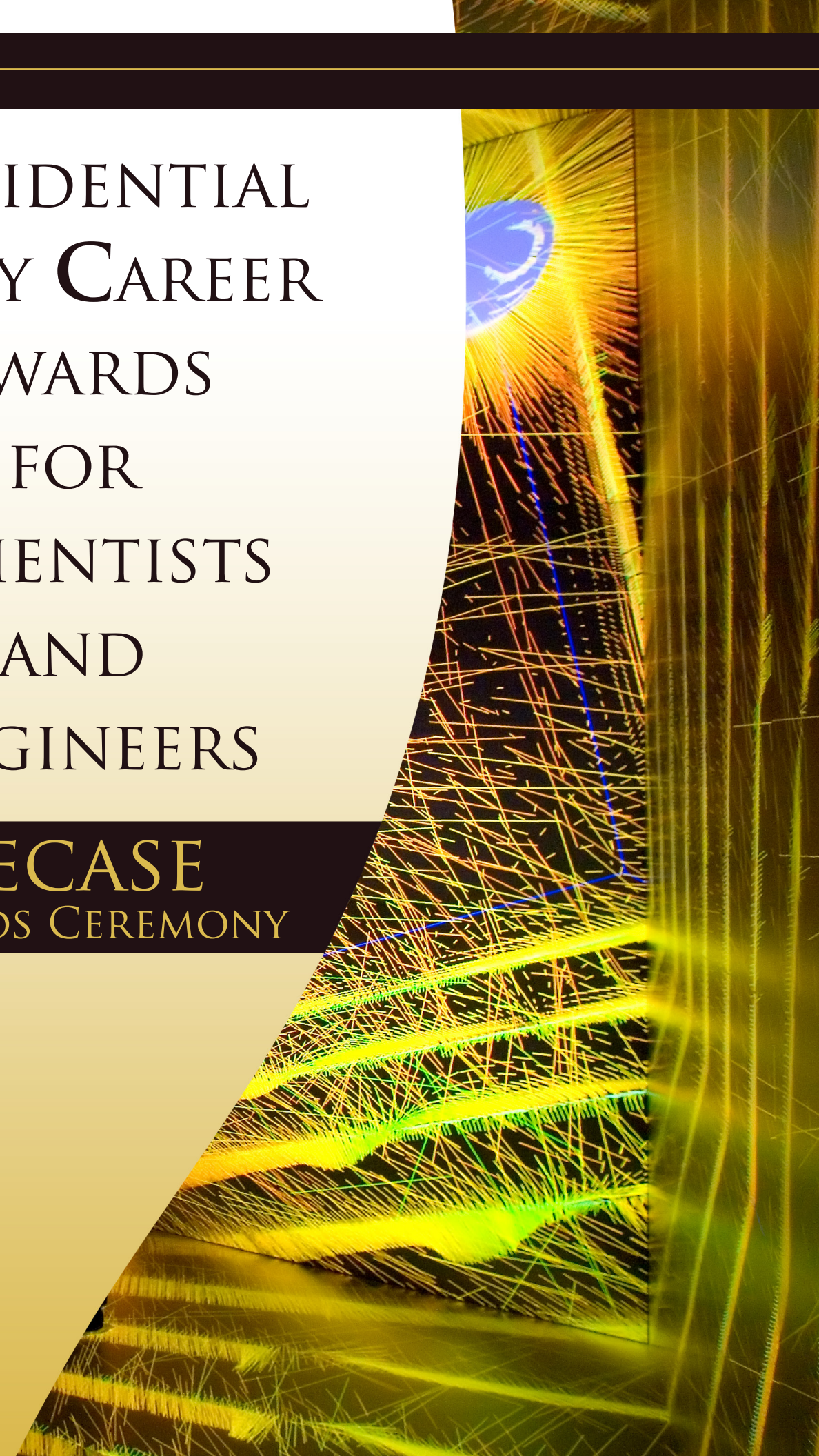
Presidential Early Career Awards for Scientists and Engineers

PECASE
Awards Ceremony



U.S. DEPARTMENT OF ENERGY

Office of Science

WE WOULD LIKE TO THANK THE DEPARTMENT OF ENERGY
LABORATORIES FOR THE USE OF THEIR IMAGES IN THE VIDEO FOR THIS CEREMONY.

