PECASE

PRESIDENTIAL EARLY CAREER AWARDS FOR SCIENTISTS AND ENGINEERS

U.S. DEPARTMENT OF
ENERGY
Office of Science

AWARDS CEREMONY

We would like to thank the Department of Energy
Laboratories for the use of their images in the video for this ceremony

A G E N D A

Welcome

Opening Remarks

Remarks on the PECASE Awards

Presentation of the Awards

Closing Remarks

Group Photo

Reception Immediately Following

PECASE

The Presidential Early Career Award for Scientists and Engineers

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.

AWARDEES

Office of Science

Dr. Theodore A. Betley
Harvard University

Dr. Gary E. Douberly
University of Georgia

Dr. Mattan Erez
University of Texas, Austin

Dr. Sean A. Hartnoll
Stanford University

Dr. Daniel N. Kasen
University of California, Berkeley

Dr. Jennifer L. Reed
University of Wisconsin, Madison

National Nuclear Security Administration

Dr. Matthew R.W. Brake
Sandia National Laboratories

Dr. Miguel A. Morales
Lawrence Livermore National Laboratory

Dr. Seth Root
Sandia National Laboratories

Office of Electricity Delivery and Energy Reliability

Mr. Adrian R. Chavez
Sandia National Laboratories

Office of Energy Efficiency and Renewable Energy

Dr. Adam Z. Weber
Lawrence Berkeley National Laboratory

Office of Fossil Energy

Dr. Brian James Anderson
West Virginia University

Office of Nuclear Energy

Dr. Meimei Li
Argonne National Laboratory

Dr. Brian J. Anderson

West Virginia University

Office of Fossil Energy

For developing novel simulation techniques for energy production from methane hydrates; advances in the simultaneous use and sequestration of carbon dioxide in hydrates and geothermal systems; and strong commitment to university teaching and mentoring.

Brian J. Anderson is the Director of Strategic Research in Energy at West Virginia University and the GE Plastics Materials Engineering Professor in chemical engineering at West Virginia University (WVU). He has been a NETL-RUA Faculty Fellow at the National Energy Technology Laboratory since 2008 where he is the coordinator of the International Methane Hydrate Reservoir Simulator Code Comparison study. Dr. Anderson received his Bachelor's degree in chemical engineering in 2000 at WVU and his M.S. and Ph.D. in chemical engineering from the Massachusetts Institute of Technology in 2004 and 2005 respectively.

After joining the faculty at WVU in January of 2006, he coauthored the MIT report, "The Future of Geothermal Energy: Impact of Enhanced Geothermal Systems (EGS) on the United States in the 21st Century," considered the seminal report on EGS and the future of geothermal energy. He was awarded the College of Engineering and Mineral Resources New Researcher of the Year in 2007. In 2010, Dr. Anderson was selected to the National Academy of Science's 2010 Frontiers of Engineering Education Workshop, named the College of Engineering and Mineral Resources Teacher of the Year, and was the Opening Keynote speaker at the inaugural 2010 Gordon Research Conference on Gas Hydrates. In 2011, he was awarded an Honor Achievement Award from the Secretary of the Department of Energy for his role on the Flow Rate Technical Group, a team spanning multiple National Laboratories that worked in response to the Deepwater Horizon oil spill. He serves on the technical advisory board of AltaRock Energy and as a member of the DOE Geothermal Strategic Planning and Analysis Working Group. In the summer of 2011, along with colleagues from Stanford, MIT, Cornell, University of Utah, Southern Methodist University, and the University of Nevada, he cofounded the National Geothermal Academy. His research interests include molecular, reservoir, and multiscale modeling applied to energy and biomedical systems.

Dr. Ted Betley

Harvard University

Office of Science

For the design of an innovative class of polymetallic catalysts for the conversion of small molecules like carbon monoxide, carbon dioxide, and nitrogen into value-added chemicals, including fuels; and for developing an academic outreach program to increase minority representation in science.

