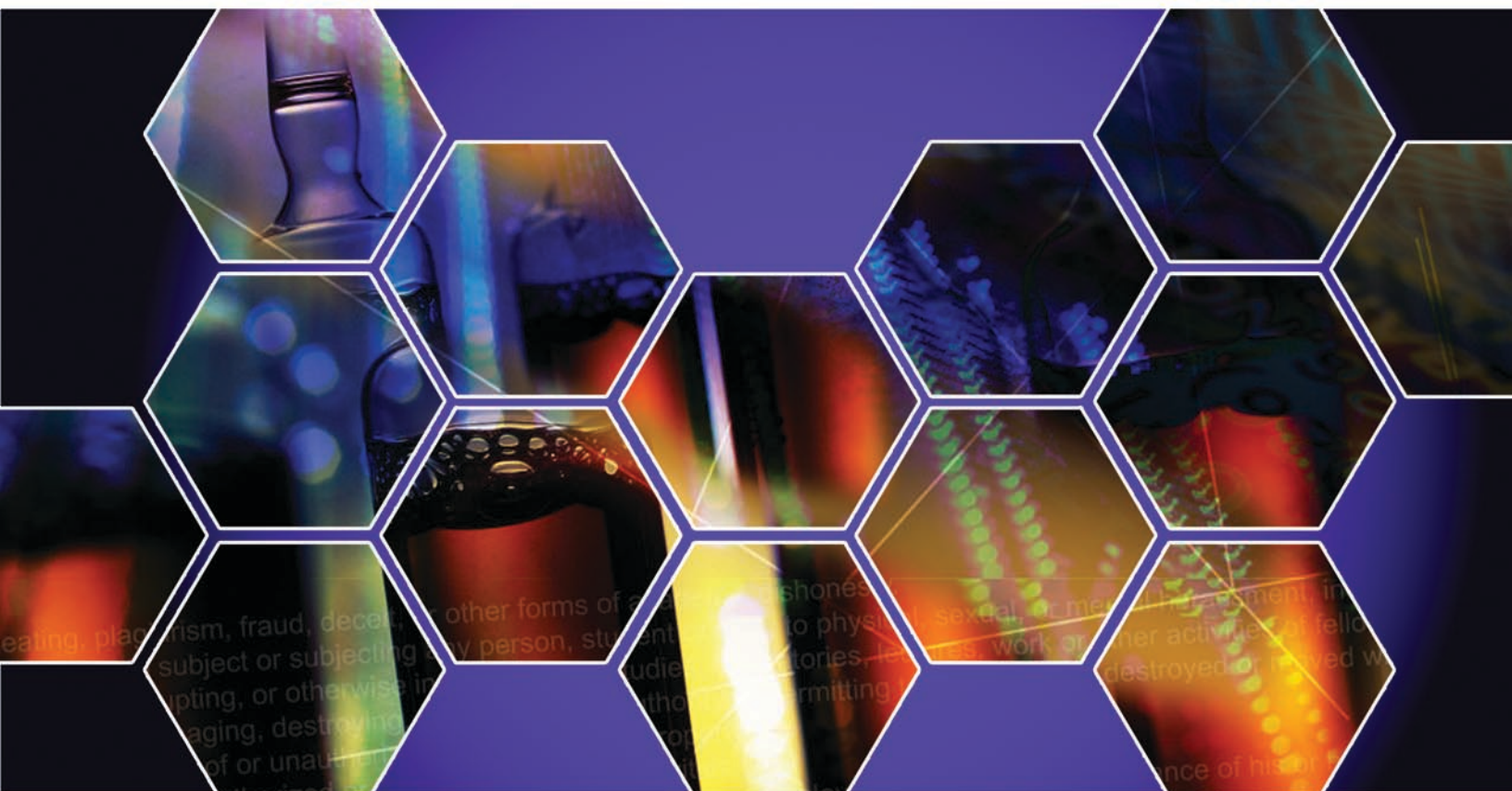


SERCh Competition

Program Book



Science and Energy Research Challenge

November 14-15, 2010

Argonne National Laboratory



U.S. DEPARTMENT OF
ENERGY

Science and Energy Research Challenge (SERCh)

The third annual Science and Energy Research Challenge (SERCh), sponsored by the Department of Energy's (DOE) Office of Science, will take place November 14-15, 2010, at Argonne National Laboratory. Ninety-six students have been selected to participate in this prestigious and highly competitive National poster competition.

Any undergraduate student that completed a research internship at one of the Department's national laboratories or was part of a research project funded by the DOE during fiscal year 2010 was eligible to apply for SERCh. Students were required to submit a poster as part of their application. A review committee selected the students that are participating in the event in November.

At the competition, each competitor will be judged twice in one of five categories listed below. The top three posters in each category will receive scholarships: \$3,000 for 1st place, \$1,500 for 2nd place, and \$1,000 for 3rd place. One grand prize finisher will receive a total of \$10,000 (\$3,000 for 1st place plus \$7,000).

While the poster competition is the focus of SERCh, participants will also hear from prominent scientists, attend seminars/workshops, and meet other like-minded students and faculty for invaluable networking.

Science and Energy Research Challenge poster categories:

- Engineering and Computational Science
- Energy
- Environmental Science
- Life Sciences
- Physical Sciences (includes physics, chemistry, and nanoscience)



Department of Energy

Washington, DC 20585

November 14, 2010

Welcome to the third annual U.S. Department of Energy (DOE) Science and Energy Research Challenge (SERCh). The research that you and other student researchers are presenting reflects the wide range of basic and applied science supported by DOE and also reflects your commitment to pursuing research that is high in quality and reflects some of the most important national challenges we are confronting in energy, the environment and national security.

As you network with your fellow presenters and other scientists, you will meet researchers in the fields of high energy physics, genomics, nanoscience and many other areas of modern science. During 2010, nearly 700 undergraduates were awarded research internships at the DOE's 17 national laboratories, in addition to the grants awarded to university faculty who employed student researchers. Your presence here highlights the achievement of all of those participants. In many ways, you are at the forefront of our Department's and Nation's scientific and technical work force for the future.

I join with your professors, your mentors, Argonne National Laboratory, Oak Ridge Associated Universities, the Office of Science, and all of the Department of Energy in expressing my pride in the achievements you are demonstrating at this gathering. I congratulate you on your dedication to science and this recognition of your current accomplishments.

Best wishes for the future,

A handwritten signature in black ink, appearing to read "W. Valdez".

William J. Valdez, Director
Office of Workforce Development for
Teachers and Scientists
Office of Science

Participating Students

<i>Adam Arthurs</i>	<i>Emily Sprague</i>	<i>Lin Fan</i>
<i>Alex Chen</i>	<i>Emir Rubi</i>	<i>Lindsey Klinge</i>
<i>Alexander Rothman</i>	<i>Emma Rudie</i>	<i>Luis Martinez</i>
<i>Allison Mitchell</i>	<i>Erik Archibald</i>	<i>Marc Knezevic</i>
<i>Amanda Parra</i>	<i>Evan Staley</i>	<i>Margaret Scheiner</i>
<i>Amy Bumbaco</i>	<i>Faith Whitehouse</i>	<i>Mary Elizabeth Parker</i>
<i>Amy E. Zellman</i>	<i>Fernando Fuentes</i>	<i>Matthew Caplan</i>
<i>Andrew McMahon</i>	<i>Forrest Iandola</i>	<i>Matthew Irwin</i>
<i>Andrew Runciman</i>	<i>Frank Li</i>	<i>Melissa Christine Franch</i>
<i>Angela Fioretti</i>	<i>Giang Nguyen</i>	<i>Meral K. El Ramahi</i>
<i>Ann Greenaway</i>	<i>Giovanni Merilis</i>	<i>Michael Christiansen</i>
<i>Benjamin Knox</i>	<i>Han Wang</i>	<i>Michael Driscoll</i>
<i>Benjamin Ray</i>	<i>Heather Henderson</i>	<i>Miles Price</i>
<i>Benjamin Shassere</i>	<i>Hefei Li</i>	<i>Natasha Robateu</i>
<i>Braedn Gilchrist</i>	<i>Ivy Fortmeyer</i>	<i>Nathaniel Sanchez</i>
<i>Brandon Callis</i>	<i>James L Young</i>	<i>Neil Goeckner-Wald</i>
<i>Brett Rolf</i>	<i>Janey Duong</i>	<i>Nicholas Lubinsky</i>
<i>Brittany Hubmann</i>	<i>Jason Grider</i>	<i>Nik Goodell</i>
<i>Brooke Faulkner</i>	<i>Jeffrey Kodysb</i>	<i>Patrick Lutz</i>
<i>Cailie Carlile</i>	<i>Jennifer Ausland</i>	<i>Patrick McBride</i>
<i>Calina Copos</i>	<i>Jennifer Beveridge</i>	<i>Pavel Brodskiy</i>
<i>Carlos Rosales</i>	<i>Jennifer Robles-Chancellor</i>	<i>Richard McIsaac, Jr.</i>
<i>Caryn Burnett</i>	<i>Jesse Bikman</i>	<i>Robit Arora</i>
<i>Catherine Schweppe</i>	<i>Jessica Klein</i>	<i>Ronald Wilcox</i>
<i>Chad Marshall</i>	<i>John Cook</i>	<i>Sean Burgess</i>
<i>Colin Bailie</i>	<i>Joseph Silo</i>	<i>Sindhu Thevuthasan</i>
<i>Colin Jarvis</i>	<i>Juliette Logan</i>	<i>Ting Zheng</i>
<i>Dana Sulas</i>	<i>Katherine Bryant</i>	<i>Travis Sarver</i>
<i>Daniel Jacobson</i>	<i>Katherine Rose Heal</i>	<i>Travis Toth</i>
<i>Dominique Townsend</i>	<i>Keisha Theresa Watt</i>	<i>Victoria J. Richards</i>
<i>Ehren Mannebach</i>	<i>Kerry Wang</i>	
<i>Ellen Briggs</i>	<i>Kristen Fauria</i>	

Erik Archibald

University: Brigham Young University
Major: Engineering - Civil
Research Institution: Lawrence Livermore National Laboratory
Research Topic: *Nuclear Fallout Protection for First Responders*
Hometown: Provo, UT

Rohit Arora

University: California State University, East Bay
Major: Biological Sciences - Biological Biochemistry
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Ionic Liquid Pretreatment for Enhanced Sugar Yields of Forage Sorghum Lines with Reduced Lignin Content*
Hometown: Berkeley, CA



Adam Arthurs

University: Harvard University
Major: Applied Math for Physics
Research Institution: Princeton Plasma Physics Laboratory
Research Topic: *Measurement of the Emissivity of Liquid Gallium Alloy for Temperature Measurements of Free-Surface Flows*
Hometown: Westport, CT
Hobbies/Interests: Baseball, Basketball, Football, Classical Piano

