cal properties of ice, deformation, the polar ice caps, and history of the climate and the chemical composition of the atmosphere as revealed in bubbles found in ice borings. The institute's borings have gone as deep as 4000 meters—equivalent to 500 000 years—and have made an important contribution to the data base used to evaluate, for example, theories about the impact of the greenhouse effect and the origins of the ice ages. Researchers at the institute believe that their findings confirm the Milankovitch theory, which holds that climatic change depends largely on the orientation and extent of the Earth's tilt with respect to the Sun.

The spectroscopy institute has groups working in solid-state physics on matters such as ultraviolet absorption, nuclear magnetic resonance, semiconductors and structural phase transitions. Researchers at the nuclear institute work primarily on heavy-ion physics.

Polytechnic. Faculty members at the National Polytechnic Institute of Grenoble are responsible primarily for the training of engineers but the Polytechnic also runs laboratories that do sophisticated research in applied mathematics, mechanics, hydraulics, advanced microelectronics, artificial intelligence and robotics.

Daniel Thoulouze, a former director of the low-temperature lab and the current CNRS representative for the Rhône–Alpes region, takes pride in Grenoble's emergence as a major intellectual as well as national center of physics research. He notes that an international *lycée* soon will be started to serve Grenoble's 10 000 foreign residents.

In his most enthusiastic moments, Thoulouze refers to Grenoble as the "California of France," alluding to the large concentration of physics facilities on the West Coast. Thoulouze admits, though, that growth has come with a price. Because the city is surrounded by big dams, nuclear reactors and chemical plants producing dangerous gases, France's new minister for the environment—who also happens to be mayor of Grenoble—has proposed to make the city the focus of a pilot study on the management of disasters.

—William Sweet

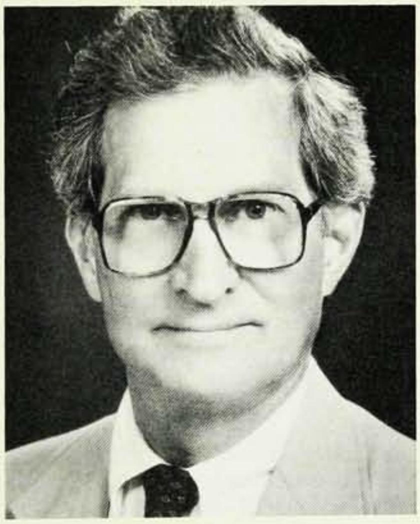
Ford is new AIP Executive Director

Hans Frauenfelder, chairman of the governing board of the American Institute of Physics, has announced that Kenneth W. Ford will succeed H. William Koch as executive director of AIP, effective March 1987. Last February Koch made known his intention to retire as AIP executive director (physics today, March, page 106).

Frauenfelder announced Ford's appointment on 20 October at the conclusion of the governing board's meeting in Annandale, New Jersey. The governing board had elected Ford executive director the preceding evening, acting at the recommendation of a search committee headed by W. W. Havens Jr, executive secretary of The American Physical Society.

Ford has been active for many years in programs conducted by APS, AIP and the American Association of Physics Teachers, showing a particularly strong interest in education and public policy. He was president of AAPT in 1972 and chairman of the APS Forum on Physics and Society in 1981. He is current chairman of the APS Committee on Education and is the APS education officer. He has served on the editorial board of *Physical Review* and has been chairman of the judges' panel for the AIP science-writing awards.

Ford is the author of three books: *The World of Elementary Particles* (1963), which was translated into German, Italian and Russian; *Basic Physics*



FORD

(1968), an introductory text for non-science majors; and *Classical and Modern Physics* (1972–74), an introductory text in three volumes for science and engineering students. He also edited or coedited nine volumes of *Brandeis Summer Institute Lecture Notes*, and was coauthor and coeditor of *Efficient Use of Energy*, the report of the 1974 APS summer study.

