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NSF chooses Schopf as second Waterman Award recipient

The second Alan T. Waterman Award of the National Science Foundation has been presented to J. William Schopf, professor of geology and geophysics at the University of California, Los Angeles. The award, which was authorized by Congress in 1975, is composed of a medal and a grant of up to $50 000 per year for each of three years for research or advanced study.

Schopf studied geology as an undergraduate at Oberlin College and earned his PhD in biology from Harvard University in 1968. That same year he joined the faculty at the University of California, Los Angeles. In 1973 he was promoted to the rank of full professor.

During the period 1968–71, Schopf was one of a small number of university-based scientists selected by the National Aeronautics and Space Administration to participate in the earliest stages of lunar-rock studies. His responsibility was to determine whether there was any evidence of past or present life in lunar material returned by Apollo 11 and Apollo 12. After these early studies Schopf served in the Apollo program as principal investigator of lunar samples; he is now a member of a group charged by NASA to formulate plans and suggest priorities during the next 10 or 15 years for exploration of terrestrial planets and satellites.

Schopf was a Guggenheim Fellow in 1973 and a National Academy of Sciences visiting fellow to the Soviet Union in 1975.

The Waterman Award, which is named in honor of the NSF's first director, cited Schopf for his geochemical and micropaleontological analyses of Precambrian organic matter, his studies of delicate and ancient microorganisms and his development of techniques, such as transmission electron microscopy, used for the identification and examination of microorganisms.

SCHOPF

Goldman and Spear win European physics prizes

The (British) Institute of Physics has announced the winners of two 1977 prizes, of which it is a co-sponsor: the Holweck Medal and Prize has been presented to Maurice Goldman (Center for Nuclear Studies, Saclay, France), and the Max Born Medal and Prize has been awarded to Walter E. Spear (University of Dundee, Scotland). The French Physical Society and the German Physical Society co-sponsor the Holweck Medal and Prize and the Max Born Medal and Prize, respectively.

Goldman studied at the Ecole Supérieure de Physique et Chimie in Paris and joined the Center for Nuclear Studies in 1955; he now holds the position of senior physicist at Saclay and is also assistant director to Anatole Abragam at the College de France, Paris. Goldman's research specialities are nuclear magnetism, with an emphasis on nuclear magnetic resonance in solids, and spin temperature theory.

Spear, professor of physics at the University of Dundee, received his doctorate from the University of London. In 1953 he was appointed to a lectureship at the University of Leicester, where he began to study solid-state physics, particularly electron transport properties. Spear now holds the Harris Chair of Physics at the University of Dundee. Most recently, Spear has studied the electronic, optical and photoconductive properties of amorphous semiconductors.

Newly elected members of the American Academy of Arts and Sciences are these scientists of interest to physicists and astronomers: **Stephan Berko** (Brandeis University), **Hans G. Dehmelt** (University of Washington), **George Feher** (University of California, San Diego), **Jeffrey Goldstone** (MIT), **Lee Grodzins** (MIT), **Albert W. Overhauser** (Purdue University), **Peter P. Sorokin** (IBM, Yorktown Heights, N.Y.), **Tai Tsun Wu** (Harvard University), **Neil Bartlett** (University of California, Berkeley), **Bryce L. Crawford Jr** (University of Minnesota), **David Harker** (State University of New York, Buffalo), **F. Sherwood Rowland** (University of California, Irvine), **James E. Gunn** (California Institute of Technology), **P. James E. Peebles** (Princeton University), **Wallace L. W. Sargent** (Caltech), **Peter A. Strittmatter** (University of Arizona) and **John B. Gunn** (IBM, Yorktown Heights, N.Y.).

The Gravity Research Foundation (Gloucester, Mass.) has announced the winners of its 1977 awards for essays. They are: **Abhay Ashtekar** (Enrico Fermi Institute, University of Chicago), **G. F. R. Ellis** (University of Cape Town, South Africa), **Robert M. Wald** (Enrico Fermi Institute, University of Chicago), **P. Candelas** (University of Texas, Austin, Center for Relativity), **Dennis W. Sciama** (Mount Holyoke College, South Hadley, Mass.), **Gregory A. Shields** and **J. Craig Wheeler** (both of the University of Texas, Austin).

Clive L. Dym, senior scientist at Bolt, Beranek and Newman Inc, has been appointed professor and head of the University of Massachusetts (Amherst) department of civil engineering.

The first P. W. Bridgman Award of the International Association for the Advancement of High Pressure Technology has been presented to **Harry G. Drickamer,** professor of chemical engineering and

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physical chemistry at the University of Illinois.

The American Geophysical Union has presented its Walter H. Bucher Medal to **Bruce Heezen** and its James B. Macelwane Award to **Paul Richards;** both recipients are faculty members of the Columbia University department of geology.

Newly elected as foreign members of the Royal Society are **Erich Hückel** (formerly of University of Marburg, Federal Republic of Germany) and **Ephraim Katzir** (Weizmann Institute of Science, Rehovoth, Israel).

The new chairman of the University of Rochester department of physics is **Harry Gove,** a faculty member since 1963 and also the director of the University's nuclear-structure research laboratory.

Formerly of Wesleyan University, **John U. Trefny** has been appointed assistant professor of physics at the Colorado School of Mines.

The Harvey Prize in science and technology of the Technion (Israel), including $35 000, has been awarded to **Freeman John Dyson** of the Princeton University Institute for Applied Science.

The first occupant of the recently endowed Thomas Dudley Cabot Institute Chair at the Massachusetts Institute of Technology is **Samuel C.C. Ting,** professor of physics and co-recipient of the 1976 Nobel Prize in Physics.

Gerson Goldhaber, physics group leader at Lawrence Berkeley Laboratory and University of California, Berkeley professor of physics, has been named California Scientist of the Year by the California Museum Foundation.

Recently appointed assistant professors of physics at Stanford University are **Stuart Freedman** (Princeton University) and **Harriss T. King** (Rutgers University).

David J. Dumin, formerly technical director of Allied Chemical's synthetic crystal division, has been appointed professor of engineering at Clemson University.

obituaries

Erwin W. Mueller

Erwin W. Mueller, an Evan Pugh research professor emeritus of physics at The Pennsylvania State University, died 17 May at the age of 65, following a stroke suffered at a National Academy of Sciences meeting in Washington, D.C.

Mueller was born and educated in Berlin, Germany. He studied physics under Nobel Laureate Gustav Hertz at the Technical University in Berlin. Shortly after obtaining his doctorate in 1936, Mueller conceived the idea of the field-emission microscope, which enabled him to image the surface of submicroscopic metal crystals with a resolution of about 20 angstroms. For the first time, the diffusion and reconstruction of surface layers could be vividly seen. In 1941 he discovered field desorption—removal of surface atoms at low temperature by application of a high positive electric field.

With an ambition to see individual atoms by improving the resolution of the field-emission microscope, he investigated the possibility of imaging surface atoms by adsorption and subsequent field desorption of gas atoms. This work led to his invention of the field-ion microscope in 1951 at the Fritz Haber Institute of the Max Planck Society in Berlin. In 1952 he was invited to the US for a lecture tour. After giving an inspiring colloquium he was invited to take a position in the physics department of The Pennsylvania State University as a research professor.

There he developed most of the techniques and elucidated the physical process in field-ion image formation, in addition to perfecting the field-ion microscope. In 1955 he achieved atomic resolution of the field-ion microscope by cryogenic cooling of the specimen. For this achievement he became world famous as the first man to "see" atoms.

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