

# Spring 2010

## Prizes and Awards

### APS Announces Spring 2010 Prize and Award Recipients

Thirty-four prizes and awards will be presented during special sessions at three spring meetings of the Society: the 2010 March Meeting, March 15-19, in Portland, OR, the 2010 "April" Meeting, February 13-16, in Washington, DC, and the 2010 Atomic, Molecular and Optical Physics Meeting, May 25-29, in Houston, TX.

Citations and biographical information for each recipient follow. The Apker Award recipients appeared in the December 2009 issue of *APS News* (<http://www.aps.org/programs/honors/awards/apker.cfm>).

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

#### 2010 Prizes, Awards and Dissertations

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

**Mark J. Kushner**  
University of Michigan

**Citation:** "For ground-breaking contributions to developing and applying hybrid plasma models that have advanced the fundamental understanding of the chemistry, surface kinetics, and energy transport in low temperature plasmas."

Mark J. Kushner received the BS in Nuclear Engineering and the BA in Astronomy from the University of California at Los Angeles in 1976; and the MS and Ph.D. in Applied Physics from the California Institute of Technology in 1977 and 1979. He served on the technical staffs of Sandia National Laboratory and Lawrence Livermore National Laboratory before joining Spectra Technology where he was Director of Electron, Atomic, and Molecular Physics. In 1986, Dr. Kushner joined the faculty at the University of Illinois at Urbana-Champaign where he was the Founder Professor of Engineering in the Department of Electrical and Computer Engineering while also serving in many administrative roles. In January 2005, Dr. Kushner became Dean of Engineering and the Melsa Professor of Engineering at Iowa State University. He then joined the University of Michigan as founding director of the Michigan Institute for Plasma Science and Engineering and George I. Had-dad Collegiate Professor in September 2008.



liquid helium as warm-up calculations before doing nuclei. They made variational Monte Carlo calculations of  $^{16}\text{O}$  in the early 1990s, and in 1995 he inherited the Green's function Monte Carlo program that Brian Pudliner had developed with Pandharipande and Joseph Carlson. With Ewing Lusk and Ralph Butler it has just been adapted to computers with more than 30,000 processors. It was used to develop the Illinois three-nucleon potentials, which currently reproduce nuclear states up to 12C very well.

Robert Bruce Wiringa was born in Houston, Texas in 1950 and graduated from Darien High School, Darien, Connecticut in 1968. He attended Rensselaer Polytechnic Institute in Troy, New York, earning his B.S. in 1972, and the University of Illinois at Urbana-Champaign, where he received an M.S. degree in 1974 and a Ph.D. in 1978, working with Vijay Pandharipande on nuclear matter. He was a Research Associate at Los Alamos Scientific Laboratory for two years before joining the Physics Division at Argonne National Laboratory in 1981, where he became a Senior Physicist in 2000. At Argonne he began a long-term collaboration with Steven Pieper, as well as continuing to work with groups at Urbana, Los Alamos, and later at Jefferson Laboratory.

His work has focused on the nucleon-nucleon and three-nucleon interactions, quantum Monte Carlo calculations of nuclear structure and reactions, and variational studies of dense nucleon matter and neutron stars.



concepts of traditional crystallography, especially the appearance of quasi-crystals, and the applications of electron microscopy.

Paul J. Steinhardt, the Albert Einstein Professor in Science and Director of the Princeton Center for Theoretical Science, is in the Department of Physics and the Department of Astrophysical Sciences at Princeton University. He received his B.S. in physics at Caltech in 1974, his physics M.A. in 1975 and physics Ph.D. in 1978 at Harvard University. He was a Junior Fellow in the Harvard Society of Fellows from 1978 to 1981 and on the faculty of the Department of Physics and Astronomy at the University of Pennsylvania from 1981 to 1998, where he was Mary Amanda Wood Professor between 1989 and 1998.

His current research is on inflationary cosmology and an alternative, known as the 'cyclic universe.' He also studies the properties of synthetic quasicrystal and disordered dielectric structures with application to photonics while searching for natural geological sources of quasicrystals and theories to explain quasicrystal growth and stability.



has developed a number of dimension reduction and tabulation methodologies. His textbook "Turbulent Flows" was published in 2000.

##### Dannie Heineman Prize for Mathematical Physics

**Michael Aizenman**  
Princeton University

**Citation:** "For his development of the random current approach to correlations which has had an impact on a wide variety of problems, especially his rigorous non-perturbative proof of the triviality of  $\phi^4$  field theory."

Michael Aizenman is a mathematical physicist at Princeton University. Recently he has been working on quantum effects of quenched disorder.

He received his undergraduate education at the Hebrew University of Jerusalem, and PhD degree in 1975 at Yeshiva University (Belfer Graduate School of Science), New York, advised by Joel Lebowitz. After postdoctoral appointments at Courant Institute of NYU, 1974-75, and Princeton University 1975-77 with Elliott Lieb, he was Assistant Professor at Princeton. In 1982 he moved to Rutgers University as Associate Professor and then full Professor. In 1987 he moved to the Courant Institute and in 1990 returned to Princeton as Professor of Mathematics and Physics.



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

**Chris H. Greene**  
JILA, University of Colorado

**Citation:** "For seminal contributions to theoretical AMO physics, including dissociative recombination, ultracold matter, and high-harmonic generation, and for the prediction of 'trilobite' long-range molecules."

Chris Greene has been a Fellow of JILA and Professor of Physics at the University of Colorado at Boulder since 1989. He earned his doctorate in theoretical atomic physics from the University of Chicago in 1980, under his advisor Ugo Fano. His undergraduate degree was in math and physics from the University of Nebraska-Lincoln in 1976, with an honors thesis supervised by Donal Burns. A one-year postdoctoral stint in Richard Zare's group at Stanford was then followed by over seven years on the faculty at Louisiana State University.

Dr. Greene's theoretical research interests cover much of atomic, molecular, and optical physics, notably few-body processes in ultracold gases, dissociative recombination in electron collisions with molecular ions, photon-atom and photon-molecule interactions, and molecular Rydberg state behavior.



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

**Duncan Steel**  
University of Michigan

**Citation:** "For seminal contributions to nonlinear optical spectroscopy and coherent control of semiconductor heterostructures."

Duncan Steel received his undergraduate degree in physics from the UNC-Chapel Hill in 1972 and his Ph.D. with David Bach and James Duderstadt from the U. Mi. in 1976. Prior to joining the faculty at Michigan in 1985, he was a Senior Staff Physicist at the Hughes Research Laboratory in Malibu. It was at HRL, he began to understand the power of probing the nonlinear optical response to study the quantum behavior in these systems. When he started research at Michigan, he initiated experiments in solids, eventually focusing on understanding the nonlinear optical response of the exciton in GaAs. Hailin Wang in his group showed that the leading term in the nonlinear optical response was due to physics similar to collisional interactions that lead to dephasing. Working with Phil Bucksbaum, he learned how to apply the concepts of coherent control to these systems. Currently, he has been working to understand the nature of optical interactions in quantum dots and to develop them for applications to quantum computing.



##### Fluid Dynamics Prize (2009)

**Stephen B. Pope**  
Cornell University

**Citation:** "For seminal contributions to the understanding and prediction of turbulent phenomena, especially the development of the PDF approach for turbulent reacting flows."

Steve Pope is the Sibley College Professor in Mechanical & Aerospace Engineering at Cornell University. He received his undergraduate and graduate education in the Mechanical Engineering Department of Imperial College, London, receiving his B.Sc. and Ph.D. degrees in 1971 and 1976. Following post-doctoral positions at Imperial College and at the California Institute of Technology, he joined the Mechanical Engineering faculty at the Massachusetts Institute of Technology in 1978, and then moved to Cornell in 1982.

Pope's research is in the areas of modeling and simulation of turbulent flows and turbulent combustion. He pioneered the use of probability density function (PDF) models for turbulent reactive flows, and has made various contributions to the statistical modeling of turbulent flows, and to their study via direct numerical simulations. For combustion chemistry, he



##### Hans A. Bethe Prize

**Claus Rolfs**

Ruhr-Universität Bochum, Emeritus

**Citation:** "For seminal contributions to the experimental determination of nuclear cross-sections in stars, including the first direct measurement of the key  $^3\text{He}$  fusion reaction at solar conditions."

Claus Rolfs received his vordiplom in physics from the Universität Freiburg in 1962. He went on to receive his diplom in physics in 1966 and his promotion to doctorate in physics in 1967 from the same university. After serving as a postdoctoral fellow at the Universität Freiburg and later at the University of Toronto, he took a position as a physics professor at the Universität Munster in 1974. In 1990 he accepted the chairmanship of experimental physics at Ruhr-Universität Bochum, where he stayed until retiring in 2007.

During his career, Rolfs focused on nuclear astrophysics. He also contributed greatly to finding ways to safely dispose of radioactive waste.



##### Oliver E. Buckley Prize

**Dov Levine**

Technion, Israel Institute of Technology

**Alan Mackay**

Birbeck College, Emeritus

**Paul Steinhardt**

Princeton University

**Citation:** "For pioneering contributions to the theory of quasicrystals, including the prediction of their diffraction pattern."

Dov Levine is Professor in the Department of Physics at the Technion-Israel Institute of Technology. He received his B.S. in Physics from S.U.N.Y. Stony Brook in 1979, and his Ph.D. in Physics from the University of Pennsylvania in 1986. He was a postdoctoral member of the Institute for Theoretical Physics at the University of California Santa Barbara (now KITP) from 1986 to 1988, when he became a faculty member at the University of Florida. In 1990 he joined the Physics Department of the Technion.

In addition to his work on quasicrystals, Dr. Levine's research has mainly been concentrated in soft condensed matter physics, particularly granular materials, emulsions, and foams, and more recently on systems far from equilibrium and on the quantification of unconventional order in solids.

Alan Mackay retired as Emeritus in 1991 from his position as Professor of Crystallography at Birbeck College in the University of London.

He was educated at Wolverhampton Grammar School and Oundle School and entered Cambridge University with a major entrance scholarship at Trinity College in 1944. He read physics, with half subjects chemistry, electronics and mineralogy and graduated in 1947. He then worked at Philips Electrical for two years and in 1951 took a Ph.D. degree (D.Sc. 1986) in the Department of Physics at Birbeck College, London, then headed by J.D. Bernal, on X-ray crystal structure analysis. He then spent almost all his career at Birbeck College, becoming professor in 1986. He was elected a fellow of the Royal Society in 1988. His work has concerned such topics as corrosion, symmetry theory, the generalization of the



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

**Steven C. Pieper**

Argonne National Laboratory

**Robert B. Wiringa**

Argonne National Laboratory

**Citation:** "For development of quantitative, ab initio calculations of the properties of nuclei from  $A=6-12$ , including deep physical insight into the nature of nuclear forces and the application of state-of-the-art computational physics."

Steven C. Pieper received his B.S. degree in physics from the University of Rochester in 1965 and his Ph.D. from the University of Illinois, Urbana-Champaign, in 1970. After a postdoc at Case Western Reserve, he joined Argonne National Laboratory, where he is currently a senior physicist.

With colleagues, he developed the heavy-ion scattering program Ptolemy, which is still in use. In 1982 he joined Vijay Pandharipande and Robert Wiringa in doing quantum Monte Carlo calculations of drops of



##### Julius Edgar Lilienfeld Prize

**David Campbell**  
Boston University

**Shlomo Havlin**  
Bar-Ilan University

**Citation:** "For pioneering new approaches to the

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study of complex systems, using the complementary approaches of nonlinear dynamics and statistical physics, and for communicating the excitement of this new field to diverse audiences."

Dr. David Campbell received his B.A. in Chemistry and Physics from Harvard University in 1966 and Ph.D. from Cambridge University in Theoretical Physics and Applied Mathematics in 1970. He held post-doctoral positions at UIUC from 1970 to 1972 and the Institute for Advanced Study in Princeton from 1972 to 1974. He joined Los Alamos National Laboratory in 1974 as the first Oppenheimer Fellow, co-founding and later directing the Center for Nonlinear Studies. In 1992 he became Professor in and Head of the Department of Physics at UIUC, moving in 2000 to Boston University, where he is currently University Provost and Professor, Electrical Engineering and Physics.

Campbell is known for his studies of localized nonlinear excitations—"solitons," polarons, bipolarons, "breathers" and "intrinsic localized modes"—in many branches of physics particularly in conducting polymers, magnetic systems, and related novel solid state systems.

Shlomo Havlin, born in 1942 in Jerusalem, obtained his M.Sc. at Tel-Aviv University and his PhD at Bar-Ilan University in 1972. Havlin became Professor of Physics at Bar-Ilan in 1984 and served as Chair from 1984-1988, and as Dean of the Faculty of Exact Sciences from 1999 to 2001. He was elected president of the Israel Physical Society and served from 1996 to 1999.

Havlin and his collaborators made fundamental contributions in statistical physics that opened new avenues of active research in several areas including better understanding of anomalous transport in disordered media. He also aided in the discovery of long range correlations in DNA sequences and in physiological data which related to the development of the DFA method for analyzing non-stationary records. Havlin demonstrated also that many networks belong to a new universality class due to their heterogeneous topology, represented for example by the absence of a percolation threshold and novel critical exponents.

### James Clerk Maxwell Prize for Plasma Physics (2009)

**Miklos Porkolab**

Massachusetts Institute of Technology

**Citation:** "For pioneering investigations of linear and nonlinear plasma wave and wave-particle interactions; fundamental contributions to the development of plasma heating, current drive and diagnostics; and leadership in promoting plasma science education and domestic and international collaborations."