Vita. Ford received an AB in physics from Harvard in 1948 and a PhD in theoretical physics from Princeton in 1953. As a graduate student he held research positions at Los Alamos Scientific Laboratory and at Princeton's Project Matterhorn, where he was part of the team that developed thermonuclear weapons.

In the early 1950s Ford helped articulate the collective, or unified, model of the atomic nucleus, which he describes as "a model that took into account both independent particle properties connected with the shell model and collective properties more associated with the liquid-drop picture of the nucleus." His first paper, coauthored with David Bohm in 1950, provided the first evidence of size resonance resulting from the relative transparency of the nucleus to low-energy neutrons. Perhaps his most frequently cited work, he thinks, is a series of three papers he did in 1959 with John Wheeler providing a semiclassical analysis of scattering. Ford also did extensive work on the analysis of muonic atoms and made some forays into mathematical aspects of field theory.

Ford joined Indiana University as a research associate in 1953 and was an associate professor by 1957, when he left to work as a consultant at Los Alamos for a year. In 1958 he was appointed associate professor at Brandeis University, where he subsequently became full professor. From 1964 to 1970 he was a professor and the first physics-department chairman at the University of California, Irvine.

Ford was a professor at the University of Massachusetts, Boston, from 1970 to 1975, and he was president of the New Mexico Institute of Mining and Technology from 1975 to 1982. In 1982–83 he was executive vice-president of the University of Maryland, with responsibilities for budgeting, planning and liaison between the university's president, physicist John Toll, and campus officials.

Ford left the academic world in 1982 to become president of Molecular Biophysics Technology Inc, a start-up company in Philadelphia. The company achieved significant research results on the effects of intense picosecond laser pulses on DNA and proteins, Ford explains, but the results did not sustain the founders' hope for a commercial process to sterilize blood products, and the company did not prosper. In 1986 Ford joined APS as its first education officer.

Education interests. As education officer, Ford sought to help APS exert more leadership in education and launch a number of new projects. He also was principal author of a "white paper" on education, which puts APS education activities in historical perspective, lists a number of possible new activities and discusses the special roles of APS, AIP and AAPT.

In the paper Ford wrote that AIP

"should be encouraged to do what it has already shown it can do well: public information, including working with science writers and creating and distributing educational materials for the general public; data gathering and analysis; and the management of sizable programs (this could include the Physics Olympiad, as well as visiting-scientist programs)." Ford told PHYSICS TODAY that he now has a larger vision of what AIP might do in education.

Ford will take office as AIP executive director at the end of March. "Until then," he said, "I have a job to do for APS, but I will spend as much time as I can learning about AIP. It is nice to be stepping into a financially healthy organization in which there is so much depth of talent.

"AIP was formed to serve the societies," he went on. "It can do that not only through efficient publishing and business services, but also through broader service to the physics community and, on behalf of physics, to the general public."

Ford has raised seven children (three are in college this year, and one is a graduate student). He admits to a special fondness for New Mexico. He is an instrument-rated commercial pilot and has logged over 3500 hours in airplanes and gliders. He now makes his home in Philadelphia, where his wife Joanne teaches school.

Corporate Associates meet at Exxon R&E

Each year the American Institute of Physics holds a meeting with representatives of its Corporate Associates—some 105 research-oriented firms that provide AIP with moral, material and intellectual support. This year the Corporate Associates Meeting took place at Exxon Research and Engineering Company in Annandale, New Jersey, on 21–22 October.

Greeting participants at Exxon's sprawling new red-brick research facility near New Brunswick, David R. Clair, president of Exxon R&E, talked about the difficulties of realizing the commercial potential of science. Clair, a businessman by training, assured his audience of academic, government and industry physicists of his faith in the ongoing scientific process. "A lot of onions are a long way from being peeled," he said.

In recent years the Corporate Associates meetings usually have taken place over two days at a host company's research facility, with the first day devoted to current advances in some area of physics of interest to the host lab, and the second day to broader scientific developments and matters of public policy.

