

# APS Announces Spring 2013 Prize and Award Recipients

Thirty-nine prizes and awards will be presented during special sessions at three spring meetings of the Society: the 2013 March Meeting, March 18-22, in Baltimore, MD, the 2013 April Meeting, April 13-16, in Denver, CO, and the 2013 Atomic, Molecular and Optical Physics Meeting, June 3-7, in Quebec City, Quebec, Canada.

Citations and biographical information for each recipient follow. The Apker Award recipients appeared in the December 2012 issue of *APS News* (<http://www.aps.org/programs/honors/awards/apker.cfm>).

Additional biographical information and appropriate web links can be found at the APS web site (<http://www.aps.org/programs/honors/index.cfm>). Nominations for most of next year's prizes and awards are now being accepted. For details, see pages 8 of this insert.

## 2013 Prizes, Awards and Dissertations

### 2013 PRIZES, AWARDS & DISSERTATIONS

#### Will Allis Prize for the Study of Ionized Gases

(Not awarded in 2013)

#### Hans A. Bethe Prize

George M. Fuller

University of California, San Diego

**Citation:** "For outstanding contributions to nuclear astrophysics, especially his seminal work on weak interaction rates for stellar evolution and collapse and his pioneering research on neutrino flavor-mixing in supernovae."

George Fuller is Distinguished Professor of Physics at the University of California, San Diego, and the Director of the Center for Astrophysics and Space Sciences (CASS) there. Fuller's work has revolved around the interplay of the weak interaction, nuclei, and gravitation in the cosmos. The recent focus of his work has been on neutrino physics, in particular the role of neutrino mass and flavor mixing in the early universe and in core collapse supernovae, the synthesis of the light and heavy nuclei, and cosmology.



#### Tom W. Bonner Prize in Nuclear Physics

Michael K. Moe

University of California, Irvine

**Citation:** "For his leadership in the first observation of the rare process of two neutrino double beta decay, where his creative contributions were instrumental to its successful detection and transformed the field."

Michael Moe received his bachelor's degree from Stanford University in 1959. Graduate work under Frederick Reines at Case Institute of Technology led to a PhD in 1965. He spent a year as a postdoc at Caltech, doing cloud-chamber studies of high-energy cosmic-ray interactions.



In 1966 he moved to the University of California, Irvine, where he recognized that a cloud chamber would mitigate a troublesome  $^{214}\text{Bi}$  background. Moe designed a TPC for double beta decay to finally see the first solid evidence of two-neutrino decay in  $^{82}\text{Se}$  in 1987.

His group went on to measure this rare decay in  $^{48}\text{Ca}$ ,  $^{100}\text{Mo}$ , and  $^{150}\text{Nd}$ . In a 1991 paper outlined steps toward the vast increase in sensitivity needed for a serious search for neutrinoless decay.

Moe retired from UCI in 1997, but remains a member of EXO.

#### Herbert P. Broida Prize

Daniel M. Neumark

University of California, Berkeley

**Citation:** "For his pioneering work in reaction and cluster dynamics using transition state spectroscopy and time-resolved femtosecond photoelectron spectroscopy."

Daniel Neumark was an undergraduate at Harvard University, where he earned a BA in Chemistry and Physics and an MA in Chemistry in 1977. He was a graduate student at the University of California, Berkeley and received his PhD in 1984.



He then carried out post-doctoral research at the University of Colorado, Boulder. In 1986, he joined the Chemistry Department at U.C. Berkeley as an Assistant Professor, where he still resides. He is best known for experiments in which he used negative ion photodetachment to probe and characterize the transition state of chemical reactions, and for the development of time-resolved photoelectron spectroscopy of negative ions. He was Director of the Chemical Sciences Division at Lawrence Berkeley National Laboratory from 2000-2010. He is currently Chair of the Chemistry Department at Berkeley.

#### Oliver E. Buckley Condensed Matter Physics Prize

Luc Berger

Carnegie Mellon University

John Slonczewski

Stanford University

**Citation:** "For predicting spin-transfer torque and opening the field of current-induced control over magnetic nanostructures."

Luc Berger was born in 1933 and is now an emeritus professor of Physics at Carnegie Mellon. He received his BSc in Mathematical Sciences at the University of Lausanne in 1955 and his PhD in 1960. He did his postdoctoral research fellowship with help from the Swiss National Science Foundation at Carnegie Mellon University from 1960 through 1961 and was an instructor there until 1963. He was an assistant professor of physics at CMU until 1967, then an associate professor until 1973. He was a visiting associate professor at UCLA in 1973 and 1974 before returning to CMU to become a Professor of Physics until 1995 when he became a professor emeritus.



John Slonczewski received the Physics BS at Worcester Polytechnic Institute in 1950 and the Physics PhD at Rutgers University in 1955. He pursued solid-state theory as Research Staff Member in IBM from 1955 until retiring in 2002.



His research in solids included fundamental theories of graphite bands, dynamic Jahn-Teller effect, and structural phase transitions. But he mostly concentrated on magnetism, including magnetic anisotropy, dynamics of bubble domains, magnetoresistance and spin-transfer torque between magnetic films separated by tunnel barriers or metallic spacers, dynamics of magnetic vortices, and exchange interactions between films. Some of this work contributes critically to magnetic-memory initiatives. At times, he managed groups of general theorists and magnetism experimentalists. His personal research today involves thermally-driven spin transfer.

#### Davison-Germer Prize in Atomic or Surface Physics

Geraldine L. Richmond

University of Oregon

**Citation:** "For elegant elucidation of molecular structure and organization at liquid-liquid and liquid-air interfaces, using nonlinear optical spectroscopies."

Geraldine (Geri) Richmond is the Richard M. and Patricia H. Noyes Professor in the Department of Chemistry at the University of Oregon. She received her BS degree in chemistry from Kansas State University in 1975 and PhD degree from UC Berkeley in physical chemistry in 1980. Her fundamental research in understanding the chemistry and physics that occurs at complex surfaces and interfaces has relevance to important problems in energy production, environmental remediation and atmospheric chemistry. She is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and currently serves as a Presidential Appointee to the National Science Board. Her professional service and workforce development activities including Co-Founder and Director of COACH have earned her numerous awards.



#### Max Delbrück Prize in Biological Physics

(Not awarded in 2013.)

#### Einstein Prize

Irwin I. Shapiro

Harvard-Smithsonian CFA

**Citation:** "For his contributions to experimental solar system tests of relativistic theories of gravity, and in particular for proposing and measuring the Shapiro time delay effect."

Irwin Shapiro graduated in 1950 from Cornell University with a BA in mathematics, and in 1955 from Harvard with a PhD in physics. He worked at the MIT Lincoln Laboratory from 1954 until 1970; from 1967 until 1985 he was professor of earth and planetary sciences and professor of physics at MIT, becoming Schlumberger professor in 1980; he became emeritus in 1985. Starting in 1982 until the present, he has been a professor of astronomy and a professor of physics at Harvard, and a senior scientist at the Smithsonian Institution. From 1983 through mid 2004, he was the director of the Harvard-Smithsonian Center for Astrophysics. His research centered on the use of radio and radar techniques for testing general relativity, and for studying the earth and planets, as well as stars and quasars. He has also been deeply involved in pre-college science education.



#### Fluid Dynamics Prize (2012)

John F. Brady

California Institute of Technology

**Citation:** "For his seminal contributions to the rheology of 'complex fluids', for creating the Stokesian Dynamics technique for predicting the macroscopic properties of concentrated suspensions under shear, and for his services to Fluid Dynamics as Associate Editor and Editor, respectively, of two top journals."

John F. Brady is the Chevron Professor of Chemical Engineering and Professor of Mechanical Engineering at the California Institute of Technology. He received his BS in chemical engineering from the University of Pennsylvania in 1975, which was followed by a year at Cambridge University as a Churchill Scholar. He received both an MS and PhD in chemical engineering from Stanford University, the latter in 1981. Following a postdoctoral year in Paris at ESPCI, he joined the Chemical Engineering department at MIT. Brady moved to Caltech in 1985. Brady's research interests are in the mechanical and transport properties of two-phase materials, especially complex fluids such as biological liquids, colloid dispersions, suspensions, porous media, etc. His research combines statistical and continuum mechanics to understand how macroscopic behavior emerges from microscale physics.



#### Dannie Heineman Prize for Mathematical Physics

Michio Jimbo

Rikkyo University

Tetsuji Miwa

Kyoto University

**Citation:** "For profound developments in integrable systems and their correlation functions in statistical mechanics and quantum field theory, making use of quantum groups, algebraic analysis and deformation theory."

Michio Jimbo received his BS in 1974 from University of Tokyo and his PhD in 1986 from Kyoto University. During 1976-1988 he was research associate at RIMS, Kyoto University, in the group of Mikio Sato. In 1988 he became associate professor of Department of Mathematics, Kyoto University, where he became full professor. In 2000 he moved to University of Tokyo. As of 2009 he is professor at Rikkyo University. Michio Jimbo is known for his contributions in integrable systems, which include the Ising model and monodromy preserving deformation theory, transformation groups for soliton equations, and correlation functions of the XXZ spin chain. During the study of the Yang-Baxter equation he introduced the Drinfeld-Jimbo quantum groups. Understanding fermionic basis of local fields and their expectation values has been the theme of his latest researches.



Tetsuji Miwa graduated from University of Tokyo in 1971, got diploma in Mathematics from University of Tokyo in 1973, and PhD from Kyoto University in 1981. In 1973, he moved to the Research Institute for

Mathematical Sciences, Kyoto University and joined the activity of the Sato school. He collaborated with Mikio Sato and Michio Jimbo on the isomonodromic deformation theory and its application to the 2-dimensional Ising model. Miwa is widely recognized by his work on solitons and exactly solvable lattice models in connection with the representation theory of the affine Lie algebras, and on correlation functions of quantum spin chains in connection with the representation theory of the quantum affine algebras. These works are joint works with Jimbo, with whom he was awarded the Heineman prize. Since 1993 he is Professor at Kyoto University, in RIMS (~2000) and in Math Department (2000~).



#### Frank Isakson Prize for Optical Effects in Solids

(Not awarded in 2013)

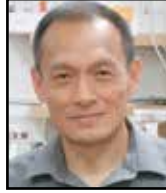
#### Irving Langmuir Prize

Wilson Ho

University of California, Irvine

**Citation:** "For his development and application of transformative experiments that have allowed the visualization of physical and chemical phenomena within molecules at the atomic scale."

Wilson Ho received his BS and MS degrees in chemistry from the California Institute of Technology in 1975, and his PhD in physics from the University of Pennsylvania in 1979. He spent a year at the AT&T Bell Laboratories and was on the faculty at Cornell University prior to joining the University of California, Irvine in 2000. Over the last 15 years, he has used homemade scanning tunneling microscopes (STM) to investigate single atoms, molecules, and artificial nanostructures on solid surfaces. His key discoveries include the realization of inelastic electron tunneling spectroscopy and microscopy of molecule vibrations, spin excitations, and light emission in the interior of single molecules. Some of his research results have appeared in textbooks.



#### Julius Edgar Lilienfeld Prize

Margaret Geller

Harvard-Smithsonian CFA

**Citation:** "For her pioneering work leading to the discovery of the large-scale structure of the universe and for her extraordinary contributions to science education of diverse audiences around the world."

Margaret Geller received her BA (physics) from UC Berkeley in 1970 and her PhD from the Princeton University physics department in 1975. She joined the permanent staff of the Smithsonian Astrophysical Observatory (part of the CFA) in 1983.



Geller is best known for her pioneering maps of the distribution of galaxies in the nearby universe. Together with COBE observations of fluctuations in the microwave background, these maps profoundly changed the view of large-scale structure in the universe. Geller has also made substantial contributions to the study of galaxies and their environment. She has developed and applied techniques for measuring the matter distribution in clusters of galaxies. She is currently working on a deeper map of the galaxy distribution called HectoMAP.

### Table of Contents

- |   |                                        |
|---|----------------------------------------|
| 1 | Prize and Award Recipients             |
| 5 | New APS Fellows                        |
| 8 | Nominations for 2014 Prizes and Awards |

## James Clerk Maxwell Prize for Plasma Physics (2012)

Liu Chen

University of California, Irvine

**Citation:** "For seminal contributions to plasma theory, including geomagnetic pulsation, kinetic Alfvén wave, toroidal Alfvén eigenmode, fishbone oscillation and energetic particle mode, nonlinear dynamics of drift wave, and nonlinear gyrokinetic equation."

Liu Chen received his Bachelor's degree from National Taiwan University in 1966, and his PhD from University of California at Berkeley in 1972. From 1972 to 1974, he was a post-doctoral staff member at Bell Laboratories. In 1974, he joined Princeton Plasma Physics Laboratory as a research scientist, and, later, also became a faculty member in the Department of Astrophysical Sciences. In 1993, he was appointed a Full Professor in the Department of Physics and Astronomy of University of California at Irvine, and, in March 2012, became an Above-Scale Professor Emeritus. Currently, he is a Professor of Physics and the Director of Institute for Fusion Theory and Simulation of Zhejiang University, Hangzhou, China. His current research is focused on waves, instabilities, and turbulence in magnetized laboratory and space plasmas, as well as nonlinear dynamics of coherent high-power radiation devices.



## James C. McGroddy Prize for New Materials

John B. Pendry  
Imperial College

David R. Smith  
Duke University

Costas M. Soukoulis  
Iowa State University

**Citation:** "For the discovery of metamaterials."

John Pendry worked at the Blackett Laboratory, Imperial College London, since 1981. He began his career in the Cavendish Laboratory, Cambridge, followed by six years at the Daresbury Laboratory where he headed the theoretical group.



In 1992 he turned his attention to photonic materials. This interest led to his present research which concerns the remarkable electromagnetic properties of "metamaterials." Successively metamaterials with negative electrical permittivity, then with negative magnetic permeability were designed and constructed. These designs were subsequently the basis for the first material with a negative refractive index. He went on to explore the surface excitations of the new negative materials and showed that these were part of the surface plasmon excitations familiar in metals. More recently, he has developed the concept of "transformation optics" which prescribes how electromagnetic lines of force can be manipulated at will.

David R. Smith is the William Bevan Professor of Electrical and Computer Engineering Department at Duke University and Director of the Center for Metamaterial and Integrated Plasmonics. He holds the positions of Adjunct Associate Professor in the Physics Department at the University of California, San Diego, and Visiting Professor of Physics at Imperial College, London. He received his PhD in 1994 in Physics from UCSD. His research interests include the theory, simulation and characterization of unique electromagnetic structures, including photonic crystals and metamaterials.



Smith is best known for his theoretical and experimental work on electromagnetic metamaterials. Metamaterials are artificially structured materials, whose electromagnetic properties can be tailored and tuned in ways not easily accomplished with conventional materials.

Costas Soukoulis is a Senior Scientist in the Ames Laboratory and a Distinguished Professor of Physics at Iowa State University. He received his BSc from University of Athens in 1974. He obtained his PhD in Physics from the University of Chicago in 1978. From 1978 to 1981 he was at the Physics Department at University of Virginia. He spent three years (1981-84) at Exxon Research and Engineering Co. and since 1984 has been at Iowa State University (ISU) and Ames Laboratory. He has been an associated member of IESL-FORTH at Heraklion, Crete, since 1983.