Miklos Porkolab Education: B.A.S.c., University of British Columbia, 1963; Ph.D., Stanford University, 1967. Employment: Princeton University, Plasma Physics Laboratory: Research Staff (1967-1977); Astrophysical Sciences, Lecturer with Rank of Professor, from 1975 to 1977. MIT, Professor, Physics Department, 1977-present. Director, Plasma Science and Fusion Center, MIT, 1995-present. At Princeton, Porkolab's research concentrated on a quantitative understanding of the dispersive properties of plasma waves and instabilities in magnetized plasmas. In 1977 Porkolab joined the MIT Physics Department and the newly established Plasma Fusion Center where he began pioneering experiments on lower hybrid current drive in tokamak plasmas. Further work included clarifying the physics of ion cyclotron heating and mode conversion processes in multi-ion species fusion plasmas. Critical aspects of this work included measurements of mode converted ion Bernstein and ion cyclotron waves (ICW) using Phase Contrast Imaging (PCI). Recent work with PCI concentrated on measuring turbulence and Alfvén wave phenomena in tokamak plasmas.

### James C. McGroddy Prize for New Materials

**Sang-Wook Cheong**  
Rutgers University

**Ramamoorthy Ramesh**

University of California, Berkeley

**Nicola A. Spaldin**

University of California, Santa Barbara

**Citation:** "For groundbreaking contributions in theory and experiment that have advanced the understanding and utility of multiferroic oxides."

Sang-Wook Cheong obtained his Bachelor (mathematics, 1982) from Seoul National University, and Ph.D. (Physics, 1989) from University of California, Los Angeles. He worked at Los Alamos National Laboratory for 1986-1989, and was a member of tech-

nical staff at Bell Laboratories (1989-2001). Since 1997, he has been a professor at Rutgers University. He became the founding director of Rutgers Center for Emergent Materials (2005-). His scientific field has been the physics of complex oxides, including multiferroics, colossal magnetoresistive oxides and high  $T_c$  superconductors.

He is currently a Divisional Associated Editor for *Physical Review Letters*, a Distinguished Professor at Pohang Science and Technology University, Korea, and a Distinguished Visiting Scholar, National Synchrotron Radiation Research Center, Taiwan.

Ramamoorthy Ramesh graduated from the University of California, Berkeley with a Ph. D. in 1987. He returned to Berkeley in 2004 and is currently the Plato Malozemoff Chair Professor in Materials Science and Physics. From 1989 to 1995, at Bellcore, he initiated research in several key areas of oxide electronics, including ferroelectric nonvolatile memories.

His landmark contributions in ferroelectrics came through the recognition that conducting oxide electrodes are the solution to the problem of polarization fatigue. In 1994, in collaboration with S. Jin of Lucent Technologies, Ramesh initiated research into manganite thin films and they coined the term, Colossal Magnetoresistive (CMR) Oxides. His group at Berkeley demonstrated the existence of a large ferroelectric polarization in multiferroic BiFeO<sub>3</sub> films. They also demonstrated electric field control of antiferromagnetism as well as ferromagnetism. His current research interests include thermoelectric and photovoltaic energy conversion in complex oxide heterostructures.

Nicola Spaldin is a Professor in the Materials Department at the University of California, Santa Barbara. She received her undergraduate degree in Natural Sciences from Cambridge University in 1991, and her PhD in Chemistry from UC Berkeley in 1996, followed by postdoctoral research in Applied Physics at Yale University.

Her research develops and applies electronic structure methods for designing and understanding novel multifunctional materials. She is particularly renowned for her contributions to the emerging field of multiferroics. She is Director of the International Center for Materials Research.

### Lars Onsager Prize

**Daniel Friedan**

Rutgers University

**Stephen Shenker**

Stanford University

**Citation:** "For seminal work on the classification and characterization of two-dimensional unitary conformal field theories of critical states."

Daniel Friedan received his PhD in physics in 1980 from the University of California at Berkeley. He worked at the Centre d'Etudes Nucléaires de Saclay from 1980 to 1981. In 1981, he joined the Physics Department and the Enrico Fermi and James Franck Institutes of the University of Chicago. The work cited by the APS was done there in collaboration with Zongan Qiu and Stephen Shenker. Since 1989, Dr. Friedan has been at Rutgers the State University of New Jersey, in the Department of Physics and Astronomy and the New High Energy Theory Center.

He has been working on two speculative projects there. The first looks at the possibility of a mechanism that could produce quantum field theory at observable distance scales in space-time. His second project investigates the possibility of making asymptotically large quantum computers from near critical quantum circuits belonging to universality classes described by 2d quantum field theories.

Stephen Shenker received his A. B. degree from Harvard University in 1975 and his Ph.D. from Cornell University in 1980. After postdocs at the University of Chicago and the ITP at UCSB he joined the faculty at Chicago where he taught until 1989. He then moved to Rutgers University where he helped to found the New High Energy Theory Center. In 1998 he moved to Stanford University.

Shenker's research interests range from statistical physics to quantum field theory and string theory. He and his collaborators have studied the phase structure of gauge theories and the consequences of conformal invariance for two dimensional critical phenomena and string theory. They have discovered nonperturbative formulations of string theory and have pointed out the existence of distinctively stringy nonperturbative effects. His recent interests include the applications of quantum gravity to the study of cosmology and space-time singularities.

### Abraham Pais Prize for History of Physics

**Russell McCormmach**

University of Oregon, Emeritus

**Citation:** "For the study of German science in the 19th and 20th centuries and a major biography of Henry Cavendish (with Christa Jungnickel, his late wife), and for founding the journal *Historical Studies in the Physical Sciences*."

Russell McCormmach received a bachelor degree in physics from Washington State College in 1955 and, a second bachelor degree in politics, philosophy, and economics from Oxford University in 1959. In 1967, he received a Ph.D. in history of science at Case Institute of Technology, where one of his principle teachers was the first recipient of the Abraham Pais Prize, Martin Klein. After acquiring his advanced degree, he became a professor of history of science, first at the University of Pennsylvania and then at Johns Hopkins University.

His latest work is a biography together with an edition of letters of the eighteenth-century English natural philosopher John Michell.

### PAKE PRIZE

**Robert A. Frosch**

Harvard University

**Citation:** "For original research in marine geophysics, exceptional leadership and innovative management of the General Motors Research Laboratory, and sustained contributions to national science policy."

Robert A. Frosch received an AB from Columbia College in 1947, and a PhD in theoretical physics from Columbia University in 1952. Beginning in 1951, he did research on long range underwater acoustics at Columbia University's Hudson Laboratories, later becoming Director of the Laboratories.

He was later Director for Nuclear Test Detection, and then Deputy Director of the Advanced Research Projects Agency, Assistant Secretary of the Navy for R&D, Assistant Executive Director of the United Nations Environment Programme, Associate Director for Applied Oceanography at the Woods Hole Oceanographic Institution, Administrator of NASA, and President of the American Association of Engineering Societies. In 1982 he became Vice President of the General Motors Corporation in charge of Research Laboratories, until retiring in 1993.

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

**Eugene W. Beier**

University of Pennsylvania

**Citation:** "For major contributions to studies of neutrino interactions, especially studies of solar neutrinos demonstrating unequivocally the existence of neutrino flavor oscillations."

Eugene W. Beier is the Fay R. and Eugene L. Langberg Professor of Physics at the University of Pennsylvania. He received his B.S. from Stanford University in 1961 and M.S. and Ph.D. degrees from the University of Illinois in 1963 and 1966, respectively. He has been a member of the faculty of the University of Pennsylvania since 1967.

Professor Beier has studied neutrino interactions and properties for the past thirty years. He has been involved in experimental work on neutrinos at Brookhaven National Laboratory, the Kamiokande II experiment, and the Sudbury Neutrino Observatory. Current work seeks to determine if neutrinos are their own antiparticles through a search for neutrinoless double beta decay.

### Earle K. Plyler Prize for Molecular Spectroscopy

**Lester Andrews**

University of Virginia

**Citation:** "For vibrational spectroscopy in cryogenic matrices that combined with quantum calculations, has led to the identification and characterization of many molecules, ions, and complexes across the periodic table."

W. Lester S. Andrews, born in Lincolnton, North Carolina, received his B.S., Chemical Engineering, Mississippi State University, 1963 and his Ph.D., Physical Chemistry, University of California, Berkeley, 1966. Lester Andrews has authored or co-authored over 750 scientific papers in refereed journals from 1966 to date.

These papers involve matrix isolation spectroscopy of metal oxides, free radicals, hydrogen-bonded

complexes, molecular ions, metal hydrides, methylidene and methylidyne complexes, metal dihydroxide and tetrahydroxide molecules, and other novel chemical species. His current sponsored work is aimed at using the laser-ablation process to make new transition metal, lanthanide metal, and actinide metal-containing molecules.

### Polymer Physics Prize

**Michael Rubinstein**

University of North Carolina

**Citation:** "For his leadership in the field of structure and dynamics of polymer liquids, interfaces and gels."

Michael Rubinstein received B.S. with honors in physics from Caltech in 1979 and Ph.D. in physics from Harvard University in 1983 specializing in soft condensed matter theory. Between 1983 and 1985 he was a post-doctoral fellow at AT&T Bell Laboratories in Murray Hill, NJ where he started his research in polymer physics.

In 1985 he joined Research Laboratories of Eastman Kodak Company in Rochester, NY where he worked for ten years in different areas of polymer theory. In 1994 he was Juliot Curie Visiting Professor at ESPCI in Paris.

In 1995 he moved to the University of North Carolina at Chapel Hill where he is currently a John P. Barker Distinguished Professor in the Department of Chemistry and in the Curriculum of Applied Sciences and Engineering as well as a member of the Program in Molecular and Cellular Biophysics and of the Institute for Advanced Materials, Nanoscience and Technology. In 1998 he was Visiting Professor at College de France.

### Aneesur Rahman Prize for Computational Physics

**Frans Pretorius**

Princeton University

**Citation:** "For his brilliant computational solution of a fundamental problem in Einstein's theory of General Relativity, the collision of two black holes, with implications for fundamental physics, astrophysics, and gravitational wave observations."

Frans Pretorius received his undergraduate degree in computer engineering from the University of Victoria, British Columbia, in 1996, and a M.Sc. in Physics at the same institute under the supervision of Werner Israel in 1999. Pretorius completed a Ph.D. in Physics at the University of British Columbia in 2002. Pretorius was the Richard Chase Tolman Postdoctoral Fellow at the California Institute of Technology from 2002 to 2005, an Assistant Professor of Physics at the University of Alberta from 2005 to 2007, and is presently an Assistant Professor of Physics at Princeton University.

Pretorius's main area of research is Einstein's theory of general relativity. His work has included studies of gravitational collapse, cosmic singularities, and binary black hole mergers. His latest efforts have focused on high speed black hole collisions (of relevance to putative black hole formation scenarios at the Large Hadron Collider), and the structure of gravitational waves emitted by compact object mergers in the universe.

### SAKHAROV PRIZE

**Joseph Birman**

CCNY-CUNY

**Morris (Moishe) Pripstein**

National Science Foundation

**Herman Winick**

SLAC

**Citation:** "For tireless and effective personal leadership in defense of human rights of scientists throughout the world."

Joseph L. Birman received his B.S. from CCNY in 1947, his Ph.D. from Columbia University in 1952 and a Docteur es Sciences, h.c from Université de Rennes in 1974. He was Professor of Physics at NYU from 1962 to 1974 and Senior Scientist at GTE Research Labs from 1952 to 1962.

His research is in symmetry related aspects of phase transitions and response functions, mechanisms of optical properties and cooperative and competitive many particle effects. He is known for work on resonant light scattering, mechanisms of light emission, and the dynamical symmetry (Lie Algebra) collective effects in condensed matter systems.

He supports repressed scientists around the world by personal intervention with authorities, as well as by being a member or chair of numerous international committees.

His work toward international cooperation includes co-organizing three US-USSR Bi-National Symposia on Light Scattering in Solids. He also negotiated a US-China Cooperative Program in AMO





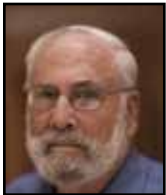
and Condensed Matter Physics.

Morris Pripstein pursued his undergraduate studies at McGill University in engineering physics where he received his Bachelor of Engineering degree in 1957. He then went to the University of California, Berkeley for graduate work and earned his PhD there in experimental elementary particle physics in 1962, conducting his research at the Lawrence Radiation Laboratory (LRL) as it was then known. In 1965 he returned to LRL to join Luis Alvarez's bubble-chamber research group. He was promoted shortly thereafter to Staff Senior Scientist and later became a research group leader, including that of Group A, the successor of the Alvarez Group.



Since retiring from the Lawrence Berkeley National Laboratory (as LRL became known) in 2005, he has been a program director at the National Science Foundation, overseeing its support of the U.S. Large Hadron Collider (LHC) Program at CERN. For two years before then, while on leave from LBNL, he held the corresponding position at the Department of Energy.

Herman Winick, received his Bachelor of Arts from Columbia College in 1953 and his Ph.D. from Columbia University in 1957. Winick played a major role in developing synchrotron radiation sources and research at Stanford and around the world. After positions at the University of Rochester and Harvard University, in 1973 he led construction of the Stanford Synchrotron Radiation Project. He served as Deputy Director until semi-retirement in 1998.



His work on wiggler and undulator magnets as advanced radiation sources has received awards, including the DOE Distinguished Associate Award. In 1992 he initiated studies of the Linac Coherent Light Source Project to construct an x-ray laser at SLAC.

He has had extended stays abroad and continues to work on the UNESCO-sponsored SESAME Project, modeled on CERN, which he was instrumental in initiating in 1997. His strong interest in human rights and international science led to chairing the APS Committee on International Freedom of Scientists and the Forum on International Physics.

