440-MW VVER reactors—the non-Chernobyl type that more closely resemble US light-water reactors—*is* reprocessed, and the separated uranium is sweetened with highly enriched uranium from the weapons stockpile to make 2–4% enriched fuel for RBMKs. The feedstock for Soviet enrichment plants contains reprocessed spent fuel from plutonium production reactors, as well as virgin uranium concentrate.

Soviet commercial uranium enrichment now takes place entirely by means of the centrifuge method, the visitors were told. The Soviets said they have ten centrifuge plants, each with a capacity of 1 million SWU (separative work units) per year. Plutonium production takes place in reactors at three sites: Kyshtym, Tomsk and Dodomovo, near Krasnoyarsk. When Cochran asked how much plutonium the Soviet Union has stockpiled, he was told, "A little more than you."

Somehow members of the group came away with the impression that Kyshtym may house a heavy-water tritium production reactor that they were not told about. Apparently tritium is produced in heavy-water reactors at the other two facilities.

Civilian conversion?

Kyshtym managers expressed concern about what will become of the population of some 100 000 that the facility supports as old reactors are retired and plutonium production is reduced or even entirely eliminated. Apparently there is serious talk about building facilities to manufacture milk processing equipment or VCRs.

Sensitive to constituent concerns of this kind, Congressman Olin commented to PHYSICS TODAY: "It will be hard for them to shut down the [plutonium production] facilities just for that reason [the difficulty of converting them], if nothing else." Nevertheless, Olin came away with the impression that the Soviets are "pretty serious" about the possibility of a limit or freeze on weapons material production. "The main message [of the visit]," Olin said, "was that the Soviet Union has far more reactor capacity than needed, especially if we go ahead with a strategic arms reduction treaty."

Congressman Carr shares Olin's impression that Gorbachev's government would like to negotiate a bilateral agreement on plutonium. His understanding is that the Supreme Soviet plans to consider new legislation this fall that would modify the USSR's atomic energy act to permit further disclosure of information about plutonium.

Regarding the more urgent and much more difficult question of tritium, Carr says one official told him during the visit—"half in jest"—that the USSR might be willing to sell the United States some!

—WILLIAM SWEET

US STUDENTS CONTINUE TO CHOOSE PHYSICS MAJORS

While the overall college-age population in the US is shrinking, the number of students choosing physics majors has remained stable, according to the latest figures on graduation and enrollment in physics programs at US universities gathered by the American Institute of Physics.

The survey of 800 physics and astronomy departments across the country found that 5152 physics bachelor's degrees were awarded during the 1987–88 academic year, down slightly from the 5253 awarded the previous year and about the same as in 1984–85. The number of undergraduates who declared physics majors in 1988 was roughly what it had been the previous several years.

"This comes as a pleasant surprise," says Susanne D. Ellis, one of the survey's authors. "We know that the college-age population is going down, so the fact that physics bachelors are only leveling off—and not slipping—is a good sign." She points out that in addition to those students who major in physics, over 300 000 students take an introductory physics course while in college. "That's a very large number," Ellis said. "And it's especially important now, when the need for scientifically literate people is so great."

This year's survey also turned up a surprising finding on student enrollment at the graduate level: The distribution of foreign students among US physics programs is very uneven. Since the early 1980s, the proportion of foreign students in US graduate physics programs has been high; foreign citizens now account for about two of every five graduate slots. But few schools actually fall at the 40% mark, Ellis says. After looking at individual schools' enrollments earlier this year, she discovered that "graduate programs seem to have either one-fourth or else three-fourths foreign students."

Why the disparity? "In general, those physics programs that are most attractive to US students tend to have fewer foreign students," Ellis says. For example, in the top ten physics departments (as ranked in "An Assessment of Research-Doctorate Programs in the United States: Mathematical and Physical Sciences," a 1982 report by the National Academy of Sciences), an average of 27% of the graduate students are foreign—compared with a combined average of 42% for all doctorate-granting institutions. At the University of Illinois at Urbana-Champaign—with 315 students, the country's largest physics graduate program—only 14% were foreign in 1988–89.

New highs in the number of physics graduate degrees were reached in 1988 compared with the preceding ten years. There were 1733 physics master's degrees granted last year, of which 1035 went to students interested in pursuing higher physics degrees and 698 to those ending their studies at the master's level. Eight years ago, when the number of physics master's degrees bottomed out, only 1370 degrees were awarded. A 4.1% increase was seen in physics doctorate recipients in 1988, with 1150 doctorates awarded, compared with 1105 the previous year.

Ellis attributes the rise in physics graduate degrees to the influx of foreign students enrolling in US graduate programs. Based on current enrollment and graduation trends, the survey projects that the number of physics doctorates granted will continue to rise into the early 1990s, to as many as 1300 per year, and will then either level off or begin to decline.

The number of women and minorities granted physics degrees in 1987–88 remained about the same as the previous year. Women accounted for 15% of the bachelor's degrees awarded in 1988 and 9.5% of the doctorates. Blacks made up 3.5% of physics bachelor's recipients, Asians (including Asian-Americans and Indians) 4.4% and Hispanics 1%.

