



Spring 2005 Prizes & Awards

APS Announces Spring 2005 Prize and Award Recipients

Numerous APS prizes and awards will be presented during special sessions at three spring meetings of the Society: the 2005 March Meeting, 21-25 March, in Los Angeles, California; the 2005 April Meeting, 16-19 April, in Tampa, Florida; and the 2005 meeting of the APS Division of Atomic, Molecular and Optical Physics, 17-21 May in Lincoln, Nebraska.

Citations and biographical information for each recipient follow. This year's Apker Award recipients appeared in the December 2004 issue of *APS News* [www.aps.org]. Additional biographical information and appropriate web links can be found at the APS web site (<http://www.aps.org/praw/index.cfm>). Nominations for most prizes and awards are now being accepted. For details, please see pages 7 and 8 of this insert.

PRIZES

HANS BETHE PRIZE

Stanford E. Woosley
UCSC

Citation: "For his significant and wide ranging contributions in the areas of stellar evolution, element synthesis, the theory of core collapse and type Ia supernovae, and the interpretation of gamma-ray bursts—most notably, the collapsar model of gamma-ray bursts."

Woosley received his BA in physics in 1966, and his PhD in space science in 1971, both from Rice University. He spent three years as a post at Caltech's Kellogg Radiation Laboratory, working on nuclear physics issues related to the synthesis of heavy elements in stars. In particular, he helped calculate the set of nuclear reaction rates used for studies of nuclear energy generation and nucleosynthesis throughout the 1980s and most of the 1990s. From 1975 to the present he has been on the faculty of UCSC's Department of Astronomy and Astrophysics, serving repeatedly as department chair over the years. His research centers on nuclear astrophysics, stellar evolution, supernova models, and gamma-ray bursts. Most recently, he has been working on multi-dimensional models for supernovae and gamma-ray bursts and invented the currently popular "collapsar" model (aka, the hypernova) for bursts. Woosley is also a co-investigator for NASA's High Energy Transient Explorer, dedicated to the study of gamma-ray bursts, and is principal investigator and director of the Department of Energy's SciDAC Supernova Science Center, devoted to the study of supernovae by numerical simulation.



TOM W. BONNER PRIZE

Roy Holt

Argonne National Laboratory

Citation: "In recognition of his

pioneering role in experimental studies of the structure of the deuteron and especially for his innovative use of polarization techniques in these experiments."

Holt received his BS degree (1969) from Southern Methodist University and his MPh (1971) and PhD (1972) degrees from Yale University. He served on the research staff at Yale University until 1974, when he joined the staff of the Physics Division at Argonne National Laboratory. In 1994 he became a professor of physics at the University of Illinois at Urbana-Champaign, where he also served as a Director of the Nuclear Physics Laboratory and continued experiments at Jefferson Lab, DESY-Hamburg (HERMES experiment) and IUCF. He returned to Argonne in 2000, where he serves as chief of the Medium Energy Physics group in the Physics Division. His present research interests include the structure of the nucleon and nucleus as well as a search for a non-zero electric dipole moment in ²²⁵Ra. He has served on program advisory committees for several accelerator facilities, NSAC subcommittees, panels for DOE and NSF, and editorial boards of *Physical Review C*, *Nuclear Physics A* and the *Journal of Physics G*.



HERBERT P. BROIDA PRIZE

Hanna Reisler

University of Southern California

Citation: "For theoretical insights and carefully executed experiments on the detailed dynamics of small molecules."

Reisler obtained her BSc and MSc degrees from the Hebrew University of Jerusalem, Israel, in 1964 and 1966, respectively, and a PhD in physical chemistry from the Weizmann Institute in 1972. She was awarded an Atomic Energy Agency Fellowship to pursue postdoctoral studies at the Johns Hopkins University during 1972-1974. From 1974 to 1977, she was a group leader of the Chemical Laser Project at the Soreq Nuclear Research Center in Yavne, Israel. She came to USC in 1977 and held research positions in the Departments of Electrical Engineering, Physics and Chemistry. She was appointed associate professor of chemistry in 1987 and professor in 1991. Her research interests are in the area of reaction dynamics, in particular photodissociation dynamics and unimolecular reactions of small gas-phase molecules and radicals studied by imaging techniques and interactions of molecules on thin films and on single crystal surfaces. She has won the NSF Faculty Award for Women Scientists and Engineers in 1991,



and a Max Planck Research Award in 1994. In 2002 she was appointed as the first holder of the Women in Science and Engineering Gabilan Chair.

OLIVER BUCKLEY PRIZE

Gabriel Aeppli

University College, London

David Awschalom

University of California – Santa Barbara

Myriam Sarachik

City College of New York

Citation: "For fundamental contributions to experimental studies of quantum spin dynamics and spin coherence in condensed matter systems."

Aeppli is the Quain Professor of Physics and head of the Condensed Matter and Materials Physics Group at University College London (UCL), as well as director of the London Centre for Nanotechnology, a joint venture between Imperial College and UCL. Prior to taking up these posts in the autumn of 2002, he was a senior research scientist for NEC (Princeton), a Distinguished Member of Technical Staff at Bell Laboratories, a research assistant at MIT, and an industrial co-op student at IBM. He obtained a BSc in Mathematics and PhD, MSc and BSc in Electrical Engineering from MIT. His research interests include magnetism, superconductivity, quantum information processing, nanotechnology, and particle accelerator-based probes of condensed matter.



Awschalom received his BSc in physics from the University of Illinois at Urbana-Champaign, and his PhD in experimental physics from Cornell University. He was a research staff member and manager of the Nonequilibrium Physics Department at the IBM Watson Research Center in Yorktown Heights, New York. In 1991 he joined the University of California, Santa Barbara as a professor of physics, and in 2001 was additionally appointed as a professor of electrical and computer engineering. He is presently director of the Center for Spintronics and Quantum Computation, and associate director of the California Nanosystems Institute. His group has research activities in optical and magnetic interactions in semiconductor quantum structures, spin dynamics and coherence in condensed matter systems, macroscopic quantum phenomena in nanometer-scale magnets, and implementations of quantum information processing in the solid state. He has developed a variety of femtosecond-

resolved spatiotemporal spectroscopies and micromagnetic sensing techniques aimed at exploring charge and spin motion in the quantum domain.

Sarachik earned a BA cum laude from Barnard College in 1954, and a MS and PhD in 1957 and 1960, respectively, from Columbia University. Following research associate positions at IBM Watson Laboratories at Columbia University (1961-1962) and at Bell Laboratories (1962-1964), she joined the faculty of City College of New York as an assistant professor of physics, where she was promoted through the ranks to Distinguished Professor in 1995. Sarachik has served the physics community in many ways, including as a member (and chair) of the Solid State Sciences Committee of the NRC, the Human Rights Committee of the New York Academy of Sciences, and the Board of the Committee of Concerned Scientists. She served as APS president in 2003. An experimentalist working at low temperatures, Sarachik has investigated superconductors, disordered metallic alloys, metal-insulator transitions in doped semiconductors, hopping transport in solids, strongly interacting electrons in two dimensions, and spin tunneling in nanomagnets.



DAVISSON-GERMER PRIZE

Ernst G. Bauer

Arizona State University

Citation: "For contributions to the science of thin-film nucleation and growth, and for the invention of Low Energy Electron Microscope."

Bauer received his MS (1953) and PhD (1955), both in physics, from Munich University, Germany. In 1958 he moved to the Michelson Laboratory in China Lake, California, where he became head of the Crystal



Table of Contents

1 Prize and Award Recipients

5 New APS Fellows

8 Nominations for 2005 Prizes and Awards

Physics Branch and US citizen. In 1969 he accepted the position of professor and director of the Physics Institute at the Technical University Clausthal in Germany. In 1991 he was appointed Distinguished Research Professor at the Arizona State University. His classic early work on the classification of thin film growth modes, which is used worldwide today, provided the theoretical thermodynamic understanding of epitaxy. In 1962 he invented LEEM (Low Energy Electron Microscopy). In the late eighties/early nineties he extended the LEEM technique in two directions by developing two new surface microscopy methods: Spin-Polarized Low Energy Electron Microscopy (SPLEEM) and Spectroscopic Photo Emission and Low Energy Electron Microscopy (SPELEEM). Using these methods a comprehensive (structural, chemical, magnetic, electronic) characterization of surfaces and thin films on the 10 nm scale is now available.

EINSTEIN PRIZE

Bryce DeWitt
University of Texas

Citation: "For a broad range of original contributions to gravitational physics, especially in quantum gravity, gauge field theories, radiation reaction in curved spacetime, and numerical relativity; and for inspiring a generation of students."