Jennifer Ausland

University: Del Mar College
Major: Biological Sciences - Cell Biology
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Green Gasoline: Fatty Acid Production Through Expression of a Thioesterase*
Hometown: Corpus Christi, TX

Colin Bailie

University: Texas A&M University
Major: Engineering - Mechanical
Research Institution: Texas A&M University
Research Topic: *Decay of Perturbations on a Shockwave Induced by Richtmyer-Meshkov Instability*
Hometown: Plano, TX



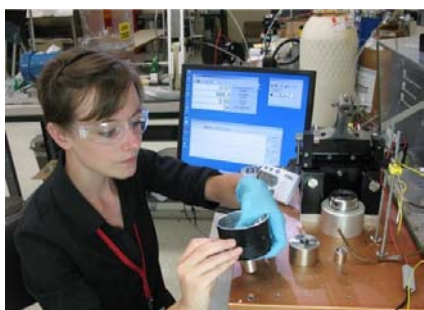
Jennifer Beveridge

University: Indiana University of Pennsylvania
Major: Chemistry
Research Institution: Thomas Jefferson National Accelerator Facility
Research Topic: *Effect of Temperature on Niobium Surface Morphology During Buffered Electropolishing*
Professional Societies/Associations: American Chemical Society, American Physical Society, Alpha Chi Sigma
Hometown: Harrisburg, PA
Hobbies/Interests: Swing Dancing, Playing Piano and Violin, Reading



Jesse Bikman

University: University of North Carolina at Charlotte
Major: Mathematics
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Effects of Meteorological Forcing Conditions on Estuarine Processes as a Result of Climate Change – a Sensitivity Analysis in Hood Canal of Puget Sound*
Professional Societies/Associations: Marine Technology Society, Charlotte Area Robotics, Producing Readiness of Diverse University Cohorts in Education (PRODUCE)
Hometown: Milwaukie, OR/Asheville, NC
Hobbies/Interests: Boating, Eating, Gardening, Mountain Biking, Photography, Swimming, Traveling



Ellen Briggs

University: University of Illinois at Urbana-Champaign
Major: Chemistry
Research Institution: Argonne National Laboratory
Research Topic: *Investigation of Tribological Performance and Tribochemical Interaction of Colloidal Lubricants*
Hometown: Carol Stream, IL
Hobbies/Interests: When I'm not studying, I like to read, make bread, and play the cello.



Pavel Brodskiy

University: Iowa State University of Science and Technology
Major: Chemical Engineering and Biology
Research Institution: Iowa State University of Science and Technology
Research Topic: *Immunohistochemical Analysis of a Zebrafish Model for Retinoblastoma*
Professional Societies/Associations: Society for Neuroscience
Hometown: Clive, IA



Katherine Bryant

University: University of Colorado, Boulder
Major: Chemistry
Research Institution: National Renewable Energy Laboratory
Research Topic: *Protective Oxide Coatings on GaInP₂ Photoelectrochemical Water-Splitting Electrodes*
Hometown: Fort Morgan, CO
Hobbies/Interests: Traveling, Learning New Languages, Marching Band, Choir, Music, Reading, Hiking, Cross-Country Skiing, Camping, Trail Work, Chemistry, Math, Flowers, Being Outside



Amy Bumbaco

University: Virginia Polytechnic Institute and State University
Major: Materials Science and Engineering
Research Institution: Brookhaven National Laboratory
Research Topic: *Characterization of Photoresists for Electron Beam Lithography for Nanofabrication in the Center for Functional Nanomaterials*
Professional Societies/Associations: Materials Engineering Professional Societies
Hometown: Virginia Beach, VA
Hobbies/Interests: I love to explore materials science and learn more about polymers and nanomaterials. I hope to go into thin film nanotechnology after I receive my undergraduate degree (whether I go to graduate school or get a full time position).



Sean Burgess

University: Stony Brook University
Major: Chemical Engineering
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Triazole as an Alternative to Water in Fuel Cell Membranes*
Professional Societies/Associations: American Institute of Chemical Engineers Society of Hispanic Professional Engineers
Hometown: Santa Maria, CA
Hobbies/Interests: As one might expect, I like to conduct research. Being on the scientific forefront is quite exciting to me. I also enjoy playing guitar, dancing and learning Spanish.

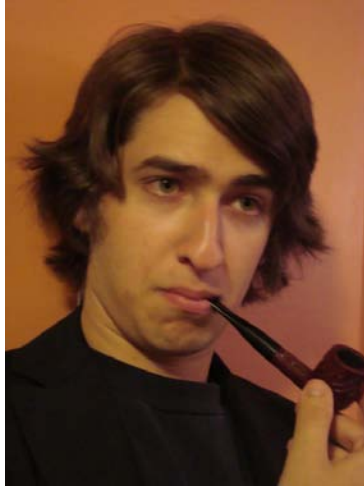
Caryn Burnett

University: University of Colorado
Major: Physics
Research Institution: National Renewable Energy Laboratory
Research Topic: *Catalytic Upgrading of Pyrolysis Vapors*
Hometown: Littleton, CO
Hobbies/Interests: I like to bake and go backpacking. I am also learning how to snowboard.



Brandon Callis

University: Prairie View A&M University
Major: Chemistry
Research Institution: Ames Laboratory
Research Topic: *Hybrid Mo-, Pd-, Pt-, and Au-CdS_{1-x}Sex Metal-Semiconductor Heterostructures: Active Photocatalysts for the Photobleaching of Methylene Blue and Rhodamine 590*
Professional Societies/Associations: Chemistry Club, Math Club, Spanish Club
Hometown: Waller, TX



Matthew Caplan

University: University of Virginia
Major: Physics
Research Institution: Thomas Jefferson National Accelerator Facility
Research Topic: *Comparing Two Methods of Wire Tension Monitoring for CLAS12 Drift Chambers*
Hometown: Newport News, VA
Hobbies/Interests: Guitars, Video Games, Motorcycles

Cailie Carlile

University: Missouri University of Science and Technology
Major: Environmental Engineering
Research Institution: Brookhaven National Laboratory
Research Topic: *Endophytic Bacteria in Nicotiana xanthi Daughter Plants for Increased Biomass Productivity*
Professional Societies/Associations: Tau Beta Pi, Kappa Mu Epsilon, Chi Epsilon, Phi Kappa Phi, USPA
Hometown: Sedalia, MO
Hobbies/Interests: Hula Hooping, Skydiving

Alex Chen

University: UC Davis
Major: Engineering - Mechanical
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Characterizing Lithium Salt in Polyethylene Oxide*
Hometown: Hercules, CA



Michael Christiansen

University: Arizona State University
Major: Physics
Research Institution: National Renewable Energy Laboratory
Research Topic: *Measuring Thermal Properties of Heat Transfer Material for Concentrating Solar Power*
Professional Societies/Associations: Arizona State University's Society of Physics Students
Hometown: Lakewood, CO
Hobbies/Interests: Although my professional interests center primarily on physics and materials research, I also dabble in mammalian paleontology with the Denver Museum of Nature and Science, studying fauna from the Eocene of central Wyoming.



John Cook

University: University of California at Berkeley
Major: Chemistry
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Hydrothermal Synthesis of Lithium Manganese Oxide for Li-ion vehicle Batteries*
Professional Societies/Associations: ACS
Hometown: Los Angeles, CA
Hobbies/Interests: I enjoy surfing.

Calina Copos

University: University of Richmond
Major: Physics, Mathematics
Research Institution: Argonne National Laboratory
Research Topic: *Electron Capture Delayed Fission of ^{180}Tl*
Professional Societies/Associations: APS, AMS, ODK, PTSA
Hometown: Richmond, VA

Michael Driscoll

University: UC Berkeley
Major: Computer Sciences
Research Institution: Lawrence Livermore National Laboratory
Research Topic: *Interprocedural Control Flow Analysis in the ROSE Compiler*
Hometown: Berkeley, CA

Janey Duong

University: New York University
Major: Mathematics/Statistics
Research Institution: Oak Ridge National Laboratory
Research Topic: *ARONE: Adaptive Real-time Optimization for Neutron Scattering Experiments*
Hometown: Astoria, NY

Lin Fan

University: Georgia Institute of Technology
Major: Engineering - Mechanical
Research Institution: National Renewable Energy Laboratory
Research Topic: *Analysis and Modeling of Wind Turbine Wakes at a Large Onshore Wind Farm*
Hometown: Atlanta, GA

Brooke Faulkner

University: Simpson College
Major: Physics
Research Institution: National Renewable Energy Laboratory
Research Topic: *Optimizing Carbon Nanotubes for Transparent Electrodes*
Professional Societies/Associations: Society of Physics Students
Hometown: West Des Moines, IA
Hobbies/Interests: Physics Club, Fishing, Water Skiing, Playing Piano and Viola, Renewable Energy, Physics, and Engineering

Kristen Fauria

University: University of Oregon
Major: Physical Sciences - Geological Sciences
Research Institution: National Renewable Energy Laboratory
Research Topic: *Measurement Accuracy of In-Use Speed Profiles for Vehicle Fuel Use Modeling*
Hometown: Eugene, OR

Angela Fioretti

University: Western State College of Colorado
Major: Physical Sciences - Chemistry
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Novel Approach to Lithium Battery Failure Analysis*
Hometown: Gunnison, CO



Ivy Fortmeyer

University: Columbia University
Major: Chemistry
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Examination Of Catalytic Properties of Oxovanadium Complexes Deposited on a Surface*
Professional Societies/Associations: American Chemical Society
Hometown: Whites Creek, TN
Hobbies/Interests: My academic interests include inorganic and materials chemistry, as well as the German language. I am a member of the Columbia University cheerleading team, and also enjoy activities such as exploring new places, baking, and doing gymnastics.



Fernando Fuentes

University: Polytechnic University of Puerto Rico
Major: Computer Engineering
Research Institution: Oak Ridge National Laboratory
Research Topic: *Nuclear Density Functional Theory Parameters Correlations*
Professional Societies/Associations: IEEE, SHPE, IACSIT
Hometown: Humacao, PR
Hobbies/Interests: Research, Computational Sciences, Traveling



Melissa Christine Franch

University: North Carolina State University
Major: Science Education, Biological Sciences
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Mitigation of Radiation Injuries via a Proprietary Compound. The focus of the study was to determine the efficacy of a proprietary compound to restore hematopoietic stem cells and increase their survival.*

Professional Societies/Associations: NSTA (National Science Teachers Association), NCSU College of Education Student Ambassador, Burroughs-Wellcome Scholar

Hometown: Willow Springs, NC
Hobbies/Interests: I enjoy teaching, reading, running, traveling, hiking, and biking.



