

# Spring 2011 Prizes and Awards

## APS Announces Spring 2011 Prize and Award Recipients

Forty-three prizes and awards will be presented during special sessions at three spring meetings of the Society: the 2011 March Meeting, March 21-25, in Dallas, TX, the 2011 April Meeting, April 30-May 3, in Anaheim, CA, and the 2011 Atomic, Molecular and Optical Physics Meeting, June 13-14, in Atlanta, GA.

Citations and biographical information for each recipient follow. The Apker Award recipients appeared in the December 2010 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 website (<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 page 8 of this insert.

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

### Frank Isakson Prize for Optical Effects in Solids

### Andrei Sakharov Prize

NOT AWARDED IN 2011

### Hans A. Bethe Prize

#### Christopher J. Pethick

*Nordic Institute for Theoretical Physics*

*Citation: "For fundamental contributions to the understanding of nuclear matter at very high densities, the structure of neutron stars, their cooling, and the related neutrino processes and astrophysical phenomena."*

Christopher Pethick received his B.A. degree in 1962 and his D. Phil degree in 1965, both from the University of Oxford. After postdoctoral positions at Magdalen College, Oxford and the University of Illinois, he joined the Illinois faculty in 1970. In 1973 he became professor at NORDITA, and for many years following that he divided his time between NORDITA and the University of Illinois. He was director of NORDITA from 1989 to 1994. He has contributed to the theory of diverse physical systems, including the helium liquids and superconductors, ultracold atomic gases, and dense matter in neutron stars and supernovae.



### Tom W. Bonner Prize in Nuclear Physics

#### Richard F. Casten

*Yale University*

*Citation: "For providing critical insight into the evolution of nuclear structure with varying proton and neutron numbers and the discovery of a variety of dynamic symmetries in nuclei."*

Rick Casten, D. Allan Bromley Professor of Physics at Yale, received his B.S. from Holy Cross, and Ph.D. from Yale in 1967. After post-docs at the Niels Bohr Institute and Los Alamos National Laboratory, he went to Brookhaven National Laboratory in 1971. He came to Yale in 1995, as director of the Wright Nuclear Structure Laboratory from 1995-2008. His research focuses on collectivity in nuclei, including: dynamical symmetries of the IBA Model; structural trajectories and regularities in the IBA symmetry triangle; quantum phase/shape transitions and critical point descriptions; and microscopic drivers of collectivity.



### Herbert P. Broida Prize

#### Warren S. Warren

*Duke University*

*Citation: "For the development of nonlinear coherent techniques which enhance molecular spectroscopy and molecular imaging."*

Biography unavailable at press time.

### Oliver E. Buckley Condensed Matter Physics Prize

#### Juan Carlos Campuzano

*Argonne National Laboratory*

#### Peter D. Johnson

*Brookhaven National Laboratory*

#### Zhi-Xun Shen

*Stanford University*

*Citation: "For innovations in angle-resolved photoemission spectroscopy, which advanced the understanding of the cuprate superconductors, and transformed the study of strongly-correlated electronic systems."*

Juan Carlos Campuzano received a B.Sc. in applied mathematics and physics in 1973 and a Ph.D. in physics in 1978 from the University of Wisconsin-Milwaukee. He was at the Donnan Laboratories, University of Liverpool, from 1978 to 1981. He went on to the Cavendish Laboratory, University of Cambridge until 1985 when he

joined the University of Illinois at Chicago, and Argonne National Laboratory in 1987. Research contributions include the observation of conformal invariance at the Ising critical point, the Luttinger scaling of the Fermi volume in high temperature superconductors, the observation of an extended singularity in their energy spectrum, momentum distribution sum rules in photoemission, the spectral function interpretation of the photoemission lineshape, the pseudogap in the energy spectrum of underdoped superconductors, Fermi arcs and their scaling and the observation of spontaneous time reversal symmetry breaking in high temperature superconductors.

Peter D. Johnson obtained a B.Sc. from Imperial College, London in 1972 and a Ph.D. from Warwick University in 1978. After a period as a research associate at Warwick University, he joined Bell Laboratories in 1981. In 1983 he joined the Physics Department at Brookhaven National Laboratory and continued the developments of the inverse photoemission technique, spin polarized photoemission and more recently high resolution photoemission. Key discoveries include image states, a new class of surface electronic state; spin polarized quantum well states in thin film and multilayer systems, mass renormalization in the cuprate superconductors and a particle-hole asymmetry in the underdoped cuprates.

Dr. Shen received his Ph.D. in Applied Physics from Stanford University in 1989, M.S. from Rutgers University in 1985, and B.S. from Fudan University in 1983. He is the Paul Pigott Professor in Physical Sciences of Stanford University, and has been a professor of physics, applied physics, and SLAC photon science since 2000, an associate professor from 1996 to 2000, and assistant professor from 1992 to 1996. Dr. Shen's research interest lies in the area of condensed matter and materials physics, as well as the energy applications of materials. His current research topics include: superconductivity and electronic materials, nano-structured diamond, and photon-enhanced thermionic emission for solar concentrator systems.



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

#### Joachim Stöhr

*Stanford University*

*Citation: "For the development of soft x-ray based spectroscopy and microscopy leading to fundamental contributions to the understanding of chemical bonding, magnetism and dynamics at surfaces and interfaces."*

Joachim Stöhr received his undergraduate degree at Bonn University, Germany, in 1968 and his Ph.D. at the Technical University in Munich in 1974. After a postdoctoral period at Lawrence Berkeley National Laboratory, he became a staff scientist at the Stanford Synchrotron Radiation Laboratory in 1977. In 1981 he joined Exxon and continued his work in surface science. In 1985 he moved to the IBM Almaden Research Center where he developed soft x-ray spectroscopy and microscopy methods for the study of organic and magnetic thin films. In 2000 he joined Stanford University and SLAC. He became SSRL director in 2005 and director of the Linac Coherent Light Source in 2009. While at Stanford/SLAC, his research has concentrated on the study of magnetic thin films and nanostructures.



### Max Delbruck Prize in Biological Physics (2010)

#### Xiaowei Zhuang

*Harvard University*

*Citation: "For contributions to the field of single molecule biophysics and super-resolution imaging."*

Xiaowei Zhuang is a professor of chemistry and chemical biology and professor of physics at Harvard University and investigator at Howard

Hughes Medical Institute. Her lab develops advanced optical imaging techniques, in particular single-molecule and super-resolution imaging methods, to study problems of biomedical interest. Zhuang received her B.S. in Physics from the University of Science and Technology of China, and her Ph.D. in Physics from University of California at Berkeley under the supervision of Y. R. Shen. From 1997 to 2001, she performed postdoctoral research in biophysics in Steven Chu's laboratory at Stanford University. In 2001, she joined the faculty of Harvard University.



### Einstein Prize

#### Ezra Ted Newman

*University of Pittsburgh*

*Citation: "For outstanding contributions to theoretical relativity, including the Newman-Penrose formalism, Kerr-Newman solution, Heaven, and null foliation theory. For his intellectual passion, generosity and honesty, which have inspired and represented a model for generations of relativists."*

Ezra Ted Newman received his B.A. from New York University in 1961, and his M.A. and Ph.D. from Syracuse University in 1955 and 1956 respectively. He started at the University of Pittsburgh as an instructor in 1956 until becoming first an assistant professor in 1959, associate professor in 1962, then a full professor in 1966 until his retirement in 1996.

The greatest scientific influences in his career were his interactions with his thesis advisor, Peter Bergmann, and his friendship with Penrose. His research has centered on the properties of 'null objects.' His present interest lies in a strange relationship that exists between the asymptotic behavior of the gravitational field and equations of motions.



### Fluid Dynamics Prize (2010)

#### Stephen B. Pope

*Cornell University*

*Citation: "For insightful contributions - including exact results, averaging methods, scaling arguments, and approximate approaches - to suspension mechanics, free-surface flows, flow in porous media, evolution of polymers in flows, and other research topics in the flow of complex fluids."*

John Hinch received his education at Cambridge University, graduating with a B.A. in mathematics in 1968 and a Ph.D. in 1972. After a post-doc at Caltech he returned to a faculty position at Cambridge University and since 1998 has been there a professor of fluid mechanics. He collaborated with Andreas Acrivos and his students, and later with experimental groups in France following introductions by Etienne Guyon. He is a Fellow of the APS and the Royal Society of London. His research interests include suspensions of particles and other mobile particulate systems, the flow of non-Newtonian fluids and applications of mathematics to industrial problems.



### Dannie Heineman Prize for Mathematical Physics

#### Herbert Spohn

*TU München*

*Citation: "For his seminal contributions to nonequilibrium statistical mechanics as exemplified by his exact solutions of growth models and stationary states of open systems. Combining mathematical rigor with physical insight his work elucidates the transition from microscopic to macroscopic behavior."*

Herbert Spohn received his undergraduate education in physics at the Technical University of Stuttgart and his Ph.D. degree in 1975 from the Ludwig-Maximilians-Universität at München. He was postdoc at Yeshiva University and Rutgers University with Joel Lebowitz and at Princeton University with Elliott Lieb. In 1982 he joined as associate professor the group of Herbert Wagner at the LMU. Since 1998 he has been full professor at Zentrum Mathematik and



Physik Department of the Technical University at München. Herbert Spohn is most widely known through his work on interacting stochastic particle systems. He strived for a deeper understanding of how macroscopic laws emerge from the underlying motion of atoms.

### Irving Langmuir Prize

#### Stephen Leone

*University of California, Berkeley*

*Citation: "For his pioneering use of soft x-rays in probing ultrafast dynamics in atomic and molecular systems."*

Stephen Leone is a professor at the University of California, Berkeley and director of the Chemical Dynamics Beamline at Lawrence Berkeley National Laboratory. Leone received his B.A. in Chemistry at Northwestern University in 1970 and his Ph.D. in chemistry at the University of California at Berkeley in 1974. He was at the University of Southern California from 1974 to 1976. He assumed a position with NIST and the University of Colorado in 1976 until moving to Berkeley in 2002. His research interests include ultrafast laser investigations of femtosecond and attosecond processes, wave packet dynamics, soft x-ray probing of valence and core levels, attosecond physics, state-resolved collision processes and kinetics investigations, heterogeneous aerosol reactions, nanoparticle and biomolecule spectroscopy, nanoparticle photodynamics and plasmonics.



### Julius Edgar Lilienfeld Prize

#### Gerald Gabrielse

*Harvard University*

*Citation: "For novel methods that enable measurement of the electron magnetic moment and fine structure constant to unprecedented precision, and for exceptional skill in sharing the science with diverse audiences."*

Gerald Gabrielse, the Leverett Professor of Physics at Harvard, chaired its physics department from 2000-2003. He received his Ph.D. from the University of Chicago in 1980 followed a B.S. from Calvin College in 1973. His research interests include measuring the electron and positron magnetic moments, deducing the fine structure constant, and testing the standard model and QED. His antimatter research compared the antiproton and proton magnetic moments, and developed methods now making possible the work of four international collaborations at a dedicated CERN storage ring. He also taught a year of high school physics for fun.



### James Clerk Maxwell Prize for Plasma Physics (2010)

#### James Drake

*University of Maryland*

*Citation: "For pioneering investigations of plasma instabilities in magnetically-confined, astrophysical and laser-driven plasmas; in particular, explication of the fundamental mechanism of fast reconnection of magnetic fields in plasmas; and leadership in promoting plasma science."*

James F. Drake is a Professor in the Department of Physics and the Institute for Physical Science and Technology at the University of Maryland, College Park. He received his B.S. in 1969 and Ph.D. in physics from UCLA in 1975. Dr. Drake remained at UCLA as a post-doc for two

## Table of Contents

1	Prize & Award Recipients
5	New APS Fellows
8	Nominations for 2012 Prizes and Awards

years before moving to the University of Maryland. Early in his career Drake worked on the interaction of intense lasers with plasma but then switched his focus to plasma turbulence and transport and magnetic reconnection with applications in the laboratory, the heliosphere and the broader universe.



Charles Darwin and the history of physics and just finished Volume One of *Faith in Reason*, a biography of Hans Bethe.

### George E. Pake Prize

**Bernard S. Meyerson**

IBM T.J. Watson Research Center

*Citation: "For his excellence in scientific, engineering, and business leadership, including his ground-breaking contributions to the development and commercialization of Si-Ge semiconductor technology and mixed-signal semiconductor applications."*

**Bernard S. Meyerson** received his BS in physics in 1975 from the City College of NY, and his Ph.D. in physics from the City University of NY in 1980. He joined IBM in 1980 as a research staff member researching surface chemistry and epitaxy as related to silicon germanium-based heterostructure devices. Over the years he led a series of science, engineering and business organizations culminating in the development of IBM's Analog and Mixed Signal business. He now serves as IBM's Vice President of Innovation.



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

**Douglas Bryman**

University of British Columbia

**Laurence Littenberg**

Brookhaven National Laboratory

**A.J. Stewart Smith**

Princeton University

*Citation: "For leadership in the measurement of kaon decay properties and in particular for the discovery and measurement of  $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ ."*

**Douglas A. Bryman** has been the J. B. Warren Chair Professor in the Department of Physics and Astronomy at the University of British Columbia since 1999. He received a B.Sc. from Syracuse University in 1966 and a Ph. D. from Virginia Polytechnic Institute and State University in 1972. He was a Research Fellow and Senior Research Scientist at TRIUMF from 1972 to 1999, and Program Director for Medium Energy Physics at the National Science Foundation from 1978 to 1979. Dr. Bryman's research has focused on flavor physics through the study of rare decays of muons, pions, and kaons at TRIUMF and Brookhaven National Laboratory.