Dr. Betley is a professor at Harvard University where his group specializes in the synthesis of metal-based catalysts that permit the activation and functionalization of the most inert chemical bonds in nature. In particular, he has focused on the conversion of small molecules (e.g. CO_2 or N_2) into useable chemical feed stocks or precursors for synthetic fuels. State-of-the-art small molecule activation catalysts typically require strong oxidants or reductants to engage substrate, incurring large overpotential costs (or wasted energy) that limits their utility. The group uses catalysts comprised of first-row transition metals to drive the multi-electron reactions required to break down strong chemical bonds without necessitating the use of strong oxidants or reductants.

His research has laid the foundation for altering reactivity and catalysis through modulation of electronic structure, or spin. Designing materials that are biased towards instability (e.g., facile ligand exchange, plasticity, and limited covalency) create reactive templates for discovering new catalytic processes. It has demonstrated the utility of this approach through the generation of base metal catalysts capable of functionalizing robust C–H bonds and through the construction of cluster reaction sites at the molecular level. In this latter context, his group exploited molecular attributes resulting from high-spin to achieve efficient multi-electron small molecule activation processes, cooperatively driven by polynuclear reaction sites.

Dr. Betley was born in Livonia, MI. He graduated from the University of Michigan with a degree in Chemical Engineering in 1999. Formative research experiences at the University of Michigan, Ford SciLab, Exxon, and IBM led him to pursue his doctoral training in chemistry at Caltech from 2000. Upon graduating in 2005, he moved to MIT as a postdoctoral fellow before taking a position at Harvard University in 2007.

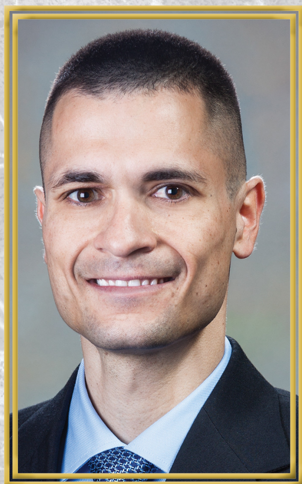
Dr. Matthew Brake
Sandia National Laboratories

National Nuclear Security Administration

For development of novel elastic-plastic impact models; methods for probabilistic and optimization analysis of nonlinear complex structures; and development of frameworks for coupled fluid-structure interactions.

Dr. Matthew Brake is a principal research scientist at Sandia National Laboratories, where he has been working since receiving his Ph.D. in Mechanical Engineering from Carnegie Mellon University in 2007. During his time at Sandia, Matthew has been elected to several leadership positions within the American Society of Mechanical Engineers (ASME), including as the secretary of the ASME Research Committee on the Mechanics of Jointed Structures, he has been a visiting academic at the University of Oxford, he has organized multiple international workshops and conferences, and he has been teaching at the University of New Mexico as a research assistant professor.

Dr. Brake's research involves collaborations across multiple disciplines of engineering: structural and nonlinear dynamics, solid mechanics, tribology, fluid mechanics, statistics, numerical methods, and applied mathematics. Within these disciplines, his primary research focuses on deriving the mathematical framework for reduced order models, and developing constitutive models for interfacial mechanics. Matthew has pioneered the inclusion of dual numbers, a branch of complex numbers based on the non-zero square root of zero, into numerical models, which allows for parameterized models of a system that can be used to study thousands of perturbations for an uncertainty or optimization analysis while only necessitating a single solid model of the system. This advance significantly reduces the computational time and man hours required for design and analysis of real systems. Matthew's research in interfacial mechanics has focused on both contact mechanics for high speed impact applications, and frictional energy dissipation in bolted structures. In particular, he has developed multi-national collaborations to discern the energy dissipation mechanisms in frictional events and to understand the variability and non-repeatability associated with bolted joints. He founded and directs the Sandia National Laboratories Nonlinear Mechanics and Dynamics Summer Research Institute, which is bringing together researchers from around the world to collaborate on problems germane to interfacial mechanics.



