	U. S. Department of Energy LDRD Project List -- FY 2014	
Project ID	**Project Name**	**FY Total**
AMES - Ames Laboratory		
FY2013-AKI-0513	Demistifying the hydration layer on nano oxide in suspensions by liquid cell TEM	$112,391
FY2013-GOR-1218	Dynamic Whitelist Generation for Automated Intrusion Response	$228,075
FY2013-HUA-0413	Atomic and electronic level control of nanocluster catalysts encapsulated in MOFs	$103,711
FY2013-JON-0114	Rapid, Small-Scale, High-Purity Rare Earth Metal preparation	$43,205
FY2013-WAN-0113	Femtosecond-Resolved Polarimetry Probes of Electronic Nematicity in Iron Pnictides	$37,575
FY2014-LOG-1212	Self-healing adaptive structural coatings	$70,296
FY2014-LWA-0413	Adsorption-induced Shape-changing in Nanoalloys: Extended Alloy Wulff Construction with First-principles Calculations	$51,806
FY2014-SAD-0709	Sensitizers for Dynamic Nuclear Polarization NMR Spectroscopy	$168,390
FY2014-SLO-0604	Customized Assembly of Catalytic Systems by 3D Printing Technology	$142,335
	Total # of Projects for AMES: 9	
	Total Cost for AMES: $957,784	
	Total Administrative Cost: $102,866	
ANL - Argonne National Lab		
P/ANL2011-210	Improved Catalytic Performance by Applying Electrochemical Control	$85,400
P/ANL2011-213	Towards the Exascale Sky	$754,600
P/ANL2011-214	Mobile Device Vulnerability Research	$150,300
P/ANL2011-217	Polyelectrolyte Brushes in Multi-Valent Ionic Media	$264,500
P/ANL2012-012	New High Energy Rechargeable Li Batteries Based on Selenium and Selenium-sulfur Composite Electrodes	$215,600
P/ANL2012-015	Mesoscale Elastic Problems	$196,900
P/ANL2012-016	Knowledge Discovery in Microbial Community Composition and Metabolite Turnover Using Satellite Remote Sensing Data	$104,200
P/ANL2012-061	Revealing Lithium-based Battery Performance by In Situ Characterization	$150,000
P/ANL2012-072	Graphene Enabled Superlubricity: Vanishing Friction and Wear in Static and Sliding Contacts	$190,300
P/ANL2012-074	Carbon Flux from Thawing Permafrost: Development of a Predictive Model Linking Microbial Activity and Biogeochemistry with Carbon Metabolism	$400,700
P/ANL2012-087	Rechargeable Nanofluids Technology for Electrical Energy Storage	$150,300

P/ANL2012-114	Extreme-Scale Electromagnetic Modeling with Nanoscience Applications	$131,100
P/ANL2012-180	Novel Non-Carbon Catalyst Support for Polymer Electrolite Membrane Fuel Cells	$104,700
P/ANL2012-181	Curing Cancer with the Power of Fireflies	$155,300
P/ANL2012-202	A Future for Energy-efficient General-purpose Computing Based on Heterogeneity	$149,400
P/ANL2012-204	Membrane Bound, Broad Spectrum, Photo-driven Protein Devices	$121,800
P/ANL2012-205	Modeling the Interactions of Biophysical, Biogeochemical, and Microbial Dynamics in Permafrost-affected Soils: From Pore Scale to Regional Scale	$301,300
P/ANL2012-206	Developing, Improving, and Testing Methods for Predicting Spatial and Vertical Distributions of Soil Organic Carbon at Regional Scales	$284,100
P/ANL2012-208	20kV/10A 4H-SiC Vertical Trench Field-Controlled Thyristor	$398,800
P/ANL2012-209	Atomistically Informed Mesoscale Modeling for Advanced Electrical Energy Storage Systems	$418,800
P/ANL2013-013	Improving the Stability of Rubisco Activase, the Weak-link, In the Biological CO2 Fixation Machinery	$222,000
P/ANL2013-016	Spin-based Thermal Power Generation	$189,500
P/ANL2013-022	Superlubricious Carbon Films Derived from Natural Gas for Home-refueling Applications	$141,500
P/ANL2013-035	Extreme Optomechanics	$198,000
P/ANL2013-036	Development of Near-Field Enhanced Terahertz Pump X-ray Probe Techniques for Ultrafast Control of Strongly Correlated Materials	$234,300
P/ANL2013-063	Visualization of Stress-induced Polarization Switching in Electromechanically Coupled Ferroelectric Polymers	$192,500
P/ANL2013-070	Imaging Ecological Engineers: A Novel Quantum Dots Approach to Map Microbes in Complex Soil Structures with X-rays	$217,200
P/ANL2013-080	Ultra-low Loss Superconducting Microstrip for Multi-chroic Cosmic Microwave Background Detectors	$246,500
P/ANL2013-096	Graphene Windows for Advancing Electron Radio Frequency Guns	$93,100
P/ANL2013-100	3-D Compositional Control of Intermediate-Band Solar Cells	$212,600
P/ANL2013-111	Feasibility Study of Applying Thin Film High-Temperature Superconducting Films on Copper or Niobium-Sputtered-on-Copper for the Purpose of Achieving Helium-Free Operation with Cryocoolers	$370,700
P/ANL2013-116	Nanolaminate Coatings for Improved Nuclear Fuel Cladding Performance	$130,500
P/ANL2013-148	Development of Predictive Multi-dimensional Combustion Modeling Capability with Detailed Chemistry	$608,400

P/ANL2013-152	Nanolaminate Materials for Extreme Environments - A Demonstration of Argonne Capabilities for Design, Synthesis and Accelerated Testing of Radiation Tolerant NE Materials	$593,200
P/ANL2013-154	Atomic Layer Deposition System for Continuous, High Speed Thin Film Processing	$296,600
P/ANL2013-156	Fast High-Efficiency Process To Fabricate Aligned Nanotubes In Nano-Composite Membranes For High-Performance Filtration Applications	$501,900
P/ANL2013-165	Integrating Simulation and Observation: Discovery Engines for Big Data	$1,983,100
P/ANL2013-168	The Tao of Fusion: Pathways for Big-data Analysis of Energy Materials at Work	$499,800
P/ANL2013-171	Unconventional Signatures for Characterizing Culture Conditions	$177,400
P/ANL2013-173	Ratiometric Semiconductor Nanocrystal-Based Sensors for Threat Reduction Applications	$504,200
P/ANL2013-177	Identifying Novel Pathways for Anaerobic Microbial Oxidation of Methane	$252,500
P/ANL2013-178	Uranium and Plutonium Detection by Plasmonic Graphene-based Nanosensors	$140,600
P/ANL2013-184	Hierarchical Modeling of Self Assembly in Nanostructured Soft Materials at Equilibrium and Far from Equilibrium	$300,300
P/ANL2013-194	Annotating, Modeling, and Exploring Enzyme Promiscuity	$183,700
P/ANL2013-199	Multi Resolution Adaptive Numerical Environment for Scientific Simulation for Materials	$99,600
P/ANL2013-202	Computational Molecular Science	$306,100
P/ANL2013-206	Mathematical Techniques to Model Urban Data	$390,800
P/ANL2013-208	General-Purpose Technical Cloud Platforms	$185,700
P/ANL2013-212	Multiscale Materials Modeling using Accurate Ab Initio Approaches	$99,600
P/ANL2013-213	X-PECT: Performance Framework to Characterize and Transform Applications and Architectures at Extreme Scales	$198,300
P/ANL2013-215	Mesoscale Materials by Design from Assemblies of Ionic Polymers and Nanoparticles	$453,000
P/ANL2013-216	Directed assembly and three-dimensional characterization of block copolymers in semi-thick films	$419,800
P/ANL2013-218	Urban Systems Integration Modeling and Analysis	$98,700
P/ANL2013-219	Transition Edge Sensors for Fundamental Physics	$2,044,100
P/ANL2014-004	Magnetic Separation of Rare Earth Elements	$119,800
P/ANL2014-018	Dynamics of Spin Ice	$170,500
P/ANL2014-019	Exploring the Universe with Full-Sky Simulations of the Cosmic Microwave Background	$130,000
P/ANL2014-023	Development of Large-Area VUV Microchannel Plate Photodetectors for Use in Large Liquid Argon and Xenon Time Projection Chambers	$199,500

P/ANL2014-025	New Paradigms for High Tc Superconductivity in Acene-based Materials	$201,800
P/ANL2014-034	Exploring the direct observation of the 229mTh isomeric decay	$138,700
P/ANL2014-046	Plastic Artificial Leaves for Water Splitting	$196,800
P/ANL2014-051	Carbon Nano-network as Next Generation Support for Catalysis and Electrocatalysis	$165,400
P/ANL2014-054	Thin Film Skyrmion Spin Textures	$159,800
P/ANL2014-077	Directly Probing Nanoscale Dynamics in Shear Thickening Complex Fluids	$160,600
P/ANL2014-081	Pb-assisted Corrosion/Cracking Mechanisms at the Interface between Pb-containing Solution and Nickel Oxide Surface	$191,700
P/ANL2014-084	Probing the Chemistry of Atmospheric Dust Particles Using X-ray Spectromicroscopy: Implications for Climate Science	$190,700
P/ANL2014-095	Tuning the Transport Properties of Coupled Majorana	$158,200
P/ANL2014-108	Single Cell Structural Genomics of Uncultured Sediment Archaea. On the Trail for Novel Proteases	$161,800
P/ANL2014-120	Grid Level Energy Storage for Integration of Renewable Energy	$303,500
P/ANL2014-121	Integration of Scalable Microwave Reactor with High-Energy X-ray Beamline for High-Throughput Screening Energetic Nanomaterial Synthesis	$302,700
P/ANL2014-122	Superconducting Radio Frequency Cavities for Hard X-ray Science	$266,400
P/ANL2014-127	Development of a Novel Analyzer Systems for Resonant Inelastic X-ray Scattering with better than 10 meV resolution	$174,600
P/ANL2014-128	Length-scale Bridging Computational Scheme for Structure and Transport	$110,100
P/ANL2014-129	The Design and Synthesis of Novel Oxides: Coupling Materials Informatics with a Next-Generation Deposition System Employing In Situ X-Ray Scattering and Photoemission Spectroscopy	$300,000
P/ANL2014-130	New Materials for Natural Gas Storage and Conversion Technologies	$346,400
P/ANL2014-132	Identifying Patterns and Association among Hyperspectral Data and Meteorological and Biological Measurements for Investigating Near-Surface Atmosphere-Biosphere Interactions	$127,000
P/ANL2014-133	In-situ X-ray Characterization of Doped Materials by Atomic Layer Deposition for Energy Applications	$329,700
P/ANL2014-134	Three Dimensional Coherent Diffraction Imaging Using Polychromatic Hard X-rays	$269,700
P/ANL2014-137	YBa2Cu3O7 High-Temperature Superconducting prototype undulator	$182,300
P/ANL2014-139	Fast Electronic Structure Methods for Rapid Reaction Screening for Inorganic Materials Synthesis and Particle Formation	$213,800
P/ANL2014-141	Minimizing Environmental Microbial Community Complexity at the Bench: Isolating and Characterizing Minimal Stable Communities Over Time	$196,400

P/ANL2014-145	Developing Remote Automated Sensors to Direct Sampling of Aerobic-Anaerobic Switching in Floodplain Ecosystems to Characterize the Response of Microbial Carbon Metabolism at High Temporal Resolution.	$199,400
P/ANL2014-151	Developing Predictive Models of Wide Bandgap Semiconductor Synthesis and Processing	$762,800
P/ANL2014-157	Biology@Speed: D-Factory, a Novel Experimental Framework	$279,600
P/ANL2014-160	Developing An Integrated Sensor Network for Science	$217,300
P/ANL2014-161	Bridging the Electronic and Atomistic Scales: Force Field Development for Reactive Interfaces from First Principles	$399,300
P/ANL2014-162	Soft X-ray Scanning Transmission X-ray Microscopy: Giving Argonne a Nanoscale Picture of Carbon in Sils and in Energy Materials	$303,200
P/ANL2014-163	Emerging Compute and Data Infrastructure	$94,900
P/ANL2014-166	Scalable Stochastic Algorithms for Exascale Computational Mesoscience	$200,000
P/ANL2014-167	Improving and Validating Models of the Urban-Climate Connection with Dense Sensor Networks	$217,900
P/ANL2014-169	Magneto-Dielectric Composite Substrates Comprised of High Aspect-Ratio Magnetic Nanofibers for Smart Antennas Operating at Microwave Frequency	$253,900
P/ANL2014-174	Advanced Pipeline for High-throughput Digitization of Large-scale Collections	$100,100
P/ANL2014-175	Automation of In Situ Crystallization Plate Screening and Data Collection at Room Temperture	$80,200
P/ANL2014-177	Development of a Computational Fluid Dynamics Multiphase Boiling Capability to predict the Critical Heat Flux in Nuclear Reactor Fuel Assemblies	$298,500
P/ANL2014-181	Data Knowledge-based Extreme-scale Resilience	$561,000
P/ANL2014-182	Dynamic Data Mirroring for Data-intensive Science	$192,200
P/ANL2014-183	Impact of Radiation and Surface Turbulent Fluxes on the Transition from Stratocumulus to Cumulus Cloud Regime	$88,500
P/ANL2014-184	Long Super Conducting Undulator Magnet	$930,000
P/ANL2014-185	Enabling Sodium-ion Batteries for Grid Storage	$127,900
P/ANL2014-187	Self-assembled Functional Membranes for Filtration and Photocatalytic Water Treatment	$70,500
P/ANL2014-188	Timescale of Groundwater Transport: A Prerequisite for Developing and Maintaining Groundwater Reservoirs	$76,200
P/ANL2014-189	Membrane-Biofilm Nexus: Advanced Membrane Autopsy as a Tool for Revealing Membrane Biofouling and Development of New Membranes Materials and Structures	$31,600
P/ANL2014-190	Feasibility Study of a Fast Reactor for Isotope Production	$200,400
P/ANL2014-191	Defect-localized Spins in Semiconductors for Quantum Optoelectronics	$171,000

P/ANL2014-192	Computational Spectroscopy of Heterogeneous Interfaces	$154,100
P/ANL2014-193	Turbulent Transports in Cumulus Topped Boundary Layers	$92,700
P/ANL2014-194	Crime on the Urban Edge: Simulating the Interface between Transnational and Local Crime	$141,300
Total # of Projects for ANL: 107		
Total Cost for ANL: $29,226,300		
Total Administrative Cost: $23,400		
BNL - Brookhaven National Lab		
10-040	Development of a Laser System for Driving the Photocathode of the Polarized Electron Source for the Electron Ion Collider	$29,812
11-032	2D Membrane Solution Scattering for Probing the Structures of Membrane Proteins	$7,419
11-033	Exploring the Role of Glue in Hadron Structure by an Electron Ion Collider	$5,876
11-036	CMOS-Pixel Vertex Detector for Electron Ion Collider	$264,089
12-007	Complex Modeling: Leveraging Advanced Scattering Data with Computation to Push Back the Materials Complexity Frontier	$551,909
12-012	Inter-Individual Variation in Radiation-Induced Epigenetic Modifications and their Potential Impact on Carcinogenesis	$449,519
12-015	Developing an Integrated Atmosphere-Ecosystem Model for Investigating Interactions Between Atmospheric System and Ecosystem under a Warming Climate	$204,618
12-018	Conical Slit for Probing Buried Micron or Sub-Micron Volumes for Dynamic Measurements of Heterogeneous Materials	$153,410
12-021	In-Situ Transmission X-Ray Microscopy Studies of Structure and Function in Energy Storage	$94,350
12-022	Million Electron Volt Ultrafast Electron Diffraction for Ultrafast Science	$96,148
12-023	Femto-Second X-ray Pulse Generation by Electron Beam Slicing	$147,263
12-024	Thermochemical Conversion of Biomass to Fuels and Chemicals	$199,947
12-025	Flow-Based Battery Architectures for Large-Scale Electrical Energy Storage	$604,301
12-032	Laser-Driven Proton Accelerator	$81,594
12-033	Water-based Liquid Scintillator Detector for Neutrino and Proton Decay Experiments	$102,110
12-034	Quantum Electrodynamics for QCD Precision Studies at the Electron Ion Collider	$78,963
BNL13-003	Investigating eRHIC beam-beam effects with CeC linear accelerator	$320,653
BNL13-005	Permanent magnet solution of the eRHIC with the NON-SCALING Fixed Field Alternating Gradient	$349,358
BNL13-006	Time resolved imaging of X-rays and charged particles	$283,324

BNL13-013	Electrochemical reduction of carbon dioxide on surface-modified metal electrodes	$212,394
BNL13-017	A NSLS-II Workflow Prototype System for Supporting Data Intensive Beamline Experiments	$400,864
BNL13-020	Synthetic Control of Lipid Biosynthesis in Plant Vegetative Tissue	$278,750
BNL13-022	Tracking lithium electrochemical reaction in individual nanoparticles at NSLS-II	$192,613
BNL13-024	Elucidating the Role of Nanostructured Domains in CIGS (a specific material) PV Device Performance	$401,427
BNL13-025	A Probabilistic Approach to Sizing Battery Energy Storage Systems for Improved Grid Inertial Response	$345,201
BNL13-027	In-situ Studies of Interfaces Under Extreme Environments	$258,098
BNL13-031	Modulation Enhanced Diffraction: a new tool for powder diffraction and total scattering studies	$213,396
BNL13-032	Development of At-Wavelength Metrology Tools	$228,155
BNL13-033	Multidimensional imaging data analysis: from images to science	$228,194
BNL13-034	Atomic resolution elemental mapping using x-ray assisted Scanning Tunneling Microscope	$149,555
BNL13-036	Segmented Adaptive-Gap Undulator with different period lengths in segments for production of high flux and brightness Hard x-rays at NSLS-II	$4,622
BNL13-038	Catalysis Program in Sustainable Fuels	$437,125
BNL14-003	Boron Arsenide Thin Films for Next-Generation Thermal Neutron Detectors	$249,095
BNL14-011	High Performance Direct Winder Superconducting Magnets	$275,085
BNL14-021	In-situ investigation of the strain distribution in next-generation 3D transistors using x-ray nanodiffraction	$107,320
BNL14-024	Enable Early Sciences in NSLS-II with Experiment-Driven Big Data Stream System	$741,946
BNL14-026	Increasing efficiency of nitrogen use by plants: a prerequisite for bioenergy crops on marginal lands	$363,894
BNL14-028	Tissue-specific metabolic models in plants	$332,241
BNL14-035	Operando studies of C1 catalytic reactions: Probing model and technical catalysts at high pressures using soft x-rays	$153,517
BNL14-036	Correlative microscopy, spectroscopy and diffraction with a micro-reactor	$18,221
	Total # of Projects for BNL : 40 **Total Cost for BNL :** $9,616,376	
	Administrative Cost Paid by Laboratory Overhead	
FERMI - FERMI National Accelerator Lab		
FNAL-LDRD-2014-010	Cosmic Microwave Background Detector Development at Fermilab	$18,568
FNAL-LDRD-2014-012	Development of HTS Based Rapid-Cycling Accelerator Magnets	$12,677

FNAL-LDRD-2014-016	High Frequency Gallium Nitride Driver	$10,080
FNAL-LDRD-2014-025	The Sinuous Target	$7,014
FNAL-LDRD-2014-027	From Magic to Method: Characterizing High Voltage in Liquid Argon Time Projection Chambers with the Breakdown in liquid argon cryostat for high voltage experiments	$20,158
FNAL-LDRD-2014-028	Deployment and operation of prototype CCD array at Reactor Site for detection of Coherent Neutrino-Nucleus Interaction	$70,518
FNAL-LDRD-2014-038	Application-Oriented Network Traffic Analysis based on Graphical Processing Units	$48,693
	Total # of Projects for FERMI : 7	
	Total Cost for FERMI : $187,708	
	Administrative Cost Paid by Laboratory Overhead	
INL - Idaho National Lab		
I12-001	Long Term Evolution Wireless Cyber Security	$99,132
I12-026	Protectiveness and stability of the zirconium oxide in early-phase corrosion of zirconium alloys - predictive relations to surface structure and composition	$214,060
I12-031	2-D and 3-D Electron Backscatter Diffraction Technique Development and Microstructure Reconstruction for Phase Field Microstructure Evolution Models	$235,201
I12-056	Recovery of Precious Metals from Used Nuclear Fuel and Electronic Waste Using Sulfur-Impregnated Nanoscaffolds	$195,534
I12-059	Chemistry and Flowsheet Development for Lanthanide Separations	$84,815
I12-061	Development of a High Burn up Zr Based Fuel Cladding for Light Water Reactors	$70,446
I12-062	Development of Diamond Based Sensors for User Facility Capabilities at INL Advanced Test Reactor	$173,979
I12-070	Separate Effects Fuels Development Capability	$203,492
I12-077	Observation of zirconium oxidation at atomic level using non-linear optical spectroscopy	$149,204
I12-086	Alert/Alarm Dashboard	$92,805
I12-093	Development of unique nanomaterials for selective replacement of strategic & critical materials	$249,033
I12-095	Power Line Field Wave Analysis	$125,588
I12-113	Coupled Smoothed Particle Hydrodynamics and Discrete Element Model Simulations of Hydraulic Fracturing and Shale Gas Production	$249,020
I13-011	Integrated Approach to Algal Biofuel, Bio-power, and Agricultural Waste Management	$265,943
I13-013	Development of a micromechanistic phase-field modeling approach for life estimation and risk assesment of reactor pressure vessels	$202,977

I13-027	Diagnostics of advanced energy storage materials	$269,245
I13-029	In-Pile Detection of Crack Growth in the Advanced Test Reactor	$370,242
I13-032	Experimental and Computational Analysis of Hydride Microstructures in Zirconium in Dry Storage Conditions	$746,830
I13-033	Magnetic Separation Nanotechnology for Spent Nuclear Fuel Recycle	$176,930
I13-035	Development of New Molten Salt Sensor Technology for Application to Safeguarding Pyroprocessing	$87,799
I13-039	Induction Based Fluidics Mass Spectrometry for Characterizing Radioactive Extraction Solvents	$116,735
I13-040	Epistemic Uncertainty Quantification in Dynamic Probabilistic Risk Assessment	$196,663
I13-050	Concurrent atomistic to macroscale modeling of materials under irradiation using the phase field crystal model	$263,068
I13-060	Metal Fluoride Preparation for Accelerator Mass Spectrometer Analysis	$172,807
I13-065	Multi-domain Modeling, Simulation, and Integration Tools for the Dynamic Analysis and Optimization of Hybrid Energy Systems	$562,429
I13-068	Cooling in Fractured Geothermal Reservoirs: Analyses of long-term cooling in typical geothermal reservoirs and application to geothermal resource potential assessments	$158,317
I13-071	Advanced Fracture Modeling for Nuclear Fuel	$249,125
I13-079	Diverse Biological Factories for Sustainable Manufacturing	$224,067
I13-092	Fission Product Standard Production	$99,796
I13-093	Spectrum Allocation and Communications in Dynamic Spectrum Access Channels	$514,887
I13-095	Development and Validation of a Societal-Risk Goal for Nuclear Power Plant Safety	$106,751
I13-097	Multiphysics Object Oriented Simulation Environment Capability Extension In Support of Full Core Modeling	$407,257
I13-105	Micro/Nano Scale Atomic Force Microscopy-based Thermal Conductivity Measurement and Atomistic Modeling for Oxide Fuel: the effects of grain boundary, fission gas and radiation damage	$179,016
I13-106	Building Organic-Inorganic Hybrid Materials to Protect Metal Ion Sequestering Agents from Radiation-Induced Oxidative Damage	$223,111
I13-110	Nuclear-Renewables-Oil Shale Hybrid Energy System	$119,860
I13-114	Multiphase Fluid Trapping in Propped Hydraulic Fractures	$258,831
I13-115	Multi-scale full core reactor physics simulation	$503,496
I13-118	Geomagnetic Disturbance Field Coupling Measurement	$193,542
I13-121	Advanced In-Situ Measurement Techniques in Transient Reactor Test Facility	$299,671
I14-009	Development of an INL Capability for High Temperature Flow, Heat Transfer, and Thermal Energy Storage	$551,034

