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resonance methods that elucidate the potential energy landscapes of flexible biomimetic molecules and their hydrates by optical control of isomer populations.”

Glenn Fredrickson wins the Polymer Physics Prize “for insightful and predictive theories regarding the thermodynamics and dynamics of macromolecular systems.” He is a professor of chemical engineering at the University of California, Santa Barbara.

Jun Ye, a JILA fellow and associate professor adjoint of the physics department at the University of Colorado, Boulder, receives the I. I. Rabi Prize in Atomic, Molecular, and Optical Physics. Ye is being recognized “for advances in precision measurement, including techniques for stabilizing and measuring optical frequencies, controlling the phase of femtosecond laser pulses, and measuring molecular transitions.”

Daniel Frenkel is being honored with the Aneesur Rahman Prize for Computational Physics “for groundbreaking contributions to computational physics through the development of novel methodologies and algorithms to probe soft matter systems, thereby providing understanding of their diverse behaviors.” He is a researcher at the FOM Institute for Atomic and Molecular Physics in Amsterdam.

The J. J. Sakurai Prize for Theoretical Particle Physics goes to **Stanley Brodsky** “for applications of perturbative quantum field theory to critical questions of elementary particle physics, in particular to the analysis of hard exclusive strong interaction processes.” Brodsky is a professor in SLAC’s theoretical physics group.

Szymon Suckewer wins the Arthur L. Schawlow Prize in Laser Science “for pioneering contributions to the generation of ultra-short wavelength femtosecond lasers and x-ray microscopy.” Suckewer is a professor of mechanical and aerospace engineering at Princeton University.

Dennis E. Grady receives the Shock Compression Science Award “for his pioneering contributions into the fundamental principles controlling dynamic failure and fragmentation, [for] developing a large database of the dynamic response of brittle materials, and [for] identifying a universal relationship between shock wave structure and its amplitude.” He is an associate and principal scientist with Applied Research Associates in Albuquerque, New Mexico.

The Leo Szilard Lectureship Award goes to **James E. Hansen**, head of NASA’s Goddard Institute for Space Studies in New York City and an ad-

junct professor in the Earth and environmental sciences department at Columbia University. He receives this award “for his seminal contributions to climate physics, especially the incorporation of radiative transfer in climate models, and his tireless efforts to bring the results of climate science to the attention of policymakers and the public.”

The John Wheatley Award is bestowed on **F. Bary Malik**, emeritus research professor in theoretical nuclear and atomic physics at Southern Illinois University at Carbondale. He receives the award “for his extensive contributions to developing physics and inspiring physicists in emerging nations through insightful personal collaboration, continuing education of graduate students, creation of research centers and groups in developing countries, organization of international meetings, and attracting resources in the USA and internationally to sustain all these activities for over thirty years.”

The Robert R. Wilson Prize for Achievement in the Physics of Particle Accelerators is being presented to **Lee C. Teng**, who retired from Argonne National Laboratory in 2005. He is being honored “for invention of resonant extraction and transition crossing techniques critical to hadron synchrotrons and storage rings, for early and continued development of linear matrix theory of particle beams, and for leadership in the realization of a facility for radiation therapy with protons.”

NAE hands out awards

The National Academy of Engineering has bestowed its highest honors in recognition of achievements that have revolutionized how people use information and that have opened new medical applications of biomechanics, among other milestones. Two of the recipients do physics-related work. The awards were presented in February during a ceremony in Washington, DC.

The NAE awarded its Charles Stark Draper Prize—a \$500 000 annual award that honors engineers whose accomplishments have significantly benefited society—to **Timothy Berners-Lee** “for developing the World Wide Web.” Berners-Lee is the director of the World Wide Web Consortium and a senior researcher at MIT’s Computer Science and Artificial Intelligence Laboratory, where he holds the 3Com Founders chair and leads the decentralized information group. He is also a professor of

computer science at the University of Southampton's School of Electronics and Computer Science in the UK.

Yuan-Cheng Bertram Fung received the Fritz J. and Dolores H. Russ Prize—a \$500 000 biennial award recognizing engineering achievement that significantly improves the human condition—"for the characterization and modeling of human tissue mechanics and function leading to prevention and mitigation of trauma." He is a professor emeritus of bioengineering at the Jacobs School of Engineering at the University of California, San Diego.

obituaries

To notify the community about a colleague's death, subscribers can visit <http://www.physicstoday.org/obits>, where they can submit obituaries (up to 750 words), comments, and reminiscences. Each month recently posted material will be summarized here, in print. Select online obituaries will later appear in print.

Markus Eduard Fierz

Markus Eduard Fierz, professor emeritus of theoretical physics at ETH Zürich in Switzerland, died peacefully on 20 June 2006, his 94th birthday, after a rich, harmonious life. Fierz made significant contributions to relativistic quantum field theory and to general relativity, the most important new physics theories in his younger days.

Born on 20 June 1912 in Basel, Switzerland, Fierz went to the University of Göttingen, Germany, in 1931 to study physics and biology. There he enjoyed the inspiring lectures of Hermann Weyl and studied the works of Immanuel Kant. After the Nazis came to power in 1933, Fierz returned to Zürich to major in physics under the guidance of Gregor Wentzel at the University of Zürich and Wolfgang Pauli at ETH.

In his doctoral dissertation, completed in 1936 under the supervision of Wentzel, Fierz discovered the infrared catastrophe in the description of scattering processes of relativistic charged particles. He found a divergent scattering cross section in the lowest nontrivial order due to the emission of soft photons. Fierz spent the 1936 summer term in Germany at the University of

Leipzig's Institute for Theoretical Physics, headed by Werner Heisenberg, then returned to Zürich to become Pauli's assistant.

In 1937, in his work on Fermi's theory of beta decay, Fierz succeeded in reducing to five the number of invariant matrix elements without derivative couplings using what are now called Fierz transformations. This work allowed him to compute the beta spectra and neutron-proton forces for a general linear combination of the five invariants, an elegant and modern approach.

Inspired by the work of Felix Bloch and Arnold Nordsieck, in 1938 Pauli and Fierz studied what is now known as the Pauli-Fierz model of a nonrelativistic electron coupled to the radiation field. This exactly solved model has scattering states that carry a representation of the canonical commutation relations inequivalent to the Fock representation. The infrared divergencies occur in an unjustified perturbative expansion.

Fierz's most important result, accomplished in 1939, was his proof of the general connection of spin and statistics of elementary particles, namely Bose-Einstein statistics for integer spin and Fermi-Dirac statistics for half-integer spin. Fierz received the Max Planck



Markus Eduard Fierz

BARBARA KRUCK

Medal for this work in 1979. In the 1950s and 1960s, the result was generalized by others to interacting fields, which satisfied the Wightman axioms of general quantum field theory; it is one of the pillars of particle physics. In joint work with Pauli, Fierz applied his methods to fields that have electromagnetic interactions. Their results on the local gauge groups of massless

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