DeWitt graduated from Harvard in 1943. Following a World War II stint as a naval aviator, he returned to Harvard and did his PhD thesis under the direction of Julian Schwinger. He was awarded the PhD in 1950. After a postdoc at the Institute for Advanced Study in Princeton, he spent six months at the Eidgenossische Technische Hochschule in Zurich and by a year as a Fulbright Scholar at the Tata Institute of Fundamental Research in Bombay. From 1952-55 he was a senior physicist at Livermore, where he became an expert in numerical hydrodynamics, which he and his students used later in studies of colliding black holes and other astrophysical investigations. In 1956 he became director of the Institute for Field Physics at the University of North Carolina. In 1972 DeWitt moved to the University of Texas. Of the books he published after 1973, the most important is *The Global Approach to Quantum Field Theory* (Oxford 2003).



DANNIE HEINEMAN PRIZE

Giorgio Parisi
INFN-Seigone

Citation: "For fundamental theoretical discoveries in broad areas of elementary particle physics, quantum field theory, and statistical mechanics; especially for work on spin glasses and disordered systems."

Parisi graduated from Rome University in 1970. He has worked as researcher at the Laboratori Nazionali di Frascati from 1971 to 1981. From 1981 to 1992 he was full professor of Theoretical Physics at the University of Roma II, Tor Vergata and he is now professor of quantum theories at the University of Rome I, La Sapienza. Parisi's main activity has been in the field



of elementary particles, theory of phase transitions and statistical mechanics, mathematical physics and string theory, disordered systems, neural networks theoretical immunology, computers and very large-scale simulations of QCD, non-equilibrium statistical physics and optimization methods. However, his deepest contribution concerns the solution of the Sherrington-Kirkpatrick mean field model for spin glasses. Parisi proposed his replica symmetry breaking solution that has been proven to be exact 25 years later, although much more complex than anticipated. Later, Parisi and co-workers Mezard and Virasoro clarified greatly the physical meaning of the mysterious mathematics involved in this scheme. This discovery opened the doors to vast areas of application, e.g. in optimization problems and in neural network theories.

IRVING LANGMUIR PRIZE

David Chandler
University of California—Berkeley

Citation: "For the creation of widely used analytical methods and simulation techniques in statistical mechanics, with applications to theories of liquids, chemical kinetics, quantum processes, and reaction paths in complex systems."

Chandler is a professor at the University of California, Berkeley. He received his SB degree in chemistry from MIT in 1966, and his PhD in chemical physics from Harvard University in 1969. He began his academic career in 1970 at the Urbana-Champaign campus of the University of Illinois. Prior to joining the Berkeley faculty in 1986, Chandler spent two years as professor of chemistry at the University of Pennsylvania. Chandler's primary area of research is statistical mechanics. His most significant contributions include the development of the Weeks-Chandler-Andersen theory, generally regarded as the basic equilibrium theory of the liquid state, and the Pratt-Chandler theory of hydrophobic effects. Chandler has also created many of the basic techniques with which condensed matter chemical equilibrium and chemical dynamics are understood with molecular theory. His most recent works focus on dynamics and structure far from equilibrium, including processes of self assembly and also the glass transition.



LILIENFELD PRIZE

Robert Austin
Princeton University

Citation: "For his pioneering and creative work in applying advanced techniques in experimental physics to significant problems in biological physics, and for his skill in communicating the excitement of his research to a wide range of audiences."

Austin is a professor of physics at Princeton University. He received his BA in 1968 from Hope College in Holland Michigan. He received his MS and PhD in physics from the University of Illinois at Urbana-Champaign in 1970 and 1975 respectively. He was a postdoc at the University of Illinois and then at Max Planck Institute for Biophysical Chemistry in Goettingen,



Germany, and joined the faculty at Princeton in 1979. He was promoted to associate professor of physics in 1984 and to professor in 1989. In 2002 he was chair of the APS Division of Biological Physics of the American Physical Society. Austin's research spans a number of different topics in biological physics including fractionation of DNA in microlithographic arrays, the study of energy flow in biomolecules and the study of ultra-rapid diffusion mixing.

MCGRODDY PRIZE

Yoshinori Tokura
University of Tokyo

Citation: "For pioneering work in the synthesis and characterization of transition metal oxides having unusual charge and spin order."

Biographical information unavailable at press time.



LARS ONSAGER PRIZE

Valery Pokrovsky
Texas A&M University

Citation: "For fundamental and original contributions to statistical physics, including development of the scaling theory for correlation functions near critical points and of theories for commensurate-incommensurate phase transitions."

Pokrovsky received his master's degree from Kharkov University, Ukraine in 1953. He spent 13 years in Novosibirsk, first as a teacher of mathematics at a technical high school, later as a PhD student under supervision of Yu. B. Rumer. He received his PhD in 1957 from Tomsk University. From 1957 till 1966 he was first a scientist, then the head of a group at Institute of Radiophysics, later called the Institute of Semiconductor Physics of Siberian Branch of Academy of Sciences. Simultaneously he taught theoretical physics at Novosibirsk University. In 1966 he was invited to join the newly organized Landau Institute for Theoretical Physics at Chernogolovka, Moscow District. He was also employed as a professor at Moscow Institute of Physics and Technology. In 1992 he became a professor of physics at Texas A&M University. His research is in quantum mechanics, statistical physics, and condensed matter theory.



GEORGE E. PAKE PRIZE

Cherry Murray
Bell Labs – Lucent Technologies

Citation: "For fundamental studies in surface and scattering physics, and for leadership as Senior Vice President of Bell Labs Research, Lucent Technologies, overseeing Bell Laboratories at an important time in its history."

Murray is Senior Vice President at Bell Labs, Lucent Technologies for Physical Sciences and Wireless Research, and was recently named Deputy Director for Science and Technology at Lawrence Livermore National Laboratory, effective December 1, 2004. She is a physicist who has been nationally recognized for her work in surface physics, light scattering. *Discover* magazine named her one of the

"50 Most Important Women in Science" in 2002. She first joined Bell Labs in 1978 as a member of the technical staff. She was promoted to a number of positions over the years, including department head for low temperature physics, department head for condensed matter physics and semiconductor physics and director of Bell Lab's physical research lab. In 2000, Murray became vice president for physical sciences and then senior vice president in 2001. She received her BS and Ph.D in physics from Massachusetts Institute of Technology. In 1989, she won the APS Maria Goeppert-Mayer Award.



W.K.H. PANOFSKY PRIZE

Pier Oddone
Lawrence Berkeley National Laboratories

Citation: "For his insightful proposal to use an asymmetric B-Factory to carry out precision measurements of CP violation in B-meson decays, and for his energetic leadership of the first conceptual design studies that demonstrated the feasibility of this approach."

Oddone serves as the Deputy Director of the Berkeley Lab, responsible for scientific programs. As part of his charge he oversees major laboratory initiatives and strategic planning. He was director of the Physics Division at Berkeley Lab from 1987 through 1991. In 1987, he proposed the idea of using an Asymmetric B-factory to study the violation of CP symmetry in the decay of B-mesons. Two such facilities were built, one at the Stanford Linear Accelerator Center and one at the KEK, the Japanese particle accelerator laboratory. Experiments at these facilities led to the first observation of CP violation in B meson decays. In the late 1970s and early 1980s, he was a member of the team that developed the first Time Projection Chamber (TPC). This technology was subsequently used for many particle and nuclear physics experiments. He led the TPC collaboration from 1984 to 1987. Oddone was born in Peru. He obtained his BS degree in physics at MIT in 1965 and his PhD in physics at Princeton in 1970. He was a postdoctoral fellow at Caltech until 1972, when he joined the Berkeley Lab.



ERLE K. PLYLER PRIZE

Robert Tycko
National Institutes of Health

Citation: "For the development of novel techniques in NMR spectroscopy and their application to a wide range of fundamental problems including work on Berry's phase, fullerenes, quantum wells, and amyloid fibrils."

Tycko received his AB from Princeton University in 1980, and his PhD in chemistry from the University of California at Berkeley in 1984. After postdoctoral research on biological solid state NMR methods at the University of Pennsylvania from 1984 to 1986, Tycko became a Member of Technical Staff in the Physical Chemistry Research Department at AT&T Bell Laboratories. At Bell Labs, Tycko carried out NMR studies of novel materials such as fullerenes and superconducting alkali fullerenes. In 1994, Tycko moved to the Laboratory of Chemical Physics, a physical chemistry and biophysics research department in the

National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health.

Tycko is currently a member of the Senior Biomedical Research Service of the NIH. He has made numerous contributions to solid state NMR methodology for structural studies of proteins and other complex molecular systems. A major project in recent years has been the elucidation of the molecular structures of amyloid fibrils that are associated with Alzheimer's disease and related phenomena.



ANEESUR RAHMAN PRIZE

Uzi Landman
Georgia Institute of Technology

Citation: "For pioneering computations that have generated unique insights into the physics of materials at the nanometer length scale, thereby fostering new theoretical and experimental research."