I14-010	Use of Linear Variable Differential Transformer -Based Methods to Detect Real-Time Geometry Changes during Irradiation Testing	$302,661
I14-025	Minor Actinide and Lanthanide Separations in Alternative Media	$393,431
I14-026	Multiscale Modeling on Delayed Hydride Cracking in Zirconium: Hydrogen Transport and Hydride Nucleation	$212,919
I14-031	Multidimensional Multiphysics Modeling of Fuel Behavior During Accident Conditions	$459,208
I14-032	Remove Vulnerability Analysis of Controller Area Network Bus Networks	$282,246
I14-035	Safer Energetic Materials - Ignition Prevention with Improper Heating Rate	$120,297
I14-036	Innovative Research for Fieldable Nuclear Measurements	$149,415
I14-037	Development of Advanced Nuclear Material Characterization Technology for Security Applications	$183,229
I14-038	Multivariate Calibration of Complex Simulation Codes using Disparate Types of Evidence	$236,075
I14-041	Uranium Nitride - Uranium Silicide composite ceramic fuel production via Spark Plasma Sintering	$205,602
I14-042	Treaty Relevant Modeling	$124,303
I14-044	Development of actinide halide and Oxy-halides for isotopic separations	$149,702
I14-045	End-to-End Radiation Detector Enhancements for Improved Safety and Security in Safeguarded Facilities	$125,728
I14-075	Development of Tools and Methodologies for Uncertainty Quantification and Validation for the Multi-Physics Fuel Performance Simulation	$323,816
I14-078	Extended Stability Gamma-Gamma Prime Containing Nickel-Base Alloys	$370,591
I14-079	Second Generation Switchable Polarity Solvent Draw Solutes for Forward Osmosis	$375,725
I14-080	Battery Material Characterization Technologies	$99,827
I14-086	Development of a Microgrid/Smartgrid Testbed for Energy Systems Laboratory and Super Lab Initiative with Load variability characterization and control for renewable energy integration	$529,182
I14-087	Transparent Fiber Reinforcements for Transparent Protection Systems	$149,769
I14-090	SWANS: Secure Wireless Sensor Networks for Smart Grid Communications	$199,966
I14-091	Battery health estimation based on self-discharge fast measurement and soft short-circuit detection.	$244,707
I14-093	All Hazards Critical Infrastructure Knowledge Framework	$260,215
I14-094	Special Manufacturing Capability Advanced Armor Materials and Systems R&D	$248,527

I14-095	In Situ Measurement of Electrolyte Chemistry in Battery Cells During Operation	$194,602
I14-098	Irradiation Effects of Uranium Dioxide	$291,267
I14-102	Advanced Seismic Probabilistic Risk Assessment	$45,211
I14-103	Grid-centric Demonstration of Resilience Technologies	$513,201
I14-104	Development of a Multiphysics Algorithm for Analyzing the Integrity of Nuclear Reactor Containment Vessels Subjected to Extreme Thermal and Overpressure Loading Conditions	$360,244
I14-106	Understanding the Growth of Ultra-long Carbon Nanotubes	$218,075
	Total # of Projects for INL: 69 **Total Cost for INL:** $17,032,479	
	Total Administrative Cost: $245,717	

KCP - Kansas City Plant		
24565	IPG Photonics Laser System	$53,636
24572	Tooling to Support Additive Manufacturing	$1,924
24613	Microreactor	$60,626
24625	Aspect Particle Analyzer	$346,763
24630	Small Scale Mixer for Polysilicon Applications	$140,312
24634	Tooling to support Inspection of Additive Manufacturing Parts	$15,091
24635	Tooling to Support Metal Additive Manufacturing	$11,790
24639	Displacement Transducers for Component Testing	$45,703
24640	Silicone Reactor Vessel	$59,394
24642	Leak Detector for Hermetic Sealing	$65,670
24652	Myers Small Batch Dispenser	$152,107
24678	High Frequency Modal Response System	$103,840
24683	Power Supply for Optical Trigger Development	$18,075
703566	PDRD Program Management Expenses	$328,692
703745	Rapid Response Tech Evaluation	$1,133
704161	Nanofibers for Advanced Compos	$5,198
704178	High Frequency Low Loss Low Temperature Cofire Ceramic	$484
704186	Nanoparticle Solubility, D & P	$6,440
704330	GTS Laser and DeepTIG	$161,513
704331	Additive Manufacturing Direct Ink Writing	$272,729
704337	Laser Detection and Characterization	$96,669
704338	PDRD Transmitter Design	$16,597
704343	Microfluidics and Capsules	$198,728
704348	Acceleration Characterization	$105,232
704349	High Voltage Dielectric Testing	$89,043
704352	Additive Manufacturing Metals	$1,634,969
704356	Advanced Thin Films on Low Temperature Cofire Ceramic	$471,573
704357	Thin Film and Silver Thick Film compatibility	$195,695
704358	Damage Evolution	$54,876
704362	Common Tester Arch Technology	$146,241

704363	Multi-Chip Module Complex Material Analysis	$111,013
704375	Safety Project Maturation	$423,310
704379	Advanced Glass-Ceramic Headers	$350,069
704390	Cloud Computing at Kansas City Plant	$103,652
704391	Enterprise Resource Planning Software as Service	$26,578
704400	Finite Element Analysis of Ceramic Column Grid Array	$41,040
704417	Field Programmable Gate Array Wireless Communication Design	$28
704420	High Voltage Capacitive Discharge Unit Engineering	$1,459
704439	Test Equipment Additive Manufacturing	$69,175
704444	Integrated Telemetry Transmitter	$77,751
704445	Alternate Conductor Patterning	$233,998
704453	FY14 PDRD Proposal Development	$111,444
704456	Thermal Pyrolytic Graphite and Metal Matrix Composites for High Power Integrated Circuit Heat Sinking in Multi-Chip Modules	$188,415
704458	Process Effects on Product Outputs	$85,302
704460	Direct Write Thick Film Circuit	$283,805
704467	Automate Solder Joint Verification	$327,815
704472	Optical Trigger Source Develop	$258,066
704473	Interactive Web Based Training Showcase Demos	$114,783
704476	Composite Structures	$266,863
704486	Printed Circuit Board Physically Uncloneable Features	$64,524
704492	Through Substrate Via PDRD	$286,856
704493	ASIC Trusted/Counterfeit Test	$187,821
704498	Advance Radar Target Simulator	$376,364
704499	Pre-Oxi/Glass-Ceramic Sealing	$151,117
704502	Expert Feature Extraction	$211,725
704507	Testing inorganic starting material	$281,714
704509	Ceramic Technology Assessment	$135,183
704518	Encapsulation processing & development	$77,635
704520	PDRD FY14 Test Stand	$634,775
704523	Dev. 304L Stainless Steel on Selective Laser Melting System	$147,071
704524	Shock & Vibration Dynamics	$128,737
704527	Additive Manufacturing Surface	$274,317
704529	Silicone Nanocomposites	$236,071
704532	Metal Forming/Processing	$54,873
704536	T-Stratasys 900MC Development	$408,633
704537	T-Additive Manufacturing Part Testing	$298,641
704538	T-National Secure Manufacturing Center PDRD FY14 Proposal	$63,500
704544	Tester Security	$31,814
704545	New Apps of Soft Additive Mfg.	$200,241
704547	T-Photochromic Radiation Sens.	$147,138
704550	Electro-Magnetic Simulations	$104,231
704552	Environmental Sensing Device Data Acquisition & Real Time Digital Signal Processing on Beam	$162,843

704553	Additive Manufacturing - Metals	$106,910
704555	Real-Time Failsafe Controller	$106,164
704558	Tester Data Mining	$106,985
704562	Rapid Image Frame Correlation	$189,414
704564	Silicone Supply Security	$161,272
704569	Silicone Poly. Scale Down Capability	$9,269
704578	T-National Secure Manufacturing Center PDRD Proposal	$137,532
704580	Rapid Response Activity-Mirage Drive	$396,897
704581	Rapid Response Activity - Additive Manufacturing	$229,227
704582	Rapid Response Activity-Infantry Rifle Optic	$80,866
704585	Vibration Measurement	$99,111
704586	Rapid Response Activity-Gun Shot Detection System	$1,274,384
704587	Rapid Response Activity-University Senior Design	$112,027
704588	Rapid Response Activity-System Engineering & Creative Problem Solving	$303,011
704589	Center of Excellence Technology & Roadmap Planning	$2,177,616
704590	Rapid Response Activity - PDRD Test Cell	$1,548,065
704591	Rapid Response Activity - GS Innovation Program	$498,511
704592	FY 14 Kirkland Operations Quick Response	$554,822
704594	Rapid Response Activity- Variable Laser Optic	$366,743
704595	Unleashing Creativity	$192,287
704596	Rapid Response Activity- Zoom Binoculars	$552,570
704662	Molecular Modeling of Polymers	$52,751
704684	Tooling for New Spin Former	$50,667
704998	T-National Secure Manufacturing Center PDRD Mid-Year Call	$6,652
704999	National Secure Manufacturing Center PDRD Admin	$1,200
	Total # of Projects for KCP: 98 Total Cost for KCP: $21,916,085	
	Total Administrative Cost: $329,892	

LANL - Los Alamos National Lab		
LANL-20110190ER	Understanding Earth's Deep Water Cycle: Neutron Diffraction and Calorimetric Studies of Hydrous Minerals	$71,058
LANL-20110356ER	Foundational Methods and Experiments in Ultracold Molecular Physics	$341,172
LANL-20110516ECR	Identifying, Creating, and Controlling Functional Hotspots in DNA	$51,241
LANL-20110583PRD2	Charge Parity Violation in Scenarios Beyond the Standard Model	$2,462
LANL-20110710DR	Optimization Principles for Co-Design applied to Molecular Dynamics	$737,160
LANL-20110711PRD2	Quantum simulations: From superconductivity to nanoscale electronics	$39,533
LANL-20110716PRD2	Multiferroic Magnetoelectric Hybrid Inorganic-Organic Frameworks	$71,638

LANL-20110736PRD2	Shortcuts to Adiabaticity in Quantum Devices	$198,230
LANL-20110737DR	CoCoMANS: Computational Co-design for Multi-scale Applications in the Natural Sciences	$713,203
LANL-20110748PRD3	Probing the Structure of Superconducting States with Rotating Magnetic Fields	$4,782
LANL-20110750PRD3	Influence of Velocity Shear on Turbulent Magnetic Reconnection at the Earth's Magnetopause	$21,027
LANL-20110752PRD3	Catalysts Containing Earth Abundant Metals for Energy Applications	$62,573
LANL-20110754PRD4	Investigation of the electronic structure of heavy fermions using Angle-Resolved Photoemission Spectroscopy and time resolved Angle-Resolved Photoemission Spectroscopy	$9,916
LANL-20110756PRD4	Determining Physiological Predictors of Climate-driven Forest Mortality	$91,803
LANL-20120003DR	Energy Storage - Efficient processes to convert electricity, water, and nitrogen to ammonia	$1,328,868
LANL-20120007DR	Dynamic Earthquake Triggering, Granular Physics and Earthquake Forecasting: Determining the Physical Controls	$1,466,426
LANL-20120011DR	TeV Jets: Nature's Particle Accelerators	$1,565,074
LANL-20120019DR	Organic Electronic Materials: Designing and Creating Functional Interfaces	$1,642,766
LANL-20120024DR	Plutonium-242: A National Resource for the Fundamental Understanding of 5f Electrons	$428,348
LANL-20120029DR	Genetically Encoded Materials: Libraries of Stimuli-responsive Polymers	$1,443,299
LANL-20120036DR	IMPACT: Integrated Modeling of Perturbations in Atmospheres for Conjunction Tracking - A New Orbital Dynamics and Drag Model to Avoid Collisions in Space	$1,560,328
LANL-20120047ER	Next Generation Earth Models	$359,823
LANL-20120053ER	Developing Potentials for Atomistic Modeling of Defect Phenomena at Metal-Ceramic Interfaces	$330,627
LANL-20120068DR	Predicting Climate Impacts and Feedbacks in the Terrestrial Arctic	$1,706,667
LANL-20120072DR	Hydrodynamical Mix Studies at the National Ignition Facility	$547,461
LANL-20120077DR	Advancing the Fundamental Understanding of Fission	$645,983
LANL-20120101DR	Physics Beyond the Standard Model with the Long-Baseline Neutrino Experiment	$1,922,709
LANL-20120103DR	Hierarchical Sparse Models for Robust Analysis of Video Data.	$1,538,617
LANL-20120116ER	A Time Reversal Non Contact Acoustical Source for Nonlinear Elastic Wave Spectroscopy	$375,421
LANL-20120123ER	Uncertainty Quantification for Networks	$336,592
LANL-20120149ER	Non-Equilibrium Fluctuation-Induced Interactions	$321,087
LANL-20120153ER	Petascale Kinetic Plasma Simulation of the Interaction Among Laser Speckles in Nonlinear Optical Systems	$342,716

LANL-20120166DR	Elucidating Humankind's Evolving Environment: From the Earth's Core to the Cosmos	$1,637,755
LANL-20120167DR	Modern Challenges in Actinide Science	$1,312,581
LANL-20120190ER	Multiscale Spacecraft Charging Simulations in Support of New Space Missions	$315,738
LANL-20120197ER	From Waste to Fuels and Feedstocks: Reduction of CO_2 Using Main-Group Catalysts	$314,039
LANL-20120200ER	Laboratory Study of Cosmically-Relevant Collisionless Shocks	$370,012
LANL-20120206ER	Separation of Time Scales at High Latitudes: Fundamental Science and Numerical Method Development	$188,738
LANL-20120218ER	Nuclear Quadrupole Resonance: From no Field to Ultra-Low Field	$332,826
LANL-20120227ER	Time-gated Super Resolution Imaging	$305,432
LANL-20120232ER	First Principles Many-Body Approaches to Strongly Correlated Actinide Metals	$318,203
LANL-20120246ER	Lanthanum Bromide Glass Ceramics for Gamma-Ray Spectroscopy	$302,461
LANL-20120247ER	Measurement of Pressure and Temperature in Thermal Explosions	$283,398
LANL-20120250ER	Are Nanoscale Foams Radiation Resistant?	$306,866
LANL-20120255ER	A Novel Mo-99 Separation Process Designed for Next Generation Medical Isotope Production	$297,924
LANL-20120256ER	Biofuel Enzymes by Design	$331,299
LANL-20120259ER	Laser-Driven Relativistic Mechanics, Radiation, and Ion Acceleration	$171,171
LANL-20120266ER	Monte Carlo for Quantum Transport	$299,551
LANL-20120278ER	Ultrafast Spectro-microscopy for Nanoscale Magnetic Domain Imaging	$305,255
LANL-20120285ER	High-Energy Segregated Fuel-Oxidizer Solid Rocket Propulsion System	$351,683
LANL-20120300ER	Unlocking Plasmons in Graphene	$311,684
LANL-20120314ER	Probing Beyond the Standard Model Discoveries at the Large Hadron Collider	$305,766
LANL-20120330ER	Plasmon-Exciton Interactions in Single-Wall Carbon Nanotube – Metal Nanostructure Complexes	$318,410
LANL-20120340ER	Nonequilibrium Spin Noise in Semiconductors: Physics and Applications	$313,469
LANL-20120365ER	Novel Inverted Nanoshells for Multimodal Diagnostic Imaging and Cancer Therapy	$236,504
LANL-20120374ER	Flipping the (light) Switch on Nano-magnetism: Emergent Photomagnetization in Quantum-confined Semiconductors	$305,618
LANL-20120375ER	A Novel Exploration of Nature's Largest Explosions	$338,830
LANL-20120395ER	Transport by Thermodynamic Cross-terms in Inertial Confinement Fusion Capsule Plasmas	$318,603

LANL-20120399ER	Co-Evolution of Protoplanets and Transitional Protoplanetary Disks - Pathway to Giant Exoplanet Formation	$319,685
LANL-20120400ER	Metabolic Engineering of an Algal Lipid Bioswitch	$295,798
LANL-20120443ER	Phylogenetic Classification and Analysis of Computer Malware	$298,787
LANL-20120449ER	A New Class of Antibody-like Molecules that Signal upon Binding	$311,565
LANL-20120459ER	Forensic Archaeology of a Manhattan Project Era Nuclear Site	$298,990
LANL-20120464ER	Exploiting Metal/Organic Interfaces as Potential Bulk Heterojunctions: Unlocking the Efficiency of Organic Photovoltaics	$323,392
LANL-20120469ER	Combinatorial Approaches To Graphical Models: Theory & Applications	$306,837
LANL-20120522ECR	Gating and Emission Enhancement of Diamond Field-Emitter Arrays	$53,768
LANL-20120535ER	Energy Efficient, Inducible Harvesting of Microalgae for Biofuels Production	$435,603
LANL-20120707DR	Accelerating Materials Certification through Co-Design	$372,834
LANL-20120715ECR	Understanding Energetic Ion Transport and Loss in Natural and Artificial Radiation Belts at Low Altitudes	$104,629
LANL-20120716ECR	Construction and Functionalization of Novel Biomimetic Human Liver	$115,131
LANL-20120721ECR	Enabling Temporal & Spatial Shaping of Ultra-Intense Laser Pulses for Next-Generation, Compact Particle and Radiation Sources	$99,735
LANL-20120732PRD1	Fabrication of an All-Carbon Solar Cell	$52,954
LANL-20120736ECR	Investigating the Itinerant to Localized Crossover of the 5f Electrons in Plutonium Alloys and Compounds	$108,504
LANL-20120737PRD1	Non-equilibrium Transport in Nanoscale Thermal Energy Harvesting	$74,224
LANL-20120738ECR	Deterministically Enhanced Monte Carlo for Radiative Transfer	$92,440
LANL-20120746PRD1	High Efficiency Upconversion of Infrared Radiation in Semiconductor-metal Nanostructures for Applications in Solar Energy	$110,274
LANL-20120747PRD1	Minority carrier devices based on concentric nanowires: Theory and Experiment	$84,205
LANL-20120750PRD2	Chemically Modifying the Uranyl Ion	$187,180
LANL-20120751PRD2	Frustrated Materials - Computational methods for modeling materials, like actinides, with competing interactions	$193,987
LANL-20120752PRD2	Cyber Security of the Smart Grid	$59,684
LANL-20120753PRD2	Designing and Probing Novel Materials by Pressure Tuning of Nanocrystals	$195,970
LANL-20120754PRD2	Atomic Coherence with X-Ray Free-Electron Lasers	$79,234
LANL-20120755PRD2	Precision Fission Cross Section Measurements with a Time Projection Chamber	$55,917
LANL-20120756PRD2	The Assembly of Primeval Galaxies and the Birth of the First Quasars	$104,486

LANL-20120757PRD2	Searching for Sterile Neutrinos with MicroBooNE	$156,636
LANL-20120758ECR	Large-Scale Simulations for Nuclei and Strongly-Correlated Matter	$79,600
LANL-20120759ECR	Precision Predictions for Jet Cross Sections	$85,130
LANL-20120765PRD3	Functional Soft Materials by Assembling Metallo-Biopolymers	$89,145
LANL-20120766PRD3	Tuned Optical Properties of Low-Dimensional Carbon Nanomaterials for Energy Harvesting	$122,427
LANL-20120767PRD3	Edge Traffic Monitoring in Computer Networks	$107,867
LANL-20120768PRD3	3D Turbulent Magnetic Reconnection Experiments and Simulations	$152,148
LANL-20120769PRD3	Enhanced Structural Robustness in Metal/Nonmetal Nanocomposites using Bio-inspired Structure Design	$141,831
LANL-20120770PRD3	Nanoscopic Recrystalization Dynamics and Phase Behavior in Liquid Crystals and Polymers	$131,631
LANL-20120771PRD4	Measurement of Orthogonal Velocity Components using Photon Doppler Velocimetry	$35,106
LANL-20120772PRD4	The Fate of the Three Dimensional Electron Far beyond the Quantum Limit	$91,326
LANL-20120773PRD4	The Role of Microscopic Eye Movements in Visual Perception	$98,688
LANL-20120774PRD4	Access to Industrially Important Chemical Compounds by Direct Hydrogenation of Biomass Derived Molecules Containing Carbonyl Fragments	$63,420
LANL-20120775PRD4	Using Jet Production to Investigate quark-Gluon Plasma at RHIC	$82,477
LANL-20120776PRD4	Catalytic Mechanism and Inhibition of Metallo-beta-lactamases, the Ultimate Threat Against Antibiotics.	$142,923
LANL-20130003DR	Using Microreactors for Efficient Plutonium Separations	$1,593,536
LANL-20130005DR	Disruptive Innovation in Numerical Hydrodynamics	$1,162,673
LANL-20130013DR	Empowering the Expert: Machine Learning with User Intelligence	$1,472,390
LANL-20130019DR	Illuminating the Origin of the Nucleon Spin	$1,691,602
LANL-20130026DR	Fighting Carbon with Carbon: All-Carbon Nanomaterial Photovoltaics	$1,565,883
LANL-20130030DR	Peta-scale Studies of Cosmic Explosions and Supernova Shock Breakout with Palomar Transient Factory	$1,560,439
LANL-20130052DR	Design Principles for Materials with Magnetic Functionality	$1,454,142
LANL-20130058DR	High Performance Atom-Based Sensors for Fields and Rotations	$1,634,518
LANL-20130065DR	Non-Precious Metal Electrocatalysts for Clean Energy	$1,512,424
LANL-20130091DR	Maximizing Flux through Engineered Metabolic Pathways	$1,485,365
LANL-20130118DR	Phase Stability of Multi-Component Nanocomposites under Irradiation	$1,499,953
LANL-20130121DR	Battlefield MRI	$1,640,080
LANL-20130232ER	3-Dimensional Characterization of Nuclear Fuels: Microstructural Evolution under Representative Temperature and Thermal Gradients	$296,967

LANL-20130239ER	Label-Free Measurement of Single Cells by Impedance Cytometry in a Microfluidic Device	$294,734
LANL-20130244ER	A Computationally Efficient Model for Warm Dense Mixtures	$322,087
LANL-20130252ER	Software/Hardware Mapping for Data Locality Optimization	$326,247
LANL-20130265ER	Contextual Learning and Recognition	$321,824
LANL-20130285ER	Very Low Temperature Scanning Point Contact Spectroscopy Investigation of Inhomogeneous States on the Nano-scale.	$394,816
LANL-20130297ER	A New Hypothesis to Explain the Variability of the Outer Radiation Belt: Can we Predict Post-storm Fluxes of Energetic Electrons Based only on Pre-storm Fluxes of the Lower-energy Population?	$318,179
LANL-20130309ER	Excited State Quantum Interactions in Carbon Nanotubes	$353,059
LANL-20130319ER	Multidisciplinary Studies of Long Non-coding RNAs: towards a Structural Basis for RNA in Epigenetics	$336,020
LANL-20130334ER	A New Approach to Multiscale Plasma Physics Simulations	$330,086
LANL-20130348ER	Enhancing Thermoelectric Properties of Topological Insulators through Nanostructuring	$336,952
LANL-20130350ER	"Upscaling" Nanoscale Thermoelectrics: The Meso-macroscale Design Challenge for Real-World Energy Needs	$351,164
LANL-20130385ER	Giving Cold Atoms Weight: creating Heavy Fermions in Optical Lattices	$324,730
LANL-20130409ER	Topology in Superposition: Quantum Decoherence in Many-body Systems	$335,979
LANL-20130416ER	Threat Reduction via Nanomaterials: Engineering a Novel Surface-enhanced Raman spectroscopy Platform for Chemical Detection	$291,153
LANL-20130418ER	Physics-Based Data Models and Architecture-Optimized Backends for a Portable Data-Parallel Computation Library	$155,009
LANL-20130442ER	How Trees Die: Multi-scale Studies of Carbon Starvation and Hydraulic Failure during Drought	$323,954
LANL-20130457ER	Co-Design of Burst Buffer Hardware and Data Analysis/Visualization Software for Large-Scale Simulations	$105,014
LANL-20130463ER	Ultra-Bright Electron Beam Acceleration in Dielectric Wake Accelerators	$406,132
LANL-20130487ER	Pyrocumulus Collapse: Unpredicted Wildfire Dangers	$310,205
LANL-20130504ER	Validating Near-Ideal Data Throughput Using a Rate-Compatible Protocol	$179,651
LANL-20130517ER	Accurate Interfacial Structures for Atomistic Simulations: Minimizing the Grand-Canonical Free Energy	$332,288
LANL-20130525ER	Understanding and Controlling Magneto-Electric Coupling in Multiferroic Materials	$352,927
LANL-20130527ER	High Performance Thin Film Super Capacitors	$275,018
LANL-20130558ER	Sparse, Distributed, and Robust Network Control	$315,455
LANL-20130564ER	Wide Field-of-View Plasma Spectrometer	$286,689
LANL-20130590ER	Biocatalysts for Remediation of Uranium Wastes	$309,243