Mr. Adrian Chavez
Sandia National Laboratories

Office of Electricity Delivery and Energy Reliability

For pioneering trust anchor computational algorithms that enhance energy-sector cybersecurity through provably secure obfuscation of energy delivery software; leadership in interoperable secure communications among energy delivery control system devices; and community outreach to under-represented, at-risk students.

Mr. Adrian Chavez is a principal member of technical staff at Sandia National Laboratories. Adrian was nominated by the Office of Electricity Delivery & Energy Reliability at the Department of Energy for his cybersecurity innovations in energy delivery systems.

Adrian specializes in cybersecurity focused on enhancing the security of our nation's critical infrastructure systems. Adrian has developed an architecture for these systems that provides end-to-end cryptographically secure communications, secure remote engineering access, high fidelity execution of critical software, built-in situational awareness and a framework that is capable of harnessing next generation security technologies. His research has resulted in several publications and commercial products that interoperate with one another and that can be found fielded in the energy sector today.

Additionally, Adrian regularly volunteers his time to mentor, teach, and increase interest in STEM related fields for the next generation of scientists and engineers. His volunteer activities span the entire spectrum of education levels beginning with kindergarten to graduate students. He has taught students about computer hardware and software, how to program and interact with embedded devices, and how to defend and securely configure computer systems.

Adrian earned a B.S. degree in computer science from the University of New Mexico, an M.S. degree in computer science from the University of Colorado at Boulder and is now a Ph.D. computer science student at the University of California, Davis. Adrian is currently researching moving target and dynamic defense techniques to provide additional protections within a control system environment.

Dr. Gary Douberly

University of Georgia

Office of Science

For foundational spectroscopic studies of previously unobserved, complex, hydrocarbon combustion intermediates critical to the understanding of ignition and soot formation; and for service to undergraduates and the scientific community.

Dr. Gary Douberly was nominated by the Gas Phase Chemical Physics program of the Chemical Sciences, Geosciences, & Biosciences division of the DOE Office of Science for his work on the isolation and stabilization of transient combustion intermediates in ultra-low temperature superfluid helium droplets. Dr. Douberly has made significant contributions to the development of helium nanodroplet isolation spectroscopy, a novel technique where droplets of liquid helium freeze out high energy metastable configurations of a reacting system, permitting laser spectroscopic characterizations of products and intermediates that result from hydrocarbon radical reactions with molecular oxygen and other small molecules relevant to combustion environments. The majority of these transient species have never been directly observed in traditional spectroscopy experiments. Dr. Douberly's research group is developing methods to carry out the first direct observation of the elusive hydroperoxyalkyl radical (QOOH) and its oxygen adducts (O_2QOOH), which are important in the low temperature hydrocarbon oxidation chemistry associated with homogeneous charge compression ignition (HCCI) engines. These studies aim to improve our understanding of the detailed mechanisms of hydrocarbon combustion, resulting in more accurate predictive combustion models.

Dr. Douberly received a B.S. degree in Chemistry from the University of Central Florida in 2000 and a Ph.D. in Physical Chemistry from the University of North Carolina at Chapel Hill in 2006 under the direction of Roger E. Miller and Tomas Baer. Following postdoctoral work with Michael A. Duncan at the University of Georgia, he began his faculty appointment at the University of Georgia in 2008. In addition to the Early Career Research Program Award from the DOE Office of Science, Professor Douberly has received the Rao Prize, the CAREER award from the National Science Foundation, and the Journal of Physical Chemistry Lectureship Award.

Dr. Mattan Erez
University of Texas, Austin

Office of Science

For innovative research to overcome severe reliability obstacles in using advanced computer architectures for scientific discovery, and for dedicated service and professional leadership in the scientific computing community.

Dr. Mattan Erez is an Associate Professor at the Department of Electrical and Computer Engineering at the University of Texas at Austin. His research focuses on improving the performance, efficiency, and scalability of computing systems through advances in processor architecture, software systems, and programming models. His vision is to increase the cooperation across system layers and develop flexible and adaptive mechanisms for proportional resource usage. His work demonstrates the potential improvements in energy efficiency and performance that are enabled by breaking traditional layered system interfaces and provides foundations for more cooperative, adaptive, and flexible computers.