Program

WELCOME

OPENING REMARKS

REMARKS ON THE PECASE AWARDS

PRESENTATION OF THE AWARDS

CLOSING REMARKS

GROUP PHOTO

RECEPTION IMMEDIATELY FOLLOWING

The Presidential Early Career Award for Scientists and Engineers (PECASE)

In 1996, the National Science and Technology Council (NSTC) was commissioned to create an award to recognize and honor outstanding scientists and engineers at the outset of their independent research careers. The NSTC was established to coordinate the multiagency science and technology policy-making process, and to implement and integrate the President's science and technology policy agenda across the federal government.

The Presidential Early Career Award for Scientists and Engineers (PECASE) embodies the high priority placed by the government on maintaining the leadership position of the United States in science by producing outstanding scientists and engineers and nurturing their continued development. The Awards identify a cadre of outstanding scientists and engineers who will broadly advance science and the missions important to the participating agencies.

The PECASE Awards are intended to recognize some of the finest scientists and engineers who, while early in their research careers, show exceptional potential for leadership at the frontiers of scientific knowledge during the twenty-first century. The Awards foster innovative and far-reaching developments in science and technology, increase awareness of careers in science and engineering, give recognition to the scientific missions of participating agencies, enhance connections between fundamental research and national goals, and highlight the importance of science and technology for the nation's future.

The PECASE Award is the highest honor bestowed by the U.S. government on outstanding scientists and engineers beginning their independent careers. The awards are conferred annually at the White House following recommendations from participating agencies. To be eligible for a PECASE Award, an individual must be a U.S. citizen, national, or permanent resident. Each PECASE Award will be of five years duration. Individuals can receive only one PECASE award in their careers.

Office of Science

Dr. Christopher Hirata
California Institute of Technology

Dr. Heileen Hsu-Kim
Duke University

Dr. Pablo Jarillo-Herrero
Massachusetts Institute of Technology

Dr. Peter Mueller
Argonne National Laboratory

Dr. Daniel B. Sinars
Sandia National Laboratories

Dr. Jesse Thaler
Massachusetts Institute of Technology

Defense Programs

Dr. Amy J. Clarke
Los Alamos National Laboratory

Dr. Jeffrey W. Banks
Lawrence Livermore National Laboratory

Dr. Heather Whitley
Lawrence Livermore National Laboratory

Office of Electricity Delivery and Energy Reliability

Dr. Stanley Atcitty
Sandia National Laboratories

Office of Energy Efficiency and Renewable Energy

Dr. Thomas Jaramillo
Stanford University

Office of Fossil Energy

Dr. John R. Kitchin
Carnegie Mellon University

Office of Nuclear Energy

Mr. Derek R. Gaston
Idaho National Laboratory

Dr. Stanley Atcitty
Sandia National Laboratories

OFFICE OF ELECTRICITY DELIVERY AND ENERGY RELIABILITY AWARDEE

For advances in power electronics for the electric grid including the development of a high-temperature silicon-carbide power module and an ultra-high-voltage silicon-carbide thyristor, for research on grid integration of energy storage, and for mentorship in the Native American community.

Dr. Stan Atcitty, principal member of Sandia National Laboratories' technical staff, leads the power electronics subprogram as part of the DOE Energy Storage Program. This program has gained international recognition for its state-of-the-art research and development under his leadership. Four of his projects, the emitter turn-off thyristor (ETO), fiber optic transducer, high temperature silicon-carbide (SiC) power module, and ultra-high-voltage SiC thyristor, have won the prestigious R&D 100 award from Research & Development magazine. Stan brings unique cutting-edge approaches to the design and development of power conversion systems for a broad range of energy storage applications. Stan is a team player who is comfortable leading multiple technical projects simultaneously while consistently delivering high-quality technical work. His work has been demonstrated in peer-reviewed journals, patents, and presentations for a broad range of academic, government, and industry audiences. Currently, Stan has over 30 publications and holds three patents and another patent pending.

Stan's unique skill set allows him to bridge the technology gap between industry and academia, effectively communicating proper integration and control of energy storage and power electronics. He uses his skills and insight to foster cooperation between those in the industry who design power conversion systems and those who manage the electric utilities with which the power conversion systems are integrated (resulting in more cost-effective, efficient, and reliable systems). As a result of both his in-depth technical knowledge and his knowledge of the "big picture" issues, he is highly sought after by both industry and academia, including Department of Defense programs, as a national expert in the field.

Dr. Atcitty received his undergraduate and graduate degrees in electrical engineering from New Mexico State University. In 2006, he was the first Native American to receive a Ph.D. in electrical and computer engineering from Virginia Polytechnic Institute and State University.