LANL-20130601ER	Phase Transitions at Extremes: Emergence of Topological Defects	$408,371
LANL-20130620ER	Structure Determination of Large and Membrane-Bound Proteins by Nuclear Magnetic Resonance Spectroscopy	$339,566
LANL-20130624ER	Magnetic Nanomarker Detection and Imaging with Superconducting quantum interference device	$316,610
LANL-20130626ER	Beyond the Standard Halo - Hashed Oct-tree simulation of dark matter and galactic halos	$332,344
LANL-20130632ER	Coherent Diffractive Imaging of Ultrafast Ejecta Processes	$353,620
LANL-20130637ER	In Search of Light weakly interacting massive particles	$339,858
LANL-20130672ER	Redox active Catalysts for C-C Coupling Reactions Relevant to Renewable Energy	$335,439
LANL-20130679ER	Electron Capture Spectroscopy for Neutrino Mass: Isotopes, Science, and Technology Development	$477,569
LANL-20130681ER	Novel Chemical Architectures for Supercapacitor Electrolytes: Comparing In Situ Scattering Measurements to Theory and Simulation	$346,495
LANL-20130688ER	Emittance-Reduction System for Future Accelerator Solutions	$247,143
LANL-20130727DR	Quantum Chemistry, Information, Materials and Metrology	$550,757
LANL-20130728DR	Non-Equilibrium Phenomena in Materials, Fluids, and Climate	$565,053
LANL-20130733ECR	The World's First Drought and Insect Caused Global Tree Mortality Monitoring System	$209,812
LANL-20130737ECR	From Troposphere to Ionosphere: How Much do Thunderstorms Disturb the Total Electron Distribution?	$154,370
LANL-20130738ECR	Room Temperature Oxidation and Corrosion of Plutonium	$216,651
LANL-20130741ECR	Quantum Methods for Fast Signal Processing and Metrology	$214,333
LANL-20130744ECR	First Principle Study of Relativistic Beam and Plasma Physics Enabled by Enhanced Particle-In-Cell Capability	$197,711
LANL-20130745ECR	Novel Mesoscale Modeling Approach for Investigating Energetically Driven Nanoscale Defect/Interface Interactions	$217,426
LANL-20130749ECR	Stochastic Modeling of Phase Transitions in Strongly Interacting Quantum Systems	$204,983
LANL-20130755ECR	Magnetic Field Effects on Convection-Modified Solid-Liquid Interfaces	$211,354
LANL-20130757ECR	Understanding The Catalytic Conversion of Oligosaccharides to Fuels and Chemical Feedstocks.	$219,208
LANL-20130758ECR	Answer to Heavy Element Production Puzzle by Measuring Neutron-induced Charged Particles at Los Alamos Neutron Science Center	$226,082
LANL-20130764ECR	Effects of Joining Processes on Bimetal Interface Content and Radiation Damage Resistance	$209,876
LANL-20130772ECR	Probing Interface Reactions of Calcite Nanocrystals at Elevated Temperatures and Pressures	$221,502
LANL-20130777PRD1	Extending the Time-Scale of Protein Simulations using Accelerated Molecular Dynamics Techniques	$76,169

LANL-20130778PRD1	Stimuli Responsive, Functional Biopolymers: Quinic Acid-Based Polymers and Their Assemblies	$148,842
LANL-20130779PRD1	Single Cell Genomics for Better Control of Plant Pathogens	$169,183
LANL-20130780PRD1	NMR Study of Quantum States of Matter	$140,413
LANL-20130781PRD1	Electronic and Photonic Transport in Chiral Materials and Nanostructures	$151,677
LANL-20130782PRD2	Exploring Doubly Parasitic Radioisotope Production Via Secondary Neutron Fluence From the 100 MeV IPF Irradiations	$166,272
LANL-20130783PRD2	Theoretical investigation of nucleon and nuclear structure at very high energies	$199,540
LANL-20130784PRD2	A Quadrature Approach for Non-Gaussian Uncertainty Representation and Propagation	$118,412
LANL-20130785PRD2	Efficient Carbon Nanotube Growth on Graphene-Metal Surfaces	$193,479
LANL-20130787PRD2	Hybrid Nanostructures for Photoreduction of CO_2 to Hydrocarbons	$108,884
LANL-20130788PRD2	Alternating Positive-Negative Charge Systems: New Compounds and Synthetic Routes	$134,701
LANL-20130789PRD2	The Intersection of the Energy, the Intensity, and the Cosmic Frontiers in the era of the Large Hadron Collider and XENON experiments	$142,465
LANL-20130790PRD2	Graphene Quantum Dots for Carrier-Multiplication-Enhanced Solar Cells	$183,563
LANL-20130792PRD2	Mixing and Diffusion in Granular Flows	$213,770
LANL-20130794PRD2	Boosting New Physics Discoveries with Jet Substructure	$141,876
LANL-20130796PRD2	Microstructured Biohybrid Synthesis of Photosynthetic Assemblies	$149,432
LANL-20130804PRD3	Photoactive energetic materials for quantum optical control	$62,913
LANL-20130805PRD3	Topological Kondo Insulators - Development of new experimental techniques	$132,500
LANL-20130806PRD3	Poly-Triphenylamine-Functionalized Graphene Quantum Dots for Flexible High-Performance Polymeric Memory Devices	$69,518
LANL-20130807PRD3	Joint Inversions of Seismic and Gravity Data in Volcanic Areas to Advance Hazards Assessment: A Focus on the Alaskan Subduction Zone and Kilauea, Hawaii	$150,058
LANL-20130808PRD3	Probing and Modifying Intertube Interactions in Semiconducting Carbon Nanotubes	$134,678
LANL-20130810ER	Integrated Biosurveillance	$693,774
LANL-20130812PRD3	Understanding and Controlling Magnetism in Multiferroics with THz Pulses	$155,521
LANL-20130813PRD4	Broken Symmetries in Superconductors	$124,740
LANL-20130814PRD4	Ultrafast Vacuum Ultraviolet Spectroscopy of Complex Materials	$147,485
LANL-20130815PRD4	Discovery of Novel Bioactive Natural Products	$147,724
LANL-20130816PRD4	Hybrid Metal-Semiconductor Nanostructures for Optimized Photosynthetic Algal Growth	$126,828

LANL-20130817PRD4	From Food to Fuel: Making Ammonia Synthesis Viable for Energy Storage Applications	$120,214
LANL-20140002DR	Discovery Science of Hydraulic Fracturing: Innovative Working Fluids and Their Interactions with Rocks, Fractures, and High Value Hydro-carbons	$1,575,651
LANL-20140005DR	Photoactive Energetic Materials for Quantum Optical Initiation	$1,519,946
LANL-20140011DR	Optical and Laser Spectroscopy of Th-229 Electronic and Nuclear Transitions for the Development of Solid State Nuclear Quantum Sensors	$1,482,746
LANL-20140013DR	Information-Driven Materials Discovery and Design	$1,537,193
LANL-20140015DR	Probing New Sources of Time-Reversal Violation with Neutron Electric Dipole Moment	$1,577,331
LANL-20140025DR	Multiferroic Response Engineering in Mesoscale Oxide Structures	$1,659,573
LANL-20140029DR	First Direct Measurement of High-Z/Low-Z Plasma Interface Evolution in Isochorically Heated Dense Plasma	$1,818,162
LANL-20140033DR	Remote Raman-LIBS Spectroscopy Signature Integration	$1,723,907
LANL-20140046DR	The Role of Short-lived Actinide Isomers in High Fluence Environments	$1,717,822
LANL-20140049DR	Explosives signatures for detection: Nonlinear GHz to THz responses	$1,363,427
LANL-20140051DR	Exploring Mechanisms of Catalysis on Plutonium Surfaces	$1,670,305
LANL-20140059DR	k_effective: First Measurement of Nanosecond-Pulsed Nuclear Reactivity on a Subcritical Assembly	$346,772
LANL-20140061DR	Space Hazards Induced near Earth by Large, Dynamic Storms: Understanding, Modeling, and Predicting	$347,210
LANL-20140066DR	F-Element Nitrides: New Synthetic Methodologies and Signatures for the Preparation of Advanced Nuclear Materials	$342,851
LANL-20140074DR	Next Generation Quantum Molecular Dynamics	$1,568,457
LANL-20140090DR	Enabling Data-aware Distributed Scientific Computing	$351,257
LANL-20140114DR	Mesoscale Materials Science of Ductile Damage in 4 Dimensions: Towards the Computational Design of Damage-Tolerant Materials	$1,464,458
LANL-20140121DR	Combating Antibiotic Resistance: Targeting Efflux Pump Systems at Multiple Scales	$1,582,599
LANL-20140123DR	Meso-Photonic Materials	$354,295
LANL-20140143ER	Micro-Mirror Full-Frame Programmable Spectral Filters for the Long-wave Infrared	$283,553
LANL-20140177ER	Spin-state Transitions as a Route to Multifunctionality	$445,853
LANL-20140180ER	Hybrid Shock Ignition as an Alternate Concept for Fusion Energy	$304,778
LANL-20140186ER	One-step Supercritical Fluid Extraction and Separation of Rare Earths	$282,165
LANL-20140200ER	Time Resolved Phonon Spectroscopy for Cryogenic Bolometer Readout	$336,984
LANL-20140216ER	Deciphering the Algal Phycosphere	$405,538

LANL-20140237ER	Measuring Winds in the Stratosphere using Passive Acoustic Sensors	$254,848
LANL-20140252ER	Quantum Kinetics of Neutrinos in the Early Universe and Supernovae	$348,621
LANL-20140261ER	Beyond the Chemical Reaction Zone: Detonation Product Gases in the Warm Dense Regime	$277,779
LANL-20140269ER	Designing the Next Generation Compton Light Source	$348,306
LANL-20140270ER	From the Finite Element Method to the Virtual Element Method.	$342,573
LANL-20140271ER	Topological Kondo Insulators - Test of the theoretical prediction of a new quantum state	$353,527
LANL-20140275ER	Cryogenic Laser Refrigerator for Infrared Imaging	$301,569
LANL-20140293ER	Semiclassical Modeling of Non-adiabatic Processes in Molecular Materials	$320,676
LANL-20140302ER	Large Fluctuations in Stochastic Dynamical Systems	$354,288
LANL-20140307ER	Intrinsically Disordered Proteins: New Tools for Old Controversies	$354,079
LANL-20140309ER	Electromagnetic Field Control of Cold Molecular Collisions	$243,866
LANL-20140323ER	Accelerating Time Integration for Multi-scale Simulations	$328,763
LANL-20140348ER	Making nano-Mg a reality	$350,657
LANL-20140351ER	Combined Klystron and Linac (Klynac)	$272,233
LANL-20140355ER	Automated Identification and Reverse Engineering of Malware	$323,712
LANL-20140362ER	Matter Wave Circuits	$366,112
LANL-20140371ER	Toward Tunable Functionalties Using Epitaxial Nanoscaffolding Films	$314,667
LANL-20140389ER	Temporal Graphs	$330,695
LANL-20140396ER	Chemical Shift Signatures of Nuclear Material: 235U and 239Pu NMR spectroscopy	$320,856
LANL-20140406ER	Solid-State Gamma-Ray Detectors Based on Quantum Dots	$394,121
LANL-20140425ER	Agile Persistent Space Situational Awareness Surveillance Networks Using Mobile Platforms	$309,665
LANL-20140433ER	Signatures of Reactor Operations from Plutonium Production samples	$433,577
LANL-20140444ER	Multi-scale Probabilistic Resuspension Modeling of Spores and Radionuclides from Outdoor Surfaces	$321,084
LANL-20140446ER	Direct-gap Group-IV Nanocrystals:Cheap, Versatile Materials for Solar Cells	$337,471
LANL-20140450ER	Understanding of Nanoscale Fracture and Its Application in Developing High Fracture Toughness Nanoscale Composites	$345,311
LANL-20140456ER	Metal and Semiconductor Nanocrystal Superlattices Under Pressure: Multiscale Tuning of Structure and Function	$458,404
LANL-20140458ER	Efficient Method for Large Scale Simulations of Fermionic Gases Interacting with Classical Fields	$327,717
LANL-20140483ER	First Direct Observation of Weibel Instability in Collisionless Shocks	$394,653

LANL-20140486ER	Graphene Shield Enhanced Photocathodes	$358,360
LANL-20140495ER	Interactions of Electrons with Quantum-Confined Systems Probed by Scanning Tunneling Spectroscopy	$328,066
LANL-20140504ER	New Chemistry Towards High Purity Uranium and Thorium Nitrides	$335,668
LANL-20140507ER	Integrated Photonics Pathfinder	$271,889
LANL-20140525ER	Multiplexed LIDAR of Absorbing Gases	$274,382
LANL-20140540ER	Unraveling Interfacial Charge and Energy Transfer Processes in Single Layer 2D Transition Metal Dichalcogenides	$402,946
LANL-20140546ER	Discovery and Implication of Negative Ions in the Earth's Magnetosphere	$340,018
LANL-20140558ER	Viral Disarmament: A Trojan Protein Approach	$354,253
LANL-20140565DR	Optimization and Control of Dynamic Networks	$367,302
LANL-20140566DR	Quantitative Biology: From Molecules to Cellular Function	$575,479
LANL-20140568DR	Research Enabling a Next Generation Neutron Lifetime Measurement	$498,057
LANL-20140575ECR	Effects and Mitigation of Hot Electrons in Direct Drive Implosions	$14,781
LANL-20140580ECR	Laser-Driven Neutron Source for Detection of Nuclear Material	$157,948
LANL-20140581ECR	Microscopic Fission Model for Data Needs	$88,074
LANL-20140591ER	Multi-GeV Electron Radiography	$271,691
LANL-20140616ER	Photocathodes in Extremes: Understanding and Mitigating High Gradient Effects on Semiconductor Cathodes in X-FELs	$161,078
LANL-20140622ECR	Attosecond Dynamics of Correlated Electrons in f-Electron Materials	$169,758
LANL-20140624ECR	Deciphering Nature's Chemical Toolbox: Decoding the Logic of Biosynthetic Assembly Lines	$165,603
LANL-20140629ECR	Deployment and Installation Technologies for Distributed Measurement Systems in Inconvenient/Hazardous Environments.	$170,380
LANL-20140630ER	Microstructure Based Continuum Process Modeling of Weapons Metals	$257,522
LANL-20140639ER	Solute and Microstructure Prediction during Processing	$338,629
LANL-20140643ER	In situ X-ray Imaging and Diffraction to Understand the Mechanics of Initiation Mechanisms in Explosive Single Crystals	$237,076
LANL-20140645ER	Enabling Mesoscale Science: Nonlocal Dislocation-Flux Crystal Plasticity under Shock Loading Conditions	$236,123
LANL-20140650ER	Embedded Fiber Sensor Approach for Dynamic Pressure and Temperature Measurements in Explosives	$163,064
LANL-20140655ER	Ultrafast Nanocomposite Scintillators: Decay Rate Enhancement by Electromagnetic Coupling to Plasmon Resonances	$193,388
LANL-20140657PRD1	Ultrafast Measurements of Emergent Magnetism in New Complex Oxide Materials	$135,015
LANL-20140658PRD1	Design Principles for High Performance Organic Photovoltaics	$99,351
LANL-20140659PRD1	Synthesis of Novel Energetic Materials	$51,320

LANL-20140660PRD1	Genetically Encoded Tools for Light-controlled Molecular Assembly	$50,044
LANL-20140661PRD1	Investigating Structure-Directing Agents in Nonconventional Nanowire Synthesis Using a Transmission-Electron-Microscope Flow-Cell Holder	$56,279
LANL-20140662PRD1	Tracking Microbial Activity to Predict the Impacts of Climate Change on Ecosystem Function	$96,474
LANL-20140664PRD2	Complexes Containing Redox-Active Ligands for the Synthesis of Fuels from Readily-Available Carbon Sources	$84,551
LANL-20140665PRD2	Investigating Properties of Quark-Gluon Plasma using Jets and Heavy Quark Production at RHIC	$113,251
LANL-20140666PRD2	Bottom-up Chemical Synthesis of Large, Well-Defined, and Organo-Processable Nanographene-based Triarylamine for Optoelectronic Applications	$106,020
LANL-20140667PRD2	Thermodynamics and information processing at the nanoscale	$25,055
LANL-20140668PRD2	Photoactive energetic materials for quantum optical control	$83,297
LANL-20140669PRD2	Mesoscopic Lattice Boltzmann Modeling and Investigation of Boiling Multiphase Flows	$23,717
LANL-20140671PRD2	New Tools to Probe Matter with an Electron-Ion Collider	$15,152
LANL-20140672PRD2	Access to Industrially Important Optically Active beta-X-alcohols via Direct Enantioselective Ester Hydrogenation	$104,882
LANL-20140673PRD2	Electric Dipole Moments of Hadrons from Lattice Quantum ChromoDynamics	$20,918
LANL-20140674PRD3	Multi-wavelength Studies of Explosive Astrophysical Transients	$21,329
LANL-20140675PRD3	Ultrafast Carrier Dynamics in Novel Two-Dimensional Nanomaterials	$23,724
LANL-20140676PRD3	New Room Temperature Multiferroic Thin Films Enabled by Strain Engineering	$23,350
LANL-20140677PRD3	Synthesis and X-ray Spectroscopy of Actinide Thiocyanates	$19,170
LANL-20140679PRD3	Rational Design of Multiferroics and Influence of Cationic Disorder on Multiferroicity in Perovskites	$8,674
LANL-20140680PRD3	Shock-Driven Material Dynamics Investigated by Ultrafast X-ray Diffraction	$19,091
LANL-20149999ER	Post-project Debits and Credits	$86,647
Total # of Projects for LANL: 290		
Total Cost for LANL: $118,459,454		
Total Administrative Cost: $2,185797		
LBNL - L. Berkeley National Lab		
LB11045	Modeling Desert Soil Crust Microbial Community Response to Pulsed Climate Events	$185,736
LB12004	Developing a Mechanistic High-latitude Biological Soil Carbon and Nitrogen Cycle Module for Site, Regional and Global Land Models	$157,357

LB12009	An Optimization-based Strategy for Computational Design of Nanoporous Carbon-Zero Materials	$169,969
LB12012	Simulating Astrophysical Explosions through High Performance Computing	$232,565
LB12021	Quantitative Image Analysis for Computational Modeling	$156,341
LB12024	Numerical Algorithms and Mathematical Software for Computational Material Science and Chemistry	$90,151
LB12025	High-throughput Isolation and Functional Screening (HIFS) of Microbes Relevant to Today's Carbon Cycling and Bioenergy Needs.	$123,236
LB12034	Computational Methods for X-ray Free-Electron Laser Studies of Solar Energy Converting Biocomplexes	$218,605
LB12035	Interlinkage of Cross-Disciplinary Mathematical Technologies	$534,585
LB12040	New Monolithic CMOS Sensors on a Fully Isolated Substrate (2nd Year Request)	$214,503
LB13001	Probing Point Defect Dynamics in Solids with Short Ion Beam Pulses	$525,917
LB13002	Magnetic-Field-Induced and Transient Quantum Phases in Correlated Materials	$261,910
LB13004	Next generation Gratings for Spectroscopy and Pulse Manipulation	$303,063
LB13007	High-Performance Parallel Graph-Analysis for Key Genomics Computations	$387,462
LB13008	Modeling Subsurface Reactive Transport Processes from Mineral-to-Pore-to-Continuum	$261,376
LB13009	SPOT Suite - Towards an End-to-End Solution for Light Source Data	$453,414
LB13010	Computational approaches to understanding ultrafast science	$174,983
LB13011	Laboratory Institute for Globally Transformative Technologies Clinic-in-a-Box	$265,431
LB13012	Stick-on Electricity Meters: Low Installed Cost Building Sub-Meters for Commercial and Industrial Energy Efficiency	$164,596
LB13013	Integrated Assessment Capability for Sustainable Water-Energy Co-Management	$258,741
LB13015	Urban Scale Energy Grid Modeling	$182,720
LB13016	A Novel Nanoscale Chemical Analysis System for Low-Cost Solar Materials	$181,829
LB13017	Integrative Mapping of Soil Heterogeneity at the Microbial Scale	$594,167
LB13018	Isotopic Probe of Ion Migration Processes in Li-ion Batteries	$143,685
LB13019	Nanoparticles-Stabilized Supercritical CO2 Foams: Developing Novel Microemulsions for CO2-Enhanced Oil Recovery	$194,258
LB13020	Development of Biosensors for High-throughput Functional Screening of Biosynthetic Pathways	$107,892

LB13021	Function-Based Approaches for Distant-Acting Enhancer Discovery	$229,859
LB13022	Developing Epigenomic Technologies to Interrogate Genome Functions Relevant for Environment and Bioenergy	$156,674
LB13023	Integrated Imaging of Microbial Community Response to External Threats	$477,000
LB13024	Development of Protein Localization Atlases at Multiple Scales in Eukaryotes	$475,000
LB13025	Exciton Visualization and Engineering in Organic Materials for Energy Conversion	$261,570
LB13026	Integrated Tools for Next Generation Bioimaging	$295,328
LB13027	Probing Dynamics of Electron Transfer for Microbial-based Energy Interconversion	$172,875
LB13028	Functional Genomic Encyclopedia of Bacteria and Archaea: Evidence-Based Annotation of the Microbial Tree of Life	$327,319
LB13029	Simultaneous INverse Beam Anomalous Diffraction	$147,691
LB13030	Optimizing Plant-microbe Interactions for Sustainable Supply of Nitrogen for Bioenergy Crops	$343,597
LB13031	Synchrotron X-Ray Footprinting: A Step Beyond Standard Structural Techniques in Revealing Protein Interactions and Dynamics	$148,664
LB13032	Transforming Infrared Astronomy with Nanostructured IR Filters	$232,823
LB13033	Higher Performance CCDs for Next Generation Dark Energy Experiments	$312,728
LB13035	Rational Design Approach to the Formation of Hybrid Framework Materials	$401,804
LB13036	New Algorithms for Performing and Analyzing Large-scale Electronic Structure Calculations	$296,944
LB13037	4D Dynamics of Epigenome Regulation in Response to Environmental Challenges	$430,008
LB13038	Ultra-high Resolution Microscopy of Nano-materials by Scanning X-ray Diffraction Microscopy	$195,926
LB13040	Search and Synthesis of the Next Generation of Topological Insulators	$202,155
LB13041	Using Experiments and Numerical Models to Examine Ecosystem and Land Management Interactions With Atmosphere and Climate	$290,684
LB13042	Superconductor Undulators for Light Sources	$596,325
LB13043	Generative Design Methods for Integration of Energy and Sustainability in Early-Stage Architectural Design (Year 2)	$35,987
LB13044	Tropical Forest Ecosystems Under a Changing Climate	$187,753
LB13045	Creating the vehicle-to-grid simulation platform for predicting the impact and optimally integrating plug-in electric vehicles on the electricity grid	$233,931

