

ASTRONOMY

Scientists Study Eclipse

Scientists from all over the world, including 125 from the United States, will gather in the South Pacific to observe the solar eclipse May 30—By Ann Ewing

► AS MANY as 125 U.S. scientists will be in the South Pacific on May 30 to observe a total eclipse of the sun. They will be joined by colleagues from around the world.

So many are going to such a distant place because the moon will black out the sun for more than five minutes during the longest part of totality. They are also making the lengthy trip because the eclipse will occur at a time when the sun is at a low point in its 11-year cycle of activity.

At the time of the last solar minimum in 1954, many of the techniques that will be used to study the eclipsed sun, such as X-ray measurements from rockets, had not yet been perfected.

The tip of the moon's tapering shadow as the moon passes between the sun and the earth on May 30 will sweep out a long curved path covering 8,000 miles from New Zealand to Peru. Virtually all of this path of totality, less than 150 miles wide, lies in the South Pacific Ocean. Only a few tiny islands upon which astronomers can set up their bulky equipment lie in the blacked-out strip.

However, jet planes have given scientists one advantage over ground-based observations. By flying some 40,000 feet above the Pacific Ocean, the length of totality can be extended considerably, more than four minutes at this mid-eclipse.

Because weather prospects at the few available ground sites are not very promising, airborne observations are planned from a Convair-990, and three Boeing KC-135's over the South Pacific and a Navy Superconstellation over Peru. The jet planes will race along the eclipse path at some 600 miles an hour, thus staying within the easterly moving shadow for more than nine minutes over the South Pacific.

A dozen scientific teams from the U.S. are planning to make observations from the tiny South Pacific islands in the path of totality. Leader of the joint ground expedition is A. Keith Pierce of Kitt Peak National Observatory.

To carry scientists and their equipment to these land-based sites, Ralph Larrabee of Los Angeles has loaned his 138-foot schooner, the Goodwill, to Kitt Peak authorities. The 300-ton vessel left California in early April in order to deliver some 30 scientists to their eclipse sites in good time.

The solar eclipse observations are part of the world-wide program known as the International Years of the Quiet Sun, IQSY, in which 70 countries are participating. IQSY is taking place during a low point in the 11-year cycle of sunspot and solar flare activity.

This program is timed to help scientists unravel some of the complex interrelationships of the sun and the earth demon-

strated during the International Geophysical Year in 1957-58, which was timed to coincide with the most recent period of high solar activity. The IGY actually occurred during the most active solar maximum ever recorded.

From the island of Rarotonga, which is just outside the path of totality, four Nike-Tomahawk rockets will carry instrument payloads to an altitude of about 200 miles during the eclipse. This program, conducted for the U.S. Atomic Energy Commission, is aimed at studying X-ray lines of the sun's corona.

Although there are man-made instruments that blot out the corona, or sun's faint outer halo, they are not able to mask solar radiation sufficiently to catch much of this faint emission.

As the moon moves across the sun, it will cover and uncover any localized sources of the sun's X-rays, a change the scientists expect to measure with their rocket-borne instruments.

Another project sponsored by AEC will be carried out by scientists flying to the eclipse area. They will investigate the layer of the atmosphere that seems to cause the twinkling of stars.

On May 30, two balloons with a capacity

of 100,000 cubic feet each will be released from the Goodwill, each carrying four cameras and a special telescope with telemetering equipment. Dr. Edward Ney of the University of Minnesota is conducting this experiment to obtain photographs of the very faint outer solar corona from a height of about 20 miles.

Eleven agencies of the Government, as well as many universities and some industrial firms, are cooperating in the many eclipse observations. The Government agencies include the Atomic Energy Commission, Defense Atomic Support Agency, National Bureau of Standards, National Science Foundation, National Aeronautics and Space Administration, National Academy of Sciences-National Research Council, Office of Naval Research, Naval Research Laboratory, Naval Ordnance Test Station, Air Force Office of Space Research and Air Force Cambridge Research Laboratories.

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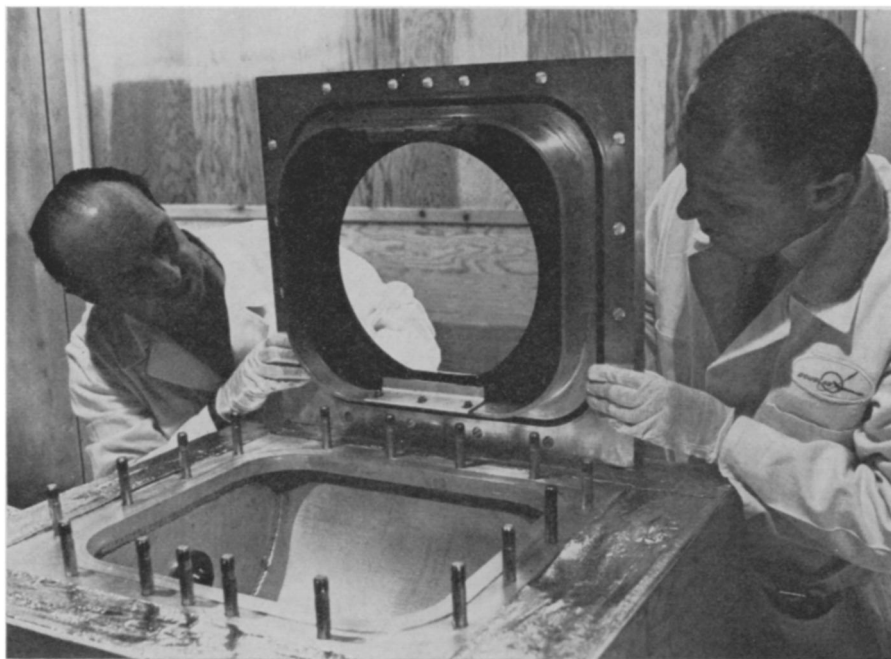
TECHNOLOGY

Glass Fiber Strengthens Hulls for Deep Descents

► A RELATIVELY new manufacturing process, filament winding, may be the answer to building undersea exploration vessels whose hulls can withstand the tremendous pressures of deep descents.

By winding epoxy saturated strands of glass fiber onto a hull mold, added strength has been obtained. A test vessel made by filament winding Fiberglas, an Owens-Corning Fiberglas Corporation development, recently completed tests representing submergence to 27,000 feet, over five miles.

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Douglas Aircraft Company, Inc.

WINDOW ON THE SUN—A special optical quality glass window, to be used aboard a jet plane solar eclipse observatory, is prepared for altitude and temperature testing at Douglas Missile and Space Systems Division environments laboratory, Santa Monica, Calif.