Dr. Jeffrey W. Banks
Lawrence Livermore National Laboratory

DEFENSE PROGRAMS AWARDEE

For work in computational physics, scientific computation, and numerical analysis, especially pioneering contributions in numerical approximations to hyperbolic partial differential equations focusing on the development and analysis of nonlinear and high-resolution finite-volume and finite-difference methods, and for service in high schools and the scientific community.

Jeffrey Banks was nominated by Lawrence Livermore National Laboratory for his work in computational physics, scientific computation, and numerical analysis in support of DOE missions. He received his Ph.D. in applied mathematics from Rensselaer Polytechnic Institute in 2006, and completed postdoctoral appointments at both Sandia National Laboratories and Lawrence Livermore National Laboratory. In 2009 he joined the staff at Lawrence Livermore National Laboratory as a research scientist.

Dr. Banks has made significant contributions to the theory and application of computer simulation of time evolving partial differential equations where wave phenomena plays a central role. These mathematical models are an important part of the basic description for many physical and engineered systems. Dr. Banks' work has been used in understanding a variety of application areas including fluid dynamics, plasma physics, and solid mechanics. In addition, he has developed new methods and theoretical analysis for systems where multiple physical domains are coupled, for example the interaction of high-speed fluids and embedded solids.

In addition to research, Dr. Banks places significant value in education and outreach. He has mentored or co-mentored multiple students and one postdoc. He has involved himself in the local school system by giving lectures about careers in math and science, serving as a judge for science competitions, and as a coach for track and field.

Dr. Amy J. Clarke
Los Alamos National Laboratory

DEFENSE PROGRAMS AWARDEE

For research on uranium niobium alloy deformation mechanisms using micro-pillar compression testing to determine the influence of orientation on stress-strain response, for using in-situ solidification and proton radiography with potential to finally resolve liquid-solid processing questions relevant to nuclear weapons, and for mentoring future ferrous metallurgists.

Dr. Amy Clarke is a Research and Development Scientist at Los Alamos National Laboratory (LANL) in the Materials Science and Technology – Metallurgy Group. Her research focuses on innovative materials synthesis and processing through the use of unique tools and probes to control the microstructure and properties of important materials for energy, defense, and industry. The result is enhanced performance and reliability of materials.

Dr. Clarke received her B.S. degree in Metallurgical and Materials Engineering from Michigan Technological University and her M.S. and Ph.D. degrees in Metallurgical and Materials Engineering from the Colorado School of Mines (CSM). During her graduate studies at the Advanced Steel Processing and Products Research Center at CSM, she explored novel thermal processing strategies creating advanced high-strength steels for automotive applications enabling lighter vehicles, better fuel efficiency, and improved crash characteristics. Dr. Clarke received the Willy Korf Award for Young Excellence in 2007 for her Ph.D. research.

Dr. Clarke joined LANL in 2006 as a G.T. Seaborg Institute Postdoctoral Fellow. Her early research at LANL focused on the examination of uranium alloy aging and shape memory effect deformation structures and texture development, which are important to stockpile stewardship, and low enriched uranium alloy fuels for high performance research and test reactors using advanced characterization techniques. Dr. Clarke's current research involves in-situ monitoring of alloy melting and solidification using proton radiography and synchrotron x-ray radiography and tomography at National User Facilities. She received a U.S. Department of Energy Office of Science Early Career Research Program Award in 2012.

Dr. Clarke is active in The Minerals, Metals & Materials Society (TMS), the Association for Iron & Steel Technology, and the Los Alamos Chapter of ASM International. She was the TMS Young Leader International Scholar in 2010 and received a TMS Young Leader Professional Development Award in 2008.

Mr. Derek R. Gaston
Idaho National Laboratory

OFFICE OF NUCLEAR ENERGY AWARDEE

For the development of a multi-physics simulation framework that enables the rapid creation of fast engineering simulation tools, for the application of this framework to the understanding of accident-tolerant and novel nuclear fuels, and for service to the scientific community.

For the past four years, Derek Gaston has led the Computational Frameworks group inside the Fuel Modeling and Simulation department at Idaho National Laboratory (INL). During this time, Derek and his team have developed the Multiphysics Object Oriented Simulation Environment (MOOSE) framework. This unique computational platform provides scientists and engineers with a rapid development environment for creation of new multiphysics simulation tools. When utilizing MOOSE scientists and engineers can focus on the physics they are trying to model while MOOSE applies modern, massively parallel numerical techniques for solution of the problem. More than twenty applications have already been built using MOOSE, modeling everything from nuclear fuel in a reactor to groundwater flow. Most of the national laboratories, many universities and several foreign science laboratories have acquired MOOSE licenses.