Braedn Gilchrist

University: University of Toledo
Major: Mechanical Engineering
Research Institution: National Renewable Energy Laboratory
Research Topic: *Molecular Dynamics Modeling of Phonon/Thermal Transport in Aluminum*

Professional Societies/Associations: Theta Tau Professional Engineering Fraternity

Hometown: Cleveland, OH
Hobbies/Interests: Cooking, Hiking, Ultimate Frisbee, Reading

Neil Goeckner-Wald

University: Carnegie Mellon University
Major: Engineering - Electrical
Research Institution: Thomas Jefferson National Accelerator Facility (JLab)
Research Topic: *Detector Electronics for APEX Dark Matter Experiment*
Hometown: Plano, TX

Nik Goodell

University: California Polytechnic State University
Major: Engineering - Mechanical
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Energy Information System Implementation in Commercial Buildings*
Hometown: Concord, CA

Ann Greenaway

University: Hendrix College
Major: Physical Sciences - Chemistry
Research Institution: National Renewable Energy Laboratory
Research Topic: *GaInP2 Electrode Protection by Transparent Carbon Nanotube-based Coatings*
Hometown: Conway, AR

Jason Grider

University: Rice University
Major: Engineering - Chemical
Research Institution: Los Alamos National Laboratory
Research Topic: *Grider poster 8 26 2010.ppt*
Hometown: Houston, TX



Katherine Rose Heal

University: Colorado College
Major: Environmental Chemistry
Research Institution: Oak Ridge National Laboratory
Research Topic: *Influence of Geochemical and Physical Properties of Subsurface Soils on the Sorption of Dissolved Organic Carbon*
Professional Societies/Associations: ASLO
Hometown: Chaska, MN
Hobbies/Interests: Making Pottery, Eating Well, Seeing Places

Heather Henderson

University: Volunteer State College
Major: Biological Sciences - Biology
Research Institution: Oak Ridge National Laboratory
Research Topic: *Soil Moisture Drives Soil CO₂ Efflux in a Loblolly Pine Stand*
Hometown: Hendersonville, TN

Brittany Huhmann

University: Washington University
Major: Earth and Planetary Sciences
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Microbial Characterization of Hanford Site Sediments*
Hometown: Jefferson City, MO
Hobbies/Interests: Environmental Activism, Organic/Local Agriculture, Crochet



Forrest Iandola

University: University of Illinois at Urbana-Champaign
Major: Computer Science
Research Institution: Lawrence Livermore National Laboratory
Research Topic: *PyMercury: Interactive Python for the Mercury Particle Transport Code*
Professional Societies/Associations: Association for Computing Machinery, The IEEE Computer Society, Society for Industrial and Applied Mathematics, SIAM Activity Group on Supercomputing
Hometown: Pearl City, IL
Hobbies/Interests: Forrest's research focuses on computationally modeling physical science problems that involve molecular dynamics, atomic particle transport, and weather and studying the underlying programming paradigms for optimizing



Matthew Irwin

University: Vanderbilt University
Major: Chemical Engineering
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Investigating the Electrochromic Properties of Niobium Oxide Films*
Professional Societies/Associations: American Institute of Chemical Engineers and Tau Beta Pi
Hometown: Knoxville, TN
Hobbies/Interests: I am interested in a wide variety of music from classical to more modern music and regularly attend concerts. After I graduate, I intend to pursue a PhD in Chemical Engineering.

Daniel Jacobson

University: Harvard College
Major: Chemistry and Physics
Research Institution: Brookhaven National Laboratory
Research Topic: *Self-Assembly of Block Copolymer/Nanocrystal Composite Thin Films*
Hometown: Providence, RI



Colin Jarvis

University: Macalester College
Major: Math and Physics
Research Institution: Thomas Jefferson National Accelerator Facility
Research Topic: *Betatron Tunes in the Proposed Medium-Energy Electron-Ion Collider at Jefferson Lab*
Hometown: Madison, WI
Hobbies/Interests: I play varsity basketball, work with kids in an after-school program, and I enjoy all sorts of outdoor activities. I also take bagpipe lessons.



Jessica Klein

University: University of Washington
Major: Microbiology
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Biocompatibility Assesment of Titanium Dioxide Nanparticles and Multi-Walled Carbon Nanotubes in Type II Alveolar Epithelial Cells*
Hometown: Richland, WA
Hobbies/Interests: Aside from microscopy, I enjoy hiking with my dogs, painting, and photography. My academic interests include microbial physiology and nanopharmacology.



Lindsey Klinge

University: State Univeristy of New York at Purchase College
Major: Chemistry, Math
Research Institution: Brookhaven National Laboratory
Research Topic: *The Effects of Ambient Processing Conditions on the Exciton Lifetime of Poly 3-Hexylthiophene Using Femtosecond Upconversion Fluorescence Spectroscopy*
Professional Societies/Associations: AAAS, ACS, APS, CSTEP, Sigma Xi, Phi Theta Kappa
Hometown: Purchase, NY
Hobbies/Interests: Long Distance Running, Backpacking, Spectroscopy



Marc Knezevic

University: Barry University
Major: Biology, minor in Chemistry
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *In-situ Modification Of Silica Monoliths via Photografting*
Professional Societies/Associations: American Medical Students Association
Hometown: Miami, FL
Hobbies/Interests: Swimming, Working Out, Reading

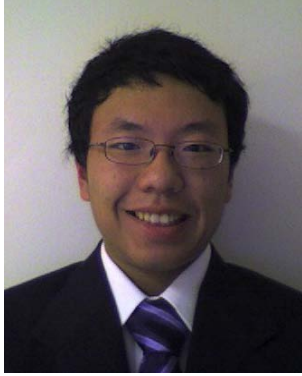
Benjamin Knox

University: Eastern Washington University
Major: Biological Sciences - Microbiology
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Aspergillus terreus is a source of novel organic compounds*
Hometown: West Richland, WA



Jeffrey Kodysh

University: University of Toledo
Major: Geography
Research Institution: Oak Ridge National Laboratory
Research Topic: *A GIS-Based Methodology for Assessing Rooftop Solar Energy Potential*
Professional Societies/Associations: Association of American Geographers
American Geophysical Union
Hometown: Toledo, OH
Hobbies/Interests: Geography and Geospatial Data Analysis, Scientific Advancement Pertaining To American Industry and Commerce, The Great Outdoors - Hiking, Hunting, Fishing, Camping, Travel - Domestic and International



Frank Li

University: Massachusetts Institute of Technology
Major: Computer Science
Research Institution: Los Alamos National Laboratory
Research Topic: *Computational Modeling and Sensitivities in Uniform DT Burn*
Professional Societies/Associations: ACM, IEEE
Hometown: North Oaks, MN
Hobbies/Interests: Programming, Mathematics, Football, Basketball

Hefei Li

University: Columbia University
Major: Mathematics/Statistics
Research Institution: Brookhaven National Laboratory
Research Topic: *Computational Modeling and Sensitivities in Uniform DT Burn*
Hometown: New York, NY



Juliette Logan

University: Duke University/University of Illinois at Urbana-Champaign
Major: Biomedical Engineering
Research Institution: Brookhaven National Laboratory
Research Topic: *Regional Atrophy and Neuroinflammation Following Brain Irradiation in Mice*
Professional Societies/Associations: Biomedical Engineering Society, Society of Women Engineers, Foundation for the International Medical Relief of Children
Hometown: Naperville, IL
Hobbies/Interests: Badminton, Listening To Music, Dancing

Nicholas Lubinsky

University: Rensselaer Polytechnic Institute
Major: Physical Sciences - Physics
Research Institution: Thomas Jefferson National Accelerator Facility (JLab)
Research Topic: *Designing a Tritium Target for the MARATHON Experiment*
Hometown: Granby, CT

Patrick Lutz

University: Syracuse University
Major: Physical Sciences - Chemistry
Research Institution: Brookhaven National Laboratory
Research Topic: *Assembly of Silver DNA Nano-structures*
Hometown: Syracuse, NY



Ehren Mannebach

University: University of Wisconsin-Madison
Major: Materials Science and Engineering
Research Institution: Oak Ridge National Laboratory
Research Topic: *Oxide Heterostructures for Generating Electricity from Sunlight*
Professional Societies/Associations: Wisconsin Alpha Chapter of Tau Beta Pi
Hometown: Fond du Lac, WI
Hobbies/Interests: Downhill Ski Racing, Reading

Chad Marshall

University: University of Memphis
Major: Electronic Engineering Technology and Recording Technology
Research Institution: Oak Ridge National Laboratory
Research Topic: *Modeling Smart Cruise Control: Vehicle to Vehicle and Vehicle to Traffic Light*
Professional Societies/Associations: Audio Engineering Society (AES)
Hometown: Memphis, TN
Hobbies/Interests: Playing Guitar, Writing Songs, Frisbee Golf, Geo-Caching

Luis Martinez

University: University of Puerto Rico
Major: Engineering - Mechanical
Research Institution: National Renewable Energy Laboratory
Research Topic: *Wind Turbine Modeling for Computational Fluid Dynamics*
Hometown: Cupey, PR



Patrick McBride

University: California Polytechnic State University
Major: Materials Engineering
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Temperature Sensing with Red Fluorescent Semiconducting Nanocrystals*
Professional Societies/Associations: National Society of Collegiate Scholars
Hometown: Davis, CA
Hobbies/Interests: Dancing, Quantum Mechanics, Soccer, Hanging Out With Friends



Andrew McMahon

University: Manhattan College
Major: Electrical Engineering
Research Institution: Brookhaven National Laboratory
Research Topic: *Analyzing Patterns of Temperature Inversions at Brookhaven National Laboratory to Improve Emergency Management Data*

Professional Societies/Associations: Institute of Electrical and Electronics Engineers (IEEE)
Hometown: Miller Place, NY
Hobbies/Interests: I enjoy playing the piano and guitar, working on little engineering projects and relaxing at the beach.



Giorvanni Merilis

University: Florida State University
Major: Environmental Studies
Research Institution: University of Iowa
Research Topic: *Synthesis of Mesoporous Nanocrystalline Zeolite Beta*

Hometown: Miami, FL
Hobbies/Interests: I love the game of basketball as a stress reliever. I also enjoy watching nature and its processes.



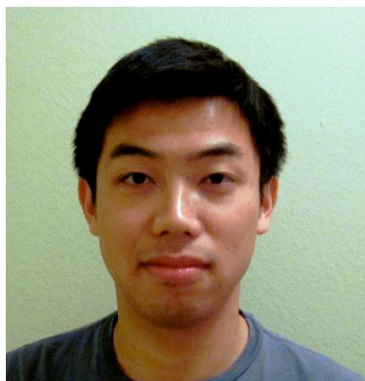
Richard McIsaac, Jr.

University: Idaho State University
Major: Secondary Education - Biology
Research Institution: Idaho National Laboratory
Institution:
Research Topic: *My research was focused on developing "best practice" for storing filtered groundwater samples prior to performing microbial DNA extractions. Development of best practice was important to other research I was involved in*
Hometown: Idaho Falls, ID
Hobbies/Interests: I enjoy developing educational materials in math and biology for students in middle school and high school. I also enjoy reading, biking, and philosophy.