His research interests is to develop theoretical understanding of the properties of disordered systems, with emphasis on electron and photon localization, photonic crystals, random lasers, and metamaterials. The theoretical models developed are often quite sophisticated to accurately reflect the complexity of real materials.

## Lars Onsager Prize

Daniel Fisher

Stanford University

**Citation:** "For innovative and wide-ranging contributions to the statistical physics of disordered systems, including but not limited to random magnets, sliding charge density waves, and vortices in superconductors."

Daniel S. Fisher was born in London in 1956, received a BA from Cornell in 1975, and a PhD from Harvard in 1979. After a decade at Bell Labs, he joined the faculty at Princeton and subsequently at Harvard. Currently he is Professor of Applied Physics and, by Courtesy, of Biology and of Bioengineering at Stanford.



Trained as a condensed matter theorist, Fisher's research has included low dimensional systems, superconductivity, the effects of randomness on phase transitions and dynamics in disordered materials, and fracture and friction from laboratory scales to earthquakes. In recent years he has focused on biology, mostly trying to develop quantitative understanding of the dynamics of evolutionary processes, with forays into cellular biophysics.

## Abraham Pais Prize for History of Physics

Roger H. Stuewer

University of Minnesota, Minneapolis

**Citation:** "For his pioneering historical studies of the photon concept and nuclear physics, and for his leadership in bringing physicists into writing the history of physics by helping to organize and develop supporting institutions and publications."

Roger H. Stuewer is Professor Emeritus of the History of Science and Technology and of Physics at the University of Minnesota. He received his BS in 1958 and his PhD in 1968 in history of science and physics at the University of Wisconsin. His books include *The Compton Effect: Turning Point in Physics and Nuclear Physics in Retrospect*. He has served as Secretary of the History of Science Society, Chair of the AIP Advisory Committee on History of Physics, Chair of the APS Forum on the History of Physics, Chair of the AAAS Section on History and Philosophy of Science, President of the Minnesota Chapter of Sigma Xi, and Chair of the Advisory Board of the Seven Pines Symposium. He co-founded and has co-edited the journal *Physics in Perspective* and edits the Resource Letters of the *American Journal of Physics*.



## George E. Pake Prize

Mark Pinto

IEEE

**Citation:** "For seminal contributions to the physics of semiconductor devices and computation models and algorithms for device simulation, and for visionary leadership of global semiconductor, display, and solar industries."

Mark Pinto is currently an Executive Vice President at Applied Materials and General Manager of the Energy and Environmental Solutions business. While serving as Applied's CTO, Pinto initiated efforts to extend nanomanufacturing technologies into clean energy applications. He also led Applied's flat panel display business as it scaled thin film equipment to Gen 8.5 (>5m<sup>2</sup>) substrates, enabling volume manufacturing of LCD HDTVs. Previously Pinto spent 19 years with Bell Laboratories and later the Lucent Microelectronics group where he served in research, development and business management roles involving IC and optoelectronics technologies. Pinto received Bachelors degrees from Rensselaer Polytechnic Institute and a Masters and PhD from Stanford University where he developed a semiconductor device simulator that served as the basis for standard industry CAD tools for over 20 years



## W.K.H. Panofsky Prize in Experimental Particle Physics

Blas Cabrera

Stanford University

Bernard Sadoulet

University of California, Berkeley

**Citation:** "For their pioneering work and leading roles in the development and use of phonon detection techniques enabling direct searches for weakly interacting massive particles."

Blas Cabrera obtained his BS in Physics at the University of Virginia in 1968, and his PhD in Physics at Stanford University in 1974. After several postdoctoral fellowships he joined the faculty of the Physics Department at Stanford University in 1981. He is a Fellow of the American Physical Society. His research has focused on the use of low



temperature techniques, including superconducting, to mount experiments to identify what makes up the dark matter in and around our galaxy and throughout our universe. He is currently the Spokesperson for the SuperCDMS (cryogenic dark matter search) Collaboration, a seventeen-institution effort to search for dark matter in the form of weakly interacting massive particles or WIMPs.

Bernard Sadoulet was a student at Ecole Polytechnique from 1963 through 1965 and a CERN fellow until 1973. He received his PhD from the University of Orsay, France in 1971. He did his postdoc at the Lawrence Berkeley Laboratory until 1973, participating in the Mark I experiment at SPEAR in SLAC.



From 1976 through 1985 he was a permanent member of the staff of CERN, working on the Initial Cooling Experiment. In 1985 he was appointed full Professor of Physics with tenure in the physics department of the University of California, Berkeley, searching for dark matter with cryogenic detectors. In 1999 he was named as Director of the Institute for Nuclear and Particle Astrophysics and Cosmology University of California and director of the UC Dark Matter Search Initiative in 2009.

## Earle K. Plyler Prize for Molecular Spectroscopy

Brooks Pate

University of Virginia

**Citation:** "For the development of innovative microwave spectroscopy techniques that take full advantage of new technologies, allowing new insights into rotational and vibrational relaxation in complex molecules."

(Bio unavailable at press time)

## Polymer Physics Prize

Stephen Z.D. Cheng

The University of Akron

**Citation:** "For pioneering contributions to the fundamental understanding of crystallization, metastability, and phase transformations of semi-crystalline polymers."

Stephen Z. D. Cheng entered the Graduate School of East China Institute of Science and Technology and switched his field to polymer science and engineering, obtaining his MS degree in 1981. He received his PhD degree from Rensselaer Polytechnic Institute in May 1985 and spent the next two years there as a postdoctoral researcher.



In October 1987, Cheng joined The University of Akron as an Assistant Professor in Polymer Science. In 2007 Cheng was appointed Dean of the College of Polymer Science and Polymer Engineering. He has also had appointments as a visiting and guest professor in Japan and China. His research interests in the solid state of polymeric materials include phase transition thermodynamics, kinetics, molecular motion and relaxation processes, crystal structure and morphology, liquid crystal polymers, surface and interface structures and ordering, high-performance polymer fibers, films for electronic and optical applications and high-temperature composites.

## I.I. Rabi Prize

Markus Greiner

Harvard University

**Citation:** "For seminal contributions to the field of ultracold atoms, including the observation of the superfluid-to-Mott-insulator transition, the study of the BEC-BCS cross over for fermions, and the development of imaging techniques for atoms in optical lattices with single-atom resolution."

Markus Greiner is the winner of the thesis award of the American Physical Society 2004 and of the William L. McMillan Award 2005 for outstanding contributions in condensed matter physics. He was named a 2011 MacArthur Fellow.



He studied under the 2005 Nobel Laureate Theodor Hänsch at the Ludwig-Maximilians University and at the Max-Planck-Institute of Quantum Optics, where he received his diploma in physics. The diploma thesis was entitled "Transport of magnetically trapped atoms: a simple approach to Bose-Einstein condensation." He earned his PhD for his work on "Bose-Einstein condensates in three-dimensional optical lattices" at the same institution. He then moved to the United States and from 2003-2005 he was a postdoctoral researcher at the Joint Institute for Astrophysics (JILA) in Boulder, Colorado, where he worked on the creation of a fermionic condensate of ultracold atoms.

## Aneesur Rahman Prize for Computational Physics

James R. Chelikowsky

University of Texas at Austin

**Citation:** "For computational applications of quantum theories to understand and predict material properties."

Jim Chelikowsky holds the W.A. "Tex" Moncrief Jr. Chair in Computational Materials within the Institute for Computational Engineering and Sciences at the University of Texas at Austin where he is a professor in the Departments of Physics, Chemical Engineering, and Chemistry and Biochemistry. He received his BS in physics summa cum laude from Kansas State University in 1970 and his PhD in physics from the University of California at Berkeley in 1975. Prior to his current position, he was a group leader in theoretical physics and chemistry at Exxon Corporate Research Science Labs and on the faculty in the Department of Chemical Engineering and Materials Science at the University of Minnesota. His research focuses on optical properties, interfacial phenomena, nano-regime systems, liquid microstructures, simulated imaging and the development of high performance algorithms to predict the properties of materials.



## Andrei Sakharov Prize

(Not awarded in 2013))

## J.J. Sakurai Prize for Theoretical Particle Physics

Roberto Peccei

University of California, Los Angeles

Helen Quinn

SLAC

**Citation:** "For the proposal of the elegant mechanism to resolve the famous problem of strong-CP violation which, in turn, led to the invention of axions, a subject of intense experimental and theoretical investigation for more than three decades."

Roberto D. Peccei is a particle theorist whose principal interests lie in the area of electroweak interactions and in the interface between particle physics and cosmology.



Peccei obtained both his BS and PhD from MIT. He was on the faculty of Stanford University in the 1970s and on the staff of the Max Planck Institute in Munich and of the DESY Laboratory in Hamburg in the 1980s. He returned to the United States in 1989, joining the faculty of the Department of Physics and Astronomy at UCLA. At UCLA he has served both as Dean of Physical Sciences and Vice Chancellor for Research.

Helen Quinn received her Ph.D in physics from Stanford in 1967. After a postdoc at DESY, in Hamburg Germany she became a postdoc and then a junior faculty member at Harvard. Returning to Stanford as a visitor supported by a Sloane Fellowship in 1976, she worked with Roberto Peccei on the research honored by this prize. She then became a staff member at Linear Accelerator Center (now SLAC National Accelerator Laboratory) where she worked until her retirement in 2010. She is now a Professor Emerita there. Her research in particle physics connects fundamental theory with phenomenology, and has had a long-term focus on issues related to CP symmetry and its violation. She has had a long-term engagement in education issues and has worked on them at the local, state, and national level.



## Prize for a Faculty member for Research in an Undergraduate Institution

Mario Affatigato

Coe College

**Citation:** "For high-impact research on optical and structural properties of glasses, stewardship of professional societies and journals, and extensive international collaborations, melded with energetic, compassionate supervision of undergraduate research participants."

Mario Affatigato obtained his undergraduate degree from Coe College in 1989, followed by his PhD from Vanderbilt University in 1995. After returning to Coe that same year, he began a research effort investigating the relationship between the optical properties and structure of glassy materials. The work he continues with his students (over 70 to date) has expanded into laser-induced modification and exotic manufacturing methods like aerolevitation. His research primarily deals with oxide glasses, especially vanadates, borates, and samples with heavy metals. Currently he is the Fran Allison and Francis Halpin Professor and chair of the Physics Department.



## Prize for Industrial Application of Physics

**John Woollam**

University of Nebraska

**Citation:** "For sustained contributions to commercialization of spectroscopic ellipsometry, including greatly improved instrumentation and numerous new applications."

**John Woollam** received his undergraduate degree in physics from Kenyon College, in 1961, and PhD in Physics from Michigan State University in 1967. He also received a master's in Electrical Engineering from Case Western Reserve University in 1978. His Doctorate research was in condensed matter cryophysics. Upon receiving his PhD, he worked for NASA Lewis Research Center from 1967-1979. He became Professor of Electrical Engineering at the University of Nebraska in 1979. In 1987 he founded the J.A. Woollam, Co, Inc., now a worldwide leader in ellipsometry. The company is recognized for commercialization of spectroscopic ellipsometry, including greatly improved instrumentation, as well as new solutions to complex materials problems. Ellipsometers have sub-monolayer interface sensitivity and are used in a range of applications from materials research to metrology in manufacturing.



## George E. Valley, Jr Prize (2012)

**Jinhui Chen**

Chinese Academy of Science

**Citation:** "In recognition of his discovery of the first antimatter hypernucleus and his seminal contributions to the study of partonic matter using  $\rho$  mesons produced in relativistic nuclear collisions."

**Jinhui Chen** received his BS degree from Dalian University of Technology, China in 2003, and his PhD in Physics from Shanghai Institute of Applied Physics, Chinese Academy of Science in 2008. From July 2008, he worked in Division of Nuclear Physics at SINAP as an Assistant Physicist during 2008-2009. He returned to the Division of Nuclear Physics at SINAP in October of 2009 and was promoted to Associate Physicist in October 2010. At SINAP, he continues to measure and study the properties of strange antimatter with improved data sets and uses hypernuclei as a tool to probe and understand the quark gluon plasma state and the phase diagram of nuclear matter. Chen is a member of the STAR collaboration at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven.



## Robert R. Wilson Prize for Achievement in the Physics of Particle Accelerators

**John Galayda**

SLAC

**Citation:** "For his leadership and outstanding and pioneering contributions to the development, construction and commissioning of the LCLS, the first X-ray FEL to lase at 0.15nm, and his contribution of the Advanced Photon Source and the National Synchrotron Light Source."

**John Galayda** is director of the Linac Coherent Light Source II project at SLAC National Accelerator Laboratory. He joined SLAC in 2001 to lead the Linac Coherent Light Source project (LCLS). In 2005, Galayda received the first joint appointment to both SLAC faculties: Photon Science, and Particle Physics and Astrophysics



Galayda came to SLAC from Argonne National Laboratory where, from 1990-99, he led construction, commissioning and operations of the Advanced Photon Source accelerator systems.

From 1977-90 he worked at Brookhaven National Laboratory, where he participated in the construction and commissioning of the National Synchrotron Light Source. He received a tenure appointment at BNL in 1986.

Galayda received a doctoral degree in physics from Rutgers University in 1977. He graduated magna cum laude from Lehigh University in 1970, receiving a bachelor's degree in physics.

## AWARDS

### David Adler Lectureship Award in the Field of Materials Physics

**Jean-Luc Brédas**

Georgia Institute of Technology

**Citation:** "For his outstanding computational studies of the electronic, charge transport, and optical properties of conjugated polymers and related materials and their impact on organic electronics and photonics."

**Jean-Luc Brédas** received his BS (1976) and PhD (1979) degrees from the University of Namur, Belgium. In 1988, he was appointed Professor at the University of Mons, Belgium, where he established

the Laboratory for Chemistry of Novel Materials. While keeping an Extraordinary Professorship appointment in Mons, he joined the University of Arizona in 1999 before moving in 2003 to the Georgia Institute of Technology. At Georgia Tech, he is Regents' Professor of Chemistry and Biochemistry and holds the Vasser-Woolley and Georgia Research Alliance Chair in Molecular Design. Since 2011, he is Adjunct Professor of Chemistry at King Abdulaziz University in Jeddah. The research interests of his group focus on the computational characterization and design of novel organic materials of relevance for organic electronics and photonics.



### LeRoy Apker Award (2012)

**Yuliya Dovzhenko**

Princeton University

**Theodore Yoder**

Franklin & Marshal College

**Citation:** "Coherent Control of a Semiconductor Charge Qubit."

**Citation:** "The Standard Model Extension and its Application to Hydrogen."

**Yuliya Dovzhenko** received a BA in physics with high honors from Princeton University in 2012. Her interests include condensed matter physics and quantum computation. While at Princeton, she conducted research in Jason Petta's lab, focusing on quantum control of semiconductor quantum bits.



Dovzhenko's project investigated quantum coherence of a single charge trapped in a gallium arsenide double quantum dot. She demonstrated coherent multi-pulse control of a semiconductor charge qubit, which is an essential requirement for performing dynamic decoupling to battle charge noise. She also worked on developing spin qubit devices in silicon/silicon-germanium heterostructures, which can be isotopically purified to eliminate the hyperfine interaction.