Before coming to INL, Derek held a position at Sandia National Laboratory (SNL) developing massively parallel verification and validation tools. While employed by SNL Derek received his M.S. in Computational Applied Mathematics from the University of Texas in Austin. His master's work focused on enhancement of computational frameworks for inclusion of advanced error estimation and mesh adaptivity techniques. Mr. Gaston's research is focused on making modern parallel computing accessible to a wide range of researchers.

Derek has authored or co-authored numerous papers in diverse areas such as: nuclear fuel simulation, geothermal modeling, chemical reactive transport, microstructure evolution, and multiscale simulation. In 2011 he received the INL Laboratory Director's Award for Early Career Exceptional Achievement for his work on MOOSE and in 2012 his team was honored with a Laboratory Director's Award for contributions to nuclear energy modeling and simulation.

Dr. Christopher Hirata
California Institute of Technology

OFFICE OF SCIENCE AWARDEE

For innovative work reducing astrophysical uncertainties that limit the extraction of fundamental physics parameters from cosmological observations, for studies of the sensitivity of structure formation to the relative velocity between dark matter and baryons in the early universe, and for service on NASA/DOE Joint Dark Energy Mission working groups.

Hirata is a professor at the California Institute of Technology, where he uses both theoretical and observational techniques to explore the origin, evolution, and large scale structure of the Universe.

Over the past 7 years, Hirata and his students have carried out highly accurate simulations of the recombination epoch – the period 300,000 years after the Big Bang when the Universe cooled off enough to become neutral and transparent to the cosmic microwave background (CMB). These calculations are critical to using the CMB to infer the initial conditions of the Universe and test models of inflation.

Hirata's group has also investigated the early stages of structure formation in the Universe. This program has resulted in a new understanding of how the first molecules in the Universe formed; a method to measure the masses of the galaxies that reionized the Universe, which may be implemented with the next generation of radio telescopes; and new statistical tests that can be used to search for primordial gravitational waves from CMB and galaxy survey data.

Hirata has worked extensively on image processing and data analysis software for galaxy surveys. His work in the Sloan Digital Sky Survey collaboration helped to "weigh" nearby galaxies and confirm the theoretically predicted relationship between their mass and large-scale spatial distribution. He is currently working on the design of future ground and space-based instruments to survey galaxies at earlier epochs in cosmic history, and use their statistical properties to probe the history of cosmic expansion.

Hirata was born in Ypsilanti, Michigan. He received his undergraduate education at the California Institute of Technology from 1997-2001, and completed his Ph.D. in physics at Princeton University in 2005. He was a postdoctoral fellow at the Institute for Advanced Study for two years before returning to the California Institute of Technology as an assistant professor.

Dr. Heileen Hsu-Kim
Duke University

OFFICE OF SCIENCE AWARDEE

For leading nanogeochemistry research to understand toxin subsurface transport establishing a new geochemical framework for predicting mercury methylation potential in contaminated sediments and for leadership in publishing and collaboration with synchrotron scientists in the United States and Europe.

Heileen Hsu-Kim is an Assistant Professor of Environmental Engineering at Duke University. She specializes in environmental chemistry and aquatic geochemistry. Her research is focused on trace element contaminants and the environmental processes that contribute to their mobilization and toxicity in water, soil, and sediments. She is a leading expert on sulfide nanogeochemistry of pollutant metals. Current research topics in her group include mercury biogeochemistry, environmental nanotechnology, and the environmental implications of coal ash disposal.

Hsu-Kim's DOE Early Career Award is supporting research on mercury nanogeochemistry and bioavailability in aquatic environments. The work aims to improve our ability to predict hazards related to mercury in water and soil environments and to generate information that can lead to lasting solutions for remediation. Mercury, particularly in the form of methylmercury, is a neurotoxic element that bioaccumulates in the food web of contaminated ecosystems and poses a risk for human health. This research seeks to characterize the geochemical forms of mercury that persist in polluted sediments and link this knowledge to their bioavailability towards microbes. Hsu-Kim's aim is to elucidate the nanoscale interactions between mercury, sulfide, and natural organic matter. These interactions are critical drivers of mercury geochemistry in the environment. This information will ultimately be used to establish a new framework for predicting methylmercury production in contaminated sediments.

Hsu-Kim earned a B.S. degree in environmental engineering science at MIT, and M.S. and Ph.D. degrees in environmental engineering from the University of California, Berkeley. Hsu-Kim trained as a postdoctoral fellow at the University of Delaware's School of Marine Science prior to joining the faculty at Duke University in 2005. Hsu-Kim was born and raised in Pittsburgh, Pennsylvania and is a daughter of first generation American immigrants from Taiwan.