**Laurence Littenberg** received an AB in physics from Cornell University in 1963 and his Ph.D. from the University of California at San Diego in 1969. He worked for four years at the Daresbury Laboratory. He next took a position at Brookhaven National Laboratory. There he studied  $K_L$  in which several new decay modes were discovered and a series of experiments primarily searching for and then studying the rare decay  $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ . More recently he has been a participant in the Daya Bay Reactor Neutrino Experiment. He is currently a senior physicist and associate chair for high energy physics in that department.



**Stewart Smith** received BA and MSc degrees from the University of British Columbia in 1959 and 1961 respectively, and his Ph.D from Princeton University in 1966. He worked at the Deutsches Elektronen-Synchrotron on experiments testing QED and measuring couplings of photons to vector mesons. He then joined the Princeton faculty, chairing the physics department from 1990 to 1998, and serving as Princeton's first dean for research since 2006. Smith has carried out experiments on K-decays at Brookhaven, and lepton-pair production and hadron structure functions at Fermilab. The BaBar experiment at SLAC has been Smith's main interest since 1995 where he had a central role in its 2001 discovery of CP-violating asymmetries in the B-meson system.



### Earle K. Plyler Prize for Molecular Spectroscopy

**Shaul Mukamel**

University of California, Irvine

*Citation: "For seminal contributions toward establishing the theoretical underpinnings of nonlinear interactions between light and matter and for providing the field of ultrafast spectroscopy with the tools to develop new non-linear methods based on his work."*

**Shaul Mukamel** received his B.Sc degree in chemical physics in 1969 and his Ph.D. in 1976 both from Tel Aviv University. He served on the faculty of the Weizmann Institute and Rice University and in 1982 he joined the chemistry department of the University of Rochester and became a professor in 1985. Since 2003 he serves on the faculty of UC Irvine as a chancellor professor of chemistry.



Professor Mukamel's interests focus on theo-

retical and computational studies aimed at the design of novel ultrafast multidimensional coherent nonlinear optical spectroscopies for probing electronic and vibrational dynamics of molecules, biological complexes and semiconductor nanostructures.

### Polymer Physics Prize

**Gary Grest**

Sandia National Laboratories

**Kurt Kremer**

Max Planck Institute for Polymer Research

*Citation: "For establishing numerical simulation as a tool on equal footing with experiment and theory in the field of polymer science, as exemplified by their seminal simulations of entangled polymer melt dynamics."*

**Gary Grest** received his B.Sc. in 1971 and his Ph.D. in 1974 in physics from Louisiana State University. Following postdoctoral positions at Rutgers University and the University of Chicago he joined the faculty of physics at Purdue University in 1979. In 1981 Gary was invited to join Exxon's Corporate Research Laboratories. Since 1998 Gary has been a Distinguished Member of Technical Staff Sandia National Laboratories. His research includes the studies of entangled polymer melts and networks, responsive polymer interfaces, polymer nanocomposites, and nanoparticle suspensions.



**Kurt Kremer** received his Diploma in physics in 1980 and the Ph.D. in 1983 from the University of Cologne, Germany. After being a postdoc at Exxon Research and Engineering he moved to the University of Mainz and then in 1988 as senior scientific staff to the Research Center Jülich. In 1995 after a short stay at Bayer he became director at the Max Planck Institute for Polymer Research in Mainz, heading the theory department and 1996 adjunct Professor of Physics at the University of Mainz. His research focuses on soft matter physics, especially based on computer simulation methods, where he also is strongly involved in various aspects of method development.



### I.I. Rabi Prize in Atomic, Molecular and Optical Physics

**Cheng Chin**

James Franck Institute

*Citation: "For pioneering work in strongly interacting Fermi gas and few body physics including the discovery of the Efimov effect."*

**Cheng Chin** obtained his Bachelor of Science degree from National Taiwan University in 1993, and his Ph.D. in Physics from Stanford University in 2001. He was a postdoctoral fellow at Stanford University and Innsbruck University, Austria, and was a visiting professor at Innsbruck University and ETH (Zurich), Switzerland. He joined the Physics Department and James Franck Institute faculty of the University of Chicago as an Assistant Professor in 2005 and has been an Associate Professor since 2009. Cheng Chin's research interest focuses on the quantum behavior of few- and many-body atomic systems. His works cover Feshbach resonances in cold collisions, degenerate quantum gases, ultracold molecules and optical lattices.



### Aneesur Rahman Prize for Computational Physics

**James M. Stone**

Princeton University

*Citation: "For his pioneering work in computational magnetohydrodynamics, including the development and dissemination of widely used codes, and the application of those codes to important problems in astrophysics."*

**James Stone** is a professor in the Department of Astrophysical Sciences at Princeton University. He received a BSc in physics in 1984 and MSc in 1986 from Queen's University, in Kingston Ontario, and a Ph.D in astronomy from the University of Illinois at Urbana-Champaign in 1990. He was a postdoctoral research associate at UIUC before joining the faculty at the University of Maryland in 1992. In 2002 he was elected to the professorship of mathematical physics at Cambridge University, and moved to his current position at Princeton in 2003. Stone's research interests are in the use of numerical methods to study nonlinear and multidimensional fluid dynamics in astrophysical systems.



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

**Estia Eichten**

Fermilab

**Ian Hinchliffe**

Lawrence Berkeley National Laboratory

**Kenneth Lane**

Boston University

**Chris Quigg**

Fermilab

*Citation: "For their work, separately and collectively, to chart a course of the exploration of TeV scale physics using multi-TeV hadron colliders."*

**Estia Eichten** received his B.S. in Physics in 1968 and his Ph.D. in Physics in 1972 from the Massachusetts Institute of Technology. Eichten joined the Theory Group at Fermi National Accelerator Laboratory in 1981. In QCD, he has contributed to the study of heavy quark-antiquark systems and heavy quark effective theory in the continuum and on the lattice. Eichten and Kenneth Lane have studied the possibility that electroweak symmetry breaking arises from dynamical symmetry breaking associated with a new strong interaction. They explored the theoretical and phenomenological consequences of this beyond-standard-model physics. They showed that an extended Technicolor is necessary to give fermion masses in such theories. Eichten has recently been exploring the physics potential of a multi-TeV muon collider.



**Ian Hinchliffe** obtained his BA in physics from University College Oxford in 1974 and his D.Phil in theoretical particle physics from St. Johns College Oxford in 1977. In 1983 he became a staff senior scientist at Lawrence Berkeley National Laboratory. His main activity now is with the ATLAS collaboration at CERN's Large Hadron Collider, which he joined in 1996; he served as ATLAS physics coordinator in 2006-2007 and currently heads Berkeley Lab's ATLAS group. Most of his work demonstrates how the Standard Model can be tested at hadron colliders. Since ATLAS started taking data in 2009, he is delighted to be participating directly in exploring the TeV energy scale.



**Kenneth Lane** received his B.S. in 1964 and M.S. in physics in 1965 from Georgia Institute of Technology, and his Ph.D. in 1970 from Johns Hopkins University. Since 1988 Lane has been a professor in the physics department at Boston University.



At Berkeley, he characterized dynamical chiral symmetry breaking in quantum chromodynamics. At Cornell, he developed the "Cornell potential model" of charmonium. At Harvard, he and Eichten invented the flavor symmetry breaking mechanism of dynamical electroweak symmetry breaking.

Lane wrote *Supercollider Physics*, which explored the reach of high-energy hadron colliders for the physics of the standard model and for potential new physics associated with the electroweak breaking scale of 1 TeV.

**Chris Quigg** graduated from Yale in 1966 and received his Ph.D. in physics at Berkeley in 1970. After four years at Stony Brook, he moved to Fermilab. For ten years he was head of Fermilab's theoretical physics department. In 1987 he returned to Berkeley to serve for two years as deputy director of the Superconducting Super Collider Central Design Group. He has held many visiting appointments, including École Normale Supérieure in Paris and CERN. Quigg's scientific interests range from hadron structure and quarkonium through electroweak symmetry breaking and ultrahigh-energy neutrino interactions. His current research focuses on experiments at the Large Hadron Collider.



### Arthur L. Schawlow Prize in Laser Science

**Jorge Rocca**

Colorado State University

*Citation: "For pioneering developments in compact soft x-ray lasers and applications of these lasers in high resolution imaging, plasma diagnostics, interferometry and material studies."*

**Jorge J. Rocca** has been a professor at Colorado State University since 1983. He received a diploma in Physics from the University of Rosario in Argentina in 1978, and a Ph.D in ECE from Colorado State University in 1983. His group demonstrated the first gain-saturated table-top soft x-ray laser using a discharge plasma as gain medium, and later extended bright high repetition rate table-top lasers down to 10 nm using laser-created plasmas, achieving full phase coherence by injection seeding. He and his collaborators have demonstrated the use of these lasers in nano-scale imag-



### James C. McGroddy Prize for New Materials

**Arthur P. Ramirez**

University of California, Santa Cruz

*Citation: "For the intellectual leadership leading to the identification of geometrically frustrated magnets as an important class of materials."*

**Arthur Ramirez** is dean of the Baskin School of Engineering and professor of physics and electrical engineering at the University of California, Santa Cruz. He received his B.S. in 1978 and his Ph.D. in 1984, both in physics from Yale University. From 1984 until 2000 he was a member of technical staff at Bell Labs. From 2001 to 2003 he was a group leader at Los Alamos. He returned to Bell Labs as director of condensed matter physics in 2003. His research focuses on experimental properties of condensed matter, especially geometrically frustrated magnets and the thermodynamic identification of superconductivity.



### Lars Onsager Prize

**Alexander A. Belavin**

L.D. Landau Institute for Theoretical Physics

**Alexander M. Polyakov**

Princeton University

**Alexander B. Zamolodchikov**

Rutgers University

*Citation: "For outstanding contributions to theoretical physics, and especially for the remarkable ideas that they introduced concerning conformal field theory and soluble models of statistical mechanics in two dimensions."*

**Alexander Belavin** received his Ph.D in physics in 1970 from the Institute Theoretical and Experimental Physics (ITEP) at Moscow under the supervision of Prof. M. Terentiev and Prof. I. Kobzarev). In 1970 he joined the Physics Department of the University of N. Novgorod. Since 1976 Dr. Belavin has been at the Landau Institute for Theoretical Physics. His work relates to quantum field theory, integrable field theory and string theory. In particular, important results are: Instantons in QCD and Sigma models; Elliptic solutions of Yang-Baxter equation; Holomorphic property of string amplitudes; 2d Conformal field theory; 4p-correlation function in Minimal Liouville gravity.



**Alexander M. Polyakov** biography unavailable at press time.

**Alexander Zamolodchikov** graduated from the Moscow Institute for Physics and Technology in 1975, with a master's degree in nuclear engineering. In 1978 he received his Ph.D in theoretical and mathematical physics from the Institute of Theoretical and Experimental Physics. In 1978 he became a researcher at the L.D. Landau Institute for Theoretical Physics. In 1990 Zamolodchikov became a professor at Rutgers University, and a member of New High Energy Center, the position he holds to this day. His most important contributions are in integrable quantum field theories, conformal field theories in two space-time dimensions, and in renormalization group in 2D quantum field theories.



### Abraham Pais Prize for History of Physics

**Silvan Schweber**

Brandeis University, Emeritus

*Citation: "For his sophisticated, technically masterful historical studies of the emergence of quantum field theory and quantum electrodynamics, and broadly insightful biographical writing on several of the most influential physicists of the 20th century: Einstein, Oppenheimer, and Bethe."*

**Silvan (Sam) Schweber** attended the City College of NY and graduated as a chemistry and physics major in 1947. He obtained a MS in physics from the University of Pennsylvania in 1949 and a Ph.D from Princeton University in 1952. In 1955 he accepted a faculty appointment at Brandeis University until his retirement in 2005.



He is author and co-author of several books including Volume I of *Mesons and Fields*; *An Introduction to Relativistic Quantum Field Theory*; *QED and the Men Who Made It*, *Bethe and Oppenheimer and the Moral Responsibility of Scientists*, and of *Einstein and Oppenheimer: The Meaning of Genius*. He has written extensively on

ing, dense plasma diagnostics, nano-scale material studies, and photochemistry.

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

**Janet Seger**

Creighton University

*Citation: "For significant contributions to the understanding of ultra-peripheral relativistic heavy ion interactions, skill in involving undergraduates in a large experimental research collaboration, and successful mentoring of undergraduates at her institution."*

**Janet Seger** is Professor and chair of the department of physics at Creighton University. She earned her B.S. in physics from Grinnell College in 1985, and her Ph.D. in physics from the University of Wisconsin-Madison in 1991. She joined the faculty of Creighton University in 1991. She is a member of the international STAR collaboration, which studies relativistic heavy ion collisions at RHIC. Her research focus is the study of ultra-peripheral heavy ion collisions. These collisions allow the study of photon-induced interactions in a nuclear environment. Professor Seger has actively involved undergraduates, including several non-physics majors, in the study of ultra-peripheral collisions at STAR.



### Prize for Industrial Application of Physics

**Nicholas P. Economou**

ALIS Corporation

**William Ward**

ALIS Corporation

*Citation: "For innovative developments in the physics of field ion microscopy and the invention and commercial introduction of the Helium Ion Microscope."*

**Dr. Nicholas Economou** is president of PointSpectrum, a developer and manufacturer of advanced optical components for the solar panel, lighting and display industries. He is the former president of Carl Zeiss SMT, Inc., the North American operation of Carl Zeiss SMT AG. He was co-founder of the venture capital funded start-up ALIS Corporation, which developed the helium ion microscope and was acquired by Zeiss in July 2006.



