

PHYSICS

New Particle Discovered

A new particle of the atom's core that exists only one-hundredth of a millionth of a millionth of a billionth of a second has been discovered by University of Pennsylvania physicists.

► A NEW INHABITANT of the atom's core, called the "f-zero," has been discovered by a team of University of Pennsylvania physicists.

They used the world's largest and highest-energy atom-smasher to find 35 examples of the new particle in a careful search of 25,000 photographs.

If further work confirms that the "f-zero" is a particle predicted recently by some theoretical physicists, then a new way of looking at nuclear structure may well have been found. So far the new particle has lived up to its predicted characteristics:

It is electrically neutral; is about 30% heavier than a proton, which is the nucleus of the hydrogen atom, giving it a weight of about 1,250 million electron volts; and exists for one of the shortest lifetimes now known, only one-hundredth of a millionth of a millionth of a billionth of a second.

This is the length of time it takes light to cross a nucleus. After this fleeting lifetime, the particle splits into two pi mesons, familiar products of nuclear disintegration.

The University of Pennsylvania research team's work was partially supported by the Atomic Energy Commission. It included Drs. Walter Selove and Howard M. Brody, Vasken B. Hagopian, Mrs. Anne L. Baker and Eugene L. Leboy. A report on their discovery appears in *Physical Review Letters*, 9:272, 1962, published by the American Institute of Physics in New York.

The theoretical prediction of the particle was made by Drs. G. F. Chew of the University of California and Steven C. Frautschi of Cornell University, Ithaca, N. Y., based on work done by the Italian physicist, T. Regge.

They have suggested a unifying concept for the more than 30 particles that have been found to be inhabitants of the atom's core. Their idea is that no particles are elementary but the same one manifesting itself in continuously changing forms.

The basis of this is the so-called "Regge pole" theory. That is the name given for a mathematical object that has the physical properties of a particle. Drs. Chew and Frautschi then suggested that all known particles are "Regge poles."

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METEOROLOGY

Tiros VI Satellite Launched Successfully

► THE SIXTH TIROS weather satellite has been successfully launched. The launching is aimed at getting maximum coverage during the last half of the hurricane season and aiding in forecasting worldwide weather for Astronaut Walter Schirra's orbital flight planned for Sept. 28. The satellite is carrying two TV cameras and is expected to operate for four months, as the other Tiros satellites have.

This marks the sixth time in as many attempts that a U.S. meteorological satellite has been successfully placed in orbit. It has established a record unmatched by any other satellite of the National Aeronautics and Space Administration. The weather satellites are sent into orbit from Cape Canaveral, Fla.

The successful launching also set a new reliability record for the Delta booster vehicle, which has now put 11 satellites in a row in orbit, an unprecedented record for U.S. rockets.

Tiros V, which was launched on June 19, provided coverage of hurricane and typhoon areas during the early part of the 1962 season. However, the electrical system for the medium angle lens in Tiros V failed in early July, so the schedule for launching Tiros VI was moved up. In addition, the new radiation belt created by the U.S. high-

altitude H-bomb test adversely affected the operation of Tiros V. Tiros VI does not carry the usual equipment to detect the earth's infrared radiation.

This is not expected to be much of a loss because scientists are still working over the wealth of infrared information from previous Tiros satellites. Future Tiros satellites will carry the infrared equipment.

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ASTRONOMY

Solar Eclipse Visible From Maine Next July

► FOR THOSE who like to make next year's vacation plans this fall, a rare opportunity to see a total eclipse of the sun will occur Saturday, July 20, in Alaska, Canada and Maine.

The moon's shadow will race eastward from Japan, crossing the North Pacific, Alaska, Canada and Maine, before sweeping past the tip of Nova Scotia and out over the Atlantic Ocean.

If weather is good, this is expected to be one of the most extensively observed solar eclipses in several years, since the path of totality lies in or near many heavily populated regions, particularly in eastern Canada and Maine.

The sun will be at least partly hidden by the moon's dark shadow for all observers in the United States and Canada, as well as Central America and the northern tip of South America.

From the standpoint of weather prospects, there are two probably favorable sections to be considered for seeing the total eclipse. Other areas are more apt to have general summer cloudiness.

One section is in Alaska. Parts of it can be reached by automobile from the Alaska Highway (Route 2), which runs from British Columbia to Fairbanks. The path of totality passes directly over the highway just at the U.S.-Canadian border. Other likely viewing spots westward from this highway are Slana, Sourdough or Talkeetna.

Over the eastern part of Canada, the eclipse path will cross a rather densely populated area offering a large number of sites that are easy to reach. The chances of cloud cover, however, are fairly high.

Maine, on the other hand, has many easily accessible places with a high percentage of clear weather even in the late afternoon. Two good spots are Sebasticook Lake, near Newport, and Moss Pond, slightly north and west.

Although Maine's coastal areas are often foggy in July, the fog can be escaped by moving a few miles inland, or to higher ground. The totality path crosses over Bangor, and also Belfast and Bar Harbor.

The total eclipse begins at sunrise in Japan, will be seen about 11 in the morning from Alaska and ends at sunset in the mid-Atlantic Ocean. At Bar Harbor, the eclipse will begin at 4:44 p.m. EST, and last just less than a minute. An observer should be sure that his western horizon has no obstructions as high as 24 degrees, since that will be the sun's altitude.

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TIROS VI—At the top of gantry 17, at Cape Canaveral, satellite technicians have just completed mating the Tiros VI payload to the Delta launch vehicle. The weather satellite's solar cells are visible plus its two TV cameras that will send pictures of any new tropical storms it passes over back to earth.