LB14001	Towards the Development of a Fiber Based Laser Plasma Accelerator and Assessment of its Utility for Potential Biomedical Applications.	$385,855
LB14002	High-accuracy Scalable Solvers for Modeling of Future Ultrafast Photon Sources	$299,493
LB14003	Novel Accelerator Techniques for Diffraction Limited Light Sources	$1,094,917
LB14004	Probing Ultrafast Dynamics with Multi-color, Multi-pulse Laser and Synchrotron Photons	$305,112
LB14005	Design of Mesoscale Catalyst Networks	$443,607
LB14006	Designing Fluctuations and Dynamics of Enzyme Catalytic Networks	$216,713
LB14007	Computational-Experimental Studies of Aerosol Transformations from the Liquid to Glassy State	$188,654
LB14008	Graph-based Analysis and Visualization of Multimodal Multi-resolution Large-scale Neuroimaging Data.	$367,797
LB14009	Advanced Computational Chemistry and Semantic Data Tools for Mesoscale Science	$319,981
LB14010	Numerical Methods for Multiple Evolving Interfaces	$84,872
LB14011	A Graphene-Based Platform for Correlative Electron and Super-Resolution Microscopy	$143,302
LB14012	Virtual Grid Integration Lab	$521,506
LB14013	NanoReporter - an Radio Frequency Powered, Nanoscale 3D Microelectronic Assembly for Mapping the Functional Connectome of the Brain	$24,003
LB14014	A Mesoscale Study of Hydrologic Properties of Shales	$152,338
LB14015	Quantifying the Mesoscale Dynamics that Control Natural Organic Matter Conformation and Reactivity	$245,889
LB14016	Modification of the Genetic Code to Construct a Safe Industrial Microbe for Synthetic Biology	$178,364
LB14017	Sequencing-based Functional Genomic in-vivo Characterization of Plant Promoters	$167,009
LB14018	Development of a Cas9 Based Resource for Genome Engineering	$321,553
LB14019	Toward Laser Spectroscopy of Transfermium Elements	$203,591
LB14020	Next Generation Si-based Tracking and Massive Online Data Processing for Collider Experiments	$226,607
LB14021	Enhancing the Design-Build-Test-Learn Cycle for Metabolic Engineering	$770,457
LB14022	Tactical High Throughput Computing: Improving interdisciplinary Tools for High Throughput Computing at NERSC and Beyond	$152,670
LB14023	Advanced Composites for Next Generation Scientific Instruments	$396,608
LB14024	Next Generation Cosmic Microwave Background Detector Arrays: Enabling a Factor 10-100 Increase in Array Size	$256,674

LB14025	Dynamics of Mesoscale Electronic Ordering in Complex Materials	$607,742
LB14026	Codesigning Big Iron for Big Data	$374,415
LB14027	Reinventing Pre-clinical and Environmental Testing Paradigms	$632,816
LB14028	Responsive Nanoparticle Assemblies	$324,308
LB14029	Construction of a Quantitative Differential Electrochemical Mass Spectrometer	$136,500
LB14030	Simultaneous Above- and Below-Ground Terrestrial System Monitoring	$305,045
LB14031	Neuro/Nano Technology for Brain Mapping	$414,409
LB14032	Enabling Technologies for Advanced Semiconductor Manufacturing Research	$83,199
LB14033	Hard X-Ray Photoemission for Materials Science	$118,745
LB14034	Overcoming Technical Constraints to Urban Food Systems: Sustainable Solutions for Energy, Nutrient, Space and Water demands	$159,863
Total # of Projects for LBNL: 83		
Total Cost for LBNL: $23,621,751		
Administrative Cost Paid by Laboratory Overhead		
LLNL - L. Livermore National Lab		
11-ERD-035	Adaptive Sampling Theory for Very-High-Throughput Data Streams	$135,010
11-ERD-075	The Role of Plasma Electromagnetic Fields in Anomalous Mass Diffusion: Applications to High-Energy-Density Science	$168,280
11-ERD-076	Large-Scale Energy System Models: Optimization Under Uncertainty	$631,490
11-SI-006	Creating Optimal Fracture Networks for Energy Extraction	$1,168,240
12-ERD-005	Asteroid Deflection - Methods that could be used to protect Earth in the event of impending collision	$567,590
12-ERD-013	Novel Rare Earth Permanent Magnets	$510,760
12-ERD-020	First-Principles Materials Characterization and Optimization for Ultralow-Noise Superconducting Qubits	$204,690
12-ERD-021	Probing Atomic-Scale Transient Phenomena Using High-Intensity X Rays	$334,900
12-ERD-022	Computational Gyro-Landau Fluid Model for Tokamak Edge Plasmas	$405,590
12-ERD-023	High-Fluence, Multipulse Laser Surface Damage: Absorbers, Mechanisms, and Mitigation	$1,109,860
12-ERD-024	Network Simulation and Its Applications	$771,880
12-ERD-026	An Open Framework to Explore Node-Level Programming Models for Exascale Architectures	$333,050
12-ERD-027	A Scalable Topological Quantum Device	$332,820
12-ERD-030	High-Order Curvilinear Arbitrary Lagrangian-Eulerian Hydrodynamics	$51,640

12-ERD-031	Dynamical Imaging of Biomolecular Interactions	$819,150
12-ERD-032	Hydrogen Ice Layers for Inertial-Confinement Fusion Targets	$1,165,680
12-ERD-033	Efficient and Accurate Metagenomics Search Using a k-mer Index Stored in Persistent Memory	$436,430
12-ERD-035	Dynamically Tunable Nanometer-Scale Materials: From Atomic-Scale Processes to Macroscopic Properties	$433,560
12-ERD-038	Automatic Complexity Reduction for Electromagnetic Effects Simulation	$197,620
12-ERD-040	Novel Multiple-Gigahertz Electron Beams for Advanced X-Ray and Gamma-Ray Light Sources	$1,613,190
12-ERD-041	Ionic Dopant Pairs for High-Fluence Filters	$628,120
12-ERD-042	Strength in Metals at Ultrahigh Strain Rates	$405,480
12-ERD-043	A New Approach for Reducing Uncertainty in Biospheric Carbon Dioxide Flux	$273,000
12-ERD-046	Predicting Weapon Headspace Gas Atmosphere for Modeling Component Compatibility and Aging	$436,830
12-ERD-047	A Model-Reduction Approach to Line-By-Line Calculations for Opacity Codes	$293,540
12-ERD-048	A Linearly Scalable Algorithm for First-Principles Molecular Dynamics at Exascale	$346,390
12-ERD-050	Laser Lethality Experimentation, Modeling, and Simulation Capability	$626,860
12-ERD-051	Forward Path to Discovery at the Large Hadron Collider	$216,800
12-ERD-052	Equation of State of Polymers Under Extreme Conditions with Quantum Accuracy	$351,190
12-ERD-053	Multiscale Capabilities for Exploring Transport Phenomena in Batteries	$424,260
12-ERD-055	Multilayer Thin-Film Science for Core Missions	$377,550
12-ERD-058	Early-Phase Hydrodynamic Instability Development in National Ignition Facility Capsules	$412,220
12-ERD-060	The Next Generation of Gamma-Ray Sources: Dual Isotope Notch Observation	$228,070
12-ERD-061	Theory and Simulation of Large-Amplitude Electron Plasma and Ion Acoustic Waves with an Innovative Vlasov Code	$730,560
12-ERD-062	Pair-Plasma Creation Using the National Ignition Facility	$350,430
12-ERD-064	Predictive Models for Target Response During Penetration - develop new, high-fidelity, three-dimensional modeling capabilities for predicting conventional penetrator performance against hardened and deeply buried targets	$353,710
12-ERD-066	New Energetic Materials	$225,010
12-ERD-069	Forecasting and Uncertainty Quantification of Power from Intermittent Renewable Energy Sources	$529,920
12-ERD-071	Operations Security Aware	$551,950
12-ERD-073	Carbon Nanometer-Scale Membrane Channels	$368,980

12-LW-008	Comprehensive Study and Treatment of Major Depressive Disorder Using Electrical and Chemical Methods	$189,220
12-LW-026	Physics Beyond Feynman	$158,100
12-SI-004	Computational Advancements in Countermeasures for Emerging Bio-Threats	$1,384,060
12-SI-005	Transport Properties of Dense Plasmas and a New Hybrid Simulation Technique for Matter at Extreme Conditions	$1,921,290
12-SI-007	Extreme Compression Science	$1,329,410
12-SI-008	Ultrahigh-Burnup Nuclear Fuels	$205,140
13-ERD-002	Coupled Segmentation of Industrial Computed Tomographic Images	$694,840
13-ERD-004	A Three-Dimensional Radioisotope Battery	$198,740
13-ERD-009	Micro-Reflector Array for High-Speed Directed-Light-Field Projection	$261,400
13-ERD-016	Low-Energy-Threshold Phonon Detectors for Coherent Neutrino Scattering	$364,700
13-ERD-020	Detection of Novel Infectious Agents from Clinical Samples Through Immunoglobulin M and Toll-Like Receptor Capture	$382,460
13-ERD-022	Rapid Synthesis, Functionalization, and Assembly of Nanometer-Scale Particles for Designer Materials	$353,010
13-ERD-023	Illuminating the Dark Universe with the Sequoia Supercomputer	$324,420
13-ERD-025	Data-Centric Computing Architecture	$1,064,920
13-ERD-029	Reactive Materials for Hydraulic Fracturing	$635,000
13-ERD-030	Unraveling the Physics of Nanometer-Scale Fluidic Phenomena at the Single-Molecule Level	$349,170
13-ERD-031	Fast Running Codes via High-Fidelity Reduced-Order Models	$442,820
13-ERD-032	Selecting Better Models for Climate Change Detection and Attribution	$181,620
13-ERD-033	Neutron Star Science with the Nuclear Spectroscopic Telescope Array	$137,430
13-ERD-035	Whole-Heart Modeling on High-Performance Computing Systems	$474,760
13-ERD-036	Radiochemical Measurements of Nuclear Reactions at the National Ignition Facility	$1,008,650
13-ERD-038	Complex Electronic Structure of Rare Earth Activators in Scintillators	$540,360
13-ERD-042	Optimizing Drug Efficacy through Pharmacogenomics-Driven Personalized Therapy	$569,730
13-ERD-043	Large-Scale Integrated Electric Transmission and Distribution Grid Dynamic Simulation	$835,330
13-ERD-044	Theoretical and Computational Studies of Rare Earth Substitutes: A Test Bed for Accelerated Materials Development	$410,030
13-ERD-046	A Hybrid Content- and Concept-Based Approach to Large-Scale Video Analytics	$634,450

13-ERD-047	Simulation of Engineering Fracture and Fragmentation	$234,020
13-ERD-048	Hard X-Ray Mirrors for Nuclear Security	$411,070
13-ERD-051	High-Explosive Components Using Advanced Manufacturing Methods	$582,760
13-ERD-055	Task Mapping on Complex Computer Network Topologies for Improved Performance	$299,220
13-ERD-056	Next-Generation Process for Tritium Recovery for IFE Applications	$528,950
13-ERD-057	Optimized Three-Dimensional Electrodes for Energy Storage	$342,230
13-ERD-058	Transient Loading Effects on Structural Materials for Laser Inertial Fusion Energy	$706,050
13-ERD-062	Dynamic Predictive Analytics Approach to Comprehensive Nuclear Forensic Analysis	$446,890
13-ERD-063	Measuring Dark Energy with the Large Synoptic Survey Telescope	$279,460
13-ERD-067	Quantum Monte Carlo Benchmarks for Materials on Demand	$247,780
13-ERD-072	Scalable, Revealing Factorizations of Directed Graphs and Hypergraphs	$497,460
13-ERD-073	Generation and Characterization of Matter at Extreme Gigabar Pressures at the National Ignition Facility	$314,800
13-ERD-078	Strength and Phase Transformation Kinetics Under Dynamic Compression	$303,930
13-FS-006	Enhancing Laser-Driven Ion Beams by Self-Guiding of Intense and Ultrashort Laser Pulses in Plasma	$11,190
13-LW-003	Why Is Nuclear Matter So Red?	$169,520
13-LW-004	Search for Metallic Hydrogen: An Advanced First-Principles Study	$269,930
13-LW-031	Nanometer-Scale Porous Designer Materials	$247,380
13-LW-032	Wonder Bugs and the Carbon Cycle: Characterizing the Carbon Metabolism of Thaumarchaeota	$215,610
13-LW-048	Experimental and Ab Initio Theoretical Search for Lanthanide Covalency for Enhanced Rare Earth Separations	$275,830
13-LW-065	Electromagnetic Manipulation of Nuclear Decay	$267,030
13-LW-066	Manipulation of Surface Plasmon Resonance by Programmable Nanometer-Scale Particle Assemblies	$269,410
13-LW-076	A Compact, Femtosecond Hard X-Ray Source for Materials Characterization and High-Energy-Density Science	$299,380
13-LW-085	Simulated Opening of the Glutamate Receptor for Enabling Alzheimer's Treatment	$270,100
13-LW-099	Transformative Catalysts for Nonconventional Feedstocks	$269,960
13-SI-001	Giga-Shot Optical Laser Demonstrator	$1,459,890
13-SI-002	Accelerated Certification for Additively Manufactured Metals	$2,700,560
13-SI-004	Continuous Network Cartography	$1,768,470
14-ERD-001	A Coupled Seismic and Acoustic Simulation Capability	$437,900
14-ERD-005	Biological Printing of Vasculature for Artificially Grown Tissue	$367,950

14-ERD-006	Atmospheric Source Reconstruction with Uncertainty Quantification	$314,930
14-ERD-010	Enzyme-Embedded, Microstructural Reactors for Industrial Biocatalysis	$491,580
14-ERD-013	Parallel Time Integration for High-Performance Computing	$406,610
14-ERD-014	Picosecond Laser Interactions with Materials: Mechanisms, Material Lifetime, and Performance Optimization	$866,720
14-ERD-018	Time-Dependent Measurement of Carbon Condensation and Void Collapse in Detonating High Explosives	$582,880
14-ERD-020	Internet Protocol version 6 Research	$449,900
14-ERD-024	Enabling Multiscale Simulations of Atmospheric Flow over Complex Terrain in Earth System Models	$399,080
14-ERD-025	Structural Free-Standing Films with Atomic-Scale Thickness	$659,850
14-ERD-028	The Application of Imposed Magnetic Fields to Ignition and Thermonuclear Burn at the National Ignition Facility	$439,720
14-ERD-031	Advanced Double-Shell Target Designs for Inertial Fusion Energy	$229,900
14-ERD-032	Advanced Discretization Techniques for Paraxial Laser Propagation	$158,970
14-ERD-034	Nuclear Fission in a Plasma	$111,100
14-ERD-035	Ternary Alloy Development for Enhanced Safety and Performance of Fusion Systems	$764,020
14-ERD-038	Wetlands as a Source of Atmospheric Methane: A Multiscale and Multidisciplinary Approach	$450,130
14-ERD-039	Improved Sensor Performance Using Innovative Algorithms	$223,100
14-ERD-040	Thermal Management of High-Heat-Flux Laser Diodes Using Liquid-Vapor Phase Change	$575,630
14-ERD-041	From Topological Surfaces to Magnetic Collapse of f-Shell Electron Quantum Materials	$475,090
14-ERD-042	Understanding the Creation and Reduction of Surface Microscale Roughness During Processing of Glass Optics	$874,440
14-ERD-048	Cyclodextrin-Based Nanometer-Scale Scaffolds for Capture and Catalytic Degradation of Chemical Warfare Agents	$359,940
14-ERD-051	Real-Time Microseismic Processing for Induced Seismicity Hazard Detection	$400,930
14-ERD-056	Real-Time Adaptive X-Ray Optics	$587,290
14-ERD-058	Superluminal Radiating System	$866,950
14-ERD-062	Planetary-Scale Agent Simulations	$462,120
14-ERD-064	Multi-Functional Metamaterials	$203,750
14-ERD-065	Computation Power at Scale	$332,640
14-ERD-067	Advanced Synthesis and Characterization Techniques for Ultrahard Film Growth	$319,250
14-ERD-070	Multichannel Air-Guiding Fibers to Transport Extreme Lasers and Enable High-Flux Particle Accelerators	$542,210

14-ERD-076	Exploiting the Gemini Planet Imager: Revolutionary Exoplanet Science and Advanced Adaptive Optics	$404,580
14-ERD-077	High-Temperature Plasma Chemistry Kinetics Test Bed	$449,360
14-ERD-078	Short-Wavelength, High-Power Fiber Laser Sources	$225,650
14-ERD-081	Rapid Detection and Characterization of Emerging Foreign Animal Disease Pathogens	$685,870
14-ERD-082	Improving Resonance Ionization Mass Spectrometry for Next-Generation Nuclear Forensics	$433,180
14-ERD-084	High-Average-Power Diffraction Pulse Compression Gratings Enabling Next-Generation Ultrafast Laser Systems	$843,280
14-ERD-087	Optimal Fabrication Methodologies for Additive Manufacturing	$361,590
14-ERD-091	Analysis of a Metabolically Engineered Microbial Consortium for Optimal Production of Biofuels	$124,940
14-ERD-094	Extending Atomistic Simulation to Mesoscale in Time and Length	$288,170
14-ERD-095	Statistical and Dynamical Approaches to Probabilistic Decadal Climate Prediction	$196,840
14-ERD-098	Laser-Matter Coupling Mechanisms Under Varying Chemical and Particulate Surface Configurations	$747,620
14-ERD-100	The Livermore Brain: Massive Deep-Learning Networks Enabled by High-Performance Computing	$982,270
14-ERD-101	Plasma Interactions with Mixed Materials and Impurity Transport	$379,250
14-ERD-103	Modeling Materials Under Strongly Driven Conditions	$349,410
14-LW-009	Developing a Compact, High-Power Pulsed Generator System	$269,460
14-LW-073	The World`s Lowest Nuclear State in Thorium-299m	$243,040
14-LW-077	New Steady-State Viral Culturing Platform for Infectious-Disease Therapeutics	$269,690
14-LW-079	Detecting and Partitioning Carbon Dioxide Fluxes	$262,580
14-LW-087	Solving the Reactor Antineutrino Anomaly	$269,530
14-LW-091	Testing Hypotheses of the Little Ice Age and Holocene Climate Change	$250,400
14-SI-001	In Vitro Chip-Based Human Investigational Platform	$2,163,090
14-SI-002	Scalable High-Order Computational Multiphysics at Extreme Scale	$1,196,480
14-SI-003	Physical States and Processes in Inertial-Confinement Fusion: Matter at Extreme Energy Density	$1,121,080
14-SI-004	Deterministic Multifunctional Materials and Manufacturing Initiative	$2,543,360
14-SI-005	Cooperative Constellations: Resilient, Persistent, and Flexible Satellite Systems	$1,495,830
Total # of Projects for LLNL: 147		
Total Cost for LLNL: $78,173,370		
Total Administrative Cost: $1,939,060		
NNSS - Nevada National Security Site		
J1701023	Ultrafast All-Optical Framing Technology	$240,435

J1701044	Ionospheric Plasma Coupling to Low-Frequency Electromagnetic Radiation	$348,904
J1701063	Electron Mobility Measurements in Scintillator Materials	$17,425
J1701083	Study of Radiation-Induced Refractive Index Change in GaN for Ultrafast Scintillator Applications	$6,358
J1701093	Development of an X-ray Radar Imaging Technique for 3-D Scene Scanning	$296,269
J1701223	Solid-state Neutron Detectors using Uranium Oxides	$294,270
J1701303	DPF Magnetic Mirror Experiment	$9,218
J1701342	Pulse-Mode Spiral Neutron Detector	$334
J1702033	Quantification for Signals with Poisson-Gaussian Mixed Noise	$267,926
J1703013	MPDV and Large Data-set Statistics	$171,280
J1703014	Reduced Order Modeling for Real-Time Monte Carlo Simulations with Applications to Radiation Detection	$274,630
J1703084	Grain-Selective MPDV Experiments	$279,669
J1703113	Quantifying Uncertainty and Error Propagation in Radiography Image Processing	$472
J1703184	Optimizing DPF Neutron Output using Particle-in-Cell and MHD Models	$316,112
J1703244	Three-Dimensional Seismic-Attribute Model for Yucca Flat	$166,246
J1703264	High-Resolution Flash Neutron Radiography of Dense Objects	$221,472
J1703333	Plastic Deformation Study Using Light Gas Gun	$272,244
J1704024	Advanced Modeling and Uncertainty Quantification for the Aerial Measurement System	$214,587
J1704083	Hand-held Directional Gamma Ray Radioisotope Identifier	$845
J1705033	Ejecta Breakup Dynamics	$1,058
J1705034	Dynamic Temperature and Pressure Measurements with Rare-Earth-Doped Phosphors	$138,573
J1705044	Dynamic Recompression of Damaged Materials	$261,983
J1705053	Understanding Damage Anomalies in Shocked Metals	$285
J1705054	LIBS as a Surrogate for Large Scale Detonations and Means to Characterize Intermediates	$327,883
J1705093	Detection of Phase Transitions and Effusivity Changes through Isobaric Heating of Shock Compressed Materials	$56
J1705103	Passive Method to Characterize Atmospheric Turbulence	$123,698
J1705193	An Experimental and Theoretical Investigation into the Chemical Properties of Uranium and Thorium Ions in the Gas-Phase and on Surfaces	$309,843
J1705224	New Methods to Quantify Thermodynamic and Phase Properties of Shocked Materials	$245,559
J1705253	Chemically Activated Quiescent Persistent Sensors	$245,193
J1705324	Ultra-High Sensitivity Fiber-Optic Links	$268,262
J1705333	Secure Sensor Networks using Direct-Sequence Spread-Spectrum	$198,625

J1705433	Covariance Processing of Asymmetry of Compton Crosstalk for Directional Sensing	$27,306
J1705513	Time-resolved Hyperspectral Frequency Modulated Spectroscopy: Raman Scattering and DFT of Excited States	$18,689
J1706043	Power Automation System Vulnerability Assessment in Smart Grid	$222,541
J1706063	Novel Deployment of Elpasolites as a Dual Gamma Neutron Directional Detector	$255,490
J1706234	Predictive Radiological Background Distributions from Geologic Data	$176,134
J1706254	Development of Fluorescent Technetium Compounds as a Radioactive Distributed Source	$115,923
J1707013	Solid-state IR Fast Streak Based on Beam Deflection	$36,007
J170FS14	FEASIBILITY STUDY: Anti-Neutrino Flux Monitored by Changes in Beta Decay Rates	$20,684
J170FS24	FEASIBILITY STUDY: Development of a Detailed High-Yield Photocathode Model for the Investigation of Novel Photocathode Designs and Materials	$29,581
J170FS34	FEASIBILITY STUDY: Precision Time-Resolved Ranging System Proof of Concept	$26,813
Total # of Projects for NNSS : 41		
Total Cost for NNSS : $6,448,882		
Total Administrative Cost: $1,060,298		

NREL - National Renewable Energy Lab		
6001010	LDRD Program Crosswalk	$8,657
6271201	A Genetic Engineering Approach to Improve Flocculation of Green Algae for Biofuel Production	$43,779
6271202	An Integrated Biohybrid Approach for Photocatalytic Production of Higher Alcohols	$169,735
6271301	Synthetic TCA Cycle for Photobiological Production of Ethylene from Cyanobacteria	$152,941
6271401	Next Generation in planta Expression of Glycoside Hydrolases: Reduction in Plant Cell Wall Recalcitrance	$213,442
6271402	Probing Structure and Reaction Mechanisms of the Ethylene-Forming Enzyme	$98,518
6271403	An Evolutionary Approach to Increase the Tolerance to Biomass Hydrolysates in Clostridium Thermocellum	$78,913
062C1201	High-Fidelity Computational Modeling of Wind Turbine Structural Dynamics	$77,659
062C1301	Integrated Energy Management and Analysis for the ESIF's Computational Systems	$256,373
062C1302	Novel Visualization and Analysis for Extreme-Scale Wind Turbine Array Simulations	$253,356

6501401	Extreme-Scale Flexible Downwind Wind Turbine	$249,095
6511202	Hydrocarbon and Coke Forming Reactions of Biomass Oxygenates on Zeolites and Hierarchical Zeolites	$133,874
6511203	Low-Temperature High Selectivity Process for Gasoline Synthesis via Biomass Gasification	$66,427
6511301	Two-Component Signal Systems in Nitrogen Assimilation: Increasing Algal Lipid Productivities through Pathway Engineering	$303,049
6511302	Computational Glycobiology and Glycomics: A New Frontier for Protein Engineering	$131,606
6511303	Computational-Experimental Approach toward Shape-Controlled Metal Carbide and Metal Nitride Nanocrystal Catalysts for Deoxygenation and Upgrading of Biomass Intermediates	$260,813
6511304	Selective and Efficient Deoxygenation of Biomass-Derived Intermediates to Produce Hydrocarbons Using a Novel Electrochemical Reactor and Electrocatalysts	$304,480
6511305	Enhanced Computational Approaches to Elucidate Mechanisms of Enzyme Catalysis	$139,032
6511401	Yeast Mitochondrial Pathway Engineering for the Production of 8-Hexadecene: A Drop-in Renewable Diesel Hydrocarbon	$195,210
6521202	Engineering Nanoionic Interfaces by Pulsed Laser Deposition for Energy Conversion and Storage	$135,961
6521301	Low-Cost Silicon Carbide on Compliant Substrates by Hot-Wire Chemical Vapor Deposition	$204,196
6521302	Lattice-Matched III-Vs on Si for Low-Cost, High-Efficiency Concentrating Photovoltaics	$221,205
6521303	Enhanced Photovoltaic Performance of Cu2ZnSnS4 Heterojunctions: An Interfacial Engineering Approach	$156,059
6521401	Epitaxial ZnSiP2/Si for Tandem Solar Cells	$188,091
6541401	Distributed Control of Energy Storage on the Grid for Frequency and Voltage Correction	$255,507
6551301	Community-Scale Residential Energy Analysis	$149,056
6551401	Hybrid Model-Based and Data-Driven Fault Detection and Diagnostics for Buildings	$196,308
6591202	New Concept for Hot Carrier Solar Cell	$217,396
6591301	Light-Stimulated Epitaxy of Amber LEDs	$325,104
6591302	Developing Polymeric Nanocomposites for Inexpensive Thermoelectricity Generation	$281,228
6591303	Structure Prediction for Improving Charge Transport through Electronic Materials Formed from Nanoparticles	$240,851
6591304	Heterometallic Polynuclear Clusters for Catalytic Water Oxidation	$204,582
6591305	Linear Multicomponent Nanoparticle Chains for Water Splitting Applications	$252,268
6591306	Spectroscopy of Conduction Band States of Quantum Dots	$162,369

