

APS-AIP SURVEY OF FACULTIES FINDS SHORTAGES IN TWO PHYSICS SUBFIELDS

A new survey of physics department chairs, the second such survey since 1986, has found a persistent scarcity of qualified experimentalists for faculty positions in condensed matter and in atomic, molecular and optical physics.

The survey was carried out by a work force of The American Physical Society's Committee on Opportunities in cooperation with the education and employment statistics division of the American Institute of Physics. It is a followup to a similar survey of department chairs done in 1986 by an *ad hoc* committee of the APS Panel on Public Affairs. That survey, which elicited a high response rate of 76%, uncovered a "pronounced shortage of suitable candidates for academic employment in the areas of condensed matter experimental physics as well as atomic, molecular and optical physics." Anecdotal information assembled by the 1986 committee suggested "that the universities have difficulty competing with industry for high-quality candidates."

The 1986 survey was addressed to the chairs of some 170 PhD-granting departments. The new survey was extended to include, in addition to all 175 PhD-granting institutions, 80 departments at undergraduate institutions. These were selected because they appear in Oberlin College's "list of 50 research-intensive liberal arts colleges" or because they grant unusually large numbers of bachelor's degrees in physics. The response to the 1988 survey was even better than in 1986: 90% of the PhD-granting institutions and 80% of the undergraduate institutions replied.

The executive summary of the new survey highlights the following points:

▷ "While elementary-particle theoreticians are regarded as abundant, condensed matter and atomic, molecular and optical experimentalists are scarce, and the chairs are seriously concerned about maintaining quality programs in these areas."

▷ "In each of the major disciplines, theoreticians are regarded as more abundant than experimentalists."

▷ "BS department chairs are particularly interested in experimentalists in atomic, molecular and optical and condensed matter areas. They find them very scarce and are hard pressed to compete with other potential employers."

▷ "While funding and equipment are major concerns in the PhD institutions, the size of the teaching load and the lack of teaching ability of the candidates are major problems at the BS institutions."

The survey also found that "the demand for nuclear and particle experimentalists, while relatively small at the smaller institutions, is significantly greater in the large departments. . . . The interest in astrophysicists in large departments is also striking."

In contrast to the 1986 survey, the new survey explicitly asked chairs to comment on particular factors thought to account for scarcities in subfields. At PhD-granting institutions, the two major problems are seen to be a lack of top-quality applicants and a lack of funds for the salaries and start-up research needed to attract the top people. One chair complained that start-up funding figures were "rivaling NFL football contracts."

At the undergraduate institutions,

heavy teaching loads and low salaries were seen as mainly responsible for scarcities. "There was also a surprisingly large write-in response identifying lack of teaching ability of the candidates interviewed as a major impediment to hiring," the report says.

The survey found that faculty turnover, defined as the ratio of openings to total positions, is about 6% across the board—independent of the size or type of institution. But the report warns that if current demographic projections are correct, increased retirement of physics faculty will lead to a turnover significantly exceeding 6% in the 1990s. "A better match between the physics subfields of graduating PhDs and the needs of universities and industry will be essential. . . . It is important that we remain conscious of this problem and track any variations during the next few years."

The report recommends that the next survey, in 1990, ask specifically whether competition with industry is a major factor inhibiting physics departments from obtaining faculty in the subfields suffering from scarcities.

A copy of the COP Physics Faculty Workforce Survey—1988 can be obtained from Amy Halsted, The American Physical Society, 335 East 45 Street, New York NY 10017.

—WILLIAM SWEET

US AND SOVIET ACADEMIES REACH GLOBAL ECOLOGY AGREEMENT

Responding to fast-mounting concern about major threats to the world's environment, the US and Soviet Academies of Science are establishing a joint committee on global ecological concerns. Agreement on a joint protocol for the committee was reached in December during a visit to the United States of a team headed by Soviet Academy President Guri Mar-

chuk, and the agreement was announced on 13 December at the US National Academy's Beckman Center in Irvine, California.