Landman was born and raised in Israel where he received his education, obtaining a D.Sc. from the Israel Institute of Technology-Technion, and played the accordion with groups in Israel and Europe. In 1977 he joined the School of Physics at the Georgia Institute of Technology, where he is currently a Regents' and Institute Professor, holding the Callaway Chair in physics, and serving as director of Georgia Tech Center for Computational Materials Science. Landman's contributions deepened our insights into the microscopic origins of physical and chemical phenomena in systems of basic and technological significance. He contributed significantly to the conceptual and practical development of classical and quantum simulation and modeling methodologies. His investigations had far reaching impact on both experiments and theory in diverse fields, ranging from surface science, nanocatalysis, microscopic hydrodynamics, and nanotribology, to clusters, nanostructures, quantum dots and charge transport in DNA.

POLYMER PHYSICS PRIZE

Thomas P. Russell
University of Massachusetts

Citation: "For his pioneering research and fundamental elucidation of the surface and interfacial behavior of polymers."

Russell received his PhD in 1979 in polymer science and engineering from the University of Massachusetts, Amherst, then spent two years as a postdoc in Mainz, Germany. For the next 16 years he was a research staff member at the IBM Research Center in San Jose, California, where he investigated the structure and properties of thin polymer films, and the thermodynamics and kinetics of phase transitions in polymers. In 1997 he became a professor of polymer science and engineering at Amherst, where his research interests include the surface and interfacial properties of polymers, phase transitions in polymers, directed self-assembly processes, the use of polymers as scaffolds and templates for the generation of nanoscopic structures, the interfacial assembly of nanoparticles, and the influence of supercritical fluids on phase transitions and dynamics in polymer thin films. He is director of the Materials Research Science and Engineering Center on Polymers, associate director of MassNanoTech and is an associate editor of *Macromolecules*.



J.J. SAKURAI PRIZE

Susumu Okubo
University of Rochester

Citation: "For groundbreaking investigations into the pattern of hadronic masses and decay rates, which provided essential clues into the development of the quark model, and for demonstrating that CP violation permits partial decay rate asymmetries."

Okubo completed his undergraduate studies at the University of Tokyo's Department of Physics 1952 (undergraduate) Department of Physics, University of Tokyo, and completed his graduate studies in physics in 1958 at the University of Rochester. Since 1964, he has been a professor of physics and astronomy at Rochester. His current research is mostly mathematical in nature, dealing with non-associative algebras. He has been awarded the 1976 Nishina Prize from Nishina Foundation in Japan for research in particle physics. He is also a member of the American Physics Society and American Mathematical Society.



I.I. RABI PRIZE

Deborah Jin
NIST

Citation: "For her pioneering work in the production of degenerate Fermi gases and exploitation of their novel physical properties."

Jin is a physicist at the Commerce Department's National Institute of Standards and Technology (NIST) in Boulder, Colorado, and adjunct assistant professor of physics at the University of Colorado. She graduated from Princeton University in 1990 and received her Ph.D. in physics from the University of Chicago in 1995. From 1995 to 1997, she was a National Research Council research associate with NIST, working at JILA. After her postdoc assignment, Jin was hired as a NIST physicist and assistant professor adjunct in 1997. She is the recipient of several awards, including the APS Maria Goeppert-Meyer Prize in 2002, the 2002 National Academy of Sciences award for initiatives in research; a 2003 recipient of a \$500,000 MacArthur Fellowship, and the 2000 Presidential Early Career Awards for Scientists and Engineers (PECASE), the highest honor bestowed by the U.S. government on young professionals at the outset of their independent research careers.

ARTHUR L. SCHAWLOW PRIZE

Marlan O. Scully
Texas A&M University

Citation: "For his many far reaching contributions to quantum optics and quantum electronics and, in particular, for the quantum theory of lasers, for the theory of free-electron lasers and laser gyros, and for theoretical and experimental contributions to optical coherence effects."

Scully received undergraduate training in engineering physics and nuclear engineering from the University of Wyoming and Rensselaer Polytechnic Institute, and earned his PhD in physics from Yale University in 1966. He has held faculty positions at Yale, MIT, University of Arizona, University of New Mexico and the

Max-Planck-Institut für Quantenoptik. He presently holds a joint appointment between Texas A&M and Princeton Universities. He has been instrumental in many seminal contributions to laser science and quantum optics. These include: The Scully-Lamb quantum theory of the laser, the classical theory of the free electron laser, the theory of the laser gyroscope and especially the theory of correlated spontaneous emission noise quenching in such devices, the first demonstration of lasing without inversion and the first utilization of coherence effects to generate ultraslow light in hot gases. Scully's work on quantum coherence and correlation effects has shed new light on the foundations of quantum mechanics and yielded new insights into quantum thermodynamics.



ROBERT R. WILSON PRIZE

Keith R. Symon
University of Wisconsin

Citation: "For fundamental contributions to accelerator science including the FFAG concept and the invention of the RF phase manipulation technique that was essential to the success of the ISR and all subsequent hadron colliders."

Symon received his BS from Harvard College in 1942 and his PhD from Harvard University in 1948. He taught at Wayne University in Detroit from 1947 to 1955, and at the University of Wisconsin-Madison from 1955 until he retired in 1989. From 1956 to 1967 he was a staff member of the Midwestern Universities Research Association, and its technical director in 1957-60. He chaired the Argonne Accelerator Users Group in 1961-62, was acting director of the Madison Academic Computing Center in 1982-83, and acting director of the UW-Madison Synchrotron Radiation Center from 1983 to 1985. His research areas are the theory and design of particle accelerators and theoretical plasma physics. He invented the FFAG accelerator design, and contributed to the theory of radio-frequency acceleration, collective instabilities, and colliding beam techniques. He developed bit-pushing and distribution-pushing techniques for the numerical solution of the Vlasov equation for the study of collective instabilities in plasmas and accelerator beams.



UNDERGRADUATE RESEARCH INSTITUTE

Murtadha A. Khakoo
California State University—Fullerton

Citation: "For his challenging and sophisticated experiments in electron-atom collisions that have provided significant tests of atomic theory and for his energetic, sustained mentoring of students in his research."

Khakoo received his BSc in 1975 and his PhD in 1980, both from University College, London (UK). He spent three years as a postdoc at CalTech's Jet Propulsion Laboratory, followed by three years with the Electron Scattering Group in Windsor, Canada. He spent two years as a research assistant professor at the University of Missouri, Rolla, before joining the physics department at California State University, Fullerton, as a full professor. His ongoing research focuses on fundamental electron collisions, and over the years he has explored electron-impact excitation of the rare gases, and of atomic hydrogen, molecular hydrogen and molecular nitrogen. He has also performed Monte-Carlo simulations of spin-polarized electron scattering from foil targets. He is the author of 62 peer-reviewed published papers, 25 of which were written with undergraduates as co-authors.



AWARDS

DAVID ADLER LECTURESHIP AWARD

Ramamoorthy Ramesh
University of California—Berkeley

Citation: "For his contributions to materials physics that have enabled a deeper understanding of ferroelectric materials, the discovery of colossal magnetoresistance, and leadership in communicating the excitement of materials physics to a broad audience."

Ramesh graduated from the University of California, Berkeley with a PhD in 1987. As a staff scientist at the Lawrence Berkeley Laboratory from 1987-1988 he carried out pioneering research on high temperature superconductors and was among the first to identify the 110K superconducting phase in the bismuth cuprate system. From 1989-1995 at Bellcore, he initiated research in several key areas, including ferroelectric nonvolatile memories. His landmark contributions in ferroelectric perovskites came through the recognition that conducting oxide electrodes are the solution to the problem of polarization fatigue, which for 30 years, remained an enigma and unsolved problem. This contribution is now recognized worldwide with many industrial and research laboratories implementing such an



GEORGE VALLEY PRIZE

Ivo Souza
University of California—Berkeley

Citation: "For fundamental advances in the theory of polarization, localization and electric fields in crystalline insulators."

Souza, a citizen of Portugal, received his undergraduate degree in engineering physics in 1995 from Universidade Técnica de Lisboa, where he started doing research in solid-state physics with José Luis Martins. He received his PhD in physics in 2000 from the University of Illinois at Urbana-Champaign. Afterwards he spent three and a half years doing post-doctoral work at Rutgers University. In January of 2004 he joined the Department of Physics at the University of California, Berkeley as an assistant professor. His research is in theoretical and computational solid-state physics. He is



approach. In 1994, he initiated research into manganite thin films and they coined the term, colossal magnetoresistive oxides. He joined the University of Maryland in 1995 and was promoted to professor in 1999 and Distinguished University Professor in 2003. He is currently a professor at the University of California, Berkeley, where he continues to pursue key scientific and technological problems in complex oxide thin films and heterostructures.

BOUCHET AWARD

Godfrey Gumbs
Hunter College, CUNY

Citation: "For pioneering contributions to our understanding of low-dimensional heterostructures; and for leadership in recruitment, retention, and mentoring of under-represented minority students."