6591401	New Magnesium-Boride Anode Material for Next-Generation Mg-Air Batteries	$206,095
6591402	High Performance, Solid-State, Perovskite-Based Solar Cells	$241,385
6591403	Next Generation Thermoelectric Materials for Direct Solar Power Conversion	$262,795
6591404	Precision Control of Semiconductor Interfacial Energetics to Enable Photocatalysis	$258,098
6591405	Basic Energy Science of Heterointerfaces	$75,267
6591406	Single-Walled Carbon Nanotube Absorber Layers for Next-Generation Photovoltaics	$99,172
6591407	Enhance the Capabilities of High-Performance Computer Simulation to Inform the Design of Materials for Next-Generation Applications	$78,676
6591408	Photonic Enhancement of Polymer-Dye Composites for Visible through Infrared Photon Harvesting	$56,539
065D1401	Distributed Controls for Future Sustainable Electricity Systems: Integrated Hardware-in-the-Loop Test Bed, Residential Level Intelligence, and Enabling Control Theory	$412,598
065D1402	Cyber-Physical-Energy Systems: Theory and Test Bed	$299,443
065D1403	Comparisons of Stochastic Modeling Applications at Multiple Operational Time Scales	$129,003
065D1404	Electricity Market Design for High Renewable Energy Futures	$67,359
065J1401	Outdoor Imaging for Field-Testing and Characterization of PV Modules	$23,926
065J1402	Recombination Engineering in Solid-State Lighting and Infrared Detection Devices	$31,081
065K1401	Environment-Controlled, Solution-Processing Tool for High-Quality Perovskite Films	$50,562
065K1402	Far-Field Transport Imaging	$21,060
6641204	Campus Energy Models for Control and Performance Validation	$475,198
6641301	Fundamentally Accelerating the Simulation of Bulk Power System Operation	$87,874
6641401	A Framework for Comparison of Competing Spatiotemporal and Time Series Datasets	$167,158
6641402	Energy Services Test Bed Experiments	$94,722
6641403	Integrated Energy System Model	$321,676
066A1502	Demand-Side Participation in Electricity Grid Integration Models	$47,092
06RF1201	Advancing Solar Photoconversion through a Study of Long-Range Energy Transfer	$457,239
Total # of Projects for NREL: 57		
Total Cost for NREL: $10,291,158		
Total Administrative Cost: $192,257		

ORNL - Oak Ridge National Lab		
6070	Synthetic metabolic pathways for bioconversion of lignin and biomass inhibitors	$48,963
6146	Science of the Plasma-Materials Interface at Extreme Conditions	$84,845
6175	Template Assisted Bicontinuous 3D Electrode Architecture for Energy Storage Materials	$69,263
6217	High-Throughput Transcriptomics for Microbial Bioforensic Analysis	$49,982
6271	New Capabilities for Neutron-Based Biomembrane Research at ORNL	$60,853
6348	Universal Sensing Platform for Autonomous Data Correction in Building Technologies	$40,981
6361	Toward Scalable Algorithms for Kinetic Equations: A New Hybrid Approach to Capturing Multiscale Phenomena	$403,209
6362	Probing the Structure-Function Relationship of Protein Kinase A	$311,931
6368	A novel uncertainty quantification paradigm for enabling massively scalable predictions of complex stochastic simulations	$433,409
6380	A comprehensive theoretical/numerical tool for electron transport in mesoscale-heterostructures	$319,151
6384	Distributed Enterprise-Level cyber-Physical Intelligence	$369,907
6389	Advanced Mitigation of Ion Beam Space-Charge	$312,266
6404	Hybridizing HPC: Modern Cray Architectures for Big Data Problems	$462,345
6408	Hardware/Software Resilience Co-Design Tools for Extreme-scale High-Performance Computing	$392,945
6414	Assembly of functional microbial communities	$368,471
6420	Detecting Malicious Network Behaviors At Scale	$349,990
6427	Interactive Analysis of High Throughput, Unstructured Information Streams	$374,736
6428	Structural Biology of Metabolic and Signaling Pathways in Plants	$353,680
6436	Developing Grazing Incident Small-Angle Neutron Scattering for Studying the Interplay between Amyloid-beta Peptide and Cholesterol in Lipid Bilayers	$323,791
6450	Stochastic parameterization of the influence of subgrid scale land heterogeneity on convection in a climate model	$359,331
6463	Development Testing and Evaluation of Resilient Control Techniques for Cyber-Defense of Real-Time Control Systems	$355,486
6469	New Measurement Technology for Physical and Biological Characterization of Fundamental Carbon Cycle Processes in the Subsurface Environment	$394,871
6471	Diabatic Void Fraction Measurements in Channels with Small Hydraulic Diameters using Neutron Imaging	$167,926

6472	High-voltage Electrode Development for a neutron Electric Dipole Moment Experiment at the SNS	$311,128
6481	Improved Metagenomic Analysis with Confidence Quantification for Biosurveillance of Novel and Man-made Threats	$344,903
6500	High-Flux Nanoporous Graphene Membranes for the Desalination of Water	$309,016
6502	Nondestructive Evaluation on Hydrided Zr Cladding by In-situ Neutron Scattering and Tomography of Hydrogen	$336,092
6508	Quantum state stabilization for unbiased random number generation	$320,535
6509	Single-Crystal and Single-Crystal-Like Graphene in Large-Areas for Electronic and Energy Applications	$394,011
6521	Synthesis and Characterization of Novel Two-Dimensional Mesoscale Organic Nanomembranes	$373,711
6528	Advanced Modeling and Simulation to Support High Performance Research Reactor Conversions to Low Enriched Uranium	$445,047
6544	Understanding and controlling the nano- to mesoscale evolution of structure and function in electroactive molecules during thin film formation	$492,864
6552	Meso-scale Liquid Confinement Systems for Enhanced Bioseparations and Bioconversion Strategies	$389,588
6558	Low-Cost, Multi-Sensor Wireless Platform for Smart Buildings	$404,545
6562	Low-cost tailored carbon nanocomposite for polymer additive manufacturing	$356,923
6565	Towards a Resilient and Scalable Infrastructure for Big Data	$370,003
6576	Emergent quasi-particles and their detection through neutron scattering	$122,211
6581	High-throughput, Energy-Efficient System for Obtaining Highly Textured, Large-Crystal Materials	$170,847
6587	Experimental Studies and Theoretical Modeling of the Spin Dynamics in a Multiferroic Material	$135,301
6619	Strigolactones in the Woody Bioenergy Crop Populus	$30,113
6630	Inexpensive Efficient Hybrid Neutron Sensor	$153,987
6634	Image Analysis for Calibration and Comparison of Hyperspectral Retina Fundus Camera Data and Ocular Phenomena	$132,529
6637	High-Performance Computer Simulation Study of the Mechanism of Nerve Agent Degradation by an Enzymatic Bioscavenger	$56,340
6639	Detection and characterization of meso- and nanoscopic bubbles on patterned and native metal surfaces using neutron small-angle scattering and reflectivity techniques	$77,369
6640	Development of high performance lithium-ion hybrid ultracapacitors	$46,134
6654	Advancing Lignin-based Carbon Fibers from Lab Scale into the Commercial Market	$996,537

6655	Synthesis of the Heaviest Atomic Nuclei in Experiments Using Californium Targets	$48,799
6668	Stimuli-responsive polymer materials with switchable interfaces	$209,977
6671	Synthesis of Ceramic Structures with Controlled Morphology	$216,642
6673	Secure two factor authentication using quantum random numbers and enhanced hashing	$59,985
6674	A Distribution-Oblivious Scalable Approach for Large-Scale Scientific Data Processing	$66,192
6679	Performance and Reliability Enhancement of Concrete Confinement Structures for Nuclear Applications through Improved Concrete/Steel Interfacial Bonding	$64,332
6684	Corrosion prevention of magnesium alloys via surface conversion treatments using ionic liquids	$59,937
6685	Lanthanide separations for industry applications of rare earth radioisotopes	$110,508
6715	Synthesis of Tin-Doped Indium Oxide Nanofibers	$110,056
6717	NEMO (the name of the code - not an acronym) Code Enhancement for Vector Sensor Towed Array Signal Processing	$49,990
6735	Reducing Environmental Impacts of Hydrofracturing by Subsurface Co-Precipitation of Barium and Radium	$359,050
6736	Pulsed Magnetic fields for Neutron Measurements	$259,903
6741	Exploration of Superconductivity in Non-layered Three-dimensional Materials for Potential High-field Magnet Applications	$142,339
6743	Computational Design of Soft Matter Materials	$74,083
6745	Expanding ORNL neutron capabilities by increasing spatial resolution at the High Flux Isotope Reactor CG-1D neutron imaging prototype beamline and co-registering imaging and diffraction data	$66,198
6757	Intelligent Supervisory Power Management Control in Plug-in electric vehicles	$114,573
6761	Large Scale, Out of the Oven Additive Manufacturing	$388,090
6766	High-Throughput, Super-Selective Membranes to Improve Biofuel Economics	$59,953
6767	Toward Improved Understanding of High Gradient Magnetic Separation for Aerosol Particle Collection	$28,945
6781	A New Integrated Signaling-Encryption Technique to Reduce Error Propagation in Wireless Communications	$154,959
6782	Complexity Reduction Code Package for Reactor Physics Modeling and Simulation of Reactor Systems	$46,667
6783	Application of Plenoptic Computational Photography to Improve Off-Axis Iris Recognition	$74,646
6784	A sacrificial coating system for Mg alloys	$79,965

6789	Thermo-Mechanical Integrity of Critical Engineering Structures by High Spatial Resolution Neutron Diffraction	$309,230
6802	Predictive Soft Matter Materials Simulation	$426,822
6810	Passive/Active Tools	$504,100
6813	New Paradigms in Passive Polymer Membranes for Carbon Dioxide Separation	$399,260
6814	Dynamic Neutron Imaging of Intra-nozzle Fluid Dynamics of Fuel Injectors	$394,468
6816	Toward the Development of an Integrated Energy-Water Risk Assessment Tool for Probable Maximum Precipitation and Flood	$362,453
6826	Direct catalytic conversion of methane to methanol	$279,963
6831	Mini-Apps: Building Laboratories for Portable Performance from the Petascale to the Exascale	$321,897
6837	Neutron Scattering Studies of Select Uranium Compounds	$331,912
6840	Pattern Discovery and Predictive Modeling on Heterogeneous Graphs using Cray's uRiKA	$479,514
6845	Decoupling Structural and Electronic Variables in Molecular Beam Epitaxy-grown Films of Iron-based Superconductors	$387,258
6847	Infrared computer tomography spectroscopy for long-term characterization of large scale greenhouse gas emissions	$325,556
6858	Mobile Device Security	$398,094
6863	Residual Stress Modeling and Neutron Characterization of Additive Manufactured Components	$582,096
6874	Large Scale Hydraulic Fracture (Fracking) Simulation	$364,474
6877	Situation Awareness in Complex Networks	$389,410
6895	Sustainable Energy through Complex Oxide Materials: Multivalent Oxygen Sponges for Efficient, Low Temperature Catalysts	$395,374
6898	Provably Secure Time Stamp Distribution for the Electric Grid	$399,970
6901	Laser based diagnostics for characterizing materials exposed to a plasma environment.	$234,484
6907	Heteroepitaxial Diamond Films for Next Generation Power Electronics	$260,168
6917	To the Nation's Health: Computational National Healthcare Model for Value-Based-Purchasing Cost Projections	$368,633
6923	Complementary Silicon Carbide Wide Band Gap Integrated Circuits for Bidirectional Electric Vehicle Chargers	$320,865
6928	Next Generation Compact and Reliable WBG-Based Inverter Breakthrough with Additive Manufacturing and High Performance Computing	$335,282
6932	Accelerated Discovery and Design of Complex Materials	$278,395
6944	Transformative Process for Coupling Solar Energy to Biofuel Production in Yeast for Steady State Bioconversion Reactors	$352,015

6945	Nanocellulose reinforced polymers for additively manufactured structural composites	$300,945
6984	A genome-enabled approach for predicting plant functional traits in dynamic vegetation models	$233,588
6987	Preparing OpenACC for Exascale	$399,668
6988	Revealing the structural organization of membranes in living cells by small-angle neutron scattering	$339,475
7004	Untangling the role of boundaries, defects, and interfaces in two-dimensional inorganic materials: a combined theoretical and experimental approach	$360,303
7019	Rational Design of Novel Porous Polymeric Organic Framework Materials	$404,728
7022	An Advanced Materials Irradiation Facility to Promote Innovative Materials Research at the High-Flux Isotope Reactor	$299,842
7033	Design and demonstration of a Material-Plasma Exposure target station for neutron irradiated samples	$426,166
7036	Transformational Capability for Integrated Analysis of HFIR Irradiation Experiments and Isotope Production Using High-Fidelity Modeling and Simulation	$429,927
7042	Algorithm Resilience with Respect to Hardware Error	$74,846
7043	Operationally Focused Active Learning in Cyber-Security	$22,459
7044	Chaotic Controller Enabling High-Power Scalability of Fiber Sources	$142,177
7048	Development of ultrasensitive analytical techniques for the MAJORANA 1-ton experiment.	$435,661
7054	Novel tubular battery with solid electrolyte membrane	$110,663
7055	Adaptive OFDM Radar Waveform Design for Enhanced Target Detection and Discrimination	$80,008
7062	Request for General Hire	$96,409
7065	Epitaxial Oxide - Intermetallic Alloy Heterostructures	$124,774
7066	Shaping High Power Diode Laser for High Efficiency Spin Exchange Optical Pumping	$164,746
7067	Assessment of global climate change on mercury flux in the Arctic environments	$37,351
7069	The role of surface oxygen vacancies in perovskite oxide catalysis	$127,027
7073	New protocols for user authentication and key distribution for Smart Grid applications using Physical Unclonable Functions	$91,202
7074	Oxygen stabilized flame propogation to improve SI engine efficiency and performance	$186,419
7075	A new approach to electrochemical noise analysis to understand and monitor localized corrosion	$178,233
7077	Sulfur Trioxide Point Measurements Via Regenerable Fiber Tip Luminescence	$154,477
7085	Scalable Malware Repository and Analysis Platform	$88,440

7088	Mechanical Testing and Characterization of Irradiated Concrete Structures for Light Water Reactor Life Extension Analysis	$85,249
7104	Universal Circuit Optimizer for Quantum Information and Metrology Applications based on Linear Optics	$99,971
7105	Large Time Scale Atomistic Modeling of Metallic Glasses Deformation	$225,412
7115	First principles study of the influence of disordered dopants on the electronic structure of functional materials	$217,175
7149	Production of renewable hydrocarbon fuels from Saccharomyces cerevisiae	$219,670
7150	Revealing the Functionality of Nanomaterials for Energy Applications at the Atomic Scale	$219,137
7160	Quantum Plasmonic Memory	$99,999
7164	Magnetically controlled crystallization of biological macromolecules	$53,102
7165	Multicomponent Shape Memory Alloys with Enhanced Magnetocaloric Effects	$189,982
7167	Scalable Knowledge Discovery Framework for Multi-Structured Data Analysis	$189,438
7171	Developing a Nanothermodynamic Formalism and Example of Avoiding Phase Separation of Li/FePO4 at Room Temperature	$30,222
7177	Selectively Probing Femtosecond Excited State Dynamics at the Surface of Semiconductor Nanowires using Time-Resolved Sum Frequency Generation	$241,465
7178	Improved Unresolved Resonance Self-Shielding Methods for Reactor Analysis	$29,319
7184	Neutrino Physics at ORNL: Neutrinoless Double-Beta Decay, Direct Mass Measurements, and Neutrino Measurements at SNS	$146,953
7185	Develop a top-ring in-situ sampling method for internal combustion engine lubricant/fuel mixtures	$29,916
7188	Use of novel magnetic fields and pitch oligimers to produce continuous graphene.	$182,759
7190	Visual Analytics Applications	$81,993
7193	Understanding principles of small peptide binding and inhibition of amyloid fibril growth in Alzheimer's, and other amyloidosis using high-performance computational docking	$189,981
7199	Background Studies for an ORNL Neutrino Program	$137,072
7213	Fabrication of Sub-Micron Metamaterial Structures Using Drawn Composite Fibers	$25,375
7215	Additive Manufacturing of Advanced Ceramic Components	$143,722
7223	Unconventional Magnetism and Superconductivity in Non-centrosymmetric CeTX3 (X = Ge,Si) Studied by Neutron Scattering	$178,182
7224	Novel Low Temperature Aluminum Recycling and Purification Methodology	$59,835

7225	Cell free production of complex chemicals	$125,033
7227	Structure-Function Studies of Nucleic Acids Using Neutron Crystallography Enabled by Selenium Modification	$54,450
7238	Fundamental Understanding of Banded Structure Formation during Laser Additive Manufacturing of a Titanium Alloy using Massively Parallel Phase Field Simulations	$148,815
7239	Fast joint spatio-spectral characterization of quantum light sources	$29,291
7244	High Yield Process for Lignin-Based Activated Carbon Fibers	$64,992
7250	Fibrillated Carbon Precursor Materials for Use as Composite Preforms	$60,083
7255	Tritan	$26,554
7257	Development of a New Lattice Physics Methodology for Doubly Heterogeneous Particulate Fuels	$65,330
7262	Adaptive ADER Time Stepping Schemes for Efficient, Parallel Scientific Simulations	$104,965
7271	Atomistic response of the MAX phases to irradiation	$99,941
7278	Enabling Biophysical Characterization of Intrinsically Disordered Protein Ensembles	$45,118
7280	Demonstrating a Novel Bio-defense Capability using Public Health Data Informatics	$13,995
7281	DNA2Face: Predicting Faces from a DNA Sample	$17,391
7285	Chemical and Radiation Induced Volumetric Expansion (CRIVE) of Minerals Composite in Interaction with Cement-like Materials	$104,072
7286	Next Generation Studies of Quark-Gluon Matter with High Luminosity Pb-Pb Collisions at the CERN Large Hadron Collider	$228,768
7294	Couette Columns: Multi-stage Separation Devices for Use in Isotope Separations	$44,708
7299	Modeling and Analysis of Gapless Ferromagnetic Core Inductors	$113,397
7312	Novel Mathematical and Computational Paradigm for Nonlinear Filtering Problems (This is a Householder Fellowship)	$99,946
7315	Developing hydroxide fuel cells based on novel polymers with improved stability and higher ionic conductivity	$19,421
7321	Beryllium Trace Detection using Raman Microscopy	$29,979
7412	Predicting Climate Feedbacks from Microbial Function in Tropical Ecosystems	$34,753
7476	Exploring Structure and Functionality of Oxides in Real Space: 'Deep Data' in Atomic Resolution Imaging	$19,983
7482	Phylogenetic Distribution of CRISPRs, a Bacterial "Immune" System: Which Pathogens can be induced to commit suicide?	$23,874
7487	Corrosion Protection For Small Arms Components	$27,196
7489	Magnetic annealing of Pt3Ni7 Nanostructure Thin Film Catalysts for Enhanced Activity	$30,154

7499	Investigation of Hydrogen Behavior in Tungsten for Fusion Reactor Divertors	$42,409
7509	Advanced Atom Probe Tomography for Nanoscience Applications	$124,349
7531	Filamentous fungi for biodiesel production using lignocellulosic residuals	$27,053
7536	Two-Dimensional Transition Metal Based Electrode Materials for Lithium-ion Batteries	$74,534
7540	Optimization of the SNS Second Target Station Source Parameters and Instrument Suite for Science	$718,885
7569	A Measurement of Neutrino Induced Neutron Backgrounds in Lead Shielding at the SNS	$30,543
7607	Protein Segmental Labeling For Contrast Variation in Small Angle Neutron Scattering Studies	$4,090
Total # of Projects for ORNL: 174		
Total Cost for ORNL: $36,265,083		
Total Administrative Cost: $156,672		
PNNL - Pacific Northwest National Lab		
PN11041/2363	Increased Sensitivity and Improved Quantification of Th and U in Particles by SIMS	$95,970
PN11061/2383	Photocathode Development for Next-Generation Light Sources	$174,529
PN11075/2397	The Statistical Mechanics of Complex Process in Bulk and Interfacial Environments	$73,924
PN11078/2400	Understanding the Processes that Govern Subsurface Microbial Communities	$195,201
PN12001/2402	A Multi-Layer Data-Driven Advanced Reasoning Tool for Smart Grid Integrated Information Systems	$253,596
PN12003/2404	Actionable Visualization Tools For Power Grid Situation Awareness	$329,932
PN12005/2406	Optofluidics and Microfluidics for Exploring Biofuel Production at the Single Cell and Molecule Levels	$256,568
PN12012/2413	BazookaSPECT Neutron Imager	$324,795
PN12015/2416	Characterization of Catalyst Materials in the Electron and Atom-Probe Microscopes	$390,363
PN12023/2424	Development of Graphene/Ionic Liquid Hybrid Material for Ultracapacitors	$133,226
PN12024/2425	Development of Hard X-Ray Emission Spectroscopy Nanoprobe	$167,372
PN12035/2436	Future Power Grid Control Paradigm	$231,549
PN12039/2440	Hybrid Electrodes for Next Generation High Energy Ultracapacitors	$78,611
PN12041/2442	Imaging the Nucleation and Growth of Nanoparticles in Solution	$185,219
PN12048/2449	Microscale Reconstruction of Biogeochemical Substrates Using Combined X-ray Tomography and Scanning Electron Microscopy	$175,677

PN12054/2455	Next Generation Network Simulations for Power System Applications	$409,508
PN12059/2460	Numerically Robust Climate Simulation Through Improved Interaction between Model Components	$241,116
PN12061/2462	Predicting the Response of Complex Biological Systems	$295,184
PN12062/2463	Probing Composition and Structure of Polarizable Reaction Mixtures Inside the Pores of Supported Metal-oxo Catalysts	$207,416
PN12063/2464	Probing Structural Dynamics with High Spatial and Temporal Resolution	$566,682
PN12065/2466	Pulmonary Injury from Acute Events Related to Nuclear Energy Production	$219,940
PN12067/2468	Quantitative Imaging of Atomic Scale Chemistry Changes at Interfaces	$134,120
PN12071/2472	Simultaneous 14C and T Dating: A Case Study Using Soil Organic Matter	$178,374
PN12079/2480	Ultra-Precise Electron Spectroscopy to Measure the Neutrino Mass	$257,488
PN12080/2481	Uranium Enrichment Facility Signature Exploitation	$209,952
PN13001/2482	The Integration of Water in iRESM	$207,547
PN13004/2485	Directed Mesoscale Synthesis of Tunnel Structured Materials for Energy Applications	$230,165
PN13005/2486	Novel Alloy Nanoparticle Materials for Catalysis and Energy Storage	$226,064
PN13006/2487	Novel CO2-Selective Polymer/Double Salt Composite Membranes for Continuous CO2 Removal from Warm Syngas	$220,333
PN13007/2488	Developing A Next Generation Biogeochemical Module for Earth System Models	$215,667
PN13008/2489	Resolving the Reactor Neutrino Anomaly by Precision Beta Spectrometry	$216,979
PN13009/2490	Structure and Dynamics of Biological Systems	$501,410
PN13010/2491	Probing Structure-Property Relationship of Energy Storage Materials Using Ex Situ and In Situ Dynamic Microscopy and Spectroscopy with High Spatial and Fast Temporal Resolution	$337,624
PN13011/2492	Manifold Learning for Accurate Search and Locate Tasks in Image Datasets	$175,739
PN13012/2493	Network Analysis and Modeling of Illicit Nuclear Trafficking	$111,533
PN13013/2494	Improving the Performance of Li-Air and Li-S Batteries Using Polymeric and Metallic Nanomaterials	$282,786
PN13014/2495	Hierarchical Signature Detection in High-Throughput Environments	$205,904
PN13015/2496	Atomic Mass Separation for Enhanced Radiation Detection Measurements	$370,042
PN13016/2497	GridOPTICS	$370,638