Most recently, his work has explored new directions in system resilience from programming models, through runtime systems, to architecture and circuits. The goal of this effort is to overcome the reliability bound to scalability and enable efficient scientific computing at extreme scales. He is leading the development of the Containment Domains framework for application and system resilience, which provides a concise set of abstractions that can be consistently used to express resilience needs at the application level and provide resilience mechanisms and actions across the system stack. This is a vertically-integrated research effort that includes programming model, programming and analysis tools, runtime system, processor and memory architecture, and circuit components.

Mattan earned a B.Sc. in Electrical Engineering and a B.A. in Physics from the Technion, Israel Institute of Technology in 1999. As an undergraduate student, he worked as a computer architect in the Intel Israel Processor Architecture Research team, where he contributed to several patents and research papers. He joined the University of Texas at Austin in 2007 after earning his M.S. and Ph.D. in Electrical Engineering at Stanford University. While at Stanford, he worked on multiple aspects of high-performance computer systems as a member of the Merrimac Streaming Supercomputer project and the Brook and Sequoia programming model projects. Mattan is a recipient of an NSF CAREER Award and a DOE Early Career Research Award.

Dr. Sean Hartnoll

Stanford University

Office of Science

For innovative research in high-energy string theory applied to condensed matter physics, and for exploiting the connection offered by "holographic duality" between classical gravitational space-time and quantum condensed matter systems to explore quantum gravity theory and solid state physics.

Dr. Sean Hartnoll is an assistant professor of physics at Stanford University. He did his undergraduate and graduate studies at Cambridge University, in the UK, earning his Ph.D. in 2005. He was a postdoctoral researcher at the Kavli Institute for Theoretical Physics in Santa Barbara and subsequently at Harvard University. He took up his position at Stanford University in 2011.

Dr. Hartnoll is a theorist working on a newly emerging interface between gravitational physics and exotic phases of low temperature matter. This connection builds upon the `holographic correspondence', which is among the most surprising results to emerge from string theory in recent years. The correspondence implies that the gravitational dynamics of black hole event horizons can be equivalently formulated as the dissipative dynamics of strongly correlated matter. This equivalence simultaneously offers to shed light on mysterious aspects of black hole physics and also to provide a new computationally tractable window into strongly correlated quantum matter such as high temperature superconductors.

Dr. Hartnoll has published around 70 papers on topics ranging from quantum gravity and the emergence of spacetime to the transport of electrons in exotic materials. He has given lectures at a large number of conferences and schools on five continents. He is the recipient of an Alfred P. Sloan Fellowship (2011) and a DOE Early Career Award (2012).

Dr. Daniel Kasen

University of California, Berkeley

Office of Science

For advances in the use of high-performance computing to model the transport of radiation in stellar explosions; connecting the theory of such phenomena to astrophysical observables; and service in support of summer schools and the computational physics community.

Dr. Daniel Kasen is an assistant professor in the Physics and Astronomy Departments at the University of California, Berkeley, and a faculty scientist in the Nuclear Science Division at Lawrence Berkeley National Laboratory. His research in theoretical and computational astrophysics focuses on supernovae, neutron star mergers, and other stellar explosions, with an interest in how these phenomena intersect with fundamental questions in physics and cosmology. Stellar explosions are laboratories of extreme states of dense, hot matter, and are strong sources of gravitational waves; they are used as tools for measuring cosmological dark energy, and are the sites within which the heavy elements in the Universe were synthesized.

Dr. Kasen's group uses high performance supercomputer calculations to simulate the dynamics, nuclear physics, and radiation transport in stellar explosions, providing a means to connect theoretical models with terrestrial experiments and astronomical observations. His studies of white dwarf disruptions have illuminated the origins of thermonuclear supernovae, and helped clarify their utility as tools for measuring the expansion of the Universe. He has also developed theories of massive star explosions thought to explain some of the most luminous supernovae in the Universe. His predictions of the visible appearance of neutron star mergers have guided experimental searches for these events, offering a means to localize gravitational wave sources and measure the production of heavy elements.

