RESEARCH FACILITIES AND PROGRAMS

Magnets

A continuous magnetic field of 126 000 gauss, believed to be the strongest ever produced, has been generated at the Massachusetts Institute of Technology Lincoln Laboratory in a solenoid magnet about the size of a grapefruit, which was designed by Henry H. Kolm of the Laboratory staff. The Kolm magnet, which is reported to be six times as powerful as an iron-core magnet producing the same volume field, consists mainly of a ribbon of thin copper, six inches wide at one end, tapering to an inch and a half at the other, and 135 feet in length. More than 3000 square channels have been cut into the ribbon, and when it is wound between insulating material, the channels line up in a spokelike pattern, permitting water to be forced through for cooling purposes. The 126 000-gauss field is produced with an electric current of 10 000 amperes in a tube in the center of the coil, a space one inch in diameter by two inches long. Three hundred and twenty gallons of water per minute are used to dissipate the heat produced by 1 800 000 watts of electricity, the present limit of the MIT power supply. When a new source of 8 000 000 watts is installed, still stronger magnetic fields are expected.

The new magnet was engineered and built by the High Voltage Engineering Corporation of Burlington, Mass., as part of the Lincoln Laboratory Solid-State Program. It was tested at the National Magnet Laboratory. Another new magnet being developed by Bruce Montgomery and Francis Bitter is intended to provide continuous fields up to 250 000 gauss.

The formation of Electromagnetics Corporation, in Hudson, Mass., a firm which will specialize in the manufacture of electromagnets for industrial and research laboratories, has been announced by its president, Ronold L. Dennis. An initial research program has been established and full-scale production of a line of proprietary products is to follow. Engineering of products will be under the direction of Bent Nielsen, formerly director of the Magnet Division of High Voltage Engineering Corporation.

Anglo-Soviet Exchange Agreement

Under an agreement providing for Anglo-Russian collaboration during the next five years on the peaceful uses of atomic energy, which was signed on May 19 in London, the United Kingdom Atomic Energy Authority and the USSR State Committee of the Council of Ministers for the Utilization of Atomic Energy have formally pledged to organize reciprocal visits of personnel and mutual conferences, to exchange copies of unclassified reports having to do with peaceful uses of atomic energy, and (within the limits of each country's export regulations) to assist each other in obtaining needed scientific instruments and radioisotopes for medical and biological purposes. The subjects involved in the agreement to exchange information and visits include nuclear physics, solid-state physics, basic radiation chemistry, certain aspects of inorganic chemistry, research on isotopes and their applications, plasma physics, high-energy physics, reactor physics, and experimental fast reactors.

British negotiators included Sir Roger Makins, chairman of the Authority; Sir William Penney, deputy chairman; Sir William Cook, the Authority's member for reactors; Sir John Cockcroft, part-time member of the Authority; F. A. Vick, director of the Research Group of the Authority and of AERE, Harwell; and T. G. Pickavance, director of the National Institute for Research in Nuclear Science. USSR representatives were V. S. Emelyanov, chairman of the State Committee; K. D. Sinelnikov, director of the Physico-Technical Institute of the Academy of Sciences of the Ukranian SSR; and A. I. Leipunski, scientific director of the Physico-Energetics Institute of the State Committee.

Space Work

Caltech's Jet Propulsion Laboratory has awarded a \$4-million contract to Consolidated Vacuum Corporation, a subsidiary of Bell & Howell/Consolidated Electrodynamics Corp. of Rochester, N. Y., for the design and construction of a space-environmental facility capable of simulating solar radiation as well as the atmospheric conditions of outer space. The simulator is described as a stainless steel tower 80 feet high and 27 feet in diameter, with a vacuum chamber in the lower portion large enough to accommodate full-scale space vehicles. The upper portion of the tower will house the solar-simulation unit.

The optical system, designed by Bausch & Lomb, will use 150 compact-arc mercury-xenon lamps as its energy source. Light from the lamps will fall on a concave parabolic mirror, which will reflect it upward to a convex hyperbolic mirror. The hyperbolic mirror will send the rays back down through a three-foot lens in the center of the parabolic mirror into the vacuum chamber. Inside the vacuum chamber the beam will be reflected two more times until it becomes a broad, collimated beam shining down on the object under test. The radiation intensity can be varied to simulate conditions in the area between the orbits of Venus and Mars and the vacuum system will be able to reproduce atmospheric conditions at an altitude of 250 miles. In order to simulate the thermal conditions of outer space, the interior of the vacuum chamber will be lined with a "shroud" of dull black aluminum plates which can be cooled by liquid nitrogen to − 320°F. The shroud is expected to absorb and carry off 99 percent of the heat