

Wolf Foundation Presents Prizes in Physics, Chemistry, and Mathematics

At a special meeting of the Knesset next month, Israeli President Moshe Katsav will present the 2005 Wolf Prizes. **Daniel Kleppner** will receive the physics prize, **Richard Zare** will receive the chemistry prize, and **Gregory Margulis** and **Sergei Novikov** will split the mathematics prize.

The Lester Wolfe Professor of Physics at MIT, Kleppner is being recognized for “groundbreaking work in

selective, and subcellular levels.” Zare is the Marguerite Blake Wilbur Professor in Natural Science at Stanford University.

Margulis was cited “for his monumental contributions to algebra, in particular to the theory of lattices in semi-simple Lie groups, and striking applications of this to ergodic theory, representation theory, number theory, combinatorics, and measure theory.” The jury adds, “Though his work ad-

L’Oréal and UNESCO Honor Five Women Physicists

In a special ceremony in Paris last month, cosmetics giant L’Oréal and the United Nations Educational, Scientific and Cultural Organization recognized five women, one from each continent, with the L’Oréal–UNESCO for Women in Science Awards. This year’s recipients are **Zohra Ben Lakhdar**, **Belita Koiller**, **Dominique Langevin**, **Myriam P. Sarachik**, and **Fumiko Yonezawa**. The awards, which alternate each year between the life sciences and materials science (including physics and chemistry), are each accompanied by a cash prize of \$100 000. This year’s presentation in materials science appropriately coincides with the World Year of Physics 2005.

Ben Lakhdar, the laureate for Africa, is a professor of physics at the University of Tunis in Tunisia. She is being honored “for her experiments and models on infrared spectroscopy and its applications to pollution detection and medicine,” according to the citation. She “has greatly furthered the development of optics and photonics as a scientific discipline in Tunisia and all of Africa” and has made “a number of valuable contributions to optical science and its applications in many different areas.”

Koiller was chosen as the laureate for Latin America “for her innovative theoretical research on electrons in disordered materials such as glass.” The selection jury adds, “Belita Koiller is a renowned theorist, whose innovative work has helped improve the understanding of complex condensed matter systems.” She is a professor of physics at the Federal University of Rio de Janeiro in Brazil.

“For her fundamental investigations of detergents, emulsions, and foams,” Langevin is the laureate for Europe. The jury praised the valuable contributions that her work has made in industry, “from petroleum to laundry detergents, milk proteins, hair products, nuclear waste treatment, and even the construction of a foam module for the International Space Station.” She is a director of research in the laboratory for the physics of solids at the University of Paris–Sud in Orsay, France.



atomic physics of hydrogenic systems, including research on the hydrogen maser, Rydberg atoms, and Bose–Einstein condensation,” according to the citation. “Over the last 45 years,” the prize jury adds, he “has made fundamental contributions to atomic physics and quantum optics, mainly using hydrogen and hydrogen-like atoms. He built new devices, performed spectroscopic tests of extreme precision, and investigated novel quantum phenomena.” Among the contributions highlighted by the foundation are the development by Kleppner and Norman Ramsey of the hydrogen maser in 1960 and the Bose–Einstein condensation of hydrogen, achieved in 1998 with Thomas Greytak.

Zare is receiving the chemistry prize “for his ingenious applications of laser techniques for identifying complex mechanisms in molecules and their use in analytical chemistry.” The jury praised his “seminal contributions to the theory and practice of both physical and analytical chemistry.” Among those contributions are “novel techniques in applied physical chemistry [that] have become indispensable to progress in chemical and biochemical analysis, particularly in relation to detection at the single-molecule, area-

dresses deep unsolved problems, his solutions are housed in new conceptual and methodological frameworks, of broad and enduring application.” He is a professor of mathematics at Yale University.

Novikov, distinguished university professor in the mathematics department and the institute for physical science and technology at the University of Maryland, College Park, and a principal researcher at the Landau Institute for Theoretical Physics in Moscow, is being honored “for his fundamental and pioneering contributions to algebraic and differential topology, and to mathematical physics, notably the introduction of algebraic–geometric methods.” His contributions to mathematical physics include a systematic study of finite-gap solutions of two-dimensional integrable systems and work on “almost commuting” operators that appear in string theory and matrix models.

The Wolf Prizes are sponsored by the Wolf Foundation, based in Herzlia Bet, Israel. The prizes, of \$100 000 each, are given every year in four out of five scientific fields, in rotation: agriculture, chemistry, mathematics, medicine, and physics.

A distinguished professor of physics at the City College of New York, Sarachik was selected as the laureate for North America “for important experiments on electrical conduction and the transition between metals and insulators.” The jury acknowledged in particular her “seminal contributions to Kondo physics, a central theme in condensed matter physics, and the metal–insulator transition.”

