

# Physical Sciences Notes

## ASTROPHYSICS

### Dust Particles Mapped in Barnard Loop

Dr. Karl Henize, the Northwestern University astronomy professor who was selected for the scientist-astronaut program earlier this month, will report in the December *ASTROPHYSICAL JOURNAL* results of his evaluation of data obtained by Gemini 11 astronauts during a star photographing mission last year.

One of the ultraviolet photographs of a large nebula in the constellation of Orion, known as the Barnard Loop Nebulae, showed that the large area had faint extensions in certain directions, extending much farther than when seen from earth's surface and having a different structure. Careful analysis revealed that the light was caused almost entirely by scattering from dust particles.

By measuring the intensity of the light, Dr. Henize and Dr. C. R. Odell, director of Yerkes Observatory, were able to map the distribution of dust particles in this region, the first such direct identification of the positions of dust particles in Orion.

The dust is distributed, not in a uniform cloud, but in a hollow sphere—more dense at greater distances from the center until the edge, where it chops off. The Orion region is of particular interest to astronomers, since new stars are being formed there.

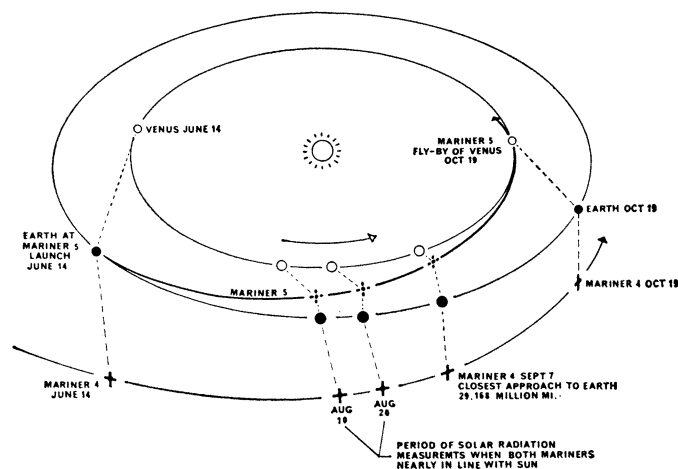
Further evaluation of the data, could, therefore, lead to revised theories on star formation.

## SOLAR SYSTEM ASTRONOMY

### Solar Plasma Studied from Probes

The Mariner Venus spacecraft, launched from Cape Kennedy on June 14, is being combined with the Mariner Mars spacecraft, launched Nov. 28, 1964 in an experiment to obtain information on solar plasma and space magnetism while the two probes are in the same direct line with earth and the sun.

The two spacecraft in mid-August were about 70 million miles apart, with earth roughly in the middle,



on a line drawn from the sun. The periods of conjunction being studied are from Aug. 10 to 21, and Sept. 1 to Oct. 10.

Aim of the joint effort by the California Institute of Technology Jet Propulsion Laboratory scientists is to

record shock waves and other disturbances in the solar wind, and magnetic fields encountered by each spacecraft. The two spacecraft will also be used to measure the speed and direction of the streams of electrons and protons in the solar wind.

## OCEANOGRAPHY

### Sea Level Changes Charted

Radiocarbon dating of sediments on the continental shelves off Texas and off the northeastern states reveal differential movement of the two shelves, the Atlantic having sunk with respect to the Texas one.

Dr. K. O. Emery of Woods Hole Oceanographic Institution, Woods Hole, Mass., and Louis E. Garrison of the University of Rhode Island report in the Aug. 11 *SCIENCE* that they do not know why this should be so. However, they caution "against acceptance of measurements of past relative sea levels on any single continental shelf as an indication of absolute changes of sea levels throughout the world ocean."

Dr. Alfred C. Redfield of Woods Hole also reports in the Aug. 11 *SCIENCE* on postglacial changes in sea level of the western North Atlantic. Radiocarbon dating, he finds, shows that the relative sea level at Bermuda, southern Florida, North Carolina and Louisiana has risen at approximately the same rate during the past 4,000 years, two and a half feet every 1,000 years.

The rise in sea level along the northeastern coast of the United States has been at a rate much greater than this, indicating that the land there is sinking. Between Cape Cod and Virginia, coastal subsidence of 13 feet appears to have occurred between 4,000 and 2,000 years ago, Dr. Redfield finds.

## ASTRONOMY

### Maksutov Telescope for Chile

Five Russian technicians, directed by astronomer Leon Panaiotov, are installing a Maksutov telescope—claimed to be the only one of its type in the world—on Robels Mountain, 44 miles from Santiago.

The Russian telescope is a major installation of the astronomical station going up on the mountain in an agreement reached by the University of Chile and the U.S.S.R. Academy of Sciences.

The Chilean phase of the work is under the direction of astronomer Charles Torres.

The Maksutov telescope is an astrograph that permits taking photographs of stars, using as reference distant galactic systems, to permit measuring the motions of relatively near stars.

According to astronomer Panaiotov, the telescope was constructed at the Pulkovo Observatory near Leningrad especially for the Chilean installation, at a cost of \$200,000. The telescope is scheduled for completion in November.

Underwriting of telescope costs was taken over by the Russians, who have agreed to leave the instrument in Chile two decades, after which a new agreement will be arranged.

Astronomers believe that Chile is on the road to becoming one of the most important astronomical centers in the world because atmospheric conditions there are exceptionally favorable.