

WE HEAR THAT

Pioneering Neutrino Astronomers to Share 2000 Wolf Prize in Physics

The Wolf Foundation has announced that **Raymond Davis Jr** and **Masatoshi Koshih**a will be the corecipients of the Wolf Prize in Physics for 2000. They are being cited “for their pioneering observations of astronomical phenomena by detection of neutrinos, thus creating the emerging field of neutrino astronomy.” The two researchers, who developed complementary methods for neutrino detection, will share the \$100 000 prize, which will be awarded in a ceremony in Israel in May.

The foundation, based in Herzliya, Israel, noted that “their observations of the elusive neutrinos of astrophysical origin have opened a new window of opportunity for the study of astronomical objects, such as the Sun and exploding stars, and the study of fundamental properties of matter.”

Currently a professor of astronomy at the University of Pennsylvania, Davis developed the first large-scale radiochemical neutrino detectors while at Brookhaven National Laboratory. He obtained the first measurement of the flux of neutrinos from the sun using a 400 000-liter tank of tetrachloroethylene in an abandoned gold mine in Homestead, South Dakota. A handful of incoming neutrinos were captured by chlorine atoms, which were transformed into argon atoms through inverse β decay. Davis developed the techniques of extracting the few argon atoms from the tank—critical to the experiment’s success. With the continuing theoretical sup-



MASATOSHI KOSHIHA

port of John Bahcall, the measurements were shown to provide a very stringent test for theories of the solar interior.

Koshih led the design and construction of the Kamiokande neutrino detector and its successor, Superkamiokande. The approach used in these detectors is to record the Čerenkov radiation given off by electrons, positrons, and muons created when neutrinos scatter in the detector’s large tanks of highly purified water. The detectors provided the first recording of the arrival time, energy, and direction of incoming neutrinos. These attributes allowed researchers to identify neutrinos from Supernova 1987a; to establish that low-energy neutrinos originate in the Sun; and to measure the fluxes of different flavors of neutrinos produced in the atmosphere by cosmic rays, thereby providing the first evidence that neutrinos have mass (see PHYSICS TODAY, August 1998, page 17). Koshih is a professor emeritus at the International Centre for Elementary Particle Physics at the University of Tokyo.

Franklin Institute to Present Awards

The Franklin Institute will honor 10 scientists and a business executive next month for their achievements in science and technology. Six of the laureates are being cited for physics-related research.

Eric Cornell, **Carl Wieman**, and **Wolfgang Ketterle** will receive the Benjamin Franklin Medal in Physics for, in the words of the citation, “their epoch-making experimental confirmation of the 1925 prediction by Satyendra Bose and Albert Einstein, who claimed on theoretical grounds that a dilute gas can condense into a large quantum-mechanical system and display properties that are usually found only on an atomic or molecular scale.” Cornell is a senior scientist at the National Institute of Standards and Technology in Boulder, Colorado, and a fellow of JILA and a professor adjoint at the University of Colorado at Boulder. Wieman is also a fellow of JILA and a distinguished professor of physics at the university. Ketterle is the John D. MacArthur Professor of Physics at MIT.

Antoine Labeyre will garner the Benjamin Franklin Medal in Engineering for “the invention of speckle interferometry, which permits large ground-based astronomical telescopes to achieve their full theoretical angular resolution, and for pioneering work in extending Michelson’s method for performing long-baseline multi-telescope interferometry to obtain angular resolutions on the order of 10^{-3} arc-seconds.”

The Benjamin Franklin Medal in Engineering will also be presented to **James Powell** and **Gordon Danby**, both formerly of Brookhaven National Laboratory, for their 1968 invention “of a novel repulsive magnetically levitated train system using superconducting magnets and subsequent work in the field.”

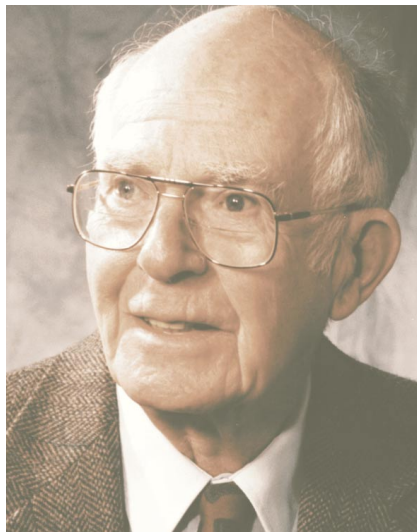
APS to Bestow Honors at California Meeting

The American Physical Society will present awards and prizes to several individuals at its April 2000 meeting in Long Beach, California next month.

The Hans A. Bethe Prize will go to **Igal Talmi**, a professor emeritus of particle physics at the Weizmann Institute of Science in Rehovot, Israel.

Talmi is being honored for his “pioneering work on the shell model of the nucleus that laid the foundation of much of what we know about nuclear structure,” according to the award citation.

Raymond G. Arnold, a research professor of physics at the University



RAYMOND DAVIS JR

of Massachusetts, has been named to receive the Tom W. Bonner Prize in Nuclear Physics. He is being praised for his "leadership in pioneering measurements of the electromagnetic properties of nuclei and nucleons at short distance scales that addressed the fundamental connection of nuclear physics to quantum chromodynamics and motivated new experimental programs."

