

TECHNOLOGY

New Accelerators to Come

Smaller and more powerful particle accelerators, machines used to investigate the atom's nucleus, may be built by using streams of completely ionized gases.

► **USE OF STREAMS** of highly conductive gas, such as likely to be used in applying to atomic power production the H-bomb fusion reaction, promises to allow the building of atom-smasher particle accelerators more compact and more powerful than any hitherto believed possible.

David dePackh, U. S. Naval Research Laboratory scientist, told the Philosophical Society of Washington meeting in Washington, D. C., that conductive plasmas or completely ionized gases hold the promise of greatly reducing the cost and size of particle accelerators such as are attacking the secrets of the atomic nuclei, in both the United States and Russia. Higher energies may be reached.

These plasmas may serve either as a guiding mechanism for the accelerated particles or as a means of acceleration.

The apparatus now under design aims to confine the electrical current into a very fine gas stream, merely a small fraction of an inch in diameter, and thus concentrate the energy used to project the atomic parti-

cles to smashing into the hearts of various sorts of matter. The ionized gas streams would be surrounded by very large magnetic fields at their surface, very close to the place where the particles are located.

In the ordinary accelerators the equivalent portions are fairly far away and dense, whereas the plasma is close and non-dense.

As a result, Mr. dePackh is confident that by applying the new ideas it will be possible to compress a giant accelerator generating 25 to 30 billion electron volts, as the one now building at Brookhaven National Laboratory on Long Island, N. Y., into 10- to 50-foot diameter instead of the approximately 860 feet called for in the present design.

Two groups at the U. S. Naval Research Laboratory are working intensively upon increasing the power of accelerators and other problems under the direction of Dr. M. Shapiro of the nucleonics division. One of these groups is headed by Mr. dePackh and the other by Dr. Willard Bennett.

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SATELLITE—The satellite can be seen as it moves from left to right approaching and then passing the star Epsilon. The motion picture, taken by the Westinghouse Broadcasting Co., Inc. in cooperation with the Airforce Cambridge Research Center, Bendix Aviation Corp., Operation Moonwatch and the Smithsonian Astronomical Observatory, was taken about 6:17 a.m., Oct. 12.

GEOPHYSICS

"Moon" Pictures Needed

See Front Cover

► **THE NATION'S** thousands of amateur astronomers were urged to provide scientists with much needed photographic records of sputnik's flight around the earth.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows how the rocket that launched the Soviet satellite looked as it flashed across the sky at 6:06 a.m., Oct. 15. Oceanographer Q. Carlson of the Navy Hydrographic Office near Washington, D. C., took the picture with a Voigtlander camera and a 50 mm. lens, mounted on a tripod. He used 35 mm. Tri-X film exposed for 30 seconds with an f/2 lens opening. The rocket passed above the point where the Big Dipper joins its handle.

Father Francis J. Heyden, S.J., director of Georgetown University's observatory, said "any amateur astronomer with a reasonably fast camera can be of great service to our scientists" by photographing the satellite and recording pertinent data. Father Heyden said only two photographic observations have been recorded.

The astronomer told the Society of Photographic Scientists and Engineers meeting in Washington, D. C., that comet photography techniques could be used to photograph the satellite and would make possible more accurate determinations of sputnik's orbit and speed.

The astronomer urged amateurs to send their photographs, with the exact time of the photography and the location of the camera, to the Society of Photographic Scientists and Engineers, P. O. Box 1609, Main Post Office, Washington, D. C.

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GEOPHYSICS

Satellite and Rocket Receive Official Names

► **PEOPLE** will probably still call it sputnik, but the Russian artificial earth satellite now has a new name given to it by astronomers.

Sputnik is now Satellite 1957 alpha 2.

Sputnik's companion in space, the third stage of the rocket that delivered the satellite into its orbit, is called Satellite 1957 alpha 1.

Prof. Fred L. Whipple announced from the Harvard College Observatory, Cambridge, Mass., that the present artificial satellite, and others expected to follow, will be handled observationally and orbitally as are comets. When more than one object is observable from a launching they will be indicated by numbers following the letters of the Greek alphabet that designate the launching.

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