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

**Robert Brout**

*Université Libre de Bruxelles*

**François Englert**

*Université Libre de Bruxelles*

**Gerald S. Guralnik**

*Brown University*

**Carl R. Hagen**

*University of Rochester*

**Peter W. Higgs**

*University of Edinburgh, Emeritus*

**T.W.B. Kibble**

*Imperial College*

**Citation:** "For 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."

Robert Brout obtained his undergraduate degree from New York University in 1948 and doctorate from Columbia in 1953. His research began in Rochester in 1953, continuing at the Université Libre de Bruxelles from 1954 to 1956, then at Cornell from 1956 to 1961, as a Sloan Fellow from 1959 to 1961 and as a Guggenheim Fellow from 1961 to 1962. He was established in Europe as a Solvay Fellow from 1962 to 1966 then as a professor in the "Service de Physique Théorique" co-directed with François Englert. He became active in three main fields: statistical mechanics, particle physics and cosmology.



His paper, "The Causal Universe," published in 1978, introduced the inflation mechanism and received first award of the International Gravity Contest by the "Gravity Research Foundation" along with Englert and Gunzig.

François Englert received his diplôme d'ingénieur in Civil Electricien-Mécanicien from the Université Libre de Bruxelles in 1955, his licencié in physics in 1958 and his doctorate in 1959. Englert did his post doctoral research at Cornell from 1959



to 1961 before returning to the Université Libre de Bruxelles. He lectured there until 1964 when he assumed the position of a full time professor at the university. In 1980 he became the director of the Theoretical Physics Group until 1998 and is now professor emeritus at the university.

His research interests range among the fields of Solid state physics, Statistical mechanics, Field Theory, Gravity, Supergravity, Cosmology and different

approaches to Quantum Gravity. His present research is centered on Kac-Moody approaches to gravity and supergravities and on the quantum significance of event horizons.

Gerald Guralnik received his BS Degree from MIT in 1958 and his PhD degree from Harvard in 1964. He went to Imperial College in London as a postdoctoral fellow supported by the National Science Foundation from 1964 to 1965 and then became a postdoctoral fellow at the University of Rochester. In the fall of 1967 he became an assistant Professor at Brown University and became a full Professor in 1973.



He frequently visited Imperial college and Los Alamos National Laboratory where he was a staff member from 1985 to 1987. While at Los Alamos, he did extensive work on the development and application of computational methods for lattice QCD. His primary interests are currently in quantum field theory and general relativity. He is particularly interested in the phase structure and the full solution set of quantum field theory analyzed both abstractly and through numerical techniques.

Carl R. Hagen was born and raised in Chicago. He pursued his studies in physics at M.I.T. obtaining his bachelor and master degrees in 1958. Also at M.I.T. he completed his Ph.D. in 1963 with a thesis topic in quantum electrodynamics. Later that year he became a research associate at the University of Rochester, eventually rising to the position of professor. On leave to Imperial College in London in 1964 he collaborated on the broken symmetry problems. He worked at the ICTP in Trieste, Italy in 1967, spending a month of that time at the American University in Beirut lecturing and carrying on research.



His research work has largely been concerned with various aspects of quantum field theory. This has included the formulation and quantization of higher spin field theories within the context of Galilean relativity as well as that of special relativity. More recent applications include studies of Chern Simons field theories and their special cases such as the Aharonov Bohm effect.

Peter Higgs graduated with 1st class Honors in Physics from King's College, University of London, in 1950. A year later, he was awarded an MSc and started research, initially under the supervision of Charles Coulson and, subsequently, Christopher Longuet-Higgins. In 1954, he was awarded a PhD for a thesis entitled "Some Problems in the Theory of Molecular Vibrations", work which signaled the start of his life-long interest in the application of the ideas of symmetry to physical systems. In 1954, Higgs moved to the University of Edinburgh and remained for a further year as a Senior Research Fellow. He returned to London in 1956 to take up an ICI Research Fellowship, spending a year at University College and a little over a year at Imperial College, before taking up an appointment as Temporary Lecturer in Mathematics at University College. October 1960 saw Peter Higgs return to Edinburgh where he stayed until retiring in 1996.



Tom Kibble was born in Madras, India. He graduated from the University of Edinburgh earning his masters in 1955, his BSc in 1956 and his PhD in 1958. Following a year at Caltech he came to Imperial College London in 1959, joining the group led by Professor Abdus Salam. He was appointed to the faculty as a lecturer in 1960, and promoted to professor in 1970. He was head of the Imperial College Physics Department from 1983 to 1991, and since 1998 has been a senior research fellow and emeritus professor of Theoretical Physics. Dr Kibble spent a year in 1967-68 at the University of Rochester, Rochester, NY, and in 2007 was Lorentz Professor at the University of Leiden, Netherlands.



His primary interests are in quantum field theory and cosmology, especially formation and properties of topological defects such as cosmic strings and analogs in condensed matter.

### Arthur L. Schawlow Prize in Laser Science

**Henry C. Kapteyn**

*University of Colorado—Boulder*

**Margaret M. Murnane**

*University of Colorado*

**Citation:** "For pioneering work in the area of the ultra-fast laser science, including development of ultra-fast optical and coherent soft x-ray sources."

Henry C. Kapteyn has been a Professor of Physics at the University of Colorado at Boulder and a fellow of JILA since 1999. Previously he held faculty positions at Washington State University (1990-1995) and the University of Michigan (1996-1999). He received his BS from Harvey Mudd College in 1982, MS from

Princeton in 1984, and a PhD in Physics from the University of California at Berkeley in 1989. He and his wife and long-term collaborator, Margaret Murnane, are well known for research in ultrashort pulse laser science and technology, particularly for pioneering developments making it possible to access new physics in the few-optical-cycle and sub-optical cycle (attosecond) regime of laser matter interactions, and in techniques for upconverting laser light to make coherent beams of x-rays.



Margaret Murnane is a Fellow of JILA and a Professor in the Department of Physics and of Electrical and Computer Engineering at the University of Colorado. She runs a joint research group with her husband, Professor Henry Kapteyn. She received her B.S. and M.S. degrees from University College Cork, Ireland, and her Ph.D. from the University of California at Berkeley in 1989. She joined the faculty at Washington State University in 1990, moved to the University of Michigan in 1996, and to Colorado in 1999.



Prof. Murnane and her group use coherent beams of laser and x-ray light to capture the fastest dynamics in molecules and materials at the nanoscale.

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

**Enrique Galvez**

*Harvey Mudd*

**Citation:** "For his contributions to quantum optics, his enthusiastic inclusion of undergraduates in a significant way in his research, and his contributions to the wider physics community."

Enrique "Kiko" Galvez completed his undergraduate studies in physics at the Pontifical Catholic University of Peru in 1980. He received his Ph.D. in physics at the University Notre Dame in 1986, and did a postdoc at Stony Brook University. He has been permanent faculty at Colgate University since 1988.



His early research involved experimental atomic physics of ion and atomic beams, measuring the Lamb shift in two-electron ions and studying highly excited Rydberg atoms. More recently he has been studying classical and quantum properties of light, which includes geometric phases, helical modes of light, optical vortices and quantum interference with correlated photons. He has also been active in developing new undergraduate laboratories and modernizing the physics curriculum.

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

**John Peoples, Jr**

*Fermilab*

**Citation:** "For critical and enduring efforts in making the Tevatron Collider the outstanding high energy physics accelerator of the last two decades."

John Peoples was Director of Fermilab from 1989 until 1999 when he was appointed Director Emeritus in 1999. He received a B.S.E.E. from Carnegie Institute of Technology in 1955. After working at the Martin Aircraft Corporation as an engineer, he entered Columbia University in 1959, where he received a Ph.D. in Physics in 1966. After serving on the faculties of Columbia University and Cornell University he joined Fermilab in 1972. He collaborated in high energy photoproduction experiments, which observed the J/Y particle, providing evidence that it was a hadron. He was appointed project manager of Tevatron I in 1981 and led the construction and commissioning of the Antiproton Source.



Under his leadership, the Tevatron luminosity increased by a factor of 20 between 1990 and 1994, making it possible for CDF and D0 to discover the top quark. Under his leadership the Main Injector Project was completed in 1999 which increased the collider luminosity by another factor of 20, further extending its potential for discovery.

### AWARDS

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

**Patricia Thiel**

*Iowa State University*

**Citation:** "For seminal contributions to surface structure and dynamics of complex metallic alloys, including quasicrystals and kinetically limited growth and relaxation of nanostructures in thin metal films."

Patricia A. Thiel is a Senior Scientist in the Ames Laboratory, and a Distinguished Professor of Chemis-

try at Iowa State University. Her current research areas include nanostructure evolution on surfaces, and surface properties and structures of complex metallic alloys, including quasicrystals. She earned her B.A. in Chemistry at Macalester College in 1975, and her Ph.D. in chemistry at the California Institute of Technology in 1981. After postdoctoral work at the University of Munich as a von Humboldt Fellow, she joined the technical staff at Sandia National Laboratories, Livermore, then moved to Iowa State University in 1983.



### LeRoy Apker Award (2009)

**Kathryn Greenberg**

*Mount Holyoke College*

**Citation:** "Thermal Coupling and Lensing in Arrays of Vertical Cavity Surface Emitting Lasers."

**Bilin Zhuang**

*Wellesley College*

**Citation:** "Thermodynamics of Ising Systems on the Triangular Kagome Lattice and Small-Model Approximations to Geometrically Frustrated Systems."

Kathryn Greenberg received her B.A. in physics from Mount Holyoke College in 2009, as well as a minor in mathematics. As an undergraduate, Greenberg studied heating in vertical cavity surface emitting lasers (VCSELs) as well as thermal coupling in VCSEL arrays in Professor Janice Hudgings' laboratory. Specifically, she used high resolution thermoreflectance microscopy to investigate the temperature distribution across the surface of the VCSELs and VCSEL arrays.



Greenberg is currently pursuing a Master of Philosophy in physics at the University of Cambridge on a Gates Cambridge Scholarship where she is working in Professor Sir Richard Friend's laboratory to create more efficient organic light emitting diodes. Following her year of study at the University of Cambridge, Greenberg will be attending Harvard University to pursue a Ph.D. in Applied Physics.

Bilin Zhuang received her B.A. degree with majors in Physics and Chemistry from Wellesley College in June 2009. She conducted her undergraduate thesis research in the thermodynamic properties of frustrated Ising systems under Professor Courtney Lannert in Wellesley College. Her thesis research focused on modeling the thermodynamic properties of extended two-dimensional frustrated Ising systems with much smaller systems of less than 30 atoms.



Currently, she is employed by the Agency for Science, Technology and Research in Singapore and works on theories related to MRAM devices. She intends to pursue PhD studies in theoretical physics or chemistry starting in fall 2010.

### Edward A. Bouchet Award

**Herman B. White**

*Fermilab*

**Citation:** "For his contributions to KTeV experiments and the establishment of a new kind of interaction distinguishing matter from antimatter, as well as his outstanding public service and mentorship roles."

Herman B. White, Jr. completed his A.B. physics degree at Earlham College in 1970, M.S. degree in Nuclear and Accelerator Physics at Michigan State University in 1974, and Ph.D. in Elementary Particle Physics at Florida State University in 1991. He was a Resident Research Associate in Nuclear Physics at Argonne National Laboratory in 1971, an Alfred P. Sloan Travel Fellow at the CERN Laboratory (1972), and University Fellow at Yale from 1976 to 1978. He has been a scientist at Fermilab for the past 35 years, and early in his career he contributed to the development of an empirical formula widely used at that time in the calculation of neutrino flux in high-energy interactions. His work in HEP has included studies in prompt muon production, hadronic pair production, neutrino and kaon physics, including the discovery of direct CP violation in neutral K-meson interactions with the KTeV collaboration. His current research focuses on neutrino cross-section measurements and muon conversion experiments.



### Joseph A. Burton Forum Award

**Pervez Hoodbhoy**

*Quaid-e-Azam University*

**Abdul Nayyar**

*Sustainable Development Policy Institute*

**Citation:** "For broadening the public understanding of science in Pakistan and for informing the public of the dangers of the nuclear arms race in South Asia."

Pervez Amirali Hoodbhoy is chairman and pro-



essor at the department of physics at Quaid-e-Azam University, Islamabad, where he has taught for 36 years. He received a PhD in nuclear physics from MIT in 1978.



His research interests lie in theoretical high energy physics. Dr. Hoodbhoy has spoken and written extensively for over 25 years against nuclear weapons in South Asia, produced a widely viewed documentary film "Pakistan and India Under the Nuclear Shadow", was a member of the Pugwash Council, and is a sponsor of the Bulletin of the Atomic Scientists, and authored "Islam and Science: Religious Orthodoxy and the Battle for Rationality", now in seven languages. He was a post-doctoral fellow at the University of Washington in Seattle and a visiting professor at MIT, Carnegie Mellon University, and the University of Maryland. Dr Hoodbhoy produced several documentary series for Pakistan Television popularizing science, and analyzing the Pakistani education system.

Abdul Hameed Nayyar received his MSc from Karachi University, Pakistan, in 1966, and his PhD in theoretical condensed matter physics in 1973 from Imperial College, London. He served on the faculty of the Department of Physics, Quaid-e-Azam University, Islamabad, from 1973 to 2005. He is currently a Senior Research Fellow at the Sustainable Development Policy Institute, Islamabad, directing programs on education reform and energy policy.



Since 1998, Nayyar has been a visiting researcher at Princeton University's Program on Science and Global Security, working on technical and policy studies of nuclear weapons and nuclear energy programs in Pakistan and India that can inform the South Asian nuclear-policy debate and foster a process of arms control and disarmament. He has also held visiting positions at the University of Manitoba, Winnipeg, Canada, and at the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste.

### John Dawson Award for Excellence in Plasma Physics (2009)

**Yitzhak Maron**

Weizmann Institute of Science

**Citation:** "For revolutionary, non-invasive spectroscopic techniques to measure magnetic fields in dense plasmas and for resolving in detail in space and time the implosion phase of the Z pinch."