Dr. Thomas Jaramillo
Stanford University

Office of Energy Efficiency and Renewable Energy

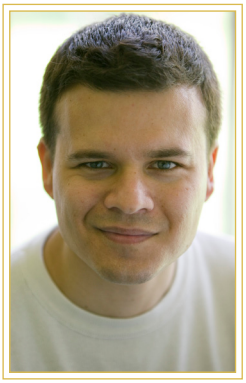
For innovations in solar hydrogen production, including using quantum confinement in molybdenum-disulfide nano-particles to enhance catalytic reactivity, for incorporating these catalysts into high-surface-area scaffolds, and for excellence in mentoring at the university level.

Thomas Francisco Jaramillo, from San Juan, Puerto Rico, is an Assistant Professor of Chemical Engineering at Stanford University. Prof. Jaramillo was nominated by the Office of Energy Efficiency and Renewable Energy at the Department of Energy for his innovations in energy-related technologies.

Prof. Jaramillo's research efforts are aimed at developing materials and processes that can accelerate energy-related chemical transformations with improved efficiency and durability. The overarching theme is the development of cost-effective, clean energy that can be produced domestically and with a positive impact to both the economy and the environment in the U.S. and across the globe. In pursuit of these goals, Prof. Jaramillo investigates the surface and bulk chemistry of materials, aiming first to produce fundamental knowledge regarding the physical and chemical phenomena at play, and then to leverage that insight to engineer materials with improved performance.

One of his primary research thrusts is the production of fuels and sustainable chemicals from renewable resources. By engineering materials at the nano-scale and at the atomic-scale, Prof. Jaramillo has revealed new insights into how materials work and also a means to control their properties. In his efforts to nanostructure molybdenum disulfide (MoS2), Prof. Jaramillo has developed active, stable catalysts that can produce hydrogen from water with high efficiency, while also tailoring their electronic band structure for direct solar photolysis. In related work, Prof. Jaramillo has been investigating next-generation transparent conducting oxide (TCO) materials, developing unprecedented high surface area TCO thin-films that will serve as a platform for a wide variety of energy technologies including batteries, supercapacitors, photovoltaics, and solar fuels.

Dr. Pablo Jarillo-Herrero
Massachusetts Institute of Technology



OFFICE OF SCIENCE AWARDEE

For pioneering research on quantum transport phenomena in graphene and topological insulators, which has expanded understanding of the fundamental electronic structure and laid a foundation for future energy applications, and outreach to the public through the popular press.

Professor Jarillo-Herrero's research interests lie in the area of experimental condensed matter physics. The basic electronic properties of most materials are described by quantum mechanics and its famed Schrödinger equation. Therefore it came as a surprise when a few years ago scientists realized of the existence of many materials whose electronic properties are better described by the Dirac equation of relativistic quantum mechanics, a theory normally used to describe particles moving near the speed of light in accelerators or in the cosmos. This novel behavior suggests radically new electronic properties with far-reaching consequences beyond the academic domain, including potential applications ranging from ultra-efficient energy harvesting devices to fault-tolerant quantum computation.

Jarillo-Herrero's research efforts are devoted to the exploration of novel quantum transport and optoelectronic phenomena emerging from the low-dimensionality and unique relativistic-like electronic structure of two such families of materials: graphene-based materials and topological insulators. An example of his research is the realization that the intrinsic optoelectronic response of graphene devices is based on a novel hot carrier photothermoelectric effect, rather than the usual photovoltaic effect of standard semiconductor solar cells. This novel mechanism may lead to the design of novel photodetectors and solar/thermal energy harvesting devices.

Pablo Jarillo-Herrero joined MIT as an assistant professor of physics in January 2008. He received his M.Sc. in physics from the University of Valencia, Spain, in 1999. Then he spent two years at the University of California in San Diego, where he received a second M.Sc. degree before going to the Delft University of Technology in The Netherlands, where he earned his Ph.D. in 2005. After a one-year postdoc in Delft, he moved to Columbia University, where he worked as a NanoResearch Initiative Fellow. His awards include the Spanish Royal Society Young Investigator Award (2007), an NSF Career Award (2008), an Alfred P. Sloan Fellowship (2009), a David and Lucile Packard Fellowship (2009), the IUPAP Young Scientist Prize in Semiconductor Physics (2010), and a DOE Early Career Award (2011).

