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vide advanced science training to high-school students of exceptional ability. Hayden Planetarium is one of 173 institutions participating in the over-all program.

Directed by Franklyn M. Branley, associate astronomer at the Planetarium, the course dealt with such topics as descriptive astronomy, radio astronomy, celestial mechanics, space technology, and astrophysics. Classroom instruction was provided by Gibson Reaves, associate professor of astronomy at the University of Southern California, and Robert E. Danielson, research associate at Princeton University Observatory. A number of additional lecturers spoke on topics related to their current work.

Support for regional science-education projects for students and teachers has again been provided through National Science Foundation grants to State Academies of Science and similar organizations. Among this year's list of projects are visiting-scientist programs, aid for science clubs and workshops, the expansion of Junior Academies of Science, and various experimental approaches to science education at both high-school and college levels. A list of the 51 grants can be obtained from the National Science Foundation, 1951 Constitution Ave., N. W., Washington 25, D. C.

Equipment and Laboratories

The redesigned electron synchrotron at the California Institute of Technology is now able to operate at its maximum energy of 1.5 Bev, according to an announcement by Robert F. Bacher, director of the synchrotron project and chairman of Caltech's Division of Physics, Mathematics, and Astronomy. It is the only electron accelerator in the world with beam energies covering the range from 1.2 to 1.5 Bev. The latter energy yields a velocity of 99.999995 percent of the speed of light for the orbiting electrons.

Construction of the machine began in the spring of 1950 under contract with the AEC, and after its completion in July 1952 it had a top operating energy of 500 Mev. Improvements brought the maximum up to 1.2 Bev in August 1956. The recent modifications, accomplished under the leadership of Matthew Sands, deputy project director, resulted in the synchrotron's present upper limit, which is the ultimate attainable with its 14 000-gauss magnet.

The accelerated electrons are used mainly to generate x-ray beams for studies of the photoproduction of elementary particles. The facility operates 24 hours a day during the week and day shift only on weekends. In addition to Bacher and Sands, the synchrotron group includes physicists Robert L. Walker, Alvin V. Tollestrup, Vincent Z. Peterson, Joe H. Mullins, Ricardo Gomez, Robert F. Deery, and Hans G. E. Kobrak. Other project members are Robert V. Langmuir (professor of electrical engineering), Bruce Rule (chief engineer), Edward Taylor (operations engineer), and Camilo Paganini (electronics engineer), plus an operations staff and about 15 graduate students.

New laboratory equipment for science teaching in schools and colleges will be designed by 56 scientists and engineers who have recently been awarded National Science Foundation grants totaling \$716 400. The objective of the program is to encourage competent designers to develop teaching apparatus that educational institutions will find useful. The Foundation has stipulated that funds provided under the program may not be used for the purchase or development of equipment for exclusive use by individual institutions. Complete information about the newly designed pieces of apparatus and the ways to apply them in teaching is to be made available through articles in professional journals and at meetings. It is also expected that interested commercial suppliers will be permitted to enter negotiations for the production and marketing of such equipment. Approximately half of the grants were awarded for the development of apparatus by members of engineering departments. Four of the 56 grants went to physics department members for the design of physics-teaching equipment.

The Rutgers University College of Engineering has acquired a water-moderated subcritical reactor for use as a teaching device in its graduate program in nuclear engineering. Established with the aid of a grant from the Atomic Energy Commission, the program is now in its third year, and is approved for those holding AEC fellowships in nuclear engineering.

Northwestern University recently announced that its Gas Dynamics Laboratory is undergoing "a sharp expansion"—but the explosion, it turns out, has to do with an increase in the number of faculty members (from four to nine), a doubling of the laboratory's space, and anticipations of a large increase in the number of graduate students (the current number is 24). As a result of this enlargement, the laboratory is being separated from the Mechanical Engineering Department and organized as an independent interdisciplinary laboratory open to students and faculty from all engineering and science departments.

At present the faculty includes the director, Ali Bulent Cambel (who is also chairman of the Mechanical Engineering Department); two assistant professors, Marvin Lewis, a theoretical physicist, and Thomas Anderson, an experimentalist; and one associate professor, Arthur Kovitz, an aerodynamicist.

A Triga Mark I training and research reactor has been purchased by the University of Texas from General Atomic. Partly financed by a \$150 000 educational grant from the Atomic Energy Commission, the hydrogen-moderated underground facility is expected to be installed late this year or early in 1962 at the University's Austin campus for use as a teaching facility for students in the college of engineering and to irradiate samples and produce radioisotopes for the physics, chemistry, bacteriology, botany, and zoology departments.

Ph.D. Physicists

The fundamental research section of the Allis-Chalmers Research Laboratories offers opportunity for professional growth and accomplishment in an expanding physics group. Areas of present and planned activity include defect solid state, semi-conductors, high temperature-high pressure solid state reactions, ferromagnetism, plasma physics, spectroscopy, dielectrics, and low temperature physics.

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