Allison Mitchell

University: Juniata College
Major: Physics
Research Institution: Thomas Jefferson National Accelerator Facility
Research Topic: *Using a CO₂ Laser to Heat a Gallium Arsenide Wafer*
Professional Societies/Associations: Society of Physics Students
Hometown: Reedsville, PA



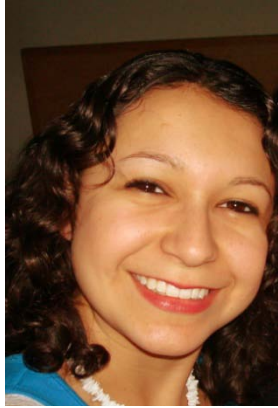
Giang Nguyen

University: Louisiana State University
Major: Chemical Engineering
Research Institution: National Renewable Energy Laboratory
Research Topic: *Supported Molybdenum Sulfide Based Catalysts for the Thermochemical Conversion of Synthesis Gas*
Professional Societies/Associations: American Institute of Chemical Engineers, Tau Beta Pi
Hometown: Lafayette, LA
Hobbies/Interests: Bicycling, Gadgets, Foreign Cuisine, Occasional Gaming, Science Fiction



Mary Elizabeth Parker

University: University of Tennessee
Major: Materials Science and Engineering
Research Institution: Oak Ridge National Laboratory
Research Topic: *Single Crystal Growth of Maus' Salt $[K_5Fe_3(SO_4)_6(OH)_2 \cdot nH_2O]$ by Counter Diffusion*
Professional Societies/Associations: Tau Beta Pi Engineering Society; activities with Materials Advantage Student Program: ACerS, AIST, ASM International, and TMS.
Hometown: Greeneville, TN
Hobbies/Interests: I enjoy music, oil painting, spending time outdoors, traveling, and new experiences.



Amanda Parra

University: University of Texas at El Paso
Major: Chemistry
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Measurement of Uptake and Ozone Effects in Volatile Organic Compounds Using Passive Samplers*
Professional Societies/Associations: Research Initiative for Scientific Enhancement (RISE)
Hometown: El Paso, TX
Hobbies/Interests: My interests include nature, hiking, reading and traveling. I also enjoy listening to music and spending time with friends and family.

Miles Price

University: Rensselaer Polytechnic Institute
Major: Physics
Research Institution: Thomas Jefferson National Accelerator Facility
Research Topic: *Search for the Exotic Baryon Θ^{++}_{1540}*
Professional Societies/Associations: American Physical Society
Hometown: Lawnside, NJ
Hobbies/Interests: Card Collecting and Reading



Meral K. El Ramahi

University: University of Southern Indiana
Major: Biology
Research Institution: Brookhaven National Laboratory
Research Topic: *Microbeam Radiation Therapy to Treat Spinal Cord Injury in Rats*

Professional Societies/Associations: USI Pre-Professional Health Club, Sigma Zeta Honorary Society, Alpha Mu Gamma, Foreign Language Honorary Society, University of Southern Indiana (USI) Alumnus, American Medical Student Association

Hometown: Newburgh, IN

Hobbies/Interests: Playing Basketball, Tennis, and Flag Football With My Nephew, Dance, Reading Working Out, Running, Traveling, Writing, Journalism, Medicine

Benjamin Ray

University: Stanford University
Major: Other
Research Institution: Fermi National Accelerator Laboratory (FermiLab)
Research Topic: *Seeing the Light from the Tevatron*
Hometown: St. Charles, IL



Victoria J. Richards

University: Cedar Crest College
Major: Chemistry, concentration in forensic science
Research Institution: Ames Laboratory
Research Topic: *An Investigation of the Effects of Different Laundering Treatments on Commonly Used Fabrics in Regards to Bloodstain Pattern Formation and Analysis*
Professional Societies/Associations: Forensic Science Student Organization
Hometown: Oceanside, CA

Natasha Robateu

University: Southern University at New Orleans
Major: Biology
Research Institution: Brookhaven National Laboratory
Research Topic: *Understory Vegetation Analysis in the Proposed Long Island Solar Farm of Pine Barrens Forest, NY*
Professional Societies/Associations: Scholarships for Excellence in Natural Sciences (SENS), Beta Beta Beta (BBB), National Institute of Science (NIS), Beta Kappa Chi (BKX)
Hometown: New Orleans, LA
Hobbies/Interests: I enjoy reading with Clear Thoughts Book Club, participating with Pure Foundations Positive Sisterhood activities, and spending time with family and friends.

Jennifer Robles-Chancellor

University: Del Mar College
Major: Biological Sciences - Biology
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Detecting Radiation Sensitivity in Human Cells Using Green Fluorescent Protein*
Hometown: Corpus Christi, TX

Brett Rolf

University: Miami University
Major: Geography, Urban and Regional Planning; Economics
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Life Cycle Assessment of U.S. Residential and Commercial Buildings*
Hometown: Potomac, MD
Hobbies/Interests: The Environment, The Economy, The Developing World, School, Sports, Sporadic Activities, Listening To Enlightening Lecturers And Timeless Music (Not At The Same Time Though!)

Carlos Rosales

University: SUNY College of Environmental Science and Forestry
Major: Biological Sciences - Biology
Research Institution: Brookhaven National Laboratory
Research Topic: *Bioaugmentation of Salix spp. Biomass Using Endophytic Bacteria for Biofuel Production*
Hometown: Syracuse, NY



Alexander Rothman

University: Vanderbilt University
Major: Chemical and Biomolecular Engineering
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Ionic Liquid Pretreatment for Enhanced Sugar Yields of Forage Sorghum Lines with Reduced Lignin Content*
Professional Societies/Associations: AIChE
Hometown: Demarest, NJ
Hobbies/Interests: Sports

Emir Rubi

University: Barry University
Major: Physical Sciences - Chemistry
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Preparation of Porous Aluina Monoliths for Separation of Phosphorylated Compounds*
Hometown: Duarte, CA

Emma Rudie

University: University of Massachusetts- Amherst
Major: Environmental Science
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *Polymer-Mediated Delivery of Luminescent Nanocrystals for Bioimaging*
Hometown: Boston, MA
Hobbies/Interests: Swing dancing is just about my favorite thing to do. I play harmonica and ukulele (but not at the same time... yet). I also really like taking macro photos of plants.

Andrew Runciman

University: East Tennessee State University
Major: Computer Sciences
Research Institution: Oak Ridge National Laboratory
Research Topic: *ORNL Climate Change Informatics Tagging System*
Hometown: Kingsport, TN

Travis Sarver

University: Arizona State University
Major: Engineering - Mechanical
Research Institution: National Renewable Energy Laboratory
Research Topic: *Superhydrophobic Coatings for Dust-Dew Mitigation on Photovoltaic Modules*
Hometown: Tempe, AZ



Nathaniel Sanchez

University: University of New Mexico
Major: Mechanical Engineering
Research Institution: Los Alamos National Laboratory
Research Topic: *Gas Gun Experiments to Measure the Equation of State and Shock Initiation Behavior of High Performance Propellant (HPP)*

Professional Societies/Associations: Mechanical Engineering Honor Society (Pi Tau Sigma), ASME student member, American Physical Society student member

Hometown: Chimayo, NM

Hobbies/Interests: Kayaking, Rafting, Hunting, Fishing, Camping, Spending Time With Family And Friends, Detonation Performance Of High Explosives, Equation Of State For High Explosives, Crystallographic Texture

Margaret Scheiner

University: Cornell University
Major: Engineering - Materials
Research Institution: Cornell University
Research Topic: *Effects on Efficiency of Substrate Thickness, TiCl₄ Treatment, and Oxygen Plasma Processing on TiO₂-based Dye-Sensitized Solar Cell*

Hometown: Ithaca, NY

Catherine Schweppe

University: University of Washington
Major: Biology, Psychology
Research Institution: Pacific Northwest National Laboratory
Institution:
Research Topic: *Subcellular Fractionation Methods for Applications in Organelle Proteomics*
Hometown: Richland, WA
Hobbies/Interests: Swimming, Playing Piano, Going To Concerts, Spending Time With Family and Friends



Ben Shassere

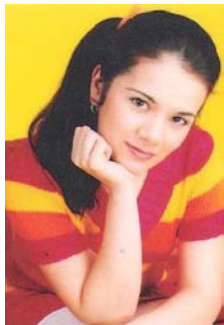
University: Tennessee Technological University
Major: Chemical Engineering
Research Institution: Oak Ridge National Laboratory
Research Topic: *Materials Discovery for the Enhancement of the Magnetocaloric Effect to be Used in Advanced Refrigeration*
Professional Societies/Associations: AIChE
Hometown: Oak Ridge, TN
Hobbies/Interests: Cross Country/Track, Kayaking, Fishing

Joseph Silo

University: UC Berkeley
Major: Engineering - Bioengineering
Research Institution: Brookhaven National Laboratory
Research Topic: *Using Microbeam Radiation Therapy with Synchrotron X-Rays to Treat the 9LGS Rat Brain Tumors*
Hometown: El Sobrante, CA

Evan Staley

University: Whitworth University
Major: Biological Sciences - Biophysics
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Biokinetics of Radium in Soft Tissue*
Hometown: Spokane, WA



Emily Sprague

University: University of Illinois at Urbana-Champaign
Major: Engineering Physics
Research Institution: SLAC National Accelerator Laboratory
Research Topic: *Bi-Plasma Interactions on Femtosecond Time-Scales*
Professional Societies/Associations: Society of Women in Physics, Physics Society, Society of Women Engineers
Hometown: St. Louis, MO
Hobbies/Interests: Music, Dance, Fencing, Cooking/Baking, Outdoor Sports



Sindhu Thevuthasan

University: University of Washington
Major: Physiology
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Biocompatibility and Toxicity Assessment of Engineered SiO₂ and ZnO Nanomaterials in Alveolar Epithelial Cells*
Hometown: Kennewick, WA
Hobbies/Interests: I enjoy dancing, camping, hiking, road-tripping/traveling with my family, and eating all sorts of delicious things. In my free time, I often ponder how using the art of interpretive dance as a form of communication could solve all global issues.

