

"known and certain," says Michael Barnett, a particle theorist at Lawrence Berkeley Laboratory. "At the first meeting, we sat down and listed what we thought was the minimum such a wall chart should contain," Barnett says. The chart is intended to summarize the major results of the past three decades of particle physics research. But given that most teachers can only devote one or two weeks to the topic, deciding what to include and what to leave out was somewhat involved. Indeed, it took four more years of meetings and regular correspondence to iron out the details.

The project has received the bulk of its funding from the US Department of Energy, Lawrence Berkeley Laboratory and the Stanford Linear Accelerator Center, with additional support from corporate sponsors and the American Association of Physics Teachers. Committee member Helen Quinn, a particle theorist at SLAC, estimates that the project has cost about \$100 000 so far.

A preliminary version of the wall-chart appeared in the December 1988 issue of *The Physics Teacher*. With the assistance of the Lawrence Hall of Science, the committee then conducted a field test with the cooperation of about 400 high school and college teachers, who were given copies of the chart as well as a teacher's guide and computer software explaining the basic concepts of the standard model.

One of the field test subjects was Cathy Mariotti, a physics teacher at William P. Clements High School in Sugar Land, Texas. She incorporated the material into a three-week unit on nuclear physics, which she teaches at the end of the spring semester.

"When the students first look at the wall chart, they're a bit overwhelmed by all the new terminology," says Mariotti. "They may have heard the word 'quark' before, but not in the context of physics."

Mariotti says her students have been especially taken with the software, which is interactive and is illustrated with some clever graphics and animation. With the aid of physicists on the committee, Andria Erzberger, a physics teacher at Palo Alto High School in California, designed the software using the Hypercard program, which runs on Apple Macintosh computers. Hypercard allows one to "page" through a branching series of screens or "cards." In Erzberger's software, for example, a picture of the wall chart is displayed on-screen and a student can then select a word or figure to have it explained further. The software also includes a set of cards describing the design, use

and history of particle accelerators and detectors, which are not dealt with in the chart.

Mariotti readily admits that, like many of her colleagues, she had a sketchy understanding of particle physics before she began the field test. To bring herself up to speed, she did a lot of outside reading and studied the teacher's guide thoroughly; she even wrote a study guide to accompany the software. Other teachers have attended CPEP-sponsored workshops on the use of the chart and software.

Barnett reports that nearly all the field test participants were enthusiastic about the wall chart and the related materials. Based on the results of the field test and other feedback, the chart was recently updated and reprinted. The new chart is much more readable and better organized, says Barnett. The software package has also been revised, and an IBM-compatible program is now being developed. CERN has translated the software into French and incorporated it into a popular ongoing exhibit at its visitors center.

CERN also plans to translate the wall chart and will distribute both it and the software within Europe. The teacher's guide is being rewritten as a textbook for students.

The CPEP group, which originally consisted of 10 physics researchers and teachers, has since grown to 18 members; last year it was incorporated as a nonprofit organization. The group now plans to continue its mission by producing an education film on particle physics.

Distribution of the wall chart and interactive software is being handled by the SSC Laboratory. The materials can be purchased by contacting CPEP, c/o Office of Education and External Affairs, SSC Laboratory, 2550 Beckleymeade Avenue, Dallas TX 75237-3946. Full-size wall charts are \$5 each. Half-size charts (0.75 meter by 0.5 meter) and notebook inserts are also available: The half-size charts are \$4 and inserts are \$6 for a package of 30. The software is \$14. (Prices do not include shipping and handling fees or sales tax.)

—JEAN KUMAGAI

AIP AND AGU APPOINT CONGRESSIONAL SCIENTIST FELLOWS

William T. Elam, a research physicist at the Naval Research Laboratory in Washington, DC, will be the Congressional Scientist Fellow sponsored by the American Institute of Physics in 1990-91. The American Geophysical Union has selected Jeffrey L. Payne of the College of Geosciences, Texas A&M University, to be its Congressional fellow in the coming year.

Elam received a bachelor's degree in physics from Mississippi State University in 1973. He completed his graduate studies at the University of Maryland, where he received a master's degree in 1977 and a PhD in physics in 1979. His thesis work involved electron spectroscopy of materials.

From 1979 to 1982 Elam was a postdoctoral research associate at the University of Washington, where his research included determining the structure of the active site of a biologically important protein using x-ray absorption spectroscopy. In 1982 he began working at the Naval Research Lab. He received NRL's research publication award in 1985 and 1988.

Elam succeeds Kenneth A. Goettel, who worked for Representative Vic Fazio, a California Democrat, as general science expert. Goettel got involved with 20 or 30 issues, mostly

scientific, including the earthquake hazards reduction program, solar and renewable energy, and magnetic confinement fusion.

Payne earned his BS in geology at West Virginia University in Morgantown in 1979 and his PhD in oceanography at Texas A&M University, College Station, in 1989. He has worked as shipboard scientist on several marine expeditions and as a consulting scientist or technician on numerous other projects. His principal research interests are geodynamics and ocean surveying techniques.

Payne replaces Barbara Frank, who spent 1989-90 working for the House subcommittee on international scientific cooperation.

The other Congressional science fellows sponsored by AIP member societies in 1989-90 were Charles P. Blahous III (The American Physical Society) and James Mastracco (Acoustical Society of America). Blahous worked for Senator Alan Simpson, a Wyoming Republican, mainly on matters requiring mathematical proficiency; he now has taken a permanent position on Simpson's staff as a legislative assistant with responsibility for taxes, banking, education, the arts and government affairs. Mastracco worked for Senator Pete V. Domenici,

a Republican representing New Mexico, and helped draft legislation providing for establishment of national supercomputing networks.

