

ASTRONOMY

Downgrading of Pluto

► THE DOWNGRADING of Pluto from its 26-year-old position as a planet in the solar system continues.

Although most astronomers will still consider it a planet, recent studies show it was formed differently from the other eight planets and should be considered an escaped satellite, or runaway moon, of Neptune.

Pluto's position as the ninth planet was first challenged by Dr. Gerard P. Kuiper of the University of Chicago's Yerkes Observatory, Williams Bay, Wis. (See SNL, Feb. 11, p. 85.)

More findings by another astronomer to support Dr. Kuiper's theory of Pluto's non-planetary origin, were reported to the American Astronomical Society meeting in Berkeley, Calif.

Dr. Eugene K. Rabe of the University of Cincinnati Observatory, Ohio, said his mathematical studies "significantly" supported Dr. Kuiper's theory not only on Pluto's status as an escaped moon, but also his theory on the formation of the solar system.

Discovery of Pluto, then thought the outermost planet in the solar system, by young Clyde Tombaugh of Lowell Observatory, Flagstaff, Ariz., was announced on March 13, 1930.

Dr. Rabe's new calculations on Pluto are based on a generalized theory concerning the effects of losses of material from the large planets on the orbits, or paths, of such small bodies as Pluto.

RADIO ASTRONOMY

Radio Waves From Venus

► THREE CLASSES of radio signals from Venus can be heard, scientists at the American Astronomical Society meeting in Berkeley learned.

Radio waves caused by the planet's own heat suggest temperatures on Venus may be at least 50 degrees higher than boiling water, or 262 degrees Fahrenheit, Dr. C. H. Mayer of the Naval Research Laboratory.

Reporting work done cooperatively with Drs. R. M. Sloanaker and T. P. McCullough, Dr. Mayer said recent observations with the N.R.L. 50-foot radio antenna seemed to indicate that the strength of signals from the earth's nearest neighbor planet decreased as the amount of sunlight reflected from Venus lessened.

If these observations are confirmed, the drop in strength of radio waves would reflect a decrease in the planet's temperature due to changes in the amount of surface illuminated by sunlight.

Dr. John D. Kraus, director of Ohio State University's Radio Observatory, reported he had found two classes of radio waves from Venus. Signals that sound as

According to Dr. Kuiper's theory of the solar system's origin, the primitive planets, or protoplanets, were most massive shortly after they had formed out of the original solar material. Most of the excess mass evaporated gradually as the sun began to get hot early in its history. The mass loss is predicated on the very low density of the large protoplanets and their atmospheres.

Dr. Rabe's calculations on Pluto's present orbit indicate this mass loss for all the planets amounted to about a twenty-fifth that of the sun after Pluto had escaped from the primitive Neptune.

This figure, he said, is in "strikingly good agreement" with that of one-twentieth the sun's mass, obtained by using the same theory applied to the orbits of the Trojan group of minor planets.

The Trojans, both Dr. Kuiper and Dr. Rabe believe, developed from an outer satellite of the primitive Jupiter. Their orbits now are close to Jupiter's, forming an approximately equal-sided triangle with respect to Jupiter and the sun.

The combined masses of the protoplanets, Dr. Rabe reported, is about 50 times the present figure for all of the planets, approximately one-thousandth of the sun's mass. This result, he said, "is in good agreement also with earlier" results by Dr. Kuiper for the masses of the various protoplanets that were based on present chemical composition and considerations of stability.

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though they are coming from a radio telescope station somewhere on earth he calls Class II. These are of much longer duration than those received with the Ohio antenna earlier this year, which he calls Class I.

The Class I signals have "burst-like characteristics somewhat resembling atmospherics from terrestrial thunderstorms," and are of very short duration, only a small fraction of a second.

So far, only two planets, Venus and Jupiter, have been detected by the radio waves they broadcast, but radio astronomers hope soon to tune in on radio signals from Mercury, Mars and Saturn.

Both the Class I and Class II radio signals from Venus are heard at a wavelength of about 11 meters, or about 36 feet. Those of thermal origin are caught at a wavelength of 3.15 centimeters, or about one and one-quarter inches.

Dr. Mayer said the signals, although barely detectable on May 2, increased fourfold by June as the planet's distance from earth decreased.

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● RADIO

Saturday, September 15, 1956. 1:45-2:00 p.m. EDT
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Four youthful scientists just out of high school, winners of last year's Science Talent Search, holding jobs at the National Bureau of Standards, discuss "How to Plan for Science Careers." Participants are Robert Moore, Mary Dell Matchett, Rosemary Och and Charles Gray.

ASTRONOMY

Exploding Solar Material Emitted Near Sunspots

► THE HUGE CLOUDS of gas shooting out from the sun's surface, known as prominences, originate in material surrounding sunspots rather than in sunspots themselves.

Dr. Donald H. Menzel, director, and Dr. Max Krook, Harvard College Observatory, who developed this new theory, reported it to the American Astronomical Society meeting in Berkeley, Calif.

The energy prevented from flowing through a sunspot leaks out through the surrounding material, Dr. Krook and Dr. Paul Wild of the Harvard Observatory suggested.

Night sky radiation in the far ultraviolet was detected for the first time when an Aerobee rocket from White Sands Proving Ground was shot 62 miles into the atmosphere last Nov. 17, Dr. J. E. Kupperian Jr. of the Naval Research Laboratory said.

Reporting work done in cooperation with Drs. E. T. Bryam, T. A. Chubb and H. Friedman, he said the emission appeared as a "diffuse radiation over the entire night sky." The line emission of hydrogen at 1216 angstroms could be told from the continuous emission of very hot stars at about the same wavelength, Dr. Kupperian reported. One angstrom equals four-billionths of an inch.

The man-made satellites to be sent whirling around the earth during the International Geophysical Year, which starts next July 1, will enable scientists to find "accurately the long-disputed value" of how much our planet differs from a true circle at the equator.

Drs. John A. O'Keefe and Charles D. Batchlor of the Army Map Service, Washington, reported to the meeting their calculations on the effect of irregularities of the earth's gravitational field on the motion of a satellite.

Harvard College Observatory's 60-foot radio telescope, a large saucer-shaped antenna, will probably be used to search the space between the stars for a combination of oxygen and hydrogen known as hydroxyl, Dr. Bart J. Bok of Harvard College Observatory reported.

Dr. Bok, who will be director of the Commonwealth Observatory, Canberra, Australia, starting next year, said hydroxyl, if detectable, should be found at a frequency near 1,667 megacycles per second.

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