### 2006 Prizes and Awards

#### Will Allis Prize
Michael Lieberman
University of California – Berkeley

**Citation:** “For his ground-breaking and insightful experimental and theoretical work on the physics of electrical discharges and their applications to plasma processing.”

Lieberman received his Ph.D. from the University of California, Berkeley, in 1968. He joined the Department of Electrical Engineering and Computer Sciences (EECS) at Berkeley in 1968. His research interests are plasma processing of materials and plasma modelling and diagnostics. He has also collaborated on research in nonlinear dynamics. His latest book, co-authored with A.J. Lichtenberg, *Principles of Plasma Discharges and Materials Processing*, was published in 1994, with an expanded second edition appearing in 2005.

#### Hans Bethe Prize
Alastair G.W. Cameron
Harvard University

**Citation:** “For his pioneering work in developing the fundamental concepts of nuclear astrophysics, and for the ideas, laid out almost 50 years ago, that are still the basis of current research in this field.”

Cameron earned his Ph.D. in nuclear physics from University of Saskatchewan and taught at Iowa State College until 1959, when he moved to CalTech. In 1966, he moved to Yeshiva University in New York, and seven years later settled in at Harvard University. His research included astrophysics, planetary sciences and meteoritics. He was among the first to develop the theory of nucleosynthesis, and made important contributions to the study of supernova explosions, neutron stars, planet formation, stellar evolution, and the physics of planetary atmospheres. Shortly after being named winner of the Bethe Prize, Cameron died of heart failure in Tucson, Arizona. He was 80 years old.

#### Biological Physics Prize
Alfred G. Redfield
Brandeis University

**Citation:** “For his seminal contributions to the theory and technical development of NMR spectroscopy, and for pioneering applications of this technique to the study of biological molecules.”

Redfield received a Ph.D. from the University of Illinois in 1953. His postdoc at Harvard recoupled the early NMR papers on spin thermodynamics in the rotating frame, and on perturbation theory of relaxation. He joined the late IBM Watson Laboratory at Columbia University in 1955 where he studied primarily normal and superconducting metals using pulsed NMR. In 1969 he shifted to work on biological NMR. He moved to Brandeis in 1972, where his early work included demonstration and utilization of pulsed FT NMR using soft and composite pulses in, especially, transfer RNA. During his recent retirement he has demonstrated the feasibility of building a device to perform high-resolution field-cycling NMR in a shared commercial (500 MHz) instrument.

#### Macroalgal Photosynthesis Prize
John C. Hardy
Texas A&M University

**Citation:** “In recognition of ultra-high precision measurements and extraordinarily detailed analyses of 0–15 kcal/mol beta decay rates to explore the unitarity of the Cabibbo–Kobayashi–Maskawa quark mixing matrix as a test of the electroweak Standard Model.”

Hardy received his Ph.D. in nuclear physics from McGill University in 1965. He spent the next two years at the Oxford University (England) Nuclear Physics Laboratory, where he worked with the Lawrence Radiation Laboratory at the University of California, Berkeley. He returned in 1970 to Canada, joining the staff at the Chalk River Nuclear Laboratories of AECL. He led AECL in 1997 to join the Cyclotron Institute of Texas A&M University. His current research interests are nuclear structure of the weak interaction via superallowed Fermi beta decay. His past interests include shell-model calculations of nuclear structure, meson-exchange currents, magnetic moments, axial-vector couplings in beta decay and transfer reactions.

#### Otvos Prize
C. Lewis Cocke
Kansas State University

**Citation:** “For a sustained record of novel experimental developments and new insights into interactions of ion and photon beams with atoms and molecules.”

Cocke received his Ph.D. in nuclear physics at Caltech in 1967. After two years as a research associate at the Centre de Recherches Nucléaires in Strasbourg, France he moved to atomic physics and joined the physics faculty at Kansas State University. His atomic physics work has been in the areas of energetic ion-atom collisions, especially involving highly-charged ions, recoil ion physics, momentum imaging, and the interaction of synchrotron radiation and short intense laser pulses with atoms and light molecules.