During a press conference at the Irvine center, Kiril Kondratiev of the Soviet Institute of Limnology said that current trends threaten "nothing less than an ecological catastrophe." Kondratiev, an atmospheric

scientist who was the acting senior member of the Soviet party after Marchuk had to return early to the USSR because of the Armenian earthquake, told *PHYSICS TODAY* that the Academy-Academy negotiations were successful but that agreement on more specifics would have been reached if Marchuk had been able to stay for the intended duration of the visit. Marchuk, a specialist in applied mathematics, has done considerable work on modeling of ecological systems.

As a result of Marchuk's departure, signature of the protocol by the Soviets has been delayed, but finalization of the agreement is considered routine.

The agreement calls for a committee of experts from a wide variety of disciplines to be established. The committee will meet twice a year and report directly to the two academies. "Its activities will complement and support the many bilateral intergovernment programs currently under way and planned, particularly those programs carried out within the framework of the US-USSR agreement on environmental protection," the agreement says. "Also, it will assist in international efforts, such as the International Geosphere-Biosphere Program. When appropriate, the committee will consider preparing joint statements for public release concerning the state of the global ecology and the need for international action."

In a report justifying the establishment of the committee, representatives of the two academies said: "Natural resources are being exhausted on land and in the sea, and thousands of species of plants, animals and microorganisms are becoming extinct. Natural biogeochemical cycles, on which all life depends, are being disrupted; all parts of the environment are being polluted. The global ecosystem is being degraded rapidly, so that its sustainability is being called into question. As a consequence of the exhaustion of land, water, fishery, forest, mineral and other natural resources, the basis for economic development is being undermined. Indeed, it is calculated that human beings currently consume directly, divert or waste some 40% of total global photosynthetic productivity on land, while our numbers climb rapidly. In these circumstances, urgent action is clearly required."

"To reverse these threatening trends, accelerated research by scientists from all nations is of critical importance. . . . Mathematical models of different levels of complexity will

become increasingly important in ecology for the study and forecasting of the dynamics of the biogeochemical cycle that is a part of the Earth's life-support system. . . . Continued monitoring of the whole planet and of its separate regions must be done. For this reason, the application of satellite and other airborne remote sensing, in combination with conventional observations, to monitor the Earth is becoming an increasingly vital element. . . . In order to monitor the consequences of human activities, it is necessary to have a better base-line inventory of appropriate environmental components. For example, we do not even approximately know the number of species of organisms that exist: Estimates vary from 5 to 50 million species, with only about 1.4 million described thus far."

The committee's mandate is to focus, initially, on the following areas:

- ▷ global energy and biogeochemical cycles
- ▷ observation systems for assessing global change
- ▷ global changes in biotic activity
- ▷ theoretical and methodological bases for understanding ecological change
- ▷ review and support of related inter-

national efforts.

Concurrently with the announcement of the agreement on global ecology, it was disclosed that the Soviet Union had accepted an offer from the US National Academy to send a team of US earthquake experts to Soviet Armenia.

—WILLIAM SWEET

Fermilab Names Computing Center After Feynman



The Feynman Computing Center at Fermilab, shown here in an aerial view, was dedicated on 2 December. Construction of the new building was started four years ago, and the decision to name it after Richard Feynman was made last year. The objective of the center is to "increase fivefold the computing capacity available for scientific applications and to provide new space for these and related activities," according to the Department of Energy. The cost of the project has been about \$25 million. Robert R. Wilson, the former director of Fermilab, designed the building for the center in collaboration with Edward Crumpley of Fermilab's construction engineering services.

IN BRIEF

A recording of Richard Feynman playing the bongo drums and telling stories about his safecracking escapades during the Manhattan Project days at Los Alamos is available. The price is \$15 for a compact disc and \$10 for a cassette tape. Checks should be made out and addressed to Ralph Leighton, Box 70021, Pasadena CA 91107. All proceeds go to the Richard Feynman Memorial Fund for Cancer Research at the University of California, Los Angeles.

Addison-Wesley is publishing a special commemorative edition of the *Feynman Lectures in Physics* this year. Each of the three hardbound volumes sells for \$36.50 and the packaged set for \$88.95.