

steel wire mesh and steel rope trusses (see photo on page 73). This design, explains Swarup, "allows wind to pass through," and thus presents less wind resistance than would a solid dish. Moreover, the wire mesh dishes weigh less than solid ones, so that smaller—and cheaper—gear boxes and motors can be used to steer them. And, adds Swarup, the radio-wave reflection is good: "About 95% at the shortest wavelengths, and better for longer wavelengths."

To see how the antennas would hold up in a hailstorm, Swarup and his colleagues froze water-filled balloons, and then hurled them from a moving car at test panels made of wire mesh. "Nothing broke when we threw 2 cm ice balls at 70 km/hr," says Swarup, "and hail will not have a stronger force than that." Willem Baan, a radio astronomer at Arecibo Observatory in Puerto Rico, says, "GMRT will be an important telescope, and it is very impressive what they have done on such limited funds." Nearly all parts of GMRT were made in India.

GMRT will be used to observe a series of radio astronomy spectral lines, including the 1420 MHz atomic hydrogen line. Swarup, who is now emeritus but remains very involved, says that at this frequency, "We will look for supergalactic-sized hydrogen clouds to test Big Bang theory predictions regarding galaxy formation."

Swarup says that some of the antenna receivers will be modified in 1998 to extend the observation range of GMRT to include the 1612 MHz hydroxyl spectral line. This, of course, means that he and his colleagues are concerned about possible interference from the Iridium global mobile telephone system. "So far, it is relatively radio-quiet in India. It's an underdeveloped country, and even taxi drivers don't have walkie-talkies. But this is changing."

TONI FEDER

IUPAP General Assembly Held in Sweden

The International Union of Pure and Applied Physics (IUPAP) held its general assembly in Uppsala, Sweden, in September. Burton Richter, director of the Stanford Linear Accelerator Center and winner of the 1976 Nobel Prize in Physics, was elected president-designate. Sweden's Jan Nilsson moved from that position to become president,



JAN NILSSON

succeeding Japan's Yoshio Yamaguchi, now past president. And France's René Turlay was elected secretary general. The new office holders will serve until the next general assembly is held in 1999, in Atlanta, Georgia. Each has a seat on IUPAP's governing council.

IUPAP is a nongovernment organization and a member of the International Council of Scientific Unions (ICSU). It has 20 commissions (and 2 affiliate commissions) representing various physics fields, including a new commission for computational physics that was established at this year's general assembly. The assembly also approved a request by the acoustics commission to change its status next year to that of an affiliate—a change that will somewhat weaken its ties to IUPAP. "Acoustical societies have many nonphysicist members, and they need better international representation than IUPAP provides," explains commission member Lawrence Crum, of the University of Washington.

In addition, the assembly delegates, who represented member physics academies from about 45 countries, voted to give commission chairs seats on the council for the first time: 5 of the 8 seats that have always been for vice presidents were redesignated. The change was made so that the IUPAP council will get more input from the commissions, or, as Richter puts it, "from where the action is."

IUPAP sponsors about 30 international conferences each year. Nilsson, who has been active in IUPAP governance for nearly 25 years, says that he wants IUPAP to take a more active advisory and lobbying role in, for example, the setting of guidelines for the establishment and use of large international physics facilities (for which a resolution was passed in Uppsala). He also wants IUPAP to create interna-



BURTON RICHTER

tional guidelines in communications and publications "to ensure a reliable flow of scientific information to all scientists, including in developing countries."

"During the cold war, IUPAP was a bridge for scientists between the East and West," says Richter. He and Nilsson agree that now the main aim is to figure out what IUPAP's role in the future should be, and to set new long-term goals.

TONI FEDER

AIP Surveys Find Enrollment Losses, Salary Gains

US enrollments in physics continued to fall in 1995, but at least some physics degree recipients commanded higher starting salaries than in the previous year, according to two surveys recently released by the American Institute of Physics.

According to the graduate student survey, there were about 13 300 physics graduate students in the US in 1994–95, down 6% from the previous year; that group included a first-year class of 2600, which was 10% smaller than in 1993–94. A total of 1461 physics PhDs and 985 master's degrees (excluding a master's earned en route to a PhD) were conferred in the US during the 1994–95 academic year. Women comprised about 16% of the graduate student population, 17% of master's degree recipients and 12% of PhD recipients.

Among the PhD recipients who found work in the US, 59% accepted postdoctoral appointments and 9% took temporary positions other than postdocs. Of the remaining 32% who

found permanent work, the majority went into industry, where the median annual starting salary was \$54 000, compared to \$50 000 in 1994. Postdocs going into government laboratories and universities earned \$36 000 and \$31 000, respectively.