Dovzhenko is currently working towards a PhD in physics at Harvard University. Her research concerns quantum computation using spins of nitrogen-vacancy centers in diamond.

**Theodore Yoder** received a BA in physics and a BA in mathematics from Franklin & Marshall College in May 2012. For his senior thesis, Yoder calculated corrections to the hydrogen spectrum using the Standard Model Extension, which makes the phenomenological addition of Lorentz and CPT violation to the standard model. While partial corrections were previously found, this was the first full calculation through first order in all the SME proton and electron parameters and second order in the fine-structure constant.



In 2010, Yoder worked to calculate photon correlations from the decay of orthopositronium and also published on the so-called ellipsoid paradox in thermodynamics.

Yoder is now pursuing a physics PhD at the Massachusetts Institute of Technology, with a particular interest in quantum information and computing.

### Edward A. Bouchet Award

**Stephon Alexander**

Dartmouth College

**Citation:** "For his contributions to theoretical cosmology, in particular the interface between fundamental physics and early universe cosmology, that includes work in leptogenesis, and parity violating effects in quantum gravity, as well as for communicating many ideas of this field to the scientific community and the public."

Leading theoretical physicist **Stephon Alexander** joined the Dartmouth faculty in the summer of 2012 as the Ernest Everett Just 1907 Professor. Alexander, a native of Trinidad who was raised in the Bronx, specializes in particle physics and cosmology and is also an accomplished jazz saxophonist. Alexander explores the fundamental nature of reality in the absolute extremes of physics, from subatomic particles to the largest constituents of the Cosmos. Alexander attended Haverford College as an undergraduate and received his master's and doctoral degrees from Brown University. He conducted postdoctoral research at Imperial College, London and the Stanford University Linear Accelerator Center. Prior to his appointment at Dartmouth, Alexander held the position of associate professor of physics at Haverford.



### Stanley Corrsin Award (2012)

**Daniel Lathrop**

University of Maryland

**Citation:** "For his striking observations of flow in a quantum fluid, including detection of counter-flow that confirmed the two-fluid picture of quantum fluid, observation and characterization of reconnections of

quantized vortices, and the discovery of an inverse-cube tail in the velocity distribution of superfluid turbulence."

**Daniel P. Lathrop** is Professor of Physics, Professor of Geology, and Associate Dean for Research at the University of Maryland. He received a BA in physics from the University of California at Berkeley in 1987, and a PhD in physics from the University of Texas at Austin in 1991. He served at Yale University as a postdoctoral fellow, research affiliate, and lecturer, and at Emory University as Assistant Professor. He joined the University of Maryland in 1997, the year he received a Presidential Early Career Award from the National Science Foundation. From 2006 to 2011 he served as Director of the University of Maryland's Institute for Research in Electronics and Applied Physics. His research focuses on nonlinear dynamics, rotating turbulent fluid flows, geomagnetism, and quantum turbulence.



### Joseph A. Burton Forum Award

**Jeremy Bernstein**

**Citation:** "For his important contributions to public understanding of the physics of nuclear policy and for his graceful and subtle explanations of modern science in his books and articles over many decades."

**Jeremy Bernstein** was a professor emeritus of physics at the Stevens Institute of Technology in Hoboken, New Jersey. He was a staff writer for the *New Yorker* from 1961 to 1995. He has written some fifty technical papers and three technical monographs. In addition, he has written many books on popular science and mountain travel. He has taught non-fiction writing as a Ferris Professor of Journalism at Princeton University most recently in the Fall of 1992. He has had articles published in most of the national magazines. He was born in Rochester, New York on December 31, 1929, and educated at Harvard University; all three degrees. He lives in New York City and Aspen, Colorado. His scientific research interest is in the theory of elementary particles and cosmology.



### John Dawson Award for Excellence in Plasma Physics (2012)

**Debra Ann Callahan**

Lawrence Livermore National Laboratory

**Laurent Divol**

Lawrence Livermore National Laboratory

**Robert Kirkwood**

Lawrence Livermore National Laboratory

**George Kyrala**

Los Alamos National Laboratory

**Nathan Meezan**

Lawrence Livermore National Laboratory

**Pierre Michel**

Lawrence Livermore National Laboratory

**Edward Williams**

Lawrence Livermore National Laboratory

**Citation:** "For predicting and demonstrating the technique of laser scatter on self-generated plasma-optics gratings that enables generation and redirection of high-energy laser beams important for indirect drive inertial confinement fusion and high-power laser-matter interactions."

**Debbie Callahan** received her BS degree in Physics and Mathematics from the University of Denver in 1985. After spending two years at Cornell University, she moved to the University of California, Davis to complete her PhD under the direction of Bruce Langdon and John DeGroot. Her thesis research was carried out at Lawrence Livermore National Laboratory. She completed her PhD in 2003 and has continued to work on inertial confinement fusion and inertial fusion energy at LLNL.

Callahan is currently a group leader for ICF/IFE target design within AX Division in the Weapons and Complex Integration Directorate, and the target design leader for the Integrated Tuning Campaign within the National Ignition Campaign (NIC) on NIF.

**Laurent Divol** received his engineering BA from Ecole Polytechnique in 1994, masters in Oceanography (ENSTA, France) and Theoretical Physics (Ecole Normale Supérieure, Paris, France) in 1996 and his PhD in theoretical physics with highest honors from Ecole Polytechnique in 1999 for his theoretical work on the effect of laser beam smoothing techniques on stimulated backscattering. He worked from 1996 to 2001 at the Commissariat à l'Énergie Atomique (CEA-DAM, Bruyères-le-Châtel, France) as an engineer for the Laser MegaJoule project, France's approach to indirect drive inertial confinement fusion. He joined Lawrence Livermore National Laboratory in 2001, where he spent a decade developing a quantitative understanding of laser plasma interaction under ICF relevant conditions by combining detailed experimental measurements (mostly at the



Laboratory for Laser Energetics, U. Rochester and at the Jupiter Laser facility at LLNL) with state of the art numerical simulations and analytical theory.

**Robert Kirkwood** received his Bachelors and Masters degrees in Electrical Engineering from UCLA in 1982 and 1984. He worked at TRW corporation from 1984 to 1985 designing particle diagnostics for magnetic mirrors and where he received a graduate fellowship. He received his doctoral degree from MIT in Applied Plasma Physics in 1989, where he developed the first cyclotron absorption diagnostics for tokamaks. He later worked at Caltech developing wave-current drive and as staff physicist at the Air Force Phillips Lab remotely studying energetic particles on Shuttle flights. Kirkwood moved to the Lawrence Livermore National Laboratory in 1994 to help initiate the National Ignition Facility program. There he led experiments on multi-beam interactions, which led to wavelength tuning of drive symmetry on NIF, and current models of multi-beam backscatter.



**George Kyrala** graduated from the American University in Beirut with BS in Physics and Yale with PhD in Atomic Physics. He has worked at JILA and Univ. of Arizona before he joined Los Alamos National Lab. At JILA he measured the absolute cross sections for excitation of H, H<sub>2</sub> and He. At Univ of Arizona he and William Wing measured the absolute frequency of HeH<sup>+</sup> using a merged Ion-Laser techniques. At LANL Kyrala performed many experiments in Laser driven x-ray generation, hohlraum characterization, x-ray imaging of capsules at Omega and imploding cylinders on pulse power machines. Currently, Kyrala is interested in implosion physics driven by lasers and hohlraums, studying the effects of their irradiation symmetry and mix on the implosion performance.



**Nathan Meezan** received his BS in Mechanical Engineering from Stanford University in 1997. He remained at Stanford for his MS and PhD in Mechanical Engineering. Since completing his PhD in 2002, Meezan has been a target designer in the Inertial Confinement Fusion (ICF) program at Lawrence Livermore National Laboratory. He has been a group leader for ICF in the Secondary Design AX Division since 2010.



Meezan has worked on theory and computation for the National Ignition Facility (NIF) program, focusing on the physics of hohlraums and other laser-produced plasmas. He has designed, simulated, and analyzed laser-produced plasma physics experiments on laser facilities in the U.S. and abroad and was the responsible target designer for the 2009 NIF Hohlraum Energetics experiments. Recently, he has focused on experimental designs for studying ICF capsule hydrodynamics and ablation physics.

**Pierre Michel** received undergraduate degrees in Physics and Photonics from Strasbourg University (France) in 2000; he got his PhD with highest honors from Ecole Polytechnique, Paris in 2003, for his work on laser-plasma interactions for inertial confinement fusion applications. From 2004 to 2006 he worked on laser-plasma acceleration of particles and its applications for x-ray sources at the LOA-SIS program of Lawrence Berkeley National Laboratory, where he was awarded the "A.M. Sessler" post-doctoral fellowship. He then joined Lawrence Livermore National Laboratory in 2006 where he is currently a staff scientist pursuing numerical, theoretical and some experimental work on laser-plasma interactions. Michel has been leading the National Ignition Campaign's "laser-plasma interaction working group" since 2009.



**Edward Williams** obtained a first-class honors degree in Mathematics from Trinity College, Cambridge in 1968. From there he went to Princeton University for graduate study. His thesis, "The Theory of Fluctuations in Plasma" is the basis for an article in the *Handbook of Plasma Physics*, co-authored with his advisor, Carl Oberman. His doctorate in Physics was awarded in 1973, with Marvin Goldberger as his Physics Department advisor. After spending two years at the University of Colorado, working with Martin Goldman and Donald Dubois, he spent two years at the Institute for Advanced Study, back in Princeton, working with Marshall Rosenbluth. After a stint at the University of Rochester, Laboratory for Laser Energetics, where he became the leader of the plasma physics group, he has spent the remainder of his career working in the laser program at Lawrence Livermore Laboratory.



## John H. Dillon Medal for Research in Polymer Physics

**Mahesh Mahanthappa**  
University of Wisconsin

**Citation:** "For fundamental studies of block copolymers with controlled dispersity."

**Mahesh K. Mahanthappa** received his BA in Chemistry and Mathematics with distinction from the University of Colorado–Boulder in 1997, after which he obtained his PhD in Chemistry with R. M. Waymouth at Stanford University. Following postdoctoral studies Mahanthappa commenced his independent career at the University of Wisconsin–Madison as an Assistant Professor of Chemistry in 2006 and was promoted to the rank of Associate Professor in 2012. Mahanthappa's research program leverages chemical synthesis and physical materials characterization to identify new methods for manipulating block copolymer and lyotropic liquid crystal self-assembly into unique morphologies that manifest unusual bulk properties. Specific targets of interest include the development of degradable block copolymers and surfactants, electrochemically stable single-ion conductors for fuel cell and battery applications, and next-generation gas and liquid separations membranes.



## Excellence in Physics Education Award

**SmartPhysics Group (Gary Gladding, Mats Selen and Timothy Stelzer)**

**Citation:** "For the creative application of physics education research results with components of modern technology to create a new pedagogy for an introductory physics curriculum that substantially changes the roles of the instructors and students and, as measured through research, provides significant and nationally recognized learning benefits."

(Bio of **Gary Gladding** unavailable at press time)

**Mats Selen** earned a BS in physics from the University of Guelph in 1982, a MSc in physics from Guelph in 1983, and a PhD in physics from Princeton in 1989. He was a research associate at Cornell University from 1989–1993, and joined the Physics faculty at the University of Illinois in 1993.



His current research is focused on physics education. He helped develop the smartPhysics "flipped lecture" approach. He worked to create the popular i-clicker classroom response system several years ago, and more recently he developed IOLab.

He developed Physics 123, "Physics Made Easy", a hands-on course designed specifically for pre-service elementary school teachers. He started the University of Illinois Physics Van and he is "The Whys Guy" on local morning television.

**Tim Stelzer** is an associate professor of physics, and distinguished teacher-scholar at the University of Illinois. He received a BS in physics from St. Johns University in 1988 and a PhD in theoretical particle physics from the University of Wisconsin at Madison in 1993. His particle physics research has focused on physics at hadron colliders such as the Tevatron at Fermi National Accelerator Laboratory and the LHC in Geneva Switzerland. Stelzer worked on the award winning transformation of the introductory physics courses and is a founding member of the Physics Education Research group at the University of Illinois. His education research has focused on making appropriate use of technology to improve student learning. He is a co-inventor of the i-clicker personal response system and is coauthor of the "smartPhysics" learning system.



## Joseph Keithley Award for Advances in Measurement Science

**Nergis Mavalvala**  
Massachusetts Institute of Technology

**David McClelland**  
Australian National University

**Roman Schnabel**  
Leibniz Universität Hannover

**Citation:** "For seminal contributions to the development and application of quantum metrological methods, in particular of squeezed light sources and optical springs, enabling sensitive measurements beyond the standard quantum limit."

**Nergis Mavalvala** is a physicist whose research links the world of quantum mechanics, usually apparent only at the atomic scale, with some of the most powerful, yet elusive, forces in the cosmos. She received a BA from Wellesley College in 1990 and a PhD from the Massachusetts Institute of Technology in 1997. She was a postdoctoral fellow and research scientist at the California Institute of Technology between 1997 and 2002. Since 2002, she



has been on the Physics faculty at the Massachusetts Institute of Technology where she is now a Professor of Physics and recipient of a 2010 MacArthur "genius" award. In her spare time, she loves to bicycle long distances, play squash, and hang out with her 4-year-old son.

**David McClelland** received a Bachelor of Science with Honours in 1977 and a Master of Science in 1982 from the University of Western Australia, and a Doctor of Philosophy in 1987 from the University of Otago. He is currently Professor of Physics, Head of the Department of Quantum Science and Director of the ANU Centre for Gravitational Physics at The Australian National University. He has worked in the field of gravitational wave detection for 20 years with an emphasis on quantum noise limited instrumentation, optical squeezing and opto-mechanics on the gram scale and above. He is principal investigator for Australia's partnership in the Advanced LIGO gravitational wave detection project. He actively pursues the application of techniques developed for this purpose to areas such as optical sensing for exploration and security and earth observation from space.



**Roman Schnabel** graduated in Physics in 1994 at Hannover University, Germany, where he also received his PhD in the fields of plasma physics and laser spectroscopy in 1999. He was a postdoctoral researcher at the Max Planck Institute for Quantum Optics until 2000, when he received a Feodor-Lynen fellowship of the Alexander von Humboldt Foundation to participate in a research project on quantum teleportation at the Australian National University. In 2002 he went back to Germany to become a researcher at the Max Planck Institute for Gravitational Physics. From 2003 to 2008 he was a Junior professor and has been since then Professor at the Faculty of Mathematics and Physics of the Leibniz Universität Hannover. His research fields of interest are nonclassical states, quantum information and gravitational wave detection.



## Landau-Spitzer Award

**Sergei Anisimov**  
Landau Institute for Theoretical Physics,  
Moscow

**Citation:** "For outstanding contributions to plasma physics ranging from fundamental plasma theory to laboratory plasmas, controlled inertial fusion and astrophysical phenomena, particularly in the areas of laser interaction with plasma, plasma dynamics and stability, compressed matter and turbulence."

