

FRANKLIN INSTITUTE BESTOWS ANNUAL ACCOLADES

In May, at its annual Medal Day ceremonies, the Franklin Institute in Philadelphia recognized six scientists for outstanding work.

David Turnbull of Harvard University was one of two recipients of the Franklin Medal, regarded as the Institute's most prestigious award. Turnbull was recognized for his "pioneering theoretical and experimental research in phase transitions in condensed matter, particularly in the formation of the amorphous state by normally crystalline materials."

In 1959, in collaboration with Morrel H. Cohen, Turnbull predicted—correctly, it turned out—that a metallic glass, a previously unknown state of matter, would form in certain alloys, given sufficient undercooling.

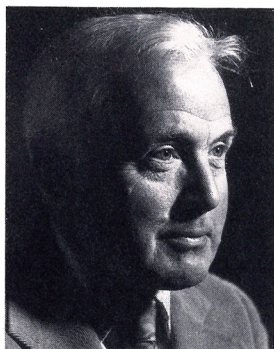
Since that time Turnbull has advanced the understanding of glassy elements and alloys: With Cohen he formulated the free-volume model for diffusion and viscosity in liquids; he established the principles governing the formation of metallic glasses; and with his student Ho-Sou Chen he demonstrated the existence of a glass transition in these materials.

Turnbull earned his PhD in physical chemistry from the University of Illinois in 1939. In 1946 he left the faculty of Case Institute of Technology to join the General Electric Research Laboratory. In 1962 he became Gordon McKay Professor of Applied Physics at Harvard.

Also receiving a Franklin Medal was Hugh E. Huxley of Brandeis

University, who was cited for his "application of low-angle x-ray diffraction with both conventional and synchrotron x-ray sources and with electron microscopy to study the mechanism of muscle contraction."

In his doctoral research Huxley pioneered the use of low-angle x-ray diffraction to probe the detailed structure of muscle. Based on later observations using electron microscopy and interference microscopy, Huxley, with Jean Hanson, proposed the "sliding filament model" of muscle contraction. Along with Richard Limn, Edwin Taylor and others, Huxley formulated the "cross-bridge cycle," a detailed chemical-mechanical process explaining the sliding motion of muscle filaments.



Hugh E. Huxley



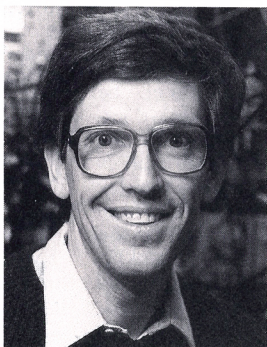
David Turnbull



Marlan O. Scully



Akito Arima



H. Jeffrey Kimble



Larry L. Smarr

Using synchrotron "snapshots" of the diffraction patterns of an active muscle, Huxley and his colleagues characterized the molecular events of muscle contraction with millisecond precision.

Huxley received his PhD in molecular biology in 1952 from the University of Cambridge. For many years he was on the staff of the Medical Research Council Laboratory of Molecular Biology at Cambridge, where he became joint head of the structural studies division and deputy director of the laboratory. Since 1988 Huxley has been the director of the Rosenstiel Center at Brandeis University.

Marlan O. Scully of the University of New Mexico won the Elliott Cresson Medal, for his "pioneering theoretical discoveries in laser physics and for his numerous seminal contributions to quantum optics, atomic physics, and statistical physics, and also for his achievements in biological engineering."

As a graduate student Scully, with Willis Lamb, developed the "Scully-Lamb theory," a quantum-mechanical explanation of the laser. With Vittorio DeGiorgio Scully demonstrated in detail the parallels between a laser near threshold and a system undergoing a phase transition. Scully also solved crucial problems in the development of the laser gyroscope, and has recently invented the so-called correlated emission laser.

Scully earned his PhD in physics from Yale University in 1966, and was on the faculties of Yale, MIT and the University of Arizona before becoming Distinguished Professor of Physics at the University of New Mexico in 1980. Scully is the founder and director of the Center for Advanced Studies at New Mexico, and is head of the theory group at the Max Planck Institute for Quantum Optics in Garching, Germany.

