

Heilmeier to Receive Kyoto Prize

Electronics engineer **George H. Heilmeier**, whose research led to the development of the LCD, is one of three recipients of the 21st annual

THE INAMORI FOUNDATION



Heilmeier

Kyoto Prizes, awarded by the Inamori Foundation in Kyoto, Japan. Chairman emeritus of Telocity Technologies Inc of Piscataway, New Jersey, Heilmeier will receive the 2005 Kyoto Prize in Advanced Technology "for pioneering contributions to the realization of flat-panel displays using liquid crystals." Heilmeier will receive a diploma, a Kyoto Prize medal, and a cash prize of ¥50 million (approximately \$460 000) when he and other laureates convene for ceremonies in November in Kyoto. The other recipients do not work in physics-related fields.

In Brief

The former senior adviser for the Office of International Science and Engineering at NSF has been named deputy director of the Woodrow Wilson International Center for Scholars' Project on Emerging Nanotechnologies at the Smithsonian Institution in Washington, DC. **Julia A. Moore**, who had been with NSF for 10 years, began her new post on 27 June and will focus on nanotechnology's societal impacts.

Five scientists involved with development of the *Corona* satellite—the world's first operational photo reconnaissance satellite, designed to observe Soviet missile capabilities during the Cold War—have been jointly awarded the 2005 Charles Stark Draper Prize, one of engineering's top honors, by the National Academy of Engineering. **Minoru Sam Araki**, **Francis J. Madden**, **Edward A. Miller**, **James W. Plummer**, and **Don H. Schoessler** were presented with the award at a February ceremony in Washington, DC, "for

the design, development, and operation of *Corona*," and will share its \$500 000 cash prize. Araki, former president of Lockheed Martin Missiles and Space Co, is CEO and president of ST-Infonox in San Jose, California. Madden is chief engineer of the *Corona* camera system at Bellingham, Washington-based Itek Corp's optical systems division; Miller is a former General Electric Co program manager and project engineer; Plummer is former vice president of Lockheed Martin; and Schoessler is a former senior supervising development engineer at Eastman Kodak Co.

The invention of a blood glucose sensor and a device for measuring blood oxygen levels won **Leland C. Clark Jr** the National Academy of Engineering's Fritz J. and Dolores H. Russ Prize, which he received at a February ceremony in Washington, DC. Clark is a Distinguished Service Professor Emeritus at the College of Medicine at the University of Cincinnati, the retired head of the neuro-

physiology division of the Children's Hospital of Cincinnati, and professor of science at Antioch College.

Jeong H. Kim has been named president of Lucent Technologies' Bell Labs, located in Cherry Hill, New Jersey. Kim, a venture businessman and the founder and former chief executive of Yurie Systems Inc, which Lucent acquired in 1998, succeeds **Bill O'Shea**, who has retired after 33 years of service.

Murray Gell-Mann, discoverer of the quark and winner of the 1969 Nobel Prize in Physics, is the 2005 recipient of the American Humanist Association's Humanist of the Year Award. Gell-Mann is being honored for his contributions to science, his dedication to the environment, and his critical inquiry and skepticism, according to Tony Hileman, AHA executive director. Currently Gell-Mann is a Distinguished Fellow of the Santa Fe Institute, and his recent research has focused on complex adaptive systems.

Obituaries

Asher Peres

Asher Peres, one of the founders of quantum information theory, died on 1 January 2005 in Haifa, Israel.

Asher Peres was born Aristide Pressman in Beaulieu-sur-Dordogne, France, on 30 January 1934 to Shlomo (Solomon) and Shulamit (Salomea) Pressman, Jewish émigrés from Lemberg, which is now Lviv, Ukraine. The family was deported to Poland soon after Asher's birth but was allowed to return to France shortly before the outbreak of World War II.

After the fall of Paris, the family fled to Asher's birthplace to hide from the Nazi regime. Following exposure of their Jewish identity by local anti-Semites and after extortion attempts, Asher's father joined the Resistance and mother and son went into hiding. Asher related his wartime experiences in a memoir entitled "I Am the Cat Who Walks by Himself," after Rudyard Kipling's tale (see <http://arXiv.org/abs/physics/0404085>).

Reunited after the war, the family immigrated to Israel in 1949; Asher



Asher Peres

enrolled at the Technion-Israel Institute of Technology in Haifa in 1952. His father, a down-to-earth electrical engineer, believed there were no job opportunities for a physicist in the new country and persuaded his son to study mechanical engineering.

Asher was a brilliant but challenging student. After he had pointed out an embarrassing error in a proof, one of his math professors promised him

For PHYSICS TODAY to consider an obituary for publication, we must be notified within five months of the scientist's death.

the highest grade on the condition that he not attend the lectures. Asher's first article in theoretical physics, written when he was a second-year undergraduate, was recommended by Louis de Broglie for publication in the *Comptes Rendus*. The article was accepted and appeared in the journal in 1954. A few years later, the physics department got a major boost when Nathan Rosen, the "R" of the celebrated EPR (Einstein-Podolsky-Rosen) gedanken experiment, joined the faculty. Asher became Nathan's graduate student, and their association grew into a lifelong mutual admiration. (Asher outlived his mentor and asked to be buried next to him.)