Dr. Jesse Thaler
Massachusetts Institute of Technology

OFFICE OF SCIENCE AWARDEE

For innovative work exploring possible new physics beyond the Standard Model, for development of improved techniques for distinguishing events at the Large Hadron Collider involving new physics from those due to known interactions, and for developing tools that have helped train aspiring particle phenomenologists confronting the challenges of collider data.

Jesse Thaler is an Assistant Professor of Physics at the Massachusetts Institute of Technology (MIT). Dr. Thaler joined the MIT faculty in 2010 as a member of the Center for Theoretical Physics. From 2006 to 2009, he was a fellow at the Miller Institute for Basic Research in Science at the University of California, Berkeley. He received his Ph.D. in Physics from Harvard University in 2006, and his Sc.B. in Math/Physics from Brown University in 2002.

Dr. Thaler's research is in theoretical particle physics, with a particular focus on the Large Hadron Collider (LHC) experiment at CERN. The LHC is pushing the frontiers of scientific knowledge through high energy particle collisions. Dr. Thaler's research is aimed at finding new ways to use LHC data to address outstanding questions in fundamental physics, including the origin of mass, the nature of dark matter, the apparent weakness of gravity, and the symmetry structure of our universe.

In his work, Dr. Thaler analyzes the theoretical frameworks and possible LHC signatures for physics beyond the standard model. He is particularly interested in how the properties of dark matter might be tested at the LHC, and has proposed a scenario in which LHC measurements of dark matter would also provide insight into the structure of space-time. In addition, he works on methods to improve LHC data analysis, including new ways to measure and characterize jets, collimated sprays of particles that are copiously produced at the LHC. Dr. Thaler has authored over 45 papers on these and related topics, and he received an Early Career Research Award from the Department of Energy in 2011.

Dr. John R. Kitchin
Carnegie Mellon University

OFFICE OF FOSSIL ENERGY AWARDEE

For advances in electrochemical separations for carbon capture including the demonstration of alkaline ion exchange membranes for oxygen separation, for fundamental advances in computational simulation of metal catalyst reactivity, and for excellence in teaching, student mentoring, and introduction of computing into the engineering curriculum.

Dr. Kitchin is currently an Associate Professor in the Department of Chemical Engineering at Carnegie Mellon University with a courtesy appointment in the Materials Science and Engineering Department. His research focuses on catalysis and CO2 capture enabling technologies. He investigates the interactions of small molecules at metal and oxide surfaces and their impact on oxygen evolution electrocatalysis. He also develops methodologies to design new materials for solid oxide fuel cell electrodes and chemical looping applications, and solid sorbent and ionic liquid solvent development and characterization. Dr. Kitchin is actively involved in the National Energy Technology Laboratory Regional University Alliance, particularly in the area of CO2 capture enabling technologies. A distinguishing characteristic of Dr. Kitchin's research is his use of quantum chemical calculations and experimental studies to accelerate the rate of progress and understanding in his work.

Dr. Kitchin received his B.S. in Chemistry from North Carolina State University. After working for two years at Lord Corporation developing magnetorheological fluids and applications, he pursued a M.S. in Materials Science and then a Ph.D. in Chemical Engineering at the University of Delaware. He was an Alexander von Humboldt postdoctoral fellow at the Fritz-Haber-Institut der Max-Planck-Gesellschaft in Berlin, Germany before joining the faculty in the Department of Chemical Engineering at Carnegie Mellon University in 2006. Dr. Kitchin received the Kun Li Award for Excellence in Education in 2010. In 2010 he also won a Department of Energy Early Career Award to investigate multifunctional oxide electrocatalysts for the oxygen evolution reaction in water splitting using experimental and computational methods. He has given lectures at an international summer school on the use of quantum chemical calculations in modeling materials and their properties and invited lectures in courses on CO2 capture. He has published over 30 peer-reviewed papers, which have been cited over 1300 times.

Dr. Peter Mueller
Argonne National Laboratory

OFFICE OF SCIENCE AWARDEE

For scientific leadership in developing precision laser spectroscopy and atom trapping techniques resulting in groundbreaking insights on the charge radii of exotic light nuclei and the fundamental nature of the weak interaction via precise measurement of nuclear beta decay.

Peter Mueller received his PhD in Physics in 2003 from Johannes Gutenberg-University in Mainz, Germany. Following a postdoctoral appointment at Argonne National Laboratory and receiving Argonne's Willard Frank Libby Fellowship in 2005, he has been a scientific staff member in Argonne's Physics Division since 2007, and also an Affiliated Assistant Professor at the University of Washington, Seattle, since 2012.