Gumbs is The Maria A. Chianta and Alice M. Stoll Professor of Physics at Hunter College of the City University of New York. He received his BA from Trinity College, Cambridge, in 1971 and his MSc and PhD degrees in theoretical condensed matter physics from the University of Toronto in 1973 and 1978, respectively. He was a post-doctoral fellow at the National Research Council (NRC) in Ottawa (1978-1982), and a Natural Sciences and Engineering Research Council (NSERC) of Canada University Research Fellow and Assistant / Associate Professor of Physics from 1982-1991. In 1992, he joined the faculty of CUNY as professor of physics. His research has focused on electron transport and optical response in semiconductor heterostructures such as the two-dimensional electron and hole gases in addition to lower-dimensional quantum structures such as quantum dots and antidots, quantum wires as well as nanotubes. He has employed both analytical and numerical methods in dealing with these problems. They include many-body diagrammatic techniques and molecular dynamics simulations. He is currently involved in a project dealing with single-electron transport and its applications to quantum computing, single-photon sources and detectors using surface acoustic waves in piezoelectric materials.



BURTON FORUM AWARD

Lawrence Krauss
Case Western Reserve University

Citation: "For major contributions in defending science in the schools through his efforts in combating the opponents of teaching evolution, and for continuing to enhance the public understanding of contemporary physics."

Krauss is Ambrose Swasey Professor of Physics, professor of astro-nomy, and chair of the Physics Department at Case Western Reserve University. He received his BSc (Hons) in mathematics and physics from Carleton University in 1977. He received his PhD in physics from the Massachusetts Institute of Technology in 1982 then joined the Harvard Society of Fellows. In 1985 he joined the faculties of physics and astronomy at Yale University, and moved to take his current appointment in 1993. Krauss is the author of over 200 scientific publications, as well as numerous popular articles on physics and astronomy. In addition, he is the author of seven popular books, including *The*



Physics of Star Trek. Atom: An Odyssey from the Big Bang to Life on Earth and Beyond, and his upcoming book, *Hiding in the Mirror: The Mysterious Allure of Extra Dimensions*. He has lectured to popular audiences at such places as the Smithsonian Air and Space Museum, the National Museum of Natural History, and the Museum of Natural History in New York, and appears frequently on radio and television around the world. Krauss is the recipient of the AAAS 2000 Award for the Public Understanding of Science and Technology, the 2001 APS Julius Edgar Lilienfeld Prize, the 2001 AIP Andrew Gemant Award, the 2002 AIP Science Writing Award, and the 2003 AAPT Oersted Medal.

DILLON MEDAL

Jan Genzer

North Carolina State University
Citation: "For his highly creative manipulation of surface properties via monolayer and macromolecular films."

Genzer, a native of the Czech Republic, received the "Diploma-engineer" degree in chemical and materials engineering from the Institute of Chemical Technology in Prague, Czech Republic, in 1989. In 1991 he moved to the US to pursue graduate studies at the University of Pennsylvania, receiving his PhD in materials science and engineering in 1996. He was a post-doctoral student at Cornell University (1996-1997) and later at University of California at Santa Barbara. In the fall 1998 he joined the faculty of North Carolina State University as an assistant professor of chemical engineering. In 2004 he was promoted to the rank of an associate professor of chemical engineering. His group at North Carolina State University is actively involved in research related to the behavior of polymers at interfaces and in confined geometries, molecular self-assembly, and combinatorial materials science.



KEITHLEY AWARD

E. Dwight Adams

University of Florida (emeritus)
Citation: "For the pioneering development of the capacitive pressure transducer, its application to the OHe melting pressure thermometry, and other scientific uses."

Adams received his BA degree from Berry College in 1953 and his MS degree from Emory University in 1954. After two years in the US Army, he attended Duke University, receiving his PhD in 1960. This was followed by two years as a postdoctoral associate at Stanford University. There he invented the persistent switch for superconducting magnets, a device that is crucial to this technology. He arrived at the University of Florida as assistant professor in 1962, where he initiated the ultra-low temperature program, conducting research on quantum fluids and solids. With his first graduate student, Gerald Straty, he invented the capacitive Straty-Adams gauge for *in situ* high-resolution low temperature pressure measurement. This gauge is now in common use in low temperature labs around the world and has received the ultimate recognition of being used without reference. Adams has received the Beams Medal for Outstanding Research from APS, and recently retired from the University of Florida. He is



regarded as one of the world's foremost authorities on low-temperature physics.

MARIA GOEPPERT MAYER AWARD

Yuri Suzuki
University of California - Berkeley

Citation: "For her research in epitaxial oxide thin films, nanostructures and devices with tailored magnetic, electronic and optical properties."

Suzuki received her AB degree in physics from Harvard University in 1989 and her PhD in applied physics from Stanford University in 1995. From 1994-1996, she was a postdoc at AT&T Bell Laboratories (later Lucent Technologies Bell Laboratories). She was on the Cornell faculty in Materials Science and Engineering as an assistant professor (1997-2001) and later as an associate professor (2001-2002). In 2003, she joined the UC Berkeley faculty in Materials Science and Engineering as an associate professor. Suzuki's primary research interests are in the areas of magnetics and photonics. Her projects include studies of the structure-property relationships in novel magnetic oxide systems, magnetism at the nanometer length scale, magnetic tunnel junction devices and photonic bandgap materials.



NICHOLSON MEDAL

Joel Lebowitz
Rutgers University

Citation: "For his tireless personal activism, throughout his superb career as a theoretical physicist, to help scientists and defend their human rights in countries around the globe."

Lebowitz received his BS from Brooklyn College in 1952 and his PhD from Syracuse University in 1956. He spent the following year as a postdoctoral fellow at Yale University before joining the faculty of Steven Institute of Technology in New Jersey. From 1959 to 1977 he was a professor of physics at Yeshiva University in New York City. He is currently the George William Hill Professor of Mathematics and Physics at Rutgers University, and director of the Center for Mathematical Sciences. His current work is primarily in the field of statistical mechanics, with particular emphasis on the properties of stationary non-equilibrium states. He is also working on the evolution of quantum systems subjected to time dependent external fields. In addition, he serves as editor of the *Journal of Statistical Physics*, and *Computational Mathematical Physics*.



ABRAHAM PAIS AWARD ON HISTORY OF PHYSICS

Martin Klein
Yale University

Citation: "For his pioneering studies in the history of 19th and 20th-century physics, which embody the highest standards of scholarship and literary expression and have profoundly influenced generations of historians of physics."

Klein received his PhD in 1948 from the Massachusetts Institute of Technology and

served as a research associate in physics there from 1946-1949. He joined the physics faculty at the Case Institute of Technology, becoming a full professor in 1960 and chairing the department from 1966-1967. His early research areas included papers on the diffraction of sound, thin ferromagnetic films, and numerous problems in statistical mechanics. However, his true scholarly interest began to turn towards the history of physics, particularly the formative years of quantum mechanics and the work of Ehrenfest, Planck, and Einstein. As a result, he was appointed professor of the history of physics at Yale University in 1967, where he has been a professor emeritus since 2000. He is a two-time chair of the APS Forum on the History of Physics.

FRANCIS M. PIPKIN AWARD

Ronald Walsworth
Harvard-Smithsonian Center for Astrophysics

Citation: "For broad investigation in precision measurements involving masers; in particular, for using hydrogen and noble-gas masers in achieving record sensitivities to violations of Lorentz and CPT symmetry in neutrons and protons, and for innovative applications of masers to imaging."

Walsworth received his BS from Duke University in 1984, and his PhD in physics from Harvard University in 1991. His doctoral research with Isaac Silvera focused on the development of a cryogenic hydrogen maser, as well as the use of room-temperature hydrogen masers to measure hydrogen spin-exchange effects and to test the linearity of quantum mechanics. Walsworth continued development of the cryogenic hydrogen maser as a postdoctoral researcher working with Robert Vessot at the Harvard-Smithsonian Center for Astrophysics (CfA). In 1993, Walsworth moved into a Smithsonian Trust scientist position at the CfA and developed a research group that applies atomic physics and magnetic resonance techniques to a wide range of problems. Currently, Walsworth is a Smithsonian Federal scientist as well as a Senior Lecturer on Physics at Harvard University. He also serves as a Distinguished Traveling Lecturer for the APS Division on Laser Science.



SHOCK COMPRESSION SCIENCE AWARD

Vladimir Evgenievich Fortov
Institute for High Energy Densities of Russian Academy of Sciences

Citation: "For pioneering research in high-energy density physics, strongly-coupled plasmas, hot-condensed matter, shock-compression science and their applications."

