

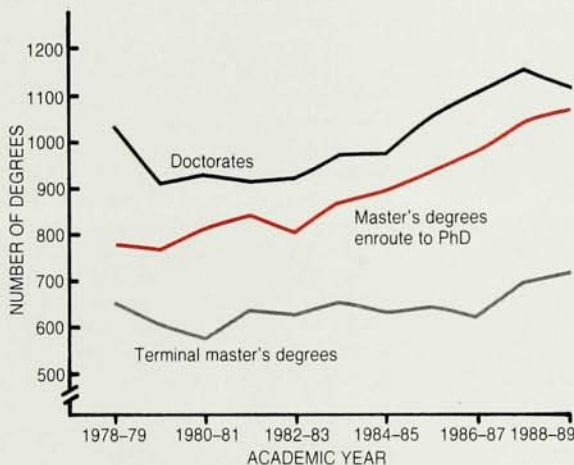
AIP SURVEY FINDS MORE PHYSICS GRAD STUDENTS, FEWER UNDERGRADS

Is the cup half empty or half full? Depending on the weight you attach to one or another indicator, the latest figures on US physics programs may strike you as good news or not-so-good news.

According to the 1989 survey of enrollments and degrees conducted by the American Institute of Physics, the number of US students in the first-year graduate population fell by 5.5% from 1988 to 1989, while the proportion of first-year foreign students reached an all-time high of 44%. This is the second year in a row that the size of the entering graduate population has dropped, despite serious efforts to recruit more Americans into physics graduate work. For the first time in five years, the number of new physics PhDs also shrank: There were 1100 physics PhDs granted in 1989, a drop of 3% from 1988.

On a more positive note, there were 1780 master's recipients in 1989, representing an increase for the ninth year in a row in the number of master's degrees awarded. According to Susanne D. Ellis, the survey's senior author, the increases have been a result of growth in the number of students getting master's degrees en route to PhDs. From 1980 to 1989, the size of that group expanded from 760 to 1100. Ellis is therefore projecting increases in the number of physics doctorates over the next three years, peaking at about 1260 PhDs in 1992. The physics graduate student population has been growing slowly but steadily since 1979, when 9600 were enrolled, to 13 700 in 1989.

The survey found that during the past five years the number of juniors and seniors majoring in physics has declined steadily. Likewise, from 1988 to 1989, the number of freshmen physics majors—as estimated by the chairpersons of physics departments—fell by 4%. But even with sagging undergraduate enrollments, US schools have continued to award about the same number of physics bachelor's degrees since 1985, about



Number of students taking master's degrees with intention of going on to earn doctorates in physics has increased notably. Trend was masked initially by presumption that students at non-PhD granting institutions would not seek doctorates. Growing numbers of foreign students at such institutions suggested that presumption would prove wrong.

5200 per year.

Enrollment in US astronomy programs showed substantial growth in 1989, as did the number of astronomy bachelor's and master's degrees awarded. For example, the number of master's degrees jumped from 75 in 1988 to 93 in 1989, a 24% increase. The number of first-year graduate students grew by 10%, to 186. The

number of astronomy PhDs awarded in 1989 was the same as in the previous year: 94.

Copies of the 1989 Survey of Enrollments and Degrees can be obtained from Susanne Ellis, Education and Employment Statistics Division, American Institute of Physics, 335 East 45 Street, New York NY 10017.

—JEAN KUMAGAI

US TEAM FACED TOUGH QUESTIONS IN LATEST PHYSICS OLYMPIAD

Alexander Barnett, a high school student from Great Britain, was the top scorer in the XXI International Physics Olympiad held in Groningen, The Netherlands, from 5-13 July. The result was a bit of a disappointment for the United States, which came away with the top honor last year. But the five students representing the US this year did garner two bronze medals and an honorable mention, and all the US contestants did well.

The twenty-first Olympiad—the fifth in which a US team has participated—drew 160 competitors from 32 countries. This year's questions proved to be particularly tough, says

Bernard V. Khoury, the new executive officer of the American Association of Physics Teachers, who accompanied the US team. There were only six gold medals awarded this year, compared to 11 last year, and overall there were 30% fewer medals than last year.

The number of medals is based on the average of the top three scores achieved on the Olympiad exam. To earn a gold medal, a student had to get at least 90% of that average. Reflecting the exceptional difficulty of this year's competition, the average score on the theoretical section was 9.8 out of a possible 30 and the average score on the experimental

section was 10.6 out of a possible 20. Barnett, the winner of the Olympiad, scored 45.7 out of a possible 50.

Jonathan Higa of Iolani High School in Honolulu, Hawaii, and Dylan Thurston of Princeton High School in Princeton, New Jersey, earned the bronze medals for the American team, and Perry Cheng of Memorial High School in Houston, Texas, received an honorable mention. The other US competitors were Christopher Niell of Bromfield School in Harvard, Massachusetts, and Joshua Winn of Deerfield High School in Deerfield, Illinois.

