astronomy notes

Gathered at the meeting of the American Astronomical Society in Charlottesville, Va.

INTERSTELLAR

Organic molecules suggested

Dust grains in interstellar space that dim or block out the waves of red light, as well as infrared radiation, may be due to organic molecules—not live but formed from carbon and hydrogen atoms. Dr. Bertram Donn and K. S. Krishna Swamy of the National Aeronautics and Space Administration's Goddard Space Flight Center in Greenbelt, Md., suggested that molecules formed of benzene rings, such as ovalene or circumanthracene, could cause "interstellar extinction."

PLANETS

Barnard's star precisely located

Barnard's star, the first to be suspected of having an unseen companion quite likely to be a planet, has now had its position accurately measured 3,036 times, an increase of 623 over the last report five years ago. Its position is now known so accurately that not only earth's motion, but the perturbations in earth's path by the planets Jupiter and Saturn must be taken into account in order to calculate the motion of Barnard's planet-like companion, Dr. Peter van de Kamp, director, Swarthmore College's Sproul Observatory, reports.

INTERSTELLAR

Molecular hydrogen found

The tentative identification of molecular hydrogen in interstellar space was reported by Drs. Michael W. Werner and Martin Harwit of Cornell University and Kitt Peak National Observatory. They found infrared radiation from the Orion Nebula indicating the presence of molecular hydrogen, believed to account for about 50 percent of the mass the universe is supposed to contain, according to Einstein's gravitational theory.

RADIO ASTRONOMY

New microwave line discovered

A previously unobserved line of microwave radiation at 6.3 centimeters wavelength has been detected by astronomers from Harvard University in the direction of a gaseous nebula in the constellation Cassiopeia known to astronomers as IC-1795 or W-3.

The observations were made by Drs. Ben Zuckerman, Patrick Palmer, Hayes Penfield and A. Edward Lilley with the 140-foot radio telescope at the National Radio Astronomy Observatory. The new radio line originates from an excited state of the hydroxyl molecule.

The W-3 source has been intensively studied throughout the past few years by radio astronomers since it is one of the Milky Way's strongest sources of radio waves in previously discovered hydroxyl lines radiating at wavelengths near 18 centimeters.

The first laboratory measurements of the new emission line from the excited hydroxyl molecule were made by H. E. Radford of the National Bureau of Standards, who showed that three lines of hydroxyl should have frequencies of 4765, 4750 and 4660 megahertz, with the 4750 line being twice as intense as the other two.

However, the observations showed the strongest line at 4765 megahertz, lending support to the theory that the gas in W-3 is radiating by a nonthermal emission.

RADIO ASTRONOMY

Measuring quasars by interferometry

Fifteen scientists from six U.S. institutions and Sweden report the results of two experiments in late January between four radio telescopes, using long base line interferometry.

One experiment measured the angular diameters of more than a dozen radio sources at wavelengths of 6 and 18 centimeters, most of which were quasars. The other measured the angular size of the radio source W-3 at 18 centimeters (SN: 3/23, p. 281). Both measurements were designed to determine how small the quasars and hydroxyl emission sources are.

The six-centimeter experiment between Green Bank, W. Va., and Onsala, Sweden, confirmed the complex structure of the brightest quasar, 3C-273. Component A has a jet 23 seconds of arc long. Component B coincides with a star-like optical object. The quasar was known to be a double, one part of which was only two-hundredths of a second of arc in diameter; the other has now been measured as less than three-thousandths of a second of arc in diameter.

The results also show that this remaining component consists of at least two additional sources of radiation, one having a diameter of two-thousandths of a second of arc and the remainder appearing as a point source with a diameter less than six ten-thousandths of a second of arc.

GEOLOGY

Application of Gemini photos

Preliminary geologic results of the synoptic terrain photography experiments carried aboard most of the Gemini flights were reported by Drs. John A. O'Keefe and Paul D. Lowman Jr. of the National Aeronautics and Space Administration's Goddard Space Flight Center in Greenbelt, Md.

Nearly 1,100 pictures usable for purposes of the S-5 experiment were taken with hand-held cameras, mostly in strips and small groups. The best coverage was of northern Africa and southwest Asia because of the geometry of the flight path and the weather.

Many of the photographs give strong evidence that planetary features are not always what they seem. Mountain areas, for instance, come out darker than the reddish lowlands, support for the theory that what appear to be maria on Mars are mountains.

Some of them also showed that circular areas many would term impact craters are actually ring dikes, "the external expression of a circular crack through which magma has erupted." Dr. O'Keefe says the ring dikes could well be the result of the impact of a smaller body, as the earth responded volcanically to the shock.