until 1957. He became vice-president of Hewlett–Packard in 1957. In 1983 he retired from Hewlett–Packard and became head of the Ames center's SETI-program office.

Antoni Zygmund, professor emeritus of mathematics at the University of Chicago, was honored for his "outstanding contributions to Fourier analysis and its applications to partial differential equations and other branches of analysis. He created the strongest school of analytical research in the contemporary mathematical world." Zygmund received his PhD in mathematics in 1923 from the University of Warsaw in Poland. He taught mathematics at the Warsaw Polytechnic School from 1923 until 1930, when he became a professor at Wilno University. He taught at Mount Holyoke College from 1940 until 1945, and then became a professor at the University of Pennsylvania. In 1947 he became a professor at the University of Chicago, and in 1967 was named Swift Distinguished Service Professor of Mathematics.

National Academy of Sciences elects new members

The National Academy of Sciences has elected 59 new members, including the following researchers in physics or related fields: Peter J. Bickel, dean of physical sciences at the University of California in Berkeley; Walter Lyons Brown, head of the department of radiation-physics research at AT&T Bell Laboratories; Gerard H. deVaucouleurs, professor of astronomy, University of Texas in Austin; Gert Ehrlich, professor of metallurgy, University of Illinois at Urbana; David J. Gross, professor of physics, Princeton University; Robert W. Hellwarth, professor of electrical engineering and physics, University of Southern California; Ira Herskowitz, vice-chairman of the department of biochemistry and biophysics in the school of medicine of the University of California in San Francisco; Bertil Hille, professor of physiology and biophysics, University of Washington in Seattle; Yuet Wai Kan, professor of medicine, laboratory medicine, and biochemistry and biophysics, University of California in San Francisco; Daniel Kleppner, professor of physics, Massachusetts Institute of Technology; Brian W. Matthews, professor of physics, University of Oregon in Eugene; Frank B. McDonald, chief scientist at NASA headquarters in Washington, DC; John C. Moll, director of integrated-circuit-structures research at Hewlett–Packard Corporation, Palo Alto, California; C. Bradley Moore, professor of chemistry, University of California in Berkeley; Robert C. Richardson, professor of physics, Cornell University; David N. Schramm, professor of astronomy and astrophysics, University of Chicago; Joseph V. Smith, professor of physical sciences, University of Chicago; and Karen Uhlenbeck, professor of mathematics, University of Chicago.

Gravity Foundation essay awards for 1986

The Gravity Foundation presented its 1986 essay awards to the following individuals: M. J. Bowick, L. Smolin and L. C. R. Wijewardhana (Yale University) shared the $1500 first prize for their essay "Does string theory solve the puzzles of black hole evaporation?" in which they suggest that the massive modes of closed superstring theories may play a crucial role in the last stages of black-hole evaporation. Itzhak Bars and Matt Visser (University of Southern California, Los Angeles) shared the $500 second prize for "Feeble forces and gravity." Gordon D. Pusch (Virginia Polytechnic Institute and State University, Blacksburg) received the $200 third prize for "A new test of the weak equivalence principle." Lawrence H. Ford (Tufts University) received the $150 fourth prize for "Does $\Omega > 1$ imply that the universe will expand forever?" Richard L. Davis (Stanford University) won the $100 fifth prize for "Cosmological textures."

AVS selects Testoni as 1985 Varian Fellow

The American Vacuum Society has selected Anne L. Testoni, a graduate student at Northwestern University, as its 1985 Russell and Sigurd Varian Fellow for developing a pulse-counting, low-energy electron diffractometer to enable her to measure the role of surface defects in surface processes such as oxidation. The award, which consists of a $1500 fellowship and a scale model of the pump invented in 1957 by Varian, recognizes excellence in graduate studies in vacuum science and technology; it was established in 1983 by Varian Associates to honor the company's founders.