**Sergei Anisimov** graduated from Leningrad Polytechnic Institute (St.-Petersburg Technical University, 1958), received his PhD from the Institute of Physics, Byelorussian Academy of Sciences (1961), received his Doctor of Sciences Degree from P.L. Kapitza Institute of Physical Problems, USSR Academy of Sciences (1970). He worked in A.F. Ioffe Institute for Physics and Technology (1958), Institute of Physics, Byelorussian AS (1959–1965), L.D. Landau Institute for Theoretical Physics (1965–present time), Moscow Institute for Physics and Technology (1967–1994), Joint Institute of High Temperatures, USSR Academy of Sciences (1988–1994). In 1987 he was elected as a corresponding member of the USSR Academy of Sciences. He has published more than 230 papers devoted to plasma physics, laser fusion, physics of condensed matter, and laser-matter interaction. He is a member of Scientific Councils on Plasma Physics, on Nonlinear Dynamics, on Combustion and Explosion. He is a member of the IUPAP committee on mathematical physics (1996–2002), and of the Executive committee of AIRAPT (1997–2003).



## Maria Goepfert Mayer Award

**Feryal Ozel**  
University of Arizona

**Citation:** "For contributions to neutron star astrophysics, including the theoretical interpretation of X-ray emission from magnetars and determination of accurate masses and radii that yield constraints on the equation of state; and for her outstanding contributions to the public understanding of science."

**Feryal Ozel** received her bachelor degree in physics and applied mathematics from Columbia University in 1996 and her PhD from Harvard University in 2002. Prior to joining the faculty at the University of Arizona as an assistant professor in 2005, she was a member at the Institute for Advanced Study at Princeton, where she also held a NASA Hubble Postdoctoral Fellowship. She became an associate professor in 2010 and holds appointments in the Departments of Astronomy and Physics.



Ozel is a theoretical astrophysicist whose primary research interests include the physics of neutron stars and black holes, as well as the forma-

tion of supermassive black holes and galaxies in the early Universe.

## Nicholson Medal for Human Outreach

(Not awarded in 2013)

## Francis Pipkin Award

**Randolf Pohl**

Max Planck Institute of Quantum Optics

**Citation:** "For the observation of the 2S state of muonic hydrogen and for a precision measurement of the Lamb shift of muonic hydrogen, which has significant implications for the determination of the charge radius of the protons."

**Randolf Pohl** received his Diploma in Physics from the Technical University of Munich in 1997, doing laser spectroscopy on antiprotonic helium at CERN. He received his PhD in Physics from ETH Zurich in 2001 for the observation of the long-lived 2S state in muonic hydrogen. From 1998 he was member of the muonic hydrogen Lamb shift collaboration at PSI, Switzerland, which, in 2009, succeeded to measure for the first time the Lamb shift in muonic hydrogen, yielding a ten times more accurate value of the proton charge radius. In 2005 Pohl joined the Laser Spectroscopy group at the Max Planck Institute of Quantum Optics in Garching, Germany. Since 2009 Pohl has been doing laser spectroscopy on the 1S-2S and 2S-4P transitions in regular hydrogen and deuterium.



## Henry Primakoff Award for Early-Career Particle Physics Research

**Teppei Katori**

Massachusetts Institute of Technology

**Citation:** "For outstanding contributions to a wide range of accelerator-based neutrino physics, including cross section measurements and searches for violations of Lorentz and CPT symmetry."

**Teppei Katori** is a postdoctoral associate at Massachusetts Institute of Technology, in the Neutrino and Dark Matter Group of the Laboratory for Nuclear Science.



He earned his BS at Tokyo Institute of Technology in 2002, and completed his PhD at Indiana University in 2008. His main focus of research is neutrino physics. Within this area, he is interested in both neutrino scattering and in Beyond-Standard-Model physics revealed by the neutrino.

In the case of the former, he performed neutrino cross section measurements at the MiniBooNE experiment at Fermilab. With respect to the later, he has performed tests of Lorentz violation using neutrino oscillations, using data from LSND, MiniBooNE, and Double Chooz experiments. Currently, he is working on the light collection system of MicroBooNE experiment at Fermilab, and further development of neutrino cross section models for current and future oscillation experiments.

## Shock Compression Award

**Gennady I. Kanel**

Joint Institute for High Temperature,  
Russian Academy of Science

**Citation:** "For outstanding contribution to the physics of shock waves in condensed matter, discovery and studying anomalous thermal hardening, superheated solid states, failure wave phenomena, investigations of sub-microsecond strength properties of materials over a wide range of load durations and temperatures."

**Gennady I. Kanel** graduated from Tomsk State University, USSR, in 1967. After the University, he worked in the Institute of Problems of Chemical Physics of Russian Academy of Sciences (Chernogolovka) until 1988. He then joined the Joint Institute for High Temperatures RAS (Moscow) and has been here as a head of laboratory, head of department, and now—as a deputy director. He got the degree of candidate of physical and mathematical sciences in 1972, the degree of doctor of physical and mathematical sciences in 1987, the title of professor in 1996, and was elected to Russian Academy of Sciences as a corresponding member in 2006. His research work is focused on understanding of the fundamental mechanisms and evaluation of kinetics of inelastic deformation, fracture, structural transformations in solids and energy release in high explosives under shock-wave loading.



## Leo Szilard Lectureship Award

**Geoffrey West**  
Santa Fe Institute

**Citation:** "For path-breaking work on the origin of universal biological scaling laws and quantitative models for structural and functional design of organisms. For theoretical insights about the long-term sustainability of cities."

**Geoffrey West** is Distinguished Professor and former President of the Santa Fe Institute (2005–2009). Prior to SFI, he was leader of high energy physics at Los Alamos, where he remains a Senior Fellow. He received his BA from Cambridge (1961) and his PhD in physics from Stanford (1966). After spells at Cornell and Harvard, he joined the faculty at Stanford (1970). West is a theoretical physicist whose primary interests have been in fundamental questions, ranging from elementary particles and their interactions to universal scaling laws in biology and the development of a physics-inspired theory of cities, companies and long-term global sustainability. His research has included metabolic rate, growth, aging & death, sleep, cancer, and ecosystem dynamics and, more recently, rates of growth and innovation, the accelerating pace of life, and why companies die, yet cities survive.



## John Wheatley Award

**Sultana N. Nahar**

The Ohio State University

**Citation:** "For efforts to promote physics research and teaching through collaboration, mentoring, and philanthropy in several third-world countries, and in particular for her promotion, as both an advocate and role model, of Muslim women scientists."

**Sultana Nurun Nahar**, an atomic astrophysicist at The Ohio State University, received her BSc Hons in physics in 1977 and MSc in theoretical physics in 1979 from Dhaka University in Bangladesh. She received MA in Quantum Optics in 1984 and PhD in atomic theory in 1987 from Wayne State University. After a postdoctoral position at the Georgia State University, she moved to The Ohio State University in 1990. Her research is on atomic processes of photoionization, electron-ion recombination, photoexcitation, collision. Her contributions include development of the unified method for total electron-ion recombination, theoretical spectroscopy for Breit-Pauli R-matrix method, resonant nano-plasma theranostics method for cancer treatment. She is involved in promoting physics research and education in a number of countries and is the founder of International Society of Muslim Women in Science.



## DISSERTATION AWARDS

### Andreas Acrivos Dissertation Award in Fluid Dynamics (2012)

**William Durham**  
University of Oxford

**Citation:** "For innovative work at the interface of fluid mechanics and environmental science, and specifically for demonstrating through a combination of original experiments and modeling that hydrodynamic effects can have a major impact on the spatial distribution of motile plankton in the ocean."

**William 'Mack' Durham** graduated with a BS in Civil Engineering from Clemson University in 2004 and then moved to the Massachusetts Institute of Technology for graduate work, receiving a SM in 2006 from the Department of Civil and Environmental Engineering with a thesis titled 'The effect of fluid acceleration on sediment transport in the surf zone'. He was awarded a National Defense Science and Engineering Graduate Fellowship to pursue PhD work with Prof. Roman Stocker, which was completed in 2011 with a thesis titled 'Phytoplankton in Flow'. He is currently a Departmental Research Lecturer in the Department of Zoology at the University of Oxford. Mack's current work aims to resolve how fluid flow shapes the ecology and evolution of microorganisms.



### Award for Outstanding Doctoral Thesis Research in Biological Physics (2012)

**Timothy Sanchez**  
Brandeis University

**Citation:** "Self-Organization in Active Cytoskeletal Mixtures: Cilia-like Beating of Microtubule Bundles and Spontaneous Bulk Mixing."

**Timothy Sanchez** received his PhD in Physics, with a specialization in Quantitative Biology, from Brandeis University in 2012 under the guidance of Zvonimir Dogic.

Using purified cytoskeletal components, he developed a robust and well-controlled experimental system for studying self-organized phenomena, important biological functions, and far-from-equilibrium materials. His system was composed of microtubules (MTs), kinesin motor clusters, and a depletion agent that bundles MTs. First, he demonstrated a range of self-organized biomimetic functions, including the cilia-like beating of MT bundles, the synchronization



of many active bundles to produce propagating meta-chronal waves, and internally generated flows in 3D MT networks that generate super-diffusive transport. The occurrence of these biomimetic functions as self-organized processes provides unique insight into the mechanisms driving their biological analogues.

Sanchez studied physics as an undergrad at New College of Florida. He is currently doing further post-doctoral research at Brandeis until Spring 2013.

## Outstanding Doctoral Thesis

### Research in Atomic, Molecular and Optical Physics Award (2012)

**Waseem Bakr**

*Massachusetts Institute of Technology*

**Citation:** "Microscopic studies of quantum phase transitions in optical lattices."

**Waseem Bakr** started his studies in physics as an undergraduate at MIT in 2001. He joined the ion trap quantum computation where he developed an apparatus for trapping strontium ions in a cryogenic environment close to the surface of a chip. After writing an M.Eng. thesis on this topic in 2006, he moved to Harvard University. Bakr's doctoral dissertation introduced "quantum gas microscopy", a technique for imaging and manipulating strongly-correlated systems of ultracold atoms in optical lattices at the single atom level. Using this microscopy technique, Bakr performed site-resolved studies of two quantum phase transitions. Since defending his dissertation in 2011, Bakr returned to MIT, where he is studying ultracold Fermi gases in lower dimensions and with spin-orbit coupling. Simultaneously, he is working on



extending the techniques of quantum gas microscopy to fermionic atoms in optical lattices.

### Outstanding Doctoral Thesis in Beam Physics Award

**Daniel Ratner (2012)**

*Stanford University*

**Citation:** "Much ado about Microbunching: Coherent Bunching in High Brightness Electron Beams."

(Bio. unavailable at press time)

### Nicholas Metropolis Award for Outstanding Doctoral Thesis Work in Computational Physics

**David Yllanes**

*University of Madrid*

**ADVISOR: Luis Antonio Fernández and**

**Victor Martín-Mayor**

**Citation:** "For developing and applying new computational methods to diluted Ising ferromagnets and spin glasses while presenting this material with exceptional clarity. This includes the novel tethered Monte Carlo algorithm as well as implementing detailed low level simulations on the Janus special purpose computer."

**David Yllanes** was born in Corunna (Spain) in 1984. He received his Licenciatura en Física from the Complutense University of Madrid in 2007, where he also obtained a PhD in 2011, under the supervision of Luis Antonio Fernández and Víctor Martín Mayor. Yllanes's thesis was on the topic of rugged free-energy landscapes, investigating both their equilibrium profiles and their impact on the extremely



slow dynamics of disordered spin systems.

One of the main contributions is the introduction of the Tethered Monte Carlo method, a general strategy to manage systems with rugged free-energy landscapes. This work was based on very large-scale simulations, carried out with the Janus special-purpose computer.

Currently, Yllanes is a postdoctoral researcher in the group of Giorgio Parisi, at La Sapienza University of Rome, where he continues to work on the statistical mechanics of complex systems.

### Nuclear Physics Dissertation Award

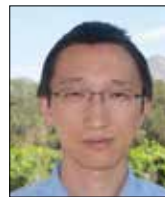
**Gang Shen**

*University of Washington*

**Citation:** "For the development of a new self-consistent equation of state of nuclear matter that provides a unified description of nuclei and hot dense matter, and is suitable for use in numerical simulations of core-collapse supernova, neutron star merges and related extreme astrophysical phenomena."

**Gang Shen** received a BE-degree from Zhejiang University, China in 2002, and a MS degree in physics from Peking University, China in 2005. He then came to Indiana University at Bloomington and worked under the guidance of Professor Charles Horowitz. He was awarded a PhD degree in 2010 for his thesis on new equation of state (EOS) of hot dense matter in a self-consistent framework for both nuclei and nuclear matter.

Following his PhD he moved to Los Alamos National Laboratory as postdoctoral researcher, working on both neutrino-nuclear matter interaction in supernova and neutrino-nucleus cross section for laboratory experiments. Currently he is a research associate in the



National Institute for Nuclear Theory at University of Washington. His current research interests focus on the neutrino interactions in astrophysics.

### Marshall N. Rosenbluth Outstanding Doctoral Thesis Award (2012)

**Yu-Hsin Chen**

*Lawrence Livermore National Laboratory*

**Citation:** "For measurements and theory of the ultrafast, high field, nonlinear response of gases near the ionization threshold, characterization of femtosecond plasma filaments, and demonstration that femtosecond filamentation requires plasma stabilization."

**Yu-Hsin Chen** received the BS degree in electrical engineering and the MS in electro-optical engineering in 2000 and 2002, respectively, both from National Taiwan University. He obtained his PhD degree in electrical engineering from University of Maryland, College Park in 2011. His dissertation investigated the effect of ultrafast optical nonlinearities of air molecules on laser filamentation, and demonstrated the direct, time- and space-resolved measurement of plasma density in femtosecond laser-produced filament in atmosphere for the first time. This work was conducted in Intense Laser-Matter Interactions Group advised by Prof. Howard Milchberg at University of Maryland.



### Mitsuyoshi Tanaka Dissertation Award in Experimental Particle Physics

(Not awarded in 2013)

## APS Council Announces 2012 APS Fellows

The APS Council elected the following as Fellows of the Society at its November 2012 meeting. Nominations for fellowship are received at APS Headquarters throughout the year, and are forwarded for review to the appropriate division, topical group or forum fellowship committees. The deadlines for the various units appear on page 8 of this insert, and are posted on the web. Fellowship nomination forms may be completed on the web at <http://fellowship.aps.org/>. Information for completing the form is available at <http://www.aps.org/programs/honors/fellowships/nomination-requirements.cfm>.