Dr. Economou began his professional career as a researcher at Bell Laboratories and MIT Lincoln Laboratory. In 1984, he became involved in his first start-up company, Micrion Corporation, which was the first to develop commercial systems utilizing gallium focused ion beam technology.

**Bill Ward** was founder, president, and chief executive officer of ALIS Corporation, a developer and supplier of a new generation of focused-ion-beam microscopes for the semiconductor, materials and life sciences industries until the acquisition of ALIS by Carl Zeiss Corporation in 2006. Formerly, Bill was a founder of Micrion Corporation, a global leader in FIB systems, where he served as senior vice president and chief technical officer for eighteen years. Prior to his experience at Micrion, he founded Ion Beam Technologies, the first ion microscope company in the U.S. Earlier, Bill was on the founding team and R&D manager at Varian's E-beam Lithography division.



### George E. Valley, Jr. Prize

**Shina Tan**

Georgia Institute of Technology

*Citation: "For the exact relations he derived for Strongly Interacting Fermi gases with large scattering length, which are found to be of fundamental importance in cold atom physics."*

**Shina Tan** received his B.S. from Tsinghua University, China in 1997, his M.S. from the Chinese Academy of Sciences in 2000, and his Ph.D. in physics from the University of Chicago in 2006. He was a postdoctoral research associate at the University of Washington from 2006 to 2008 and a postdoctoral prize fellow at Yale University from 2008 to 2010. He joined the Georgia Institute of Technology in August of 2010.



Tan's major research interests are the general quantum many-body problem and the few-body physics of ultracold atoms and molecules. Tan solved the equivalent of the ultraviolet divergence problem for a strongly interacting Fermi gas with large scattering length.

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

**Yaroslav Derbenev**

Thomas Jefferson National Accelerator Facility

*Citation: "For a broad range of seminal contributions and innovations in beam physics, including theory and control of polarization with "Siberian snakes," electron and ionization cooling, round-to-flat beam transformations, FELs, and electron-ion colliders."*

Biography unavailable at press time.

### AWARDS

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

**Stephen Pearton**

University of Florida

*Citation: "For contributions to the development of compound semiconductor processing methods crucial to the development of electronic and photonic devices."*

**Steve Pearton** received his B.S. degree in physics from University of Tasmania in 1978 and a Ph.D. from University of Tasmania in 1983. He was a postdoc at UC Berkeley prior to joining AT&T Bell Laboratories. He joined the University of Florida in 1994. At Bell Labs he developed the use of ion implantation, dry etching and contact technologies in successive generations of compound semiconductor devices. At UF, Dr. Pearton has primarily focused on fabrication processes for blue/green/UV GaN-based LEDs, laser diodes and power electronics. His most recent interests have been in developing solid state sensors.



### LeRoy Apker Award (2010)

**Chia Wei Hsu**

Wesleyan University

*Citation: "Self-Assembly of DNA-Linked Nanoparticles."*

**Christopher Chudzicki**

Williams College

*Citation: "Parallel Entanglement Distribution on Hypercube Networks."*

**Chia Wei Hsu** received his B.A. in physics and mathematics from Wesleyan University in 2010, and is currently pursuing his Ph.D. in physics at Harvard. At Wesleyan, Chia Wei studied properties of DNA-linked nanoparticles. In 2007, he discovered that nanoparticles with four DNA strands can form a hierarchy of interpenetrating structures, resulting in a multitude of distinct phases. Subsequently he found that these interpenetrating structures stem from a combination of short-range repulsion and long-range attraction among particles. In his senior year, he worked on the development of a theoretical description for the clustering and assembly kinetics of these nanoparticles.



**Christopher Chudzicki** received his B.A. in physics and mathematics from Williams College. In his senior thesis research, Chris studied theoretical aspects of quantum state transfer on qubit and oscillator networks, with an eye towards implementation in the realm of superconducting quantum circuits. His research was on parallel quantum state transfer: transferring several quantum states between different nodes of the same network at the same time. They discovered that high-fidelity, in fact, perfect, parallel state transfer is possible on hypercube oscillator networks. He is now pursuing his Ph.D. in theoretical physics at the Massachusetts Institute of Technology.



### Edward A. Bouchet Award

**Peter Delfyett**

University of Central Florida

*Citation: "For his significant scientific contributions in the area of ultrafast optical device physics and semiconductor diode based ultrafast lasers, and for his exemplary and continuing efforts in the career development of underrepresented minorities in science and engineering."*

**Peter J. Delfyett** received his B.E. from the City College of New York in 1981, his M.S. from the University of Rochester in 1983, and his M. Phil and Ph.D. from the Graduate School & University Center of the City University of New York in 1987 and 1988, respectively. He joined Bell Communication Research where he concentrated his efforts towards generating ultrafast high power optical pulses from semiconductor diode lasers. He helped develop the world's fastest, most powerful modelocked semiconductor laser diode. Dr. Delfyett joined the College of Optics & Photonics and the Center for Research and Education in Optics and Lasers at the University of Central Florida in 1993.



### Joseph A. Burton Forum Award

**M. Granger Morgan**

Carnegie Mellon University

*Citation: "For his public service and major contributions in the field of risk analysis and its application leading to increased public understanding of issues at the interface of physics and society."*

**M. Granger Morgan** is head of the Department of Engineering and Public Policy at Carnegie Mellon University. His research addresses problems in science, technology and public policy with a particular focus on energy, environmental systems, climate change and risk analysis. Much of his work has involved the development and demonstration of methods to characterize and treat uncertainty in quantitative policy analysis. He holds a BA from Harvard College (1963) where he concentrated in Physics, an MS in Astronomy and Space Science from Cornell (1965) and a Ph.D. from the Department of Applied Physics and Information Sciences at the University of California at San Diego (1969).



### John Dawson Award for Excellence in Plasma Physics (2010)

**Eric Esarey**

Lawrence Berkeley National Laboratory

**Cameron Geddes**

Lawrence Berkeley National Laboratory

**Simon Hooker**

Oxford University

**Wim Leemans**

Lawrence Berkeley National Laboratory

**Carl Schroeder**

Lawrence Berkeley National Laboratory

**Csaba Toth**

Lawrence Berkeley National Laboratory

*Citation: "For experiments and theory leading to the demonstration of high-quality electron beams from laser-plasma accelerators."*

**Eric Esarey** received a B.S. in nuclear engineering from the University of Michigan in 1981 and a Ph.D. in plasma physics from the Massachusetts Institute of Technology in 1986. He worked at the Naval Research Laboratory from 1986 to 1998 and has been a member of the Accelerator and Fusion Research Division of Lawrence Berkeley National Laboratory since 1998. As chief theoretician, Dr. Esarey is in charge of the theory and computational effort of the LOASIS Program. Dr. Esarey has published numerous papers on the physics of intense laser interactions with plasmas and electron beams with applications to advanced accelerators and novel radiation sources.



**Cameron Geddes** is a staff scientist in the LOASIS program of Lawrence Berkeley National Laboratory, investigating use of laser driven plasma waves to build compact next generation laser-plasma wakefield particle accelerators. He pursues experiments on control of particle injection and laser guiding to improve these accelerators, and large-scale simulations of the experiments. Geddes received his Ph.D. in 2005 at the University of California, Berkeley. He received his B.A. degree from Swarthmore College in 1997. Previous research included Thomson scattering measuring driven waves in inertial confinement fusion plasmas, wave mixing, small aspect Tokamaks, and nonlinear optics.



**Simon Hooker** was awarded undergraduate and D.Phil degrees in physics by the University of Oxford in 1986 and 1990 respectively. Following post-doctoral work at Oxford and Stanford University, he returned to the UK in 1996 to take up a Royal Society University Research Fellowship. He joined the faculty at Oxford in 2005. Simon Hooker's research looks for applications of high-intensity laser pulses interacting with matter. He and his group have worked on development of bright sources of coherent short-wavelength radiation, such as optical field ionization lasers and quasi-phase-matched high-harmonic generation; the development and application of techniques for guiding high-intensity laser pulses; and laser-driven plasma accelerators and their application to radiation generation.



**Wim Leemans** is a senior scientist and Head of the LOASIS Program at LBNL, research physicist at UC Berkeley and adjunct professor at the University of Nevada, Reno. He obtained an electrical engineering (EE) degree from the Vrije Universiteit Brussel in Belgium in 1985, and MS and Ph.D. degrees in EE with emphasis on plasma physics, in 1987 and 1991 respectively, from UCLA. In 1991 he joined LBNL and, in 1994, started the LOASIS group in the Accelerator and Fusion Research Division which focuses on laser plasma accelerator science and hyperspectral radiation sources.



**Carl B. Schroeder** received undergraduate de-

grees in Mathematics and Physics with high honors in 1994 from the University of Maryland, College Park and did his graduate work at the University of California, Berkeley, where he completed his Ph.D. in Physics in 1999. Dr. Schroeder was a UCLA postdoctoral fellow. Dr. Schroeder joined the Lawrence Berkeley National Laboratory in 2001. His chief research interests are the physics of intense laser-plasma interactions, plasma-based accelerators, and novel radiation sources. This has led to investigations in the areas of nonlinear plasma wave excitation, short-pulse laser-plasma instabilities, particle trapping, and radiation generation from beam-plasma interactions.



**Csaba Toth** is a staff scientist at the Lawrence Berkeley National Laboratory. He received his undergraduate degree in Physics in 1983, and his Ph.D. in Physics and Quantum Electronics in 1987, from the Eötvös University, Budapest, Hungary. He started his career at the Research Institute for Solid-State Physics, Budapest. Since 1992 he continued his research at Rice University in Houston, then at UCSD in San Diego, which involved high peak-power, ultrashort laser pulses of pico-, femto-, and attoseconds. In 2000 he joined LBNL, where his interest includes laser plasma accelerators and new LPA-based light sources from THz to X-ray radiation. Since 2009 he is also involved in the BELLA Project.



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

**Raffaele Mezzenga**

ETH Zurich

*Citation: "For exceptional contributions to the understanding of self-assembly principles and their use to design and control materials with targeted functionalities."*

**Raffaele Mezzenga** received his masters degree from Perugia University, Italy, in Materials Science and Engineering, while actively working for the CERN and NASA on elementary particle-polymer interactions. In 2001 he obtained a Ph.D. in Polymer Physics from EPFL Lausanne. He then spent 2001 and 2002 as a post-doctoral scientist at University of California, Santa Barbara. In 2003 he moved to the Nestlé Research Center in Lausanne. In 2005 he was hired to the physics department of the University of Fribourg, and he then joined ETH Zurich in 2009. His research focuses on the fundamental understanding of self-assembly processes in polymers, lyotropic liquid crystals, food and biological colloidal systems.



### Excellence in Physics Education Award

**Physics Teaching Resource Agents: George Amann, Lawrence Badar, Robert Clark, Jan Mader, Karen Jo Matsler, James Nelson**

*Citation: "For providing peer-led professional development for 25 years to more than 5000 physics and physical science teachers nationwide through a network of more than 500 master teachers."*

**George Amann** graduated with a BA in Physics Education from Long Island University in 1972, and an MS in Education from Hofstra University in 1975. He taught high school physics from 1972 to 2002, and worked as an adjunct physics instructor for 19 years at Dutchess Community College in Poughkeepsie, NY until his retirement in 2002. For the past five years George has also worked as an academic consultant to the Active Physics revision project. He was the physics director for the New York State Science Teachers association from 1994 to 2000. George has worked with the PTRA program since 1992.



**Lawrence Badar** received his B.S. in physics from John Carroll University in 1951 and M.S. from St. Louis University in 1954, followed by two years in the Army Chemical Corps as a researcher. He received a physics faculty appointment at St. Bonaventure University. After additional graduate work, he taught physics at Rocky River High school for nearly three decades. From 1987 to 1989 he served as a Program Officer in the Education Directorate at NSF. He then spent fifteen years as special assistant to the deans of Engineering and Arts and Sciences at Case Western Reserve University. During that period he also held the positions of PTRA program Co-director and Teacher Coordinator of Project Discovery, Ohio's State Systemic Initiative in Science and Mathematics.



**Robert Beck Clark** received his B.A. and Ph.D. Degrees from Yale University in 1963 and 1968. He served on the faculty and as a member of the Center for Particle Theory of the University of Texas at Austin from



1968 until 1973, when he joined the faculty of Texas A&M University. There he served as Regents Professor in the Department of Physics and associate dean in the College of Science. In 2000 he joined the faculty of Brigham Young University. From 1969 until 2009 he designed and directed a number of physics teacher and physics faculty enhancement programs which were supported by the NSF.

**Jan Mader** biography unavailable at press time.

**Karen Jo Matsler** received her undergraduate and master's degrees from Texas Tech University in 1977 and holds a doctorate in Curriculum and Instruction.



She has taught for over 30 years, served as K-12 science coordinator, and currently is a professor at Dallas Baptist University while being an independent program evaluator and curriculum consultant. As co-principal investigator for the AAPT/PTRA project, Karen Jo was responsible for gathering data to document the impact of PTRA on over 1,000 teachers and 500,000 students. This work led to the establishment of an evaluation and professional development center, Education Assessment and Training, Inc.

**James Nelson** is Director of the AAPT/PTRA Program. He provides advising and mentoring to the project and workshop leaders. Nelson works with the project leaders to assure the quality of the AAPT/PTRA curriculum, instruction and assessment. Nelson is a highly acclaimed teacher who represents AAPT as past president and has overall responsibility for the AAPT/PTRA curriculum, instruction, assessment and leadership development.



Nelson is responsible for the workshop classroom activities to assure that they will be activity-based, hands-on, and minds-on. Participants analyze laboratory data to determine relationships. They build simple equipment and take-home kits. Participants also develop new materials and laboratory activities.

