get deficit this year, arising in part from the controversy surrounding its overhead accounting practices.

The subject of overhead rates is of course receiving attention throughout the university system, but the effects of the current governmental scrutiny will probably be drastic in only a few cases. Most state universities, which charge lower overhead rates to begin with, may be almost entirely unaffected by tighter regulations. It's the private universities where much of the impact will be felt. Department chairs at those institutions say research is bound to be affected, if only because more time and money will go into bookkeeping.

A. J. Stewart Smith, physics department chair at Princeton, points out that the vast majority of indirect costs are legitimate. "That money will have to come from somewhere.... It's bound to stifle [university-based] research in some way."

At one private university in the Northeast, known for its skill at political logrolling, the department chair says the number of graduate students there may have to be cut 50% if the NSF really imposes the kind of overhead regulations that have been discussed.

Despite that kind of scenario, the general situation of the elite private institutions is still felt to be rather strong. Their highly selective admissions render them relatively impervious to demographic fluctuations among the college-age population, and their endowments give them a cushion most state schools lack (although falling interest rates have meant less endowment income). As a rule, their graduates fare far better in the job market.

Demographics versus recession

Complicating the current employment picture is the convergence of several demographic trends—in particular, the shrinking high school population and the growing number of retirement-age faculty. The prospect of retirements, widely noted since the early 1980s, has been interpreted by some to mean that we need to train more scientists.

But the recession has altered this picture, at least temporarily. We are hearing of positions created by retirements going unfilled. At the University of North Carolina, Chapel Hill, to take just one example, four professors retired this past year but only two will be immediately replaced. Of course the general expectation is that once the recession is over, replacement of retiring professors will resume. But what if the recession is longer lasting than is now predicted? Other questions also arise: Will US schools, which now award 40% of their physics PhDs to foreigners, also be keen on having that same cohort as their faculty? And what if there are simply not as many jobs as forecast, if it becomes apparent that graduating PhDs are not getting positions after completing their postdocs?

"Unlike law school or business school, the graduate physics training is treated like an apprenticeship," says Kate Kirby, a research physicist and associate director at the Harvard–Smithsonian Center for Astrophysics, who was chair of the APS committee on membership in 1990–91. "Students have the expectation that when they arrive at the other end of the process they will continue to do basic research," she says, in industry or academia or at a national lab. That somewhat overly optimistic expectation, Kirby says, has left many young physicists feeling confused and misled.

With the job prospects in the traditional sectors drying up, groups such as the APS physics planning committee and the APS committee on membership have become interested in identifying alternative career paths for PhD physicists, Kirby notes. "This is a really hot topic."

The statistics division of the American Institute of Physics currently is completing a special study of the postdoc population, designed precisely to cast light on whether current postdocs are experiencing trouble in securing permanent jobs. This study, which tracks new PhDs for up to three years after graduation, is the first the division has conducted since 1977. Beverly Porter notes that the latest study "clearly indicates that PhDs emerging from their postdocs are having difficulties locating permanent physics research employment." Academic positions are still limited, she says, while industry and national lab positions have been severely curtailed by the recession. Although unemployment is still rare, Porter says, "many appear to be prolonging their postdocs."

Meanwhile, the forthcoming AIP survey of 1991 bachelor's degree recipients shows a shift into graduate study—as a means of riding out the recession—and a growing proportion of physics bachelors doing work unrelated to their major.

—Jean Kumagai
and William Sweet

PHDS FARED WORSE IN 1990 JOB MARKET, SURVEY SHOWS

The latest employment survey of recent physics graduates reveals a noticeably grimmer job market for new physicists. Conducted in the winter of 1990–91 by the American Institute of Physics, the survey polled those who had received degrees in 1990 to see how they fared in the job market during the months following graduation. What the survey found was that, compared to the previous year, respondents took longer to find jobs, unemployment increased, and starting salaries for PhDs dropped.

The amount of time recent graduates spent looking for work increased significantly during the past several years and was up sharply from 1989 to 1990. Since the early 1980s, for example, the proportions of bachelor's and master's degree recipients who took more than six months to find a job more than doubled. From 1989 to 1990, the proportion of physics doctorates who took three months or more to find work rose from 58% to 70%.

Unemployment among recent graduates was also higher in 1990 than in 1989. Among physics bachelors, 10% said they were unemployed at the time of the survey, compared to 7% the year before, although at least one-third of the unemployed held some kind of job during the six months between graduation and the survey. Underemployment was also a problem among physics bachelors, with 7% working only part-time and primarily in jobs that did not make use of their physics training. Five percent of the 145 master's degree holders and 3% of the 495 PhDs who responded to the survey said they were not working, compared to 4% and 1%, respectively, in 1989.

Among the new PhDs who found work in the US in 1990, two-thirds took postdocs, the same as in 1989. The proportion of PhDs accepting jobs outside the US increased slightly from 8% to 10%, while the number finding full-time work in the US fell from 31% to 27%.