#### O. E. Buckley Prize
Noel A. Clark
University of California – Berkeley

**Citation:** “For groundbreaking experimental and theoretical contributions to the fundamental understanding and applications of liquid crystals, particularly their ferroelectric and chiral properties.”

Clark received his Ph.D. from MIT in 1970. He then spent seven years at Harvard, and in 1977 he joined the faculty of the University of Colorado, Boulder, where he is now professor of physics and director of the Liquid Crystal Materials Research Center. In 1984 he co-founded Displaytech, Inc., currently the world’s largest producer of ferroelectric liquid crystal devices and materials. Clark has worked in many areas in soft condensed matter and complex fluid physics, including liquid crystals, colloidal liquids and crystals, liquid structure and melting, and biophysics. His current interests are in liquid crystals of nucleic acids.

#### Dennis Heitner Prize
Ian S. Towner
Queen’s University

**Citation:** “For constructing supergravity, the first supersymmetric extension of Einstein’s theory of general relativity, and for their central role in its subsequent development.”

Towner received his Ph.D. from MIT in 1974. After a year at Chalmers University of Technology, where he is now associate professor in Physics and Chemical Engineering, he moved to atomic physics at Brandeis University in 1976. He spent 1983-1987 as a research associate at the National Laboratories, as a CNRS Visiting Scientist at the Laboratoire de Physique Theorique, Ecole Normale Superieure, Paris, and at the Theoretical Studies Division at CERN, Geneva. He became a staff member of CERN in 1981 and a professor of physics at the University of California, Los Angeles, in 1985. Since 1986 he has been a senior staff member at CERN. Ferrara has written many papers in theoretical elementary particle physics and mathematical physics.

#### Daniel Freedman Prize
Sergio Ferrara
CERN

**Citation:** “For constructing supergravity, the first supersymmetric extension of Einstein’s theory of general relativity, and for their central role in its subsequent development.”

Ferrara graduated from the University of Rome in 1968. Since then he has worked as a researcher at the Frascati National Laboratories; as a CNRS Visiting Scientist at the Laboratoire de Physique Theorique, Ecole Normale Superieure, Paris, and at the Theoretical Studies Division at CERN, Geneva. He became a staff member of CERN in 1981 and a professor of physics at the University of California, Los Angeles, in 1985. Since 1986 he has been a senior staff member at CERN. Ferrara has written many papers in theoretical elementary particle physics and mathematical physics.

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James M. Grodardy Prize

Hongjui Dai
Stanford University

Citation: For developing novel synthesis pathways for preparing carbon and boron nitride nanotubes, and for pioneering applications of these for sensing, electronics and nanomechanics.

Born in the Shangyuan, Hunan, province of China, Dai received his Ph.D. from Harvard University in 1994. After postdoctoral work with Richard E. Smalley at Rice University, in 1997, he joined the faculty of Stanford University. Dai’s research group has developed chemical vapor deposition synthesis methods for carbon nanotubes, including deterministic synthesis of nanotube arrays useful for integration into various devices for quantum transport and other mesoscopic physics studies. The group’s latest research includes interfacing carbon nanotubes with biological systems for novel nanobiotechnology applications, and using nanotubes as novel near infrared antennae for nuclear acid delivery and cancer cell destruction.

George E. Pake Prize

Charles B. Duke
Xerox Innovation Group

Citation: For groundbreaking theoretical contributions to the understanding of tunneling in solids, and metastatic scattering of low-energy electrons in solids, and for his outstanding contributions to Xerox Corporate Research both as an intellectual leader and researcher manager.