**Aizenberg, Joanna**

*Harvard University*

**Citation:** For research in biomineralization and the control of templated nucleation and growth of crystals - Nominated by: Division of Condensed Matter Physics

**Alamo, Rufina**

*Florida State University*

**Citation:** For her use of well-characterized materials and performance of carefully designed experiments to address structure-property relationships in polyolefins - Nominated by: Division of Polymer Physics

**Alfredsson, P. Henrik**

*Royal Institute of Technology*

**Citation:** For the development of innovative, creative and rigorous experimental methods leading to seminal contributions to our understanding of instabilities, transitional and turbulent flows - Nominated by: Division of Fluid Dynamics

**Allegrini, Maria**

*University of Pisa*

**Citation:** For contributions to laser interactions with atoms and small molecules: energy pooling collisions, high resolution spectroscopy, laser cooling of diatomic molecules, and contributions to international physics through collaborations and professional service - Nominated by: Forum on International Physics

**Altfeder, Igor**

*Air Force Research Lab*

**Citation:** For important developments in Scanning Tunneling Microscopy, in particular for development of thermal Scanning Tunneling Microscopy technique and experimental discovery of field-induced vacuum phonon tunneling - Nominated by: Topical Group on Instrument and Measurement Science

**Anderson, William**

*Los Alamos National Laboratory*

**Citation:** For significant contributions to the field of dynamic material properties research, and specifically for achieving a better understanding of the dynamic response of geophysical, planetary, and materials of importance to national security - Nominated by: Topical Group on Shock Compression of Condensed Matter

**Arrington, John**

*Argonne National Laboratory*

**Citation:** For his extensive and systematic work in understanding the electromagnetic form factors of the nucleon and the role of short distance phenomena in nuclei - Nominated by: Topical Group on Hadronic Physics

**Aschenauer, Elke-Caroline**

*Brookhaven National Laboratory*

**Citation:** For her scientific and technical accomplishments in the study of the spin structure of the nucleon, and her demonstrated ability to lead large, international collaborations in design and execution of such experiments. - Nominated by: Division of Nuclear Physics

**Aspelmeyer, Markus**

*University of Vienna*

**Citation:** For outstanding contributions to experimental quantum information, quantum optics, and quantum foundations, including the first experimental realization of a one-way quantum computer using 4-photon entangled cluster states and the first demonstration of radiation-pressure based cavity cooling of a micromechanical system - Nominated by: Topical Group on Quantum Information

**Aspuru-Guzik, Alan**

*Harvard University*

**Citation:** For his contributions at the interface of quantum information and chemistry and biology, including theory and experiment on quantum simulation for molecules, the development of the understanding of quantum coherence in photosynthesis, and density functional theory for open quantum systems - Nominated by: Topical Group on Quantum Information

**Balicas, Luis M.**

*Florida State University*

**Citation:** For experimental studies of unconventional superconductors, heavy fermion materials, and frustrated magnetic systems - Nominated by: Division of Condensed Matter Physics

**Bao, Wei**

*Renmin University of China*

**Citation:** For neutron scattering studies of the magnetic structure and spin dynamics of highly correlated electron systems - Nominated by: Division of Condensed Matter Physics

**Bari, Robert**

*Brookhaven National Laboratory*

**Citation:** For his many contributions to nuclear power reactor safety, security, and proliferation resistance, including major contributions to probabilistic risk assessment and to methods for analyzing proliferation

resistance of complex nuclear systems; and for leadership in advancing safety internationally - Nominated by: Forum on Physics and Society

**Barzi, Emanuela**

*Fermilab*

**Citation:** For her innovations in the development of advanced superconductors, her continuous efforts in promoting International scientific collaborations, and her unwavering mentoring of US and Italian students - Nominated by: Forum on International Physics

**Bashir, Rashid**

*University of Illinois, Urbana-Champaign*

**Citation:** For contributions to applications of nanotechnology to biology and medicine, and development of electrical and mechanical biosensors for molecules and cells - Nominated by: Division of Biological Physics

**Battle, Xavier**

*Universitat de Barcelona*

**Citation:** For his major, original contributions to the fundamental understanding of the magnetic properties of nanostructured materials and particle-like systems, and of the interplay among finite-size, surface, interface, interaction and proximity effects - Nominated by: Topical Group on Magnetism

**Beane, Silas**

*New Hampshire University*

**Citation:** For advancing the understanding of few-hadron systems from Quantum Chromodynamics by pioneering the application of effective field theories and lattice calculations of the QCD path integral to these systems - Nominated by: Topical Group on Few-Body Systems

**Beatty, James J.**

*The Ohio State University*

**Citation:** For contributions to cosmic ray astrophysics, including leadership roles in the design, construction, and operation of the Pierre Auger Observatory, balloon-borne studies of cosmic ray antiprotons and positrons, and in searches for high energy neutrinos using radio techniques - Nominated by: Division of Astrophysics

**Beausoleil, Raymond**

*Hewlett-Packard*

**Citation:** For contributions to basic research in nonlinear and quantum optics with applications to information technology - Nominated by: Forum on Industrial and Applied Physics

**Behnia, Kamran**

*LPEM-ESPCI*

**Citation:** For high-resolution thermal transport measurements to understand unconventional quantum states of matter - Nominated by: Division of Condensed Matter Physics

**Belyanin, Alexey**

*Texas A&M University*

**Citation:** For pioneering contributions in the ultrafast and nonlinear optics of nanostructured materials and the development of novel semiconductor laser sources in the mid-infrared and terahertz spectral range - Nominated by: Division of Laser Science

**Bertulani, Carlos A.**

*Texas A&M University*

**Citation:** For leading the development of theories for electromagnetic processes in heavy-ion collisions, including many pioneering and successful predictions for reactions involving nuclei far from the stability line. - Nominated by: Division of Nuclear Physics

**Bilek, Marcela M.**

*University of Sydney*

**Citation:** For outstanding contributions to the physics of plasma processing, resulting in plasma sources, processes and materials with applications to industries ranging from information technology to biomedicine - Nominated by: Division of Plasma Physics

**Blackmon, Jeffrey C.**

*Louisiana State University, Baton Rouge*

**Citation:** For his vision and innovation in exploiting radioactive nuclear beams to advance our understanding of nuclear processes that govern astrophysical phenomena - Nominated by: Division of Nuclear Physics

**Blick, Robert H.**

*University of Wisconsin, Madison*

**Citation:** For his distinctive contributions to the physics of quantum dots and nanomechanical systems, and for his fine contributions to developing new on-chip screening methods for ion channel spectroscopy and mass spectroscopy of proteins - Nominated by: Division of Materials Physics

**Boettger, Jonathan C.**

*Los Alamos National Laboratory*

**Citation:** For diverse contributions of profound impact on modern methods of simulating matter under extreme conditions, especially

equations of state and properties of heavy element systems, and for synthesizing the computed results in ways significant to the success of experiments important to national security - Nominated by: Division of Computational Physics

**Bourne, Neil K.**

*No Company Provided*

**Citation:** For seminal work enhancing understanding of the kinetics of deformation mechanisms in condensed matter and their interaction to define the response of inert and energetic materials to extreme mechanical loading - Nominated by: Topical Group on Shock Compression of Condensed Matter

**Bousso, Raphael**

*University of California, Berkeley*

**Citation:** For fundamental discoveries in the field of quantum cosmology, including the covariant entropy bound and the string landscape - Nominated by: Division of Particles and Fields

**Brambilla, Nora**

*Technische Universität München*

**Citation:** For contributions to the theory of heavy-quark-antiquark systems, including the development of new effective field theories, and for contributions to the field of heavy-quarkonium physics through the founding and leadership of the Quarkonium Working Group - Nominated by: Topical Group on Hadronic Physics

**Branz, Howard**

*NREL*

**Citation:** For seminal research on thin film silicon: defects, metastability, growth processes, nanostructuring, and solar cells - Nominated by: Forum on Industrial and Applied Physics

**Brock, Joel D.**

*Cornell University*

**Citation:** For innovative time-resolved and in-situ synchrotron x-ray experiments on the structure, dynamics, and growth mechanisms of complex, low-dimensional systems, including liquid crystals, charge density wave systems, ion-bombarded surfaces, electrodeposition and pulsed-laser deposited complex oxides. - Nominated by: Division of Materials Physics

**Bundschuh, Ralf A.**

*The Ohio State University*

**Citation:** For his significant contributions to our quantitative understanding of biophysical properties of nucleic acids and to the use of physical approaches in biological sequence analysis - Nominated by: Division of Biological Physics

**Bunker, Bruce A.**

*University of Notre Dame*

**Citation:** For contributions to the development of X-ray absorption spectroscopy and applications to complex nanoscale materials - Nominated by: Division of Condensed Matter Physics

**Byrd, John**

*Lawrence Berkeley National Laboratory*

**Citation:** For his seminal contributions to accelerator science in the areas of: collective beam behavior, coherent synchrotron radiation in storage rings and femtosecond timing and synchronization of accelerator systems - Nominated by: Division of Physics of Beams

**Cahay, Marc**

*No Company Provided*

**Citation:** For seminal contributions to understanding transport properties of mesoscopic systems and for pioneering work in spintronic devices - Nominated by: Forum on Industrial and Applied Physics

**Cammarata, Robert**

*Johns Hopkins University*

**Citation:** For pioneering contributions to the thermodynamics and mechanics of surfaces, thin films, and nanomaterials, and to the synthesis, processing and mechanical behavior of nanocomposite thin films. - Nominated by: Division of Materials Physics

**Carpick, Robert W.**

*University of Pennsylvania*

**Citation:** For his outstanding contributions to developing an atomic-level understanding of the tribological phenomena of friction, adhesion, and wear - Nominated by: Division of Materials Physics

**Carruthers, Thomas F.**

*National Science Foundation*

**Citation:** For pioneering contributions to the fields of ultrafast optics, nonlinear optics, and fiber lasers, for services to the physics community, and for advising and overseeing the construction and operation of interferometric gravitational-wave detectors - Nominated by: Division of Laser Science

**Chandross, Michael E.**

*Sandia National Laboratories*

**Citation:** For his outstanding contributions to the development of computational physics methods and their application to tribology and

the aging and reliability of nanomaterials - Nominated by: Division of Computational Physics

**Chang, Chia-Seng**

*Academia Sinica*

**Citation:** For long lasting contribution in surface sciences and nanotechnology research, and innovative developments on scanning probe microscopy, UHV TEM-STM combined system for in-situ nanoscale observation and measurements, and the development of phase plate and wet cell for TEM for biological imaging - Nominated by: Topical Group on Instrument and Measurement Science

**Chen, Gang**

*Massachusetts Institute of Technology*

**Citation:** For pioneering contributions to the understanding of heat transfer at nanoscale and to the development of thermoelectric energy conversion technologies - Nominated by: Division of Materials Physics

**Chen, Shi-Jie**

*University of Missouri, Columbia*

**Citation:** For his pioneering contributions to physics-based theoretical and computational studies of structure, stability, folding kinetics and ion effects in Ribonucleic Acid (RNA) biology - Nominated by: Division of Biological Physics

**Chi, Cheng-Chung**

*National Tsing Hua University*

**Citation:** For studies of nonequilibrium superconductivity and quasiparticle dynamics using tunneling and ultrafast pulse experiments - Nominated by: Division of Condensed Matter Physics

**Cirigliano, Vincenzo**

*Los Alamos National Laboratory*

**Citation:** For his foundational theoretical contributions to the interpretation of weak decays of light hadrons and the delineation of broader impacts of electric dipole moment searches, and for his contributions to studies of baryogenesis in the early universe - Nominated by: Division of Nuclear Physics

**Colgan, James P.**

*Los Alamos National Laboratory*

**Citation:** For advancing our fundamental understanding in the electron-impact ionization, few-photon multiple ionization, and ion-impact ionization of atoms and molecules found in astrophysical and laboratory plasmas. - Nominated by: Division of Atomic, Molecular & Optical Physics

**Collins, Reuben T.**

*Colorado School of Mines*

**Citation:** For contributions to understanding optical properties of high temperature superconductors, complex semiconductor heterostructures, porous silicon and hybrid organic-inorganic heterostructures - Nominated by: Division of Condensed Matter Physics

**Cook, David M.**

*Lawrence University*

**Citation:** For the prominent roles he has played in developing and disseminating outstanding computational elements for undergraduate physics courses, in building an exemplary undergraduate physics program, and in executive leadership of the American Association of Physics Teachers. - Nominated by: Forum on Education

**Cottle, Paul**

*Florida State University*

**Citation:** For the impact of his efforts to improve university physics education, especially for precollege teachers, and his advocacy for effective precollege science education standards and policy in Florida and nationally - Nominated by: Forum on Education

**Cushman, Priscilla**

*University of Minnesota, Minneapolis*

**Citation:** For outstanding contributions in the design and execution of experiments probing beyond the Standard Model especially the Cryogenic Dark Matter Search and the precise measurement of the muon magnetic moment, and the development of photodetection and low radioactivity instrumentation to advance the capabilities of high energy physics experiments - Nominated by: Division of Particles and Fields

**Das, Bhanu**

*Indian Institute of Science*

**Citation:** For his seminal contributions to the theory of parity and time-reversal violations in atoms in the context of probing the Standard Model of particle physics, and for his leadership in promoting international collaborations in frontier areas of atomic, molecular and optical physics - Nominated by: Forum on International Physics

**Dasu, Sridhara**

*University of Wisconsin, Madison*

**Citation:** For leadership in understanding the mechanism of electroweak symmetry breaking in proton-proton collisions, contributions to studies of flavor-changing neutral current electro-weak decays of

the B-meson, and innovation in triggering, data acquisition and computing in particle physics experiments - Nominated by: Division of Particles and Fields

**Day, Donal**

**University of Virginia**

*Citation:* For his studies of high momentum transfer quasielastic electron scattering, scaling relations and the short-range structure of nuclei and for his contributions to the use of polarized targets in the study of nucleon form factors and spin structure functions

Nominated by: Division of Nuclear Physics

**De Gouvea, Andre Luiz**

**Northwestern University**

*Citation:* For exceptional service to the field of neutrino physics through innovative studies of possible neutrino properties and their experimental implications - Nominated by: Division of Particles and Fields

**de Melo, Carlos A.R. Sa**

**Georgia Institute of Technology**

*Citation:* For his pioneering contributions to the field of ultra-cold atoms, and for his seminal investigations of ultra-cold fermions during the evolution from Bardeen-Cooper-Schrieffer to Bose-Einstein condensate superfluidity - Nominated by: Division of Atomic, Molecular & Optical Physics

**Decker, Glenn**

**Argonne National Laboratory**

*Citation:* For outstanding contributions to the design, commissioning, and enhancement of synchrotron light sources, and for innovative developments in field of particle beam diagnostics. In particular for the development and the largest deployment in the world of photo-emission-type photon beam position monitors in the global closed-loop orbit feedback system - Nominated by: Division of Physics of Beams

**Demarteau, Marcellinus**

**Argonne National Laboratory**

*Citation:* For his contributions to our understanding of the electroweak interactions, his role in developing new capabilities for silicon based tracking detectors, and his leadership in expanding R&D for new detector technologies - Nominated by: Division of Particles and Fields

**Demler, Eugene**

**Harvard University**

*Citation:* For pioneering theoretical contributions to many-body physics with ultracold atoms. - Nominated by: Division of Atomic, Molecular & Optical Physics

**Den Hartog, Daniel J.**

**University of Wisconsin, Madison**

*Citation:* For novel advances in and applications of optical and spectroscopic plasma diagnostic techniques in different magnetic configurations, and for critical experimental contributions in understanding magnetic self-organization in the reversed field pinch

Nominated by: Division of Plasma Physics

**Deveaud, Benoit**

**Ecole Polytechnique Fédéral de Lausanne**

*Citation:* For demonstration of Bose Einstein condensation of exciton polaritons in microcavities and developments in semiconductor ultrafast optics - Nominated by: Division of Condensed Matter Physics

**Deyoung, Paul**

**Hope College**

*Citation:* For his strong and sustained leadership of facilitating research opportunities to enhance undergraduate education