PN13018/2499	Enhanced Sediment Geochronology Achieved Using Ultra-Low Background Materials and Ultra-Sensitive Detection Capability	$396,640
PN13019/2500	Alpha Coincidence Techniques for Actinide Assay	$306,434
PN13020/2501	Analytic Framework: Signature Discovery Workbench	$253,657
PN13021/2502	Controlled Datasets to Inform the Study of Sensor Degradation for CBRNE Signature	$260,789
PN13022/2503	Elucidating the Natural Spore Phenotype	$198,046
PN13024/2505	Secondary Signatures for Provenance Attribution	$141,504
PN13025/2506	Fungal Siderophore Production for Recognition of Uranium Compounds	$170,906
PN13027/2508	Anthropogenic Uranium Detection with X-ray Microscopy	$278,297
PN13028/2509	Establishing a Strategic Goods Testbed to Disrupt Illicit Nuclear Trafficking	$126,215
PN13029/2510	Market Design Analysis Tool	$311,377
PN13030/2511	Fishing for Features: Discovering Signatures when the Underlying Phenomenon is Poorly Understood	$255,593
PN13031/2512	Miniaturization of Multi-Modal Regenerative Feedback Sensor	$184,108
PN13032/2513	Mössbauer Spectral Imaging	$345,565
PN13033/2514	Developing Next-Generation Multimodal Chemical Imaging Capability by Combining STEM/APT/STXM/HIM	$565,736
PN13035/2516	Simultaneous Electrochemical and Nuclear Magnetic Resonance Techniques for the Study of Electrochemically Active Biofilms	$243,370
PN13036/2517	Novel Inorganic Complexes for Tc management in the Tank Waste	$140,198
PN13037/2518	M&Ms4Graphs: A Multi-scale, Multi-Dimensional Graph Analytics Framework for Cyber Security	$376,255
PN13038/2519	Discrete Mathematical Foundations for Cyber Systems Analysis	$234,659
PN13039/2520	Kritikos: Identifying Cyber Assets and Assessing Criticality in Terms of Business Processes	$205,029
PN13043/2524	Design, Synthesis, and Activity Measurements of Monodispersed Multifunctional Catalysts for CO2 Reduction	$99,910
PN13048/2529	Genome-Enabled Systems Approach to Predict Immobilization of Technetium in the Subsurface	$159,718
PN13050/2531	Understanding and Control of Solid -Electrolyte Interface and Interphases Layer in Multivalent Energy Storage Systems	$111,319
PN13051/2532	Cyber Security Testbed and Dataset Generation	$350,515
PN13052/2533	Engineering of Oleaginous Yeast for Production of Advanced Hydrocarbon Biofuels	$130,642
PN13053/2534	Reactor Materials Degradation During Plastic Deformation and Creep: High-resolution experiments and integrated models of microstructural evolution and materials response	$150,688
PN13056/2537	A New Modeling Approach for Biology: Combining Natural Selection and Thermodynamics for Biodesign and Natural Systems	$258,290
PN13057/2538	Scire: Scientific Process for Validation and Verification	$350,005

PN13061/2542	Meso-scale Science and Technology: Manufacturing of Nanostructured Soft Magnetic Materials	$349,604
PN13063/2544	Theory of Resilience	$470,519
PN13067/2548	Imaging and Monitoring the Initial Stages of Biofilm Formation	$323,236
PN13069/2550	Freeze Frame and Cyber Technology	$155,022
PN13070/2551	Bio-Inspired Actinides Recognition for Separation Science	$90,598
PN13071/2552	Enhancing EMSL Mass Spectrometry Capabilities for Characterization of Soil Organic Matter	$86,507
PN13072/2553	Improving magnetoelectric coupling in novel single-phase multiferroic thin films of the MTiO3 (M = Fe, Mn, Ni) family	$89,410
PN13073/2554	Measuring and Modeling the Climatic Effects of Brown Carbon Atmospheric Aerosols: Developing an Integrated Capability	$249,092
PN13074/2555	Platform for high-throughput determination of enzyme kinetic parameters for hemicellulose saccharification	$74,960
PN13076/2557	Hardware in the loop testing and power system simulation of high penetration levels of PV	$150,787
PN13081/2562	Advanced Visual Analytic for the Power Grid	$394,986
PN13082/2563	Development of Bromotyrosine Antibody Assay for blood and sputum samples	$44,801
PN13084/2565	Metal Hydrides for Thermal Energy Storage	$24,978
PN13085/2566	Rare Earth-Free Phosphors for Lighting Applications	$75,334
PN13087/2568	Super resolution fluorescence barcoding and high throughput microfluidics for quantifying the expression of multiple genes in individual intact cells	$50,289
PN13090/2571	Advanced Switching Concepts applied to a Structures for Lossless Ion Manipulations	$99,953
PN13091/2572	Operations and Planning Fusion	$234,697
PN13092/2573	Localized Surface Plasmon Resonance Spectroscopy, Microscopy, and Sensing	$299,195
PN13096/2577	Optimal Sizing Tool for Energy Storage in Grid Applications	$130,001
PN13097/2578	Laser Ablation Capillary Absorption Spectrometer for Trace Isotopic Sampling and Imaging	$75,103
PN13098/2579	Sn Project	$728,175
PN13099/2580	Optically Stimulated Luminescence Data Storage	$155,902
PN13100/2581	Optical properties modification in complex oxide epitaxial films via alloy formation	$291,266
PN13101/2582	Exploring and Engineering Phototrophic-Heterotrophic Partnerships	$275,627
PN13102/2583	Signatures of Environmental Perturbation - Microbial Community and Organic Matter Resilience	$598,248
PN14001/2585	Low Background Liquid Scinitillation Counter	$651,111
PN14002/2586	Effective Representations and Optimizations for Recursive Parallel Programming Systems	$99,935

PN14003/2587	Ultra-low Background Polymers for Structural Applications in Radiation Detectors	$395,667
PN14004/2588	Atomic-Scale Chemical Imaging via Scanning Tunneling and Electron Energy Loss Vibrational Spectroscopies	$150,564
PN14005/2589	PRIMA Framework Demonstration: Climate and Climate Policy Impacts on the Energy-Water-Land Nexus at Regional Scale	$1,348,639
PN14006/2590	Dark Matter Physics	$315,105
PN14007/2591	Determining Groundwater Residence Time through Ultra-Low Measurements of 39Ar and other Radiotracers	$668,344
PN14008/2592	Biomass-Derived Acrylonitrile for Carbon Fiber Production	$94,993
PN14009/2593	Family of Resilience Metrics for Cyber Security Operations	$391,017
PN14010/2594	Scalable Techniques for Resilient Reconstruction and Robust Reconfiguration	$109,980
PN14011/2595	Characterization of Anonymous Peer-to-Peer Networks	$231,441
PN14012/2596	High Information Content Polymers and their Assembly into Structural Motifs	$452,288
PN14013/2597	Free Form Millimeter-Wave Imaging	$181,985
PN14014/2598	Technologies for Non-intrusive, Unattended Measurement of UF6 Gas Flow	$195,472
PN14015/2599	Analytics Integration and Validation Framework	$295,187
PN14016/2600	Signatures of Communities and Change	$234,457
PN14017/2601	Membrane reactor-enabled manufacturing processes of nano-metal part	$51,005
PN14018/2602	Predictive Understanding of Self-Assembly: Particle-Mediated Growth	$512,670
PN14019/2603	High Aspect Ratio Functional Composites for Thermal Optical Applications	$228,291
PN14020/2604	PRIMA Phase 2 Model Evaluation	$197,412
PN14021/2605	Scalable High-Level Programming	$176,219
PN14022/2606	Platform for Large-Scale Determination of Protein-Ligand Binding	$189,278
PN14023/2607	Combined microscale 13C and 18O (isotopes of carbon and oxygen) measurements at cutting-edge sensitivities and spatial resolution	$219,013
PN14024/2608	Leveraging Power Grid Contingency Analysis Techniques For More Resilient Cyber Networks	$142,276
PN14025/2609	Fundamental mechanisms of nucleation and growth of particles in solution	$270,347
PN14026/2610	Robust Hierarchical Zeolite Frameworks	$403,870
PN14027/2611	Multi-scale processes controlling spatial variation in greenhouse gas emissions in a subarctic watershed	$238,758
PN14028/2612	Defects Chemistry in Solid State Electrolyte for Energy Storage and Conversion	$99,022
PN14029/2613	Signatures of Illicit Nuclear trafficking for Strategic goods	$397,779

PN14030/2614	Global Forensic Chemical Exposure Assessment for the Environmental Exposome	$204,211
PN14031/2615	Signatures of Underground Explosions	$66,642
PN14032/2616	Measurement of Solubility Curves for Light Lanthanide Elements in Ammonium Carbonate Solution	$148,336
PN14033/2617	Low Background Light Sensitive Photo-Diode Array for Scintillator Readout	$253,505
PN14034/2618	Network Chimera	$214,144
PN14035/2619	Rapid Viability Assays for Biothreat Event Characterization	$298,610
PN14036/2620	High speed, high volume data acquisition and annotation system for TEM instruments	$182,341
PN14037/2621	Development of a framework to quantify and monetize comparative risk at deep fluid injection/extraction sites	$158,103
PN14038/2622	Combinatorial Techniques for Development of Lightweight High Entropy Alloys	$147,931
PN14039/2623	Regional-Scale Measurement and Modeling of Biogenic Organic Fluxes: Bridging the Gap Between Process Studies and Climate Models	$303,188
PN14040/2624	Aggregate Load Modeling and Control for Power Grid Regulation Services	$80,980
PN14041/2625	Complex Systems Control Testbed	$194,719
PN14042/2626	Distributed Control of Large-Scale Complex Systems	$165,171
PN14043/2627	Verification and Validation of Distributed Control System Simulation and Runtime	$97,821
PN14044/2628	Agent-Based Testbed for Complex Building Control Systems	$227,793
PN14045/2629	Decision Theory for Incentive Compatible Mechanism Design	$172,034
PN14046/2630	High-Level Modeling Specification for Simulation of Control Systems	$126,322
PN14047/2631	Impacts of Communication Network on Distributed Control	$174,217
PN14048/2632	Advanced Approaches to Non-equilibrium Thermodynamics and Kinetics for Mesoscopic Materials	$219,836
PN14049/2633	Atomic level investigation of the phase stability of transition metal surfaces under reactive	$222,930
PN14050/2634	Graphene Oxide Based Structured Laminar Membranes	$365,427
PN14051/2635	Agrobacterium tumefaciens-mediated transformation of oleaginous yeast	$69,519
PN14052/2636	In-situ Fastening of Metals to Plastics	$78,884
PN14053/2637	Generation of Versatile Chemicals from Natural Gas in a Fuel Cell	$100,370
PN14054/2638	Internal Temperature Measurement Tool to Maximize LI-Ion Battery Safety, Reliability and Life	$80,477
PN14055/2639	Making MLSTONES Cyber Ready by Completing ScalaBLAST 3.0	$121,628
PN14056/2640	Reagent Free Ultrasensitive Contaminant Analysis for Semiconductor Materials	$79,969
PN14057/2641	Nanocomposite Particle Synthesis Using Switchable Ionic Liquids	$228,071

PN14058/2642	Hybrid Microchip/Capillary Electrophoresis Platform for Rapid, Ultrasensitive Bioanalysis	$90,244
PN14059/2643	Enterprise Deployment of Hone at PNNL	$49,130
PN14060/2644	Extremely Large Scale Building Energy Simulation Infrastructure	$80,230
PN14061/2645	Marine Radiochemistry: First Th-231 Measurements in Seawater for Tracing Rapid Particle Dynamics	$241,219
PN14062/2646	Low-Cost Conformable Metallic Foam	$124,921
PN14063/2647	Online Predictive Analytics on Streaming Data	$291,655
PN14064/2648	Science of Interaction: Towards Human-Machine Co-Reasoning	$206,570
PN14065/2649	Shyre: Streaming Hypothesis Reasoning	$245,708
PN14066/2650	Development of a Novel Microscopy Platform for Fundamental Studies of Ice Nucleation on Atmospheric Particles.	$161,596
PN14067/2651	Bridging length scales in complex oxides: From point defects to defect superstructures	$176,735
PN14068/2652	Simultaneous carbon-14 and tritium dating of environmental organic matter	$539,882
PN14069/2653	Barrier Analysis and Assessment for the Appliance & Commercial Equipment Standards Program	$74,819
PN14070/2654	Ionic Liquid-Based Electrolytes for the Dissolution of Polycyclic Aromatics for Redox Flow Batteries	$121,262
PN14071/2655	Smartphone Enabled Transmission and Backscatter Radiography	$33,124
PN14072/2656	Upgrading of Bio-Oils by Selective Ring-Opening of the Oxygenated Cyclic compounds	$59,419
PN14073/2657	Expedited Implementation and Simulation of Large-scale High-fidelity Biological System Models with Water and Blood Flow	$74,944
PN14074/2658	Creating a Gas Phase Chemistry Workbench by Performing Manipulations in Efficient Ion Traps	$74,964
PN14075/2659	Vapor Detection of Illicit Substances in an Atmospheric Flow Tube Mass Spectrometer	$50,513
PN14076/2660	Streaming Data Characterization	$148,862
PN14077/2661	Development of an Ultra-small Volume Detection and Sample Delivery System for Exploring Microscale Heterogeneity with NMR	$49,960
PN14078/2662	Development of a method to calculate force of storm surge and wind-wave on energy infrastructure under extreme climate conditions	$59,954
PN14079/2663	Single-Step 2-D Ion Mobility Separations Technology	$80,009
PN14080/2664	Rheoreversible CO2-Reactive Hydraulic Fracturing Fluids for Unconventional (Tight) Oil Production	$79,819
PN14081/2665	Rhizosphere Underground: Unraveling the Role of Microbes in Stabilizing Carbon Pools in Soils	$76,266
PN14082/2666	Quantifying Carbon Fluxes and Underlying Mechanisms Using Multiple Data Sets with a Joint Land-atmosphere Ensemble Kalman Filter Data Assimilation System	$44,186

PN14083/2667	Developing Signatures that Relate Fecal Microbiome Characteristics with Gastric Bypass Surgery Outcomes	$37,541
PN14084/2668	Identifying Cloud Phase States from Multiple Remote Sensing Observations	$59,150
PN14085/2669	Drugs of Abuse Retention and Degradation in Environmental Biofilms	$70,393
PN14086/2670	Topological Analysis of Graphs in Cyber Security	$45,262
PN14087/2671	Dorci - The Defenders Role in Resilient Cyber Security	$14,419
PN14088/2672	Cyber Risk Assessment Model	$10,833
PN14089/2673	Multiscale modeling and uncertainty quantification for complex non-linear systems	$54,706
PN14090/2674	Optically Resonant Subwavelength films for Tags and Seals	$24,482
PN14091/2675	EUV Laser Ionization Mass Spectroscopy	$24,278
Total # of Projects for PNNL: 182		
Total Cost for PNNL: $38,884,857		
Total Administrative Cost: $(21,454)		
PRINCE - Princeton Plasma Physics Lab		
PPPL-022	Developing a Prototype Gyrokinetic Code Using Advanced Algorithms for Non-axisymmetric and Edge Plasmas	$58,685
PPPL-031	2D Linear Mode Conversion Calculations for Solar and Heliospheric Radio Emissions	$99,479
PPPL-032	Mission and Configuration of a Spherical Tokamak Fusion Nuclear Science Facility	$260,795
PPPL-033	High-Throughput Mass Filter	$248,321
PPPL-034	Prototype of a Scalable Flowing Liquid Lithium System	$185,408
PPPL-035	Next Step Development of an Actively-cooled and Wetted Liquid Metal Divertor Target and Test Components	$123,292
PPPL-036	Fundamental Studies of Deuterium Retention in Solid and Liquid Metals	$173,119
PPPL-037	Liquid Lithium Test Stand and Textured Surface Test	$99,969
PPPL-038	Imaging x-ray spectroscopy for x-ray synchrotron radiation and high energy density experiments	$227,049
PPPL-039	Development of the Advanced Annular Couette Centrifuge	$66,705
PPPL-040	Improved Stellarators for Fusion Nuclear Missions	$156,755
PPPL-041	Development of a Plasma Data Management Program	$46,942
PPPL-042	Assessment of methodology used in estimating power plant economics	$18,994
PPPL-043	Development of Innovative Optics for Extreme Ultra Violet Lithography	$157,169
PPPL-044	Development of a Suite of Atomistic Codes for Fusion, Advanced Materials and Warm Dense Matter Applications	$83,797
Total # of Projects for PRINCE: 15		
Total Cost for PRINCE: $2,006,479		
Administrative Cost Paid by Laboratory Overhead		

PTX - Pantex Plant		
PX09003	GPC Optimization of HE Molecular Weight	$5,567
PX10002	Effects of Temperature on Explosives	$4,544
PX11001	Gas Gun Firing Mechanism	$145,268
PX11004	Ignition Properties of Energetic Material	$98,365
PX11005	Micro-Focus Computed Tomography	$141,529
PX11008	NDE - Holding Fixture	$126,183
PX11009	3-Dimensional HD Video Capture System	$194,408
PX11014	Adiprene Replacement	$122,612
PX12002	MATL Qualification - Nuclear Explosive Processes	$179,453
PX12004	HE Machining Hazards	$176,551
PX13001	Decomposition & Material Effects on HE	$52,568
PX13002	Laser Welding Process Monitor	$41,991
PX13005	LIMS & Robotic Sample Preparation	$30,298
PX13006	Simultaneous Multiple Sample Light	$174,879
PX13009	Classified Wireless Network	$283,375
PX13010	Ultra Performance Gel Permeation Chromatography	$218,558
PX13011	High Performance Ion Chromatography MS	$351,746
PX13012	Epoxy Removal - PBX & DAP	$80,563
PX13013	Synthesis & Formulation of LLM	$120,961
PX13016	Precision CNC Mill-Lathe Machining	$14,952
PX13018	System Dynamic & Economic Model - HRO	$135,918
PX14002	Acoustical Characteristics of HE Detonations	$115,673
PX14003	Maldi Feasability Study	$1,519
PX14004	Active Bay Noise Reduction	$349,023
PX14006	Cold Pour Cast Explosive	$28,367
PX14008	Historical Thermal Cook-Off Tests	$63,095
PX14009	Substitution Hydrogen Helium - CRT	$67,312
PX14010	Lightning Paths along Penetrations in Nuclear Explosive Facilities	$77,416
PX14011	HE Firing Circuits & Signal Lines	$51,365
PX14012	Rheometry Gel-Time Tool	$25,257
PX14014	Microcalorimetry - Decomposition	$2,124
PX14015	Determination - Vinyl KEL-F800/FK-800	$69,136
PX14017	Real Time Press Fluid Monitoring	$20,416
PX14019	Effects of Heating on Impurity Levels in Dry Aminated TATB	$56,553
PX14020	Purity TATB	$14,662
PX14021	High Explosive Thermal Modeling	$234,570
PX14023	AS Pressed UH	$88,279
PX14025	Non-Propagating Arrays	$43,089
PX14026	Advanced Manufacturing - Rapid Response	$36,534
	Total # of Projects for PTX: 39 **Total Cost for PTX:** $4,044,679	
	Total Administrative Cost: $432,837	

SLAC - SLAC National Accelerator Laboratory		
14-001	Functional Polymers for Lithium-Ion Batteries	$112,335
14-002	Spatial and Time Resolving Pixel Detector - Tixel	$189,101
14-003	Understanding Controlling Elevated-Temperature Charge Transfer	$180,386
14-004	Chemistry in Motion: Probing Enzymatic Reaction Mechanisms in Crstallo	$141,378
14-005	Center for Laboratory Astrophysics	$521,989
14-006	New Initiative for Synchrotron Radiation-based Catalysis and Energy Research	$302,139
14-007	Interfacial Photoelectrochemistry Using Oxide Heterostructures	$75,908
14-008	Towards in-Situ Growth and Spectroscopy of Complex Oxide Thin Films Heterostructures	$322,400
14-009	KIPAC Cosmic Inflation Initiative	$1,053,579
14-010	Exploring the Scientific Capability of Momentum-Resolved Resonant Inelastic Soft X-ray Scattering for Materials Science Research	$16,208
14-011	Low Dimensional Quantum Materials for Energy Applications	$89,793
14-012	Experimental Screening of Electrocatalysts for CO2 Reduction	$209,999
14-013	Correlated Electron Physics at Oxide Interfaces	$48,320
14-014	Non-Fermi Liquid Metals	$113,915
14-015	Prototype for a Microjoule-Class Femtosecond XUV Source	$185,490
14-016	Towards the SLAC Femtosecond Macromolecular Micro & Nanocrystallography Facilities	$249,220
14-017	Modeling Conformational Ensembles of Proteins and Complexes	$137,923
14-018	PolyUbiquitin Structural Biology	$332,849
14-019	An Automated Pipeline for Cosmological Mock Sky Survey Production	$116,485
14-020	Cpix Prototype Sensor Development	$41,387
Total # of Projects for SLAC : 20		
Total Cost for SLAC : $4,440,804		
Administrative Cost Paid by Laboratory Overhead		
SNL - Sandia National Lab		
158740	Memristor Evaluation and Optimization for Cyber Security	$304,711
158742	A Thin Hypervisor for Dynamic Analysis and Reverse Engineering of ARM Based Embedded Systems	$432,396
158743	Encryption using Electrochemical Keys	$525,336
158747	An Adaptive Web Spider for Multi-Modal Data	$26,973
158754	2-color nBn FPA	$480,883
158755	Advanced Imaging Optics Utilizing Wavefront Coding	$11,866
158757	Applying Discrimination Methods to Collected and Synthetically Modeled Explosive Signatures	$518,444
158759	Remote Optical Sensing of Ionizing Radiation	$47,576

158764	Training Adaptive Decision Making	$290,039
158765	A Complexity Science-Based Framework for Global Joint Operations Analysis to Support Force Projection	$518,325
158767	Quantitative Adaptation Analytics for Assessing Dynamic Systems of Systems	$465,175
158768	Ultra-Stable Oscillators for RF Systems	$116,781
158770	Moving Target Detection and Location in Terrain Using Radar	$623,037
158773	Electronic Battle Damage Assessment	$571,695
158774	Ablation Chemistry Effects on Boundary-Layer Transition	$405,788
158780	Inferring Organizational Structure from Behavior	$329,519
158781	Breaking the Language Barrier	$230,499
158782	Frequency Translation to Demonstrate a "Hybrid" Quantum Architecture	$573,104
158783	Cross-Domain Situational Awareness in Computing Networks	$228,234
158784	Non-linear Decision Theory Applied to Co-Hosting Analysis for National Security Space Payloads	$65,769
158785	Learning From Nature: Biomimetic Polarimetry for Imaging in Obscuring Environments	$30,240
158787	Scheduling Irregular Algorithms	$46,516
158789	Breaking Computational Barriers: Real-time Analysis and Optimization with Large-scale Nonlinear Models via Model Reduction	$290,688
158792	Exploring Heterogeneous Multicore Architectures for Advanced Embedded Uncertainty Quantification	$387,548
158793	Architecture- and Resource-Aware Partitioning and Mapping for Dynamic Applications	$616,202
158794	Automated Algorithms for Achieving Quantum-level Accuracy in Atomistic Simulations	$612,041
158795	Electromagnetic Extended Finite Elements for High-Fidelity Multimaterial Problems	$383,365
158801	Ultrafast Laser Diagnostics for Energetic-Material Ignition Mechanisms: Tools for Physics-Based Model Development	$710,938
158802	Fault Survivability of Lightweight Operating Systems for Exascale	$750,966
158803	Effect of Varying Convection on Dendrite Morphology and Macrosegregation	$30,730
158804	Next-Generation Algorithms for Assessing Infrastructure Vulnerability and Optimizing System Resilience	$29,737
158805	Next Generation Suspension Dynamics Algorithms	$45,731
158806	Multi-Scale Modeling of Brittle Heterogeneous Materials	$53,000
158809	Designing Greenhouse Gas Monitoring Systems and Reducing Their Uncertainties	$761,800
158810	The Science of Battery Degradation	$942,279
158813	Development of a Sustainable Anthrax Diagnostic Test for Countering the Biological Threat	$464,121