Duke is vice president and senior research fellow at the Xerox Innovation Group. Prior to holding this position, he was deputy director and chief scientist of the Pacific Northwest Division of the Battelle Memorial Institute and affiliate professor of physics at the University of Washington. From 1972 to 1988 he held various technical and management positions at the Xerox Research Laboratories in Webster, NY. He was an adjunct professor of physics at the University of Rochester, Illinois, following six years at General Electric in Schenectady, NY. He received his Ph.D. in physics from Princeton University in 1963. He served as president of the American Vacuum Society in 1979. He is currently the chair of a National Research Council study of Network Science.

W.K.H. Panofsky Prize

William Ford
University of Nebraska

John Jaros
SLAC

Citation: For leading contributions to the discovery of the long b-quark lifetime with the MAC and Mark II experiments at SLAC. The experimentally large value of the b-quark lifetime revealed the hierarchy of the Cabibbo-Kobayashi-Maskawa quark mixing matrix.

Ford earned his PhD in physics at Princeton University in 1967. After postdoctoral positions at Princeton and CERN, He joined the faculty of the University of Pennsylvania. At Fermilab he participated in the early observations in neutrino interactions of weak neutral currents and the dimuon signature for charm production. Since 1978, he has been a member of the physics faculty at the University of Colorado. Most of his research has been in electron-positron annihilation experiments. His current emphasis is in B meson decays, where his group has discovered a number of charmed meson decay CP violating parameters.

Jaros did his graduate work in experimental particle physics at the University of California at Berkeley, receiving his PhD in 1975. He then held a three-year postdoc at SLAC. He has remained at SLAC ever since. His research interests have centered on "vertex physics," and he has been involved in both lepton lifetimes and mixing, and taggered quark flavor and charge. At PEP, he led the B-Sea detector and Vertex Detector project and measured the tau, charm, and b lifetimes. Jaros’ current interests center around physics and detectors for the International Linear Collider.

Earl. K. Plyler Prize

Mark Johnson
Yale University

Citation: For the applications of spectroscopic methods toward the understanding of solvation on the microscopic scale, especially in solutions of proteins and hydroxide anions by water.

Johnson earned his PhD in 1983 from Stanford University. He is presently a professor of physics at Yale University. His research interests include ultrafast physical chemistry and pump-probe kinetic studies of molecular, cluster, and model system models with which to expose fundamental, molecular level paradigms underlying nanoscale and condensed phase science. He has served on the executive committee of the APS Division of Laser Science, and in the physics advisory division of the American Chemical Society.

Polymers Prize

Ludwig Leibler
Ecole Superieure de Physique et Chimie Industrielle, Paris

Citation: For outstanding theoretical contributions to the fundamental understanding of self-assembled lipid bilayer copolymers and gels, and for his leadership that continues to inspire advances and the challenges associated with the next generation of high energy accelerators.

Leibler received his PhD in 1976 in theoretical physics from Warsaw University, and then spent two years as a post-doctoral fellow at the College de France in Paris and at Saclay, France. He is a researcher in Centre National de Recherche Scientifique (CNRS). In 2001 he became an adjunct professor of soft matter and chemistry at Ecole Superieure de Physique et Chimie Industrielles in Paris where his research interests include influence of molecular disorder on the macroscopic structure and properties of polymer materials, impact resistance, fracture and adhesion, design of stimuli responsive materials and supramolecular chemistry.
Vanderbilt received his PhD in physics from the Massachusetts Institute of Technology in 1981. He has been spending most of his time searching for a Bosnian war crimes tribunal.

Citation: For his conceptual breakthroughs in his development of the ultrafast pseudopotential and the modern theory of polarization, and their impact on first-principles investigations of the properties of materials.

**ROBERT R. WILSON PRIZE**

Glen Lamberton

Lawrence Berkeley National Laboratory

Citation: For fundamental contributions to accelerator science and technology particularly in the area of beam electrodynamics including the development of beam instrumentation for the feedback systems that are essential for the operation of high luminosity electron and hadron colliders.