In 1962, Fortov entered Moscow Institute of Physics and Technology. Following his graduation in 1968 he accepted a post-graduate position in the same Institute. After completing his PhD in strongly coupled plasma physics in 1971, he was invited to the Institute of Chemical Physics of Russian Academy of Sciences (RAS). He was awarded his doctoral degree by the Russian Academy of Sciences in 1976 and became head of the High Dynamic Pressure and Detonation lab, then



as the division director of the Institute of Chemical Physics. He also accepted the directorship of the Extreme Matter Department in the Institute for High Temperature at the RAS, which in 1992 was transformed to the Institute for High Energy Density RAS. From 1991 he is a professor and Chair Director of High Energy Physics Chair in Moscow Institute of Science and Technology. Fortov performed pioneering experimental investigations on physical properties of hot dense matter at megabar pressure range, which are very important for astro- and planetary physics, energetics, engineering, and other high temperature applications. He was one of the first to apply the intense shock waves for investigations of physical properties of plasmas under extreme pressure and temperature.

LEO SZILARD AWARD

APS Study Group on Boost-Phase Intercept Systems for National Missile Defense

Citation: "In recognition of the work of the Study Group in producing a report that adds physics insight to the public debate."

JOHN WHEATLEY AWARD

Steven Manson Georgia State University

Citation: "For building collaborations with scientists in Uzbekistan, India and Turkey; and for promoting research groups and supporting students in these countries."

Manson attended Rensselaer Polytechnic Institute (RPI) and received the BS in Physics in 1961. He did his graduate work at Columbia University, specializing in theoretical atomic physics, and was awarded his PhD in 1966. He was then awarded a National Academy of Sciences/National Research Council Postdoctoral Fellowship at the National Bureau of Standards (now NIST), where he spent two years studying

atomic photoionization. Following his postdoc, he became an assistant professor at Georgia State University in Atlanta in 1968, where he is still located. He was promoted to associate professor in 1971, professor in 1976 and Regents Professor in 1984. His research work over the years has concentrated on the interaction of charged particle and electromagnetic radiation with atoms and ions. His current research is focused on photoionization of free and confined atoms and ions. His present collaborations involve scientists from France, UK, Ireland, Russia, Serbia and Montenegro, Turkey, Israel, India, South Korea and Uzbekistan.



DISSERTATION AWARDS

DISSERTATION IN BEAM PHYSICS FOR OUTSTANDING DOCTORAL THESIS AWARD

Eduard Pozdeyev Michigan State University

Citation: "For pioneering research on space charge effects of beams in the isochronous regime, including simulations and experimental verification following the design and construction of the Small Isochronous Ring."

Pozdeyev received his university diploma in physics from Novosibirsk State University in Russia in 1992, and worked as a physicist at Budker Institute of Nuclear Physics from then until 1996. He began his graduate studies at Michigan State University in 1998, with a dissertation focusing on numerical and experimental studies of space charge effects in the isochronous regime. Following his graduation from MSU in 2003, he accepted his current position as an accelerator

physicist in Jefferson Laboratory's CASA group.

DISSERTATION IN ATOMIC, MOLECULAR AND OPTICAL PHYSICS

Marcus Greiner James Thompson

Biographical information unavailable at press time.

METROPOLIS AWARD

Harald P. Pfeiffer Caltech

Citation: "For his outstanding research on determining initial data for the dynamics of black holes."

Pfeiffer began his undergraduate study at the University of Bayreuth, Germany, in 1994. In 1997, he continued at Cambridge University, where he completed Part III of the Mathematical Tripos in 1998. Then he entered the graduate program in physics at Cornell University, where he was awarded a MSc in 2001, and a PhD in 2003. He currently works at the California Institute of Technology as Sherman Fairchild Postdoctoral Scholar in Physics. His primary research interest lies in the numerical study of black holes. His thesis research concentrated on various aspects of the initial value problem of General Relativity, ranging from its mathematical formulation over the development of a multidomain pseudo-spectral elliptic solver to the construction of astrophysically realistic initial data for black hole evolutions. At Caltech, his focus has shifted to black hole evolutions, with a continued emphasis on elliptic aspects of this problem. He also



has a broader interest in theoretical astrophysics.

DISSERTATION IN NUCLEAR PHYSICS

Andriy Kurlov

Citation: "For his theoretical work on electroweak radiative corrections to precision low-energy processes, including calculations of neutrino-deuteron scattering needed to interpret solar neutrino data and other calculations to constrain limits for physics beyond the standard model."

Biographical information unavailable at press time.

MARSHALL ROSENBLUTH AWARD

Ki-Yong Kim University of Maryland

Citation: "For his development and application of ultrafast optical diagnostics to understanding the interaction dynamics of intense laser pulses with novel plasmas, including those produced in nano-scale clusters."

Kim received his BS degree in physics in 1995 from Korea University, Korea, with highest honors. He received his PhD in physics at the University of Maryland at College Park in 2003. His dissertation detailed the development of ultrafast optical diagnostics and their application to measurement of ultrafast dynamics in the interaction of intense laser pulses with gases, atomic and molecular clusters, and plasmas, including plasma waveguides. He is now a Director's Postdoctoral Fellow at Los Alamos National Laboratory (MST-10 group), pursuing the study of coherent Terahertz radiation from intense laser-produced plasmas.

TANAKA DISSERTATION AWARD

Information unavailable at press time.

APS Council Announces 2004 APS Fellows

The APS Council elected the following as Fellows of the Society at its November 2004 meeting. The names and citations of the new APS fellows are listed below. Nominations for fellowship are received by the APS headquarters throughout the year, and are forwarded for review to the appropriate division or topical group fellowship committees. These, in turn, forward their recommendations to the APS Fellowship Committee.

Fellowship nomination forms may be obtained by writing to the APS Fellowship Office, One Physics Ellipse, College Park, MD, 20740-3844, by accessing the APS URL (<http://www.aps.org>), or by sending an email message to honors@aps.org.

2004 Fellows (Alphabetical by Unit)

Adams Nigel Graham

University of Georgia
DAMOP (Atomic, Molecular, Optical)

For the development of important experimental techniques for studying charged-particle interactions with molecular neutrals and ions, and seminal contributions in understanding the synthesis of molecules in the interstellar medium.

Alonso Marcelo

Florida Institute of Technology
Forum on International Physics

For his tireless efforts to strengthen scientific research throughout Latin America, for his leadership in global physics education, and for enriching physics understanding of students worldwide through his many textbooks.

Andelman David

Tel Aviv University, Israel
DCMP (Condensed Matter)

For definitive theoretical contributions to a broad range of problems in soft condensed matter, including monolayers, surfactant solutions and polyelectrolyte solutions.

Andrei Natan

Rutgers University
DCMP (Condensed Matter)

For elucidating the many-body effects of several condensed matter systems, in particular the Kondo model, by discovering and studying their exact solutions.

Averin Dmitri V

Stony Brook University
DCMP (Condensed Matter)

For seminal contributions to the theory of single-

charge-tunneling and mesoscopic effects in metallic, semiconductor, and superconductor junctions, and their applications to quantum information processing.

Avery Paul A.

University of Florida
Particles & Fields

For leadership in developing grid computing resources for high-energy physics and other sciences.

Avishai Yshai

Ben-Gurion University, Israel
DCMP (Condensed Matter)

For important contributions to the physics of electron transport in low dimensional systems and quantum dots, including the effects of disorder, interactions and external magnetic fields.

Back Christina Allyssa

Lawrence Livermore National Lab
Plasma Physics

For the quantitative application of x-ray spectroscopy that has advanced the understanding of high energy density plasmas in the areas of x-ray hohlraums, radiation transport, and high efficiency radiation production.

Baden Andrew Robert

University of Maryland
Particles & Fields

For exceptional work in hadron collider physics, including instrumentation and ideas that contributed to the top quark discovery.

Bailey James Edward

Sandia National Laboratories
Plasma Physics

For pioneering spectroscopic measurements in challenging high energy density experiments, contributing significantly to the advancement of atomic physics in plasmas, z-pinch physics, laboratory astrophysics, inertial fusion, and basic plasma science.

Bartynski Robert Allen

Rutgers University
DCMP (Condensed Matter)

For pioneering experiments to determine the electronic properties of surfaces, especially for leadership in developing Auger Photoelectron Coincidence Spectroscopy (APECS) with synchrotron radiation as a tool for local electronic structure.

Beichner Robert John

North Carolina State University
Forum on Education

For his efforts in advancing the field of physics education research and promoting the application of its findings in the nation's classroom.

Benford Gregory

University of California - Irvine
APS

For theoretical and experimental research in a wide range of fields, introducing new ideas in plasma physics, astrophysical jets, high power microwave physics, particle physics and condensed matter.

Bennett Herbert Stanton

National Institute of Standards and Technology
Forum on Industrial and Applied Physics

For insights into solid-state materials and the development of physical models that led to improved performance of electronic, magnetic, and optical materials.

Berg Bernd A.