Dr. Kasen received his undergraduate degree from Stanford University, and his Ph.D. in physics from UC Berkeley. He was the Alan C. Davis postdoctoral fellow at the Johns Hopkins University, and a Hubble postdoctoral Fellow at UC Santa Cruz. He joined the faculty at UC Berkeley in 2010.

Dr. Meimei Li
Argonne National Laboratory

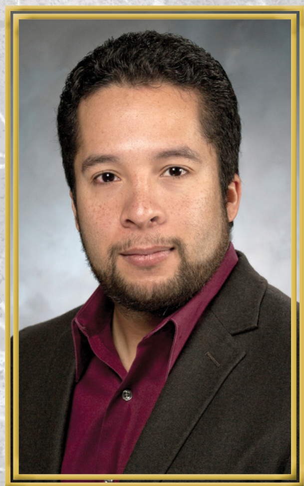
Office of Nuclear Energy

For advances in the development and qualification of structural materials for advanced nuclear reactors, including through tests of sodium compatibility; the development of mechanistic models of creep-fatigue interaction and microstructure changes of advanced materials; and service to the scientific community.

Dr. Meimei Li joined the Nuclear Engineering Division at Argonne National Laboratory as a research staff in 2008. Before coming to Argonne, she was a postdoctoral associate in the Materials Science and Technology Division at Oak Ridge National Laboratory. She had previously worked at the China Institute of Atomic Energy before she came to the United States. She received her B.S. degree in Materials Science and Engineering from Shanghai Jiao-tong University, China, and her M.S. and Ph.D. degrees in Nuclear Engineering from the University of Illinois at Urbana-Champaign.

Dr. Li's research focuses on materials in advanced nuclear energy systems. Her research seeks to understand the behavior of nuclear reactor materials using advanced characterization techniques and modeling tools to predict materials' long-term performance in extreme irradiation, temperature, and corrosive environments and develop high-performance materials for advanced nuclear systems. During her tenure at Argonne, she has made significant contributions to the DOE advanced reactor technologies, moving rapidly into a leadership role for the development, testing, and characterization of advanced materials that hold the promise for flexibility in design and significant improvement in the performance of next-generation reactors. She has also made advances in bridging materials science approaches with high temperature structural design, a paradigm shift, that hold great potential to impact the design and safe operation of advanced reactor systems.

Her leading contributions also include pursuing a new research direction in the prediction of neutron damage through in situ ion irradiations coordinated with computer simulations, and establishing new capabilities for investigating radiation damage and effects on mechanical properties using electron beams and high-energy synchrotron radiation. At Argonne, she used high energy X-rays and TEM with in situ ion irradiation to probe the structure of a material from the atomic to mesoscale and study the dynamics of microstructural evolution in situ under extreme conditions.



Dr. Miguel A. Morales

Lawrence Livermore National Laboratory

National Nuclear Security Administration

For development of ab-initio quantum simulations and their application to the evaluation of phase separation in hydrogen-helium mixtures, and for simulations showing first-order liquid-liquid transitions in hydrogen at high pressures.

Dr. Miguel A. Morales is a Research Scientist at Lawrence Livermore National Laboratory (LLNL) in the Condensed Matter and Materials Division. His research focuses on the development, implementation and application of first-principles simulation methods for materials under extreme conditions. His work combines advanced electronic structure methods with high performance computing, leading to powerful tools that can take advantage of some of the world's most powerful computers. One of the main goals of his research is the development of computational tools with high predictive capability, enabling the accurate calculation of material's properties purely from fundamental equations. His main interests lie in the study of materials at high pressures and temperatures, relevant to the study of giant planets, to the nation's nuclear stockpile and to the inertial confinement fusion program.