The American Physical Society's 1990-91 Congressional Scientist Fellow is Priscilla S. Auchincloss (see *PHYSICS TODAY*, August, page 85). ASA sponsors a Congressional fellow only in occasional years and is not sponsoring one in 1990-91.

DIXON IS NEWLY ELECTED PRESIDENT OF AAPM

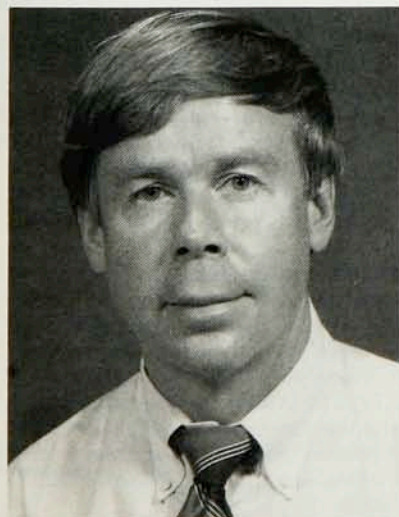
The American Association of Physicists in Medicine has a new president-elect for 1991: Robert L. Dixon, a professor at the Bowman Gray School of Medicine of Wake Forest University, Winston-Salem, North Carolina. Dixon, who takes office on 1 January, will succeed Gary D. Fullerton, who will become AAPM's president.

Dixon earned a BS in physics (1963) and a PhD in experimental nuclear physics (1970) at the University of South Carolina. He joined the Bowman Gray School of Medicine in 1970 as chief of therapy physics. Since 1986 he has been chief of diagnostic x-ray physics at the school.

Dixon has edited two books on magnetic resonance imaging and has written papers on electron and solid-state dosimetry, nuclear magnetic resonance and computed tomography.

In other election results, Bruce Curran of the New England Medical Center in Boston, Massachusetts, was chosen to succeed Guy H. Simmons of the Veterans Administration Medical Center in Lexington, Kentucky, as secretary. The newly elected board members are Karen P. Doppke (Har-

Robert L. Dixon



vard Medical School and Massachusetts General Hospital), Dennis D. Leavitt (University of Utah School of Medicine), Robert J. Morton (Siemens Medical Laboratories Inc, in Concord, California) and Jon H. Trueblood (Medical College of Georgia, Augusta).

BILLS IS WINNER OF OSA'S NEWLY CREATED ALLEN PRIZE

The Optical Society of America has awarded its first Allen Prize to Richard E. Bills, a graduate student in electrical and computer engineering at the University of Illinois, Urbana-Champaign, for contributions to lidar system development and for important new lidar observations of the composition and structure of the upper atmosphere. The Allen Prize honors a person who, as a graduate student, has made outstanding contributions to atmospheric remote sensing using electro-optic instrumentation.

Bills's work led to the first lidar observations of meteor ablation trails and sporadic iron layers in the mesopause region of the atmosphere and to the first demonstration of a new narrow-band lidar technique for measuring mesopause region temperature profiles.

Bills will receive the award, which consists of a scroll and a \$1000 honorarium, at OSA's annual meeting on 4-9 November in Boston.

COLEMAN SUCCEEDS BAROJAS AS AIP'S EDUCATION FELLOW

The American Institute of Physics has selected Lawrence A. Coleman of the University of Arkansas at Little Rock to be its senior education fellow in 1990-91. Coleman, who will work out of AIP's office in Washington, DC, succeeds Jorge Barojas. During his year as education fellow, Barojas was active in the Introductory University Physics Project, an effort to integrate a more balanced view of modern physics into the introductory college course for physics majors (see *PHYSICS TODAY*, May 1987, page 87, and October 1987, page 107), and he helped develop a proposal for an international physics education journal. Barojas also was instrumental in persuading AIP to join the American Chemical Society in publishing *WonderScience*, a magazine designed to

introduce youngsters in grades 4 through 6 to the physical sciences (see *PHYSICS TODAY*, September 1989, page 86).

Coleman's plans for the coming year include directing and expanding AIP's Visiting Scientist Program in Physics, and working on the improvement of science instruction at the pre-college level.

A graduate of Millsaps College in Jackson, Mississippi, Coleman earned his MS and PhD in physics at the University of North Carolina at Chapel Hill in 1966 and 1969. He joined the faculty of the University of Arkansas at Little Rock in 1969 and became a full professor there in 1984.

Coleman's recent research interests have included stellar astronomy and the design of a proposed large detector for high-energy gamma rays and neutrinos from astrophysical sources. He also has worked on curriculum development for both science and non-science students.

ALLEN RETIRES, STONE TO TAKE REINS AT JPL AT END OF YEAR

Edward C. Stone of the California Institute of Technology will succeed Lew Allen Jr as director of the Jet Propulsion Laboratory. Allen, who currently is chair of the committee investigating the Hubble Space Telescope problem, has headed JPL since 1982. Stone, who was chief scientist for the Voyager project, will remain vice president of Caltech and chair of the California Association for Research in Astronomy, which oversees development of the Keck Observatory and Telescope in Mauna Kea, Hawaii.

Stone earned his master's degree (1959) and PhD (1964) at the University of Chicago. He joined Caltech as a research fellow in 1964 and became a full professor there in 1976. Stone has served on numerous advisory committees to NASA and the Space Science Board.

Stone's research has been on solar and galactic cosmic rays, planetary magnetospheres, the interplanetary medium, solar system exploration, and satellite and balloon instrumentation.

Allen earned his bachelor's (1946), master's (1952) and doctoral (1954) degrees in physics at the US Military Academy at West Point. He worked at the Los Alamos Scientific Laboratory from 1954 to 1957, and was science adviser to the Air Force Special Weapons Center from 1957 to 1961. He was a member of the