

DOE in "partnership" with Chrysler, Ford and GM. Research and development people at the Big Three had identified six areas in need of basic research, and meeting participants have now drafted reports on the workshops held on those topics: energy storage materials and processes; energy conversion materials and processes; lightweight materials; the impact of emissions on the atmosphere; emission control; and sensors for control, performance and emissions.

The next conference, now being organized by James S. Langer, the director of the Institute for Theoretical Physics at the University of California, Santa Barbara (and Eisenberger's Opinion coauthor), will concentrate on modeling and simulations, and the one following that, again headed by Eisenberger, will be on industrial ecology. October's Corporate Associates meeting of the American Institute of Physics will be hosted by Ford at its Research Laboratory in Dearborn, Michigan. Eisenberger sees these conferences as bringing together "knowledge generators and knowledge users"—or, using the language of mod-

ern management, "owners of problems and owners of expertise."

But would you be seen in it?

Brailsford said that the best part of PNGV and the atmosphere surrounding it is the elimination of the "adversarial relationship" between the government and industry—or rather, he corrected himself, between "the Executive branch" and industry—in trying to achieve common goals. "There is a global fossil fuel economy at stake, and I think it's up to the United States to fully participate, in a responsible way."

Auto manufacturers must look for ways to ply their trade in a global marketplace while responding to the public's increasing desire for a livable environment. According to Eisenberger, with little or no shift in their scientific interests, many physicists could be doing some of the basic research needed for the solution of these longer-term problems. Lest we forget the total picture, however, Davis phrased the ultimate PNGV challenge: creating a high-efficiency vehicle that "somebody like you would like to drive."

DENIS F. CIOFFI

Students. Neuenschwander says that in his new position he has two primary objectives: to work with AIP member societies on educational efforts "at any level" and to lead AIP's own education division in revitalizing $\Sigma\Pi\Sigma$ and SPS.

A metric of success

SPS has about 5200 student members in 612 chapters organized in 18 zones throughout the US. Neuenschwander's experience has given him reason to think that SPS can help physics departments "reduce their cross sections" as states shrink education funds and cost-cutting university administrators look for expensive targets to attack.

Based on his seven years as the SPS chapter adviser at Southern Nazarene and on his four years as a zone councilor, Neuenschwander believes that, nationally, SPS has been underutilized. He wants to encourage its use as a tool to help "reenergize the culture of physics departments across the US." He has seen it happen at least once: When low enrollments in Southern Nazarene's physics department caused concern on the part of the university administration, the growth and activity of SPS were essential in lifting the department to safety. (See Neuenschwander's March letter.)

Neuenschwander outlines three major areas by which to measure the success of SPS. First, he says, faculty should see in SPS "a powerful instrument" for recruitment and retention of students: "Faculty have to recruit undergraduate students actively. Faculty have to be involved personally." The concept that "if you don't have students, you're out of business" is an obvious one to Neuenschwander, but given the recent elimination of the physics major at Virginia's James Madison University (see PHYSICS TODAY, March, page 81), it bears repeating. Neuenschwander argues that physics teaches many "transferable skills" and that faculty should recruit undergraduates "knowing at the outset that many may choose not to be PhD physicists."

Second, Neuenschwander says SPS should help students see themselves as members of a profession. For example, he gets undergraduates involved in research not merely for publications, but for the contrast with course work (where the answers are known) and to give them "the experience of doing science." Through such participation by students, Neuenschwander says, "SPS should be recognized as an important contributor to the overall health of the physics community."

Third, through outreach programs

New AIP Education Head Will Crank Up SPS to Help Physics Departments

When Dwight E. Neuenschwander sat at his word processor to respond to Kenneth Ford's open challenge to the national council of the Society of Physics Students, "Study Physics to Be a Nonphysicist," he had no idea that a year later, because of the experience he brought to the composition of that response, he would be made the new manager of the education division of the American Institute of Physics. (Neuenschwander later submitted a variation of his original response to former AIP Executive Director Ford as a letter to PHYSICS TODAY; see March, page 124.) John Rigden, AIP's director of physics programs, announced the appointment in January, and Neuenschwander, who replaced Donald F. Kirwan, began working part-time on 9 February. As of 1 June, he will be at AIP's offices in College Park, Maryland, full-time. He comes to AIP from Southern Nazarene University, in Bethany, Oklahoma.

Neuenschwander received his BS in physics in 1976 at the University of Southern Colorado. With a theoretical investigation of the contact-interaction approximation in quantum chromodynamics, he earned his PhD in physics from Arizona State University, in Tempe, in 1983. After teach-

Dwight E. Neuenschwander, the new manager of AIP's education division, plans to work with AIP member societies while focusing his initial efforts on the Society of Physics Students.

ing at Arizona State as a visiting assistant professor from 1983 to 1985 and as an assistant professor at Northern Michigan University at Marquette in 1985–86, he went to Southern Nazarene University. In 1988 he was named chairman of the physics department, a post he held for five years. He was the principal author of the "Structures and Interactions" model for the Introductory University Physics Project. (See the article by Rigden, Donald F. Holcomb and Rosanne DiStefano in PHYSICS TODAY, April 1993, page 32). He is an associate editor of the *American Journal of Physics* and a coach of the US Physics Olympiad team.