Although the US team came away with fewer medals this year than in any of the previous years it has competed, this was the first time all five earned scores that placed them in the top half of the competitors, according to Larry Kirkpatrick of Montana State University, who has helped coach the US team for the past three years.

—JEAN KUMAGAI

AVS SPONSORS WORKSHOP FOR HIGH SCHOOL TEACHERS

At its annual meeting next month in Toronto, Canada, the American Vacuum Society will sponsor a one-day program for local high school physics and chemistry teachers. At an estimated cost of \$11 000, about 40 teachers from 25 Toronto area schools will be given a demonstration and tutorial on the principles of vacuum science, a guided tour of the meeting's equipment exhibits, and monetary grants toward the purchase of vacuum equipment for their schools.

"This is our first endeavor to get involved at the high school level," says James Solomon of the University of Dayton, who currently heads the AVS education committee. AVS is following in the footsteps of the Optical Society of America, the American Astronomical Society and The American Physical Society, which already have introduced programs to involve high school teachers at their annual meetings.

A big component of the program will be the demonstration of a set of vacuum science experiments, which have been prepared by Ken Nebesny of the University of Arizona and Art Nelson of the Solar Energy Research Institute in Colorado. In one experiment, an alarm clock is placed inside a vacuum (bell) jar and air is then removed via a vacuum pump; the alarm beeping becomes faint as the pressure decreases. Nebesny and Nelson are also putting together vacu-

um kits to be used by the teachers in their own classrooms. AVS plans to give grants to each of the participating schools to cover the cost of the kit, which includes a vacuum pump, vacuum jar, pressure gauge and experiment book.

In addition to the demonstration, the teachers will hear a lecture on the fundamentals of vacuum science by Richard Gilbert of the University of South Florida, and they will attend the meeting's plenary lecture by John C. Polanyi of the University of Toronto entitled "The Photochemistry of Absorbates." Polanyi shared the Nobel Prize in chemistry in 1986 for his work on chemical reaction dynamics (see *PHYSICS TODAY*, March 1987, page 17). Following the plenary lecture, the teachers will be given a tour of the AVS equipment exhibit.

If all goes well, AVS plans to offer similar workshops at future annual meetings, says David W. Hoffman, the society's president. AVS also intends to open up the workshop to teachers throughout the United States and Canada. One possible arrangement would be for each of the society's 21 chapters to sponsor one or two teachers to attend the workshop.

AIP GIVES GRANTS FOR PRE-COLLEGE PHYSICS PROJECTS

Four projects designed to improve physics education at the pre-college level were recently awarded grants totaling \$25 000 as part of the William F. and Edith R. Meggers Project Award sponsored by the American Institute of Physics. The winning projects were selected by a committee headed by Jorge Barojas, AIP's senior education fellow in 1989-90.

A \$10 000 grant went to Jon Barber and Henry J. Ryan of Mounds View High School in Arden Hills, Minnesota, for the development of a videocassette explaining their use of student-run laboratories in high school physics. Paul Hickman of Phillips Academy in Andover, New Hampshire, and Jennifer Hickman of Belmont High School in Belmont, Massachusetts, received \$6300 for a project that encourages parents and children to do physics projects at home. Neel Beard of Hampden-Sydney College in Virginia was awarded \$5200 to organize a one-week summer class that will introduce high school students to physics before they begin their regular high school physics course. William J. Layton of Palisades High School and the University of California, Los Angeles, and Nuria Rodri-

gues of Santa Monica College received \$3500 to help create a database listing the physics teachers and the numbers and types of physics courses in California high schools.

MATERIALS RESEARCH SOCIETY ESTABLISHES TWO NEW PRIZES

The Materials Research Society has established two new annual awards to recognize excellence in materials research. The Outstanding Young Investigator Award will be given to individuals under the age of 35 whose "excellent interdisciplinary materials research indicates exceptional promise for future leadership in the field." The MRS Medal will recognize individuals responsible for some pioneering research achievement in any materials-related field. The new awards, which are being supported through the newly created MRS awards endowment fund, carry a cash prize of \$1000 each. Winners will be invited to give a technical talk during the MRS meeting at which they receive the award.

IN BRIEF

The Optical Society of America has moved its headquarters to 2010 Massachusetts Avenue NW, Washington DC 20036. The telephone and facsimile numbers are unchanged.

The German Physical Society (Deutsche Physikalische Gesellschaft) announced at its annual meeting, which took place in Munich in mid-March, that it soon will reunite with the Physical Society of East Germany. The enlarged DPG will have about 20 000 members, about 10% of whom will represent the membership of the East German physical society. According to Gerd Röpke, the president of the East German society, an overwhelming majority of its members already have voted to rejoin the DPG at the first opportunity.

The three 15-meter radiotelescopes built and operated by the Institute for Radioastronomy in the Millimeter Range, a French-German consortium, have come into operation on the Plateau de Bure in southern France. The telescopes, with a range of 0.8-3 mm, rest on a system of tracks and can be positioned in 28 configurations. They also can be linked to form an extended array with IRAM's 30-m radiotelescope on the Pico Valata in southern Spain, a facility managed by the Instituto Geográfico Nacional. ■