

the course through correspondence with local colleges.

The adaptation of "The Mechanical Universe" for high school use is being funded by a grant of \$650 000 from the National Science Foundation. The teachers and administrators selected to participate in the project at Caltech spent this summer selecting material from 26 half-hour videotapes on classical mechanics for three hours of video material consisting of 15-minute segments. The teachers also helped prepare instructional guides for the series. Upon returning to their schools this fall, each of the teachers is to start testing half the segments in cooperation with another teacher who did not take part in the production of the series. The results of this preliminary assessment will be evaluated by an educational consulting firm, and if the rating is high, the series will be revised next summer and distributed in fall 1985, just as Caltech's television series begins. According to Richard Olenick, a visiting associate at Caltech from the University of Dallas physics department, who serves as codirector of "The Mechanical Universe," the high school series will be made available to schools at the lowest possible cost.

Don Delson, a coordinator for the high-school project, reported that work was going "quite well" this summer and that "everything was on schedule." Olenick said that the teachers were particularly impressed by the video graphics, especially those illustrating mathematical concepts such as angular momentum and the universal law of gravitation.

If the high-school adaptation of the 30-program course on classical mechanics is well received, the participants hope to follow it with an adaptation of the course's second part, which covers electricity and magnetism, relativity, waves and optics, thermal physics and modern physics (PHYSICS TODAY, June 1984, page 67). The second part is to be shown on public television starting in Fall 1987.

"3-2-1 Contact," the PBS television science series for children aged 8 to 12, has received renewed support from the National Science Foundation, with the blessing of NSF's policy-making group, the National Science Board. In June, NSF announced a grant of \$8.5 million to support production of 20 more half-hour segments over a period of five years. Created by the Children's Television Workshop in New York, which also produces the popular "Sesame Street," "3-2-1 Contact" is the recipient of numerous prizes including four Emmy awards. A. C. Nielsen, the Chicago-based organization that surveys television viewership, reports that 23 million children have watched the series at home and another 3 million at

school. Some 650 000 teachers have received guides to the series. Of this number, 70 000 have attended workshops on how to use the program to best effect.

The third season of the program was produced this summer with \$1 million from the Corporation for Public Broadcasting. The additional 20 segments funded by the new NSF grant will bring the total number of episodes to more than 200.

Television science got another boost in August when the Josiah Macy Jr Foundation in New York announced a \$1.5-million grant to establish a training school for science writers at station WGBH in Boston. Six fellowships, each worth \$25 000, will be awarded each year for three years to bring writers to WGBH, the nation's largest producer of science programming for public television. According to John T. Bruer, a Macy Foundation official, each fellow will spend four months working on a radio news magazine show, one month learning television techniques, and seven months working independently on stories with a crew and television editor. Academic and research scientists are eligible for the fellowships and may apply to WGBH, which will make the selections each year.

—ws

Education

Stanford team writes curricula on peace and violence

Arms control, once the exclusive preserve of foreign policy specialists and weapons scientists, continues to involve more people. In a program at Stanford launched last fall, study materials on conflict, violence, war and arms control have been compiled for use in classes from kindergarten through grade 12. Project participants are developing curricular materials for use in high schools, and they plan to organize training sessions for secondary school teachers.

New center studies climate trends

A new Center for Climate Research, to study long-term climate changes, has been established under the auspices of Columbia University with a seed grant of \$1 million from the G. Unger Vetlesen Foundation. The Center is to promote cooperative work between Columbia's Lamont-Doherty Geological Observatory in Palisades, New York, and NASA's Goddard Institute for Space Studies, located near the Colum-

The project is jointly administered by the Stanford Program on International and Cross-Cultural Education and the Stanford Center for International Security and Arms Control. Steven Zansberg, outgoing coordinator of the project (soon to be replaced by Rose McDermott), reports that the best known and probably the most widely used materials located by the project were prepared by several organizations in the Boston-Cambridge area—Educators for Social Responsibility and Union of Concerned Scientists, among others. Materials for young children usually focus on how conflicts break out and are resolved, Zansberg says, while the more sophisticated material on international relationships is reserved for older students. A bibliography of such materials has been prepared at Stanford, and next summer, the project coordinators hope to bring 30 to 50 Bay Area teachers to the University for an intensive residential institute on how to teach arms control at the primary and secondary level.

Last fall, the Union of Concerned Scientists and Physicians for Social Responsibility urged teachers around the country to devote up to a week of instruction to arms-control issues, but Zansberg notes that such efforts often provoke controversy locally and nationally. Zansberg says that classroom material prepared by groups that favor arms control has come under attack from organizations such as the American Security Council in Washington, D.C., and Phyllis Schlafly's Eagle Forum in Alton, Illinois. The National Education Association, on the other hand, has endorsed use of "Choices," a 10-lesson series on war and peace issues prepared by UCS.

Stanford's International Security and Arms Control Project does not specifically endorse use of the items it compiles, and because certain items are regarded as biased in some circles, participants in the project are developing new curricular materials which—they hope—will be seen as objective on all sides. They expect to have some of the material ready next summer for the pre-college teaching institute. —ws

bia campus in New York City.

The Goddard Institute, a division of the Goddard Space Flight Center in Greenbelt, Maryland, is developing models to project climate trends into the next century. The Lamont-Doherty Observatory boasts the world's largest collection of deep-sea sediment cores, which are being studied to compile a history of the world's climate changes going back more than 100 000

years. Some of the sediment cores were collected with help of the *Vema*, a three-masted schooner that the late G. Unger Vetlesen donated to the lab in 1953 for oceanographic research. Vetlesen, a long-time patron of the Lamont-Doherty Observatory, was founder and chairman of the board of Scandinavian Airlines System, Inc.

