Physical Sciences Notes

ULTRAVIOLET ASTRONOMY

Two Planets Photographed Together

When Venus and Jupiter passed within two degrees of each other in early June, astronomers photographed the ultraviolet spectra of the two planets simultaneously from a rocket 118 miles above earth.

The ultraviolet light of both planets was recorded "with 50 times more detail than ever obtained before," according to Dr. Donald C. Morton, director of Princeton University's rocket astronomy program. With his associate, Dr. Edward R. Jenkins, Dr. Morton will spend the next several months analyzing the photographs, each of which consists of a circular negative about the size of a dime.

The six negatives each contain two spectra, one in ultraviolet of sunlight reflected from Jupiter, the other from Venus. They were made at exposures ranging from 10 seconds to three minutes by two cameras kept steady for four minutes.

The stabilization system was developed with the help of Dr. Lyman Spitzer Jr., chairman of Princeton's department of astrophysical sciences.

The atmosphere of Venus is known to contain carbon dioxide, neon, nitrogen and water vapor; Jupiter's consists mainly of methane and ammonia, with some hydrogen and helium.

Dr. Jenkins believes the new spectrograms may show evidence of some gases previously not detected on Venus or Jupiter. The astronomers hope to compare their conclusions with those to be garnered from the two spacecraft, American and Russian, now speeding toward Venus.

HIGH TEMPERATURE PHYSICS

Thermal Expansion Data

Accurate data on the thermal expansion of solids at temperatures above 1,000 degrees C. are needed for many areas of research and technology.

Such information is essential, for instance, in the study of lattice defects, phase transitions, behavior of spacecraft components, and for reference materials used in comparison measurements of other specimens.

To provide reference data, B. D. Rothrock and R. K. Kirby of the National Bureau of Standards have developed apparatus for accurate determination of thermal expansion on refractory materials at temperatures up to 1,600 degrees C.

The apparatus consists of a controlled gradient furnace and an optical comparison measuring system that gives expansion data accurate to within 50 parts per million.

PLANETARY SCIENCE

Volcanic Eruptions on Venus

The reports of high surface temperatures on Venus, derived from observations made by Mariner II and from earlier data, also imply that the lower part of the planet's crust could be very warm.

Such a high temperature could well mean high rates of volcanic and tectonic activity, two scientists suggest in the June 30 SCIENCE.

Drs. Gerald T. Davidson and Albert D. Anderson of Lockheed Palo Alto Research Laboratory, Palo Alto, Calif., have calculated that the number of eruptions might be as high as 10 per year, injecting 10 cubic kilometers of material into the planet's atmosphere.

They further propose a "conjectural atmosphere" for Venus consisting of high clouds of volcanic water vapor and ice, with other volcanic gases, lying on top of an optically thick suspension of fine dust particles.

Although the dust particles might not be easily detected from above, they would have "profound effects" on lower atmospheric circulation, which the scientists would like to see investigated theoretically.

X-RAY ASTRONOMY

Bright Source Discovered in Crux

A strong X-ray source, rivaling Scorpio XR-1 in intensity, has been discovered in the vicinity of the constellation Crux, which is visible only from the Southern Hemisphere.

The X-ray detection systems were carried aloft by two Skylark rockets launched during April from Woomera, Australia. The data was recorded at altitudes above 60 miles, since most X-rays do not penetrate earth's atmosphere much below this altitude.

Besides the new Crux source, X-rays were also detected from Scorpio XR-1 and from a cluster of objects in the region of Sagittarius, the center of the Milky Way galaxy.

The sources in Scorpius and Crux are both "very bright compared with the remainder of the known celestial X-ray objects," four scientists report in the July 1 NATURE. This suggests that the two have "a similar physical nature," according to Drs. J. R. Harris and K. G. McCracken of the University of Adelaide and Drs. R. J. Francey and A. G. Fenton of the University of Tasmania.

PUBLIC POLICY

Committee on Physics and Society

Twelve of the nation's most prominent scientists, concerned with evaluating the future role of physics and physicists in research, industry and education, have accepted membership on a Committee on Physics and Society.

The Committee, established by the American Institute of Physics, will concentrate on investigating how physics education and research is funded; the relation between physics, technology and industry, and the public image of physics. Its chairman is Dr. John Wheeler of Princeton University.