Dr. Morales' early research focused on the properties of hydrogen and helium under extreme conditions, similar to those found on Jovian planets like Jupiter and Saturn. His work shed new light on two long-standing problems related to the existence of phase transitions in the liquid phase and to the mixing properties of these elements at high pressure. His current research is focused on the study of the combined influence of electron correlation and nuclear quantum effects on dense materials and on the study of strong electron correlation on materials composed of heavy elements.

Dr. Morales was born and raised in Puerto Rico. He earned a double B.S. degree in theoretical physics and mathematics from the University of Puerto Rico at Mayagüez in 2004. He earned his Ph.D. in 2009 from the University of Illinois at Urbana-Champaign, where he was a first-generation and first alumnus of the DOE Stewardship Science Graduate Fellowship program. Morales spend a year as a postdoctoral research assistant at Rice University before joining LLNL in 2010.

Dr. Jennifer Leanne Reed

University of Wisconsin, Madison

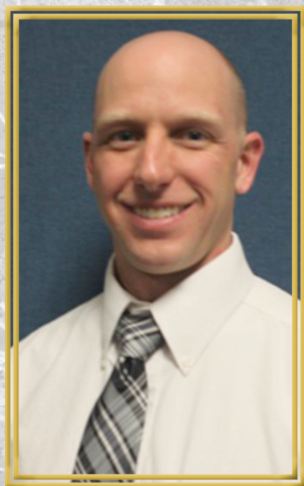
Office of Science

For leading systems biology research integrating computational simulation with genome-based experimental design to produce biofuels directly from sunlight and carbon dioxide using a photosynthetic cyanobacterium, and for community leadership through publication, mentoring, and broad scientific outreach.

Dr. Jennifer Leanne Reed is an Associate Professor of Chemical and Biological Engineering at the University of Wisconsin-Madison, and is also a project lead in the Great Lakes Bioenergy Research Center at the University of Wisconsin-Madison. Reed was nominated by the Office of Science (BER) at the U.S. Department of Energy.

Dr. Reed uses both experimental and computational approaches to study biological networks at a systems level, in order to understand, predict and manipulate cellular behaviors. Using mathematical models of microbial metabolism and regulation her research group designs experiments, analyzes genome-scale datasets, and identifies metabolic and regulatory changes needed to produce chemicals from renewable resources. Her DOE Early Career Award focuses on developing and applying systems biology tools to engineer strains of cyanobacteria for advanced biofuel production. Cyanobacteria offer a promising route for directly converting solar energy and CO_2 into biofuels. This research integrates modeling and experimental approaches to quantify metabolic fluxes in cyanobacteria and to identify genetic engineering strategies for improving butanol production by these strains.

Dr. Reed was born and raised in California. She received a B.S. in Bioengineering: Biotechnology and a Ph.D. in Bioengineering at the University of California, San Diego. After completing her Ph.D. she spent two years as a Faculty Fellow at the University of California, San Diego where she conducted research and taught classes in the Department of Bioengineering. Reed has enjoyed working with graduate students, undergraduate students and post docs at UW Madison and UCSD and is inspired by their creativity, enthusiasm for research, and eagerness to push scientific boundaries.



Dr. Seth Root

Sandia National Laboratories

National Nuclear Security Administration

For inventing capabilities and experimental techniques for precision measurements of cryogenic fluids at extreme pressures; high-pressure measurements of uranium, oxides, energetic compounds, and other materials; and pioneering analysis techniques for uncertainty evaluation.

Dr. Seth Root is an experimental physicist in shock wave physics and material science. His research involves performing experiments using Sandia's "Z" machine, the world's largest pulsed power facility. The Z machine takes electrical energy stored in capacitors and compresses in both space and time to deliver a multi-mega amp current to a target. The target geometry is designed so that the Z current pulse travels in a loop, creating a strong magnetic field. The combination of current pulse and magnetic field produces a force capable of accelerating solid flyer plates up to 90,000 mph. The flyer plate impacts a sample creating a shock wave that generates extreme pressure and temperature in the sample.