New members for Academy of Arts and Sciences

The American Academy of Arts and Sciences has elected the following members: Ralph A. Alpher, a physicist at the General Electric Research and Development Center (Schenectady, New York); Daniel Z. Freedman, professor of applied mathematics at the Massachusetts Institute of Technology; Feza Gursey, professor of physics at Yale University; Daniel Kleppner, professor of physics at MIT; Albert Joseph Libchaber, professor of physics at the University of Chicago; Ricardo Miledi, professor of biophysics at the University of California in Irvine; John Hamilton Reynolds, professor of physics at the University of California in Berkeley; Manfred Robert Schroeder, member of the technical staff in the Information Principles Research Laboratory of AT&T Bell Laboratories (Murray Hill, New Jersey); Charles Vernon Shank, director of the electronics-research lab of AT&T Bell Labs (Holmdel, New Jersey); and Joseph Smagorinsky, director emeritus of the geophysical fluid-dynamics lab of Princeton University. Paul J. Crutzen, professor of astronomy and earth sciences at the Max-Planck-Institut für Chemie (Mainz, Federal Republic of Germany), and Gerard 't Hooft, professor of theoretical physics at the State University of Utrecht (The Netherlands), were elected as foreign honorary members of the academy.

in brief

Jacek K. Furdyna, former director of Purdue University's materials-research laboratory, will join the University of Notre Dame in January 1987 as Aurora and Tom Marquez University Professor. Furdyna's research is on dilute magnetic semiconductors.

J. H. Carver, director of the Research School of Physical Sciences at the Australian National University in Canberra, **D. B. Melrose,** professor of theoretical physics in the School of Physics of the University of Sydney, and **E. Weigold,** professor of physics in the School of Physical Sciences of Flinders University in South Australia, have been elected fellows of the Australian Academy of Science.

Charles T. Prewitt, formerly professor of earth science and materials science at the State University of New York at Stony Brook, became director of the Carnegie Institution's Geophysical Laboratory on 1 July 1986. He succeeds the retiring director, Hatten S. Yoder Jr, who had been director of the lab since 1971.

obituaries

W. James Lyons

W. James Lyons, formerly director of research in physics at the Textile

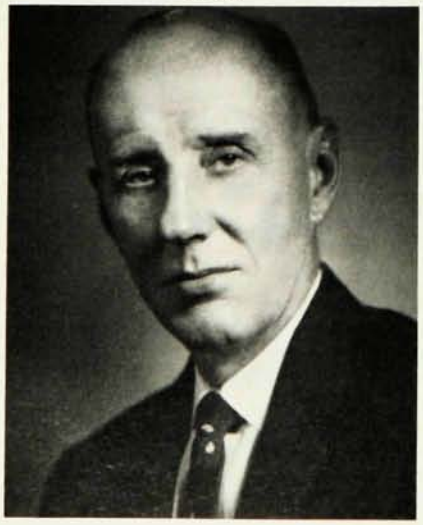
Research Institute in Princeton, New Jersey, and one of the founding members of the Division of High-Polymer Physics of The American Physical Society, died peacefully in Sudbury, Massachusetts, on 16 November 1984. He was 80 years old.

A native of Duluth, Minnesota, Lyons received his PhB from the University of Chicago and his MS and PhD from St. Louis University. He was one of the pioneers of research on the elasticity of rubber and the mechanical properties of polymeric materials, and he held a number of responsible industrial positions before taking up his appointment at the Textile Research Institute. His services to polymer physics and to physics in general were many and varied. A member of the organizing committee responsible for founding the APS Division of High-Polymer Physics in 1944, Lyons served continuously as its secretary for the next 24 years, a post including for much of that time the duties of treasurer; in his final year before retirement from professional life he served the division as its chairman. He was a man of wry good humor and steady sound judgment, also a strict parliamentarian and master of a precise literary style; the success of the division through its formative years owed much to his benevolent, but firm, guiding hand. His talents were called upon in a broader context when, in collaboration with John A. Wheeler (then president of APS), he was responsible for planning a major reorganization of the society in 1966. Lyons was the principal draftsman of the new constitution adopted by the society at that time.

To those who knew him well, it came as no surprise that after his retirement Lyons took a lively interest in the Sudbury Historical Society and in the preservation of the town's ancient documents. To this activity he brought the same good judgment and meticulous care that characterized his many years of service to the physics community.