This year the initial morning was devoted to the physics of complex materials, and the topics for the most part would be classified as basic research, though each talk also connected with the practicalities of the petroleum industry. Generally the talks were about the structure and dynamics of complex fluids and of disordered and inhomogeneous materials.

Aaron Bloch, the director of the physical-sciences laboratory at Exxon R&E and the main organizer of the technical presentations, observes that the study of disordered systems has emerged as a principal frontier in condensed-matter physics and that this emphasis coincides with the needs of the energy industry, much as discoveries in semiconductors coincided with the needs of the information industry 30 years ago. A decade ago, Bloch notes, basic concepts like fractals and tools such as synchrotron-radiation sources were not yet sufficiently developed to be of use in the study of disordered systems.

Technical sessions. The first scientific talk in the morning session was given by James Langer on pattern formation in crystal growth. Langer is a professor at the University of California, Santa Barbara, and is associated with the Institute for Theoretical Physics. His lecture was largely devoted to the fundamental conditions that determine the rates and geometries of growth in fractal and fractal-like structures such as dendrites.

The next talk, by Pierre-Gilles de Gennes, was on interface dynamics and wetting. De Gennes, known for his work on superconductivity, polymers and liquid crystals, is a professor at the Collège de France and is associated with Exxon R&E. He talked mainly about how polymers are attached to surfaces by adsorption, grafting or molecular interaction using sequential copolymers with soluble and insoluble components.

David J. Wilkinson, program leader at Schlumberger–Doll Research in Ridgefield, Connecticut, discussed multiphase flow in porous media, in which the same patterns are found that Langer analyzed in crystals. Sabyasachi Bhattacharya, a staff physicist with Exxon R&E, elucidated the dynamics of ordered fluids.

The morning session closed with an account by Charles P. Slichter of how metal catalysts are probed with nuclear magnetic resonance. Slichter is a professor at the University of Illinois who works closely with John Sinfelt at Exxon. Because of the large surface areas needed for experiments employing nuclear magnetic resonance, one needs the metal in the form of small particles, as in real catalysts.

'PRTs.' After lunch in a two-tiered dining area looking out on the New Jersey countryside, resplendent with sun-bathed autumn foliage, the afternoon started with a talk about existing and proposed photon sources.

Exxon's David Moncton provided a comprehensive list of synchrotron-radiation sources, including Argonne's proposed "advanced photon source," and he explained how "participating research teams" have been a handy means of involving industrial researchers in synchrotron work.

Described by Moncton as a "straightforward mechanism for doing proprietary research," the participating research team is a concept developed by Martin Blume of Brookhaven National Laboratory. The PRT buys and owns beam time, enabling researchers to move quickly and take risks without worrying about peer or bureaucratic review until afterward, Moncton explained.

A final afternoon talk, by Brian Flannery, was on three-dimensional x-ray microtomography. Flannery, a mathematician who works on data reduction, left an associate professorship at Harvard to work at Exxon. Using a synchrotron x-ray source, Flannery said, he and his colleagues have developed a device that can produce three-dimensional digital maps of a sample's internal structure, without damaging the sample, with 1-micrometer resolution and 1% accuracy. One of the most challenging aspects of the project, he indicated, has been the development of software for data processing.

Following Flannery's talk, attendees were free to wander at will among 12 laboratory stations scattered around Exxon's huge research building. The exhibits that were of special interest to physicists included the ones devoted to x-ray microtomography; Ronald E. Rosenzweig's innovative technique for magnetically stabilizing a gas-fluidized bed (which the American Institute of Chemical Engineers recognized last year by honoring Rosenzweig with the Alpha Chi Sigma Award); Harry W. Deckman's application of microfabrication processes to self-organizing systems to form molecular-scale porous media; Hans Thomann's use of electron spin echoes as a probe of disordered solids; and the investigation of magnetic properties of catalysts by a group that includes Bernard G. Silbernagel.

The day ended with a cocktail party at the local Hilton hotel, a dinner and an after-dinner talk by Michael F. Barnsley, a mathematician at the Georgia Institute of Technology. Barnsley's