Nominated by: Forum on Education

**Di Ventra, Massimiliano**

**University of California, San Diego**

*Citation:* For contributions to the theory of electronic transport in nanoscale conductors - Nominated by: Division of Condensed Matter Physics

**Dilling, Jens**

**TRIUMF**

*Citation:* For contributions to precision nuclear physics measurements using laser spectroscopy and mass measurements, in particular for the advancement of our understanding of Halo-nuclei, and the development of Penning trap mass spectrometry for highly charged rare isotopes. - Nominated by: Division of Nuclear Physics

**Dimits, Andris M.**

**Lawrence Livermore National Laboratory**

*Citation:* For important insights and contributions to the theory and simulation of kinetic turbulent transport in magnetized plasmas, including the effects of self-consistent turbulence-induced velocity shear and Coulomb collisions - Nominated by: Division of Plasma Physics

**Dokholyan, Nikolay**

**University of North Carolina, Chapel Hill**

*Citation:* For using multiscale modeling techniques to advance our understanding of physical interactions within and between biological molecules that yield insights into their complex organization, behavior, and evolution. He has served the community by making his these tools publicly accessible - Nominated by: Division of Biological Physics

**Dowling, David R.**

**University of Michigan, Ann Arbor**

*Citation:* For conduct and analysis of experiments on turbulent mixing and high-Reynolds number wall-bounded flows, and for contributions to fluids education

Nominated by: Division of Fluid Dynamics

**Dutta, Mitra**

**University of Illinois, Chicago**

*Citation:* For research leadership and administration in government and academia, through which she has supported the applications of physics for society, outreach to the public, and enhancement of physics education - Nominated by: Forum on Physics and Society

**Eckert, Ulrich**

**University of Augsburg**

*Citation:* For contributions to the theory of nonequilibrium superconductivity, quantum dissipation in Josephson junctions, and phase coherence in disordered and interacting mesoscopic systems

Nominated by: Division of Condensed Matter Physics

**El-Shall, M. Samy**

**Virginia Commonwealth University**

*Citation:* For his pioneering contributions to the fields of ion-induced nucleation, ion mobility, thermochemistry and structures of molecular cluster ions, gas phase cluster polymerization, nanostructured materials and nanocatalysis - Nominated by: Division of Chemical Physics

**Eliasson, Bengt**

**Ruhr Universotät Bochum**

*Citation:* For seminal contributions to computational and nonlinear plasma physics involving novel parametric interactions and coherent nonlinear structures at scales ranging from kinetic to quantum

Nominated by: Division of Plasma Physics

**Eriksson, Mark A.**

**University of Wisconsin, Madison**

*Citation:* For contributions to the understanding and development of nanodevices for spintronics and quantum information applications

Nominated by: Division of Condensed Matter Physics

**Felser, Claudia**

**Johannes Gutenberg University**

*Citation:* For creating and understanding new Heusler materials with spintronic and energy functionalities - Nominated by: Division of Condensed Matter Physics

**Fernandez, Juan C.**

**Los Alamos National Laboratory**

*Citation:* For outstanding and sustained contributions in laser-plasma interactions, relativistic laser-plasmas, and self-organizing force-free magnetized plasmas, and in their application to fusion research and national security - Nominated by: Division of Plasma Physics

**Fiorani, Dino**

**No Company Provided**

*Citation:* For his contribution to the physics of nanostructured materials and his contribution to the international aspect of physics through organization of international science meetings - Nominated by: Forum on International Physics

**Fleming, Donald G.**

**TRIUMF**

*Citation:* For his pioneering studies utilizing muons as uniquely sensitive isotopic probes of molecular interactions and quantum mass effects in the chemical sciences - Nominated by: Division of Chemical Physics

**Frenje, Johan**

**Massachusetts Institute of Technology**

*Citation:* For pioneering development of unique neutron diagnostic methods and their utilization in inertial confinement fusion research, particularly in assessing implosion performance in fundamental and applied nuclear-science experiments - Nominated by: Division of Plasma Physics

**Frischknecht, Amalie**

**Sandia National Laboratories**

*Citation:* For outstanding contributions to the theory of ionomers and nanocomposites including the development and application of density functional theory to polymers - Nominated by: Division of Polymer Physics

**Fryxell, Bruce**

**University of Michigan, Ann Arbor**

*Citation:* For his work disseminating computational methods to the field of astrophysics and applying these methods to a wide range of astrophysics from supernovae to X-ray binaries - Nominated by: Division of Astrophysics

**Fuchs, Christopher**

**Perimeter Institute for Theoretical Physics**

*Citation:* For powerful theorems and lucid expositions that have expanded our understanding of quantum foundations, through his illuminating reformulation of the view that quantum states are states of knowledge, merging the Copenhagen interpretation with the interpretation of probabilities as degrees of belief - Nominated by: Topical Group on Quantum Information

**Fursa, Dmitry**

**Curtin University**

*Citation:* For the development of the convergent close-coupling method for quasi two-electron targets - Nominated by: Division of Atomic, Molecular & Optical Physics

**Ganan-Calvo, Alfonso M.**

**Universidad de Sevilla**

*Citation:* Novel insights, including experiments and theory, for molding fluid jets into micro jets using aerodynamic, hydrodynamic or electrical forces - Nominated by: Division of Fluid Dynamics

**Ganesan, Venkatraghavan**

**University of Texas, Austin**

*Citation:* For exceptional contributions to innovative computer simulation approaches and analysis of equilibrium and dynamic properties of multicomponent polymeric materials and nanocomposites

Nominated by: Division of Polymer Physics

**Garg, Anupam K.**

**Northwestern University**

*Citation:* For theory and predictions of molecular magnetism and macroscopic quantum phenomena - Nominated by: Division of Condensed Matter Physics

**Giddings, Steven**

**University of California, Santa Barbara**

*Citation:* For his wide ranging contributions to gravitational physics at its intersection with elementary particle physics, especially his work on the quantum properties of black holes in the universe and in accelerators - Nominated by: Topical Group in Gravitation

**Glenzinski, Douglas**

**Fermilab**

*Citation:* For his leadership on many levels of the CDF experiment including the construction and commissioning of the intermediate silicon detector (ISL) effort, serving as physics coordinator as well as his many physics contributions to the characterization of the top quark and search for new physics in the B<sub>s</sub> channel

Nominated by: Division of Particles and Fields

**Goebel, Dan M.**

**Jet Propulsion Lab**

*Citation:* For the invention, development, and fielding of novel plasma devices used in science and industry, including magnetic fusion, propulsion, microwave-source, and semiconductor-processing research

Nominated by: Division of Plasma Physics

**Goldman, Rachel**

**University of Michigan, Ann Arbor**

*Citation:* For contributions to the fundamental understanding of strain relaxation, alloy formation, and diffusion, and their applications to nanostructure processing - Nominated by: Forum on Industrial and Applied Physics

**Gopalan, Venkatraman**

**Pennsylvania State University**

*Citation:* For his insightful use of symmetry combined with optical and scanning probe methods to better understand domain walls and the influence of defects, rotations, and strain on ferroelectrics and multiferroics. - Nominated by: Division of Materials Physics

**Gorelenkov, Nikolai**

**Princeton University**

*Citation:* For ground-breaking research on predictions and observations of energetic-particle-driven electromagnetic instabilities in magnetically-confined toroidal plasmas - Nominated by: Division of Plasma Physics

**Gottesman, Daniel**

**Perimeter Institute for Theoretical Physics**

*Citation:* For his pioneering theoretical work on quantum computation and cryptography, in particular laying the foundations of quantum error correction and rigorously extending the theory of fault tolerant quantum computation - Nominated by: Topical Group on Quantum Information

**Govorov, Alexandre O.**

**Ohio University**

*Citation:* For contributions to the understanding of optical properties of semiconductor and metal nanostructures, including elucidation of the optical Aharonov-Bohm and nonlinear Fano effects

Nominated by: Division of Condensed Matter Physics

**Grein, Christoph**

**University of Illinois, Chicago**

*Citation:* For achievements in novel superlattice-based infrared detectors and emitters - Nominated by: Forum on Industrial and Applied Physics

**Gullion, Terry W.**

**West Virginia University**

*Citation:* For creation, development, and numerous applications of solid-state NMR techniques for measuring distances between nuclear spins in biological, polymeric, and inorganic rotating solids

Nominated by: Division of Chemical Physics

**Guo, Chunlei**

**University of Rochester**

*Citation:* For pioneering contributions in laser-matter interactions and applications, including the discoveries of the black and colored metals and exploring their wide range of applications

Nominated by: Forum on Industrial and Applied Physics

**Gutmark, Ephraim**

**University of Cincinnati**

*Citation:* For his pioneering contributions to the fundamental flow physics of noise, combustion, and propulsion, and the development of flow control methodologies to achieve quiet aircraft engines, clean, stable and efficient combustion, and innovative propulsion systems

Nominated by: Division of Fluid Dynamics

**Hamaguchi, Satoshi**

**Osaka Unuversity**

*Citation:* For seminal contributions to theory and simulation of strongly coupled plasmas, plasmas interacting with solid particles and surfaces, and ion-temperature-gradient turbulence dynamics

Nominated by: Division of Plasma Physics

**Hau, Lene V.**

**Harvard University**

*Citation:* For slowing, stopping, and storing light pulses in Bose-Einstein condensates of laser cooled atoms and converting light into a matter imprint then resurrecting the light - Nominated by: Division of Condensed Matter Physics

**Heinrich, Andreas J.**

**IBM Almaden Research Center**

*Citation:* For the development of scanning tunneling microscope methods to study individual magnetic atoms by spin-excitation spectroscopy and nanosecond pump-probe techniques

Nominated by: Division of Condensed Matter Physics

**Henderson, Stuart**

**Fermilab**

*Citation:* For leadership in the construction and commissioning of the Spallation Neutron Source at Oak Ridge National Laboratory, and in particular for leading the effort to bring the SNS into full operational status with a beam power in excess of 1 MW - Nominated by: Division of Physics of Beams

**Henningson, Dan S.**

**Kungliga Tek Hogskolan KTH**

*Citation:* For pioneering contributions to linear and nonlinear hydrodynamic stability and numerical simulations of transitional and turbulent flows, including in-depth understanding of the concept of receptivity, bypass transition and flows over complex surfaces, as well as feedback control of these flows - Nominated by: Division of Fluid Dynamics

**Hermann, Mark C.**

**Sandia National Laboratories**

*Citation:* For innovative technical advances and exceptional leadership in the areas of inertial confinement fusion target design and magnetically driven high-energy-density science - Nominated by: Division of Plasma Physics

**Hersam, Mark C.**

**Northwestern University**

*Citation:* For pioneering research on the fundamentals and applications of nanoelectronic materials, including the development of methods for sorting carbon nanotubes and graphene, and for chemical functionalization of semiconductor surfaces - Nominated by: Division of Materials Physics

**Hess, Wayne P.**

**Pacific Northwest National Laboratory**

*Citation:* For advancing laser science to understand the dynamics and reactions of electronically excited crystalline solids and laser desorption of atoms and molecules - Nominated by: Division of Laser Science

**Hoeflich, Peter**

**Florida State University**

*Citation:* For outstanding contributions to stellar evolution, radiation hydrodynamics, and nuclear astrophysics, especially in the context of modeling the light curves and spectral evolution of supernova explosions - Nominated by: Division of Computational Physics

**Holt, Richard A.**

**University of Western Ontario**

*Citation:* For a landmark proposal to test Bell's inequality, and high-precision experiments of key significance to test quantum electrodyamics in two-electron atomic ions - Nominated by: Division of Atomic, Molecular & Optical Physics

**Holzappel, William L.**

**University of California, Berkeley**

*Citation:* For his contributions to experimental studies of the early universe, notably cosmic microwave background anisotropies and its polarization, and Sunyaev-Zeldovich effect - Nominated by: Division of Astrophysics

**Hosoi, Anette E.**

**Massachusetts Institute of Technology**

*Citation:* For her innovative work in thin fluid films and in the study of nonlinear interactions between viscous fluids and deformable interfaces including shape, kinematic and rheological optimization in biological systems - Nominated by: Division of Fluid Dynamics

**Huang, Huan Z.**

**University of California, Los Angeles**

*Citation:* For experimental measurements of strange hadrons, in particular hyperons, and quark number scaling in nucleus-nucleus collisions at RHIC - Nominated by: Division of Nuclear Physics

**Huennekens, John P.**

**Lehigh University**

*Citation:* For contributions to the development of fine and hyperfine structure, and quantum interference effects based spectroscopic probes for the study of electronic state interactions and transition dipole moments and for efforts to advance the state of undergraduate physics research experience. - Nominated by: Division of Laser Science

**Hughes, Scott**

**Massachusetts Institute of Technology**

*Citation:* For pioneering work in gravitational wave physics including modeling the waveforms of extreme mass-ratio inspirals, developing a framework for testing black hole spacetimes, and showing how gravitational waves can be used to study structure formation and measure cosmological parameters - Nominated by: Topical Group in Gravitation

**Incandela, Joseph**

**CERN**

*Citation:* For distinguished contributions to our understanding of vector bosons, the observation and studies of the properties of the top quark, and searches for new physics at the LHC as well as leadership in the design and construction of new silicon tracking detectors that enabled many important new results at the Tevatron and the LHC - Nominated by: Division of Particles and Fields

**Intrator, Tom**

**Los Alamos National Laboratory**

*Citation:* For novel experimental investigations of interrelated properties of magnetic flux ropes, magnetic reconnection, and turbulence in astrophysical, space, and fusion physics, and for seminal Alfvén-wave current-drive experiments - Nominated by: Division of Plasma Physics

**Iyer, Balasubramanian**

**Raman Research Institute**

*Citation:* For his important contributions to gravitational theory, in particular the post-Newtonian approximation and equations of motion, his outstanding leadership in creating the gravitational wave community in India through the IndIGO consortium, and his key role in the LIGO-India initiative - Nominated by: Topical Group in Gravitation

**Jhe, Wonho**

**Seoul National University**

*Citation:* For the experiments on radiative decay in optical cavities, development of a single-beam magneto-optical trap, and observation of critical many-body phenomena in periodically modulated cold-atom systems - Nominated by: Division of Atomic, Molecular & Optical Physics

**Jin, Kui-juan**

**No Company Provided**

*Citation:* For her significant contribution in the crossing area of optics and condensed matter physics, including Fano resonance applying in some semiconductor systems, laser MBE growing and novel property revealing for perovskite oxide heterostructures, and for her important role as a leading card for women in physics

Nominated by: Forum on International Physics

**Johannes, Michelle D.**

**Naval Research Laboratory**

*Citation:* For computational work that has made a strong impact in novel superconductivity, magnetism, charge density waves and battery electrode materials. Her calculations have contributed to understanding and explaining the underlying physics that governs the properties of widely diverse materials - Nominated by: Division of Computational Physics

**Johnson, Robert**

**University of California, Santa Cruz**

*Citation:* For his leadership of the design and implementation of the Fermi Large Area Telescope (LAT) Tracker - Nominated by: Division of Particles and Fields

**Julian, Stephen R.**

**University of Toronto**

*Citation:* For research on unconventional metallic and superconducting states of heavy fermion metals and strongly correlated oxides