**JOSEPH F. KEITHLEY AWARD**

Frances Hellman

University of California, Berkeley

Citation: In recognition of using emerging micromachining techniques to significantly extend the range of calorimetry into the realm of nano-scale science, by construction of Si-based microcalorimeters capable of operating in extreme environments with unprecedented sensitivity and accuracy.

**MARIA GOEPPERT-MAYER AWARD**

Hui Cao

Northern University

Citation: For her groundbreaking contributions to the experimental studies of coherent light generation and transport in disordered media, including her invention of microlasers based on photonic nanostructures.
For his leadership in combining numerical simulations with experimental data to develop advanced models of the response of materials to shock, impact, and penetration.

Citation: “For the development of computational techniques to handle 3D compact vortices in rotating shear flows, and for the application of these techniques to solve longstanding problems in the theory of planet and star formation.”

Nicholas Metropolis Award

Joseph A. Barranco
University of California, Berkeley

For contributions to understanding chemical dynamics of ion-molecule reactions, size-selected model studies at the University of Maryland at College Park. Her doctoral work was on ultracold bosonic atoms loaded in optical lattices with special focus on the superfluid to Mott insulator phase transition. She completed her PhD in 2004. In 2005 she was awarded the ITAMP postdoctoral Fellowship at the Harvard-Smithsonian Center for Astrophysics, where she does research in atomic physics.

Dissertation Award in Nuclear Physics

Li-Bang Wang
University of Illinois, Urbana-Champaign

For his outstanding and innovative experimental work to precisely measure the charge radius of the exotic and short-lived isotope $^18$Ne by laser spectroscopy studies of single atoms stored in a magneto-optical trap. The result helps to reveal the nature of weakly bound nuclei and serves as a key benchmark for nuclear models.

Alyssa Marino received her A.B. degree in physics from Princeton University in 1998. She pursued neutrino research in graduate school at the University of California at Berkeley, receiving her PhD in 2004. The topic of her dissertation was a measurement of the solar neutrino flux in the second phase of the SNO experiment. The results of this measurement provided compelling model-independent evidence for neutrino flavor changes. Since graduating, Marino has shifted the focus of her research to accelerator-generated neutrinos. She is currently a postdoctoral researcher at Fermi National Accelerator Laboratory.

APS Council Announces 2005 APS Fellows

The APS Council elected the following as Fellows of the Society at its November 2005 meeting. The nominations for fellowship are reviewed each year; the fellows are announced for the year in which they are nominated, and are forwarded for review to the appropriate divisional, 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.

2005 Fellows (alphabetical by last name)

Alan Bell
Gravitational Topical Group

For his contribution to the study of atomic collision processes through electron and photon polarization analysis and the systematic development of quantum-mechanical completely complete descriptions.

Andersen Scott Law
University of clan
Chemical Physics

For contributions to understanding chemical dynamics of non-molecule reactions, site-selected model catalytic vortices and detectors.

Andersen Nils Overgaard
Niels Bohr Institute, Denmark
DAMOP (Atomic, Molecular, Optical)

For his contribution to the study of atomic collision processes through electron and photon polarization

Mitsuyoshi Tanaka
Dissertation Award

Maria Florencia Canelli
Fermilab

For developing a new technique for extracting the maximum information in top quark events in order to measure the W boson helicity.

Citation: “For developing a new technique for extracting the maximum information in top quark events in order to measure the W boson helicity.”

Canelli graduated in 1995 from the Universidad Nacional de Asuncion, Paraguay. She obtained her Ph.D. from the University of Rochester in 2003. Since 2003, she has held a postdoctoral appointment with UCLA at the CDF experiment at Fermilab. Canelli’s dissertation involved a novel technique to gain information about the properties of the top quark. The method, is based on a direct comparison of all measured variables in antitop-top events produced at the Fermilab Tevatron with a leading matrix-element that describes the entire production and decay process. In her dissertation, she examined the decays of W bosons in such events, in order to establish the spin of the W boson in top-quark decays correlates with its momentum vector.