For his doctoral thesis, Asher calculated the gravitational radiation from an orbiting star. Although the existence of such radiation is indirectly proven by the decreasing periods of binary pulsars, antennas sensitive enough to measure it directly are only now being built. Making a precise calculation of gravitational radiation from astrophysical sources is a topic of much current interest because of its relevance to LIGO, the Laser Interferometer Gravitational Wave Observatory, and the planned LISA, the Laser Interferometer Space Antenna.

Asher joined Technion after receiving his PhD in 1959. He was rapidly promoted to full professor and remained at the university for the rest of his career. He was appointed Distinguished University Professor in 1988.

His work ranged from solving practical problems to tackling visionary and foundational issues. Work with one graduate student on the statistical properties of matrix elements of chaotic systems led to what is now known among mathematicians as the Feingold-Peres conjecture and among physicists as the Feingold-Peres theory. But Asher's greatest impact was on the foundations of quantum theory and the theory of quantum information. He was one of six authors of the 1993 quantum teleportation paper published in *Physical Review Letters*. That paper showed that even though no direct measurement can extract complete information about the state of a quantum particle, a combination of entanglement and classical communication can be used to transfer the state perfectly to another particle that has never been near the first particle. Quantum teleportation has since been experimentally confirmed in several laboratories. When a reporter asked Asher if quantum teleportation could teleport the soul as well as the body, Asher answered, characteristically, "No, not the body, just the soul."

In another important contribution, Asher showed that if conceptually re-

versing the direction of time for just one of two particles results in a nonphysical situation with negative probabilities, the two particles must be entangled. This criterion of entanglement (in mathematical terms, nonpositivity of the partial transpose of the system's density matrix) has since spawned a rich qualitative and quantitative theory of entanglement and other manifestations of nonlocality in quantum mechanics. Asher's last two students, Netanel Lindner and Petra Scudo, worked on the problem of efficiently communicating a different kind of information, namely, spatial directions and reference frames, using quantum particles.

Asher was a man of strong opinions, which he encapsulated in aphorisms such as

- Unperformed experiments have no results.
- Quantum phenomena do not occur in a Hilbert space, they occur in a laboratory.
- Quantum mechanics needs no interpretation.
- Never underestimate the ingenuity of experimental physicists.

His textbook *Quantum Theory: Concepts and Methods* (Kluwer Academic, 1993) is arguably the modern successor of John von Neumann's book *Mathematical Foundations of Quantum Mechanics* (Princeton U. Press, 1955). The uncertainty principle, for which Asher had little use, is relegated to a single entry in the index that points to the same page of the index.

In most arenas, Asher feared no one and did not aim to please. In 1983, while chairman of the physics department at Technion, he nominated—during the days of the Israel-Lebanon war—Menachem Begin, Israel's then prime minister, for the Nobel Prize in Physics. As justification, Asher said Begin deserved the physics prize as much as the peace prize, which he had shared with Egyptian President Anwar al-Sadat in 1978. The prime minister's office did not appreciate the humor, and the Technion president felt it necessary to apologize to the Swedish Academy. The academy responded that it feared the Technion president may have lost some of the spirit of good Jewish humor.

Joseph E. Avron

*Technion-Israel Institute of Technology
Haifa*

Charles H. Bennett

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Ady Mann

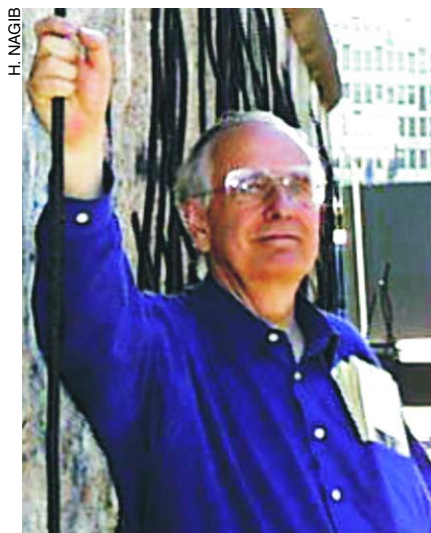
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Dietrich Wolfgang Bechert

The fluid mechanics community has lost Dietrich Wolfgang Bechert, retired chief scientist at the Institute for Turbulence Research of the German Aerospace Organization (now called DLR) in Berlin. Dietrich died on 1 December 2004 in Berlin of complications after a successful chemotherapy. His death was a shock because he had always downplayed the seriousness of his health problems.



Dietrich Wolfgang Bechert

Dietrich was open, caring, and sensitive, and had a great sense of humor. To those familiar with Berliner slang, his wit is preserved in cryptic acknowledgments in some of his scientific publications. Inspired by his superiors, particularly Eberhard Pfizenmaier, the director of his institute, he pursued his work with uncompromising perfectionism and persistence. Dietrich's passionate dedication to his work and his refusal to grant requests for quick results made him one of the preeminent experimentalists in fluid mechanics; he was also well versed in theory.

I had the immense privilege of learning firsthand his exceptional qualities in the fall of 1987, when, equipped with water and cookies, Dietrich and I spent many nights in the basement of the Institute for Turbulence Research. There, we experimentally investigated the theoretical prediction that low-density jets develop self-excited oscillations below a critical density. Measurements were impossible during the day because of vibrations from scores of shopping buses from Poland that were parked, engines running, in front of the building.