Nominated by: Division of Condensed Matter Physics

**Kaloper, Nemanja**

**University of California, Davis**

*Citation:* For numerous and imaginative contributions to theoretical cosmology, particularly for the pioneering work in the physics and

cosmology of braneworlds, for important contributions to the early universe inflation and its signatures, creative contributions to the understanding of dark energy and an elucidation of the axiverse

Nominated by: Division of Astrophysics

**Kazanas, Demosthenes**

</

**Liddle, James**

**NIST**

*Citation: For contributions to the science and technology of nano-fabrication and nanolithography, including projection electron beam lithography, high-resolution x-ray optics, diblock copolymer and chemically amplified resists, and the directed assembly and metrology of nanoparticle structures - Nominated by: Forum on Industrial and Applied Physics*

**Ligeti, Zoltan**

**Lawrence Berkeley National Laboratory**

*Citation: For major theoretical contributions to flavor physics, and, in particular, the extraction of fundamental information testing the validity of the Standard Model from analyses of particle mixing, oscillations, and decays, all processes in which the strong force obscures the details of the weak interaction - Nominated by: Division of Particles and Fields*

**Lin, Jingyu**

**Texas Tech University**

*Citation: For her seminal contributions to our fundamental understanding of the electronic and optical properties of the group III-nitride semiconductors and her significant impact on the use of these materials for nanophotonic devices. - Nominated by: Division of Materials Physics*

**Lin, Robert P.**

**University of California, Berkeley**

*Citation: For fundamental contributions to solar, space plasma, and planetary physics. Many of his discoveries derive from his development of innovative detectors and instruments for low energy electrons in space and of novel x-ray and gamma-ray imaging spectrometers - Nominated by: Topical Group in Plasma Astrophysics*

**Lipton, Ronald**

**Fermilab**

*Citation: For his numerous fundamental contributions to the development of silicon detectors which provided particle physics with discoveries of new particles containing b-quarks and observation of unique processes with b-quarks in the final states - Nominated by: Division of Particles and Fields*

**Liu, Kai**

**University of California, Davis**

*Citation: For contributions to the understanding of magnetoresistance effects, exchange bias, and magnetization reversal in magnetic nanostructures - Nominated by: Topical Group on Magnetism*

**Loesche, Mathias**

**Carnegie Mellon University**

*Citation: For elucidating the structure of phospholipids films and membranes through microscopy and reflectometry - Nominated by: Division of Biological Physics*

**Loo, Lynn**

**Princeton University**

*Citation: For elucidating the relationships between structure and function in conducting polymers and organic semiconductors, and for applying this understanding to enhance conductor, transistor, and photovoltaic device performance - Nominated by: Division of Polymer Physics*

**Lookman, Turab**

**Los Alamos National Laboratory**

*Citation: For seminal contributions to the computational physics of materials, complex fluids and nonlinear dynamics - Nominated by: Division of Computational Physics*

**Lousto, Carlos**

**Rochester Institute of Technology**

*Citation: For his important contributions at the interface between perturbation theory and numerical relativity and in understanding how to simulate binary black holes - Nominated by: Topical Group in Gravitation*

**Lu, Li**

**Chinese Academy of Science**

*Citation: For contributions to experimental studies of mesoscopic and nanoscale electronic materials, and for leadership in promoting international scientific collaborations - Nominated by: Forum on International Physics*

**MacKintosh, Frederick C.**

**Vrije University**

*Citation: For his fundamental contributions to the understanding of biopolymer and cytoskeletal networks - Nominated by: Division of Biological Physics*

**Makse, Hernan A.**

**CUNY-CCNY**

*Citation: For his contributions to a broad range of topics in non-equilibrium systems ranging from urban dynamics and complex networks to statistical mechanics of jammed matter, in particular, the elucidation of the random close packing state of granular matter*  
**Nominated by: Topical Group on Statistical and Nonlinear Physics**

**Mantica, Paul**

**Michigan State University**

*Citation: For leading the development of novel decay studies of projectile fragmentation products and the elucidation of nuclear structure through implantation-decay spectroscopy and beta-decay-NMR*  
**Nominated by: Division of Nuclear Physics**

**Martin, Stephen**

**Northern Illinois University**

*Citation: For his many contributions to both theoretical and phenomenological aspects of supersymmetry and his excellent exposition of the subject through a well-known primer, invited lectures and conference talks - Nominated by: Division of Particles and Fields*

**Mathur, Neil D.**

**University of Cambridge**

*Citation: For seminal contributions to the science and technology of magnetic and multiferroic oxides - Nominated by: Division of Materials Physics*

**McCall, Benjamin**

**University of Illinois, Urbana-Champaign**

*Citation: For integrative studies of the simplest polyatomic molecule (H3+), including its dissociative recombination, proton-swapping reaction with H2, and astronomical observations and modeling; and for the development of high-sensitivity, high-precision methods for molecular ion spectroscopy - Nominated by: Division of Atomic, Molecular & Optical Physics*

**McCartney, Matha R.**

**Arizona State University**

*Citation: For outstanding contributions to the development of off-axis electron holography and applications to the quantification of nanoscale electrostatic and magnetic fields - Nominated by: Division of Materials Physics*

**Meerson, Baruch**

**Hebrew University of Jerusalem**

*Citation: For significant and innovative contributions to the physics of non-equilibrium and non-linear systems, including extinction in population dynamics, instabilities in granular gases, coarsening, and quantum chaos - Nominated by: Topical Group on Statistical and Nonlinear Physics*

**Meltzer, David E.**

**Arizona State University**

*Citation: For his tireless advocacy for the quality of professional preparation of K-12 teachers and for the depth and breadth of his scholarly contributions to research in physics education and the community of physics education researchers - Nominated by: Forum on Education*

**Meng, Jie**

**Peking University**

*Citation: For his many important and continuing contributions in developing the Relativistic Mean Field theory into a predictive tool for nuclear structure research and for creating an active international hub at Beijing in this field - Nominated by: Forum on International Physics*

**Morr, Dirk Klaus**

**University of Illinois, Chicago**

*Citation: For contributions to the theory of strongly correlated electron materials and complex phenomena at the nanoscale*  
**Nominated by: Division of Condensed Matter Physics**

**Morris, Stephen W.**

**University of Toronto**

*Citation: For innovative experimental work in nonlinear dynamics, pattern formation, and geophysical patterns, and significant public outreach - Nominated by: Topical Group on Statistical and Non-linear Physics*

**Munro, William**

**NTT Basic Research Labs**

*Citation: For extensive contributions to applied quantum information. He proposed a scheme for quantum multiplexing in a quantum network and weak optical nonlinearities for optical quantum computing. He was the theoretician on the team that first demonstrated coupling of a superconducting flux-qubit to NV diamond spins - Nominated by: Forum on Industrial and Applied Physics*

**Myers, Steve**

**CERN**

*Citation: For his important contributions to the physics of beams and his exceptional efforts to shape international collaborations enabling successful physics programs at the ISR, LEP and LHC*

**Nominated by: Forum on International Physics**

**Nakatani, Alan**

**Dow Chemical Company**

*Citation: For outstanding contributions to experimental studies of the structure and rheology of multicomponent polymer blends, solutions, and composites using NMR, light scattering, and especially neutron scattering methods - Nominated by: Division of Polymer Physics*

**Natelson, Douglas**

**Rice University**

*Citation: For experiments in atomic- and molecular-scale junctions*  
**Nominated by: Division of Condensed Matter Physics**

**Newberg, Heidi Jo**

**Rensselaer Polytechnic Institute**

*Citation: For her contributions to our understanding of the structure of the Milky Way galaxy and the universe and for the development of software and hardware infrastructure for measuring and extracting meaningful information from large astronomical survey data sets*  
**Nominated by: Division of Astrophysics**

**Nikzad, Shouleh**

**Jet Propulsion Lab**

*Citation: For innovative development of band structure engineering techniques using delta-doping at semiconductor surfaces and their application to produce unprecedented performance in sensors and devices - Nominated by: Forum on Industrial and Applied Physics*

**Noack, Bernd R.**

**CNRS, Paris**

*Citation: For pioneering contributions to closed-loop turbulence control from reduced-order modelling to numerical and experimental demonstrations - Nominated by: Division of Fluid Dynamics*

**Norreys, Peter**

**Rutherford Appleton Laboratory**

*Citation: For major contributions to the understanding of energetic particle generation and transport in relativistic laser-plasma interactions, including innovative experiments relevant to fast ignition fusion concepts - Nominated by: Division of Plasma Physics*

**Novokhatski, Alexander**

**Stanford University**

*Citation: For pioneering contributions to accelerator physics: BNS damping, beam dynamics in Linear Colliders, wakefields and coherent radiation of very short bunches, collective instabilities in high current storage rings - Nominated by: Division of Physics of Beams*

**Ohno, Hideo**

**Tohoku University**

*Citation: For outstanding research in materials and device physics, especially the observation of ferromagnetism in magnetically doped III-V semiconductors and their application to spintronics.*  
**Nominated by: Division of Materials Physics**

**Otsuka, Takaharu**

**University of Tokyo**

*Citation: For pioneering contributions in nuclear structure, including the microscopic derivation of the IBM, role of the tensor force in nuclear structure, development of the Monte Carlo Shell Model, and role of three-body forces in understanding exotic nuclei.*  
**Nominated by: Division of Nuclear Physics**

**Padmore, Howard**

**Lawrence Berkeley National Laboratory**

*Citation: For seminal contributions to X-ray optics, instrumentation, and research with synchrotron radiation - Nominated by: Topical Group on Instrument and Measurement Science*

**Park, Hyeon K.**

**Pohang University of Science and Technology**

*Citation: For innovative development and implementation of advanced plasma diagnostics including imaging techniques, and for fundamental contributions to the understanding of MHD physics and turbulent transport in toroidal confinement systems - Nominated by: Division of Plasma Physics*

**Patankar, Neelesh A.**

**Northwestern University**

*Citation: For pioneering contributions to the understanding of super-hydrophobicity, the development of computational methods for immersed bodies, and the numerical analysis of electroosmotic flows*  
**Nominated by: Division of Fluid Dynamics**

**Pitsch, Heinz**

**Stanford University**

*Citation: For groundbreaking contributions to the development of large-eddy simulations of turbulent combustion as well as their application to aircraft-engine, gas-turbine and reciprocating-engine combustion - Nominated by: Division of Fluid Dynamics*

**Polychronakos, Alexios**

**CUNY-CCNY**

*Citation: For important contributions to the field of statistical mechanics and integrable systems, including the Polychronakos model and the exchange operator formalism, fractional statistics, matrix model description of quantum Hall systems as well as other areas such as noncommutative geometry - Nominated by: Division of Particles and Fields*

**Popovic, Dragana**

**Florida State University**

*Citation: For experimental studies of glassy behavior in strongly correlated systems near the metal-insulator transition - Nominated by: Division of Condensed Matter Physics*

**Pregenzer, Arian**

**Sandia National Laboratories**

*Citation: For her leadership in advancing arms control monitoring and verification technologies and for establishing and leading international scientific cooperation for arms control and international security - Nominated by: Forum on Physics and Society*

**Qi, Fei**

**University of Science & Technology of China**

*Citation: For his pioneering development of synchrotron-based combustion diagnostics, particularly used to study pyrolysis, oxidation and flame chemistry of various fuels - Nominated by: Division of Chemical Physics*

**Redmer, Ronald**

**University of Rostock**

*Citation: For seminal contributions to transport theory in dense plasmas, for first-principles approaches to improving planetary models, and for pioneering work on the theory of Thomson scattering in warm dense matter - Nominated by: Division of Plasma Physics*

**Redwing, Joan**

**Pennsylvania State University**

*Citation: For key contributions to the mechanistic understanding of materials synthesis by vapor growth, including Si and SiGe nanowires, group-III nitrides and boride-based superconductors.*  
**Nominated by: Division of Materials Physics**

**Reis, David A.**

**SLAC**

*For outstanding contributions to the inauguration and development of the burgeoning field of ultrafast x-ray materials science, and particularly for his pioneering use of synchrotron radiation and x-ray laser radiation as tools to understand structural changes in laser-driven solids. - Nominated by: Division of Laser Science*

**Riehle, Fritz**

**Physik-Tech Bundesanstalt**

*Citation: For his pioneering scientific contributions to the optical frequency standards, high resolution spectroscopy, atom interferometry, and ultracold atomic gases and for his leadership role in the international standards community. - Nominated by: Topical Group Precision Measurement & Fundamental Constants*

**Riseborough, Peter S.**

**Temple University**

*Citation: For contributions to quantum statistical mechanics of non-linear and non-equilibrium phenomena and correlated electron systems - Nominated by: Division of Condensed Matter Physics*

**Robin, David**

**Lawrence Berkeley National Laboratory**

*Citation: For fundamental advances to the understanding and control of the nonlinear beam dynamic behavior of electrons in particle storage rings; including the development of Frequency Map Analysis and Quasi-isochronous Storage Rings - Nominated by: Division of Physics of Beams*

**Roland, Christopher M.**

**North Carolina State University**

*Citation: For his fundamental contributions to computational materials physics and statistical mechanics, his insights into the understanding of growth phenomena for complex and nanostructured materials, and his ground breaking work on surfaces and interfaces.*  
**Nominated by: Division of Computational Physics**

**Romalis, Mikhail V.**

**Princeton University**

*Citation: For seminal contributions to the development of techniques for precision measurement of atomic spin precession and their application to tests of discrete symmetries, tests of Lorentz invariance, and atomic magnetometry - Nominated by: Division of Atomic, Molecular & Optical Physics*

**Roodman, Aaron**

**SLAC**

*Citation: For pioneering contributions to the measurements of CP asymmetries and rates of two- and three-body decays of B mesons, especially those involving neutral pions and kaons, and the determination of the CKM angles alpha and beta and their constraints on beyond-the-standard-model contributions to heavy-flavor interactions*  
**Nominated by: Division of Particles and Fields**

**Rothman, Daniel H.**

**Massachusetts Institute of Technology**

*Citation: For imaginative and insightful studies of the complexity of the natural environment, including problems of flow through porous media, geologic pattern formation, and the dynamics of Earth's carbon cycle, and for the development of discrete models of immiscible fluid mixtures - Nominated by: Topical Group on Statistical and Nonlinear Physics*

**Rowan, Sheila**

**University of Glasgow**

*Citation: For her pioneering research in the field of interferometric gravitational wave detection in the area of reducing the effects of thermal noise in optics and suspensions, and for her leadership within this field - Nominated by: Topical Group in Gravitation*

**Sanbonmatsu, Karissa**

**Los Alamos National Laboratory**

*Citation: For pioneering computer simulation of molecular machines and biomolecular complexes - Nominated by: Division of Biological Physics*

**Santos, Michael B.**

**University of Oklahoma**

*Citation: For growth of compound semiconductor nanostructures and spin transport - Nominated by: Division of Condensed Matter Physics*

**Saveliev, Sergey**

**Loughborough University**

*Citation: For distinguished contributions to the theory of classical and quantum transport, particularly for the application of stochastic methods to solid state physics, including superconducting Terahertz electronics, vortex dynamics and nanoparticle transport*  
**Nominated by: Forum on International Physics**

**Savrasov, Sergej**

**University of California, Davis**

*Citation: For his innovative design and implementation of electronic structure algorithms and software, and for his many contributions to a microscopic understanding of superconductors, magnetic materials, and strongly correlated electron systems. - Nominated by: Division of Computational Physics*