### Joseph Keithley Award for Advances in Measurement Science

**Ian Walmsley**

University of Oxford

*Citation: "For the development of concepts and methods for the complete characterization of ultrashort electromagnetic pulses by means of spectral shearing interferometry."*

**Ian A. Walmsley** received his B.Sc. in physics from Imperial College London in 1980, and Ph.D. from the Institute of Optics, University of Rochester in 1986. He was a postdoctoral research associate at Cornell until 1988, when he took a position at the University of Rochester. He took up the Hooke Chair of Experimental Physics at the University of Oxford in 2001. From 2002 to 2009 he was the head of the Atomic and Laser Physics, becoming the Pro-Vice-Chancellor for Research in 2009. His research interests span a range of optical physics, from ultrafast coherent control to quantum optics. Recent activity includes the development of metrology for complex space-time pulsed optical fields, and the development of quantum communications and other technologies.



### Maria Goeppert Mayer Award

**Reka Albert**

Penn State University

*Citation: "For her imaginative and pioneering studies of networks."*

**Reka Albert** received her B.S. and M.S. from the Babes-Bolyai University in Romania. She received her Ph.D. in Physics from the University of Notre Dame in 2001, working with Albert-Laszlo Barabasi. Dr. Albert did postdoctoral research in mathematical biology at the University of Minnesota, working with Hans G. Othmer. She joined the Pennsylvania State University in 2003, where she currently is a professor of physics with adjunct appointments in the Department of Biology and the College of Information Science and Technology. Dr. Albert is a theorist who works on predictive modeling of biological regulatory networks at multiple levels of organization.



### Nicholson Medal for Human Outreach

**Noemie Benczer Koller**  
Rutgers University

*Citation: "For unselfish commitment to advocating the freedom of scientists around the world and for leadership in fostering equal opportunities for women in science."*

**Noemie Koller** is an Emerita and Research Professor at Rutgers University. She received

her BA from Barnard College in 1953 and Ph.D. from Columbia University in 1958. After a postdoctoral stay of two years at Columbia she moved to Rutgers as an assistant professor and has been there ever since. She has been mostly active in nuclear structure with a focus on properties of low-lying nuclear states. For the last decade she has served on the APS Committee for the International Freedom of Scientists, the AAAS Committee for Scientific Freedom and Responsibility and the NY Academy of Sciences Committee on Human Rights.



### Francis Pipkin Award

**Michael Romalis**

Princeton University

*Citation: "For using ingenious high precision measurements of spin-precession to search for a nuclear electric dipole moment and other new fundamental spin interactions, and also for using such measurements to achieve the most sensitive magnetometry to date and demonstrate its utility for research in biomagnetism and medicine."*

**Michael Romalis** is a professor of physics at Princeton University. He received his BS from Illinois Institute of Technology in 1993 and a Ph.D. from Princeton in 1997. From 1997 to 2001 he was at the University of Washington, then returned to Princeton in 2002.



Romalis' research is focused on precision measurements using spin-polarized atoms. He contributed to the search for a permanent electric dipole moment. He developed atomic magnetometry with high-density alkali-metal vapor and explored its use for detection of biomagnetism, paleomagnetism, and nuclear magnetic resonance. His current interests include the use of quantum entanglement for precision measurements, novel NMR detection techniques, and development of versatile techniques for ultra-sensitive atomic magnetometry.

### Shock Compression Award

**James Johnson**

Los Alamos National Laboratory

*Citation: "In recognition of his outstanding contributions to the understanding of crystal anisotropy effects, phase transformations, tensile fracture, and chemical reactions in shock compressed condensed matter."*

**James Johnson** received a B.S. degree in mathematics and physics from the University of Puget Sound, Tacoma, Washington, in 1961, and a Ph.D. in physics from Washington State University in 1966. James then spent a year in post-doctoral study at WSU. He became a member of the technical staff at Sandia Laboratories in 1967 and then joined the research staff at Terra Tek, Inc. in 1973. In 1976 he joined the Los Alamos Scientific Laboratory. He retired from Los Alamos in 1999, but remained active in shock-wave research. Research interests include rate-dependent plastic deformation, fracture, solid explosive initiation, and shock-induced phase transformations.



### Leo Szilard Lectureship Award

**John F. Ahearne**

Sigma Xi

*Citation: "For nearly four decades of selfless dedication to the nation, and for providing a voice of reason in advising on the use of physics for the benefit of society in areas as diverse as nuclear energy, arms control, risk communication, biological safety and ethics in science and engineering."*

**John Ahearne** received a bachelor's degree in engineering physics from Cornell in 1957, an MS from Cornell in 1958, and a Ph.D. in physics from Cornell in 1966. He taught physics at the US Air Force Academy, Colorado College, and the University of Colorado - Colorado Springs. Currently he is an adjunct professor of civil and environmental engineering at Duke University. His government service includes 11 years in the Air Force, Deputy Assistant Secretary of Defense for Systems Analysis, Principal Deputy and Acting Assistant Secretary of Defense for Manpower and Reserve Affairs, White House Energy Office, Commissioner and Chairman, US Nuclear Regulatory Commission, and chair and vice-chair of several Department of Energy committees.



### John Wheatley Award

**Miguel Jose Yacaman**

University of Texas, Austin

*Citation: "For the great impact that his efforts as an influential promoter of the development of physics have had, not only in Mexico, but also in Latin America and beyond."*

Biography unavailable at press time.

## DISSERTATION AWARDS

### Andreas Acrivos Dissertation Award in Fluid Dynamics (2010)

**Matthew Paoletti**

University of Texas, Austin

*Citation: "Experimental characterization of turbulent superfluid helium."*

Biography unavailable at press time.

### Award for Outstanding Doctoral Thesis Research in Biological Physics (2010)

**Erez Lieberman-Aiden**

Harvard University

*Citation: "Evolution and the emergence of structure."*

**Erez Lieberman-Aiden** studied mathematics, physics, and philosophy at Princeton University, and received a Master's degree in applied physics from Harvard. He received a Ph.D. in applied mathematics and health science and technology from Harvard and MIT. His work integrates mathematical and physical theory with the invention of new technologies. As a graduate student Erez devised the Hi-C method for reconstructing the 3D structure of the human genome. He helped lead the team that implemented Hi-C in practice. They discovered the existence of a new type of genetic regulation, in which genes move from one compartment to another as they are turned on and off.



### Outstanding Doctoral Thesis Research in Atomic, Molecular and Optical Physics Award (2010)

**Kang-Kuen Ni**

California Institute of Technology

*Citation: "A Quantum Gas of Polar Molecules."*

**Kang-Kuen Ni** attended the University of California at Santa Barbara. During her undergraduate studies she joined research projects ranging from astrophysics and gravitational physics to condensed matter physics. In 2003, she began doctoral studies at the University of Colorado, Boulder, where she joined the research group of Carl Wieman at JILA. Kang-Kuen's doctoral dissertation describes the first experimental realization of an ultracold, near quantum degenerate gas of polar molecules. This work opens new research directions in ultralow-energy chemical reactions, quantum phase transitions, and quantum information science. After completion of her Ph.D. in 2009, Kang-Kuen joined Jeff Kimble's group at Caltech as a Center of Physics Information postdoctoral fellow.



### Outstanding Doctoral Thesis in Beam Physics Award

**Jonathan Jarvis (2010 recipient)**

Vanderbilt University

*Citation: "Development of High-Brightness Electron Sources for Free-Electron Lasers."*

**Jonathan Jarvis** received a BS in physics from Samford University in Birmingham, Alabama in 2003. He went on to receive a Ph.D. in physics from Vanderbilt University in 2009. His work focused primarily on the experimental development of high-brightness electron sources. This includes the development of new electron sources for free-electron lasers as well as the production of electron beams near the quantum degenerate limit of beam brightness. Additionally, Dr. Jarvis has been actively involved in the experimental and theoretical development of compact terahertz free-electron lasers. During the past year, Dr. Jarvis has continued his research at Vanderbilt, first as a postdoc and then as a research professor.



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

**Dmitry Fedosov**

Brown University

*Citation: "Multiscale Modeling of Blood Flow and Soft Matter."*

**Dmitry Fedosov** received his Bachelor's degree in mathematics from Novosibirsk State University, Novosibirsk, Russia in 2002. After earning a MS degree in aerospace engineering from the Pennsylvania State University in 2004, he moved to Brown University. Dmitry received a MS degree in applied mathematics in 2007 and his PhD in 2010. His thesis work was on multiscale modeling of blood flow and soft



matter. He generalized and improved a red blood cell model deriving an "accurate" cell model. He applied this model to quantify biophysical properties of red blood cells in blood flow in malaria. After completing his PhD, he was awarded a postdoctoral fellowship from the Humboldt Foundation in Germany and he continues to do research in computational biophysics.

### Nuclear Physics Dissertation Award

**Matthew W. Luzum**

Institute de Physique Theorique, France

**Huichao Song**

Lawrence Berkeley National Laboratory

*Citation: "For pioneering developments in the theory of relativistic viscous hydrodynamics, in particular for the implementation of stable numerical simulations that have been used to quantify the low value of the shear viscosity coefficient observed in ultrarelativistic heavy ion collisions at RHIC, with important implications for the near-perfect fluidity of the quark-gluon plasma."*

**Matthew Luzum** received his BA in 2003 from Saint John's University in Minnesota, and his Ph.D. in 2009 from the University of Washington. Currently he is working as a postdoctoral researcher at the Institut de Physique Theorique (CEA/Saclay) in France. His research interests relate to phenomenology of relativistic heavy ion collisions. In particular, he used viscous hydrodynamic models to extract information about the shear viscosity of the quark-gluon plasma from collisions at the Relativistic Heavy Ion Collider in Brookhaven, and to predict the results of collisions at the Large Hadron Collider at CERN. Currently, he continues to study data from RHIC as well as new data from the LHC.



**Huichao Song** received a B.S. degree in physics from Jilin University, China in 2001 and a M.S. degree in physics from Peking University, China in 2004. Then she came to the United States and received her Ph.D. in physics from The Ohio State University in 2009, with Professor Ulrich Heinz as her thesis advisor. She is currently a postdoctoral researcher in the nuclear theory group at Lawrence Berkeley National Laboratory. Her current research interests are viscous hydrodynamics + hadron cascade hybrid model and parton shower simulation for Relativistic Heavy Ion Collisions.



### Marshall N. Rosenbluth Outstanding Doctoral Thesis Award (2010)

**Jong-Kyu Park**

Princeton University

*Citation: "For the development of perturbed equilibrium calculations and generalized toroidal viscosity models providing significantly improved understanding of the response of tokamak plasmas to three-dimensional magnetic field perturbations."*

**Jong-Kyu Park** started to study plasma physics in Nuclear Engineering Department of Seoul National University, and received bachelor's degree in 2000 and master's degree in 2002. He entered the plasma physics program in Princeton University in 2004 and focused on tokamak plasma physics until finishing his Ph. D. in 2009. He was then hired to the Princeton Plasma Physics Laboratory. Park's scientific interest is the interaction between 3D fields and tokamak plasmas, and their applications to improve plasma stability and thus performance. He has developed the Ideal Perturbed Equilibrium Code for 3D equilibria and has performed theoretical study on transport driven by 3D fields.



### Mitsuyoshi Tanaka Dissertation Award in Experimental Particle Physics

**Stephen Hoover**

University of Chicago

*Citation: A Search for Ultrahigh-Energy Neutrinos and Measurement of Cosmic Ray Radio Emission with the Antarctic Impulsive Transient Antenna*

**Stephen Hoover** graduated from Purdue University in 2003 with a Bachelor of Science degree in physics and mathematics, then went to the UCLA physics graduate program. There he fell in with a group of scientific balloonists who searched for ultrahigh-energy neutrinos by exploiting coherent radio Cherenkov radiation. He traveled to McMurdo Station in Antarctica to help operate the NASA long-duration balloon experiment ANITA.



ANITA has not yet detected neutrinos, but has discovered the signature of geosynchrotron radiation from ultrahigh-energy cosmic ray air showers instead. He received his Ph.D. from UCLA in 2010. Dr. Hoover now works at the University of Chicago. He joined the South Pole Telescope collaboration, studying cosmology through the cosmic microwave background.

# APS Council Announces 2010 APS Fellows

The APS Council elected the following as Fellows of the Society at its November 2010 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>.