Akito Arima of the University of Tokyo won the John Price Wetherill Medal for "his work in the advancement of the field of physics, and, in particular, for his pivotal contributions to our understanding of atomic nuclei."

Arima was among the first to investigate the core-polarization effect, whereby nucleons are elevated from the core to valence shells. In the mid-1960s he and his students developed a model in which the nucleus is viewed as a mixture of clusters (for example, alpha particles) and shell-model states. In 1975, with his collaborator Francesco Iachello, Arima proposed the interacting boson model of the nucleus.

Arima received his DSc in physics from the University of Tokyo in 1958. He has held a faculty position at the State University of New York at Stony Brook, and has been a visiting professor at many universities, including Rutgers and Princeton. In 1975 Arima became a professor of physics at the University of Tokyo. Last year he was appointed president of that university.

H. Jeffrey Kimble of the California Institute of Technology was selected to receive the Albert A. Michelson Medal for his "numerous outstanding contributions to quantum optics and especially for his quantitative experimental demonstration of optical bistability, instabilities and squeezing."

In measurements of the nonlinear optical properties of atoms strongly coupled to resonant interferometers, Kimble and his coworkers compared the predictions of quantum theory with their observations of critical phenomena and nonequilibrium transitions. This work laid a foundation for later investigations in which Kimble's group demonstrated that the light transmitted by the bistable interferometer becomes a squeezed state of the electromagnetic field under appropriate conditions.

Kimble received his PhD in 1978 from the University of Rochester. In 1979 he joined the faculty of the University of Texas at Austin, where he was appointed to the Sid Richardson Regents Chair of Physics in 1988. In January 1989 he accepted a professorship in physics at Caltech.

Larry L. Smarr of the University of Illinois at Urbana-Champaign won the Delmer S. Fahrney Medal for leadership in science or technology. Smarr was cited for his "leadership in establishing a national supercomputer program in the United States and a unique Supercomputing Center at the University of Illinois, and for his contributions to the development of supercomputing techniques and skills."

In the early 1980s, recognizing the supercomputer famine in the US academic community, Smarr proposed that the University of Illinois be granted the first university-based national supercomputer center in the country; in 1985 NSF funded Illinois to be one of its first supercomputer centers, and Smarr became its director. According to a statement by the committee that selects the Franklin Institute Medalists, Smarr has made the facility into an unusual environment for computational science, in which "scientists from many fields... interact with each other,

and share ideas and techniques."

Smarr earned his PhD in astrophysics in 1975 from the University of Texas, Austin. In 1979 he joined the faculty at Illinois, where he is now a professor of astronomy and physics, and director of the National Center for Supercomputing Applications.

IN BRIEF

Peter J. Collings, an experimenter who works on the physics of liquid crystals, recently left Kenyon College in Gambier, Ohio, to become a physics professor at Swarthmore College in Swarthmore, Pennsylvania.

Robert Dynes, director of chemical physics research at AT&T Bell Laboratories, has accepted a position as a physics professor at the University of California, San Diego. Scheduled to start in January, Dynes plans to continue his research on high- T_c superconductivity, low-temperature physics, electrical transport in reduced dimensions, thermal transport and thermodynamic properties of materials.

Veerabhadran Ramanathan, an atmospheric scientist who studies global warming, recently became the first Victor C. Alderson Professor of Applied Ocean Science at the University of California, San Diego's Scripps Institution of Oceanography. Ramanathan comes to Scripps from the University of Chicago, where he was a professor of geophysical sciences.

Richard L. Fork, known for his work on ultrafast lasers, has left AT&T Bell Laboratories to become a professor in the physics department at Rensselaer Polytechnic Institute in Troy, New York. According to department chairman Timothy M. Hayes, Fork's appointment, together with other planned additions to the faculty and the construction of an ultrafast-laser laboratory, are part of an effort to build strong graduate and undergraduate programs in optical physics at Rensselaer.

OBITUARIES

Allan Sachs

The sudden death of Allan M. Sachs on 20 September 1989 was a deep loss to the physics community: Sachs was an outstanding scientist, a dedicated and innovative teacher and a man of rare human qualities. He was chair-