Dana Sulas

University: Massachusetts Institute of Technology
Major: Physical Sciences - Chemistry
Research Institution: National Renewable Energy Laboratory
Research Topic: *Evaluating a new Organic Solar Material: Exciton Diffusion in a Perylene Diimide Liquid Crystal*
Hometown: Portage, WI



Travis Toth

University: Millersville University
Major: Meteorology
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Using HYSPLIT Back Trajectories to Improve Understanding of Tropical Thin Cirrus Cloud Formation Mechanisms*
Professional Societies/Associations: American Meteorological Society
Hometown: Maple Glen, PA
Hobbies/Interests: Running, Baseball (Phillies!), Weather, Video Games



Dominique Townsend

University: Southern University at New Orleans
Major: Biology
Research Institution: Brookhaven National Laboratory
Research Topic: *Baseline Survey on Biomass Distribution in the Long Island Solar Farm*

Professional Societies/Associations: I have been awarded the Scholarship for Excellence in Natural Science funded by NSF S-STEM Program for four consecutive semesters. In addition to my excellence in academics, I actively participate in community outreach activities

Hometown: New Orleans, LA

Hobbies/Interests: In my spare time I enjoy creating music, reading, writing, and being an advocate for change within my city. I am a member of Students at the Center (SAC), which is a writing-based program directly serving high schools and middle schools in Orleans Parish.



Han Wang

University: University of California, Berkeley
Major: Engineering Mathematics and Statistics
Research Institution: Lawrence Livermore National Laboratory
Research Topic: *Modeling Arc Initiation of Pentaerythritol Tetranitrate: Strategies for Tool Development for High Gradient Hyperbolic Partial Differential Equations*

Professional Societies/Associations: ROTC

Hometown: Cypress, CA

Hobbies/Interests: Using Machine Learning Techniques To Predict The S&P500



Kerry Wang

University: Rice University
Major: Chemical and Biomolecular Engineering
Research Institution: Lawrence Berkeley National Laboratory
Research Topic: *First Principles Studies of the $\text{Li}_{0.5}\text{Al}_x\text{Mn}_{1-x}\text{O}_2$ System.*
Professional Societies/Associations: American Institute of Chemical Engineers (AIChE), Rice Robotics Club
Hometown: Plano, TX
Hobbies/Interests: Playing Ukulele and Practicing Martial Arts

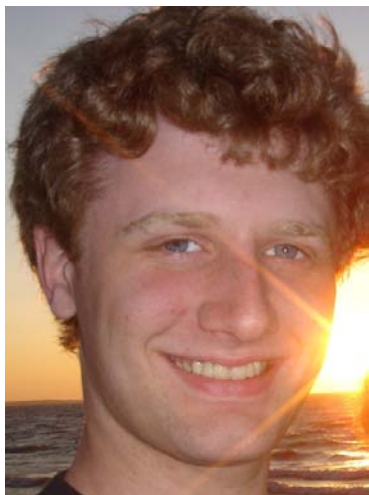


Keisha Theresa Watt

University: California State University
Major: Biochemistry/Biology
Research Institution: Salk Institute for Biological Sciences
Research Topic: *MicroRNA in Adult Neurogenesis Holds the Key to Regulation of Protein Translation*
Professional Societies/Associations: American Association for University Women, American Chemical Society, American Association for Microbiology
Hometown: Sunrise, FL
Hobbies/Interests: French Club President, Travel, Research, Studying, Crafts/Decorating

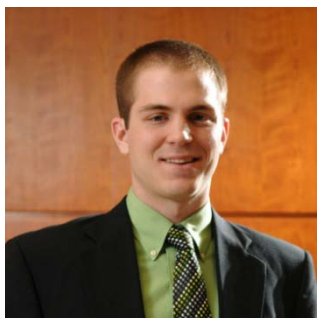
Faith Whitehouse

University: Hope College
Major: Biological Sciences - Biology
Research Institution: Oak Ridge National Laboratory
Research Topic: *Standing crop and depth distribution of fine roots under ambient and elevated levels of CO_2*
Hometown: Laramie, WY



Ronald Wilcox

University: College of William and Mary
Major: Physics
Research Institution: Brookhaven National Laboratory
Research Topic: *A Study of Chevron Readout Pads in a Gas Electron Multiplier Detector*
Hometown: Massapequa, NY



James L Young

University: University of Illinois at Urbana-Champaign
Major: Materials Science and Engineering
Research Institution: National Renewable Energy Laboratory
Research Topic: *Amorphous Mixed Metal Oxides for Photoelectrochemical Water Splitting*
Hometown: Buckley, IL



Amy E. Zellman

University: Simpson University
Major: Biological Sciences
Research Institution: Pacific Northwest National Laboratory
Research Topic: *Accelerating Wound Healing: Mechanism for Transport of Key Components by Serum Albumin*
Professional Societies/Associations: Council of Undergraduate Research, Alpha Chi Honors Society
Hometown: Franklin, NC
Hobbies/Interests: Writing, Philosophy, Hiking, Traveling, and Extreme Sports.



Ting Zheng

University:	University of Rochester
Major:	Biomedical Engineering
Research Institution:	University of Rochester Medical Center
Research Topic:	<i>Modeling of Inflammation of Cerebral Vasculature Caused by Methamphetamine and HIV Result: Methamphetamine Exposure Does Not Cause the Recruitment of Immune Cells into the CNS</i>
Professional Societies/Associations	Tau Beta Pi Engineering Honor Society
Hometown:	China/New York
Hobbies/Interests:	Emergency Medical Service, Movies, Music, Sports, Reading

U.S. Department of Energy National Laboratories

Ames Laboratory

Argonne National Laboratory

Brookhaven National Laboratory

Fermi National Accelerator Laboratory

Idaho National Laboratory

Lawrence Berkeley National Laboratory

Lawrence Livermore National Laboratory

Los Alamos National Laboratory

National Renewable Energy Laboratory

Oak Ridge National Laboratory

Pacific Northwest National Laboratory

Princeton Plasma Physics Laboratory

SLAC National Accelerator Laboratory

Thomas Jefferson National Accelerator Facility

Ames Laboratory

Ames, Iowa



Scientists at the Department of Energy Office of Science's Ames Laboratory seek solutions to energy-related problems through the exploration of chemical, engineering, materials and mathematical sciences, and physics.

Established in the 1940s with the successful development of the most efficient process to produce high-purity uranium metal for atomic energy, Ames Lab now pursues much broader priorities than the materials research that has given the Lab international credibility.

Responding to issues of national concern, Lab scientists are actively involved in innovative research, science education programs, the development of applied technologies, and the quick transfer of such technologies to industry. Uniquely integrated within a university environment, the lab stimulates creative thought and encourages scientific discovery, providing solutions to complex problems and educating tomorrow's scientific talent.

Ames Laboratory is located in Ames, Iowa, on the campus of Iowa State University. Iowa State's 2,000-acre, park-like campus is home to more than 25,000 students. Ames is approximately 30 minutes north of Des Moines, Iowa's capital city.



Argonne National Laboratory

Argonne, Illinois



The University of Chicago's Metallurgical Laboratory, part of the World War II Manhattan Project, gave rise to Argonne National Laboratory.



The laboratory has about 2,900 employees, including about 1,000 scientists and engineers. Argonne occupies 1,500 wooded acres in DuPage County, Illinois, about 25 miles southwest of

Chicago's Loop. Argonne research activities fall into broad categories:

- **Basic Science:** Basic science seeks solutions to a experimental and theoretical

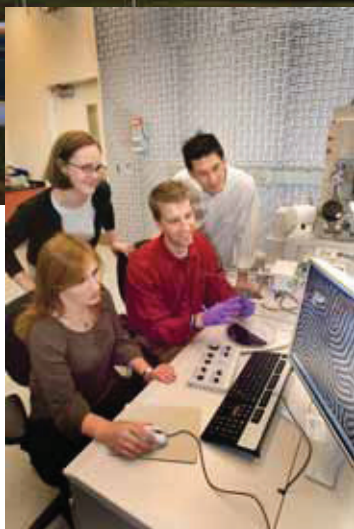
wide variety of scientific challenges. This includes work in materials science, physics, chemistry, biology, high-energy physics, and mathematics and computer science, including high-performance computing. This kind of basic research brings value to society today by helping lay the foundation for tomorrow's technological breakthroughs.

- **Facilities:** Scientific facilities like Argonne's Advanced Photon Source help advance America's scientific leadership and prepare the nation for the future. The laboratory designs, builds and operates sophisticated research facilities that would be too expensive for a single company or university to build and operate. They are used by scientists and engineers from Argonne, industry, academia and other national laboratories, and often by researchers from other nations. The laboratory is also home to the Argonne Tandem Linear Accelerator System, the Center for Nanoscale Materials, the Argonne Leadership Computing Facility and other facilities.
- **Energy Programs:** Energy resources programs help insure a reliable supply of efficient and clean energy for the future. Argonne scientists and engineers are developing advanced technologies and systems for a number of energy applications, including nuclear reactors, batteries and fuel cells, transportation, and electric power generation and storage programs.
- **Environmental Management:** Environmental management includes work on managing and solving the nation's environmental problems and promoting environmental stewardship. Research in this area includes alternative energy systems; environmental risk and economic impact assessments; hazardous waste site analysis and remediation planning; electrometallurgical treatment to prepare spent nuclear fuel for disposal; and new technologies for decontaminating and decommissioning aging nuclear reactors.
- **National Security:** National Security has increased in significance in recent years for the nation and for Argonne research. Argonne capabilities developed over the years for other purposes are helping counter the threats of terrorism. These capabilities include expertise in the nuclear fuel cycle, biology, chemistry, and systems analysis and modeling. This research is helping develop highly sensitive instruments and technologies to detect chemical, biological and radioactive threats and identify their sources. Other research is helping to detect and deter possible weapons proliferation or actual attacks.
- **Workforce Development:** Argonne's Division of Educational Programs provides workforce development to benefit researchers from postdocs, university faculty and students to regional K-12 schools.



Brookhaven National Laboratory

Upton, New York



Brookhaven National Laboratory is a Department of Energy, Office of Science multidisciplinary laboratory managed by Brookhaven Science Associates, a company founded by Battelle and Stony Brook University. Home to six Nobel Prizes, Brookhaven conducts research in the physical, biomedical, and environmental sciences, as well as in energy technologies and national security.