## Ade, Harald

North Carolina State University

Instrument & Measurement Science (GIMS)

*Citation: For the development and incisive use of soft x-ray characterization methods in a wide range of polymeric and organic systems*

## Ahmed, Musahid

Lawrence Berkeley National Laboratory

Laser Science (DLS)

*Citation: For his creation of a world-class synchrotron chemical dynamics facility serving the community and his unique marriage of lasers with synchrotron science, used to study small molecule spectroscopy and energetics, biological imaging, combustion, nanoparticle reactivity, and chemical dynamics.*

## Ahn, Charles

Yale University

Materials Physics (DMP)

*Citation: For the elucidation of novel behavior in complex materials subjected to intense ferroelectric fields, and for seminal contributions to the understanding of nanoscale interfacial phenomena in complex oxides.*

## Akylas, Triantaphyllos

Massachusetts Institute of Technology

Fluid Dynamics (DFD)

*Citation: For elegant and insightful theoretical investigations of nonlinear surface and internal gravity wave phenomena.*

## Arif, Muhammad

NIST

Precision Measurement and Fundamental Constants (GPMFC)

*Citation: For pioneering contributions in neutron interferometry, imaging and detection, with applications ranging from precise measurements of neutron scattering lengths to the imaging of flows in hydrogen fuel cells.*

## Asta, Mark

University of California, Davis

Materials Physics (DMP)

*Citation: For fundamental contributions to the physics of materials through ab initio density functional theoretical studies.*

## Atzeni, Stefano

Universita' di Roma La Sapienza

Plasma Physics (DPP)

*Citation: For contributions to the theory and simulation of inertial confinement fusion, leading to advances in ignition schemes, energy gain models, implosion symmetry and implosion stability.*

## Bakajin, Olgica

Lawrence Livermore National Laboratory

Biological Physics (DBP)

*Citation: For her contributions to the development of new instrumentation for studies of protein folding and for fundamental understanding of transport and selectivity at nano-scale, with implications to understanding of membrane channels.*

## Balitsky, Ian

Jefferson Laboratory

Hadronic Physics (GHP)

*Citation: For pioneering applications of quantum chromodynamics (QCD) to hadron physics, in particular, for development of light-cone QCD sum rules and contributions resulted in Balitsky-Fadin-Kuraev-Lipatov (BFKL) and Balitsky-Kovchegov (BK) equations.*

## Baltz, Anthony

Brookhaven National Laboratory

Nuclear Physics (DNP)

*Citation: For theoretical prediction of constraints on solar neutrino mass and mixing parameters from the Earth effect and for theoretical contributions to ultra-peripheral interactions with relativistic heavy ion reactions.*

## Bauer, Gerrit E.

Delft University of Technology

Magnetism & Its Applications (GMAG)

*Citation: For exposition of the interaction between spin transport, magnetization dynamics, charge and heat transport, and mechanical motion.*

## Bedaque, Paulo

University of Maryland, College Park

Nuclear Physics (DNP)

*Citation: For pioneering contributions to several distinct areas of theoretical nuclear physics, including effective field theories in few-body physics, the phase structure of dense quark matter, and nuclear forces from lattice QCD.*

## Belitz, Dietrich

University of Oregon

Condensed Matter Physics (DCMP)

*Citation: For work on classical and quantum phase transitions, and the nature of phases affected by generic scale invariance.*

## Bellaiche, Laurent

University of Arkansas

Materials Physics (DMP)

*Citation: For pioneering contributions to the first-principles theory of semiconductor alloys and ferroelectric materials.*

## Bennett, David

University of Notre Dame

Astrophysics (DAP)

*Citation: For pioneering work in the application of gravitational lensing to solve major astrophysical problems including the nature of dark matter and discovery of extra-solar planets.*

## Besenbacher, Flemming

University of Aarhus

Condensed Matter Physics (DCMP)

*Citation: For contributions to the understanding of atomic scale processes on solid surfaces, leading to breakthroughs in catalysis and nanotechnology.*

## Bhat, Pushpalatha

Fermilab

Particles and Fields (DPF)

*Citation: For her demonstration of the effectiveness of advanced statistical methods in extracting the most information from small signals in hadron collider physics and especially for pioneering the use of these techniques to improve the measurement of the top-quark mass in the D0 experiment at the Fermilab Tevatron.*

## Blaskiewicz, Michael

Brookhaven National Laboratory

Physics of Beams (DPB)

*Citation: For theoretical and experimental work leading to the first successful implementation of bunched beam stochastic cooling in a high energy ion collider.*

## Blume, Doerte

Washington State University

Atomic, Molecular, & Optical Physics (DAMOP)

*Citation: For contributions to physics of weakly-bound quantum clusters and strongly-interacting degenerate Fermi gases in one dimension.*

## Brady, Patrick

University of Wisconsin, Milwaukee

Gravitation (GGR)

*Citation: For pioneering contributions to gravitational-wave physics and the search for gravitational waves, and for studies that deepened our understanding of singularities and of critical collapse.*

## Breuer, Kenny

Brown University

Fluid Dynamics (DFD)

*Citation: For innovative studies of active flow control, the mechanics of flight, and micro- and nano-scale fluid mechanics, and for education leadership via Multimedia Fluid Mechanics.*

## Brongersma, Mark

Stanford University

Laser Science (DLS)

*Citation: For pioneering contributions and seminal works on plasmonics and silicon nanophotonics*

## Brown, J

North Carolina State University

Gravitation (GGR)

*Citation: For his contributions to classical and quantum general relativity, in particular for the discovery of a quasi-local expression for the energy density, and the discovery of a central charge in the Poisson algebra of symmetries of 2+1 dimensional asymptotically Anti-deSitter spacetimes.*

## Bruhwyler, David

Tech-X Corp

Physics of Beams (DPB)

*Citation: For extensive accomplishments in computations of beam and plasma, including codiscovery of quality beams from laser-plasma interaction, methods for computations of electron cooling for ion accelerators, and for discovering the importance of tunneling ionization in plasma wake field acceleration.*

## Brune, Carl

Ohio University

Nuclear Physics (DNP)

*Citation: For his numerous significant and carefully executed experiments which have advanced our understanding of nuclear astrophysics and the nuclear structure and reactions of light nuclei.*

## Buongiorno-Nardelli, Marco

North Carolina State University

Computational Physics (DCOMP)

*Citation: For his seminal work on surfaces and interfaces for energy and environment applications, as made possible by his development of novel techniques for the first principle evaluation of the properties of complex and nanostructured materials.*

## Carroll, Sean

California Institute of Technology

Particles and Fields (DPF)

*Citation: For contributions to a wide variety of subjects in cosmology, relativity, and quantum field theory, especially ideas for cosmic acceleration, as well as contributions to undergraduate, graduate, and public science education.*

## Cattell, Cynthia

University of Minnesota, Minneapolis

Plasma Astrophysics (GPAP)

*Citation: For measurements of solitary waves and electric fields in the Earth's radiation belts and for observation and interpretation of the very large amplitude whistler mode waves that provide a new mechanism for accelerating trapped electrons to relativistic energies in a fraction of a second.*

## Chang, Taihyun

Pohang University of Science & Technology

Polymer Physics (DPOLY)

*Citation: For his innovative applications of chromatographic techniques for trailblazing and exquisite molecular characterization and separation of the full range of polymers of contemporary interest.*

## Char, Kookheon

Seoul National University

Polymer Physics (DPOLY)

*Citation: For outstanding contributions to assembly of polymers in thin films leading to fundamental new insights and applications in microelectronics and optoelectronics*

## Chittenden, Jeremy

Imperial College

Plasma Physics (DPP)

*Citation: For pioneering theoretical and computational investigations of wire array Z-pinches, X-pinches and other high energy density plasmas.*

## Choi, Haechon

Seoul National University

Fluid Dynamics (DFD)

*Citation: For his contributions to the fundamental physics and control of turbulent boundary layers and bluff-body flows through numerical simulations and laboratory experiments.*

## Christen, David

Oak Ridge National Laboratory

Materials Physics (DMP)

*Citation: For sustained discovery and leadership in understanding of superconductive materials, especially their current conduction and vortex state properties.*

## Chuang, Isaac

Massachusetts Institute of Technology

Quantum Information, Concepts, and Computation (QIC)

*Citation: For his breadth and leadership in the field of quantum information science, including important theoretical discoveries and the exploration of experimental implementations.*

## Cole, Brian

Columbia University

Nuclear Physics (DNP)

*Citation: For outstanding scientific and technical contributions to the study of high transverse momentum phenomena with the PHENIX experiment at RHIC, and for leadership of the heavy ion program in the ATLAS experiment at the LHC.*

## Colonius, Timothy

California Institute of Technology

Fluid Dynamics (DFD)

*Citation: For the development of accurate and robust numerical methods for fluid dynamics and creative numerical experiments that expose the fundamental mechanics and control of instabilities, flow generated sound, and cavitation bubbles*

## Comte-Bellot, Genevieve

Ecole Centrale de Lyon

Fluid Dynamics (DFD)

*Citation: For seminal contributions to the understanding and measurement of turbulent and aeroacoustic phenomena.*

## Crooker, Scott

Los Alamos National Laboratory

Condensed Matter Physics (DCMP)

*Citation: For the development of magneto-optical spectroscopies and their applications to colloidal quantum dots and electron spin transport and noise in semiconductors.*

## Dalal, Vikram

Iowa State University

Industrial and Applied Physics (FIAP)

*Citation: For pioneering applied research in physics of thin film photovoltaic materials and devices and for invention of industrially important photovoltaic devices.*

## Dang, Liem

Pacific Northwest National Laboratory

Chemical Physics (DCP)

*Citation: For the development and application of molecular dynamics simulation methods and reliable polarizable potential models for studying processes in solution and at liquid interfaces and for modeling transport of ions and organic molecules.*

## Dasgupta, Arati

Naval Research Laboratory

Atomic, Molecular, & Optical Physics (DAMOP)

*Citation: For contributions to the theory of electron collisions with atoms and ions, and their applications to gaseous electronics, short laser pulses, inertial confinement fusion, and astrophysical plasmas.*

## Daughton, William

Los Alamos National Laboratory

Plasma Physics (DPP)

*Citation: For seminal theoretical and computational contributions to understanding of magnetic reconnection physics.*

## Day, Michael

Lebanon Valley College

History of Physics (FHP)

*Citation: For his thoughtful research, publications, and public presentations on the views of Oppenheimer, Rabi, and Condon concerning science and society.*

## De Grasse Tyson, Neil

Princeton University

Physics and Society (FPS)

*Citation: For his leadership as an educator who has excited millions of people about astrophysics and science, and for his service to the United States on commissions on NASA, space exploration, and the aerospace industry.*

## Denisov, Dmitri

Fermilab

Particles and Fields (DPF)

*Citation: For his numerous and distinguished contributions to hadronic collider physics, especially in the upgrading, physics leadership and Co-Spokesmanship of the D0 experiment at the Tevatron Collider.*

## Dhinojwala, Ali

University of Akron

Polymer Physics (DPOLY)

*Citation: Development of surface sensitive techniques to study polymeric surfaces and interfaces to understand properties such as adhesion, friction, and wetting.*

## Diebold, Gerald

Brown University

APS

*Citation: For the development of a body of elegant and sophisticated theories addressing fundamental mechanisms of the laser photacoustic effect from spheres, cylinders, and layers of fluids and solids; the discovery of an anomalous giant photoacoustic effect; the worldwide impact of his experimental applications of his theories to suspensions, colloids, dye solutions, sedimentation and biomedical imaging.*

## Dienes, Keith

University of Arizona

Particles and Fields (DPF)

*Citation: For his seminal contributions to our understanding of grand unification, and for his work studying the diverse phenomenological implications of string theory and extra spacetime dimensions.*

## Ding, Hong

Chinese Academy of Sciences

Condensed Matter Physics (DCMP)

*Citation: For contributions to the understanding of strongly correlated materials, particularly the high-temperature superconductors.*

## Ding, Weixing

University of California, Los Angeles

Plasma Physics (DPP)

*Citation: For seminal contributions to the measurement and understanding of magnetic fluctuation-induced transport, magnetic self-organization, and non-linear dynamics of laboratory plasmas.*

## Dobrosavljevic, Vladimir

Florida State University

Condensed Matter Physics (DCMP)

*Citation: For research on fundamental localization processes near the metal-insulator transition, particularly the interplay of strong electronic correlations, disorder, and quantum glassy dynamics.*

## Dolmatov, Valeriy

University of North Alabama

Atomic, Molecular, & Optical Physics (DAMOP)

*Citation: For advancing the understanding of the structure and spectra of free and confined atoms, photoelectron angular asymmetries, dynamics of half-filled-subshell.*

## Dravid, Vinayak

Northwestern University

Materials Physics (DMP)

*Citation: For seminal contributions to the materials physics of functional materials through the use of state of the art electron microscopy techniques.*

## Dray, Tevian

Oregon State University

Gravitation (GGR)

*Citation: For his contributions to the theory of general relativity, which include investigations of light-like surface layers and the physics of signature change.*

## Egedal, Jan

Massachusetts Institute of Technology

Plasma Physics (DPP)

*Citation: For pioneering contributions to understanding of driven and spontaneous magnetic reconnection in laboratory and space plasmas and the fundamental role played by trapped electrons.*

## Eggert, Jon

Lawrence Livermore National Laboratory

Shock Compression of Condensed Matter (GSCCM)

*Citation: For significant achievements in linking dynamic and static compression of condensed matter.*

## Elouadrhiri, Latifa

Jefferson Laboratory

Nuclear Physics (DNP)

*Citation: For her pioneering work on experiments in deeply virtual Compton scattering (DVCS), a powerful means of accessing the non-perturbative structure of the nucleon, and insuring the maximum fulfillment of their potential by playing a major role in the 12 GeV Jefferson upgrade.*

## Engel, Jonathan

University of North Carolina

Nuclear Physics (DNP)

*Citation: For his important contributions to our understanding of the underlying physics and importance of nuclear double beta-decay.*

## Engel, Lloyd

Florida State University

Condensed Matter Physics (DCMP)

*Citation: For contributions to the study of the quantum Hall effects and associated electron solid phases using microwaves in very high magnetic fields.*

## Everitt, Henry

US Army Missile Command

Quantum Information, Concepts, and Computation (QIC)

*Citation: For his broad leadership in furthering quantum information science, including the effective stewardship of quantum information programs for the US government and also for his own research in semiconductor optics.*

## Fang, Li-Zhi

University of Arizona

International Physics (FIP)

*Citation: For his important work in cosmology and early-universe physics; his inspiring leadership, teaching and mentoring of students in China, the United States and around the world; and his tireless, selfless, courageous and continuing advocacy of human rights in China.*

## Fichthorn, Kristen

Penn State University

Condensed Matter Physics (DCMP)

*Citation: For simulations that revealed new phenomena in the kinetics of reaction systems, self-assembly of nanostructures, and diffusion in mesoporous systems.*