Physics doctoral recipients earned less in 1990 than in 1989. The median monthly salary was $3580 for those who took potentially permanent jobs, as opposed to $3760 the year before. For postdocs the $2460 monthly salary in 1990 was less than the $2400

reported in 1989, taking inflation into account. Industrial positions for new PhDs—traditionally the most abundant and highest paying—were harder to come by and less lucrative in 1990 than was true in 1989. The median monthly salary in industry was $4000, compared to $4100 the previous year, and only 37% of PhDs took industry positions, an 11-percentage-point drop from 1989.

The survey also found increasing job dissatisfaction among respondents. Of the PhDs who took potentially permanent jobs, 40% said they were interested in a job change, compared to 24% in 1989.

One of the few bright spots in the survey's findings was that master's and bachelor's degree recipients commanded higher starting salaries than their peers of the previous year. In 1990, the median monthly salaries for masters was $3000 and for bachelors $2220; in 1989, masters earned $2680 per month, while bachelors earned $2000.

Copies of the survey are available from the AIP Education and Employment Statistics Division, 335 East 45 Street, New York NY 10017.

ACOUSTICAL SOCIETY SURVEYS COMMUNITY IN US AND CANADA

The Acoustical Society of America has concluded an ambitious survey of the acoustics community in the US and Canada, in an attempt to profile the entire community in the two countries, as compared with the parts of the community directly represented in ASA. The project was carried out by ASA's census committee, under the leadership of Chester M. McKinney, a past president of the society.

A volunteer effort, the survey aimed to include all professional scientists and engineers involved in acoustics on a full- or part-time basis, including graduate and undergraduate students and technicians. Questionnaires were sent to about 4400 organizations thought to have some involvement in acoustics. Pre-college educational institutions and operational military units were not included.

Response rates varied greatly among sectors, from 84% in government to 31% in industry, with education in between at 61%. The response rate from not-for-profit organizations was 77% and from consultants 82%.

For a number of reasons, the results are considered an underestimation of the whole acoustics community and an especially severe underestimation of acousticians in industry (including Department of Defense subcontractors working on things like antisubmarine warfare). Even so, the survey's estimate of the whole community is 12 915, more than twice the US and Canadian membership of ASA, which is about 5000. The census also counted about 2100 students doing graduate work in acoustics fields.

In several of the 21 categories of activity—including the science of underwater acoustics, underwater acoustical engineering, structural acoustics, measurements and instrumentation, acoustical signal processing, effects and control of noise, speech and audiology—the survey found close to 1000 working scientists, engineers or technicians. However, the survey did not attempt to count the approximately 50 000 speech pathologists and 8000 audiologists engaged in clinical work.

Data from the survey will be used by ASA for long-range planning and membership development. The full report, "A Profile of the Acoustics Community in the United States and Canada," can be obtained from ASA, 500 Sunnyside Boulevard, Woodbury NY 11797. The survey also appears in the February issue of the *Journal of the Acoustical Society of America.*

AAPT ELECTS VOSS TO BE 1992 VICE PRESIDENT

Howard G. Voss, a professor of physics at Arizona State University, is the new vice president of the American Association of Physics Teachers. After serving a one-year term, Voss will become president-elect in 1993 and president in 1994. The current AAPT president and president-elect are, respectively, James H. Stith of the US Military Academy and Reuben Alley of the US Naval Academy.

Voss earned an AB from Hope College in 1957 and an MS from Purdue University in 1964. After teaching high school for five years, Voss became an NSF intern at Arizona State in 1963, and he joined the physics and astronomy faculty there the following year. Voss's career has been devoted to teaching physics, which he has done at the high school, undergraduate and graduate levels. He has also developed in-service courses for elementary and secondary teachers.

In other election results, Larry D. Kirkpatrick (Montana State University) was chosen representative for four-year colleges to the AAPT executive

Howard G. Voss

board, and Robert F. Sears Jr (Austin Peay State University) was reelected AAPT treasurer. John W. Layman (University of Maryland) has been appointed to complete the term of AAPT Secretary Kenneth S. Ozawa, who resigned due to poor health.

HINZE IS APPOINTED EDITOR OF *JGR—SOLID EARTH*

William J. Hinze of Purdue University is the new editor of the *Journal of Geophysical Research—Solid Earth*, a publication of the American Geophysical Union. The journal was recently reorganized, with the multiperson editorship replaced by a single editor responsible for the entire journal. Hinze is the first editor to serve under the new editorial arrangement.

Hinze's plans for the journal include shortening lengthy papers, broadening the journal's range and emphasizing international participation. He also intends to emphasize interdisciplinary coverage of Earth geophysics.

Hinze received a PhD in geophysics from the University of Wisconsin in 1957. After working for several years in industry, he joined the geology faculty at Michigan State University in 1958. In 1972 he became a professor of geophysics at Purdue. Hinze specializes in gravity and magnetic methods and data, and he has been involved in preparing magnetic anomaly maps of the US and North America. His other work includes studies of the continental crust, global long-wavelength geophysical anomalies and environmental and engineering geophysics. ■