Dr. Root's research has focused on understanding the high-pressure behavior of noble gases cryogenically cooled to an initial liquid state. Previous data on noble liquids were limited because their low impedance makes it difficult to shock compress samples to extreme pressures. Using the Z machine, Dr. Root shock compressed the liquids up to 9 million atmospheres – the highest pressures ever attained on these liquids. The experiments elucidated the electronic behavior at extreme conditions. In addition, Dr. Root is investigating geological materials under pressure, such as magnesium oxide. The results of this work have produced accurate equation of state data up to 11 million atmospheres and have shown the existence of two phase transitions. The data help researchers to understand impact scenarios for planetary and lunar formation.

Dr. Root earned his B.S. and M.S. degree in physics from the University of Nebraska – Lincoln in 2000 and 2002. In 2007, he earned his Ph.D. from the Institute for Shock Physics at Washington State University where his thesis work examined the time-dependent chemical processes in shock compressed liquid benzene. Since graduating, Dr. Root has been a staff member at Sandia National Laboratories in the Dynamic Materials Properties group.

Dr. Adam Z. Weber

Lawrence Berkeley National Laboratory

Office of Energy Efficiency and Renewable Energy

For innovations in modeling and analysis of water and thermal management in polymer electrolyte fuel cells; the development of diagnostic techniques for fuel cells relevant to cathode flooding and freeze kinetics; and leadership in coordinating scientific collaborations.

Dr. Adam Z. Weber holds B.S. and M.S. degrees from Tufts University, the latter under the guidance of Professor Maria Flytzani-Stephanopoulos. Next, he earned his Ph.D. at University of California, Berkeley in chemical engineering under the guidance of John Newman. His dissertation work focused on the fundamental investigation and mathematical modeling of water management in polymer-electrolyte fuel cells.

Dr. Weber continued his study of water and thermal management in polymer-electrolyte fuel cells at Lawrence Berkeley National Laboratory, where he is now a staff scientist. His current research involves understanding and optimizing fuel-cell performance and lifetime including component and ionomer structure/function studies using advanced modeling and diagnostics, understanding flow batteries for grid-scale energy storage, and analysis of solar-fuel generators where he is a Team Leader for Modeling and Simulation at the Joint Center for Artificial Photosynthesis (JCAP).

Dr. Weber has authored over 50 peer-reviewed articles and 9 book chapters on fuel cells, flow batteries, and related electrochemical devices, developed many widely used models for fuel cells and their components, and has been invited to present his work at various international and national meetings including the Gordon Research Conference on Fuel Cells, the Special Invitation Session at FC Expo 2007, and eight keynote/invited lectures at national society meetings. He has also been the recipient of a number of awards including a Fulbright scholarship to Australia, the 2008 Oronzio and Niccolò De Nora Foundation Prize on Applied Electrochemistry of the International Society of Electrochemistry, and the 2012 Supramaniam Srinivasan Young Investigator Award of the Energy Technology Division of the Electrochemical Society. Dr. Weber is also on the Editorial Board of the Journal of Applied Electrochemistry and is current chair of the Energy Technology Division of the Electrochemical Society.

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

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
2003	Tamara G. Kolda Saskia Mioduszewski Margaret S. Torn Jian Shen	Catherine M. Snelson Donald P. Visco, Jr. Brian D. Wirth

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

	Office of Science Recipients	Office of Defense Programs Recipients
2004	John Arrington William Ashmanskas Hong Qin Robert B. Ross Paul Vaska Zhan gbu 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

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

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

2011
Christopher Hirata
Heileen Hsu-Kim
Pablo Jarillo-Herrero
Peter Mueller
Daniel B. Sinars
Jesse Thaler

Office of Defense Programs Recipients

2009
Ilke Arslan
Gianluca Iaccarino

2010
Fotini Chow
Gang L. Liu

2011
Amy J. Clarke
Jeffrey W. Banks
Heather Whitley

Office of Electricity Delivery and Energy Reliability
Stanley Atcitty

Office of Energy Efficiency and Renewable Energy
Thomas Jaramillo

Office of Fossil Energy
John R. Kitchin

Office of Nuclear Energy
Derek R. Gaston

NOTES

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

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