158814	Advanced Diagnostic and Sample Preparation Platform for Early Threat Surveillance	$570,024
158819	Multi-Target Camera Tracking, Hand-off and Display	$457,160
158821	Intrinsic Material Elements Seal	$433,654
158822	In-situ Study of Dynamic Phenomena at Metal Nanosolder Interfaces Using Aberration-Corrected Scanning Transmission Electron Microscopy	$568,910
158823	Deciphering Adsorption Structure on Insulators at the Atomic Scale	$350,852
158825	Crystalline Nanoporous Frameworks: a Nanolaboratory for Probing Excitonic Device Concepts	$476,084
158826	Electrically Tunable Metamaterials for Agile Filtering in the Infrared	$592,845
158828	Understanding Tantalum Oxide Memristors: An Atoms Up Approach	$604,808
158829	Understanding and Exploiting Bilayer Graphene for Electronics and Optoelectronics	$652,409
158830	GaN Unipolar Optical Modulators	$589,980
158832	Mechanism of Fusion of Pathogenic Enveloped Viruses with the Endosomal Membrane	$643,466
158835	Utilizing Biocomplexity to Propagate Stable Algal Blooms in Open System - Keeping the Bloom Going	$724,182
158836	Using High Performance Computing to Examine the Processes of Neurogenesis Underlying Pattern Separation/Completion of Episodic Information	$404,038
158850	Miniature Tritium Free Neutron Generator	$580,459
158853	Chemical Enhancement of Surface Kinetics in Hydrogen Storage Materials	$548,828
158855	Impact of Crystallization on Glass-ceramic to Metal Bonding	$427,523
158856	Synthesis of Wear-Resistant Electrical Contact Materials by Physical Vapor Deposition	$667,853
158857	Extension of Semiconductor Laser Diodes to New Wavelengths for Novel Applications	$747,757
158858	Fundamental Studies on Initiation and Evolution of Multi Channel Discharges and their Application to Next Generation Pulsed Power Machines	$556,664
158859	New Radiation-Resistant Materials	$542,215
158860	A New Capability to Model Defects in InGaAs and InGaP Alloys	$528,780
158861	Investigate Emerging Material Technologies for the Development of Next Generation Magnetic Core Inductors for LTD Pulsed Power Drivers	$492,467
159056	Intrinsically Radiation-Hard Nonvolatile Memory: SnO2 Memristor Arrays	$75,206
159184	Coupling of Quantum Dots to Nanoplasmonic Structures	$46,017

159256	Applications of Microwave Frequency Nano-Optomechanical Systems: Oscillators, Circuits, and Sensors	$275,300
159257	Science-Enabled Next Generation Photovoltaics for Disruptive Advances in Solar Power and Global Energy Safety and Security	$4,671,276
159258	Extreme Scale Computing Grand Challenge	$4,266,449
159302	Opportunities for Waste and Energy	$45,261
161862	Inherent Secure Communication Using Lattice Based Waveform Design	$57,297
161863	Optimal Adaptive Control Strategies for Hypersonic Vehicle Applications	$118,903
161864	Theoretical Foundations for Measuring the Groundwater Age Distribution	$55,505
161865	A Micro to Macro Approach to Polymer Matrix Composites Damage Modeling	$49,952
161866	Chloride-Insertion Electrodes for Rechargeable Aluminum Batteries	$49,826
161867	Digital Holography for Quantification of Fragment Size and Velocity from High Weber Number Impacts	$49,049
161868	Hybrid-renewable Processes for Biofuels Production: Concentrated Solar Pyrolysis of Biomass Residues	$91,854
161869	Modeling the Contents of Radiological Devices in Real-Time	$25,065
161870	Compressive Sensing for Nuclear Security Applications	$52,330
161871	A Cognitive and Economic Decision Theory for Examining Cyber Defense Strategies	$58,011
161873	Aerosol Aging Processes and their Relevance to Human and Environmental Hazards	$53,093
162034	Genomic Functionalization: The Next Revolution In Biology	$18,618
162299	Integration of SD and PRA to Create a Time-Dependent Prediction of the Risk Profile of a Nuclear Power Plant	$56,030
162522	Impact of Materials Processing on Microstructural Evolution and Hydrogen Isotope Storage Properties of Pd-Rh Alloy Powders	$36,907
164183	Defect Localization, Characterization and Acceleration Factor Assessment in Emerging Photovoltaic and Power Electronic Materials	$158,851
164661	Developing Software Systems for High-Assurance Applications	$120,577
164662	Self-Deconstructing Algal Biomass as Feedstock for Transportation Fuels	$172,637
164667	Heavy Duty Vehicle and Infrastructure Futures	$139,953
164668	Advanced Diagnostics for High Pressure Spray Combustion	$142,189
164671	Investigating Dynamic Hardware and Software Checking Techniques to Enhance Trusted Computing	$139,382
164672	Nano-Structured Silicon Phononic Crystals with Metal Inclusions for ZT Enhancement Proof-of-Concept	$113,488

164676	Gate-Controlled Diode Structure to Investigate Leakage Current and Early Breakdown in Graded InGaAsP/InP Junctions	$162,137
164677	Alloys and Composites for Strong and Tough Freeform Nanomaterials	$167,249
164678	Reduced Order Modeling for Prediction and Control of Large-Scale Systems	$122,347
164759	Time-Dependent Resistivity of Millimeter-Gap Magnetically Insulated Transmission Lines Operated at Megampere/Centimeter Current Densities	$130,525
164764	An Empirical Assessment of the Factors Underlying Phishing	$168,625
164869	Flexible and Scalable Data Fusion using Proactive, Schemaless Information Services	$112,045
164892	Mission Capability Analysis Environment for End-to-End Performance Assessment of Space Systems	$115,901
165464	Nanoscale Piezoelectric Effect Induced Surface Electrochemical Catalysis in Aqueous Environment	$167,434
165535	Pattern Analytics To Support High-performance Exploitation and Reasoning	$4,176,281
165537	Composing Formally Verified Modules to Analyze Security and Reliability Properties of Large-Scale High-Consequence Systems	$521,853
165541	Cyber Graph Queries for Geographically Distributed Data Centers	$343,606
165542	Applying Cognitively Inspired Computing Systems to Create a Robust Cyber Protection Architecture	$423,100
165543	Nested Narratives	$478,538
165544	Active Learning for Alert Triage	$376,782
165545	Precision Laser Annealing of Focal Plane Arrays	$348,938
165547	Computer Network Deception	$279,508
165549	Precise and Persistent RF Detection, Tracking, and Location	$279,258
165550	Hardware Solution to Flash Memory Accessibility Problems	$96,491
165551	Graphene Survivability	$220,394
165552	Combination Bearing/Flexure Joint for Large Coarse Motions and Fine Jitter Control	$468,823
165554	Wound Ballistics Modeling for Blast Loading, Blunt Force Impact, and Projectile Penetration	$375,761
165555	Ground Moving Target Extraction, Tracking, and Image Fusion	$474,057
165559	Board and System Level Spectral Analysis	$180,762
165563	Radio Frequency Environment Characterization through Novel Machine Learning Techniques	$239,255
165566	Electromagnetic-Wave Probing of Electrical Circuits	$220,410
165571	A Thermo-Optic Propagation Capability for Reducing Design-Cycle Time, Improving Performance Margins, and Lowering Realization Costs	$565,605
165572	Self-Powered Thin Electronic Systems	$288,164

165574	Large Motion High Cycle High Speed Optical Fibers for Space Based Applications	$181,543
165577	Quantum Graph Analysis: Engineering and Experiment	$597,565
165578	Distributed Receiver Approach to Robust Satellite Signal Reception	$34,338
165579	Chemical Stability and Reliability of Petroleum Based Products	$198,367
165580	Enabling Technologies for the Development of Very Small Low-Cost Interceptors	$261,089
165581	Turbocharging Quantum Tomography	$222,139
165607	Unknown Pathogen Detection in Clinical Samples: A Novel Hyperspectral Imaging and Single Cell Sequencing Approach	$963,110
165609	The Engineering and Understanding of Nanoparticle/Cellular Interactions	$656,692
165611	Operationally-Relevant Cyber Situational Awareness Tool Development	$353,964
165613	Cognitive Computing for Security	$430,647
165614	HostWatch: Situational Awareness of Machine State for Cybersecurity	$490,827
165615	Sublinear Algorithms for In-situ and In-transit Data Analysis at Exascale	$431,787
165616	Strong Local-Nonlocal Coupling for Integrated Fracture Modeling	$475,082
165617	Efficient Probability of Failure Calculations for QMU using Computational Geometry	$722,371
165618	A Universal Quantum Transport Computational Capability for Cross-Technology Comparisons of Beyond-CMOS Nano-electronic Devices	$147,328
165619	Advanced SMRs Using S-CO2 Power Conversion with Dry Cooling	$497,787
165620	Active Suppression of Drilling System Vibrations For Deep Drilling	$735,850
165630	Climate Induced Spillover and Implications for US Security	$451,104
165631	Natural Gas Value-Chain and Network Assessments	$497,541
165632	Novel Metal-organic Frameworks for Efficient Stationary Energy Sources via Oxyfuel Combustion	$574,347
165633	Sandia's Twistact Technology: The Key to Proliferation of Wind Power	$566,203
165635	Calibration, Validation, and Uncertainty Quantification for Turbulence Simulations of Gas Turbine Engines	$438,827
165636	Developing Next Generation Graphene-based Catalysts	$207,296
165637	Coating Strategies for High Energy Lithium-Ion	$45,946
165638	Synthesis of Heterometallic Manganese oxo Clusters as Small Molecule Models of the Oxygen-evolving Complex of Photosystem II	$19,974
165644	Enabling Novel Nuclear Reactors with Advanced Life-time Modeling and Simulation	$224,415

165646	Quantitative Imaging of Turbulent Mixing Dynamics in High-Pressure Fuel Injection to Enable Predictive Simulations of Engine Combustion	$778,436
165649	A Process and Environment Aware Sierra/SM Cohesive Zone Modeling Capability for Polymer/Solid Interfaces	$548,599
165652	Prediction of Spark Discharge Paths & Voltages	$442,667
165656	Time-Resolved Optical Measurements of Shock-Induced Chemistry in Energetic Materials	$671,835
165667	Determining Constitutive Material Properties From Full-Field Experiments Using the Virtual Fields Method	$166,126
165668	Methane Hydrate Formation on Clay Mineral Surfaces: Thermodynamic Stability and Heterogeneous Nucleation Mechanisms	$450,807
165669	Determination of Aerosol Scattering Characteristics for Atmospheric Measurements	$237,876
165670	Appraisal of Hydraulic Fractures Using Natural Tracers	$379,926
165676	Development and Field-testing of a Diagnostics Platform for Global Syndromic Disease Surveillance	$533,406
165679	Processing Radiation Images Behind an Information Barrier for Automatic Warhead Authentication	$450,747
165681	RGB+D for Biometrics and Physical Security	$234,894
165682	Radiography Signature Science of Homemade Explosives	$400,173
165683	Distinguishing Bioengineering from Natural Emergence in Biothreat Genomes	$492,689
165685	Jam-Proof Wireless Communications	$472,201
165686	Using electroencephalography and other methods to Understand Domain-Specific Visual Search	$259,534
165687	Improved Pulse Shape Discrimination in a Multicomponent Water/Organic System	$519,279
165692	LEEM-PEEM Studies of Localization Mechanisms in InGaN-based Heterostructures	$542,230
165694	Ion-Conduction Mechanisms in NaSICON-Type Membranes for Energy Storage and Utilization	$268,017
165696	Programmable Nanocomposite Membranes for Ion-Based Electrical Energy Storage	$290,354
165697	Science-Based Design of Stable Quantum Dots for Energy-Efficient Lighting	$468,884
165698	Predicting Growth of Graphene Nanostructures Using High-Fidelity Atomistic Simulations	$486,122
165700	Tunable Quantum Dot Solids: Impact of Interparticle Interactions on Bulk Properties	$454,188
165701	Nonlinear Response Materials for Radiation Detection	$334,749
165702	Active Plasmonics from the Weak to Strong Coupling Regime	$661,419

165703	Minority Carrier Lifetime Characterization and Analysis for Infrared Detectors	$162,865
165704	Electrically Injected UV-Visible Nanowire Lasers	$502,445
165705	Efficient Heat Removal from Power-Semiconductor Devices Using Carbon Nanotube Arrays and Graphene	$513,665
165706	Fabrication and Characterization of a Single Hole Transistor in p-type GaAs/AlGaAs Heterostructures	$227,986
165707	Optical Polarization Based Genomic Sensor	$379,599
165708	Programmable Piezoelectric RF Filters	$444,072
165711	Computational and Experimental Characterization of Aluminum Nitride-Silicon Carbide Thin Film Composites for High Temperature Sensor Applications	$239,786
165713	Exploring the Possibility of Exotic Ground States in Twisted Bilayer Graphene	$223,242
165714	Closing the Nutrient Utilization Loop in Algal Production	$257,541
165715	Testing the Effects of Transcranial Direct Current Stimulation on Human Learning	$73,860
165717	Searching for Majorana Fermions in Topological Superconductors	$192,691
165724	Understanding H Isotope Adsorption and Absorption of Al-Alloys Using Modeling and Experiments	$429,518
165725	Carbon Composite MEMS Accelerometer	$515,175
165726	Organosilicon-based Electrolytes for Long-Life Li Primary Batteries	$601,909
165729	The Use of Degradation Measures to Design Reliability Test Plans	$159,319
165731	Non-Equilibrium Electron-Ion Dynamics under Extreme Conditions via Time-Dependent Density Functional Theory	$413,735
165732	Electrical Breakdown Physics in Photoconductive Semiconductor Switches	$508,801
165733	Z-pinch X-ray Sources for 15-60keV	$446,833
165736	Implementing and Diagnosing Magnetic Flux Compression on Z	$407,147
165738	Evaluation of Warm x-ray Bremsstrahlung Diodes on Z	$316,622
165739	High Pressure Pre-Compression Cells for Planetary and Stellar Science	$372,699
165740	Assessment of Load Current Multipliers to Increase Load Magnetic Pressures for Dynamic Materials and Fusion Experiments	$97,129
165741	Radiation Susceptibility of Memristive Technologies in Hostile Environments	$357,676
165746	Exploring New Frontiers in Wave-Particle Physics in Nonstationary, ICF-related Plasmas	$256,765
165767	Identification of Nucleic Acid Biomarkers of Infection in Blood	$940,311
165822	Consolidated Bioprocessing and Biofuels Production Platform	$50,497
165823	Development of a MEMS Dual-Axis Differential Capacitance	$29,372

165824	Crossing the Membrane Barrier: Implications for Developing Medical Therapuetics	$259,360
165825	The Role of Grain Boundary Energy on Grain Boundary Complexion Transitions	$43,240
166140	Adaptive Multimodel Simulation Infrastructure (AMSI)	$26,362
166141	Kernel and Meshless Methods for Partial Differential Equations	$56,239
166143	Time-varying, Multi-scale Adaptive System Reliability Analysis of Lifeline Infrastructure Networks	$46,984
166148	Lithium Thiophosphate Compounds as Stable, High Rate Li-Ion Separators: Moving Solid Electrolytes into High Rate Applications	$44,768
166149	Structural Health Monitoring for Impact Damage in Advanced Composite Structures Using Virtual Sensor Grid	$46,672
166151	Highly Efficient Entangled Photon Source for High-speed Secure Quantum Communication Network	$45,658
166152	High Precision Testing and Structural Analysis of Li-ion Batteries	$73,968
166153	Upscaling Ab-Initio Quantum Chemistry Models for Nonequilibrium Reacting Flow Simulations	$46,282
166154	In-situ Techniques to Characterize Creep and Fatigue in Freestanding Metal Thin Films	$46,806
166537	Enabling Bidirectional Modality Transitions in Collaborative Virtual Environments	$41,818
166539	A Modular Nanoparticle Platform for Treatment of Emerging Viral Pathogens	$130,987
166636	Multiscale Modeling of Hybrid SMA Composites	$51,612
167008	Toward Interactive Scenario Analysis and Exploration: A Study on Simulation Technology Optimization and Scalability with Big-Data Analysis and their Applications	$223,959
168763	Creating a Novel Silicon Substrate for the MOCVD Growth of Low Defect GaN	$27,630
169249	Modeling the Coupled Chemo-Thermo-Mechanical Behavior of Amorphous Polymer Networks	$56,169
170798	Development of a Rapid Field Response Sensor for Characterizing Nuclear Detonation Debris	$256,966
170800	Real-Time Case-Based Reasoning using Large High-Dimensional Data	$173,115
170801	Recombinant Vesicular Stomatitis Virus for Therapeutic Antibody Epitope Mapping and Vaccine Development	$263,032
170803	Integration of a Neutron Sensor with Commercial CMOS	$296,073
170804	Systems-Level Synthetic Biology for Advanced Biofuel Production	$231,087
170805	C2R2: Compact Compound Recirculator/Recuperator for Renewable Energy and Energy Efficient Thermochemical Processing	$254,699
170806	Liquid Metal Embrittled Structures for Fragmenting Warheads	$184,247
170973	Model Reduction for Quantum Technologies	$202,408

170974	Determination of Surface-Mediated Degradation Products in Energetic Materials at Critical Interfaces	$230,023
170975	Development of High-Fidelity Models for Liquid Fuel Spray Atomization and Mixing Processes in Transportation and Energy Systems	$233,104
170976	Development of Quality Assessment Techniques for Large Eddy Simulation of Propulsion and Power Systems in Complex Geometries	$232,810
170977	Fiber Optic Streak Spectroscopy of Gas Cells in Extreme Radiation Environments	$230,115
170979	Quantifying Confidence in Complex Systems Models Having Structural Uncertainties	$202,696
170995	High Fidelity Forward Model Development for Nuclear Reactor Spent Fuel Technical Nuclear Forensics	$228,246
170996	Radar Detection of Personnel Obscured by Foliage	$246,316
171054	Revisiting the Applied Mechanics Paradigm: Multi-scale Modeling of Transport Processes in Complex Materials	$767,817
171055	Breaking Antibiotic Resistance: Use of High-Throughput, Multi-Dimensional Data Analyses and Revolutionary Advances in Engineered Nanoparticles to Design and Deliver Antisense RNA	$750,288
171056	Flexible, Adaptable, Full-spectrum Imaging via Nanoantenna Enabled Two-dimensional Detectors	$761,106
171057	Comparative Approach for a Physics-based Understanding of Power Spectrum Analysis Signatures	$689,547
171059	Counter-Adversarial Data Analytics	$803,176
171060	Beyond Moore's Law Computer Architecture	$655,651
171061	First to High Yield Fusion	$748,637
171069	Polyfunctional Desorption of Oil from Shales	$425,682
171117	Numerical Methods for Efficient Simulations and Analysis of Circuits with Separated Time Scales	$159,551
171381	Detecting Seasonal Changes in Permafrost Using in situ Seismic Velocities, Near-Field Soil Moisture Monitoring, and Remote Sensing	$424,923
171525	Use of Slurries for Salt Caverns Abandonment	$189,872
172334	Decoupling Superconducting Transmon Qubits from their Quantum Bus/Readout Resonators to Enable Scaling	$238,086
173019	Understanding and Engineering Lignolysis for Renewable Chemical Production	$571,601
173020	EKSG: A Universal Sample Prep Technology for Multidimensional Bioscience	$251,081
173021	In Vivo High Throughput Transcriptomics to Elucidate the Spatial and Temporal Dynamics of Host-Pathogen Interactions	$395,667
173022	Bio-inspired MOF-based catalysts for Lignin Valorization	$333,609

173024	Simulation Capability and Computational Assessment of Memristors as Beyond-CMOS Logic and Memory Devices	$500,142
173025	Coupling Computational Models: From Art to Science	$588,452
173026	Towards Rigorous Multiphysics Shock-Hydro Capabilities for Predictive Computational Analysis	$736,450
173028	Analyst-to-Analyst Variability in Simulation-Based Prediction	$259,894
173029	User-Accessible Unified Manycore Performance-Portable Programming Model	$340,764
173031	APEX: Application Characterization for Exascale Systems	$90,371
173034	Using Trusted Execution Environments to Provide Monitoring and Protection of Mobile Operating Systems	$292,761
173035	Using Linkographies of Cyber Attack Patterns to Inform Honeytoken Placement	$152,127
173036	Measuring Human Performance within Computer Security Incident Response Teams	$495,178
173037	Using Machine Learning in Adversarial Environments	$429,961
173038	Threat Relevant, Context Based, Internal Situational Awareness	$303,697
173039	Novel, Semi-Destructive FA Technique for Stacked Die	$268,176
173040	Novel Memory Analysis	$230,782
173042	Data Provenance for Automotive CAN Networks	$105,817
173043	Speech Detection with MEMS Zero Power Acoustic Sensor	$227,601
173044	New Methods for Characterizing Hardware Protocols	$273,247
173045	Enabling Nanoink Materials for Direct Write and Additive Manufacturing	$276,157
173046	Low Observable Technology	$198,622
173047	Automated Blind Signal Characterization	$275,004
173048	Micro Scale, Low Power RF Power Detector Using IC Based Calorimeters	$149,302
173049	Advanced Target Phenomenology for Emergent Threat Detection	$515,087
173050	Carrier Lifetime Mapping for Infrared Detectors	$237,045
173051	High Speed Remote Sensing of Optical Signatures	$167,470
173052	Reversible Electrical Interconnect	$437,255
173053	Large Scale Tracking of Unresolved Targets	$604,079
173054	Exploration of JAS Architecture for Multi-Mission Applications	$144,940
173055	Persistent Space Situational Awareness	$300,750
173056	Co-Design of Sensors and Analysis Methods for Optical Remote Sensing of Spectral-Temporal Signals	$625,763
173057	Onboard Jitter Mitigation Using Image Feedback	$32,832
173058	Advanced Beamsplitter Fabrication Techniques for Enabling a Novel Compact Multispectral Diffraction-Limited Imaging System	$150,271
173059	Deployable, Ground-Based, Discrete Zoom Telescope	$387,619
173060	Broadband Digital AESA Radar Prototype for Multi-Mission ISR Applications	$602,684

173061	Motion Estimation and Compensation for Focusing Maritime Targets	$110,157
173062	Developing a System for Testing Computational Social Models Using Amazon Mechanical Turk	$237,238
173063	Holistic Portfolio Optimization using Directed Mutations	$94,959
173064	Imaging LIDAR and Raman Imaging LIDAR through Fog and Dust for Maritime Surveillance	$370,604
173065	Modeling and Experimental Validation of Jet Vane Forces for a New Type of Missile Defense Kill Vehicle Steering System	$374,415
173066	Adaptive Waveform and Signal Processing Techniques That Mitigate Adversarial Anti-Access/Area Denial (A2AD) Technology	$281,190
173067	Dynamic Analytical Capability to Better Understand and Anticipate Extremist Shifts Within Populations Under Authoritarian Regimes	$312,769
173069	Imaging Mass Spectrometry for Biometric and Forensic Detection	$277,975
173070	Quantifying the Uncertainty of Risk Assessment for High Consequence Flight Tests	$341,171
173071	Assessing the Security Impact of Moving Target Defense Approaches	$250,123
173072	Application of Advanced Network Topologies to Reliable Space-based Computing Clusters	$154,844
173073	Optical Detection of Ultratrace Molecules	$178,714
173074	Technology Improvements for the Design and Analysis for Hypersonic Scramjets for Prompt Strike Applications	$231,924
173076	The Effect of Proppant Placement on Closure of Fractured Shale Gas Wells	$233,457
173078	The Role of Real-time Decision Making in Grid Resilience	$413,114
173079	Next Generation Global Atmosphere Model	$795,311
173090	An Advanced Decision Framework for Power Grid Resiliency	$967,843
173092	Fractal-Like Materials Design with Optimized Radiative Properties for High-Efficiency Solar Energy Conversion	$488,774
173093	Solving the Longstanding Problem of Thermal Management in LED Lighting	$415,567
173094	Measurements and Modeling of Black Carbon Aerosols in the Arctic for Climate-Change Mitigation	$646,794
173095	High Fidelity Coupling Methods for Blast Response on Thin Shell Structures	$610,209
173096	Modeling Primary Atomization of Liquid Fuels Using a Multiphase DNS/LES Approach	$437,474
173097	Experiments and Computational Theory for Electrical Breakdown in Critical Components	$480,824
173098	Mechanics of Battery Degradation Through Stress Driven Rearrangement of Percolated Conductive Networks During Discharge and Cycling	$738,496