**Schekochihin, Alexander A.**

**University of Oxford**

*Citation: For elucidating fundamental aspects of turbulence in magnetized plasma with application to magnetic field amplification, heating, and transport in astrophysical, space, and laboratory plasmas*  
**Nominated by: Division of Plasma Physics**

**Schonenberger, Christian**

**University of Basel**

*Citation: For charge transport experiments in metallic, semiconducting and molecular nanoelectronics - Nominated by: Division of Condensed Matter Physics*

**Schroeder, Carl B.**

**Lawrence Berkeley National Laboratory**

*For significant theoretical contributions to the physics of intense laser-plasma interactions, with applications to plasma-based accelerators and light sources - Nominated by: Division of Plasma Physics*

**Schultz, William W.**

**University of Michigan, Ann Arbor**

*Citation: For deep contributions to nonlinear water waves, die swell, fiber formation and fish swimming, using innovative asymptotic methods and numerical techniques in FEM, BIM and spectral representation - Nominated by: Division of Fluid Dynamics*

**Schwenk, Achim**

**Technical University of Darmstadt**

*Citation: For pioneering contributions to the nuclear many-body problem, including the application of renormalization group methods and the exploration of three-body forces in nuclear structure, fundamental symmetries and astrophysics - Nominated by: Division of Nuclear Physics*

**Seto, Richard**

**University of California, Riverside**

*Citation: For creative experimentation and leadership in the study of hadronic matter under extreme conditions including measurements and analysis leading to the discovery of the strongly-interacting Quark Gluon Plasma (sQGP) - Nominated by: Division of Nuclear Physics*

**Shattuck, Mark D.**

**CUNY-CCNY**

*Citation: For significant contributions to the understanding of the statistical properties of granular materials, and their analogy to molecular systems - Nominated by: Topical Group on Statistical and Nonlinear Physics*

**Shi, Jing**

**University of California, Riverside**

*Citation: For his pioneering work in spin transport in organic semiconductors and organic molecules - Nominated by: Topical Group on Magnetism*

**Shiner, David C.**

**University of North Texas**

*Citation: For his work on precision laser measurements in the helium atom, especially helium fine structure and helium nuclear size using the isotope shift - Nominated by: Topical Group Precision Measurement & Fundamental Constants*

**Shinn, Michelle**

**Jefferson Laboratory**

*Citation: For contributions in the applications of lasers in society, particularly the development of high power optics technologies for rare earth solid state lasers and free-electron lasers - Nominated by: Forum on Industrial and Applied Physics*

**Sinnot, Susan B.**

**University of Florida**

*Citation: For significant contributions developing and applying atomistic methods to investigate the physical and chemical properties of*

nanomaterials, material surfaces, and interfaces - Nominated by: Division of Materials Physics

**Sorensen, Chris**

**Kansas State University**

*Citation: For original contributions to condensed matter physics, especially to the scientific understanding and technical application of particulate matter - Nominated by: Division of Chemical Physics*

**Southworth, Stephen**

**Argonne National Laboratory**

*Citation: For pioneering the development of atomic and molecular spectroscopies with 3rd and 4th generation light sources including such new effects as higher multipole asymmetries, double K-shell photoionization, and femtosecond electronic response of atoms to ultra-intense x-rays - Nominated by: Division of Atomic, Molecular & Optical Physics*

**Specht, Eliot**

**Oak Ridge National Laboratory**

*Citation: For crystallographic studies of the effects of microstructural defects on materials properties, including advancing the understanding of the effects of crystallographic alignment on current transport in high-temperature superconductors - Nominated by: Forum on Industrial and Applied Physics*

**Spielman, Ian**

**NIST**

*Citation: For innovative and pioneering work in quantum phenomena at the intersection of atomic and condensed matter physics, using quantum simulation with ultracold atoms, including the use of optical interactions to create artificial electromagnetic fields and spin-orbit coupling - Nominated by: Division of Atomic, Molecular & Optical Physics*

**Spitzer, Mark**

**MicroOptical Corp**

*Citation: For seminal research on industrially important opto-electronic devices, including photovoltaic devices, micro-display devices and eyewear display devices - Nominated by: Forum on Industrial and Applied Physics*

**Stamper-Kurn, Dan Moses**

**University of California, Berkeley**

*Citation: For pioneering and trailblazing advances in the physics of quantum fluids and in quantum optics - Nominated by: Division of Atomic, Molecular & Optical Physics*

**Stancil, Phillip C.**

**University of Georgia**

*Citation: For computational studies of atomic and molecular collision processes and their applications to astrophysics, particularly the chemistry of the early universe and charge exchange phenomena of highly-charged ions in the solar system - Nominated by: Division of Atomic, Molecular & Optical Physics*

**Stanton, John F.**

**Vuletic, Vladan**  
**Massachusetts Institute of Technology**  
*Citation: For pioneering advances across AMO physics, including quantum information and precision measurement with atomic ensembles, cavity QED, atomic collisions and Casimir forces for atom condensates near surfaces - Nominated by: Division of Atomic, Molecular & Optical Physics*

**Wackerroth, Doreen**  
**State University of New York, Buffalo**  
*Citation: For careful contributions to electroweak and Higgs physics, especially the computation and phenomenology of electroweak and QCD corrections to W, Z and Higgs boson production at hadron colliders, and for service to high energy physics especially co-organizing a decade of annual LoopFest Workshops - Nominated by: Division of Particles and Fields*

**Wang, Hongfei**  
**Pacific Northwest National Laboratory**  
*Citation: For seminal contributions to the development of surface nonlinear vibrational spectroscopy and to the understanding of molecular interaction and structure at interfaces - Nominated by: Division of Chemical Physics*

**Wang, Mu**  
**Nanjing University**  
*Citation: For his original contributions in understanding nonlinear phenomena in crystallization, exploration of opto-electric properties of self-organized metallic microstructures, and his tireless efforts in promoting international scientific exchange and collaboration*  
**Nominated by: Forum on International Physics**

**Wang, Nan Lin**  
**Chinese Academy of Science**  
*Citation: For contributions to the understanding of correlated electron systems, particularly iron-based superconductors - Nominated by: Division of Condensed Matter Physics*

**Wang, Shan X.**  
**Stanford University**  
*Citation: For seminal contributions to biomagnetics, nanomagnetics,*

*and magnetic recording emphasizing fundamental physics and innovative applications of magnetic nanoparticles, spintronic sensors, and materials - Nominated by: Topical Group on Magnetism*

**Wang, Yun**  
**University of Oklahoma**  
*Citation: For her leadership in dark energy research, especially in developing a robust and consistent framework for analysing and interpreting cosmological data to place model-independent constraints on dark energy, and in optimizing the science return of planned space missions to probe dark energy - Nominated by: Division of Astrophysics*

**Watkins, James**  
**University of Massachusetts, Amherst**  
*Citation: For his pioneering efforts in manipulating polymers to develop technologically functional nanoscopic materials - Nominated by: Division of Polymer Physics*

**Weinacht, Thomas**  
**State University of New York, Stony Brook**  
*Citation: For pioneering leadership in the development and use of learning algorithms to control and shape laser light pulses in the femtosecond domain. Such coherent control selectively drives chosen transitions, both linear and non-linear, in complicated systems with a large number of other possibilities - Nominated by: Division of Atomic, Molecular & Optical Physics*

**Williams, Mark C.**  
**Northeastern University**  
*Citation: For his original contributions to the development of the field of single molecule biophysics. In particular, for his use of quantitative models to describe the interactions of single DNA molecules with biologically important proteins and DNA binding ligands - Nominated by: Division of Biological Physics*

**Wills, John M.**  
**Los Alamos National Laboratory**  
*Citation: For pioneering contributions to the development of electronic structure theory and methodology, and first-principles understanding of f-electron physics in rare-earth and actinide materials*

**Nominated by: Division of Computational Physics**

**Wolkow, Robert A.**  
**University of Alberta**  
*Citation: For contributions to atomic-scale characterization and fabrication processes with an emphasis on silicon surfaces - Nominated by: Division of Condensed Matter Physics*

**Wu, Zhen**  
**Rutgers University**  
*Citation: For innovative and insightful studies into surface interactions of spin-polarized atoms - Nominated by: Division of Atomic, Molecular & Optical Physics*

**Xiong, Peng**  
**Florida State University**  
*Citation: For contributions to the understanding of magnetotransport in nanostructured superconductors, ferromagnets, and their hybrids*  
**Nominated by: Division of Condensed Matter Physics**

**Yacoby, Amir**  
**Harvard University**  
*Citation: For experiments of low-dimensional coherent transport, local imaging, and quantum computation in mesoscopic devices*  
**Nominated by: Division of Condensed Matter Physics**

**Yang, Jihui**  
**University of Washington**  
*Citation: For pioneering studies of the design, synthesis and characterization of novel thermoelectric materials, and for leadership in their use in devices and systems for waste heat recovery applications*  
**Nominated by: Forum on Industrial and Applied Physics**

**Yoda, Minami**  
**Georgia Institute of Technology**  
*Citation: For outstanding contributions to experimental fluid dynamics and optical diagnostics and, specifically, for innovative contributions to the development of evanescent-wave illumination techniques to study flows in near-wall regions - Nominated by: Division of Fluid Dynamics*

**Zhang, Qiming**  
**Pennsylvania State University**  
*Citation: For his pioneering work in electroactive polymers in exploiting defect modifications to significantly enhance the performance of materials and in advancing their application for energy conversion and energy storage - Nominated by: Division of Materials Physics*

**Zhang, Xiaoguang**  
**Oak Ridge National Laboratory**  
*Citation: For pioneering work in the development and application of the scattering theory and computational methods to materials studies, in particular to the study of electron transport in magnetic tunnel junctions - Nominated by: Division of Computational Physics*

**Zhao, Zhengguo**  
**University of Science & Technology of China**  
*Citation: For outstanding leadership in measuring hadronic cross sections and particle properties at the Beijing Electron Positron Collider and for important contributions to the detector construction and physics analysis of the ATLAS experiment at CERN - Nominated by: Division of Particles and Fields*

**Zhuang, Xiaowei**  
**Harvard University**  
*Citation: For her seminal contributions to the development of biophysical techniques involving super-resolution fluorescence microscopy and single molecule fluorescence resonance energy transfer, and her successful applications of these techniques to many critical biological problems - Nominated by: Division of Biological Physics*

**Zimanyi, Gergely T.**  
**University of California, Davis**  
*Citation: For contributions to the theory of strongly correlated systems, vortices, and magnetic hysteresis - Nominated by: Division of Condensed Matter Physics*

## Call for Nominations for 2014 APS Prizes and Awards

To nominate a candidate for any of the APS prizes or awards, visit the appropriate link under the prize name to complete a nomination form. Nomination deadline is July 1, 2013, unless otherwise indicated on the website.

### PRIZES

- Will Allis Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=ALLIS>
- Hans A. Bethe Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=BETHE>
- Tom W. Bonner Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=BONNER>
- Oliver E. Buckley Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=BUCKLEY>
- Davison-Germer Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=DAVISSON>
- Max Delbruck Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=DELBRUCK>
- Fluid Dynamics Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=FLUID>
- Dannie Heineman Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=HEINEMAN>
- Frank Isakson Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=ISAKSON>
- Julius Edgar Lilienfeld Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=LILIENFELD>
- James Clerk Maxwell Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=MAXWELL>
- James C. McGroddy Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=MCGRODDY>

- Lars Onsager Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=ONSAGER>
- Abraham Pais Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=PAIS>
- George E. Pake Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=PAKE>
- W.K.H. Panofsky Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=PANOFSKY>
- Earle K. Plyler Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=PLYLER>
- Polymer Physics Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=POLYMER>
- Aneesur Rahman Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=RAHMAN>
- Andrei Sakharov Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=SAKHAROV>
- J.J. Sakurai Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=SAKURAI>
- Arthur L. Schalow Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=SCHALOW>
- Prize to a Faculty Member for Research in an Undergraduate Institution**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=UNDERGRADUATE>

- Robert R. Wilson Prize**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=WILSON>
- AWARDS, MEDALS & LECTURESHIPS**
- David Adler Lectureship**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=ADLER>
- Leroy Apker Award**  
[APKER@APS.ORG](mailto:APKER@APS.ORG)
- Edward A. Bouchet Award**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=BOUCHET>
- Joseph A. Burton Award**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=BURTON>
- Stanley Corrsin Award**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=CORRSIN>
- John Dawson Award for Excellence in Plasma Physics Research**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=PLASMA>
- John H. Dillon Medal**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=DILLON>
- Excellence in Physics Education Award**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=EDUCATION>
- Joseph F. Keithley Award**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=KEITHLEY>

- Landau-Spitzer Award**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=LANDAU>
- Maria Goeppert Mayer Award**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=MGM>
- Nicholson Medal**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=NICHOLSON>
- Henry Primakoff Award**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=PRIMAKOFF>
- Leo Szilard Lectureship**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=SZILARD>
- DISSERTATION AWARDS**
- Andreas Acrivos**  
<http://prizes.aps.org/prizes/login.cfm?PRIZE=ACRIVOS>
- Dissertation Award in Nuclear Physics**  
 Robert Tribble, Texas A&M University, Cyclotron Institute, College Station, TX 77843  
 Email [tribble@comp.tamu.edu](mailto:tribble@comp.tamu.edu)
- Marshall Rosenbluth**  
 Mark Gilmore, University of New Mexico, Electrical & Comp Engr Dept, MSC01 1100, Albuquerque, NM, 87131  
 Email [gilmore@ece.unm.edu](mailto:gilmore@ece.unm.edu)
- Outstanding Doctoral Thesis Research in Beam Physics Award**  
 Katherine Harkay, Argonne National Laboratory, 9700 S. Cass Avenue, Argonne, IL 60439  
 Email [harkay@aps.anl.gov](mailto:harkay@aps.anl.gov)

## 2013 APS Fellowship Nomination Deadlines

Fellowship nominations may be submitted at any time, but must be received by the deadlines listed below for the next review. For submittal information see: <http://www.aps.org/programs/honors/fellowships/nominations.cfm>

DIVISIONS	FORUMS	
Astrophysics	Education	Plasma Astrophysics ..... 04/01/2013
Biological Physics	History of Physics	Precision Measurement & Fund. Const. ... 04/01/2013
Chemical Physics	Industrial and Applied Physics	Quantum Information ..... 05/01/2013
Computational Physics	International Physics	Shock Compression ..... 04/01/2013
DAMOP (Atomic, Molecular, Optical)	Outreach and Engaging the Public	Statistical & Nonlinear Physics ..... 05/01/2013
DCMP (Condensed Matter)	Physics & Society	
Fluid Dynamics		<b>APS GENERAL</b> .....06/01/2013
Polymer Physics	<b>TOPICAL GROUPS</b>	This category is reserved for unusual situations where the contributions of the nominee clearly do not fall into the area of a technical unit. They are reviewed and recommended directly by the APS Fellowship Committee)
Laser Science	Energy Research & Applications	
Materials Physics	Few Body	
Nuclear Physics	Gravitation	
Particles & Fields	Hadronic Physics	
Physics of Beams	Instrument & Measurement Science	
Plasma Physics	Magnetism and Its Applications	