Florida State University
Computational Physics

For pioneering lattice gauge theory simulations, innovative contributions to Markov chain Monte Carlo algorithms and their applications to Statistical Physics.

Bern Zvi

UCLA
Particles & Fields

For outstanding contributions to quantum field theory, especially for developing powerful calculational techniques in gauge theories.

Bernstein Robert Howard

Fermi National Accelerator Laboratory
Particles & Fields

For the design and construction of a novel neutrino beam that made possible unprecedented precision measurements.

Bigelow Nicholas P.

University of Rochester
Laser Science

For his insightful research on cold atomic vapors and the control of atomic motion using light pressure, and particularly for his pioneering studies of the creation and manipulation of ultracold multi-species mixtures.

Bigi Ikaros I

University of Notre Dame
Particles & Fields

For correctly predicting large CP violation in B meson decays.

Bimberg Dieter H

Technical University of Berlin
DCMP (Condensed Matter)

For pioneering work in basic understanding, development and first demonstration of self-assembled quantum-dot heterostructures for novel lasers and amplifiers.

Bishop Raymond Francis

UMIST

Forum on International Physics

For pioneering development of the coupled-cluster method and its innovative application across the full spectrum of subfields of physics, as well as for his leadership of the international community of many-body theorists.

Bortoletto Daniela

Purdue University
Particles & Fields

For important contributions to top and bottom quark physics, and leadership in the development and fabrication of precision silicon detectors.

Bower Robert W.

Forum on Industrial and Applied Physics

For the invention and development of the self-aligned gate transistor, and innovative contributions in the CCD, metal silicide and three-dimensional device technologies.

[Bowick Mark John](#)

Syracuse University

DCMP (Condensed Matter)

With formidable analytic skills, numerical simulations and energetic collaborations with experimentalists, Mark Bowick has made significant contributions to understanding polymerized membranes and defect arrays in frozen topographies.

[Brenner Michael](#)

Harvard University

Fluid Dynamics

For his creative, stimulating, and seminal contributions to various subjects in Fluid Dynamics, namely to fluid singularities, single bubble sonoluminescence, electrohydrodynamics, and sedimentation.

[Brill Joseph Warren](#)

University of Kentucky

DCMP (Condensed Matter)

For his innovative experiments on the elastic, thermal and non-linear optical properties of quasi-one-dimensional charge-density-wave materials.

[Broholm Collin Leslie](#)

Johns Hopkins University

Topical Group on Magnetism & Its Applications

For his contributions to understanding low dimensional and frustrated quantum magnetism through neutron scattering.

[Brown J. Michael](#)

University of Washington

Shock Compression Topical Group

For outstanding development and application of novel shock and static techniques for the accurate measurement of the properties of geological and other materials at high pressures.

[Budhani Ramesh Chandra](#)

Indian Institute of Technology Kanpur

DCMP (Condensed Matter)

For his contributions to the understanding of vortices in superconductors, including pinning by linear defects, motion under thermal and electric field gradients, and studies of dissipation with probes of varying time scales.

[Bulsara Adi](#)

Space and Naval Warfare Systems Center

Statistical & Nonlinear Physics

For developing the statistical mechanics of noisy nonlinear dynamical oscillators especially in the theory, application and technology of stochastic resonance detectors.

[Burkardt Matthias](#)

New Mexico State University

Hadronic Physics

For his contributions towards understanding the connection between generalized parton distributions and the distribution of partons in impact parameter space and his contributions to light-cone QCD.

[Burkert Volker Dietmar](#)

Thomas Jefferson National Accelerator Facility

Nuclear Physics

Experimental research in the area of strong QCD and confinement, especially studies of nucleon excitations, their transition form factors, and the nucleon spin response in the resonance region.

[Carlson J David](#)

Lord Corporation

Forum on Industrial and Applied Physics

For contributions to controllable magnetorheological fluids, devices and systems.

[Carlsten John Lennart](#)

Montana State University

Laser Science

For fundamental studies of stimulated Raman scattering.

[Cavanagh Richard Roy](#)

National Institute of Standards and Technology

Chemical Physics

For contributions to the understanding of dynamical processes and energy-transfer mechanisms for molecular absorbates on surfaces.

[Caves Carlton M.](#)

University of New Mexico

DAMOP (Atomic, Molecular, Optical)

For pioneering working on the role of quantum mechanics in the physics of information.

[Cleland Marshall Robert](#)

Ion Beam Applications

Topical Group on Instrument & Measurement

For leadership in and contributions to the development and production of many ion and electron accelerators for research, medicine and industry, and for the promotion of practical applications of ionizing radiation.

[Cohen Robert Edward](#)

MIT Department of Chemical Engineering

Polymer Physics

For seminal contributions to the understanding of the morphology and properties of heterogeneous polymers, in particular, pioneering fundamental work on molecular structure of block copolymers and toughening of crystalline polymers.

[Cooper Peter Semler](#)

Fermi National Accelerator Laboratory

Particles & Fields

For outstanding leadership in experiments studying charm and strange particle physics.

[Coufal Hans Juergen](#)

IBM Almaden Research Center

Forum on Industrial and Applied Physics

For contributions to detection techniques for photo-thermal and photoacoustic phenomena, and to optical data storage.

[Craighead Harold G](#)

Cornell University

DCMP (Condensed Matter)

For his significant advances in experimental studies of the physical properties and utilization of nanoscale materials and structures.

[Czujko Roman](#)

American Institute of Physics

Forum on Physics & Society

For his exemplary service to the physics community through his leadership of the American Institute of Physics' Statistics Research Center, which has accumulated, analyzed, and disseminated high quality, relevant data about the physics profession.

[Dean David Jarvis](#)

Oak Ridge National Laboratory

Nuclear Physics

For his important contributions to understanding of quantum many-body systems and for applications of computational quantum mechanics to the structure of atomic nuclei.

[Degnan James H.](#)

AFRL/DEHP

Plasma Physics

For achievement in advancing the state of the art in high energy density plasma formation, compression, acceleration, and diagnostics.

[dePablo Juan J](#)

University of Wisconsin

Polymer Physics

For the development and application of innovative simulation tools to problems in polymer physics.

[Dewey, Jr Clarence Forbes](#)

Massachusetts Institute of Technology

Fluid Dynamics

For experimental and theoretical studies of high-speed and separated flows, innovations in flow measurement techniques and technology, and the understanding of the biological response of living cells to fluid-mechanical forces.

[Diebold Ulrike](#)

Tulane University

Materials Physics

For groundbreaking research on the role of defects in the interplay between bulk and surface properties of transition-metal oxides and on STM imaging of their surface structure.

[Dobrowolska Malgorzata](#)

University of Notre Dame

DCMP (Condensed Matter)

For her seminal contributions to the understanding of the role of electron spin in optical transitions in semiconductor compounds and alloys, including magnetic semiconductors and their nanostructures.

[Dowben Peter Arnold](#)

University of Nebraska

Topical Group on Magnetism & Its Applications

For his significant experimental contributions to surface magnetism, spin polarization in complex magnetic systems, and metal-to-nonmetal transitions in reduced dimensionality.

[Dressler Rainer Andreas](#)

Air Force Research Laboratory/VSBX

DAMOP (Atomic, Molecular, Optical)

For innovative developments in the study of electron, ion, and photon interactions with molecules and applications to space vehicles and space research.

[Durian Douglas Jack](#)

University of California, Los Angeles

DCMP (Condensed Matter)

For ground-breaking contributions to the measurement and understanding of dynamics in foams and granular media.

[Eaglesham David J.](#)

Lawrence Livermore National Laboratory

Materials Physics

For his seminal discoveries and technical leadership in semiconductor crystal growth and structural defects in epitaxial materials.

[Eckhardt Bruno](#)

Fachbereich Physik

Statistical & Nonlinear Physics

For fundamental contributions to chaotic scattering, periodic orbit theory, and applications of nonlinear concepts in quantum and hydrodynamic systems.

[Eisenberg Robert S.](#)

Rush University Medical Center

Biological Physics

Pioneering contributions to the understanding of ion permeation through membrane proteins.

[Elliott Steven Ray](#)

Los Alamos National Laboratory

Nuclear Physics

For significant contributions in neutrino physics, in particular for solar neutrino experiments that have demonstrated that neutrinos have nonzero mass and for his research on double beta decay.

[Esbensen Henning](#)

Argonne National Laboratory

Nuclear Physics

For significant contributions to the theoretical description of low-energy heavy-ion reactions and breakup reactions of nuclei far from stability, and for extensive contributions to experimental programs.

[Evenson William E.](#)

Brigham Young University

Forum on History of Physics

For his long service to the Forum on the History of Physics as a member of its Executive committee, as Editor of the Forum's Newsletter, and for his physical research.

[Fernando Harindra Joseph](#)

Arizona State University

Fluid Dynamics

For contributing greatly to fundamental and applied environmental fluid mechanics, including notable discoveries for how turbulence interacts with stably stratified inversion layers via waves, instabilities and mixing events.