## Flambaum, Victor

University of New South Wales

Atomic, Molecular, & Optical Physics (DAMOP)

*Citation: For searches for violations of fundamental symmetries and for space-time variation of fundamental constants, to atomic many-body theory, and to quantum chaos.*

## Franson, James

University of Maryland, Baltimore County

Atomic, Molecular, & Optical Physics (DAMOP)

*Citation: For contributions to quantum mechanics, quantum optics and quantum information processing.*

## Fuhrer, Michael

University of Maryland, College Park

Condensed Matter Physics (DCMP)

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## Geohegan, David

Oak Ridge National Laboratory

**Materials Physics (DMP)**

*Citation: For pioneering work in understanding and controlling nonequilibrium growth processes of thin films and nanomaterials through real-time laser spectroscopy, imaging, and plasma diagnostic investigations.*

## Gerber, Cecilia

University of Illinois, Chicago

**Particles and Fields (DPF)**

*Citation: For her numerous contributions to the D0 experiment, especially the implementation of the D0 muon and silicon trackers and the elucidation of the characteristics of top quarks in the strong production of top-antitop pairs and the electroweak production of single top quarks.*

## Gilbert, Pupa

University of Wisconsin

**Condensed Matter Physics (DCMP)**

*Citation: For contributions to synchrotron spectromicroscopy and its application to cancer therapy, tribology, and biomineralization.*

## Greenbaum, Steven

CUNY, Hunter College

**Industrial and Applied Physics (FIAP)**

*Citation: For pioneering advances in NMR spectroscopy applied to transport measurements leading to improved molecular level understanding of function and failure mechanisms in lithium ion batteries and fuel cells and innovative and sustained enhancement of participation in physics by under-represented groups.*

## Gronbeck-Jensen, Niels

University of California, Davis

**Computational Physics (DCOMP)**

*Citation: For his development and application of new computational algorithms and tools in Biological and Condensed Matter Physics, especially those involving massively parallel molecular dynamics, electrostatic interactions, ion implantation, and nonlinear physics.*

## Gygi, Francois

University of California, Davis

**Computational Physics (DCOMP)**

*Citation: For his outstanding contributions to the development of innovative computational algorithms for the accurate and most efficient calculation of the electronic structure of a broad variety of systems, relevant to solid state and liquid structure theory, to nanoscience and chemical physics.*

## Haan, Stanley

Calvin College

**Atomic, Molecular, & Optical Physics (DAMOP)**

*Citation: For contributions to the theory of photodetachment, photoionization, and photorecombination processes, including quantum and classical models for double ionization of atoms.*

## Hagen, Carl

University of Rochester

**Particles and Fields (DPF)**

*Citation: For the elucidation of the properties of spontaneous symmetry breaking in four-dimensional relativistic gauge theory and of the mechanism for the consistent generation of vector boson masses.*

## Hammer, Hans

University of Bonn

**Few-Body Systems & Multiparticle Dynamics (GFB)**

*Citation: For significant advances in the few-body problem in both nuclear and atomic physics, particularly through the use of effective field theories, and for elucidating the universal properties of Efimov states and related phenomena in three- and four-body systems.*

## Hammes-Schiffer, Sharon

Penn State University

**Chemical Physics (DCP)**

*Citation: For the development and application of a theory for proton-coupled electron transfer; clarifying the roles of hydrogen tunneling and protein motion in enzymes; and fundamental insight into electron-proton correlation in nuclear-electronic orbital methods and multicomponent density functional theory.*

## Hannon, James

IBM TJ Watson Research Center

**Industrial and Applied Physics (FIAP)**

*Citation: For seminal studies of surface and interface structure and properties using Low Energy Electron Microscopy.*

## Hentschel, H.

Emory University

**Biological Physics (DBP)**

*Citation: For his contributions to biological pattern formation in cellular and multicellular systems, and specifically for his work on the physical mechanisms underlying neuronal development.*

## Hillebrands, Burkard

University of Kaiserslautern

**Magnetism & Its Applications (GMAG)**

*Citation: For contributions to the understanding of dynamic magnetic excitations in confined magnetic structures, linear and nonlinear spin-wave propagation phenomena, and his pioneering work on the development of space- and time-resolved Brillouin light scattering technique.*

## Hughes, Richard

Ohio State University

**Particles and Fields (DPF)**

*Citation: For his contributions to the heavy flavor program at the Tevatron. For the development of bottom quark tagging used in the discovery of the top quark and his contributions and leadership of the Level 1 tracking and triggering system crucial to the Run II physics program at CDF.*

## Ivanov, Plamen

Boston University

**Biological Physics (DBP)**

*Citation: For his pioneering applications of statistical physics and nonlinear dynamics to physiology and biomedicine, and for uncovering fundamental scaling and multifractal properties, self-organized criticality, sleep- and circadian-related phase transitions in physiologic dynamics.*

## Jalali, Bahram

University of California, Los Angeles

**Laser Science (DLS)**

*Citation: For pioneering contributions to silicon photonics including demonstration silicon Raman laser and other nonlinear optics phenomenon.*

## Janssen, Michel

University of Minnesota, Minneapolis

**History of Physics (FHP)**

*Citation: For path-breaking contributions to the history of early twentieth-century physics, for excellent editorial work on Einstein papers, and for promoting substantive interac-*

*tions between physicists and historians of physics.*

## Jellinek, Julius

Argonne National Laboratory

**Chemical Physics (DCP)**

*Citation: For seminal contributions to the conceptual foundations of the physics of finite-size systems and phenomena, development of new simulation and analysis methodologies specifically tailored for the nanoscale, and pioneering explorations of a broad spectrum of properties of atomic and molecular clusters.*

## Jeziorski, Bogumil

Warsaw University

**Atomic, Molecular, & Optical Physics (DAMOP)**

*Citation: For contributions to symmetry-adapted perturbation theory of intermolecular interactions and computational studies of interatomic and intermolecular potential energy surfaces.*

## Jiang, Hongxing

Texas Tech University

**Materials Physics (DMP)**

*Citation: For his seminal works in the area of III-nitride wide bandgap semiconductors. In particular, for his significant contributions to the understanding of fundamental optical and defect properties and practical applications of III-nitrides and pioneering contributions to the field of nanophotonics.*

## Jin, Rongying

Louisiana State University

**Materials Physics (DMP)**

*Citation: For her significant contributions to materials physics, including science-driven materials development and pioneering studies of their underlying physics.*

## Jinnai, Hiroshi

Kyoto Institute of Technology

**Polymer Physics (DPOLY)**

*Citation: For elucidating the three-dimensional morphology of complex polymer systems by transmission electron microtomography.*

## Kaiser, David

Massachusetts Institute of Technology

**History of Physics (FHP)**

*Citation: For his outstanding publications that combine technical mastery of twentieth-century physics with a deep knowledge of recent developments in the history, philosophy, and sociology of science.*

## Kasianowicz, John

NIST

**Biological Physics (DBP)**

*Citation: For his pioneering contributions to the field of biophysics including the detection, identification, characterization and quantification of biological and chemical polymers, and for the development of a new method for protein structure determination.*

## Kawai, Maki

University of Tokyo

**Chemical Physics (DCP)**

*Citation: For pioneering work on single-molecule spectroscopy on surfaces.*

## Kennedy, T.A.

Georgia Institute of Technology

**Atomic, Molecular, & Optical Physics (DAMOP)**

*Citation: For contributions to the theory of quantum degenerate atomic gases, quantum optics, and quantum information science.*

## Kent, Stephen

Fermilab

**Astrophysics (DAP)**

*Citation: In recognition of many vital contributions to the operations and science of the Sloan Digital Sky Survey.*

## Kephart, Thomas

Vanderbilt University

**Particles and Fields (DPF)**

*Citation: For many insightful contributions to elementary particle theory, including the first explicit calculation of chiral gauge anomalies in higher dimensions.*

## Kiang, Ching-Hwa

Rice University

**Biological Physics (DBP)**

*Citation: For her work in experimental biological physics, especially for studying molecular interactions of nucleic acids and proteins using nanoscale probes, and for the discovery of single-walled carbon nanotubes.*

## Kieda, David

University of Utah

**Astrophysics (DAP)**

*Citation: For development and use of innovative ground-based astrophysical techniques to discover new sources of very high-energy gamma-rays, and for the discovery and study of cosmic rays at the highest energies.*

## Kievsky, Alejandro

INFN

**Few-Body Systems & Multiparticle Dynamics (GFB)**

*Citation: For contributions to the development of the hyperspherical-harmonics method for few-nucleon systems, and particularly for precise studies of the continuum in three-nucleon systems.*

## Killian, Thomas

Rice University

**Atomic, Molecular, & Optical Physics (DAMOP)**

*Citation: For studies of strong Coulomb coupling in ultra-cold neutral plasmas during thermal equilibration, and of cold collisions and quantum degeneracy with alkaline-earth metal atoms.*

## Kim, DaiSik

Seoul National University

**Laser Science (DLS)**

*Citation: For important contributions to ultrafast optical processes in semiconductors and near-field studies of plasmonics.*

## Kimmel, Greg

Pacific Northwest National Laboratory

**Chemical Physics (DCP)**

*Citation: For seminal contributions to understanding the structure and electron-stimulated reactivity of water at interfaces.*

## Klein, William

Boston University

**Statistical & Nonlinear Physics (GSNP)**

*Citation: For seminal contributions in the physics of nucleation and phase transitions arising from fundamental advances in statistical field-theoretic techniques, and their application to general mean field systems.*

## Kleiser, Leonhard

ETH-Zurich

**Fluid Dynamics (DFD)**

*Citation: For pioneering contributions to the develop-*

*ment of accurate numerical methods for computational fluid dynamics, and for their application to elucidate phenomena of transition and turbulence in wall-bounded flows, compressible turbulence, and gravity-driven and particle-laden flows.*

## Knize, Randall

US Air Force Academy

**Atomic, Molecular & Optical Physics (DAMOP)**

*Citation: For contributions to diode pumped alkali lasers, along with the optical trapping and cooling of neutral atoms and molecules.*

## Kudrolli, Arshad

Clark University

**Statistical & Nonlinear Physics (GSNP)**

*Citation: For his innovative experiments and significant contributions to nonlinear physics, dissipative systems, granular matter, and geomorphology.*

## Lakshminarayanan, Vasudevan

University of Waterloo

**International Physics (FIP)**

*Citation: For innovative application of advanced methods of theoretical physics and mathematics to problems in classical optics, vision science, and biomedical engineering; and for his dedication to the promotion of science education in developing countries.*

## Lee, Seung

Dongguk University

**International Physics (FIP)**

*Citation: For important contributions to low-dimensional electron systems and spintronics in diluted magnetic semiconductors, and to physics education over 25 years as a physics educator, and for enthusiastic work on the advancement and promulgation of physics knowledge into the international semiconductor and military societies.*

## Lehner, Luis

Perimeter Institute for Theoretical Physics

**Gravitation (GGR)**

*Citation: For important contributions to numerical relativity, most notably in the areas of black hole simulations, general relativistic magnetohydrodynamics, and algorithm development.*

## Liu, Amy

Georgetown Unversity

**Computational Physics (DCOMP)**

*Citation: For her innovative and influential computational studies of the electronic, structural, and vibrational properties of solids, and of electron-phonon interactions, with applications to ultra-hard materials; high-pressure phases; fullerenes, nanotubes, and related compounds; and novel superconductors.*

## Lorenzon, Wolfgang

University of Michigan

**Nuclear Physics (DNP)**

*Citation: For his leadership in precision studies of the spin structure of nucleons by polarized electron scattering from polarized targets, particularly the development of precision polarimetry of electron beams and scattering from internal targets.*

## Lukin, Mikhail

Harvard University

**Atomic, Molecular, & Optical Physics (DAMOP)**

*Citation: For theoretical and experimental work in quantum optics, quantum information, and at the interface between atomic physics and condensed matter.*

## Luo, Li-Shi

Old Dominion University

**Fluid Dynamics (DFD)**

*Citation: For his seminal contributions to the theoretical understanding and applications of the lattice Boltzmann equation and other kinetic methods.*

## Ma, En

Johns Hopkins University

**Materials Physics (DMP)**

*Citation: For pathbreaking research and outstanding publications on metastable, amorphous, and nanocrystalline metals and alloys, and international outreach in the metallic materials field.*

## Marusic, Ivan

University of Melbourne

**Fluid Dynamics (DFD)**

*Citation: For fundamental and original experiments and modeling concepts leading to improved understanding of turbulent boundary layers and high Reynolds number turbulence.*

## Mason, Bruce

University of Oklahoma

**Education (FEd)**

*Citation: For outstanding leadership in physics education, as director of the ComPADRE project and as Editor of the MERLOT physics collection of educational resources.*

## Mateja, John

Murray State University

**Education (FEd)**

*Citation: For improving undergraduate education by steadfast efforts to increase the participation of undergraduates in research and by fostering high quality educational programs at the national, state, and local levels.*

## Mavalvala, Nergis

Massachusetts Institute of Technology

**Gravitation (GGR)**

*Citation: For her contributions to the design and commissioning of LIGO, and for experimental exploration of the fundamental quantum limits of interferometric gravitational wave detectors.*

## McClelland, David

Australian National University

**International Physics (FIP)**

*Citation: For his ground-breaking experimental work in techniques to extend the sensitivity of gravitational wave detection beyond the standard quantum limit and for promoting world-wide collaboration in gravitational wave research*

## McComas, David

Southwest Research Institute

**Plasma Astrophysics (GPAP)**

*Citation: For his pioneering discoveries of the structure of the plasma heliosphere and the interaction of the solar system plasma with the interstellar medium, and for numerous significant contributions to design of missions and instrumentation leading to these discoveries.*