The 1995 survey of bachelor's degree recipients reported a total of 4268 physics bachelor's degrees awarded in 1995, 15% fewer than in 1989. This decline is expected to continue, states the survey report. "Physics bachelor's degree production will remain at levels not seen since the mid-1950s."

About a third of those responding to the bachelor's survey said they would continue on to physics or astronomy graduate study, and another 22% planned to pursue graduate study in some other field. The remainder said they would look for jobs, although about one-fourth of that group expected to enter graduate school after one year. Of those entering the labor force, 19% had not received an offer by the end of the 1994-95 academic year, compared to 24% in 1994. Among those who did find full-time work, the median annual salary was \$29 800, up from \$27 000 the previous year.

Single copies of the 1995 *Graduate Student Report* and 1995 *Bachelor's Degree Recipients Report*, coauthored by Patrick J. Mulvey and Elizabeth Dodge of AIP, are available free of charge by writing to AIP, Education and Employment Statistics Division, One Physics Ellipse, College Park, MD 20740-3843; phone 301-209-3070; e-mail stats@aip.org.

Rothenberg Is AAPM President-Elect for 1997

Members of the American Association of Physicists in Medicine recently elected Lawrence N. Rothenberg to be the AAPM president-elect for 1997. He will succeed Stephen R. Thomas, who will assume the presidency of the organization.

Rothenberg has been affiliated with Memorial Sloan-Kettering Cancer Center throughout his career, starting as a postdoctoral fellow in 1970. He is currently associate attending physician in the department of medical physics there, as well as associate professor of physics in radiology at Cornell University Medical College in New York City. Rothenberg received his BA in physics from the University of Pennsylvania, and his MS in physics and PhD in nuclear physics from the University of Wisconsin—Madison. In addition to research in image evaluation, image management and dosimetry in

general diagnostic imaging, mammography, interventional radiology and computed tomography, Rothenberg has been involved in the education and training of residents and medical physics postdoctoral fellows.

In other results of the AAPM election, James M. Galvin (New York University Medical Center) was chosen secretary, and the following board members were chosen: Priscilla F. Butler (George Washington University Medical Center), Paul M. DeLuca Jr (University of Wisconsin—Madison), David S. Gooden (Saint Francis Hospital in Tulsa, Oklahoma) and Marilyn Wexler (Santa Monica Cancer Treatment Center in California).

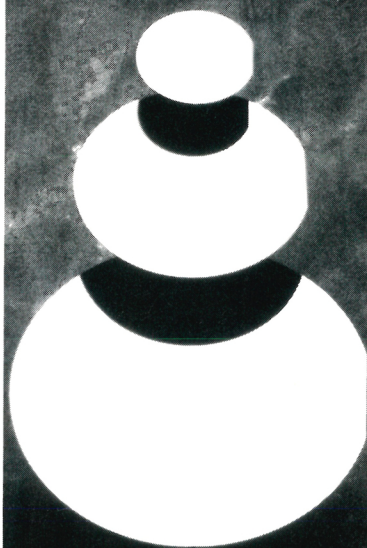
IN BRIEF

The American Vacuum Society has established two new awards. The John Vossen Memorial Award, named for a former president of AVS, will "recognize and encourage the development of high school science demonstration experiments of interest to the American Vacuum Society." High school and middle school science teachers in North America are eligible for the annual award. The George P. Hanyo Award will recognize contributions made by a technical support person working in an area of interest to AVS. The award was established by the Kurt J. Lesker Co in memory of Hanyo, a longtime employee.

On 11 November, Thomas J. McIlrath will become treasurer of the American Physical Society. McIlrath, who holds a PhD in physics from Princeton University, is a professor in the Institute for Physical Science and Technology at the University of Maryland at College Park and associate dean for research and graduate studies there. A laser and atomic physics experimenter, he is also a staff member at the National Institute of Standards and Technology in Gaithersburg, Maryland. McIlrath succeeds Harry Lustig, who has been APS treasurer since 1985. During Lustig's tenure, the operating budget of APS tripled, and the society remained on a sound financial footing. Lustig and his wife, Rosalind, will retire in Santa Fe, New Mexico.

On 1 January, Samuel Colbeck of the US Army Cold Regions Research and Engineering Laboratory in Hanover, New Hampshire, will succeed George Hornberger of the University of Virginia as editor of *Water Resources Research*, a monthly journal of the American Geophysical Union. ■

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