In astronomy, only one in ten applicants to doctoral programs is accepted, this year's survey found, in contrast to physics programs, where there is a chronic shortage of qualified students. Graduate astronomy departments can draw from a large pool of applicants when selecting their doctoral students; the choice available to physics programs is more limited. Even so, the survey con-

cludes that in both physics and astronomy "the anticipated demand . . . in the 1990s appears to exceed the numbers of students currently preparing themselves" for careers in those fields. In 1987–1988, 181 astronomy bachelor's degrees, 75 master's degrees and 94 doctorates were awarded.

For a copy of this year's report, entitled "Enrollments and Degrees," write to Susanne Ellis, Education and Employment Statistics Division, American Institute of Physics, 335 East 45 Street, New York NY 10017.

—JEAN KUMAGAI

APPLETON IS HEAD OF PHYSICAL SCIENCES AT OAK RIDGE

Bill R. Appleton has been named associate director for the physical sciences and advanced materials at Oak Ridge National Laboratory. He succeeds Alexander Zucker, who is now associate director for nuclear technologies.

Appleton earned his BS at the University of Missouri (1960) and his MS (1964) and PhD (1966) at Rutgers. He was a research staff member at RCA from 1961 to 1963 and at Bell Telephone Labs from 1966 to 1967, when he joined Oak Ridge. Appleton served as the first director of the ORNL Surface Modification and Characterization Collaborative Research Center, one of the lab's national user facilities, and from 1986 to 1988 he was director of the lab's solid-state physics division.

Appleton's research has been in surface physics, ion–solid interactions, surface modification by means of ion implantation, ion-beam mixing and laser annealing.

ROYAL SOCIETY LIMITS COLLABORATION WITH CHINA

The Royal Society of London announced in August that because of China's political crackdown in June, it was terminating scientific collaboration with Chinese government bodies. A memorandum of understanding with China's Ministry of Geology and Mineral Resources will not be renewed, and an agreement with the PRC's Natural Science Foundation is suspended. The Royal Society also will not send or receive high-level delegations to or from the PRC.

The Royal Society will continue to support visits by individual scientists, including those arranged under agreements with the Chinese Academy of Sciences and the China Association for Science and Technology. But it will not make grants to scientists to attend international meetings in China "until it can be sure that such meetings are fully international, attracting high-calibre scientists from around the world, and that attendance by British scientists will not be used to imply support for Chinese government policies."

NEW BITNET LINK AND ADDED FEATURES GIVE PINET A BOOST

A new and improved version of AIP's on-line database service, PINET, is now up and running. The new PINET came on line on 1 September, and more than 500 users have since registered.

PINET is an electronic information service developed by the American Institute of Physics for the physics and astronomy community. It provides on-line access to databases such as job listings, the PHYSICS TODAY meeting calendar, advance abstracts and published journal abstracts, and can be used to send messages to other individuals or institutions. The original PINET system came on line in March 1986.

The new PINET's added features include:

▷ An electronic mail service linking PINET to BITNET and other networks

▷ A new text search and retrieval feature for conducting Boolean searches of most of the available databases

▷ Expanded coverage of AIP's SPIN database, which provides published abstracts from over 80 AIP and member-society publications

▷ A toll-free 800 number for access from the US and Canada.

PINET operates on a Gould 60/40 computer located at AIP's Woodbury, Long Island center. There is a $15 registration fee for individuals, plus an hourly connect charge. To register, dial 1-800-727-4638 using a modem; at the LOGIN prompt, type *new* (lower case). A menu with registration information and instructions will then be displayed.

SWARTZ IS EDITOR OF *THE PHYSICS TEACHER* . . . AGAIN

What goes around comes around. Clifford E. Swartz, editor of *The Physics Teacher* magazine from 1967 to 1985, is once again sitting behind the editor's desk. He succeeds Donald Kirwan, who moved to the American Institute of Physics as manager of its education division last year.

Swartz has definite ideas on where he would like to see the magazine go. "*The Physics Teacher* should be suitable for and read by anyone who teaches an introductory physics course, whether that be in a high school, college or university," Swartz said in a recent interview. "It should be a tool for linking these different teaching groups." The magazine is published by the American Association of Physics Teachers.

Swartz became involved in physics education in the 1950s, when the Physical Science Study Committee first met to revamp high school science courses. He has written science textbooks for all grade levels.

In addition to his editorial duties, Swartz will continue as a professor of physics at the State University of New York at Stony Brook, where he has taught since 1957. Swartz received his BS, MS and PhD in physics from the University of Rochester and did experimental particle physics at Brookhaven National Laboratory from 1951 to 1963.

Editorial correspondence should be sent to: *The Physics Teacher*, Department of Physics, SUNY at Stony Brook, Stony Brook NY 11794.

IN BRIEF

The University of California, San Diego, has established an endowed chair in physics to honor the late Bernd T. Matthias, the discoverer of thousands of ferroelectric, ferromagnetic and superconducting materials. Matthias was a professor at San Diego from 1961 to 1980.

A center for the basic physics of submicron semiconductor science, the Joseph H. and Belle R. Braun Submicron Semiconductor Center, is being established at the Weizmann Institute of Science. Funded at $15 million, the center will have 5700 square feet of floor space, about 70% ultraclean, and facilities will include a molecular beam epitaxy lab, an electron-beam lab and a microlithography and processing room. It will be headed by Mordehai Heiblum, currently at the IBM Thomas J. Watson Research Center, and it will have three to five research scientists and five to ten technical personnel, as well as graduate students. ■