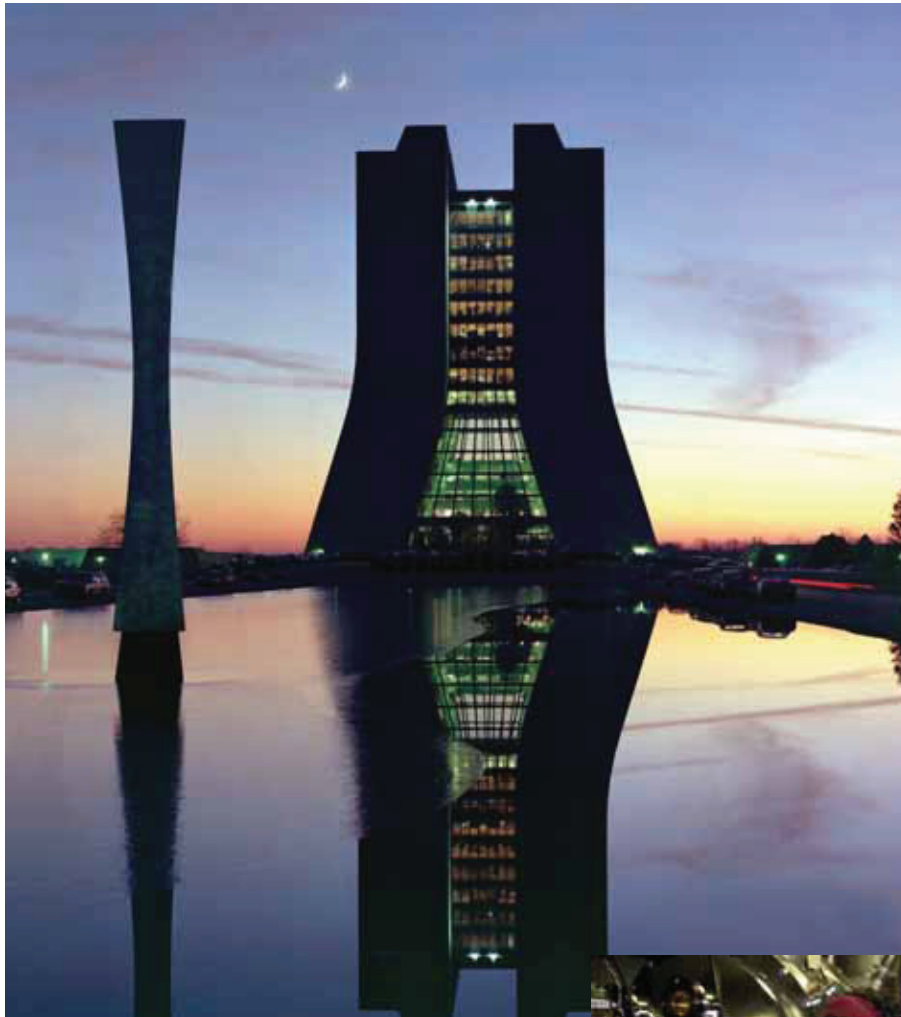
Located on a 5,300-acre site on eastern Long Island, New York, Brookhaven builds and operates major scientific facilities available to university, industry and government researchers. Among these facilities are the Relativistic Heavy Ion Collider, where physicists study the nature of matter as it existed at the beginning of the universe; the National Synchrotron Light Source (NSLS),

where researchers use beams of x-ray, infrared and ultraviolet light to study materials as diverse as computer chips and proteins; and the Laboratory's newest facility, (pictured here) the Center for Functional Nanomaterials (CFN). Scientists at the CFN study and fabricate materials on a scale of a billionth of a meter. These materials can possess different chemical and physical properties than their larger-scale counterparts. The research at the CFN is focused on developing clean and efficient forms of alternative energy to replace fossil fuels.

In addition, the NASA Space Radiation Laboratory, where scientists study the effects of space radiation on astronauts, is based at Brookhaven, and the Laboratory is home to one of the fastest supercomputers in the world, New York Blue. In 2009, Brookhaven will begin construction of a new synchrotron, the NSLS-II. When it becomes operational in 2015, it will be the world's brightest synchrotron, which will enable research advances in numerous fields.

Fermi National Accelerator Laboratory

Batavia, Illinois



Fermi National Accelerator Laboratory (Fermilab) is one of the world's foremost laboratories dedicated to high-energy physics research. It is operated for the Department of Energy Office of Science by a consortium of 90 research-oriented universities. More than 3,000 scientists from around the world use Fermilab for their experiments.

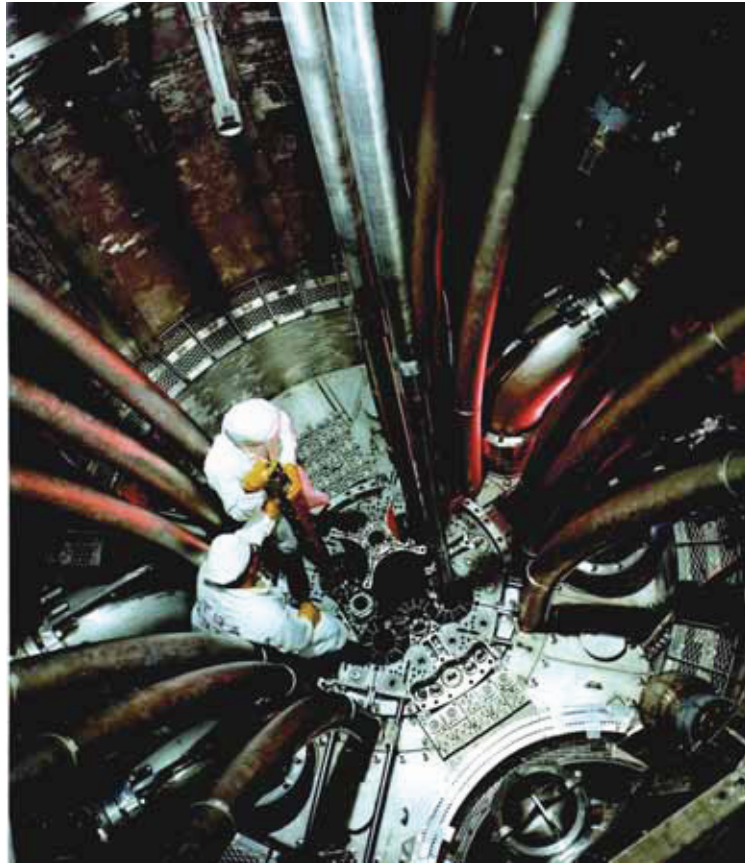
Fermilab is located on a 6,800-acre site about 35 miles west of Chicago, Illinois. The laboratory is home to the Tevatron Collider, the world's highest-energy particle accelerator. Two large detectors analyze the Tevatron's proton-antiproton collisions to unveil the fundamental forces and particles of the universe. Scientists at Fermilab discovered the bottom quark and the top quark, and first observed the tau neutrino.

Fermilab operates the world's most powerful proton beam for creating neutrinos. The Center for Particle Astrophysics at Fermilab includes groups studying cosmic rays, supernovae, dark energy and other phenomena.



Idaho National Laboratory

Idaho Falls, Idaho



In operation since 1949, The Idaho National Laboratory (INL) is a science-based, applied engineering National Laboratory dedicated to supporting the U.S. Department of Energy's missions in nuclear and energy research, science, and national defense.

INL stands out as a unique national and international resource. Notably, the lab has been formally designated as the nation's command center for advanced civilian nuclear technology research and development, and is home to the unparalleled Critical Infrastructure Test Range, with assets as diverse as an isolable electric grid and wireless test bed. Leveraging these and numerous other distinguishing features, the lab and its more than 3,300 scientists, engineers and support personnel build on the potential and promise of the theoretical for the benefit of the real world.

Located in southeast Idaho, INL covers 890 square miles of the Snake River Plain between Idaho Falls and Arco, Idaho. Offices and laboratories are also in the city of Idaho Falls (population 50,000), located about two hours from Grand Teton and Yellowstone national parks and other areas offering prime recreational opportunities.



Lawrence Berkeley National Laboratory

Berkeley, California



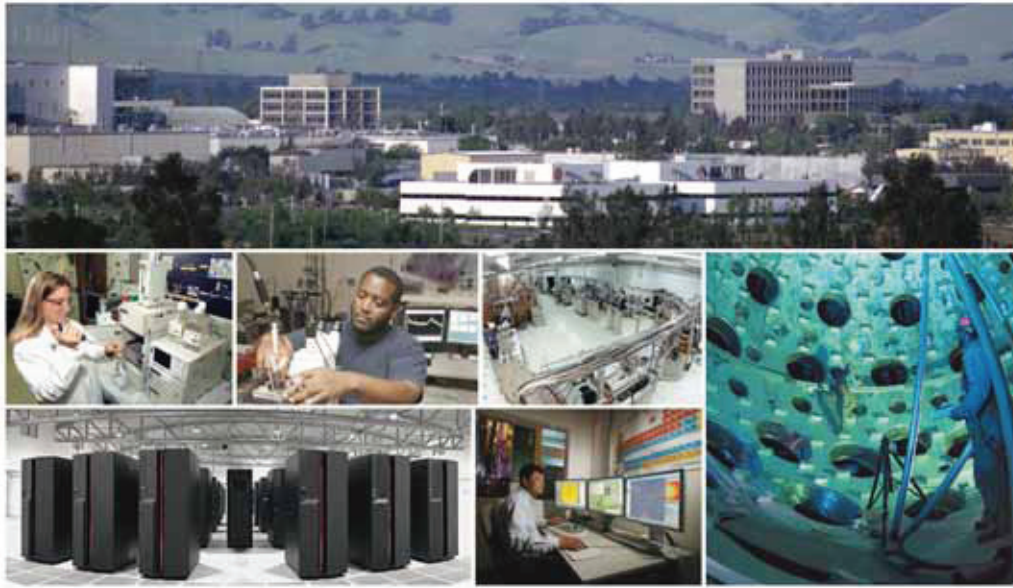
Lawrence Berkeley National Laboratory's (LBNL) research and development includes new energy technologies and environmental solutions with a focus on energy efficiency, electric reliability, carbon management and global climate change, biofuels, and fusion. Frontier research experiences exist in nanoscience, genomics and cancer research, advanced computing, and observing matter and energy at the most fundamental level in the universe.

Ernest Orlando Lawrence founded the Berkeley Laboratory in 1931. Lawrence is most commonly known for his invention of the cyclotron, which led to a Golden Age of particle physics — the foundation of modern nuclear science — and revolutionary discoveries about the nature of the universe. Berkeley Laboratory has several premier national user facilities, such as the Molecular Foundry, the National Center for Electron Microscopy, and the Advanced Light Source, centrally located on the laboratory site overlooking the San Francisco Bay.



Lawrence Livermore National Laboratory

Livermore, California



Lawrence Livermore National Laboratory (LLNL) applies cutting-edge science and engineering to enhance the nation's security. When LLNL was founded in 1952, the consuming national security concern was the nuclear arsenal of the Soviet Union and, for years, our energies, talents and resources were focused on that threat. Today, new perils have arisen that are radically different and vastly more complex, and we are directing our world-class scientific and technological resources against these threats. Assuring the safety, security, and reliability of the nation's nuclear weapon stockpile continues to be the foremost responsibility of LLNL. We are also pushing the frontiers of science and technology to make breakthroughs that will be enable us to meet future needs in national and global security, energy and environment, and economic competitiveness.

LLNL is home to some of the world's most powerful supercomputers, including BlueGene/L, first on the TOP500 list of supercomputers with a sustained world-record speed of 478.2 teraflops. LLNL also supports unique experimental facilities, including the Center for Accelerator Mass Spectrometry, the High Explosives Applications Facility, and the 192-beam National Ignition Facility, which is the world's largest laser system. Our researchers typically work in multi-disciplinary teams, where experts in physical and life sciences, engineering, and computations collaborate to devise and demonstrate solutions to nationally important problems.