Yonezawa, professor emeritus of physics at Keio University in Yokohama, Japan, is the laureate for Asia–Pacific. She is being recognized “for her pioneering theory and computer simulations of amorphous semiconductors and liquid metals.” She has “accomplished monumental work in the field of glass transition,” and with her graduate students “earned international recognition for their discovery of a completely new mechanism in metal–nonmetal transition.”

Capasso, Wilczek, and Zeilinger Share King Faisal Science Prize

At a ceremony in Riyadh, Saudi Arabia, this month, the King Faisal Foundation will present three physicists with the 2005 King Faisal Science Prize (Physics). **Federico Capasso, Frank Wilczek, and Anton Zeilinger** will split the cash endowment of 750 000 riyals (\$200 000), and each will receive a certificate handwritten in Diwani calligraphy and a commemorative gold medal.

The Robert L. Wallace Professor of Applied Physics at Harvard University, Capasso was praised by the foundation as “one of the most creative and influential physicists in the world.” The citation acknowledges his international reputation for having designed and demonstrated the quantum cascade laser. This lasing technique, “perhaps the most important development in laser physics during the last decade, signifies an imaginative breakthrough in this field” that enables “a remarkable contribution of excellent solid-state science and laser physics with new solid-state technology.”

Wilczek, Herman Feshbach Professor of Physics at MIT, is being recognized for “a host of important contributions to several arenas.” Singling out his “elucidation of quantum chromodynamics as the correct model for the strong force,” the citation says that “this masterpiece, alongside his other seminal achievements, elevates

him to the ranks of the world’s most prominent scientists.”

Zeilinger, writes the foundation, has made “contributions ranging from epistemological and foundational research to the forefront of modern quantum technology.” A professor of physics at the University of Vienna and codirector of the Institute of Quantum Optics and Quantum Information of the Austrian Academy of Sciences, Zeilinger has applied “the laws of quantum mechanics for the teleportation of the properties of a particle, heralded as a scientific milestone” and “successfully identified quantum cryptography as the only current method guaranteeing the confidentiality of a transmitted message as governed by natural laws.”

Nambu, Vail Receive Franklin Medals

This month the Philadelphia-based Franklin Institute will present Benjamin Franklin Medals to two individuals pursuing physics-related research.

Yoichiro Nambu is receiving the 2005 Benjamin Franklin Medal in Physics for “his pathbreaking contributions leading to our modern understanding of sub-atomic particles—the standard model,” writes the institute. “His work has revolutionized our ideas about the nature of the most fundamental particles and the space through which they move.” Nambu is the Harry Pratt Judson Distinguished Service Professor Emeritus in the University of Chicago’s physics department and Enrico Fermi Institute.

The 2005 Benjamin Franklin Medal in Earth and Environmental Science is going to **Peter R. Vail**, W. M. Ewing Professor of Geology and Geophysics at Rice University, “for his pioneering and innovative ideas for using seismic reflections to identify sequences of subsurface rock layers,” which has greatly enhanced exploration for oil-containing rock. The citation also acknowledges his contribution to the understanding of Earth’s geological history through his recognition that “similar changes in the rock record appear worldwide and can be attributed to global changes in sea level.”

The awards ceremony on 21 April marks the culmination of Awards Week at the institute. Other activities that week include a “meet the scientists” program, special exhibits at the institute’s science museum, and an array of lectures, symposia, and discussions.

APS Presents Awards at April Meeting

The American Physical Society will honor 12 individuals and one collaboration at its meeting this month in Tampa, Florida.

Stan Woosley is receiving the Hans A. Bethe Prize 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,” according to the citation. He is a professor of astronomy and astrophysics at the University of California, Santa Cruz.

The Tom W. Bonner Prize in Nuclear Physics is going to **Roy J. Holt**, senior physicist and chief of the medium-energy physics group at Argonne National Laboratory. He is being recognized for “his pioneering role in experimental studies of the structure of the deuteron and especially for his innovative use of polarization techniques in these experiments.”

Bryce S. DeWitt is being honored posthumously with the Einstein Prize “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.” He was the Jane and Roland Blumberg Professor Emeritus in Physics at the University of Texas at Austin until his death last September.

Robert H. Austin has garnered the Julius Edgar Lilienfeld Prize “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.” He is a professor of physics at Princeton University.

The W. K. H. Panofsky Prize in Experimental Particle Physics will be presented to **Piermaria J. Oddone**, deputy director of Lawrence Berkeley National Laboratory, “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.” He will become the director of Fermilab in July.

Susumu Okubo is receiving the J. J. Sakurai Prize for Theoretical Particle Physics “for groundbreaking investigations into the pattern of