[Fisher Galen B.](#)

Delphi Research Labs

Forum on Industrial and Applied Physics

For distinguished research in heterogeneous catalysis, using surface science techniques and principles.

[Ford Lawrence H](#)

Tufts University

Gravitational Topical Group

For pioneering contributions to quantum field theory in flat and curved spacetime.

[Fytas George](#)

Foundation for Research & Technology-Hellas

Polymer Physics

For his significant contributions in the dynamics of polymer solutions, blends, block copolymers and soft colloids as well as on the dynamics of amorphous polymers associated with the glass transition.

[Garabedian Paul Roesel](#)

New York University

Plasma Physics

For fundamental advances in the theory of equilibrium and stability in controlled fusion, and for outstanding contributions to the design and optimization of stellarators through innovative techniques in computational physics.

[Gea-Banacloche Julio](#)

University of Arkansas

DAMOP (Atomic, Molecular, Optical)

For his contributions to the understanding of quantum-mechanical effects in the interaction of light with matter, and for his valuable service to the physics community as an associate editor of Physical Review A.

[Gehrz Robert D.](#)

University of Minnesota

Astrophysics

For major contributions to the understanding of the role of classical novae in the interstellar medium, and of the properties of grains and gas in comets, interstellar clouds, and circumstellar winds.

[Gelmini Graciela Beatriz](#)

UCLA

Particles & Fields

For outstanding contributions to the theory of cosmological dark matter, neutrino mass, and the astrophysics of the highest energy cosmic rays.

[Gershoni David](#)

Technion, Israel

DCMP (Condensed Matter)

For pioneering experimental and theoretical studies of the optical properties of nanostructured semiconductors, including nanowires and single self-assembled quantum dots.

[Gibbard Bruce](#)

Brookhaven National Lab

Particles & Fields

For leadership in planning and implementing large-scale computing facilities for high-energy and nuclear physics.

[Gillaspay John Dale](#)

National Institute of Standards & Technology

DAMOP (Atomic, Molecular, Optical)

For providing fundamental insights into the radiation and collisional properties of very highly charged ions through pioneering research with an Electron Beam Ion Trap (EBIT).

[Goode Phillip R.](#)

New Jersey Institute of Technology

Astrophysics

For outstanding research in studies of solar structure and oscillations, in earthshine measurements of the global reflectance, and for critical national and international research leadership in solar astrophysics.

[Grosberg Alexander Yu](#)

University of Minnesota

Polymer Physics

For fundamental contributions in the statistical physics of macromolecules, including pioneering results in phase transitions, quenched disorder, and topology of polymers and biopolymers.

[Gumbs Godfrey Anthony](#)

Hunter College, City University of New York

DCMP (Condensed Matter)

For seminal contributions to the understanding of the optical and transport properties of semiconductor heterostructures and the electronic properties of Fibonacci superlattices.

[Guo Hong](#)

McGill University, Canada

Forum on International Physics

For pioneering contributions to theoretical and computational modeling of quantum transport in nanoelectronic systems.

[Harris Frank E.](#)

University of Florida

Computational Physics

For innovative contributions, over a 50-year period and still continuing, to methods of electronic structure computation for atoms, molecules, and solids, and to the underlying mathematics.

[Harris Alexander Lowe](#)

Brookhaven National Labs

Chemical Physics

For his pioneering work in developing vibrational spectroscopy to probe ultra-fast dynamics at surfaces, and for elucidating the vibrational energy flow pathways of adsorbates at solid surfaces.

[Hass Kenneth Charles](#)

Ford Motor Company

Forum on Industrial and Applied Physics

For significant applications of atomic-level modeling to technological materials and outstanding leadership in the promotion of industrially-relevant research and education.

[Hewitt Jacqueline N.](#)

MIT

Astrophysics

For pioneering investigations of gravitational lenses using radio astronomy, application of gravitational lens studies to cosmology, and leadership in astronomy.

[Hicks Kenneth H.](#)

Ohio University

Nuclear Physics

For his recent leadership role in experiments which have opened the new field of exotic pentaquark baryon study and for his sustained contributions to nuclear physics.

[Hirschfeld Peter Joseph](#)

University of Florida

DCMP (Condensed Matter)

For distinguished contributions to the theory of disordered unconventional superconductors which helped to identify d-wave pairing in the high-temperature superconductors.

[Holloway Stephen](#)

University of Liverpool

Chemical Physics

For his pioneering work on the applications of high-dimensional quantum and classical dynamical simulations to gas-surface reactions and inelastic scattering.

[Huff Howard Richard](#)

International SEMATECH

Forum on Industrial and Applied Physics

For contributions to silicon materials science, and its application to enhanced integrated-circuit performance, yield and reliability.

[Huppert Herbert E.](#)

University of Cambridge

Fluid Dynamics

For pioneering work in geological fluid mechanics including gravity currents, magmas, double-diffusive convections, and solidification.

[Hussain Zahid](#)

Lawrence Berkeley National Laboratory

DCMP (Condensed Matter)

For major scientific contributions in the physics of materials using synchrotron radiation spectroscopies, and for enabling discoveries by others through the development of cutting-edge instrumentation.

[Jacobson Theodore](#)

University of Maryland

Gravitational Topical Group

For pioneering work on spin-connection formulations of gravitational dynamics, black hole thermodynamics, and the possible role of the microstructure of spacetime in black hole physics and high energy particle physics.

[Jawahery Abolhassan](#)

University of Maryland

Particles & Fields

For important contributions to the measurement of bottom quark properties and the CKM matrix elements, including the CP violating phase.

[Ji Hantao](#)

Princeton Plasma Physics Laboratory

Plasma Physics

For seminal contributions of experimental research on basic physical processes important to both laboratory and astrophysical plasmas, including dynamo effects, magnetic reconnection, magnetic helicity conservation, and magnetorotational instability.

[Joynt Robert](#)

University of Wisconsin-Madison

DCMP (Condensed Matter)

For outstanding contributions to the theory of quantum hall effect, heavy fermion materials and high-Tc superconductivity.

[Jung Peter](#)

Ohio University

Biological Physics

For distinguished contributions to statistical and nonlinear physics far from equilibrium and for elucidating the role of noise in biological systems.

[Kajino Toshitaka](#)

National Astronomical Observatory of Japan

Forum on International Physics

For significant contributions to nuclear astrophysics and theoretical nuclear physics and for the promotion of scientific exchange between Japan and the international community.

physics, in particular driven diffusive systems.

Schulz Michael

University of Missouri-Rolla
DAMOP (Atomic, Molecular, Optical)
For Fundamental Experiments on Atomic Break-Up Processes.

Schumacher Benjamin Wade
Kenyon College

DAMOP (Atomic, Molecular, Optical)
For his development of quantum data compression, entanglement enhancement, and quantum capacity theorems has played a central role in the development of quantum information theory.

Schwally Robert Edward
NIST

Forum on Industrial and Applied Physics
For contributions to superconducting materials and applied superconductivity.

Scott John Campbell
IBM Almaden Research Center

Materials Physics
For contributions to the understanding and application of organic electronic materials and devices.

Selvin Paul R.
University of Illinois at Urbana-Champaign
Biological Physics
For imaginative use of single molecule fluorescence to visualize movements of a molecular motor at the nanometer level.

Shapiro Moshe
University of British Columbia

Chemical Physics
For seminal contributions to the study of molecule-light interactions, including photodissociation and the coherent control of molecular processes.

Sharma Vivek Anand
University of California, San Diego

Particles & Fields
For leading contributions to the discovery of B_s meson and the Λ_b , and to the observation of CP violation in the B⁰ system.

Shinar Joseph
Iowa State University

DCMP (Condensed Matter)
For pioneering contributions to studies of H motion in metal hydrides and amorphous Si, and optically detected magnetic resonance studies of luminescent π -conjugated polymers, fullerenes, and organic devices.

Singleton John

Los Alamos National Laboratory
DCMP (Condensed Matter)
For elucidation of many-body and reduced-dimensionality effects in molecular organic crystals and semiconductor systems, featuring creative use of optical and magnetic field techniques and clear technical exposition.

Smolyakov Andrei
University of Saskatchewan, Canada

Plasma Physics
For pioneering contributions to the theory of magnetic islands in high temperature inhomogeneous plasmas, theory of nonlinear effects in inductive gas discharge plasmas and development of the theory of secondary nonlinear instabilities.

Snow Gregory R.
University of Nebraska

Forum on Education
For outstanding contributions to education and public outreach initiatives associated with elementary particle physics and particle astrophysics.

Steadman Stephen
U.S. Department of Energy

Nuclear Physics
For his contributions to heavy ion physics at both low and high energies, his commitment to training students, and his exceptional stewardship of the RHIC program.