LLNL offers numerous opportunities for outstanding scholars and postdoctoral fellows to complement their academic endeavors and enable them to work on exciting areas of research using our advanced experimental facilities and computing resources. Laboratory scientists, many of whom are leading experts in their fields, guide and collaborate with student researchers and have earned numerous commendations as outstanding mentors.

On the local level, the laboratory offers a wide array of student science enrichment and teacher development programs tied to LLNL science and technology that benefit more than 25,000 K-12 students and teachers each year. Programs include college-accredited teacher research academies and research internships, community science lectures, a science and engineering project competition, tours for school groups, and special educational outreach events.

LLNL is located on a mile-square site at the eastern edge of the Livermore Valley, roughly an hour from San Francisco, two hours from the Pacific Ocean, and three hours from the Sierra Nevada mountains. The Laboratory is managed for the Department of Energy's National Nuclear Security Administration by Lawrence Livermore National Security LLC, a consortium of Bechtel National, University of California, Babcock & Wilcox, Washington Division of URS Corporation, and Battelle.

Los Alamos National Laboratory

Los Alamos, New Mexico



The Los Alamos National Laboratory (LANL), located in the Jemez Mountains of northern New Mexico, offers the opportunity for students to work at a multi-disciplinary, world-class research facility while enjoying a truly unique environment. Long known for its artistic community, northern New Mexico also offers a variety of exciting outdoor recreational opportunities, including rock climbing and hiking in the adjacent mountains and canyons, proximity to the Rocky Mountains, and exceptional skiing opportunities at many nearby locations.

We offer a diverse research experience for undergraduate and graduate students as a means of assuring the continued vibrancy of the science, engineering, and technology at the laboratory. Serve your internship with us and you will have the opportunity to work in a team environment with some of the world's top scientists and engineers on critical issues involving our national security, environment, infrastructure, and security. We offer internship opportunities in areas that include: Biology, Chemistry, Computer Science, Physics, Mathematics, Materials Science, Environmental Science, and Engineering: Chemical, Civil, Computer, Electrical, Mechanical, Nuclear, and Software.

If you are a problem solver and independent thinker, a team player, a good communicator, like a hands-on approach, and are self-motivated, we offer you the challenge of an internship at LANL.

National Renewable Energy Laboratory

Golden, Colorado



The National Renewable Energy Laboratory (NREL) is the U.S. Department of Energy's primary National Laboratory for renewable energy and energy efficiency research and development. From harvesting energy from the sun and wind, to advancing automotive systems, to developing biodegradable plastics from corn stalks, NREL develops renewable energy and energy efficiency technologies and practices, advances related science and engineering, and transfers research knowledge and innovations to address the nation's energy and environmental goals. NREL takes its research to the community through projects such as building Zero Energy Habitat for Humanity Homes, education outreach, teacher workshops and sponsoring interns.

NREL research has been recognized with 44 R&D Awards, ranking first among National Laboratories per researcher, as well as numerous honors from R&D, Discover, and Popular Science magazines and leading scientific organizations.

Scientist mentors work with over 200 interns annually in developing the future workforce.

Innovative, challenging and dynamic — that's our culture. If you are interested in a research internship with an institution that believes creativity and individual uniqueness is at the core of our success, then explore your options at: www.nrel.gov. We value intern talent that adds to the rich pool of research findings produced by NREL each year.

Intern accomplishments include:

- More than 27 students have been selected by the Office of Science to present major NREL research at the AAAS.
- More than 50 past student interns have been hired at NREL.
- Teacher researchers have produced over 50 renewable energy lessons for the classroom.
- Two student/scientist patents have evolved from internships.
- NREL's Education Program partners with over 40 universities throughout the nation.

NREL's main 327-acre site is in Golden, Colorado, just west of Denver. The Laboratory also operates the National Wind Technology Center on 307 acres about 20 miles north of Golden. We are an equal opportunity employer committed to diversity.

Oak Ridge National Laboratory

Oak Ridge, Tennessee



Oak Ridge National Laboratory (ORNL) is the U.S. Department of Energy's (DOE) largest science and energy laboratory. Managed since April 2000 by a partnership of the University of Tennessee and Battelle, ORNL was established in 1943 as part of the secret Manhattan Project to pioneer a method for producing and separating plutonium. Today ORNL has a research portfolio in excess of \$1.3 billion, a staff of more than 4,200 and approximately 3,000 guest researchers (undergraduates, graduate students, postgraduates, teachers, and faculty) who spend two weeks or longer each year in Oak Ridge. The \$1.4 billion Spallation Neutron Source, located adjacent to the new Center for Nanophase Materials Sciences, and the High Flux Isotope Reactor are rapidly making Oak Ridge one of the world's foremost locations for the study of materials. ORNL's National Leadership Computing Facility now houses the world's most powerful open science supercomputer and soon will house a computer capable of a mind-boggling 1,000 trillion calculations per second. Each of these facilities will work closely with ORNL's new Bioenergy Science Center, funded by DOE to develop breakthrough technologies for cellulosic ethanol.

Since 2000, UT-Battelle has provided more than \$8.25 million in support of math and science education, economic development, and corporate volunteerism in the greater Oak Ridge region as well as various civic, cultural and public awareness activities related to DOE's mission.



Pacific Northwest National Laboratory

Richland, Washington



Pacific Northwest National Laboratory (PNNL), on the sunny eastern side of Washington State, is one of the U.S. Department of Energy's (DOE) ten national laboratories, managed by DOE's Office of Science. PNNL has been proudly operated by Battelle since 1965 and performs research for other DOE offices as well as government agencies, universities, and industry to deliver breakthrough science and technology to meet today's national needs. PNNL is home to the William R. Wiley Environmental Molecular Sciences Laboratory, a DOE Office of Science national science user facility. On the campus of Washington State University (WSU) Tri-Cities in Richland, Washington, researchers from WSU and PNNL collaborate in the new Bioproducts, Sciences, and Engineering Laboratory to convert biomass into value-added fuels and chemicals. PNNL also operates the Sequim Marine Research facility in western Washington.

National security, energy demands, and environmental impacts are some of America's toughest challenges. At PNNL, we are driven to provide science and solutions to meet these challenges. We accomplish this mission through the power of our interdisciplinary teams, bringing together experts from multiple disciplines to tackle complex problems.

Through fundamental research, we generate new knowledge, new understanding, and transformational tools and techniques. These new insights and tools are advancing scientific frontiers in the molecular, environmental, biological, and computational sciences. Collaborating with our partners, PNNL is developing ways to use today's energy sources more cleanly and efficiently while helping shift our nation to more renewable resources. As national security threats become more complex and unpredictable, our technologies are becoming more sophisticated to keep pace. Our tools and methods are helping others prevent and counter terrorism and the proliferation of weapons of mass destruction. Environmental innovations from PNNL are being used to protect water sources, clean up underground contamination, and explore how greenhouse gases can be stored in deep geologic formations.

We champion science, technology, engineering, and mathematics (STEM) education from "grade school to grad school" in order to support the "college and workforce ready" agenda of the nation, DOE, our region, and local communities. We help to develop and educate the scientists and engineers of the tomorrow. We strive to impact STEM education by acting as a catalyst for sustainable positive change on national, regional, and local levels. This includes providing thought leadership, creating business-in-education partnerships, participating in scalable initiatives, and advancing the progress of existing programs that have proven results, but require additional resources and partnerships to broaden their impact.

Princeton Plasma Physics Laboratory

Princeton, New Jersey



The world's reliance on fossil fuels is imperiling our environment. Fusion, the energy source of the sun and the stars, offers an inexhaustible alternative. A fusion-powered electric generator would not produce hydrocarbon emissions, greenhouse gases, or long-lived radioactive waste; nor would it emit chemicals that cause acid rain. Consequently, the U.S. Department of Energy (DOE) Office of Science has made the development of commercial fusion power one of its highest priorities.

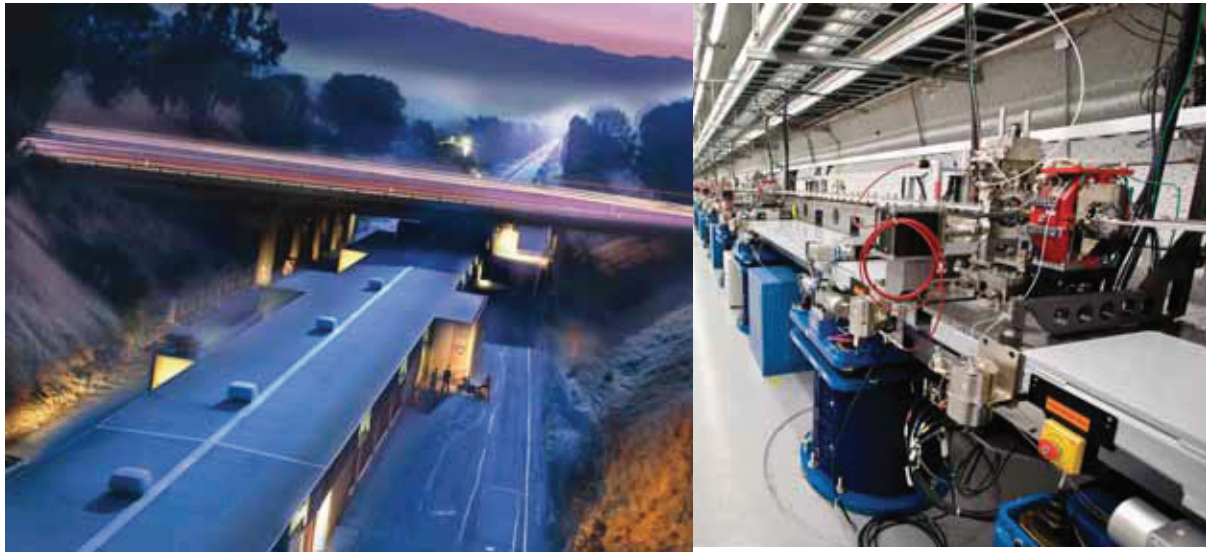
DOE's Princeton Plasma Physics Laboratory (PPPL) is one of the world's leading facilities for fusion R&D. Currently PPPL is operating the National Spherical Torus Experiment, which uses magnetic fields to confine hot ionized gas (plasma) that serves as the fusion fuel. PPPL's theoretical physicists are developing computational physics models that can predict how various plasma configurations will perform, saving time and money.

PPPL experimental physicists collaborate with their colleagues worldwide in a free, mutually beneficial, exchange of information. Princeton researchers and engineers use knowledge and skills gained in fusion research to solve other problems, including the development of plasma-based propulsion systems for space vehicles, studies of plasma phenomena that occur in the sun's corona and the earth's magnetosphere, and nuclear detection systems.