## McQueeney, Robert

Iowa State University

**Condensed Matter Physics (DCMP)**

*Citation: For the development and use of neutron scattering techniques to advance the understanding of strongly correlated electron systems.*

## Menard, Jonathan

Princeton Plasma Physics Laboratory

**Plasma Physics (DPP)**

*Citation: For seminal magnetohydrodynamic optimization studies and for experimental contributions to understanding equilibrium and stability of low aspect ratio tokamks.*

## Mestre, Jose

University of Illinois

**Education (FEd)**

*Citation: For ground-breaking applications of principles and methodologies from cognitive science to physics education research and for elucidating expert-novice performance differences in physics learning and problem solving.*

## Meyers, Marc

University of California, San Diego

**Shock Compression of Condensed Matter (GSCCM)**

*Citation: For being a leading member of the international community on the dynamic response of materials for over thirty years, publishing over 330 papers. In addition to his fundamental contributions to the field, he has provided leadership through his activities in the APS, MRS, and ARO, including co-founding the EXPLOMET conference.*

## Middleton, Arthur

Syracuse University

**Statistical & Nonlinear Physics (GSNP)**

*Citation: For his innovative numerical studies of the dynamical and static properties of disordered condensed matter systems, including charge density waves, spin glasses and disordered elastic media.*

## Midorikawa, Katsumi

RIKEN, Saitama

**Laser Science (DLS)**

*Citation: For contributions to the generation of intense high harmonics and its application to nonlinear multiphoton processes in the extreme ultraviolet region.*

## Mitas, Lubos

North Carolina State University

**Computational Physics (DCOMP)**

*Citation: For his contributions to the development of quantum Monte Carlo methods, pioneering high-accuracy calculations of atoms, molecules, clusters and solids, analysis of many-body nodes of fermion states and application of pairing wave functions.*

## Mohr, Joseph

Ludwig Maximilians University

**Astrophysics (DAP)**

*Citation: For pioneering the use of X-ray, optical, and radio observations of clusters of galaxies to determine the large-scale properties of the Universe and better understand the emergence of structure, and for his leadership in developing new instruments and observational techniques for this purpose.*

## Morrissey, David

Michigan State University

**Nuclear Physics (DNP)**

*Citation: For his outstanding contributions to the characterization of intermediate energy heavy-ion reactions, the study of projectile-like fragments from such reactions, and the thermalization of the fast fragments in helium gas for subsequent high precision mass measurements.*

## Moskalenko, Igor

Stanford University

**Astrophysics (DAP)**

*Citation: For his seminal contributions to gamma-ray astronomy, for making self-consistent computations of high-energy charged particle and gamma radiations from the galaxy and for making such calculations accessible to the astrophysics community world-wide.*

## Mudry, Christopher

Paul Scherrer Institute

**Condensed Matter Physics (DCMP)**

*Citation: For contributions to the theory of spin-charge separation in strongly correlated systems and to disorder-induced quantum criticality in metals and topological insulators.*

## Natarajan, Priyamvada

Yale University

**Astrophysics (DAP)**

## Petrovic, Zoran

*Institute of Physics*

**Atomic, Molecular, & Optical Physics (DAMOP)**

*Citation: For fundamental investigations of charged particle transport in low temperature plasmas and their interactions with bounding surfaces.*

## Qian, Hong

*University of Washington*

**Biological Physics (DBP)**

*Citation: For his original contributions to statistical non-equilibrium thermodynamics, particularly in connections to single-molecule fluctuations and the roles of energy and noise in living systems.*

## Qiu, Zi Q.

*University of California, Berkeley*

**Magnetism & Its Applications (GMAG)**

*Citation: For outstanding experiments to understand the two-dimensional magnetic origin, anisotropy and quantum size effect in magnetic nanostructures, and for the development of novel approaches involving wedged samples, curved substrates and the Surface Magneto-Optic Kerr Effect.*

## Raitses, Yevgeny

*Princeton Plasma Physics Laboratory*

**Plasma Physics (DPP)**

*Citation: For pioneering contributions to controlling plasma-wall interactions and cross-field transport in low temperature plasmas and plasma thrusters.*

## Rao, Devulapalli

*University of Massachusetts, Boston*

**Laser Science (DLS)**

*Citation: In recognition of a long record of significant contributions to the nonlinear optics of organic materials and their applications to optical power limiting, Fourier phase contrast microscopy and medical image processing.*

## Reimer, Jeffrey

*University of California, Berkeley*

**Materials Physics (DMP)**

*Citation: For the design and analysis of in situ spectroscopic studies of materials and electrochemical processes.*

## Reno, Mary Hall

*University of Iowa*

**Particles and Fields (DPF)**

*Citation: For important contributions to the physics of neutrino interactions and detection, especially at high energies.*

## Rez, Peter

*Arizona State University*

**Materials Physics (DMP)**

*Citation: For theoretical and computational developments in electron microscopy and electron spectroscopy of materials.*

## Rijssenbeek, Michael

*SUNY-Stony Brook*

**Particles and Fields (DPF)**

*Citation: For broad achievements in detector development, innovative physics accomplishments and exceptional mentoring and outreach.*

## Rogers, Barrett

*Dartmouth College*

**Plasma Physics (DPP)**

*Citation: For fundamental contributions to the understanding of magnetic reconnection and the theory of transport and stability of tokamak plasmas.*

## Rowberg, Richard

*National Academy of Sciences*

**Physics and Society (FPS)**

*Citation: For many contributions to the incorporation of technical insight into government decisions through his many advisory roles to the Congress on science and technology policy.*

## Ruckenstein, Andrei

*Boston University*

**Condensed Matter Physics (DCMP)**

*Citation: For advances in the theory of Bose condensation and collective effects in atomic gases, the Hubbard and non-Fermi liquid impurity models, and high-temperature superconductivity.*

## Rudolf, Petra

*Zernike Institute for Advanced Materials*

**Condensed Matter Physics (DCMP)**

*Citation: For explorations of fullerenes, nanotubes, graphite, and graphene, as well as light-driven synthetic molecular motors.*

## Sabbagh, Steven

*Columbia University*

**Plasma Physics (DPP)**

*Citation: For leadership in advancing the understanding of magnetohydrodynamics equilibrium, stability, rotation damping and active feedback control of high-beta tokamak and low-aspect ratio tokamak plasmas.*

## Sandford, Scott

*NASA/Ames Research Center*

**Chemical Physics (DCP)**

*Citation: For significantly advancing our understanding of the chemical makeup of extraterrestrial materials and their interstellar heritage at the most basic and fundamental level.*

## Santiago, Juan

*Stanford University*

**Fluid Dynamics (DFD)**

*Citation: For insightful and manifold contributions to microfluidics, including novel measurement methods, characterization and explanation of electrically driven flow instabilities, and studies and engineering applications of electrically driven flows for pumps, separations, and sample preparation.*

## Sargsian, Misak

*Florida International University*

**Nuclear Physics (DNP)**

*Citation: For seminal contributions to high energy nuclear physics including developing the Generalized Eikonal Approximation for high momentum transfer processes and originating a successful theory of large angle two nucleon break up induced by the absorption of high energy photons.*

## Schnetzler, Stephen

*Rutgers University*

**Particles and Fields (DPF)**

*Citation: For his work co-founding the AMY detector collaboration, at which he and his student made powerful quantitative tests of quantum chromodynamics, and for his work on experimental particle physics hardware, especially his pioneering work on diamond-based detectors.*

## Schweikhard, Lutz

*Ernst-Moritz-Armdt-University*

**Chemical Physics (DCP)**

*Citation: For his developments of ion-trapping techniques and their application in the fields of nuclear, atomic and cluster research as well as know-how transfer to analytical chemistry.*

## Sekutowicz, Jacek

*DESY*

**Physics of Beams (DPB)**

*Citation: For outstanding contributions to superconducting science and technology resulting in far reaching advances in particle accelerators.*

## Sen, Sudip

*Lancaster University*

**International Physics (FIP)**

*Citation: For his formulating novel theories in flow and plasma dynamics. These have opened up a new avenue to the ultimate breakthrough in world's fusion energy research and can also completely change the conventional wisdom in space science. Also for his leadership in promoting extensive international cooperations specially involving Asia-Pacific and Indian region with Europe and North America.*

## Seo, Eun-Suk

*University of Maryland, College Park*

**Astrophysics (DAP)**

*Citation: For leading the development and utilization of particle detectors for balloon and space-based experiments to understand cosmic ray origin, acceleration and propagation, especially as Principal Investigator of the Cosmic Ray Energetics And Mass balloon-borne experiment over Antarctica.*

## Shapiro, Paul

*University of Texas, Austin*

**Astrophysics (DAP)**

*Citation: For outstanding contributions to astrophysics and cosmology which advanced our understanding of cosmic reionization, structure formation, gas dynamics, dark matter and dark energy, the interstellar and intergalactic media, and topics from supernova polarization to relativistic shocks.*

## Shenai, Krishna

*University of Toledo*

**Industrial and Applied Physics (FIAP)**

*Citation: For pioneering contributions to the physics, technology and application of semiconductor metallization.*

## Sherrill, Charles

*Georgia Institute of Technology*

**Chemical Physics (DCP)**

*Citation: For the development and application of high-accuracy electronic structure methods in chemical physics, including investigations of higher-order electron correlation effects and seminal studies of noncovalent interactions in prototype systems.*

## Shi, Anchang

*McMaster University*

**Polymer Physics (DPOLY)**

*Citation: For outstanding contributions to the theoretical study of phases and phase transitions of block copolymers.*

## Silva, Thomas

*NIST*

**Magnetism & Its Applications (GMAG)**

*Citation: For his fundamental contributions to the experimental studies of the spin-torque oscillators, their interactions, and collective states, and for the development of new quantitative experimental methods for the investigation of magnetization dynamics in thin films and nanostructures.*

## Simon, Sindee

*Texas Tech University*

**Polymer Physics (DPOLY)**

*Citation: For pioneering contributions to the understanding of the thermal and mechanical properties of bulk and nanostructured polymeric glasses.*

## Simpkins, Peter

*Agere Sys - Murray Hill*

**Fluid Dynamics (DFD)**

*Citation: For incisive analytical and experimental studies of two-phase flows, natural convection, and various aspects of electro-optical materials processing.*

## Singh, Rajiv

*University of Florida, Gainesville*

**Industrial and Applied Physics (FIAP)**

*Citation: For distinguished scientific, technological and entrepreneurial contributions in laser-solid interactions, and processing of semiconductor surfaces and interfaces.*

## Sinova, Jairo

*Texas A&M University*

**Condensed Matter Physics (DCMP)**

*Citation: For contributions to the understanding of spin-transport in magnetic systems, particularly the spin Hall effects.*

## Sivananthan, Sivalingam

*University of Illinois, Chicago*

**Industrial and Applied Physics (FIAP)**

*Citation: For seminal contributions to the growth technology of II-VI photovoltaic materials.*

## Skomski, Ralph

*University of Nebraska, Lincoln*

**Magnetism & Its Applications (GMAG)**

*Citation: For his significant contributions to our understanding of magnetic materials, especially permanent magnets and magnetic nanostructures.*

## Snyder, Philip

*General Atomics*

**Plasma Physics (DPP)**

*Citation: For pioneering contributions to the understanding of the H-mode pedestal and edge localized modes in tokamaks, and for theoretical and computational advances in electromagnetic plasma turbulence research.*

## Sooryakumar, Ratnasingham

*Ohio State University*

**Condensed Matter Physics (DCMP)**

*Citation: For the elucidation of structure, charge, and spin dynamics in condensed matter systems via Raman and Brillouin light-scattering, and for the development of mobile magnetic traps for micro-manipulation.*

## Soper, Davison

*University of Oregon*

**Particles and Fields (DPF)**

*Citation: For seminal work in Perturbative Quantum Chromodynamics, especially proving theorems on factorization which play a crucial role in interpreting high energy particle collisions.*

## Spangler, Steven

*University of Iowa*

**Plasma Physics (DPP)**

*Citation: For fundamental advances in theory and radio-astronomical observations for a wide range of turbulent astrophysical plasmas and nonlinear Alfvén waves.*

## Spedding, Geoffrey

*University of Southern California*

**Fluid Dynamics (DFD)**

*Citation: For contributions to our understanding of unsteady animal flight and stratified turbulence, obtained using innovative diagnostic techniques.*

## Srajer, George

*Argonne National Laboratory*

**Condensed Matter Physics (DCMP)**

*Citation: For applications of synchrotron radiation to phase transitions and the structural and magnetic properties of single crystals, multilayers, and liquid crystals.*

## Stebbins, Albert

*Fermilab*

**Astrophysics (DAP)**

*Citation: For his contributions to cosmology, especially the study of the cosmic microwave background and its polarization which have led to an ambitious search for primordial gravitational waves.*

## Stebe, Kathleen

*University of Pennsylvania*

**Fluid Dynamics (DFD)**

*Citation: For lasting contributions to the physics of fluid-fluid interfaces, and in particular the discovery of surface re-mobilization and other surfactant phenomena, to the dynamics of drops and bubbles and to nano-particle self-assembly.*

## Stockman, Mark

*Georgia State University*

**Laser Science (DLS)**

*Citation: For groundbreaking theoretical contributions to plasmonics including the SPASER, adiabatic superfocusing, and coherent control on the nanoscale*

## Strinati, Giancarlo

*University di Camerino*

**Condensed Matter Physics (DCMP)**

*Citation: For contributions to the understanding of strongly interacting Fermi gases, including the physics of the BEC-BCS crossover.*