Peter's research expertise lies in using laser spectroscopy and laser trapping techniques for fundamental and applied questions in nuclear physics. These reach from measuring the size of exotic nuclei, investigating fundamental interactions and symmetries, and detecting extremely rare isotopes in the environment. The latter societal application of laser spectroscopy in fact got Peter started in his research career as a student with the quest to rapidly detect strontium-90 in the environment, a radioactive isotope of particular interest following the 1986 Chernobyl accident. At Argonne, he is involved in research to use atom traps made out of laser light to capture and count individual atoms of rare, naturally occurring noble gas isotopes, such as krypton-81 and argon-39. These isotopes can be used as tracers to determine the age of old ground water and ice samples and to study Earth's climate history and drinking water resources.

In fundamental nuclear research, Peter led an experiment to measure the nuclear charge radii of the short-lived isotopes helium-6 and helium-8 using precision laser spectroscopy of one helium atom at a time captured in a laser trap. The results give insight into the fundamental interaction between protons and neutrons and provide precision benchmarks for nuclear theory. Peter received a Young Scientist Prize in Nuclear Physics by the International Union of Pure and Applied Physics in 2010 recognizing this work.

Currently, Peter is leading an experiment to precisely study the beta-decay of helium-6 atoms suspended in a laser trap and to search for telltale signs of new interactions beyond the Standard Model predictions. This work is supported by a DOE Office of Science Early Career Award he received in 2011.

Dr. Daniel B. Sinars
Sandia National Laboratories

OFFICE OF SCIENCE AWARDEE

For developing innovative techniques to study the properties of instabilities in magnetized-high-energy-density plasma, enabling quantifiable comparison between experiment and simulation needed for validating cutting-edge radiation-hydrodynamics codes, and for demonstrating substantial leadership qualities in high-energy-density-laboratory-plasma (HEDLP) physics.

Daniel Sinars is an experimental physicist in inertial confinement fusion and high energy density physics. Most of his research involves experiments on the Sandia "Z" machine, the world's largest pulsed power facility. Z takes electrical energy stored in capacitors and compresses it in both space and time, briefly creating electrical powers over one hundred times larger than the combined generating capacity of the United States. The resulting powerful currents and magnetic fields create a drive pressure more than 100 million times atmospheric pressure that allows the extreme conditions found inside the sun, large planets, and nuclear weapons to be produced in the laboratory. This pressure is also used to accelerate and compress deuterium fuel to create nuclear fusion.

Dr. Sinars is a leader in an experimental effort to assess whether magnetically driven targets can be used to produce high-yield, single-shot inertial confinement fusion in the laboratory. The research team has the goal of demonstrating scientific breakeven on Z during the next five years (more energy produced by fusion reactions from fuel than was put into the fuel). His most recent experiments used the powerful Z-Beamlet laser to image fundamental instabilities in cylindrical liner targets compressed by Z, using an x-ray radiography technique he implemented. He has over 85 refereed journal publications to date (23 as first author). He was the recipient of the IEEE Nuclear Plasmas Sciences Society Early Achievement Award in 2007 and the Department of Energy Early Career Research Program Award in 2011.

Dr. Sinars received a B.S. degree in Engineering Physics in 1996 from the University of Oklahoma, and a Ph.D. in Applied Physics from Cornell University in 2001. From 2001-present he has worked at Sandia National Laboratories, first as a staff member and since 2011 as the manager of the High Energy Density Experiments group.

Dr. Heather Whitley
Lawrence Livermore National Laboratory

DEFENSE PROGRAMS AWARDEE

For using path-integral Monte Carlo techniques to produce very accurate quantum statistical potentials for use in molecular dynamic codes, for applying these methods to first-principles understanding of thermal conductivity in ignition capsules for the National Ignition Facility, and for service to the laboratory Postdoctoral Association.

Heather Whitley is a Design Physicist in AX Division at Lawrence Livermore National Laboratory. She has contributed to the NNSA missions through her work as part of the National Boost Initiative. Whitley completed her graduate work in theoretical chemistry at the University of California, Berkeley prior to joining LLNL as a postdoctoral researcher in September 2007, working in the Quantum Simulations Group until October 2011.

Dr. Whitley's research activities are focused on using quantum simulations to understand the properties of matter, ranging from superfluids to plasmas. In her dissertation, she developed models to describe the electronic spectra of molecules in superfluid helium droplets. As a postdoc, she performed detailed simulations of the effects of surface features on the x-ray absorption spectra of cadmium selenide nanomaterials, which may eventually be used to develop new technologies for clean energy.