Stelbovics Andris Talis
Murdoch University

Few Body Systems Topical Group
For seminal contributions to electron-atom collision theory, including co-development of the convergent-close-coupling method.

Stelle Kellogg Sheffield
Imperial College London

Particles & Fields
For outstanding contributions to quantum supergravity and theories of supersymmetric extended objects.

Stiles Mark David
NIST

Materials Physics
For his creative and skillful use of first principles calculations and phenomenological models that have substantially contributed to our understanding of the physics of magnetic heterostructures.

Straley Joseph Paul
University of Kentucky

DCMP (Condensed Matter)
For his influential theoretical contributions to the statistical mechanics of percolation and liquid crystals.

Stroscio Michael Anthony
University of Illinois at Chicago

Forum on Physics & Society
For the application of physics to issues affecting society, for leadership in government efforts to maintain open scientific communications, and for theoretical research in the physical sciences.

Sugiyama Linda Ellen

Massachusetts Institute of Technology
Plasma Physics
For contributions to the development of numerical simulation for the study of basic questions in plasma physics and the inter-relationship between the numerical and analytical approaches to plasma theory.

Syphers Michael James

Fermi National Accelerator Laboratory
Physics of Beams
For his contributions to non-linear beam dynamics and beam optics design, and to education in accelerator physics.

Tao Rongjia

Temple University
DCMP (Condensed Matter)
For fundamental contributions to the development of electrorheological and magnetorheological fluids and pioneering contributions to the discovery of a new property of superconductors-electric-field induced formation of superconducting balls.

Tarver Craig M

Lawrence Livermore National Laboratory
Shock Compression Topical Group
In recognition of his contributions to shockwave physics and in particular his development and implementation of the Ignition and Growth model for reactions in energetic materials and the non-Equilibrium ZND theory for detonating energetic materials.

Telson Michael L.

University of California-Washington Center
Forum on Physics & Society
For his contributions as both a senior congressional staffer, and a senior administrator in the US Department of Energy to the support of the physical sciences in the US.

Terminello Louis J.

Lawrence Livermore National Laboratory
Materials Physics
For his innovative use of synchrotron radiation spectroscopy in revealing the electronic and atomic structure of new materials.

Thornton Stephen T.

University of Virginia
Forum on Education
For his significant and long time contributions to physics education at the undergraduate and graduate level, especially for preservice and inservice K-12 teachers of physics and physical science.

Tomanek David

Michigan State University
Materials Physics
For contributions towards theoretical understanding of structural and electronic properties of atomic clusters and low-dimensional systems.

Torquato Salvatore

Princeton University
DCMP (Condensed Matter)
For incisive contributions to the theoretical understanding of the structure and macroscopic properties of disordered materials.

Treacy Michael Matthew John
Arizona State University

Materials Physics
For the development of novel electron microscopy techniques and applications to advanced materials including catalysts, zeolites, carbon nanotubes and disordered structures.

Tschirhart Robert Stephen

Fermi National Accelerator Laboratory
Particles & Fields
For leadership in the Fermilab kaon physics program, especially on the study of rare kaon decays.

Tu Yuhai

IBM T.J. Watson Research Center
Statistical & Nonlinear Physics
For outstanding discoveries in statistical physics, such as a novel broken-symmetry phase in two-dimensional systems, and novel applications of sta-

tistical physics to problems in computational biology.

Umstadter Donald P.

University of Michigan
Plasma Physics
For outstanding contributions to the fundamental understanding of relativistic laser-plasma interactions, as well as high-field-gradient charged-particle accelerators and light sources.

Vaida Veronica

University of Colorado
Chemical Physics
For fundamental contributions to the understanding of photodissociation dynamics of excited states and especially in the application of this understanding to processes in the atmosphere.

van Kolck Ubirajara L

University of Arizona
Nuclear Physics
For pioneering work on effective field theories of nuclear systems, including developments in the power counting and structure of two- and three-body forces, and novel predictions from chiral symmetry.

Vicent Jose Luis

Universidad Complutense
Forum on International Physics
For his seminal contributions to the understanding of superconductivity in artificial layered structures and for innovative experimental contributions to the study of magnetic dots.

Voorhees Peter Willis

Northwestern University
Materials Physics
For fundamental contributions to the theory of the kinetics and thermodynamics of morphological change.

Wagner Albert Fordyce

Argonne National Laboratory
Chemical Physics
Theoretical contributions to the fundamentals of chemical collision theory, including energy transfer, recombination, and dissociation reactions.

Waldeck David Hennessey

Chevron Science Center
Chemical Physics
For his fundamental contributions to the molecular and electronic origins of friction in chemical reactions and transport processes in liquid solutions.

Weinstein Lawrence B.

Old Dominion University
Few Body Systems Topical Group
For his original contributions to the study of nucleon-nucleon correlations in nuclei.

Wertheim Michael Stephen

Michigan Technological University
Chemical Physics
For the analytic solution of several important integral equations in the theory of fluids that led to the understanding of the structure and thermodynamics of liquids, including polar liquids.

Wilczek Frank

MIT
Particles & Fields
For the discovery of asymptotic freedom in the theory of the strong interactions.

Woelfle Peter

Universitat Karlsruhe, Germany
DCMP (Condensed Matter)
For his pioneering contributions in condensed matter theory, in particular on the superfluid phases of ³He, on quantum transport in disordered systems and on strongly correlated electron systems.

Wurtele Jonathan Syrkin

University of California, Berkeley
Physics of Beams
For his many theoretical contributions to free electron lasers, laser-plasma acceleration, laser-plasma interactions, and muon beam manipulations.

Xiao Min

University of Arkansas

Laser Science

Contributions to sub-shot-noise measurements and novel linear and nonlinear effects related to electromagnetically induced transparency.

Yakovenko Victor Mikhailovich

University of Maryland
DCMP (Condensed Matter)
For important contributions to the theory of low-dimensional organic conductors and other correlated electronic materials.

Yaney Perry

University of Dayton
APS
For outstanding contributions to the development of physicists through teaching, research and service. Performing significant and long-standing activities in the service of the physics community and mentoring a generation of electro-optics students.

Yarba Victor A

Fermi National Accelerator Laboratory
Physics of Beams
For his technical leadership of frontier accelerator projects in Russia and the US and for fostering international collaborations.

Ye Jun

JILA
Laser Science
For breakthrough developments in the stabilization and synchronization of femtosecond lasers and their application to nonlinear spectroscopy and precision frequency measurement science.

Yeh Nai-Chang

California Institute of Technology
DCMP (Condensed Matter)
For her contributions to the understanding of cuprate superconductors, vortex dynamics and phase transitions of extreme type-II superconductors, and physical properties of ferromagnetic perovskite oxides.

Yu Li-Hua

Brookhaven National Laboratory
Physics of Beams
For creative contributions to the theory of self-amplified spontaneous emissions and high-gain harmonic-generation, and the experimental demonstration of the high-gain harmonic-generation free-electron laser.

Yuen Horace P.

Northwestern University
Laser Science
For seminal contributions to the theory of quantum communications and quantum measurements.

Zank Gary P.

Institute of Geophysics and Planetary Physics
Plasma Astrophysics
For fundamental contributions to the understanding of shocks, particle acceleration and plasma turbulence, and to studies of the solar wind, corona, interplanetary shocks and global heliospheric structure.

Zimmermann Frank

CERN
Physics of Beams
For many theoretical and experimental contributions to accelerator physics including the study of beam-ion and beam-electron cloud interactions, collective instabilities, non-linear optics, and beam measurements.

Zollner Stefan

Motorola, Inc
Topical Group on Instrument & Measurement
For advancement and application of measurements enabling the development of semiconductor materials and processes for microelectronic devices, especially using spectroscopic ellipsometry and high-resolution x-ray diffraction.

2005 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/fellowship>

DIVISIONS

Astrophysics	04/29/05
Biological Physics	04/01/05
Chemical Physics	PAST
Computational Physics	04/15/05
DAMOP (Atomic, Molecular, Optical)	04/15/05
DCMP (Condensed Matter)	PAST
Fluid Dynamics	PAST
Polymer Physics	04/15/05
Laser Science	04/01/05
Materials Physics	PAST
Nuclear Physics	04/01/05
Particles & Fields	04/01/05
Physics of Beams	PAST
Plasma Physics	04/01/05

FORUMS

Physics & Society	04/01/05
History of Physics	05/13/05
International Physics	04/01/05

Industrial and Applied Physics	PAST
Education	04/15/05

TOPICAL GROUPS

Few Body Systems	04/01/05
Precision Measurement Fund. Const.	04/01/05
Instruments and Measurement	04/29/05
Hadronic Physics	04/29/05
Shock Compression	04/01/05
Gravitation	04/01/05
Magnetism and Its Applications	04/01/05
Plasma Astrophysics	04/01/05
Statistical and Nonlinear Physics	04/01/05

APS GENERAL

06/03/05

NOTE: 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.