The education division manager of AIP also holds the titles of executive director of Sigma Pi Sigma, the national physics honor society, which granted Neuenschwander membership in 1975, and director of the Society of Physics

that bring physics to the general public and into the local schools, SPS can increase science literacy. In Neuen-schwander's model, any student's potential for science literacy is "proportional to the product of interest and the ability to handle abstract concepts." To help generate and sustain that interest, Neuen-schwander encourages SPS chapters to offer tutoring and other services, including visits to grade schools and high schools to do physics demonstrations. In support of these efforts, SPS is preparing a booklet of science-outreach ideas developed by successful practitioners throughout the US. Neuen-schwander says that the long-term goal of such activities is "to help prepare the way for systemic reform" of US science education.

ΣΠΣ

In 1996 AIP will celebrate the 75th anniversary of the founding of Sigma Pi Sigma, and so Neuen-schwander will be looking at this organization too. For now, he and his assistants are reviewing membership data on the diverse careers followed by ΣΠΣ members (not all of whom were physics majors). Neuen-schwander wants to know if ΣΠΣ can be enlarged from its mostly ceremonial role to a more active one that directly serves the physics community and the public.

Amid the rush of plans and possibilities, one function of SPS continues: helping students alleviate the anxiety that can accompany the transition to a new level of intellectual rigor. Mary Beth Todd Monroe, zone 13 (Texas) councilor and chapter adviser at Southwest Texas Junior College (one of the few chapters at a junior college), says that for her students SPS "brings about a positive, family atmosphere—with good physics."

DENIS F. CIOFFI

Physics Enrollments Drop for 2nd Straight Year

Word of the tough job market in physics seems to be getting around, judging from figures in the latest survey of US physics enrollments and degrees conducted by the American Institute of Physics's education and employment statistics division. Enrollments in physics programs at both the undergraduate and graduate level appear to be eroding, and although the number of new bachelor's degree recipients and PhDs was up slightly in 1993-94, a drop in

physics degrees is in the offing if current enrollment trends continue.

The number of first-year physics grad students dropped by 6% for the second year in a row: About 2900 students entered physics graduate programs in 1993-94, down from 3300 in 1991-92. The dip in first-year enrollments contributed to a small decline in overall graduate enrollment, which totaled 14 200 in 1993-94. When the survey's authors, Patrick J. Mulvey and Michael Neuschatz, looked more closely at these data, they found that the recent declines were largely "the result of drops in the size of the first-year classes at the larger departments." In some cases these drops may have been due to explicit policy changes. For example, Cornell and the University of Texas at Austin have both announced that they are intentionally holding down physics enrollments.

Undergrad enrollments were also down, with the number of junior-year physics majors in 1993-94 (about 6150) at its lowest since 1982. Such figures "strongly suggest that a decrease in the production of both bachelor's and doctorate degrees is on the horizon," the report says.

There were 4800 bachelor's degrees, 1797 master's degrees and 1369 doctorates awarded in physics during 1992-93, about the same as in the previous year. In light of the much-discussed physics job market, "I was surprised to see that degree production hadn't started to decline," Mulvey told PHYSICS TODAY. "I suspect that most students, having already invested time in grad school, are not being enticed to drop out, especially with the comparably poor employment prospects in similar disciplines."

The survey, which was conducted during the fall and winter of 1993, polled all US physics departments to obtain data on enrollments in the 1993-94 academic year and physics degrees conferred in 1992-93.

The survey report highlighted a 10-year trend among undergrads in their fifth or higher year of study. "The number of students in this category has doubled during the past 11 years," the report notes. At present at least one-fifth of the senior class stay on beyond four years. By comparison, the Department of Education found that one-half of all bachelor's degree recipients in the US now take more than four years to graduate. Mulvey said that future surveys would attempt to explain this phenomenon.

In 1992-93, astronomy departments conferred 190 bachelor's degrees, 102 master's degrees and 119 PhDs. The PhD figure is the highest ever in the 30-year history of the survey. Undergraduate and graduate enrollments in

astronomy have remained more or less steady for the past several years.

Single copies of the enrollments and degrees report are available free by writing to Education and Employment Statistics Division, AIP, One Physics Ellipse, College Park MD 20740-3843.

Don't Miss Physics Day

The celebration from 21 to 29 April of the 11th annual National Science and Technology Week includes the 25th Earth Day and the first National Physics Day, Wednesday, 26 April. The theme of this year's NSTW is "Explore New Worlds Through Science and Technology." The American Institute of Physics is an associate sponsor of NSTW, which is organized by the National Science Foundation.

In a letter sent to faculty advisers of the Society of Physics Students, John Rigden, AIP's director of physics programs, has challenged SPS to get involved in NSTW by bringing physics demonstrations and lectures to local schools and shopping malls. Those wishing to participate should check the World Wide Web site at <http://soundprint.brandywine.american.edu/~nstw/> or call David Heil of the Oregon Museum of Science and Industry at 503-797-4508 for more information.

IN BRIEF

"The Nobel Legacy," three new one-hour television shows about medicine, physics and chemistry, can be seen on the Public Broadcasting System on 21 April and the two succeeding Fridays (check local listings). A Nobel laureate presides over each program, with Leon Lederman hosting the physics episode. The series is underwritten by Baxter International, a manufacturer and distributor of medical services and products.

On 26 February Daniel C. Stanzione succeeded John S. Mayo (see PHYSICS TODAY, December, page 51) as president of AT&T Bell Laboratories. Stanzione has a BS in electrical engineering (1967), an MS in environmental systems engineering (1968) and a PhD in electrical and computer engineering (1972), all from Clemson University. He joined Bell Laboratories in 1972 and has worked on software systems, network architecture and signal processing. ■