Yitzhak Maron received his Ph.D. in Physics from the Weizmann Institute of Science in 1977, served as a postdoctoral fellow at the Weizmann, and in the years 1980-1984 became a Research Associate at the Laboratory of Plasma Studies at Cornell University. Then, as a Professor in the Faculty of Physics of the WIS, he has been heading the Plasma Laboratory there. His Laboratory focuses on spectroscopic investigations of high-energy-density plasmas, together with developing kinetics, line-shape, and radiation-transport computations. Among the accomplishments in his studies are pioneering determination of the electric-field distribution and ion velocities in high power ion diodes; determination of the magnetic field distribution in particle diodes, Plasma Opening Switches, Z-pinch, and laser-produced plasmas; investigations of electric and magnetic fields in turbulent plasmas; demonstration of the Hall effect in magnetic field penetration; observation of simultaneous field penetration and particle reflection, studying the implosion dynamics of a Z-pinch plasma; and determining the energy balance in the stagnating plasma.



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

**Yueh-Lin Loo**

Princeton University

**Citation:** "For insightful experiments connecting structure with performance in conducting polymers, organic electronics, and fundamental block copolymers."

Yueh-Lin (Lynn) Loo received her BSEs in Chemical Engineering and Materials Science and Engineering from the University of Pennsylvania in 1996 and a Ph.D. in Chemical Engineering from Princeton University in 2001. After a year at Bell Laboratories, Lynn started her independent program at the University of Texas at Austin. In 2007, she returned to Princeton's Chemical Engineering department where she is now an associate professor.



Her group is interested in understanding the structure-function relationships that govern block copolymers, organic semiconductors and polymer conductors, especially in organic solar cells and thin-film transistors. She and her group have also been recognized for developing non-invasive printing and patterning methods for fabricating organic electronic devices.

### Excellence in Physics Education Award

**Activity Based Physics Group (Priscilla Laws, Ronald Thornton, David Sokoloff)**

**Citation:** "For twenty-three years of national and international leadership in the design, testing, validation, and dissemination of research-based introductory physics curricula, computer tools and apparatus that engage students in active learning based on the observation and analysis of real phenomena."

Priscilla Laws received a B.A. from Reed College (1961) and a Ph.D. from Bryn Mawr College (1966) in nuclear theory. She joined the faculty at Dickinson College in 1965 and began research on the health effects of radiation. This led to the publication of two consumer books on medical and dental x-rays.



Since 1986, she has dedicated herself to the development of physics education research-based curricular materials to enhance student learning in introductory physics courses. She has co-authored educational computer software and a series of books as part of the Activity-Based Physics Suite including: the Workshop Physics Activity Guide; The RealTime Physics Laboratory Modules; and a calculus-based introductory physics text entitled Understanding Physics with Karen Cummings, Edward F. Redish & Patrick J. Cooney.

Dr. Laws is a Research Professor of Physics at Dickinson College where she is promoting active learning through the development of curricular materials for physics instructors. Dr. Laws is also working on ways that physics education can be used to enhance sustainable development in Africa, Asia and Latin America.

Ronald K. Thornton, now at

Tufts University, holds a Ph.D. from Brown University in High Energy Physics. He is Director of the Tufts Center for Science and Mathematics Teaching and a professor in both Physics and Education. He has been a visiting professor at the Universities of Sydney, Rome, Naples, and Pavia. With P. Laws and D. Sokoloff he leads the Activity-based Physics Group. He does research on student learning and has co-authored several texts. He has led the development of *Tools for Scientific Thinking* Microcomputer-based Laboratory software and hardware, and the LoggerPro, Visualizer, and WebILD software packages. He has developed student and teacher conceptual understanding evaluations including the Force and Motion Conceptual Evaluation. These materials, developed with support from the National Science Foundation and the U.S. Department of Education, F.I.P.S.E. He has led teaching workshops for physics professors, K-12 teachers, and teacher educators around the world and is an author of the Teacher Education Module



David Sokoloff is a professor of Physics at the University of Oregon. He earned his BA in physics at Queens College of the City University of New York in 1966, and his Ph.D. in AMO physics at the Massachusetts Institute of Technology in 1972 under Ali Javan. For over two decades, he has studied students' conceptual understandings, and developed active learning approaches (with NSF and FIPSE support) including the four modules of RealTime Physics: Active Learning Laboratories and Interactive Lecture Demonstrations (both developed with Ronald Thornton and Priscilla Laws, and published by Wiley). He has conducted numerous international, national and local institutes and workshops to disseminate these active learning approaches.



Since 1999, he has been part of a UNESCO team presenting active learning workshops in developing countries. He is the editor of the Training Manual for the ALOP workshop that has now been presented in Ghana, Tunisia, Morocco, India, Tanzania, Brazil, Mexico, Zambia, Cameroon and Colombia.

### Joseph Keithley Award for Advances in Measurement Science

**Eugene Ivanov**

University of Western Australia

**Citation:** "For advances in microwave interferometry, ultra-low phase noise microwave oscillators and high resolution noise measurement and for elucidation of noise mechanisms affecting the fidelity of optical to microwave frequency transfer."

Eugene N. Ivanov was born in 1956 in Moscow. He graduated from Moscow Power Engineering Institute in 1979 and received a PhD in Radiophysics from the same institution in 1987.



In 1991, he joined the Physics Department at the University of Western Australia where he constructed microwave readout system for the cryogenic gravitational wave detector "Niobe" and discovered a new type of parametric interaction

between mechanical and electromagnetic resonators. Since 1994, he has been working on applications of interferometric signal processing to generation of spectrally pure microwave signals and precision noise measurements. This research resulted in more than two orders of magnitude improvement in the phase noise of microwave oscillators relative to the previous state-of-the-art.

From 1999 to 2008, Eugene worked as a Visiting Scientist at the National Institute of Standards and Technology in Boulder, Colorado. He identified and studied a number of noise mechanisms affecting fidelity of frequency transfer from the optical and the microwave domain.

### Maria Goeppert Mayer Award

**Alessandra Lanzara**

University of California, Berkeley

**Citation:** "For high-resolution angle-resolved photoemission spectroscopy and imaging studies of the cuprate superconductors and graphene that elucidate their electronic properties."

Alessandra Lanzara received her Ph.D. in Physics from University of Rome La "Sapienza" in 1999, and her Laurea (equivalent to M.S.) from the same University in 1995. In 2002 she joined the physics department of the University of California, Berkeley as an assistant professor and became an associate professor in 2006.



Her main research interests lie on the frontier aspects of condensed matter physics, motivated by the search for new states of matter with main focus on high temperature superconductivity and Dirac materials. Her main contributions to these fields are the discovery of a universal energy scale in cuprates superconductors, which might hide the secret for superconductivity, and the discovery of a new way of band gap engineering of graphene through graphene/substrate interaction, a fundamental step toward graphene electronics. She is also pushing the frontier of photoemission spectroscopy to the time and spin realm, with the development of a novel concept of electron analyzer for spin detection.

### Dwight Nicholson Medal for Human Outreach (2009)

**Marcia C.B. Barbosa**

Universidade Federal do Rio Grande do Sul

**Citation:** "For her leadership of the first International Conference on Women in Physics, that changed the visibility of women in physics, and her personal commitment to supporting and encouraging women in physics around the world."

Marcia C.B. Barbosa did her undergraduate and graduate studies at the Universidade Federal do Rio Grande do Sul. After finishing her doctoral degree in 1988 she travelled to the United States for postdoctoral studies at Maryland University with Professor Michael Fischer. In 1991 she was hired at the Universidade Federal do Rio Grande do Sul.



As part of her research she found using computer simulations that water diffuses faster when compressed at the supercooled region. She also theoretically and experimentally designed a DNA-lipid complex for gene therapy purposes.

In 2000 Marcia became the chair of the International Union of Pure and Applied Physics Working Group on Women in Physics and organized the First and the Second IUPAP International Conference in Women in Physics in 2002 and in 2005 respectively. In 2008 she was elected director of the Physics Institute of the Universidade Federal do Rio Grande do Sul where she is in charge 120 people between professors and staff.

### Leo Szilard Lectureship Award

**Frank von Hippel**

Princeton University

**Citation:** "For his outstanding work and leadership in using physics to illuminate public policy in the areas of nuclear arms control and nonproliferation, nuclear energy, and energy efficiency."

Frank von Hippel, a nuclear physicist, is a Professor of Public and International Affairs at Princeton University, where he has worked since 1974. He has worked on fissile material policy issues for the past 30 years including those relating to commercialization of plutonium recycle, ending the production of plutonium and highly-enriched uranium for weapons, and ending the use of highly enriched uranium as a reactor fuel. He has also worked in other areas of nuclear arms control, nonproliferation and energy policy.



He is currently Co-Chair of the International Panel on Fissile Materials. In 1993-4, he served as Assistant Director for National Security in the White House Office of Science and Technology Policy and played a major role in developing US-Russian cooperative programs to increase the security of Russian nuclear-weapons materials.

### DISSERTATION AWARDS

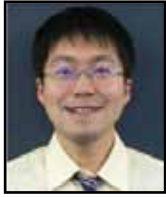
#### Andreas Acrivos Dissertation Award in Fluid Dynamics (2009)

**Xiaoyi Li**

United Technologies Research Center

**Citation:** "Computational study of fluid particles: dynamics of drops, rheology of emulsions and mechanics of biological cells."

Xiaoyi Li received a Bachelor of Science in Thermal Fluid Engineering from the University of Science and Technology of China in May 2001. He conducted graduate research in the Department of Mechanical Engineering at the University of Delaware and obtained his PhD in 2007.



His thesis work on the multi-phase flow of drops, capsules and cells and was published in several fluid dynamics journals.

After graduation, he was working as a Postdoctoral Research Associate in the Center for Advanced Modeling and Simulation at Idaho National Laboratory. The work involved multi-phase fluid dynamics modeling of complex subsurface reactive transport processes with applications to contaminant immobilization and shale oil extraction. Currently, Xiaoyi is working as a Senior Research Scientist at United Technologies Research Center. His current research focuses on multi-scale multi-phase flow modeling of spray atomization in reacting environment as manifested in aero-engines, rockets and industrial gas turbines.

#### Outstanding Doctoral Thesis Research in Atomic, Molecular and Optical Physics Award (2009)

**Andrew Ludlow**

NIST-Boulder

**Citation:** "The Strontium Optical Lattice Clock: Optical Spectroscopy with sub-Hertz Accuracy."

**Javier von Stecher**

JILA-NIST

**Citation:** "Trapped Ultracold Atoms with Tunable Interactions."

Andrew Ludlow pursued his undergraduate studies at Brigham Young University in Provo, Utah. There he worked with Dr. Scott Bergeson, using optical cavities and laser thermometry techniques to study two photon absorption processes in crystals. After graduating magna cum laude with a B.S. in physics from BYU, in 2002 he began his doctoral studies at the University of Colorado in Boulder. Following time in various laboratories as part of the Optical Science and Engineering Graduate Fellowship Program at CU, he began research in the group of Dr. Jun Ye at JILA.



Andrew's doctoral dissertation presents the development of an optical atomic clock based on ultracold neutral strontium atoms confined in an optical lattice. This work culminated in an accuracy evaluation of the newly constructed strontium optical frequency standard, demonstrating one of the smallest frequency uncertainties of any standard. These efforts contributed to the international acceptance of the strontium standard.

Javier von Stecher attended the University of Buenos Aires where he worked on the Casimir effect under Prof. F. D. Mazzitelli of the Physics Department. In 2002, he earned his Licenciatura degree in physics. In 2003, he moved to Boulder, Colorado, to begin graduate studies at the University of Colorado. In 2004, he joined Chris Greene's group at JILA, a joint institute of the National Institute of Standards and Technology and the University of Colorado, Boulder.



His research focused on the study of ultracold few-body systems with tunable interactions. He was able to improve the general understanding of few-body phenomena, in particular four-body processes. Since defending his dissertation in 2008, he has joined Dr. Ana Maria Rey's group at JILA as a post-doctoral research associate.

He is currently studying ways to control and manipulate quantum mechanical interactions in many-body quantum systems at both nano and mesoscopic scales.

#### Outstanding Doctoral Thesis in Beam Physics Award (2009)

**Ryoichi Miyamoto**

University of Texas, Austin

**Citation:** "Diagnostics of the Fermilab Tevatron using an AC Dipole"

Ryoichi Miyamoto was born in Tokyo in 1975. He earned a BS in Physics in 1999 from Tokyo Science University, and then moved to the University of Texas at Austin where he earned his PhD degree in Physics



in 2008 for work on the Fermilab Tevatron beam diagnostics using an AC dipole. His supervisors were Prof. Sacha Kopp of the University of Texas and Dr. Michael Syphers of Fermilab. Presently, he is a Toohig Postdoctoral Fellow of the US LHC Accelerator Research Program and works at Brookhaven National Laboratory.



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

**Kenneth Kamrin**  
Harvard University

**Citation:** "For synthesizing the essential physics and mathematics of elastic-plastic flow of granular materials into a numerically tractable computation, and for performing continuum-level calculations for dynamic processes in granular materials."

Ken Kamrin graduated from UC Berkeley in 2003 with a BS in Engineering Physics and a Mathematics minor. He completed his PhD in Applied Mathematics at MIT in 2008, under the supervision of Martin Z. Bazant. Ken is currently a Lecturer and NSF Postdoctoral Research Fellow at Harvard in the School of Engineering and Applied Sciences. While granular materials remain a fixture of his research, Ken's current work has branched into multiple topics in material deformation, including numerical simulation methods for fluid/solid interaction and low-Reynolds number fluid flow problems. His current work on granular media is focused on characterizing nonlocal effects in slow, quasi-static flow.



### Nuclear Physics Dissertation Award

**Calem R. Hoffman**  
Florida State University

**Citation:** "For his dissertation describing the investigation of neutron-rich isotopes at the drip line, and, in particular, for the identification of a systematic reduction in the effective  $p$ - $sd$  shell gap, indicating a weakening of the gap as neutron are added."