H. Douglas Keith
AT&T Bell Laboratories
Murray Hill, New Jersey

LYONS



Francis G. Slack

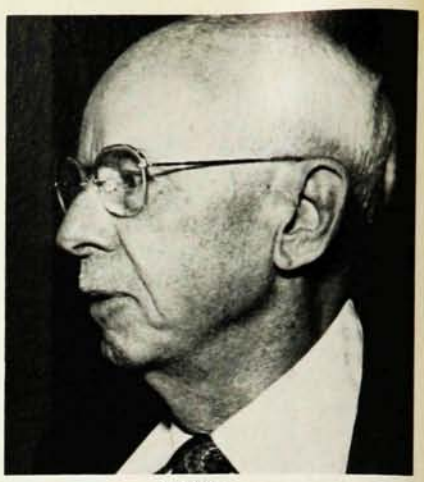
Francis G. Slack, former Landon C. Garland Professor of Physics and retired chairman of the department of physics and astronomy at Vanderbilt University, died on 26 February 1985 at the age of 88. He was born in Superior, Wisconsin, and received his BS from the University of Georgia and his PhD in physics from Columbia University. He was a pilot in the US Air Force in World War I.

Slack spent 1926–27 studying in Germany under Arnold Sommerfeld. There, in the year that Erwin Schrödinger published his revolutionary work, Slack published one of the first experimental tests of wave mechanics. He then returned to Columbia as a lecturer. In 1928 he came to Vanderbilt as an associate professor, and in 1939 he became Landon C. Garland Professor of Physics and department chairman.

When Slack came to Vanderbilt, the region was singularly backward in physics. From 1895 until 1927, no paper in the *Physical Review* came from a physicist in the Southeast. Out of his deep commitment to seeing physics flourish in Tennessee and the Southeast on a level comparable to that in the nation's centers of physics research, he helped transform physics in this region. He immediately established at Vanderbilt strong teaching and research laboratories and, from 1929 on, published regularly in the leading physics journals. In 1931, Slack, Jesse Beams of the University of Virginia and Fred Allison of Auburn were the first physicists from southeastern universities to be elected fellows of The American Physical Society.

Under Slack's leadership the Vanderbilt physics and astronomy department expanded from one to nine faculty members active in research, including a future Nobel laureate, Max Delbrück. He established a PhD program in 1946, and directed its first PhD thesis.

His energetic leadership was not limited to Vanderbilt. In 1928 there existed no organization for physicists in the Southeast. Realizing how meetings of a society could encourage the development of science, Slack helped organize what in 1937 became the Southeastern Section of The American Physical Society. He served as the first secretary of the Southeastern Section, as its chairman in 1940 and as a member of the executive committee from 1949 to 1953.



SLACK

In 1946 Slack played a key role in the creation of the Oak Ridge Institute of Nuclear Studies, now Oak Ridge Associated Universities; he was one of the five original incorporators of the institute.

Slack's most significant work came in two areas of nuclear science. First, while on leave at Columbia in 1938–39, Slack was working with a group that included John R. Dunning, Eugene Booth, Herbert L. Anderson and Enrico Fermi. When Niels Bohr brought news in early 1939 of the experiments of Otto Hahn and Fritz Strassmann suggesting the fission of uranium by neutrons, this group quickly provided the first confirmation of fission. Booth, Dunning and Slack published four very important papers on uranium fission, including ones proving that the fissioning element was U^{235} and that the process occurs by very slow neutrons, not fast ones.

Second, during World War II Slack was a division director in the Manhattan Project. He worked to solve the problem of separating the 1% of fissionable U^{235} from the very abundant U^{238}. In one of the histories of the Manhattan Project, Harold C. Urey, director of the laboratory, wrote: "Slack made an outstanding contribution to the scientific and administrative work of the project. Through his efforts the division was organized and scientific work of a quality performed that in ordinary time would not seem possible." Slack has not been widely recognized for this work because it is still highly classified. However, Dunning commented that "Slack's brilliant work on barrier development was the fundamental basis for the success of the diffusion process for separation of U^{235}." Indeed, Slack's barriers became the centerpiece of the enormous K-25 diffusion plant at Oak Ridge, which has been of inestimable value in the nation's nuclear programs.

Slack returned to Vanderbilt in 1944