

astronomer, through his television series, "Cosmos," his writings for *Parade* magazine and other mass circulation publications, his books for the general reader and his lectures that enthral listeners of all ages."

Sagan earned a PhD in astronomy and astrophysics from the University of Chicago in 1960. From 1962 to 1968 he was a lecturer and assistant professor of astronomy at Harvard. Since then he has been at Cornell, where he is currently the David Duncan Professor of Astronomy and Space Sciences and director of the Laboratory for Planetary Studies.

The Bruno Rossi Prize Lecture, sponsored by the AAS high-energy astrophysics division, was given by Gerald H. Share of the Naval Research Laboratory. He was cited for "his ingenuity and leadership in adapting the solar gamma-ray spectrometer on the Solar Maximum Mission to detect radioactive cobalt in supernova 1987A, to observe diffuse 511-keV positron annihilation radiation from the galactic center and to study the spectra of gamma-ray bursts."

Share earned a PhD in physics from the University of Rochester in 1966, after which he joined NRL. He is now an astrophysicist there.

Some of the 1993 award recipients were also announced at the meeting; they will be covered in an upcoming issue of PHYSICS TODAY.

Three other individuals, in addition to those mentioned above, were honored with awards from AAS in 1992: Edmund Bertschinger of MIT was given the Helen B. Warner Prize; Robert H. Dicke of Princeton University received the Beatrice M. Tinsley Prize; and Stanton Peale of the University of California, Santa Barbara, received the Dirk Brouwer Award.

The Warner Prize recognizes outstanding work by an astronomer who is 35 years or younger. Bertschinger was chosen for his contributions to the "understanding of large-scale structures in the universe through the development and application of a methodology by which the distribution of matter in the nearby universe can be inferred from galaxy velocities." His research interests are in theoretical astrophysics, including cosmology, galaxy and structure formation, gas dynamics, and general relativity.

Bertschinger earned a PhD in astrophysical sciences from Princeton University in 1984. He was a postdoctoral fellow at the University of Virginia from 1983 to 1985 and a research fellow at the University of California, Berkeley, from 1985 to

1986. He then joined the physics faculty at MIT, where he is currently an associate professor.

The Tinsley Prize, which is given every other year, went to Dicke for his "outstanding role in the introduction of diverse and pioneering methods of measurement applied in the fields of microwave radiation, radioastronomy, gravity physics, lunar science and cosmology."

Dicke earned a PhD in physics from the University of Rochester in 1941. During World War II he worked at the MIT Radiation Lab. In 1946 Dicke joined the physics faculty at Princeton, and since 1984 he has been Emeritus Albert Einstein Professor of Science there.

## AAPT HONORS CONTRIBUTIONS TO TEACHING AND RESEARCH

At its winter meeting in New Orleans, the American Association of Physics Teachers recognized several individuals for their contributions to physics education and research.

Anthony P. French of MIT was presented with the Melba Newell Phillips Award. AAPT cited him for "his creative leadership, for his dedicated service and for his exceptional contributions to physics education." Although his early work was in experimental nuclear physics, French has for the past three decades focused on physics education, including the development of curriculums and teaching materials. He has also been an active member of AAPT, serving as president in 1985 and as a member of various committees.

French earned his doctorate in physics from the University of Cambridge in 1948. Before emigrating to the US he worked at the Atomic Energy Research Establishment and then at Cambridge's Cavendish Laboratory. In 1955 he joined the physics faculty at the University of South Carolina. Since 1962 French has been a professor of physics at MIT.

The 52nd Richtmyer Memorial Lecture was given by Richard E. Smalley of Rice University, who spoke on "Carbon and the Challenge of Nanotechnology." Smalley is widely known for the discovery and characterization of the molecular  $C_{60}$ . In the pursuit of his research, he has developed a number of experimental techniques, including supersonic beam laser spectroscopy and supercold pulsed beams.

Smalley earned a PhD in chemistry from Princeton University in 1973.

The Brouwer Award is given by the AAS division on dynamical astronomy. In addition to fundamental work on spin-orbit resonance and tidal heating of the Moon and Io, Peale was cited for "definitive work on Cassini states of rotation of planets and satellites, and on excitation and damping of rotational wobbles of planets and satellites."

Peale earned a PhD in engineering physics from Cornell in 1965. For the next three years he was an assistant professor of astronomy and geophysics at the University of California, Los Angeles. In 1968 he moved to the University of California, Santa Barbara, where he is now a professor of physics.



Anthony P. French

After a three-year postdoctoral fellowship at the University of Chicago, he moved to Rice, where he is now the Gene and Norman Hackerman Professor of Chemistry and a professor of physics.

AAPT gave Distinguished Service Citations to several individuals: James Cederberg, Carole Escobar, Judy Franz, Marvin Nelson, Francis Peterson, Ronald Thornton and Jay Zimmerman.

Cederberg, who holds the Grace Whittier Chair of Science at St. Olaf College, was cited for combining "excellence in research with excellence in teaching at a liberal arts college." He earned a PhD in physics from Harvard in 1963.

Escobar, a physics teacher at Bellport High School in Brookhaven, New York, was cited for her work on

amusement park physics as well as for her editorial work on *The Physics Teacher* and for founding the Long Island section of AAPT. She earned an MS in physics from the State University of New York, Stony Brook, in 1981.