## Sullivan, Gregory

*University of Maryland, College Park*

**Particles and Fields (DPF)**

*Citation: For contributions to the field of experimental elementary particle physics including contributions to the discovery of the top-quark at the Fermilab tevatron and new properties of neutrinos using Super Kamiokande-I, and for the development of experimental techniques in neutrino detection with the Super Kamiokande-I and IceCube detectors.*

## Svetitsky, Benjamin

*Tel Aviv University*

**Nuclear Physics (DNP)**

*Citation: For elucidating the properties of the confinement-deconfinement transition of gauge theories at high temperature and of the quark-gluon plasma.*

## Swanson, Eric

*University of Pittsburgh*

**Hadronic Physics (GHP)**

*Citation: For contributions to the theory of hadron spectroscopy, especially in the areas of charm-quark mesons, gluonic excitations, and mesonic molecules.*

## Taatjes, Craig

*Sandia National Laboratory*

**Chemical Physics (DCP)**

*Citation: For his contributions to experimental gas-phase chemical kinetics, particularly for its application to combustion chemistry.*

## Takagi, Hidenori

*University of Tokyo*

**Materials Physics (DMP)**

*Citation: For outstanding contributions to the exploration of the physics and materials science of strongly correlated transition metal oxides.*

## Takeuchi, Ichiro

*University of Maryland, College Park*

**Industrial and Applied Physics (FIAP)**

*Citation: For pioneering contributions to the creation of novel classes of materials using combinatorial synthesis and probing their properties using novel probes.*

## Tang, Jau

*Accademia Sinica*

**Biological Physics (DBP)**

*Citation: For his contributions in elucidating the structure and the radical-pair mechanism of photosynthetic systems, photoinduced charge transfer and blinking in single nanocrystals, as well as in developing multi-quantum NMR and linear prediction filtering techniques, and for his work on nonblinking and less toxic nanostructures for biophotonics.*

## Tang, Lei-Han

*Hong Kong Baptist University*

**Statistical & Nonlinear Physics (GSNP)**

*Citation: For his pioneering contributions to statistical physics, especially in equilibrium and non-equilibrium critical phenomena and soft matter.*

## Tao, NJ

*Arizona State University*

**Industrial and Applied Physics (FIAP)**

*Citation: For pioneering and innovative contribution to the science and technology of molecular and nanoelectronics, electrochemical based nanofabrications, and chemical sensors.*

## Tong, Penger

*Hong Kong University of Science & Technology*

**International Physics (FIP)**

*Citation: For his insightful experiments to elucidate interesting new physics in turbulent thermal convection and soft matter systems, and his many contributions to the development of international research and education in experimental physics.*

## Trischuk, William

*University of Toronto*

**Particles and Fields (DPF)**

*Citation: For the development of novel particle detectors and their application for precision measurements, including the W boson mass, the tau lepton lifetime and Bs mixing, and for seminal contributions to the development of diamond sensors, a critical technology for next generation high luminosity colliders.*

## Troyer, Matthias

*ETH Zurich*

**Computational Physics (DCOMP)**

*Citation: For his scientific accomplishments in the field of computational many-body physics and for leadership of-fered to the next generation of computational physicists.*

## Tynan, George

*University of California, San Diego*

**Plasma Physics (DPP)**

*Citation: For fundamental experimental investigations of shear flow turbulence decorrelation and zonal flow-turbulence interactions, and for leadership in developing laboratory-scale experiments of turbulent transport.*

## Udem, Thomas

*Max Planck Institute*

**Precision Measurement and Fundamental Constants (GPMFC)**

*Citation: For contributions to the field of precision measurement including measurements of the hydrogen 1S-2S transition and the development of frequency comb techniques.*

## Vaia, Richard

*Air Force Institute of Technology*

**Polymer Physics (DPOLY)**

*Citation: For seminal contributions towards the fundamental understanding of thermodynamics and kinetics of polymer nanocomposite formation; the impact of nanoparticles on polymer dynamics, crystallization and elastomer network properties; and the development of relevant structure-property correlations ensuring the translation of the physics of polymer nanocomposites to commercial technologies.*

## Van Baak, David

*Calvin College*

**Education (FEd)**

*Citation: For successfully refining and extending experiments used in the undergraduate curriculum and for promulgating the use of diode lasers in the undergraduate laboratory.*

## van Enk, Steven

*University of Oregon*

**Quantum Information, Concepts, and Computation (GQI)**

*Citation: For pioneering contributions in theoretical quantum information and quantum optics, including entanglement verification, quantum communication and teleportation, and angular momentum of photons.*

## Van Vliet, Carolyne

*University of Miami*

**Statistical & Nonlinear Physics (GSNP)**

*Citation: For seminal contributions to the foundations of Linear Response Theory and to Quantum Transport involving extended or localized states, with applications to Condensed Matter problems.*

## Vassilicos, John

*Imperial College*

**Fluid Dynamics (DFD)**

*Citation: For his contributions to advance the understanding turbulence decay, mixing and particle motions, especially by recognizing and exploiting the use of fractals in theory and experiment.*

## Vekilov, Peter

*University of Houston*

**Biological Physics (DBP)**

*Citation: For his pioneering work on the thermodynamics and kinetics of protein aggregation and the discovery of a novel mechanism of nucleation of protein and small-molecule solid phases in solution.*

## Villermaux, Emmanuel

*University of Provence*

**Fluid Dynamics (DFD)**

*Citation: For insightful contributions, both qualitative and quantitative, to the fluid dynamical and statistical characterizations*

**Weber, William**

University of Tennessee

**Materials Physics (DMP)**

Citation: For his seminal contributions and scientific leadership in the materials physics of defects, defect processes, ion-solid interactions and radiation damage processes in ceramics.

**Weidemuller, Matthias**

University of Heidelberg

**Atomic, Molecular, & Optical Physics (DAMOP)**

Citation: For work on cold atom physics, especially in photoassociation and ultra cold Rydberg atom physics.

**White, Andrew**

University of Queensland

**Quantum Information, Concepts, and Computation (GQI)**

Citation: For innovative and pioneering contributions to the science and technology of linear-optical quantum information processing.

**White, Gary**

American Institute of Physics

**Education (FEd)**

Citation: For inspired leadership of the Society of Physics Students, including successful efforts to facilitate the increased participation of undergraduate students in local and national activities.

**White, Martin**

University of California, Berkeley

**Astrophysics (DAP)**

Citation: For his numerous contributions to theoretical astrophysics and cosmology in the areas of the cosmic microwave background, evolution of galaxies and probes of large scale structure, for developments in numerical cosmology and for his investigations of dark energy, dark matter and inflation.

**Wirtz, Denis**

John Hopkins University, School of Medicine

**Biological Physics (DBP)**

Citation: For his seminal contributions to the understanding of basic cellular functions through the development

and application of novel biophysical methods grounded in statistical mechanics and polymer physics.

**Wise, Frank**

Cornell University

**Laser Science (DLS)**

Citation: For contributions to nonlinear optical wave propagation, including the demonstration of self-similar pulse evolution in a laser and the generation of space-time solitons; and also for leading the development of lead-chalcogenide semiconductor nanocrystals.

**Wolverton, Christopher**

Northwestern University

**Materials Physics (DMP)**

Citation: For innovative contributions to atomic- and multi-scale computational materials physics, particularly in the area of phase stability of materials.

**Woolf, Lawrence**

General Atomics

**Education (FEd)**

Citation: For extensive work in teacher professional development, for assistance to California school districts, and for leadership in K-12 science education at a national level.

**Wu, Yong-Shi**

University of Utah

**Particles and Fields (DPF)**

Citation: For his contributions to the mathematical foundations of quantum physics—particularly for his work establishing profound connections between the physical laws and topology and geometry.

**Xia, Keqing**

Chinese University of Hong Kong

**Fluid Dynamics (DFD)**

Citation: For his tremendous contributions to our present experimental knowledge and understanding of turbulent Rayleigh-Benard convection.

**Xu, Jingming**

Brown University

**Industrial and Applied Physics (FIAP)**

Citation: For contributions to advances in industrial optoelectronics, sensor materials and bionanoelectronic.

**Xu, Zhangbu**

Brookhaven National Laboratory

**Nuclear Physics (DNP)**

Citation: For major contributions in the study of high density nuclear matter at RHIC, especially the development of improved technologies for particle identification, and new techniques for the reconstruction of short-lived resonances culminating in the discovery of the heaviest known anti-nucleus, the anti-hypertriton.

**Yamazaki, Yasunori**

RIKEN, Wako-shi

**Atomic, Molecular, & Optical Physics (DAMOP)**

Citation: For contributions to atomic and atomic-collision physics, and for studies of the structure of unstable nuclei and the interaction with matter of slow and fast highly-charged ions.

**Yoshida, Rikutarō**

Argonne National Laboratory

**Particles and Fields (DPF)**

Citation: For central contributions in the measurement of proton structure functions and for leadership in the construction, operation, and management of the ZEUS detector and collaboration.

**Yusef-Zadeh, Farhad**

Northwestern University

**Astrophysics (DAP)**

Citation: For his discovery of many astrophysical sources in the core of the galaxy, and for his contributions to our understanding of these sources, of star formation, of molecular clouds interacting with supernova remnants, and of the emission mechanism associated with the massive black hole at the galactic center.

**Zachos, Cosmas**

Argonne National Laboratory

**Particles and Fields (DPF)**

Citation: For significant theoretical contributions to supersymmetry, and for pioneering investigations of fundamental mathematical structures underlying a broad range of physical systems.

**Zaman, Khairul B.M.**

NASA Glenn Research Center

**Fluid Dynamics (DFD)**

Citation: For advancing the understanding of vortex generating tab technology for mixing enhancement and noise reduction in jets, and for discovering and explaining 'transonic tones' in overexpanded jets.

**Zanni, Martin**

University of Wisconsin, Madison

**Chemical Physics (DCP)**

Citation: For advancing the technology behind femtosecond 2D IR spectroscopy and using it to uncover novel insights into the biophysics of membrane and aggregating polypeptides.

**Zasadzinski, John**

Illinois Institute of Technology

**Condensed Matter Physics (DCMP)**

Citation: For contributions to superconducting tunneling spectroscopy.

**Zhou, Huan-Xiang**

Florida State University

**Biological Physics (DBP)**

Citation: For his pioneering contributions to theoretical and computational biophysics, in particular by developing elegant theories and methods on protein-ligand binding and the effects of intracellular environment on biophysical properties of proteins.

**Zimmerman, George**

Boston University

**History of Physics (FHP)**

Citation: For his wide-ranging initiatives to advance the history of physics, including oral history interviews, departmental histories, and dissemination of historical sessions on the internet.

**Zwicker, Andrew**

Princeton Plasma Physics Laboratory

**Physics and Society (FPS)**

Citation: For his outstanding service to Physics and Society issues and his excellent leadership on innovative education research and education outreach.

## Call for Nominations for 2012 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, 2011, unless otherwise indicated on the website.

### PRIZES

**Will Allis Prize for the Study of Ionized Gases**<http://prizes.aps.org/prizes/login.cfm?PRIZE=ALLIS>**Hans A. Bethe Prize**<http://prizes.aps.org/prizes/login.cfm?PRIZE=BETHE>**Herbert P. Broida Prize**<http://prizes.aps.org/prizes/login.cfm?PRIZE=BROIDA>**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>**Davisson-Germer Prize**<http://prizes.aps.org/prizes/login.cfm?PRIZES=DAVISSON>**Max Delbruck Prize**<http://prizes.aps.org/prizes/login.cfm?PRIZE=DELBRUCK>**Fluids 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 for Optical Effects in Solids**<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=SCHAWLOW>**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**<http://www.aps.org/programs/honors/awards/apker.cfm>**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>**Maria Goeppert-Mayer Award**<http://prizes.aps.org/prizes/login.cfm?PRIZE=MGM>**Nicholson Medal**<http://prizes.aps.org/prizes/login.cfm?PRIZE=NICHOLSON>**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>**Marshall Rosenbluth**

Ambrogio Fasoli, CRPP-EPFL, PPB Station 13, Lausanne CH-1015, Switzerland, Phone 41 21 693 3492, Fax 41 21 693 517  
Email [ambrogio.fasoli@epfl.ch](mailto:ambrogio.fasoli@epfl.ch)

## 2011 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**

Astrophysics.....04/01/2011  
Biological Physics.....05/01/2011  
Chemical Physics .....PAST  
Computational Physics.....06/01/2011  
DAMOP (Atomic, Molecular, Optical).....04/01/2011  
DCMP (Condensed Matter) .....PAST  
Fluid Dynamics .....03/29/2011  
Polymer Physics .....06/01/2011  
Laser Science .....04/01/2011  
Materials Physic.....PAST  
Nuclear Physics .....04/01/2011  
Particles & Fields .....04/01/2011  
Physics of Beams.....03/01/2011  
Plasma Physics .....04/01/2011

**FORUMS**

Education .....04/01/2011  
History of Physics .....06/01/2011  
Industrial and Applied Physics .....05/01/2011  
International Physics .....05/01/2011  
Physics & Society .....06/01/2011

**TOPICAL GROUPS**

Energy Research & Applications .....04/01/2011  
Few Body .....04/01/2011  
Gravitation .....04/01/2011  
Hadronic Physics .....04/01/2011  
Instrument & Measurement Science.....05/01/2011  
Magnetism and Its Applications .....06/01/2011  
Plasma Astrophysics .....04/01/2011

Precision Measurement & Fund. Const. .04/01/2011  
Quantum Information .....05/01/2011  
Shock Compression .....04/01/2011  
Statistical & Nonlinear Physics .....05/01/2011

**APS GENERAL**

06/01/2011

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)