

Peer Recognition

For 2001, five of the American Physical Society's awards and prizes went to researchers for innovative contributions to industrial physics.

Buckley Prize

Alan Harold Luther of the Nordic Institute for Theoretical Physics (Copenhagen,

Denmark) and Victor John Emery of Brookhaven National Laboratory shared the Oliver E. Buckley Prize "for their fundamental contribution to the theory of interacting electrons in one dimension."

Working both collaboratively and separately during much of the 1970s, when Luther was at Harvard University, the two researchers created

the theory of interacting, one-dimensional electron systems, which showed several intriguing properties, including spin-charge separation and a lack of quasi-particles. In a 1974 paper that introduced their one-dimensional model, they made extensive use of bosonization techniques, which are now a standard tool in studying one-dimensional electron systems.

Work on the theory has intensified in recent years because of its importance to such things as carbon nanotubes, semiconductor quantum wire structures, one-dimensional organic conductors, and cuprate high-temperature superconductors. "The subject of interacting, one-dimensional electron systems is today one of the most active and exciting branches of condensed-matter physics," says Sankar Das Sarma, Distinguished University Professor of Physics at the University of Maryland at College Park.

Keithley Award

James E. Faller of the National Institute of Standards and Technology (Boulder, CO) won the Joseph F. Keithley Award "for the development of sensitive gravitational detectors and their successful application to the study of physics and geophysics." Indeed, Faller has helped revolutionize

gravity measurements. When he began his work more than 40 years ago, the accuracy was about 100 ppb; today, it is 1 to 3 ppb.

Faller is

best known for his role in developing extremely accurate and highly portable absolute gravimeters. Their uses include looking at time variations that are important to investigating subsidence due to the pumping of oil or the removal of water from aquifers.

Faller's scientific interests have led him into other areas as well. He determined the size and nature of the laser retro-reflectors to be left on the moon by Apollo astronauts, which enabled scientists to precisely measure the distance of the moon from Earth and learn about the lunar interior from its rotation. He measured solar eclipses to study the sun's outer layers, and he led a precise test of Coulomb's law to set a limit on the photon rest mass. In 1981, Faller helped conceive a plan to use three satellites to detect gravitational waves over a 5 million kilometer baseline. The idea is likely to fly in about 10 years as a joint U.S.-European mission.

McGroddy Prize

Molecular beam epitaxy (MBE) has enabled the creation of such semiconductor structures as superlattices and quantum wells, wires, and dots. Arthur C. Gossard of the University of California, Santa Barbara, received the James C. McGroddy Prize "for more than 25 years of major and continuing

contributions to the science and technology of molecular beam epitaxy, and for the growth of heterogeneous-compound semiconductor structures that have furthered both device applications and physical understanding of low-dimensional structures."

In 1978, Gossard grew the first modulation-doped heterostructures with a two-

dimensional electron layer of ultrahigh mobility. This feat enabled his co-discovery in 1982, with Horst L. Stormer and Daniel C. Tsui, of the fraction-



al quantum Hall effect, a new state of matter, and the development of the high-electron-mobility transistor that is now widely used in wireless communications and in high-data-rate lightwave communications. Gossard, the co-author of more than 600 papers, is among the most frequently cited authors in the current scientific literature.

"Over the past decade and a half, Art Gossard has been one of the prime and one of the most creative material scientists to synthesize MBE material for fundamental research in lower-dimensional physics," say Federico Capasso and Stormer of Lucent Technologies' Bell Laboratories. "His work has been and continues to be central to the physics of lower-dimensional systems."

Pake Prize

It takes an unusual set of skills to be able to succeed at technical research and senior management. Lewis S. Edelheit, the General Electric (GE) Co.'s senior research and technology advisor, has excelled at both. He received the George E. Pake Prize and was cited "for outstanding technical contributions to fluoroscopic X-ray systems and fast scan, 'fan beam' computed X-ray tomography systems, and for leadership in managing the development, engineering, and marketing of world-leading commercial medical-imaging systems."



Faculty Fellowships

APS and its Forum on Industrial and Applied Physics (FIAP) have created a new fellowship program for faculty members in physics and closely related departments. The APS Faculty Industry Fellow Program aims to strengthen industrial-academic ties, enrich the experience of faculty members and their knowledge of industry, and enhance physics education by providing faculty members with short-term experiences in industrial laboratories. Companies participating in the program include Bell Laboratories, Dow Corning, Ford Motor Co., HRL Laboratories, IBM, Motorola, and Schlumberger-Doll Research. "It is hoped that Faculty Fellows will bring new skills and knowledge to the host company and help their hosts enter new areas of R&D with academia," says FIAP chair James Kaufman. Each industrial sponsor sets its fellowship's starting date and duration. Applications are now being accepted, and additional information is available at <http://www.aps.org/industrialfellow>.



Edelheit began his career in 1969 at GE, where he developed the concepts for the company's first computerized tomography (CT) X-ray medical-diagnostic system. "He helped to pioneer that major advance in medical imaging, both through his own seminal scientific contributions and through his leadership, to engineers and scientists from a wide range of technical disciplines," says physicist David K. Campbell, dean of the College of Engineering at

Boston University. In 1976, Edelheit moved to GE Medical Systems, where he helped bring a radically new form of CT scanner to market. The device remains the world leader in sales of CT equipment.

His posts at GE have included manager of the Electronic Systems Research Center and director of the Corporate R&D Center. Under Edelheit's direction, GE introduced new products that included advanced ultrasound medical imaging equipment, high-efficiency turbines, and advanced lighting and electronics-based appliances.

Science, Technology Medals

Willis E. Lamb, Jr., of the University of Arizona received a National Medal of Science, the nation's highest award for science. Lamb shared the 1955 Nobel Prize in Physics for his discovery of a new relativistic quantum effect—now a foundation of quantum electrodynamics—and pioneered the field of laser physics.

Winners of the National Medal of Technology all worked in applied physics. Douglas C. Engelbart of the Bootstrap Institute (Fremont, CA) won for "creating the foundations of personal computing," and Dean Kamen of DEKA Research and Development Corp. (Manchester, NH), received his medal for "inventions that have advanced medical care worldwide." Donald B. Keck

and Robert D. Maurer of Corning, Inc. (Corning, NY), and Peter C. Schultz of Heraeus Amersil, Inc. (Duluth, GA), were honored "for the invention of low-loss optical fiber, which has enabled the telecommunications revolution." IBM Corp. received its medal "for 40 years of innovations in the technology of hard disk drives and information storage products." 

B I O G R A P H Y

The Forum department is initiated by the American Physical Society's Forum on Industrial and Applied Physics (FIAP). For more information about the Forum, please visit the FIAP Web site (<http://www.aps.org/FIAP/index.html>), or contact the chair, James Kaufman (kaufman@almaden.ibm.com).