Franz, a professor of physics at the University of Alabama, Huntsville, was cited "for her leadership in AAPT, the American Physical Society and other scientific societies, and especially for promoting the status of women in physics." She earned a PhD in physics from the University of Illinois in 1965.

AAPT cited Nelson, a professor of physics at Green River Community College in Auburn, Washington, for "his untiring work in improving physics education in the two-year colleges." Nelson earned an MS in physics from Colorado State University.

Peterson, a professor of physics at Iowa State University, was cited for

"his dedication to teaching and his contribution to laboratory apparatus development and laboratory instruction." He earned a PhD in physics from Cornell University in 1968.

Thornton, director of the Center for Science and Mathematics Teaching and a professor of physics and education at Tufts University, was cited for "research in physics education, for developing microcomputer-based laboratories and curriculums and for instructing hundreds of physics teachers." Thornton earned a PhD in high-energy physics from Brown University in 1976.

Zimmerman, a physics teacher at Brookfield Central High School in Wisconsin, was cited by AAPT for his "dedication to physics teaching and his leadership in the high school physics teaching community." He earned an MS in curriculum and instruction from the University of Wisconsin, Milwaukee, in 1968.

## OBITUARIES

### Alvin Boyd Cardwell

Alvin Boyd Cardwell, professor emeritus of physics and longtime physics department head at Kansas State University, died on 8 September 1992 in Kingston, Tennessee.

Born on 16 October 1902 in Oral, Tennessee, Cardwell graduated in the class of 1925 at the University of Chattanooga. He went on to earn MS and PhD degrees from the University of Wisconsin in 1927 and 1930, respectively. At Wisconsin he began the experimental studies of thermionic and photoelectric electron emission from crystalline metals that continued to be a research interest during most of his career.

After five years as a physics faculty member at Tulane University, Cardwell came to Kansas State University in 1936 as a professor of physics and head of the department. Except for 1944–46, when he took leave to work on the Manhattan Project at Oak Ridge, he served as department head until 1953, when he was named associate dean of arts and sciences. Cardwell returned to the physics department as a professor in 1955, and he was department head again from 1957 to 1967. Teaching and advising students were lifelong interests for Cardwell.

Cardwell contributed to the department and the university with his leadership, planning and administration. As director of the KSU Bureau of General Research, he improved the climate for research throughout the university. Cardwell led the planning for a physics and mathematics building, which was dedicated in 1963 and named Cardwell Hall in his honor. A 6-MV tandem van de Graaff accelerator for the physical science building was installed in 1969. Cardwell's vision for the department and university laid a strong foundation for the future.

Cardwell's colleagues remember him for his fortitude in times of difficulty and his love of a good story.

JAMES C. LEGG

Kansas State University  
Manhattan, Kansas

### Herbert G. MacPherson

Herbert G. MacPherson died suddenly in Guadalajara, Mexico, on 26 January 1993, at the age of 81. Thus passed one of the most highly respected pioneers of nuclear energy.

Mac received his PhD in physics at

## NEW MEMBERS NAMED TO NATIONAL ACADEMY OF SCIENCES

On 27 April the National Academy of Sciences announced the election of 60 new members and 15 foreign associates for 1993. With the election the academy now has 1683 active US members and 298 foreign associates.

The newly elected members of NAS include the following:

**Yakir Aharonov**, professor of physics, Tel Aviv University, Israel, and the University of South Carolina, Columbia

**Bishnu S. Atal**, head, speech research department, AT&T Bell Labs

**Malcolm R. Beasley**, professor of applied physics and electrical engineering, Stanford University

**Claude R. Canizares**, professor of physics, head of the astrophysics division and director of the Center for Space Research, MIT

**Steven Chu**, professor of physics and applied physics, Theodore and Frances Geballe Professor of Humanities and Sciences, and chair of physics, Stanford University

**John Cocke**, research staff member, computer sciences department, IBM T. J. Watson Research Center

**Brent Dalrymple**, geologist, US Geological Survey, Menlo Park, California

**Donald J. DePaolo**, professor of geochemistry, University of California, Berkeley

**Jerry Gollub**, chair of physics and Kenan Professor of Physics, Haverford College

**John Huchra**, senior scientist, Smithsonian Institution, and professor of astronomy, Harvard University

**Mao Ho-kwang**, staff member, Geophysical Laboratory, Carnegie Institution of Washington, DC

**Mario Molina**, professor of atmospheric chemistry, MIT

**Alexandra Navrotsky**, Albert G. Blanke Jr Professor of Geological and Geophysical Sciences, Princeton University

**T. Maurice Rice**, professor of theoretical physics, Institute of Theoretical Physics, ETH—Hönggerberg, Zurich, Switzerland

**Maury Tigner**, professor of physics, Cornell University

**Shing-Tung Yau**, professor of mathematics, Harvard University.

The new NAS foreign associates include:

**Friedrich W. Busse**, professor of geophysics, University of Bayreuth, Germany

**Bert Sakmann**, professor, medical faculty, University of Göttingen, and director and professor of cell physiology, Max Planck Institute for Medical Research, Göttingen, Germany

**Nikolai Sobolev**, deputy director of the Institute of Geology and Geophysics, Siberian branch, Russian Academy of Sciences, Novosibirsk, Russia

**Richard Taylor**, professor of physics, Stanford University.