RADIO ASTRONOMY

Jupiter Emits Static

Radio noise has been picked up for the first time from another planet. It is believed to be caused by large scale disturbances in Jupiter's atmosphere.

➤ RADIO WAVES from Jupiter have been detected by Carnegie Institution of Washington scientists.

The radio noise is the first discovered from another planet in the solar system. Although the waves come from Jupiter itself, they are probably caused by large-scale disturbances in the planet's atmosphere resembling earth's thunderstorms. Since the noise bursts have an entirely random pattern, they are not sent by intelligent beings, Drs. Bernard F. Burke and Kenneth L. Franklin told the American Astronomical Society meeting in Princeton, N. J.

Radio waves emitted by the sun and the moon have been known for years. Scientists listening to radio noise from the celestial sphere have detected two kinds, the smooth steady hiss from the moon and radio "stars," and the rapidly varying sounds such as caused by violent processes on the sun.

Drs. Burke and Franklin said the noise heard from Jupiter sounded like "thunderstorm interference on a broadcast receiver."

The radio waves are heard at 22 megacycles, or 22,000,000 vibrations per second. Commercial AM stations broadcast at frequencies of 550 to 1500 kilocycles, thousands rather than millions of vibrations per second.

Jupiter's noise is detected only about one day out of three during the six minutes the giant planet crosses the narrow path of their radio telescope in Seneca, Md., the two scientists said. The antenna picking up Jupiter's sounds makes a giant "X," with each cross 2,047 feet long, in a 96-acre field near there. (See SNL, July 24, 1954, p. 52.)

The planet's motion through the sky caused corresponding changes in the position of the radio source over a period of several months, Drs. Burke and Franklin found.

Jupiter is the largest of all the solar planets, having an equatorial diameter of 88,700 miles, compared to the earth's diameter of 7,927 miles. The giant planet rotates on its own axis once every nine hours and 50 minutes.

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RADIO ASTRONOMY

"Short Waves" From Stars

➤ HEAVENLY SOURCES broadcast radio waves only an inch long, two scientists from the Naval Research Laboratory, Washington, have discovered. Shortest radio waves from commercial AM stations are measured in hundreds of feet.

Seven radio "stars" sending these one-inch radio signals (9,500 megacycles per second) have so far been discovered with the laboratory's 50-foot, saucer-shaped antenna, Drs. F. T. Haddock and T. F. McCullough reported to the American Astronomical Society meeting in Princeton, N. J.

One of the seven new radio sources at 9,500 megacycles is believed to be the center of the Milky Way galaxy in which the sun is but one of billions of stars. The galaxy's center is in the constellation of Sagittarius, now visible low in the southeastern sky in the early morning.

The inch-long radiation from three others of the radio "stars," also visible with binoculars, is due to heat. Although the sun and moon have for years been known to radiate at 9,500 megacycles, the Naval Research Laboratory scientists were the first to detect the one-inch wavelength from objects outside the solar system, and to pin down the reason for such radiation as being thermal.

They could do so because the small angle received by the 50-foot saucer antenna allows them to measure the size of the three sources—one in Orion, the Omega Nebula and NGC 6357.

Comparison of the visible brightness and size to the radio energy and size in each case confirmed the fact that radiation from the three is due to heat.

The mechanism by which most radio "stars" emit their radiation is not known, but it is thought not to be due to heat for bright sources at wavelengths of four inches and longer.

Knowing that one-inch radio waves from some sources are thermal in origin will help astronomers to learn the reasons why other radio "stars" emit radio waves having longer wavelengths.

If human eyes could see radio waves, the brightest stars visible at one-inch wavelengths would be bluer than those seen at four inches. Another entirely different group of stars would appear bright at wavelengths of 39 inches, or one meter.

The seven sources sending one-inch radio waves are also the most intense emitters of radiation in the four-inch range, Drs. Haddock and McCullough said. The seven discovered so far include the source in Sagittarius; the Orion Nebula and the two bright hydrogen emission nebulae, Omega and NGC 6357; and the three brightest sources at 39-inch wavelengths, Cassiopeia-A, Cygnus-A and Taurus-A.

Dr. A. E. Lilley, also of the Naval Research Laboratory, described to the meeting absorption effects in the spectra of radio "stars," particularly Cassiopeia-A, produced by interstellar hydrogen between the observer and source (see SNL Jan. 29, p. 71).

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TECHNOLOGY

Garnet Gem Created By Diamond Makers

➤ PRESSURES FAR down toward the earth's core, now duplicated by the press that has produced genuine diamonds at the General Electric Research Laboratory, have proved to be the secret of another of nature's jewel-making processes.

Garnet, the dark red gem stone which occurs with the green mineral hornblende, has been formed from that hornblende by General Electric scientist, Dr. Robert H. Wentorf Jr., one of the researchers who took part in the diamond-making venture. Dr. Wentorf has also reversed the process and changed garnet back to hornblende.

Water is a necessary ingredient in the hornblende, Dr. Wentorf found, but must be removed by adding a suitable material which will take it away in order to produce the garnet crystals. Temperature of about 2,200 degrees Fahrenheit and pressure greater than 375,000 pounds per square inch are the necessary conditions in General Electric's press, which is so built that high temperatures and high pressures can be achieved and held constant for long periods of time.

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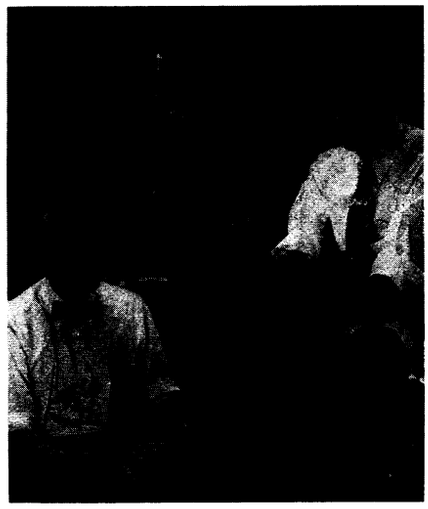

GARNET MAKERS — Dr. Robert Wentorf discusses with Dr. H. Tracy Hall how nature formed Gore Mountain garnet some 60 miles below the earth's surface.