Project Identifier Y1207112

Principal Investigator Yearwood, Cecil

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$183936
Cumulative Total Project Cost:	\$183936

Description of Project

Casting repair was done in the 1980's but we are unsure of the techniques used. A literature search on past process efforts, both inside and outside of Y-12, will be performed.

The characteristics of the uranium in the repaired areas will be studied to determine the effects of welding.

Methods to repair casting defects in uranium components will be developed and evaluated. Use of Gas Tungsten Arc Welding (GTAW) as a method of repairing casting defects and machining flaws in uranium components will be developed and evaluated. Process parameters and techniques to determine the best possible method to repair the components in a difficult-to-process material will also be investigated.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Intrinsically Safe Moisture Blending System

Project Identifier Y1207114

Principal Investigator Hallman, Russell

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$115963
Cumulative Total Project Cost:	\$115963

Description of Project

This project will attempt to show that a Moisture Blending Systems can be constructed and operated completely independent of electrical power. This will remove the possibility of creating a spark from switches or other components. It will only require compressed gas and can be operated manually. No device like this is currently commercially available and Y-12 has multiple applications where this technology would be applicable.

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report

Production Plant Y-12 Plant

Project Thermal Conversion of Uranium Oxide

Project Identifier Y1207118

Principal Investigator Cunningham, Penny

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$115181
Cumulative Total Project Cost:	\$115181

Description of Project

This project will evaluate the thermal conversion of UO₃ and U₃O₈ to UO₂ without the use of hydrogen. U₃O₈ has been reduced to UO₂ by heating to 1800 degree C in a graphite induction furnace. The graphite aids in the reduction by reacting with oxygen to form CO/CO₂ which is easily removed. However, carbon contamination in the UO₂ occurs which is undesirable. Parameters to be evaluated include: crucible/containment materials to eliminate carbon and other undesirable impurities contamination, heating sources (induction, microwave, infrared, resistance), temperature requirement, and vacuum requirements to drive off/remove the oxygen during the thermal conversion.

**United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report**

Production Plant Y-12 Plant

Project Chalcopyrite Radiation Detectors

Project Identifier Y1207120

Principal Investigator Beach, David

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$35310
Cumulative Total Project Cost:	\$35310

Description of Project

High resolution, room-temperature, portable, radiation detectors are needed at Y-12. Semiconductor radiation detectors produce a detection current that is proportional to the energy of the particles incident on the detector. To implement such a detector wide band-gap chalcopyrite single crystals and thin films will be grown and their suitability as radiation detector materials will be demonstrated. Single-crystal material samples will be prepared by Fisk University. Epitaxial growth of chalcopyrite thin-films on silicon wafers will be studied. Epitaxial growth will increase efficiency, lead to improved resolution, and allow for large area material production. Changes in composition and/or processing will be made to optimize the performance of these materials.

**United States Department of Energy
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Production Plant Y-12 Plant

Project Automatic Part Transfer

Project Identifier Y1207122

Principal Investigator Barkman, Bill

Type of Research Applied

Point of Contact Bob, Bonner

POC Phone 574-1821

FY 2007 Project Costs

Total:	\$121797
Cumulative Total Project Cost:	\$121797

Description of Project

The goal of this project is to establish a collaborative activity between Y-12 and a university partner that builds on work performed under Y-12's Precision Flexible Manufacturing System program and addresses two important issues associated with the automatic handling of workpieces. The first task is to develop and demonstrate a sensor system that enables an agile machine tool to safely and automatically transfer workpieces between machining fixtures without risking damage to the equipment or other objects. The second task is to develop and demonstrate a method to automatically align a workpiece on or within a machining fixture. The results of this project will assist Y-12 in the development of techniques for the automatic manipulation of workpieces on multi-purpose machine tools.