Calem R. Hoffman received his Bachelors of Science degree in Physics from Florida State University in the Fall of 2003. He then completed his doctoral work in Nuclear Structure Physics earning him a Ph.D. from Florida State University in the Spring of 2009. Currently he is working at his first Post-doctoral research appointment at the ATLAS Facility at Argonne National Laboratory. Past and present research interests for Calem R. Hoffman include exotic structures in nuclei far from stability with an emphasis on nuclear shell evolution, as well as detailed studies of nuclei via direct reactions and through the observation of collective high angular momentum states.



### Award for Outstanding Doctoral Thesis Research in Biological Physics (2009)

**Felix Campelo Aubarell**  
University of Barcelona

**Citation:** *Shapes in Cells. Dynamic Instabilities, Morphology, and Curvature in Biological Membranes.*

**Jeffrey R. Moffitt**  
University of California, Berkeley

**Citation:** *Viral DNA Packaging at Base-Pair Resolution.*

Fèlix Campelo Aubarell studied physics at the University of Barcelona, graduating in 2003. In 2003 he began his Ph.D. at the University of Barcelona under the supervision of Dr. Aurora Hernandez-Machado. He developed a phase-field model to study the stationary shapes of vesicles, which he later applied to study the dynamics of shape instabilities of fluid vesicles upon the insertion of amphiphilic molecules. During this time, he did a three-month long research stay at the École Normale Supérieure in Paris, under the guidance of Prof. Martine Ben Amar. He later spent one year at Tel Aviv University under the supervision of Prof. Michael M. Kozlov, where he derived a physical model of the hydrophobic insertion mechanism of membrane bending by proteins. In November 2008 he defended his thesis, entitled



"Shapes in cells. Dynamic instabilities, morphology, and curvature in biological membranes", getting the maximal qualification. In 2009 he moved for a post-doc to Vivek Malhotra's lab at the Center for Genomic Regulation in Barcelona. There, he works on both experimental and theoretical approaches to elucidate the mechanisms of transport carrier formation in the Golgi apparatus.

Jeffrey Moffitt received his B.A. in Physics from the College of Wooster in 2003, where he studied the dynamics of cellular automata under the direction of Dr. John Lindner. Jeffrey received his M.A. in 2005 and his Ph.D. in 2009 from the University of California at Berkeley. Under the guidance of Dr. Carlos Bustamante he developed experimental and theoretical tools for the study of molecular motors. After his Ph.D., Moffitt worked as a visiting scholar in the laboratory of Dr. Jens Michaelis at the Ludwig-Maximilians-Universitaet in Munich, Germany, where he developed new techniques in super-resolution microscopy. Currently, Jeffrey is studying the dynamics of genetic networks in *E. coli* with Dr. Philippe Cluzel at Harvard University.



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

**Anne White**  
General Atomics

**Citation:** "For the first simultaneous measurements of long-wavelength electron temperature and density fluctuations in the core of a high-performance tokamak plasma, demonstrating larger than expected temperature fluctuations; and for comparison of this data with nonlinear gyrokinetic simulations."

Anne White received her B.S. in Physics and Applied Mathematics from the University of Arizona in 2003. She completed her Ph.D. at the University of California, Los Angeles in 2008. Her dissertation work was performed on the DIII-D tokamak at General Atomics.

Using a correlation electron cyclotron emission diagnostic, Dr. White measured electron tempera-



ture fluctuations. She led an experimental campaign to make the first simultaneous measurements of the radial profile of electron temperature and density fluctuations in a high-performance tokamak with subsequent comparison to gyrokinetic simulation.

She is currently a DOE Fusion Energy Sciences Postdoctoral Fellow at General Atomics. Her current research builds on her dissertation work, focusing on the study of turbulence and transport in tokamak plasmas via novel measurements and detailed comparisons with models and simulations.

### Mitsuyoshi Tanaka Dissertation Award in Experimental Particle Physics

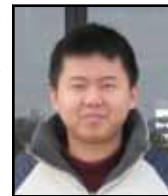
**Tingjun Yang**  
Stanford University

**Citation:** "A study of muon neutrino to electron neutrino oscillations in the MINOS experiment."

Tingjun Yang received his B.S. degree in Physics from the University of Science and Technology of China in 2002, where he worked with Prof. Hongfang Chen on a study of the MRPC detector for the RHIC-STAR experiment. He also worked on theoretical calculations of laser-solid interactions with Prof. Ji Chen.

Tingjun Yang performed his doctoral research at Stanford University under the supervision of Prof. Stanley Wojcicki, receiving his Ph.D. in Physics in 2009. His thesis work was completed on the MINOS experiment at Fermilab, which is a long baseline neutrino oscillation experiment. This work tried to identify subdominant oscillation mode,  $\nu_{\mu} \rightarrow \nu_{\tau}$  transition, which is related to the yet unmeasured mixing angle  $\theta_{13}$ . A non-zero  $\theta_{13}$  will make it possible to understand the CP violation in the neutrino sector and to determine the neutrino mass hierarchy. In collaboration with his MINOS colleagues, he developed a particle identification algorithm, a background decomposition method, and evaluated many major systematic effects.

Dr. Yang is now a postdoctoral research associate at Fermilab where he works on the CDF experiment, which studies  $p$ - $p$ bar collisions at the Tevatron, and the R&D of liquid argon detector for the future neutrino experiments.



## APS Council Announces 2009 APS Fellows

The APS Council elected the following as Fellows of the Society at its November 2009 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>.

#### Abernathy, Cammy

University of Florida  
**Industrial and Applied Physics (FIAP)**  
Citation: For contributions to the development of compound semiconductor materials growth using molecular beam epitaxy.

#### Agranovich, Vladimir M.

UTD NanoTech Institute  
**Condensed Matter Physics (DCMP)**  
Citation: For contributions to the quantum theory of polaritons and excitons.

#### Ahn, Doyeol

University of Seoul  
**Laser Science (DLS)**  
Citation: For major contributions to the theory of quantum-well lasers and development of quantum information communication research.

#### Albert, Reka Z.

Penn State University  
**Biological Physics (DBP)**  
Citation: For pioneering work in understanding the organization and dynamics of biological networks.

#### Alessi, James G.

Brookhaven National Laboratory  
**Physics of Beams (DPB)**  
Citation: For his many groundbreaking contributions to the development of intense negatively charged hydrogen ( $H^-$ ) beam sources, both unpolarized and spin-polarized, and the development of a high intensity Electron Beam Ion Source for the production of beams of high charge state heavy ions.

#### Allenspach, Rolf

IBM Zurich Research Laboratory  
**Magnetism & Its Applications (GMAG)**  
Citation: For his pioneering experimental work in the field of nanomagnetism leading to a fundamental understanding of the physical limits of magnetic behavior. His studies on oscillatory magnetic anisotropy, ultrafast magnetization reversal and current driven domain motion provide new implications for future magnetic storage and logic devices.

#### Ardalan, Farhad

Sharif Univ of Tech  
**International Physics (FIP)**  
Citation: For pioneering work in applications of noncommutative geometry in string theory and gauge theories, and for promoting the participation of Iranian scientists in CERN and Middle-East programs.

#### Arghavani, Reza

Applied Materials Inc  
**Industrial and Applied Physics (FIAP)**  
Citation: For leading the team that created a series of Stress-Tunable dielectrics for MEMORY and LOGIC technologies, also for introducing first ALD High-k into INTEL development FABs, which led to the introduction of High-k/Metal Gate into 45nm INTEL Microprocessor.

#### Arndt, Roger E.A.

University of Minnesota  
**Fluid Dynamics (DFD)**  
Citation: For his seminal contributions to our understanding of cavitation including inception physics, erosion mechanisms, noise and vibration and effects on turbomachinery performance; and for his outstanding contributions to research and education in aeroacoustics, hydroacoustics and hydroturbine technology.

#### Ashoori, Raymond C.

Massachusetts Institute of Technology  
**Condensed Matter Physics (DCMP)**  
Citation: For the development of imaging techniques that reveal the physical properties of reduced-dimensional electronic systems.

#### Baartman, Richard A.

TRIUMF  
**Physics of Beams (DPB)**  
Citation: For significant contributions to the theory and elucidation of collective instabilities and higher order aberrations in particle accelerators and beamlines.

#### Babu, Kaladi S.

Oklahoma State University  
**Particles and Fields (DPF)**  
Citation: For original contributions to neutrino physics, supersymmetric model building, and grand unification.

#### Bacic, Zlatko

New York University  
**Chemical Physics (DCP)**  
Citation: For major contributions to the theoretical treatment and understanding of the quantum bound-state and dissociative dynamics of floppy polyatomic molecules, weakly bound molecular clusters, and molecular hydrogen in nanoporous materials.

#### Barengi, Carlo F.

Newcastle University  
**Fluid Dynamics (DFD)**  
Citation: For the application of ideas and methods of modern fluid mechanics to quantum fluids, especially hydrodynamic stability, vortex dynamics and turbulence.

#### Bechhoefer, John L.

Simon Fraser University  
**Statistical & Nonlinear Physics (GSPN)**  
Citation: For seminal experimental and theoretical contributions to nonlinear dynamics, pattern formation, phase transitions, solidification and biological physics as well as important advances of scientific instrumentation.

#### Beg, Farhat N.

University of California, San Diego  
**Plasma Physics (DPP)**  
Citation: For contributions to the understanding of physics of short pulse high intensity laser matter interactions and pulsed power driven dense Z-pinch. His empirical scaling of hot electron temperature versus laser intensity has contributed significantly to the understanding of relativistic electron generation and transport in matter.

#### Benson, David J.

University of California, San Diego  
**Shock Compression of Condensed Matter (GSCCM)**  
Citation: In recognition of fundamental algorithms in hydrocodes and pioneering work in nonlinear, time-dependent continuum numerical simulations at the micromechanical level to develop a fundamental understanding of the response of materials to shock propagation, including energy.

#### Bergou, Janos

CUNY-Hunter College  
**Laser Science (DLS)**  
Citation: For outstanding work in quantum optics and quantum information, in particular work on the theory of correlated

emission lasers, the effect of pump statistics on the nature of the electromagnetic field produced in lasers and micromasers, and on quantum state discrimination.

#### Bezrukov, Sergey M.

NIST  
**Biological Physics (DBP)**  
Citation: For his seminal contributions to the physics of ion channels, thereby bridging molecular biology with physical kinetics and nonlinear dynamics by developing single-molecular methods to membrane transport and noise-facilitated signal transduction.

#### Biswas, Rana

Iowa State University  
**Condensed Matter Physics (DCMP)**  
Citation: For theoretical contributions to the dynamics of semiconductors, solar materials, and photonic crystals.

#### Black, Charles T.

Brookhaven National Laboratory  
**Industrial and Applied Physics (FIAP)**  
Citation: For pioneering contributions to the integration of nanometer-scale polymer self-assembly in the fabrication of high-performance semiconductor microelectronic devices.

#### Blandford, Roger

KIPAC  
**Astrophysics (DAP)**  
Citation: For his seminal contributions to theoretical astrophysics, including black hole astrophysics, the astrophysics of relativistic plasmas, cosmic ray acceleration and propagation, and cosmological applications of gravitational lensing.

#### Blondin, John M.

North Carolina State University  
**Astrophysics (DAP)**  
Citation: For extensive contributions to the study of accreting systems, stellar outflows, supernovae, and supernova remnants through hydrodynamic simulations, and for his authorship and maintenance of the VH-1 hydrodynamic code.

#### Bohr, Tomas

The Danish Tech University  
**Fluid Dynamics (DFD)**  
Citation: For insightful analyses of and experiments on nonlinear fluid dynamical problems, including turbulence, free-surface flows, granular dynamics, and biological flows.

#### Borquet, Eric

Temple University  
**Chemical Physics (DCP)**  
Citation: For his seminal contributions to our understanding of optical, molecular and electronic phenomena at buried interfaces, complex interfaces, and nanosystems; and for the development of novel experimental tools and methodologies, particularly the development of fluorescent labeling of surface species.

#### Bradley, David K.

Lawrence Livermore National Laboratory  
**Plasma Physics (DPP)**  
Citation: For the development and use of high speed optical and x-ray instrumentation to discover new phenomena in high energy density plasmas.

#### Brandt, William N.

Penn State University  
**Astrophysics (DAP)**

Citation: For his leadership of and numerous contributions to deep extragalactic X-ray surveys and active-galaxy studies, which have advanced understanding of the physics and evolution of accreting supermassive black holes and other cosmic X-ray sources.

#### Brasseur, James G.

Penn State University  
**Fluid Dynamics (DFD)**  
Citation: For advancements in knowledge of nonclassical inter-scale interactions in turbulence and in large-eddy simulation of the high Reynolds number boundary layer, and for interdisciplinary contributions to gastro-intestinal medicine by integrating physiology, mechanics, and mathematical modeling.

#### Budko, Sergey

Iowa State University  
**Materials Physics (DMP)**  
Citation: For significant contributions to the study of superconducting, magnetic transport properties of metals, such as field-induced quantum criticality in heavy fermions and superconductivity in layered cuprate, rare earth nickel borocarbide, magnesium diboride, and iron arsenide-based compounds.

#### Bush, John W.M.

Massachusetts Institute of Technology  
**Fluid Dynamics (DFD)**  
Citation: For novel contributions to surface-tension dominated flows, elucidation of their appearance in biological contexts, and for many illustrations of the visual beauty of fluid dynamics.

#### Cacialli, Franco

University of College London  
**Materials Physics (DMP)**  
Citation: For his significant contributions to the science and technology of organic semiconductors and related applications, and especially for seminal contributions to the scanning near-field optical microscopy (SNOM) assisted lithography of organic semiconductor nanostructures.