The Laboratory interacts with the nearby community through its tour program, Speakers' Bureau, and Science Education Program (SEP). The goal of the PPPL SEP is to combine the core research activities of PPPL with science education programs to create a center of excellence for students and teachers. To achieve its goals, the SEP strives to: (1) contribute to the training of the next generation of scientists and engineers, (2) collaborate with K-12 teachers on ways to improve science teaching using an inquiry-based approach to learning, and (3) improve the scientific literacy of the community at large. These initiatives, led by SEP staff in conjunction with PPPL volunteers, master teachers, and local education experts, create significant learning opportunities for undergraduate college students and K-12 teachers and students. PPPL is about three miles from Princeton University's main campus in Princeton, N.J.

SLAC National Accelerator Laboratory

Menlo Park, California



SLAC National Accelerator Laboratory is one of the world's leading laboratories for research in photon science, astrophysics, and accelerator and particle physics.

The laboratory's programs explore the structure and dynamics of matter as well as the properties of energy, space and time — at the smallest and largest scales, in the fastest processes and at the highest energies. Through SLAC's investigations into how matter behaves on multiple time, length and energy scales, researchers address major scientific and technological challenges affecting society at large.

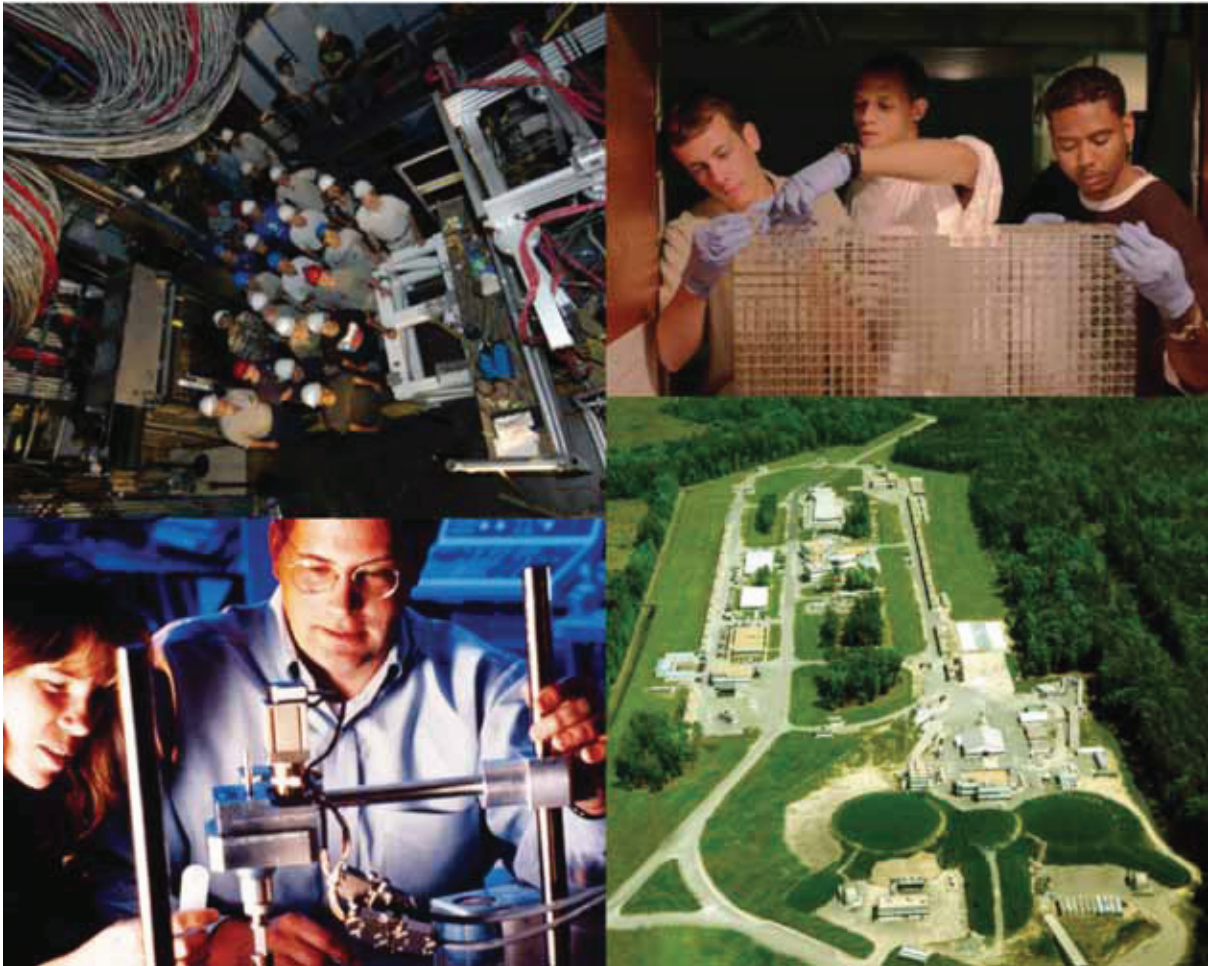
By delving into the smallest scale of matter, SLAC scientists answer fundamental questions about the most basic constituents of matter and the forces between them; create materials with extreme strength, flexibility and heat resistance; seek cleaner, greener technologies; and gain better control of molecules on the nanoscale.

Laboratory researchers also study matter on the largest scale, looking to the skies and conducting experiments deep underground to explore the history and evolution of the universe, reveal the mysteries of cosmic objects and search for new fundamental laws of nature.

SLAC is located on the Stanford University campus in Menlo Park, California. Six scientists have been awarded the Nobel Prize for work carried out at SLAC, and the future of the laboratory promises to be just as extraordinary.

Thomas Jefferson National Accelerator Facility

Newport News, Virginia



The Thomas Jefferson National Acceleration Facility, or Jefferson Lab, is a nuclear physics research laboratory located in Newport News, Virginia. Nuclear physics research scientists who use Jefferson Lab are on a journey of discovery into the nucleus of the atom. Their goal is to develop a roadmap of matter that helps unlock the secrets of how the universe is put together. Nuclear physics funding from the Department of Energy provides Jefferson Lab with leading-edge instrumentation, world-class facilities and training and support for the people involved in these pursuits. Forefront nuclear physics research conducted at Jefferson Lab provides solid foundations for other fields. The accumulation of new results and the intellectual training of new generations of scientists foster important advances in medicine, chemistry and other sciences.

Scientists at Jefferson Lab use the Continuous Electron Beam Accelerator Facility — the first large-scale application of superconducting radiofrequency technology — to conduct physics experiments. Using accelerated electron beams, experimenters probe the sub-nuclear realm. Using this same technology, Jefferson Lab has built the world's brightest high average power Free Electron Laser that offers unique capabilities for defense, industry, basic research and medicine.

AAAS Science & Technology Policy Fellowships

Plug the Power of Science into Public Policy

The Fellowships help to establish and nurture critical links between federal decision-makers and scientific professionals to support public policy that benefits the wellbeing of the nation and the planet. The Fellowships are designed to:

- educate scientists and engineers on the intricacies of federal policymaking;
- provide scientific expertise and analysis to support decision-makers confronting increasingly complex scientific and technical issues;
- foster positive exchange between scientists and policymakers;
- empower scientists and engineers to conduct policy-relevant research and other activities that address challenges facing society; and
- increase the involvement and visibility of scientists and engineers in the public policy realm.

The Fellowships support the AAAS objectives to improve public policymaking through the infusion of science, and to increase public understanding of science and technology and are part of AAAS Science & Policy Programs.

Each year, several AAAS S&T Policy Fellows give of their time to review and score undergraduate student posters for SERCh. Each has distinguished themselves in the scientific community while earning PhDs in science fields. This year, the volunteer scorers were:

Anthony Belvin
Laura Berzak
Reeshemah Burrell

Robyn Hayes
Mari-Vaughn Johnson
Chetna Khosla

Chris Spitzer
Victor Udoewa
Marcelo Vincés

Thanks for their hard work and dedication! We appreciate their scientific expertise and their research knowledge.



ADVANCING SCIENCE, SERVING SOCIETY

Office of Science Program Offices

The Department of Energy's Office of Science is the single largest supporter of basic research in the physical sciences in the United States. It oversees and is the principal federal funding agency of the Nation's research programs in high energy physics, nuclear physics, and fusion energy sciences. The Office of Science sponsors fundamental research programs in basic energy sciences, biological and environmental sciences, and computational science. In addition, the Office of Science is the federal government's largest single funder of materials and chemical sciences, and it supports unique and vital parts of U.S. research in climate change, genomics, life sciences, and science education.

ADVANCED SCIENTIFIC COMPUTING RESEARCH

Deliver Computing for the Frontiers of Science

- Computer science and software research
- Extending science through computation and collaboration
- Supercomputing technologies for science
- Computational and network infrastructure and tools

BASIC ENERGY SCIENCES

Advance the Basic Sciences for Energy Independence

- Materials sciences and engineering research
- Chemical sciences, geosciences, and physical biosciences research
- Nanoscale science, engineering, and technology research
- Scientific user facilities to understand materials and perform nanoscale science

BIOLOGICAL AND ENVIRONMENTAL RESEARCH

Harness the Power of Our Living World

- Genomics and low dose radiation research
- Climate change research
- Environmental remediation sciences
- Medical sciences

FUSION ENERGY SCIENCES

Bring the Power of the Stars to Earth

- Harnessing fusion energy through basic research in plasma and fusion sciences
- ITER, the international burning plasma experiment

HIGH ENERGY PHYSICS

Explore the Fundamental Interactions of Energy, Matter, Time, and Space

- Explore unification of the forces and particles of nature
- Understand the cosmos and the destiny of the universe
- Develop the tools for scientific revolutions to come

NUCLEAR PHYSICS

Explore Nuclear Matter—from Quarks to Stars

- Studies of hot, dense nuclear matter
- The quark structure of matter
- Nuclear structure/astrophysics, fundamental symmetries, and neutrinos

WORKFORCE DEVELOPMENT FOR TEACHERS AND SCIENTISTS

*Train the Next Generation of Scientists and Engineers to Maintain U.S. Scientific and Technological Leadership
K-12 Students*

- The National Science Bowl® for High School and Middle School Students Undergraduate Students
- Science Undergraduate Laboratory Internship (SULI)
- Community College Institute for Science and Technology (CCI)
- Pre-Service Teacher Program (PST) Educators of Science and Mathematics
- Albert Einstein Distinguished Educator Fellowship
- Academies Creating Teacher Scientists (ACTS)
- Faculty and Student Teams (FaST) Graduate Students
- Office of Science Graduate Fellowship Program (SCGF)

Acknowledgements

Office of Science


Argonne National Laboratory

American Association for the Advancement of Science (AAAS)
Science & Technology Policy Fellows

Oak Ridge Institute for Science and Education (ORISE)



U.S. DEPARTMENT OF
ENERGY

 Printed on recycled paper.