The main thrust of work at the new Center for Climate Research is likely to involve testing atmospheric models developed at the Goddard Institute with data from the climate records compiled at Lamont-Doherty. According to Wallace Broecker, a research scientist at Lamont-Doherty and a professor of geochemistry at Columbia, Goddard is recognized for its work on general-circulation atmospheric models, and Lamont-Doherty is known for paleoclimate studies. The major weakness of the new center, Broecker says, will be in fluid dynamics. He expects that endowment funds raised by the insti-

tute will be used to hire a person who is strong in fluid dynamics for the program.

The Center will also use new funds to bring in graduate students and postdocs and to support innovative research programs, Broecker says. Broecker is particularly eager to see the program get into ice-core research, which, he says, has been turning up remarkable and unexpected results in recent years. One of the most important practical objectives of the new program will be to evaluate the problem of CO₂ buildup in the atmosphere—the so-called “greenhouse effect”—in light of improved general-circulation models. Generally, Broecker says, models used to predict the results of CO₂ buildup are based on the assumption that the marine-atmospheric system remains stable. But the historical data suggest, he says, that there may be “more than one stable marine-atmospheric system.” —ws

Education

More US students enroll in physics

In the 1983-84 academic year, for the first time in a decade, foreign students accounted for a decreasing proportion of the people enrolling in graduate physics programs at US universities. Since the early 1970s, when many of the more promising American undergraduates began to be lured into other fields, physics departments increasingly have admitted applicants from abroad to graduate programs. In the 1973-74 academic year, foreign students made up 23% of new enrollments in graduate physics programs, but by 1982-83 that figure had climbed to 40%. In 1983-84, it dipped to just over 38%, according to the latest AIP survey of *Enrollments and Degrees*. A drop of less than two percentage points may seem insignificant, but it arises from more dramatic shifts in underlying trends. While enrollments by foreign students increased just 3.6% in 1983-84, enrollments by American students surged 11.9%, according to Susanne D. Ellis, the author of the AIP survey. She thinks that as US demand for physicists picks up, more Americans will continue to be attracted into the field. New graduate enrollments in physics increased last September by 8.6% to 2855. A total of 10 922 students were enrolled in graduate physics programs in 1983-84, up 4.7% from the year before.

Almost a third of the students graduating from college in 1983 with bachelor's degrees in physics enrolled immediately in master's or PhD physics programs, which has been the normal

pattern in recent years, though at one time about half the physics bachelors went straight on with graduate studies. The number of students who were awarded bachelor's degrees in physics increased 5% in 1983, while those earning PhDs rose just 1%. Roughly 7% of the people awarded physics PhDs were women, about the same as the year before.

The number of college students who took an introductory physics course continued to increase in 1983-84. During the past five years, the number has grown to more than 300 000 from around 250 000. About 40% of the students taking introductory physics are likely to become engineering majors, and roughly a quarter will go into medicine or health-related fields.

Despite the large number of foreign students competing for slots in US graduate programs, nearly 6% of the available assistantships in PhD-granting programs went unfilled in 1983-84. The increases in unfilled assistantships were especially large in the South-Atlantic and West South Central regions.

Because the average student spends about six years earning a PhD in physics, foreign nationals who entered US programs in the mid and late 1970s are only now beginning to enter the job market in significantly larger numbers. A key question, said Ellis, is “what is going to happen as these people come out.”

The latest edition of *Enrollments and Degrees* includes comprehensive statis-

tics on students in astronomy and sample results on minorities. It is available, free, from AIP Manpower Statistics Division, AIP, 335 East 45th Street, New York, NY 10017.

AIP will issue new abstracts journal starting in 1985

Starting in early 1985, AIP will issue a new journal, *General Physics Advance Abstracts*. It will provide pre-publication abstracts of articles that are to appear in some 40 AIP and Member Society journals including *Applied Physics Letters*, *The Astronomical Journal*, *Journal of Applied Physics*, *Journal of the Acoustical Society of America*, *Journal of Chemical Physics*, *Journal of Mathematical Physics*, *Medical Physics*, *Physics of Fluids*, and *Review of Scientific Instruments*, as well as the Russian translation journals published by AIP. *General Physics Advance Abstracts* will not include abstracts of papers appearing in *Physical Review*, *Physical Review Letters* and *Review of Modern Physics* because these publications already are abstracted in *Physical Review Abstracts*, which goes to over 15 000 individuals and libraries.

General Physics Advance Abstracts will be a companion publication to *Phys. Rev. Abstracts* and will appear semimonthly in a similar format. The abstracts in *Gen. Phys. Adv. Abstracts* will be grouped by journal, and each issue is expected to be about 48 pages long. The contents of *Gen. Phys. Adv. Abstracts* and *Phys. Rev. Abstracts* also will be available on the “Advance SPIN” computer tape.

The yearly price for *General Physics Advance Abstracts* will be \$12 for members of AIP Member and Affiliated Societies and \$150 for nonmembers. Members of The American Physical Society will be able to receive free subscriptions to *Gen. Phys. Adv. Abstracts* upon request (see page 102).

AIP Executive Committee cuts page charges for journals

The AIP Executive Committee decided last June to reduce page charges in 1985 for AIP-owned journals. The reductions are as follows: from \$100 to \$85 for *Applied Physics Letters*; from \$65 to \$50 for *Physics of Fluids*; from \$65 to \$45 for *Journal of Applied Physics*; from \$60 to \$45 for *Journal of Chemical Physics*; from \$65 to \$40 for *Journal of Mathematical Physics*; and from \$65 to zero for *Review of Scientific Instruments*. The American Physical Society also has announced page charge reductions for its journals in 1985 (see page 102). □