#### Cain, Laurence S.

Davidson College  
**Education (FED)**  
Citation: For strong commitment to the advancement of undergraduate teaching and research, and for significant contributions to introductory physics curriculum and assessment at the national level.

#### Campanelli, Manuela

Rochester Institute of Technology  
**Gravitation (GGF)**  
Citation: For groundbreaking work on numerical simulations of binary black hole spacetimes, and for explorations using these simulations of interesting physical effects such as "superkicks" and spin-driven orbital dynamics.

#### Candy, Jeff

General Atomics  
**Plasma Physics (DPP)**  
Citation: For groundbreaking advancements in gyrokinetic simulation of turbulent transport in fusion plasmas including the first multi-scale kinetic simulations with coupled ion and electron scales.

#### Cao, Gang

University of Kentucky  
**Condensed Matter Physics (DCMP)**  
Citation: For experimental studies of electric and magnetic single-crystal transition-metal oxides.



**Carlstrom, John**

The University of Chicago

**Astrophysics (DAP)**

Citation: For his pioneering measurements of the Cosmic Microwave Background polarization and the Sunyaev-Zeldovich effect to study the early universe. For using these measurements to constrain models of the constituents of and the physical processes in the early universe.

**Carr, G. Lawrence**

Brookhaven National Laboratory

**Condensed Matter Physics (DCMP)**

Citation: For applications of synchrotron and terahertz radiation to condensed-matter systems.

**Ceccio, Steven L.**

University of Michigan

**Fluid Dynamics (DFD)**

Citation: For experimental advancements in multiphase and high-Reynolds number flows, including cavitating flows, gas-solid flows, and skin friction drag reduction using gas and polymer injection.

**Chabay, Ruth W.**

North Carolina State University

**Education (FEd)**

Citation: For contributions to the development of computer-based learning and tutorial systems, visualizations, and curricula that have modernized and improved how students learn physics.

**Chadwick, Mark B.**

Los Alamos National Laboratory

**Nuclear Physics (DNP)**

Citation: For significant and innovative contributions to applied nuclear physics, including medical radiation therapy, nonproliferation, homeland security, the physics of nuclear weapons, and especially to development of the modern ENDF/B-VII data base.

**Chang, Ching-Ray**

National Taiwan University

**International Physics (FIP)**

Citation: For contributions to the theory of magnetism and the development of computational approaches in spin transport, and for leadership in fostering international research and education in Asia.

**Chang, Keejoo**

Korea Adv Inst of Sci & Tech

**Materials Physics (DMP)**

Citation: For his outstanding contributions to computational materials physics, in particular the fundamental understanding of defects, impurities, and high-pressure phases of semiconductors.

**Childress, Jeffrey R.**

Hitachi San Jose Research Center

**Magnetism & Its Applications (GMAG)**

Citation: For fundamental contributions to the understanding of magnetism and magnetotransport in thin-film and nanostructured materials, and their applications to magnetic recording sensor technologies.

**Chisholm, Matthew F.**

Oak Ridge National Laboratory

**Materials Physics (DMP)**

Citation: For pioneering contributions to materials and interface physics through scanning transmission electron microscopy.

**Cleland, Andrew N.**

University of California, Santa Barbara

**Condensed Matter Physics (DCMP)**

Citation: For fundamental studies and applications of nanomechanical and nanoelectronic devices.

**Cominsky, Lynn**

Sonoma State University

**Education (FEd)**

Citation: For her seminal work to promote student and teacher education using NASA missions as inspiration.

**Crabb, Donald G.**

University of Virginia

**Nuclear Physics (DNP)**

Citation: For his contributions to the use of high field polarized targets and development of high polarization and radiation resistant polarized target materials and his role in using them in seminal particle physics experiments and advancing the knowledge of the behavior in high intensity beams.

**Crouch, Jeffrey D.**

The Boeing Company

**Fluid Dynamics (DFD)**

Citation: For contributions to the theory, modeling and control of flow instabilities, including the discovery of new trailing-vortex instabilities and the advancement of practical methods for boundary-layer transition prediction and laminar flow control.

**Danzmann, Karsten V.**

Institut fur Gravitationsphysik

**International Physics (FIP)**

Citation: For his innovation and leadership in gravitational wave detection across its full spectrum and for promoting collaboration across national boundaries.

**Diehl, Hans W.**

Universitaet Duisburg-Essen

**Statistical & Nonlinear Physics (GSNP)**

Citation: For his seminal and sustained contributions to the understanding of universal critical behavior associated with surfaces and boundaries.

**Diwan, Milind**

Brookhaven National Laboratory

**Particles and Fields (DPF)**

Citation: For his contributions to neutrino and kaon physics.

**Doering, Robert R.**

Texas Instruments Inc.

**Industrial and Applied Physics (FIAP)**

Citation: For outstanding leadership in integrated-circuit device scaling and many other important areas of semiconductor industry research and development, including pre-competitive collaborations between industry, government, and academic physics and engineering.

**Duan, Luming**

University of Michigan

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

Citation: For his distinctive contributions to theoretical atomic physics and quantum information; in particular, for his seminal proposals for quantum information protocols involving atom-optical systems.

**Duffy, James W.**

University of Florida

**Statistical & Nonlinear Physics (GSNP)**

Citation: For his numerous seminal contributions to non-equilibrium statistical mechanics and its applications to granular fluids, plasmas, strongly coupled Coulomb systems, and materials science.

**Eggers, Jens G.**

University of Bristol

**Fluid Dynamics (DFD)**

Citation: For applications of the ideas of singularities to free-boundary problems such as jet breakup, drop formation, air entrainment, thin-film dynamics including wetting, dewetting and contact line motions, and with further applications to polymeric flows and models for granular dynamics.

**Eno, Sarah C.**

University of Maryland

**Particles and Fields (DPF)**

Citation: For contributions in particle physics involving electroweak parameters, precision electroweak measurements, and physics beyond the Standard Model at the Tevatron.

**Ensslin, Klaus**

ETH Zurich

**Condensed Matter Physics (DCMP)**

Citation: For contributions to the understanding of optical and transport properties of nanoscale systems.

**Evans, Todd**

General Atomics

**Plasma Physics (DPP)**

Citation: For pioneering contributions to the understanding of complex 3-D magnetic field topologies and their application to the beneficial control of the plasma edge in high temperature fusion plasmas.

**Filippone, Bradley**

California Institute of Technology

**Nuclear Physics (DNP)**

Citation: In recognition of his many contributions to nuclear astrophysics, nucleon spin structure, nuclear interactions at short distances, and fundamental symmetries and especially the development of experimental techniques to meet these challenges.

**Freese, Katherine**

University of Michigan

**Gravitation (GGR)**

Citation: For pioneering work on the theories of inflation, dark matter, and dark energy.

**Fried, Laurence E.**

Lawrence Livermore National Laboratory

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

Citation: In recognition of outstanding contributions to the physics and chemistry of shocked materials, the high pressure, high temperature equations of state of solids and liquids, and the prediction of energetic material reactivity, most notably the existence of sub-picosecond chemistry in high temperature dense fluids.

**Fujiwara, Mamoru**

Osaka University

**International Physics (FIP)**

Citation: For many and continuing contributions to nuclear physics involving innovative use of high-resolution spectrometers for charge-exchange reactions, and leadership in wide-ranging international collaborations and activities.

**Gao, Bo**

University of Toledo

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

Citation: For contributions to the quantum-defect theory of cold atom interactions and the analyses of the associated mathematical special functions.

**Garofalo, Andrea M.V.**

General Atomics

**Plasma Physics (DPP)**

Citation: For pioneering contributions to the understanding of tokamak plasma stability in the presence of a conducting wall, leading to sustained operation above the free-boundary pressure limit.

**Gentile, Thomas R.**

NIST

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

Citation: For his extensive contributions to diverse precision measurements, particularly in the development of neutron spin filters using polarized <sup>3</sup>He and in the application of polarized <sup>3</sup>He to precision measurements in neutron science.

**Giaime, Joseph A.**

Louisiana State University

**Gravitation (GGR)**

Citation: For his contributions to gravitational wave physics, in particular key aspects of the Laser Interferometer Gravitational-wave Observatory (LIGO).

**Gong, Xingao**

Fudan University

**International Physics (FIP)**

Citation: For innovative theoretical studies of the properties of clusters and wires, development of theoretical treatments of pressure effects on materials, and for tireless promotion of international collaborations in computational materials physics.

**Gourlay, Stephen**

Lawrence Berkeley National Laboratory

**Physics of Beams (DPB)**

Citation: For his intellectual leadership and technical achievements in the design, fabrication and testing of high field superconducting accelerator magnets.

**Griffiths, David J.**

Reed College

**Education (FEd)**

Citation: For advancing the upper level physics curriculum through the writing of leading textbooks and through his contributions to the American Journal of Physics in many editorial roles and as an author.

**Gross, Carl J.**

Oak Ridge National Laboratory

**Nuclear Physics (DNP)**

Citation: For enabling the studies of most exotic atomic nuclei through the invention and implementation of novel experimental methods.

**Guha, Supratik**

IBM T.J. Watson Res Ctr

**Industrial and Applied Physics (FIAP)**

Citation: For his leadership in semiconductor materials and devices and, in particular, for providing the scientific and technological underpinnings of the high dielectric constant gate stack scheduled to replace the venerable silicon dioxide gate film in field effect transistor products in IBM.

**Gundlach, Jens H.**

University of Washington

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

Citation: In recognition of his unique and outstanding contributions to precision mechanical measurements and our quantitative understanding of the strength of gravity.

**Guntherodt, Gernot**

Physikal Instiit IIA

**Magnetism & Its Applications (GMAG)**

Citation: For important contribution to the fields of Half Metallic Ferromagnets, Ultrathin Magnetic Films, Magnetic Semiconductors and Exchange Bias.

**Gutierrez, Gaston R.**

Fermilab

**Particles and Fields (DPF)**

Citation: For leading the introduction of “matrix-element” techniques for extracting precise measurements of standard-model parameters at hadron colliders and for seminal and vital contributions to the construction of the unique scintillating fiber tracker for the DZero experiment.

**Gutowski, Maciej S.**

Heriot-Watt Univ

**Chemical Physics (DCP)**

Citation: For contributions in the development and application of computational approaches tot he understanding of atomic and molecular interactions of weakly bound molecules, interfacial species, and anions of molecular clusters and biological molecules.

**Haglund Jr., Richard F.**

Vanderbilt University

**Materials Physics (DMP)**

Citation: For the innovative creation of new materials and the exploration of their properties employing sophisticated optical probes.

**Hall, Gregory E.**

Brookhaven National Laboratory

**Chemical Physics (DCP)**

Citation: For innovative applications of high resolution molecular spectroscopy to photodissociation dynamics, energy transfer and bimolecular reactions.

**Hannahs, Scott T.**

Florida State University

**Instrument & Measurement Science (GIMS)**

Citation: For his contributions to instrumentation and measurements in high magnetic fields and for scientific contributions to many fields including quantum fluids, organic superconductors, heavy fermions, quantum Hall effect, and Heisenberg spin systems.

**Hecker, Siegfried S.**

Stanford University

**Physics and Society (FPS)**

Citation: For outstanding leadership in promoting better nuclear security and international cooperation and understanding with Russia, South Asia, and North Korea, in preventing nuclear terrorism, and in ensuring a safe, secure and reliable U.S. nuclear arsenal.

**Heger, Alexander**

University of Minnesota

**Astrophysics (DAP)**

Citation: For important contributions to the understanding of massive star evolution, nucleosynthesis, supernovae, and X-ray bursts.

**Heinemann, Beate**

University of California, Berkeley

**Particles and Fields (DPF)**

Citation: For contributions to the search for physics beyond the Standard Model through precision measurements in electron-proton collisions and direct searches for new particles and phenomena in proton-antiproton collisions.

**Heintz, Ulrich**

Boston University

**Particles and Fields (DPF)**

Citation: For his contributions to the precision measurement of the masses of the W boson and the top quark.

**Hipps, Kerry W.**

Washington State University

**Materials Physics (DMP)**

Citation: For his pioneering and innovative work in tunneling spectroscopy and in STM based orbital mediated tunneling through molecular systems.

**Hodapp, Theodore W.**

American Physical Society

**Education (FEd)**

Citation: For improving physics education by helping set licensure standards for physics teachers, and by leading the PhysTEC project to develop strong liaisons between university physics departments and schools of education to increase the number of qualified high school physics teachers.

**Hogan, Craig J.**

Fermilab

**Astrophysics (DAP)**

Citation: For his innovative research in diverse areas of astrophysics, including the constituents of the universe, dark energy, gravitational waves, cosmological phase transitions, and cosmic background radiation.

**Inan, Umrhan**

Stanford University

**Plasma Physics (DPP)**

Citation: For outstanding contributions to the understanding of nonlinear whistler-mode wave-particle interactions, the physics of lightning-ionosphere interactions, and lightning-driven loss of radiation belt electrons.

**Ingersent, Kevin**

University of Florida

**Condensed Matter Physics (DCMP)**

Citation: For contributions to the theory of strongly correlated electron systems.

**Jarzynski, Christopher**

University of Maryland

**Statistical & Nonlinear Physics (GSNP)**

Citation: For pioneering work in non-equilibrium statistical mechanics, especially his elegant equality relating free energy differences between two equilibrium states to averaged work expended in non-equilibrium transformations between them.

**Jeanloz, Raymond**

University of California, Berkeley

**Physics and Society (FPS)**

Citation: For contributions to the development of sound public policy for nuclear weapons management and nuclear non-proliferation and for engaging scientists in Russia, China, and India in order to address technical and potentially sensitive issues in international security, arms control and disarmament.

**Jensen, Kevin L.**

Naval Research Laboratory

**Physics of Beams (DPB)**

Citation: For fundamental contributions to the theory and modeling of electron emission sources for particle accelerators and microwave tubes.