In addition to her work on nanomaterials, Whitley has been part of the Cimarron collaboration since 2009. As a part of this group, she has studied the properties of hot, dense plasmas relevant to inertial confinement fusion, contributing to models for incorporating the quantum mechanical properties of electrons in classical molecular dynamics simulations. Whitley is currently involved in developing new methods for describing transport properties and screening in single- and multiple- ionic component dense plasmas.

Dr. Whitley has a strong dedication to mentoring and contributing to the community. She has worked with summer students at LLNL and volunteers with organizations aimed at keeping women actively engaged in science and mathematics during their high school years. Whitley also helped to establish an active postdoctoral association at LLNL, with the goal of providing a peer advocacy group for postdocs. For those activities, she was recognized with an LLNL Institutional Operational Excellence Award in 2009.

Notes

Notes

U.S. Department of Energy
Early Career Award for Scientists and Engineers
Recipients by Year

	Office of Science Recipients	Office of Defense Programs Recipients
1996	Michael Smith John P. Hill Philip M. Jardine Christine Hartmann	Shenda M. Baker Richard A. Cairncross
1997	Andrew Brandt David J. Dean Lori A. Freitag David E. Newman John Shanklin	Bruno S. Bauer Thomas J. Matula
1998	Mari Lou Balmer James W. Lee Anthony Mezzacappa Gary P. Wiederrecht	Tonya L. Kuhl Roya Maboudian Christopher Palmer
1999	Kenneth M. Kemner John F. Mitchell Lynne E. Parker Xian Chen	Ken R. Czerwinski David M. Ford
2000	Richard B. Lehoucq Zhihongb Lin Zheng-Tian Lu Andrey Zheludev	Aaron L. Odom Jonas C. Peters
2001	Ian Anderson Vincent Cianciolo Mark Herrmann Jizhong Zhou	Kenneth A. Gall Paul Ricker Z. John Zhang
2002	Jeffrey C. Blackmon Edmond Chow Sergei Maslov Jonathan E. Menard Christine Orme	Carl Boehlert Krishnakumar Garikipati

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Early Career Award for Scientists and Engineers
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	Office of Science Recipients	Office of Defense Programs Recipients
2003	Tamara G. Kolda Saskia Mioduszewski Margaret S. Torn Jian Shen	Catherine M. Snelson Donald P. Visco, Jr. Brian D. Wirth
2004	John Arrington William Ashmanskas Hong Qin Robert B. Ross Paul Vaska Zhangbu Xu	Wei Cai William P. King Yunfeng Lu
2005	Daniel Bardayan Todd Munson Wynne Schiffer Yanwen Zhang	Christopher J. Roy Wendelin Wright Michael A. Zingale
2006	Kyle Cranmer Julia Laskin Ho Nyung Lee Len A. Pennacchio	Brian J. Kirby Jeffrey Kysar Shawn Newsam Carlos Pantano-Rubino
2007	Mickey Chiu Hooman Davoudiasl Bert Debusschere Jennifer S. Martinez Wei Pan Robin Santra Yugang Sun	Jeanine Cook
2008	Cecilia Aragon Gary Baker Joshua Breslau Gianluigi Ciovati Jason Graetz Stefan Gerhardt Jeffrey Neaton Paul Sorensen Alexandre Tartakovsky Ivan Vitev	Lynford Goddard Thao (Vicky) Nguyen

U.S. Department of Energy
Early Career Award for Scientists and Engineers
Recipients by Year

	Office of Science Recipients	Office of Defense Programs Recipients
2009	Eric D. Bauer Jeremy T. Busby Gavin E. Crooks Juan Estrada Dillon Fong Jacob M. Hooker De-en Jiang Sergei V. Kalinin Trent R. Northern Elena V. Shevchenko Jacob G. Wacker	Ilke Arslan Gianluca Iaccarino
2010	Christian W. Bauer Grigory Bronevetsky Carole Dabney-Smith David Erickson Daniel Fredrickson Christiane Jablonowski Alysia D. Marino Victoria J. Orphan Wei-Jun Qian Evgenya I. Simakov Feng Wang	Fotini Chow Gang L. Liu

Office of Science

National Nuclear Security Administration

Office of Electricity Delivery and Energy Reliability

Office of Energy Efficiency and Renewable Energy

Office of Fossil Energy

Office of Nuclear Energy

JAMES C. FORRESTAL BUILDING

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