173099	Methods for Observing Flow in High-Pressure High-Temperature Flow Experiments	$223,139
173100	Monitoring, Understanding, and Predicting the Growth of Methane Emissions in the Arctic	$550,403
173101	Technology for Subsurface Imaging with Backscattered Muons	$243,958
173102	Fundamental Study of Disposition and Release of Methane in a Shale Gas Reservoir	$558,976
173103	Sandia Communications and Authentication Network using Quantum Key Distribution	$4,862,249
173104	New Capabilities for Hostile Environments	$5,199,199
173105	Combinatorial, Microscale Fuel/Oxidizer Formulations for the Systematic Determination of HME Properties	$302,008
173106	Decontamination of Radiological Contaminated Materials Using Magnetotactic Bacteria	$430,790
173107	Tamper Indicating Materials Using Microvascular Networks	$304,171
173108	VMD Fused Radar - The First Volumetric Ultra-Low NAR Sensor for Exterior Environments	$398,878
173110	Development of a Novel Nanoparticle Delivery Vehicle for Pre-Treatment with Nerve Agent Countermeasures	$385,065
173111	Real-Time, Autonomous Field Surveillance for Vector-Borne Pathogens	$446,397
173112	Online Mapping and Forecasting of Epidemics Using Open-Source Indicators	$349,045
173113	Single-Volume Neutron Scatter Camera for High-Efficiency Neutron Imaging and Source Characterization	$497,103
173114	A Complex Systems Approach to More Resilient Multi-Layered Security Systems	$499,960
173115	Denial of Use of Bulk Chemical Agents and their Precursors	$253,580
173116	Multi-Resolution Characterization and Prediction of Environmentally-Assisted Intergranular Fracture	$718,736
173117	Phonon Scattering at Mobile Ferroelastic Domain Walls: Toward Voltage Tunable Thermal Conductivity	$468,934
173118	In Situ Study of Surface-Mediated Explosive Degradation using Surface Enhanced IR-Vis Sum Frequency Generation	$346,421
173119	Scanning Ultrafast Electron Microscopy for Charge Carrier Lifetime Imaging with High Spatial Resolution	$361,676
173121	High Fidelity Modeling of Ionic Conduction in Solids	$469,791
173122	Understanding and Overcoming Materials Challenges for AlN: A Scientific Foundation for Next-Generation Power Electronics	$409,383
173124	Harnessing Multiscale Periodicity of 2D-Crystals for Flexible Adaptable Broadband Optics	$457,295
173126	Reduced Dimensionality Lithium Niobate Microsystems	$575,939
173127	The Anatomy of the Minority Carrier - Atomic Cluster Interaction in Semiconductors	$468,177

173128	Seebeck Enhancement via Quantum Confinement in MOSFET's: Towards Monolithic On-Chip Cooling	$551,166
173129	Beyond Moore's Law Through 3D-IC Fabrication	$522,881
173130	A New Approach to Entangling Neutral Atoms	$470,515
173131	Fundamental Scaling of Microplasmas and Tunable UV Light Generation	$474,948
173132	Zero-Power Wake-up Device	$159,561
173133	Metal-Organic Framework Thin Films as Gas-Chromatography Stationary Phases for the Detection of Toxic Industrial Chemicals	$211,996
173134	A Space-like Low-energy Proton Test Environment to Rapidly Qualify Advanced Microelectronics for Flight Readiness	$237,963
173135	Single Atom Deposition	$104,202
173137	Active Control of Nitride Plasmonic Dispersion in the Far Infrared	$109,442
173139	Exploring Revolutionary Thermoelectric Performance via Quantum Confinement	$222,959
173140	Synthetic DNA for Highly Secure Information Storage and Transmission	$96,697
173142	Probing Small-Molecule Degradation to Counter Enzyme Promiscuity	$186,131
173153	Cognitive Data Science for Neutron Generator Predictive Pattern Analysis	$620,217
173154	Radiation Hardness of MEMS Capacitive and Electromagnetic Accelerometers	$452,258
173156	Recycling Scandium and Erbium from Nuclear Weapon Manufacturing Operations	$522,035
173180	Compressed Sensing to Support Reduced Flight Testing	$409,057
173182	Non-Linear Transmission Line Based Fire Sets	$796,934
173183	Organic Semiconducting Materials for Thin-Film Optoelectronic Devices	$648,301
173184	Electro-Syntheses of Intermetallic Couples as Thin-Film Heat Sources for Advanced Thin-Film Thermal Batteries	$568,194
173186	Engineered Composite Materials Science and Technology for Next Generation Glass to Metal Seals	$580,952
173187	Reconfigurable Matching Networks for High-Efficiency GaN Power Amplifiers	$296,347
173188	Welding of Advanced Shape Memory Alloys	$207,304
173189	Wavelength Conversion Arrays for Optical and X-Ray Diagnostics at Z	$397,504
173190	Investigating Laser Preheat and Applied Magnetic Fields Relevant to the MagLIF Fusion Scheme	$607,670
173191	Creating the Foundation of Next-Generation Pulsed-Power-Accelerator Technology	$1,021,089

173192	An ion-Neutron electron-Gamma SIMulation System for Radiation Testing of Optical Components for Weapons Systems - NGSIM-O	$388,460
173193	Next Generation Multi-scale Plasma Codes	$230,733
173194	A Mesh-Free Method to Predictively Simulate Solid-to-Liquid Phase Transitions in Abnormal Thermal Environments	$479,272
173269	Multifunctional Integrated Sensors	$42,250
173331	Advanced Uncertainty Quantification Methods for Circuit Simulation	$482,909
173339	Chemical Vapor into Liquid Encapsulation of Microorganisms for Hazardous Agent Detection	$48,581
173490	Plasmonic-based Optical Modulators and Switches	$85,746
173491	Simulation of Optical Phenomena in the Upper Atmosphere	$56,285
173492	3D Imaging with Structured Illumination for Advanced Security Applications	$202,082
173493	Metal Organic Frameworks for Targeted, Triggered, Sustained, and Systemic Delivery of Antibiotics	$168,242
173494	Classifier-Guided Sampling for Complex Energy System Optimization	$208,931
173495	Electrostatic Coating with Naked Copper Nanoparticles	$30,101
173496	Piezoelectric Nano-Optomechanical Systems	$81,164
173653	Utilization of Reactive Metal Films for Self-Healing Metal Matrix Composites	$31,043
173655	Fully-Coupled Simulation of Lithium Ion Battery Cell Performance	$46,810
173656	Advancing the State-of-the-Art in Brute Force Vulnerability Discovery	$34,455
173659	Ferrite Solutions for Electromagnetic Shock Lines	$57,666
173661	Deployable Molecular Assays for Biosurveillance	$109,140
173662	Predicting the Occurrence of Mixed Mode Failure Associated with Hydraulic Fracturing	$61,688
173664	Predictive Engineering Tools for Novel Fuels	$43,660
173665	Defect Characterization in Low Bandgap Materials	$75,026
173666	Process-Structure-Properties Relationship of Electrodeposited Au Thin Films Used in Thermoelectric Power Generation Device	$241,022
173667	Active Learning in the Era of Big Data	$45,689
173669	Advanced Imaging Algorithms for Radiation Imaging Systems	$47,071
173670	Engineering Bioelectronic Signal Transduction using the Bacterial Type III Secretion Apparatus	$47,317
173867	A Framework for Wind Turbine Design Under Uncertainty	$47,901
173868	Modeling of Non-local Electron Conduction for Inertial Confinement Fusion	$42,179
173869	Structural Changes of Self-Assembled Lead Sulfide, Polystyrene Thin Films Under Extreme Pressures Using in-situ High Pressure Small Angle X-ray Scattering	$46,612

173878	Reducing the Adverse Effects of Boundary-Layer Transition on High-Speed Flight Vehicles	$117,420
173881	Development of a Spatially Resolved Microwave Interferometer	$236,547
173882	Reducing Computation and Communication in Scientific Computing: Connecting Theory to Practice	$256,801
173883	Scaling up Semiconductor Quantum Computers through Multiscale Analysis	$256,950
174373	Ephemeral Connectivity and Locality for Large-Scale Emulitics	$249,003
176039	In Situ Immobilization of Selenium in Sediment	$46,829
176115	Advanced Deprocessing Techniques to Investigate White Light LVP and Other Imaging	$254,889
176117	Novel Materials and Devices for Solid-State Neutron Detection	$95,358
176307	Electric Field Control in Vertical and Lateral GaN-Based Power Transistors for Enhanced Breakdown Voltage	$608,063
176309	Effects of PSA Measurements on Device Reliability	$135,543
176311	Rocket Engine Test System for Development of Novel Propulsion Technologies	$37,772
176312	Understanding Photo-induced Oxidation Mechanisms of Volatile Organic Compounds	$53,000
176400	The Development of a Novel AlGaN Defect Detection, Localization, and Analysis Methodology	$139,203
176605	Tightly Coupled GPS/INS Flight Test Demonstration	$42,261
176606	Can Nanoporous-Carbon Host Materials Enable Multivalent Ion Electrochemical Energy Storage?	$49,997
176607	Graphene Oxide Desalination Membranes	$50,902
176729	Optimizing Enzymatic Depolymerization of Lignin: Surface Analysis of Chemical Effects is Key	$50,833
176752	Two-Fluid Hydrodynamic Printing for Electronic Components	$60,555
177858	Validating Host-Directed Therapeutics Targeting Wnt Signaling for Treatment of Emerging Infectious Disease	$56,101
177859	High-Density, Reactive Films with Nanometric 2-D Periodicity by Atomic Layer Deposition	$51,270
177860	Graded Index Materials for Advanced Optical Concepts	$52,464
177861	Exploring Charge Transport in Guest Molecule Infiltrated Cu3(BTC)2 Metal Organic Framework	$51,968
177962	Room Temperature Solid-State Deposition of Ceramics	$116,708
177963	Engineering Intrinsically Stable Nanocrystalline Alloys	$38,147
177964	Novel Cathode Materials for Large-Scale Electrical Energy Storage	$118,081
177965	Game Theory for Proactive Dynamic Defense and Attack Mitigation in Cyber-Physical Systems	$85,372
177966	Towards Global Persistent Surveillance	$233,948
177967	Cavity Electron Density Measurements within Pulsed Radiation Environments	$111,996

177968	Control of Surface State Transport in a Topological Insulator using Corbino p-n Junction	$52,936
178470	Modeling Information Multiplexing in the Hippocampus	$120,233
178661	Direct Observation of Electrothermal Instability Structures in the Skin Layer of an Intensely Ohmically Heated Conductor	$453,258
178667	Predicting the Multiscale, Mechanical Response of Additively Manufactured Materials across a Wide Spectrum of Loading Conditions	$504,014
178670	Decision Analytics for Complex Supply Chain Networks	$498,866
178675	Robust Operations and Algorithms for Quantum Information Systems	$514,000
178849	A Novel Application of Synthetic Biology and Directed Evolution to Engineer Phage-based Antibiotics	$27,650
178851	Multi-Resolution Image Fusion	$253,348
178917	Unconventional Approaches to Neutron Generators	$395,989
178921	Low-Cost Solar Simulator Development for High-Flux Materials Testing and Accelerated Aging Studies	$49,967
179224	Building the Scientific Basis for Cyber Resilience of Critical Infrastructure	$119,132
179753	Combining Interferometric Lithography with Membrane Projection Lithography	$50,261
179754	Integrated IO Services for Trilinos Data Structures	$47,920
179990	Microscopic Understanding of Fischer-Tropsch Synthesis on Ruthenium	$49,935
179991	Non-Resonant Nanoscale Extreme Light Confinement	$47,738
179992	Time Series Feature Engineering via Evolution	$52,222
180132	Numerical Continuation Methods for Intrusive Uncertainty Quantification Studies	$32,629
180134	Noise, Decoherence and Errors from Entanglement-function Theory for Quantum Computing	$44,007
180623	Magnetic Nitride Films for Superconducting Memory Devices	$46,417
180788	Electrochemical Solution Growth of Magnetic Nitrides	$50,435
Total # of Projects for SNL: 419		
Total Cost for SNL: $151,371,002		
Total Administrative Cost: $3,656,681		

SRNL - Savannah River National Lab		
LDRD-2012-00021	Characterization of chemical changes observed for uranium and plutonium particulate materials	$20,870
LDRD-2012-00030	15 MW Hardware-in-the-Loop Grid Simulation	$65,775
LDRD-2012-00038	Non-Aqueous Electrochemical Fluorination of Used Nuclear Fuel as an Advanced Separation Process	$1,132

LDRD-2012-00081	Sensor Development for In-situ Non-interrupted Chemical Speciation for Structural Health Monitoring and Functional Release Detection of Radionuclides	$15,273
LDRD-2013-00007	Conversion of TENORM-containing Gas Shale Well Drill Cuttings into High Performance Proppants Via Ionic Liquid Separation, Flame Spheroidization, and Devitrification Processing	$610
LDRD-2013-00012	Novel Materials for Actinide Separations	$10,669
LDRD-2013-00016	Long-term, In-situ Monitoring for Subsurface Contaminant Stability	$379,125
LDRD-2013-00018	Detection of fluoride and uranium exposure in terrestrial plants	$41,183
LDRD-2013-00029	Spectroscopic Techniques for the Characterization of Particulates from Proliferation Activities	$292,127
LDRD-2013-00040	A new technology in alpha-gamma and beta-gamma coincidence counting	$15
LDRD-2013-00052	Actinide/Lanthanide Separation with Magnetic Fields	$1,226
LDRD-2013-00053	Determining Distribution Coefficients by Surface Enhanced Raman Spectroscopy	$14,328
LDRD-2013-00065	Porous Rhenium Nano-Structures for TIMS Filament Enhancement	$1,156
LDRD-2013-00082	Spent Fuel Cask Fissile Material Assay by Collimated Gamma Neutron Sensing and Modeling	$19,617
LDRD-2013-00084	Fast Neutron Directional Detection Via Innovative Moderator Design	$276
LDRD-2013-00087	Solid Oxide Reduction of UNF	$1,642
LDRD-2013-00090	Ternary Carbide Clad Coatings, and High-Conductivity Fuel System, for Accident Tolerant Light Water Reactor Fuel	$312,555
LDRD-2013-00092	Structural Integrity of Dual-Purpose Canister for Used Nuclear Fuel Under Extended Storage and Transportation	$381,527
LDRD-2014-00001	Technetium Removal from Alkaline Liquid Waste	$153,004
LDRD-2014-00007	Laser-based methods for ultra-low level isotopic analysis of proliferant materials	$245,306
LDRD-2014-00009	Gas Adsorption Materials and Systems Development	$245,109
LDRD-2014-00011	Electro-Dynamic Particle Sorter	$371,046
LDRD-2014-00012	Stabilization of Radionuclides in Calcium Enriched Environmental Systems	$105,242
LDRD-2014-00014	Novel Ceramic Membranes for the Efficient Utilization of Natural Gas	$370,622
LDRD-2014-00020	Application of Radionuclide Signatures to Short Duration/Pulse Atmospheric Releases	$158,978
LDRD-2014-00028	Functionalized Magnetic Mesoporous Silica Nanoparticles for U and Tc Removal	$347,517
LDRD-2014-00029	Direct LiT Electrolysis in a Metallic Lithium Fusion Blanket	$321,192
LDRD-2014-00031	Field detector development for undeclared/declared nuclear testing for treaty verification monitoring	$203,697

LDRD-2014-00041	Detritition and Volume Reduction of Tritium Contaminated Water	$228,625
LDRD-2014-00073	Far Field Modeling Methods for Characterizing Surface Detonations	$300,415
LDRD-2014-00079	Next Generation Betavoltaic Cells – Increasing Power Density	$329,039
LDRD-2014-00096	Selective Electrochemical Extraction	$204,641
LDRD-2014-00097	Reinventing the Nuclear Waste Chemical Processing Flowsheet using Advanced Continuous Chemical Reactors and Separations	$164,146
LDRD-2014-00099	Smart Manufacturing: replacing analytical sample control with model predictive control	$208,803
LDRD-2014-00100	Low Temperature Waste Form Process Intensification	$122,045
LDRD-2014-00116	Reprocessing of Nuclear Fuels using Chromatographic Separations	$41,687
LDRD-2014-00119	Large Particle Titanate Sorbents	$127,591
LDRD-2014-00127	Electrodialysis for Intensification of Aqueous Polishing and Other Separations	$84,408
LDRD-2014-00140	Investigation of On-Line Monitoring Options at H Canyon/HB Line for Plutonium Oxide Production	$129,578
LDRD-2014-00141	Process Intensification to Improve Long-Term Monitoring of Contamination in Groundwater and Reduce Costs	$137,319
Total # of Projects for SRNL: 40		
Total Cost for SRNL: $6,159,116		
Total Administrative Cost: $200,284		

SRP - Savannah River Plant		
SR12022	Tritium Sensor Technology Development Roadmap and Tritium Instrument Demonstration Station	$354,143
SR12025	Alternative to Monthly Source Check for Facility Electrometers	$57,964
SR13001	Continuous Feed Plant Configured Mini-TCAP	$386,266
SR13007	Nuclear Magnetic Resonance (NMR) characterization of polymer and graphite degradation by tritium exposure	$9,738
SR13020	Tritium Secure Wireless Air Monitoring Cart	$9,726
SR13035	Initiate Tritium Aging Studies in LANA.85 Hydride	$26,937
SR13044	Study to Identify Magnesium Bed Elimination / Replacement Technology	$6,714
SR14008	Degradation Resistant Carbon Nanotube Reinforced Elastomer for Tritium Service	$71,792
SR14012	Development of a Zinc Active Lithium Trap	$100,695
SR14020	Evaluation of the FISH Bed	$189,143
SR14023	Glovebox Moisture De-Tritiation by Isotope Exchange	$99,312
SR14024	Graphene Permeation Barrier for the Reduction of Water & Oxygen Flux Through Glovebox Gloves	$95,336
SR14058	Safety Significant TEF Tritium Air Monitoring Design	$224,699
Total # of Projects for SRP: 13		

	Total Cost for SRP: $1,632,465	
	Total Administrative Cost: $34,211	

TJNAF - Thomas Jefferson National Accelerator Facility

2014-LDRD-07	Physics Potential of Polarized Light Ions with EIC @ JLab	$146,835
2014-LDRD-12	Development of a Prototype for a Fast RF Kicker for the MEIC Electron Cooler	$9,545
2014-LDRD-15	Wireless, Hand-Held Data Acquisition System for Imaging Detector	$61,724
	Total # of Projects for TJNAF : 3	
	Total Cost for TJNAF : $218,104	
	Administrative Cost Paid by Laboratory Overhead	

Y-12 - Y-12 Plant

PD110881	UO2 Fuel Processing Parameters	$170,877
PD121330	Induction Brazing Application	$83,089
PD121346	High Accuracy/Precision 235U Enrichment Verification Station for LEU Alloys	$304,689
PD121365	Improvement of Plant Metal Quality	$82,371
PD121369	Enriched Uranium Concentration Measurements	$161,632
PD121376	Continued Development and Fielding of Ultra-Wide Band Technologies at Y-12	$151,521
PD121389	Multi-Material Experimental Corrosion Study	$214,099
PD121392	Chip Cleaning Optimization Studies	$12,573
PD121393	Direct Material Manufacturing Process Improvement Studies	$354,178
PD121394	Radiological NMR Studies	$210,341
PD121404	Special Material Purification Parameter Study	$400,996
PD121405	New Explosives Sensors Based on Magnetic Wires and Molecular Recognition Phases	$355,714
PD121408	Special Material Characterization and Recovery	$226,075
PD121409	Thermal Decomposition & Distillation	$157,620
PD121412	Low Concentration Uranium Measurements in the Presence of Radioactive Impurities	$227,719
PD121427	Metallographic Process Development	$399,522
PD121435	Neutron Scattering Studies of Aging Effects in Y-12 Materials	$263,311
PD121436	Density Evaluation by Gas Pycnometry	$56,577
PD121492	Advanced Modeling and Simulation for System Optimization	$126,145
PD130001	Direct Recycle of Machine Dust	$248,624
PD130002	Zone Refinement of LiH	$422,023
PD130003	Small Scale Lithium Electrolytic Cell	$85,776
PD130007	Calcination of impure UNH using rotary calciner	$571,835
PD130008	Separation Technology Improvements	$135,730
PD130020	UV Raman Spectroscopy Studies	$328,560
PD130021	Determination of hydriding in uranium	$273,517

PD130022	Obsolete Software Replacement	$116,692
PD130023	Salt Conditioning System	$177,775
PD130024	Pulse Calibration Method for Mass Spectrometry	$240,277
PD130025	Advanced Modeling of Y-12's Microwave Operations	$223,486
PD130030	Mechanical Testing and Property Comparison of Non-Metal Pieces	$30,531
PD130031	Laser Processing Improvements	$161,662
PD130033	Improved Depleted Uranium Welding	$33,200
PD130034	Robust MW Insulation	$839,201
PD130040	Recovery Solution Sampler	$293,695
PD130041	Dual YZ Controller Validation	$136,485
PD130042	CMM controller equipment	$863,448
PD130050	Film Replacement MeV Digital Radiography	$193,808
PD130060	Profilometry for U-Mo Production Quality Assurance	$55,417
PD130061	Gesture-Based Computing	$35,287
PD141010	Direct Electrolytic Reduction and Electrorefining of Uranium	$4,785,366
PD141020	Distallition / Consolidation of ER Product	$93,136
PD141030	Uranium Trichloride Synthesis and ER Consolidation	$136,106
PD141040	Small Scale Lithium Compound Drying	$1,070,293
PD141050	Science Based Disassembly for Material Recovery and Reuse	$90,441
PD141070	Determination of Physical Properties I	$216,593
PD141080	SMP Demonstration	$136,526
PD141090	Red Oil Reactions	$146,238
PD141100	Aspen Area Humidity Control	$47,644
PD142010	NDE Weld Defect Analysis	$192,354
PD142020	Complex surface characterization techniques	$315,533
PD142030	Corrosion studies of LiH	$182,500
PD142040	Advanced Modeling of Y-12's Electrolysis Operations (DER-ER)	$195,230
PD142050	Helium Leak Detector Upgrade	$295,426
PD143010	Atomization to Produce Uranium Alloy Powders	$3,284,362
PD143020	Robust Rapid Heating MW Crucible Development	$52,298
PD143030	Investigation of Source of Hardened layer in Microwave Castings	$367
PD143040	Pressure Generators	$62,631
PD143050	FY14 Enhanced Alloy Processing in MW castings	$182,532
PD144010	Automated Location Tracking of Accountable Items	$169,322
PD144020	Post Inspection of Casting Pours Using Thermographic Imaging Technology	$156,861
PD144030	Bi-directional Part Program Editing	$158,059
PD144040	Classified Wireless Prototype Implementation for UPF Machining	$193,131
PD144050	Microwave Casting Temperature Measurement	$188,400
PD145010	Superresolution Imaging for Improved Spatial Resolution of Digital Panels	$71,797
PD146010	Nano-Pillar Arrays for Optical Detection of Actinides	$66,271
PD147010	Automatic MTP Part Programing	$279,967

PD147020	Develop CMM process utilizing efficient one setup methods	$21,204
PD147030	Topology Optimization and Structural Design for Additive Manufacturing	$121,163
PD147040	Interim Machining Capabilities	$312,887
PD148010	Rapid Response PDRD	$147,705
PD148020	Semiconductor-based neutron detection technologies	$323,619
Total # of Projects for Y-12: 72		
Total Cost for Y-12: $23,122,040		
Total Administrative Cost: $1,264,762		