**Jia, Quanxi**

Los Alamos National Laboratory

**Materials Physics (DMP)**

Citation: For pioneering contributions in epitaxial functional metal-oxide films for coated conductors and electronic devices.

**Jiang, Samuel J.**

Argonne National Laboratory

**Condensed Matter Physics (DCMP)**

Citation: For experimental contributions to the study of magnetotransport and magnetic coupling phenomena in magnetic nanostructures.

**Karle, Albrecht**

University of Wisconsin, Madison

**Particles and Fields (DPF)**

Citation: For pioneering contributions to the understanding, design and construction of large-scale neutrino detectors, AMANDA and IceCube, as well as the development of analysis techniques for sources of atmospheric and astrophysical neutrinos.

**Kash, Kathleen**

Case Western Reserve University

**Materials Physics (DMP)**

Citation: In recognition of the breadth of her outstanding contributions to the study of semiconductors, which include the invention and study of strain-induced semiconductor quantum wires and dots, the study of carrier-phonon interactions using optical spectroscopy, and the development of novel synthesis methods for nitride semiconductors.

**Katiyar, Ram S.**

University of Puerto Rico

**Condensed Matter Physics (DCMP)**

Citation: For contributions to the fabrication and characterization of ferroelectric thin films.

**Katz, Joseph**

Johns Hopkins University

**Fluid Dynamics (DFD)**

Citation: For his important contributions to our understanding of the underlying physics of a wide range of complex flows, including turbulent boundary layers, cavitating flows in rotating

machinery, and flows in ocean and atmospheric environments; for his numerous transformative contributions to experimental techniques; and for his years of editorial service.

**Kerr, Robert M.**

University of Warwick

**Fluid Dynamics (DFD)**

Citation: For his pioneering mix of 3D direct numerical simulations with analysis inspired by mathematics and physics to turbulent statistics, thermal convection, intense events and novel LES approaches. His 1993 Euler calculation has withstood the test of time and continues to inspire new mathematics.

**Kessler, J.O.**

University of Arizona

**Fluid Dynamics (DFD)**

Citation: For fundamental contributions to the biological fluid dynamics of swimming micro-organisms and for inspirational and enthusiastic leadership in the field.

**Khomami, Bamin**

University of Tennessee

**Fluid Dynamics (DFD)**

Citation: For his insightful application of novel numerical methods, molecular modeling, and experiments toward the physical understanding of elastic fluid flows including discovering and explaining novel aspects of their purely elastic and thermomechanical instability.

**Kim, Jin K.**

Pohang University of Sci and Tech

**Polymer Physics (DPOLY)**

Citation: For pioneering advanced spectroscopies for the characterization of heterogeneous polymer materials.

**Klein, Spencer**

Lawrence Berkeley National Laboratory

**Nuclear Physics (DNP)**

Citation: For pioneering studies of quantum-mechanical interference effects in coulomb interactions between highly-charged nuclei at ultra-relativistic energies, and in the suppression of bremsstrahlung in electron scattering from dense media.

**Kono, Junichiro**



#### Plasma Physics (DPP)

*Citation:* *For his seminal work in boundary physics research in tokomaks and spherical tori, including divertor pumping for density control, pellet fueling to surpass conventional density limits, and the discovery of a high-confinement mode and a new class of edge instabilities in large spherical tori.*

#### Marcus, Charles M.

Harvard University

#### Condensed Matter Physics (DCMP)

*Citation:* *For contributions to the fabrication of mesoscopic semiconductor devices and the study of their electronic properties.*

#### Martin, David C.

The University of Delaware

#### Polymer Physics (DPOLY)

*Citation:* *For significant contributions to the understanding of phase transformations in molecular crystals and crystalline polymers using low dose, high resolution electron microscopy (HREM), optical microscopy and X-ray diffraction techniques.*

#### Maslov, Dmitri

University of Florida

#### Condensed Matter Physics (DCMP)

*Citation:* *For contributions to the theory of quantum transport in one-dimensional systems.*

#### McBride, Patricia L.

Fermilab

#### Particles and Fields (DPF)

*Citation:* *For her original contributions to flavor physics at LEP and the Tevatron and to the development of major new initiatives in B-physics and collider physics.*

#### McLaughlin, Gail C.

North Carolina State University

#### Nuclear Physics (DNP)

*Citation:* *For her work in elucidating the role of neutrinos in nucleosynthesis in supernovae and black hole accretion disks, and for her studies of the potential of low energy beta-beams in neutrino physics.*

#### McMichael, Robert D.

NIST

#### Magnetism & Its Applications (GMAG)

*Citation:* *For broad contributions to the measurement, modeling, interpretation, and understanding of magnetization dynamics.*

#### Meisel, Mark W.

University of Florida

#### Condensed Matter Physics (DCMP)

*Citation:* *For contributions to magnetic and magneto-optical properties of low-dimensional and nanoscale materials.*

#### Meissner, Ulf G.

Universitaet of Bonn

#### Nuclear Physics (DNP)

*Citation:* *For leading the development of chiral perturbation theory with baryons, including many pioneering and successful predictions for the interactions of nucleons with photons, pions, and other nucleons.*

#### Menon, Narayanan

University of Massachusetts

#### Condensed Matter Physics (DCMP)

*Citation:* *For experiments that helped shape the current understanding of granular fluids and supercooled liquids.*

#### Meyer, Gerhard

IBM Zurich Research Laboratory

#### Condensed Matter Physics (DCMP)

*Citation:* *For developments and applications of low-temperature scanning tunneling microscopy.*

#### Michelson, Peter F.

Stanford University

#### Astrophysics (DAP)

*Citation:* *For seminal contributions to the inception, the success of the design and construction, and the breadth and depth of science contributions of the Fermi LAT telescope.*

#### Mills, Dennis M.

Argonne National Laboratory

#### Instrument & Measurement Science (GIMS)

*Citation:* *For the development of synchrotron x-ray optics and related techniques and for the build-out of beamlines at the Advanced Photon Source. In particular for the development of x-ray monochromators, phase plates, and timing techniques. For his guidance at the Journal of Synchrotron Radiation and for initiating the National Neutron and X-ray School.*

#### Miskimen, Rory A.

University of Massachusetts

#### Nuclear Physics (DNP)

*Citation:* *For his leadership in the field of experimental electromagnetic nuclear physics, especially in studies of nucleon structure and low energy QCD.*

#### Molenkamp, Laurens W.

Univ. Wuerzburg

#### Condensed Matter Physics (DCMP)

*Citation:* *For contributions to the field of semiconductor spintronics.*

#### Molvik, Arthur

Lawrence Livermore National Laboratory

#### Plasma Physics (DPP)

*Citation:* *For outstanding contributions to diverse areas of plasma physics and technology, including MHD stability limits in mirrors, and the physics of gas and electron accumulation in the ion accelerators.*

#### Montaruli, Teresa

University of Wisconsin, Madison

#### Astrophysics (DAP)

*Citation:* *For fundamental contributions, both experimental and theoretical, to the understanding of cosmic and atmospheric neutrino fluxes, neutrino mass, and the spectra of dark matter annihilations.*

#### Morse, David C.

University of Minnesota

#### Polymer Physics (DPOLY)

*Citation:* *For outstanding theoretical contributions to the fields of semiflexible polymer rheology, block copolymer thermodynamics, and membrane-forming surfactant systems.*

#### Muga, Juan G.

Universidad del Pais Vasco

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

*Citation:* *For pioneering theoretical work on tunneling time in quantum mechanics and for the development of the concept of the atom diode and its application to cooling of atoms.*

#### Murillo, Michael S.

Los Alamos National Laboratory

#### Plasma Physics (DPP)

*Citation:* *For original theoretical and computational research in several areas of non-ideal plasmas, including non-equilibrium properties of ultra-cold plasmas, collective properties of dusty plasmas, transport in strongly coupled plasmas, and atomic physics in dense plasmas.*

#### Murthy, Ganpathy N.

University of Kentucky

#### Condensed Matter Physics (DCMP)

*Citation:* *For contributions to the understanding of correlated and disordered electron systems.*

#### Naduvalath, Balakrishnan

University of Nevada, Las Vegas

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

*Citation:* *For seminal contributions to the understanding of molecular energy transfer and chemical reactivity in ultra-cold*

*atom-molecule systems.*

#### Nakano, Aiichiro

University of Southern California

#### Computational Physics (DCOMP)

*Citation:* *For the development and implementation of scalable parallel and distributed algorithms for large-scale atomistic simulations to predict, visualize, and analyze reaction processes for novel nano-mechano-chemical phenomena encompassing diverse spatiotemporal scales.*

#### Narayanan, Rajamani

Florida International University

#### Computational Physics (DCOMP)

*Citation:* *For groundbreaking work on exact chiral symmetry and topology on the lattice and important contributions to the nonperturbative calculation of the running coupling in non-Abelian gauge theories.*

#### Nattermann, Thomas

Univ. zu Koln

#### Condensed Matter Physics (DCMP)

*Citation:* *For contributions to statistical physics of disordered systems, especially the dynamics of elastic disordered media.*

#### Nazikian, Raffi M.

Princeton University

#### Plasma Physics (DPP)

*Citation:* *For seminal experimental contributions leading to the first observation of alpha particle driven Alfvén waves in deuterium-tritium plasmas and for the development of innovative diagnostics leading to major progress in understanding the internal structure of energetic particle driven instabilities and turbulent fluctuations in fusion plasmas.*

#### Ohmori, Kenji

National Institute of Natural Science

#### Laser Science (DLS)

*Citation:* *For his pioneering development of spatiotemporal wave-packet engineering in which the ultrafast wave-packet interference in a molecule is visualized and controlled with precisions on the picometer spatial and attosecond temporal scales.*

#### Onofrio, Roberto

Dartmouth College

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

*Citation:* *For contributions to measurement theory and experimental techniques, and their applications to a broad spectrum of quantum systems, in particular the Casimir force.*

#### Ordonez, Carlos R.

University of Houston

#### International Physics (FIP)

*Citation:* *For contributions to the effective chiral langrangian theory of the nucleon-nucleon interaction and to conformal quantum mechanics and its applications, particularly to black-hole thermodynamics, and for extensive efforts toward developing science in Latin America.*

#### Orme, Christine A.

Lawrence Livermore National Laboratory

#### Materials Physics (DMP)

*Citation:* *For her outstanding contributions in understanding the fundamental physics of crystallization and materials assembly with application to biominaleralizaion, biomimetic synthesis, and shape control of nanostructures.*

#### Ormos, Pal

IAC/NRC

#### Biological Physics (DBP)

*Citation:* *For developing new techniques to study the dynamics of proteins and the conversion of light energy by proteins, invention of 3-dimensional techniques to create nanofabricated structures of use in biology and medicine, and for serving as a leader in biological physics in his native Hungary.*

#### Page, Shelley A.

University of Manitoba

#### Nuclear Physics (DNP)

*Citation:* *For her leading role in a series of sequential hadronic parity violation experiments designed to elucidate the interplay of the weak and strong interactions in hadronic systems.*

#### Pan, Ci-Ling

National Tsing Hua University

#### Laser Science (DLS)

*Citation:* *For pioneering studies of the physics and technology of ion-planted semiconductor and liquid-crystal devices for ultrafast and THz applications, and for significant contributions toward developing tunable and ultrafast laser systems for applications in communications, sensing, spectroscopy and materials diagnostics and processing.*

#### Park, Yung Woo

Seoul Natl Univ

#### Condensed Matter Physics (DCMP)

*Citation:* *For contributions to the synthesis and transport in conducting polymers, carbon nanotubes, organic crystals, and highly-correlated materials.*

#### Perry, David S.

University of Akron

#### Chemical Physics (DCP)

*Citation:* *For outstanding contributions to the understanding the dynamics of molecular vibrations, especially the important roles large-amplitude motions play in intramolecular vibrational redistribution (IVR) of flexible molecules.*

#### Perry, Joseph W.

Georgia Institute of Technology

#### Laser Science (DLS)

*Citation:* *For seminal contributions to the understanding, development and application of organic nonlinear optical materials.*

#### Phillips, Rob

California Institute of Technology

#### Biological Physics (DBP)

*Citation:* *For fundamental contributions to the theoretical understanding of the influence of mechanical forces on biochemical processes, and for teaching physics in biological settings through workshops and textbook authorship.*

#### Phua, Kok-Khoo

World Scientific Publishing Co

#### International Physics (FIP)

*Citation:* *For tireless efforts to strengthen scientific research throughout Asia and promote international physics education and scholarly exchanges, and for enriching science and education through the World Scientific Publishing Company he founded.*

#### Plunkett, Robert K.

Fermilab

#### Particles and Fields (DPF)

*Citation:* *For distinguished contributions throughout the NuMI/MINOS Construction Project and subsequent leadership as co-spokesperson of the MINOS Experiment.*

#### Plusquellic, David F.

NIST

#### Chemical Physics (DCP)

*Citation:* *For seminal contributions to the spectroscopic investigation of the conformational dynamics and hydrogen-bonding interactions of biological molecules.*

#### Qian, Jianming

University of Michigan

#### Particles and Fields (DPF)

*Citation:* *For outstanding contributions and leadership in the analysis of high-energy particle interactions at CERN and at Fermilab, with especially noteworthy participation in the D-Zero experiment leading to the recent discovery of two new baryons containing b-qu.*

#### Quake, Stephen R.

Stanford University

#### Biological Physics (DBP)

*Citation:* *For his pioneering contributions to biophysics, in the study of both single molecule and microfluid physics, including the development of integrated microfluidics, leading to novel platforms for modifying, detecting, and characterizing biomolecules.*

#### Quataert, Eliot J.

University of California, Berkeley

#### Plasma Astrophysics (GPAP)

*Citation:* *For numerous pioneering contributions to theoretical astrophysics and plasma physics, including investigations into the role of convection and instabilities in accretion flows, the discovery of the heat-flux-buoyancy instability, and studies of kinetic plasma turbulence and its dissipation.*

