PHYSICS

Super Atom Smasher

The construction of a super accelerator that will help solve the mystery of the substance of the universe has been proposed by a panel of scientists.

➤ LESS THAN two decades from now, there should be a machine here on earth that will create energy rivaling that of most of the cosmic rays continuously bombarding earth from space.

In order to understand the fundamentals of matter and solve the mystery of ultimate particles, the substance of the universe, $12 billion will be needed to explore the inner space of the atom. This exploration, without spectacular astronauts' flights into space, will be as important as the space program itself.

A panel of scientists, after studying the country's future needs in the field of high-energy nuclear physics, called for construction of a super atom smasher that would fling protons with energies up to 1,000 billion electron volts at targets.

This proposed accelerator would be preceded by a 200 Bev machine recommended for construction at the University of California's Lawrence Radiation Laboratory. Both would be part of an 18-year program to achieve progress in this fundamental field of science.

The panel was a joint one of the President's Science Advisory Committee and the Atomic Energy Commission's General Advisory Committee. Dr. Norman F. Ramsey of Harvard University was chairman of the panel on high-energy accelerator physics.

The panel's recommendations were that the Federal Government:

1. Authorize, at the earliest possible date, the construction, by the Lawrence Radiation Laboratory, of a high-energy proton accelerator at approximately 200 Bev energy.
2. Authorize the construction of storage rings (for particles) at Brookhaven National Laboratory after a suitable study.
3. Support intensive design studies at Brookhaven National Laboratory of a national accelerator in the range of 600-1,000 Bev. Request for authorization may be anticipated in about five or six years.
4. Authorize in fiscal year 1965 the construction, by Midwest Universities Research Association, of a super-current accelerator without permitting this to delay the steps toward higher energy. The energy of the MURA accelerator should be 12.5 Bev instead of the 10 Bev originally proposed.
5. Support the construction of the proposed 10 Bev Cornell electron accelerator, including plans leading to its evolution into a nationally available facility.
6. Support the development and construction of electron-positron storage rings.
7. Provide strong support for the development and the utilization of new techniques of particle detection, data reduction, and data analysis.
8. Continue to support accelerators in operation or under construction, as well as their associated research programs, without neglecting the need for new facilities. Recognize the special need for expansion in operating and research budgets of the newest accelerators before they come into full operation.
9. Increase the support at universities for buildings, major equipment, and computational facilities.
10. Close down or reduce the level of operation of accelerators which become relatively unproductive. The prime considerations in continuing an accelerator program are its scientific significance, the suitability of the machine relative to other available machines, the capacity of the group to carry out the proposed program, and the provision of adequate support of research programs elsewhere. Additional factors are the educational function served by the accelerator and its use in preparing experiments for more costly facilities.
11. Support the study of new accelerator principles and techniques.
12. Recognize the need for adequate visitor housing (both short- and long-term) at the above recommended new national facilities.
13. Provide for a review of the high-energy physics program at suitable intervals.

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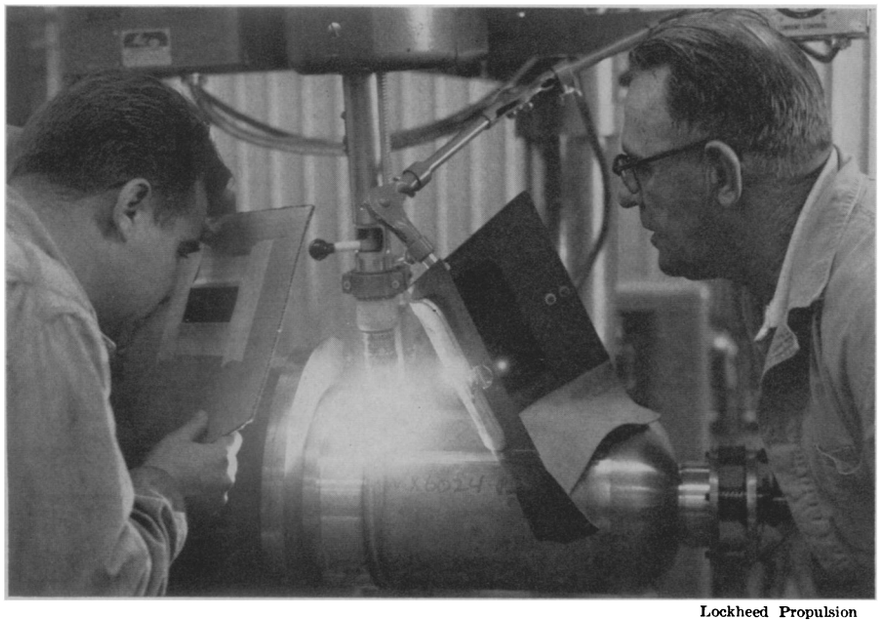

Lockheed Propulsion

APOLLO SAFEGUARD—Technicians of Lockheed Propulsion Company, Redlands, Calif., observe the automatic welding of a small control motor, a potent solid propellant rocket, developed for the launch escape system of the Apollo spacecraft.

SPACE

Eight Space Scientists Defend Space Program

➤ EIGHT top American scientists, including three Nobel Prize winners, issued a joint statement defending Project Apollo, the nation's crash program to put a man on the moon.

The project has come under increased criticism lately from some scientists who claim the same scientific benefits can be gained by sending robot instruments to the moon.

"Robot instruments will always play an important role in the exploration program," the joint statement said, "but situations are bound to arise in which the human performance is indispensable for the achievement of the scientific objectives."

The statement further claimed that, disregarding the scientific rewards, a successful Project Apollo also would "make an important contribution to the future welfare and security of the United States."

Nobel winners signing the statement were: Drs. Joshua Lederberg, chairman of the genetics department, Stanford University School of Medicine; Willard F. Libby, director of the Institute of Geophysics and Planetary Physics, University of California at Los Angeles, and Harold C. Urey, chemistry professor at the University of California.

The others are: Drs. W. Maurice Ewing, director of Lamont Geological Observatory, Columbia University; Robert Jastrow, director of the National Aeronautics and Space Administration's Goddard Institute for Space Studies; Gordon J. F. MacDonald, associate director, Institute of Geophysics and Planetary Physics, UCLA; Lyman Spitzer Jr., director of Princeton University Observatory, and James A. Van Allen, chairman of the physics department, State University of Iowa.

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