The recipient of the W. H. K. Panofsky Prize in Experimental Particle Physics will be **Martin Breidenbach**, a professor of physics at the Stanford Linear Accelerator Center. According to the award citation, Breidenbach is being honored for his "many contributions to e^+e^- physics, especially with the SLD detector at the Stanford Linear Collider," and for his involvement in all aspects of the project that led to "important advances both in the measurement of electroweak parameters and in accelerator technology."

The Joseph A. Burton Forum Award will be given to **Steven Fetter**, an associate professor in the school of public affairs at the University of Maryland, College Park. Fetter is being recognized for "developing the technical basis for diverse new initiatives in nuclear arms control and non-proliferation policy and for communicating the relevant scientific results and their context effectively to policy makers and the public."

The Dannie Heineman Prize for Mathematical Physics will go to **Sidney R. Coleman**, Donner Professor of Science at Harvard University. Coleman is being recognized for his "incisive contributions to the development and understanding of modern theories of elementary particles." The prize citation notes in particular his "contributions to symmetry breaking and the roles played by internal and space-time symmetries as well as the structure of solutions to an important model in quantum field theory."

The Aneesur Rahman Prize for Computational Physics will go to **Michael J. Creutz** for "first demonstrating that properties of QCD could be computed numerically on the lattice through Monte Carlo methods, and for numerous contributions to the field thereafter." Creutz is a senior physicist at Brookhaven National Laboratory.

Jeremiah D. Sullivan, a professor of physics at the University of Illinois at Urbana-Champaign, will garner the Leo Szilard Award. Sullivan is being recognized for his "leadership in addressing technically complex and

often controversial national security issues, such as anti-ballistic missiles, stockpile stewardship, and a comprehensive test ban" and for "setting a high standard for applying the rigorous methods of physics to the challenging problems of integrating advanced technology with sound policy in a democratic society."

Maury Tigner, the H. A. Bethe Professor of Physics Emeritus at Cornell University, has been selected to receive the Robert R. Wilson Prize for his "notable contributions to the accelerator field as an inventor, designer, builder, and leader, including early pioneering developments in superconducting radio frequency systems, inspiration and intellectual leadership for the construction of CESR, and leadership of the SSC Central Design Group."

The J. J. Sakurai Prize for Theoretical Particle Physics will go to **Curtis G. Callan Jr.** Chairman of the physics department at Princeton University, Callan is being recognized for his "classic formulation of the renormalization group" and for his contributions to "instanton physics and to the theory of monopoles and strings."

The Edward A. Bouchet Award will be presented to **Philip W. Phillips**, an associate professor of physics at the University of Illinois at Urbana-Champaign. Phillips will be honored for "opening new vistas in the study of disordered and strongly correlated condensed matter physics, including the random dimer model and the size dependence of the Kondo effect."

Donald T. Jacobs will garner the Prize to a Faculty Member for Research in an Undergraduate Institution for his "research contributions to critical phenomena in binary fluids, and for his sustained excellence and enthusiasm in promoting undergraduate research, both within and beyond his laboratory." Jacobs is the Victor J. Andrew Professor of Physics at the College of Wooster in Wooster, Ohio.

The Outstanding Doctoral Thesis Research in Beam Physics Award will be given to **Mei Bai**. She is being recognized for her "work in the theory, experimental demonstration, and clear explanation of a method using an RF dipole for overcoming intrinsic spin resonances in polarized proton acceleration." Bai is currently a research associate at Brookhaven National Laboratory.

The 1999 Leroy Apker Award for research at a PhD-granting institution will be given to **Govind Krishnaswami** for his "achievements as an undergraduate student at the University of Rochester and particularly his

research entitled 'A Model of Interacting Partons for Hadronic Structure Functions.'" Krishnaswami is currently continuing his research at the University of Rochester.

The 1999 Leroy Apker Award for research at a non-PhD-granting institution will go to **Brian Gerke** for his "achievements as an undergraduate student at Williams College and particularly his research entitled 'Ultrafast Photoisomerization Dynamics: A Tight-Binding Model Applied to Small Alkenes.'" Gerke is currently in England studying astrophysics at the University of Cambridge on a two-year fellowship.

AGU Medals Awarded at Fall Meeting

During the 1999 fall meeting of the American Geophysical Union, held in San Francisco in December, seven individuals received recognition for their contributions to geophysics.

The Charles A. Whitten Medal went to **Richard I. Walcott**, an emeritus professor of geology at Victoria University of Wellington in New Zealand. The Whitten Medal is given for outstanding achievement in research on the form and dynamics of Earth and the other planets. The medal citation praised Walcott's "great contributions to our understanding of tectonics" and noted that his research is helping to bring geodesy "back to its rightful place at the center of geophysics."

The Maurice Ewing Medal, given jointly by AGU and the US Navy for contributions to marine geophysics, went to **Arnold L. Gordon**. Gordon, a professor of oceanography and a member of the research staff at Columbia University's Lamont-Doherty Earth Observatory, was honored for his "nearly forty years of outstanding scientific contributions," which have spanned scales and oceans "from the meter scale to the global thermohaline circulation; from the hot tropical regions to the cold polar environments," and for his "tireless and exhaustive service to the oceanographic community."

Wilfried H. Brutsaert received the Robert E. Horton Medal, which is given for outstanding contributions to the geophysical aspects of hydrology. Brutsaert, a professor of civil and environmental engineering at Cornell University, was honored for such achievements as his "original and incisive contributions in the descrip-