#### Ralchenko, Yuri

NIST

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

*Citation:* *For significant contributions to the relativistic theory of highly-charged ions and collisional-radiative modeling, and through creation of online codes and databases for the atomic physics community.*

#### Raymond, John C.

Harvard-Smithsonian CFA

#### Astrophysics (DAP)

*Citation:* *For his outstanding contributions to the understanding of a broad range of astrophysical processes in the solar corona, supernova remnants, X-ray binaries, and other objects.*

#### Reed, Bruce C.

Alma College

#### History of Physics (FHP)

*Citation:* *For his contributions to the history of both the physics and the development of nuclear weapons in the Manhattan Project.*

#### Remacle, Francoise

University of Liege

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

*Citation:* *For studies of systems with a high density of states such as Rydberg systems, quantum dot arrays and peptides, and their utilization in molecular information processing and attoscience.*

#### Riles, John K.

University of Michigan

#### Gravitation (GGR)

*Citation:* *For his contributions to LIGO through performing efficient searches for continuous wave sources and by leading the drive to ensur the highest quality LIGO data.*

#### Samimy, Mo

GDTL/AARL/OSU

#### Fluid Dynamics (DFD)

*Citation:* *For outstanding contributions to the physical understanding and control of high-speed and high Reynolds number free shear flows via developing and using novel control techniques and advanced laser based flow diagnostics.*

#### Sawford, Brian L.

Monash University

#### Fluid Dynamics (DFD)

*Citation:* *For outstanding and influential advances in the understanding and modeling of dispersion, mixing and acceleration in turbulent flows.*

#### Schenter, Gregory K.

Pacific Northwest National Laboratory

#### Chemical Physics (DCP)

*Citation:* *For the development and application of quantum mechanical and classical simulation methods for describing the dynamical processes of condensed-phase systems.*

#### Seiberg, Nathan

Institute for Advanced Study

#### APS

*Citation:* *For profound contributions to our understanding of quantum field theory, string theory, and questions in particle physics.*

#### Shan, Xiaowen

Exa. Corp

#### Computational Physics (DCOMP)

*Citation:* *For seminal contributions in the formulation and applications of lattice Boltzmann models for multiphase and complex fluids; and for pioneering Lattice-Boltzmann-method based fluid dynamics algorithms for real-world engineering applications.*

#### Shapira, Dan

Oak Ridge National Laboratory

#### Nuclear Physics (DNP)

*Citation:* *For contributions to the study of nuclear collisions: the discovery of nuclear orbiting, pioneering measurements of the space-time extent of particle-emitting sources, and seminal studies of fusion with n-rich exotic beams, and for development of innovative instrumentation to enable these studies.*

#### Sheyko, Sergey

University of North Carolina, Chapel Hill

#### Polymer Physics (DPOLY)

*Citation:* *For fundamental contributions to the understanding of conformation, ordering, and flow of branched macromolecules at interfaces, and for outstanding experimental achievements in imaging and characterization of single macromolecules.*

#### Silva, Luis O.

Instituto Superior Tecnico

#### Plasma Physics (DPP)

*Citation:* *For significant contributions to the understanding of the complex interaction of relativistic laser and particle beams with laboratory and astrophysical plasmas.*

#### Slater, Gary W.

University of Ottawa

#### Polymer Physics (DPOLY)

*Citation:* *For groundbreaking contributions to our understanding of electrophoretic sieving and entropic separations of macromolecules in gels, solutions, and microfluidic devices.*

#### Slavin, Andrei N.

Oakland University

#### Magnetism & Its Applications (GMAG)

*Citation:* *For contributions to the understanding of liner and nonlinear spin wave dynamics in magnetic films and nanostructures, microwave magnetic envelope solitons, and magnetization dynamics induced by spin momentum transfer.*

#### Smith, Kevin E.

Boston University

#### Materials Physics (DMP)

*Citation:* *For pioneering contributions to the study of the electronic structure of solids using angle resolved photoemission spectroscopy, soft x-ray emission spectroscopy and resonant inelastic x-ray scattering.*

#### Sobotka, Lee G.

Washington University



### Vodopyanov, Konstantin L.

Stanford University

#### Laser Science (DLS)

Citation: For development of a new class of broadly-tunable infrared and terahertz sources based on nonlinear-optical conversion in bulk, micro- and nano- structured media, and their application to spectroscopic studies including demonstration of electromagnetically-induced transparency in quantum wells.

### Wang, Juwen

SLAC

#### Physics of Beams (DPB)

Citation: For his leadership in designing, building and testing a large variety of disk-loaded accelerator structures for electron-positron linear colliders and his pioneering studies of RF breakdown in these structures.

### Wang, Michelle D.

Cornell University

#### Biological Physics (DBP)

Citation: For developing novel single molecule techniques in biophysics for measuring protein binding locations on DNA and the torsion of DNA under stress, with applications to the investigation of DNA packing/unpacking and studies of molecular motors which operate on DNA.

### Wei, Timothy

Rensselaer Polytechnic Institute

#### Fluid Dynamics (DFD)

Citation: For development of high resolution flow measurements for turbulent flow studies of relevance to fundamental fluid mechanics, industrial applications, and medicine, and contributions to the fluid dynamics profession through outreach to government and the community.

### Weitering, Hanno H.

University of Tennessee

#### Condensed Matter Physics (DCMP)

Citation: For contributions to electronic instabilities and magnetic phenomena at surfaces, interfaces, and in thin film materials.

### Westfall, Catherine L.

Michigan State University

#### History of Physics (FHP)

Citation: For her pioneering historical research on five American national laboratories, and for her organizational work in the history of physics, especially in the productive ongoing series of Laboratory History Conferences.

### White, Nicholas E.

Goddard Space Flight Center

#### Astrophysics (DAP)

Citation: For his visionary leadership of data archiving for astrophysics missions and activism in initiating and promoting new missions in NASA's astrophysics program.

### Whitesides, George M.

Harvard University

#### Biological Physics (DBP)

Citation: For his manifold contributions to the physics of biology, materials, and surfaces, including new scientific insights in studies of molecular self-assembly, soft lithography, and micro-fluidics.

### Wilks, Scott

Lawrence Livermore National Laboratory

#### Plasma Physics (DPP)

Citation: For pioneering contributions to the understanding of intense and ultra-intense laser plasma interactions and their applications to high energy density science, including fast ignition, ion acceleration, and positron generation.

### Winer, Brian L.

Ohio State University

#### Particles and Fields (DPF)

Citation: For his leadership, direction and contributions in the discovery of the top quark and his development of state-of-the-art high speed trigger electronics which maximized the physics potential of Run II at the Tevatron.

### Wojtsekhowski, Bogdan B.

Thomas Jefferson National Accelerator Facility

#### Hadronic Physics (GHP)

Citation: For outstanding contributions to instrumentation at Jefferson Lab and his leadership role in studies of nucleon structure, particularly real Compton scattering on the proton and the neutron charge form factor.

### Wolfson, Richard

Middlebury College

#### Physics and Society (FPS)

Citation: For outstanding work in educating the general public and college-level students on energy, environmental issues, and physics, in contributing to the local and state communities in Vermont in striving to achieve carbon neutrality, and in research in astrophysics involving numerous undergraduates.

### Wood, Darien R.

Northwestern University

#### Particles and Fields (DPF)

Citation: For contributions to the exploration of the electroweak sector and technical and scientific leadership of the DZero experiment.

### Wu, Yue

University of North Carolina, Chapel Hill

#### Materials Physics (DMP)

Citation: For pioneering NMR studies of structures and dynamics of bulk metallic glasses, and of nanotubular materials including their interactions with guest molecules.

### Xu, Nu

Lawrence Berkeley National Laboratory

#### Nuclear Physics (DNP)

Citation: For important contributions to the observation of partonic collectivity.

### Yakovlev, Dmitri

Univ. of Dortmund

#### Condensed Matter Physics (DCMP)

Citation: For investigations of carrier and ionic spin dynamics in low-dimensional structures, including magnetic polaron formation.

### Yazdani, Ali

Princeton University

#### Condensed Matter Physics (DCMP)

Citation: For electronic structure studies of high-temperature superconductors and magnetic semiconductors through scanning-tunneling microscopy and spectroscopy.

### Zakhidov, Anvar

University of Texas at Dallas

### Materials Physics (DMP)

Citation: For pioneering contributions to the design, fabrication, characterization and understanding of advanced functional nanomaterials and associated devices, from carbon nanotubes, superconducting or magnetic fullerenes and photonic crystals to solar cells, OLEDs and cold field emission cathodes.

### Zegenhagen, Jorg

European Synchrotron Rad Fac

#### International Physics (FIP)

Citation: For his innovative contributions to the study of surfaces and interfaces with synchrotron radiation and his support of international science.

### Zhang, Jin Z.

University of California, Santa Cruz

#### Chemical Physics (DCP)

Citation: For important fundamental understanding of photo-physical properties and charge carrier dynamics of semiconductor and metal nanomaterials based on ultrafast studies.

### Zhang, Shiwei

College of William & Mary

#### Computational Physics (DCOMP)

Citation: For pioneering work in algorithmic innovation of quantum Monte Carlo methods and their applications to many fields of fermion physics including condensed matter, quantum chemistry, nuclear physics, and cold-atom research.

### Zhong, Dongping

Ohio State University

#### Biological Physics (DBP)

Citation: For his outstanding contributions to biophysics, by brilliantly integrating techniques of molecular biology and state-of-the-art laser physics to elucidate the mechanism of macromolecular hydration and the impact of protein structure on dynamics.

### Zurek, Wojciech H.

Los Alamos National Laboratory

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

Citation: For his seminal contributions to the theory of quantum decoherence, and his contributions to quantum foundations more generally.

## Call for Nominations for 2011 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, 2010, unless otherwise indicated on the website.

### PRIZES

#### Hans A. Bethe Prize

<http://prizes.aps.org/prizes/login.cfm?PRIZE=BETHE>

#### Tom W. Bonner Prize

<http://prizes.aps.org/prizes/login.cfm?PRIZE=BONNER>

#### Herbert P. Broida Prize

<http://prizes.aps.org/prizes/login.cfm?PRIZE= BROIDA>

#### 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>

#### Einstein Prize

<http://prizes.aps.org/prizes/login.cfm?PRIZE=EINSTEIN>

#### Fluids Dynamics Prize

<http://prizes.aps.org/prizes/login.cfm?prize=FLUID>

#### Dannie Heineman Prize

<http://prizes.aps.org/prizes/login.cfm?PRIZE=HEINEMAN>

#### Irving Langmuir Prize

<http://prizes.aps.org/prizes/login.cfm?PRIZE=LANGMUIR>

#### Julius Edgar Lilienfeld Prize

<http://prizes.aps.org/prizes/login.cfm?PRIZE=LILIENTELD>

<http://prizes.aps.org/prizes/login.cfm?PRIZE=LILIENTELD>

#### 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>

#### I.I. Rabi Prize

<http://prizes.aps.org/prizes/login.cfm?PRIZE=RABI>

#### Aneesur Rahman Prize

<http://prizes.aps.org/prizes/login.cfm?PRIZE=RAHMAN>

#### 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>

#### 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>

#### George E. Duvall Shock Compression Science Award

<http://prizes.aps.org/prizes/login.cfm?PRIZE=SHOCK>

<http://prizes.aps.org/prizes/login.cfm?PRIZE=DUVALL>

#### 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>

#### Francis Pipkin Award

<http://prizes.aps.org/prizes/login.cfm?PRIZE=PIPKIN>

#### Leo Szilard Lectureship

<http://prizes.aps.org/prizes/login.cfm?PRIZE=SZILARD>

#### John Wheatley Award

<http://prizes.aps.org/prizes/login.cfm?PRIZE=WHEATLEY>

### DISSERTATION AWARDS

#### Andreas Acrivos

Patrice Le Gal, IRPHE, 49 rue F. Joliot-Curie, Marseilles 13384, France, Phone (334) 961-3977  
Email [legal@irphe.univ-mrs.fr](mailto:legal@irphe.univ-mrs.fr)

#### Marshall Rosenbluth

Joel Fajans, University of California, Berkeley, Dept of Physics, MS 7300 LeConte Hall, Berkeley, CA 94720, Phone (510) 642-3872, Fax (510) 643-8497  
Email [joel@physics.berkeley.edu](mailto:joel@physics.berkeley.edu)

## 2010 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 .....04/01/2010  
Biological Physics .....05/01/2010  
Chemical Physics .....PAST  
Computational Physics .....05/01/2010  
DAMOP (Atomic, Molecular, Optical) ..04/01/2010  
DCMP (Condensed Matter) PAST  
Fluid Dynamics .....03/29/2010  
Polymer Physics .....05/01/2010  
Laser Science .....04/01/2010  
Materials Physics .....PAST

Nuclear Physics .....04/01/2010  
Particles & Fields .....04/01/2010  
Physics of Beams .....03/01/2010  
Plasma Physics .....04/01/2010

#### FORUMS

Education .....04/01/2010  
History of Physics .....06/01/2010  
Industrial and Applied Physics .....05/01/2010  
International Physics .....05/01/2010  
Physics & Society .....05/01/2010

#### TOPICAL GROUPS

Few Body .....04/01/2010  
Gravitation .....04/01/2010  
Hadronic Physics .....04/01/2010  
Instrument & Measurement Science ...05/01/2010  
Magnetism and Its Applications .....06/01/2010  
Plasma Astrophysics .....04/01/2010  
Precision Measurement & Fund. Const. 05/01/2010  
Quantum Information .....05/01/2010  
Shock Compression .....04/01/2010  
Statistical & Nonlinear Physics .....05/01/2010

#### APS General Nominations

06/01/2010  
*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.*