ASTRONOMY

The fast-flashing Vela pulsar

Ever since radio pulsars were first discovered, astronomers have been trying to find some that flashed in visible light as well as radio. Until this year the only such was the Crab nebula pulsar. According to the most widely accepted theory of what pulsars are—rotating neutron stars—the best candidates for optical emissions are the fastest pulsers. That makes the Vela pulsar, which has the third shortest known period, 80 milliseconds, one of the best bets, and for the last nine years astronomers have strained for a glimpse of it.

The glimpse was reported a few weeks ago at a meeting of the Royal Astronomical Society by a group of astronomers from the Royal Greenwich Observatory and the Anglo-Australian Observatory. They used the new 3.9-meter Anglo-Australian Telescope at Siding Spring, Australia, to find visible flashes at more than once per turn from the Vela pulsar. Its magnitude is 25.6, apparently the faintest yet observed.

Another view of Nova Cygni 1975

The nova that exploded in the constellation Cygnus at the end of August 1975 was one of the brightest ever recorded. Its behavior appeared extreme in several ways and led a group of astronomers to propose that it represented an entirely new kind of nova, one that happened in a star standing by itself (SN: 10/16/76, p. 251). The "classical" model of novas had assumed that they always happen to stars that are part of binary or multiple systems. The companion star is supposed to supply a flow of matter to the exploding star that renders the latter unstable and triggers the explosion.

A dissenting view about the novelty of Nova Cygni 1975 is published in the Feb. 15 ASTROPHYSICAL JOURNAL LETTERS by G. J. Ferland of the University of Texas at Austin. This view is also based on spectral studies, especially of absorptions in the group of wavelengths known as the Balmer series of hydrogen. In Ferland's view, "The observational evidence does not demand that [the nova] be interpreted as an abnormal system, but rather suggests that it is a classical, if extreme, galactic nova."

Cosmic deuterium

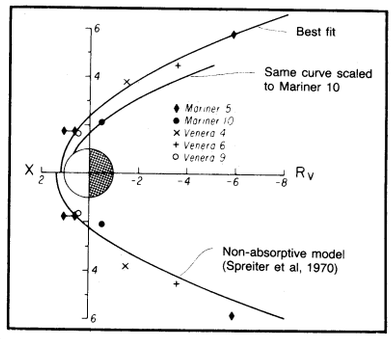
The possible discovery of another compound of deuterium in the gas clouds of interstellar space is reported in the Feb. 15 ASTROPHYSICAL JOURNAL LETTERS by N. Fourikis of the Division of Radiophysics of the Commonwealth Scientific and Industrial Organisation in Sydney, Australia, K. Tagaki of Toyama University in Japan and S. Saito of the Institute of Molecular Science at Okazaki, Japan.

The compound they believe they have found in the clouds designated Sagittarius A, Sagittarius B2, Orion A and possibly W51 is monodeuterated methylamine (CH_3NHD). This is a variant of ordinary methylamine (CH_3NH_2). It is the first time that deuterium has been found in the direction of the center of our galaxy (Sagittarius), they say. The presence of both the monodeuterated and ordinary forms of methylamine gives one more possibility of determining the ratio of deuterium to hydrogen in space, which is an important cosmological criterion.

Deuterium, one of the heavy isotopes of hydrogen, is believed to be the first atomic nucleus formed in the history of the universe. Because it is not made in stars, and apparently very little of it is used as fuel in stars, the abundance of deuterium is considered a good indication of the original density of the universe. From the density cosmologists can calculate whether or not the universe will expand forever.

SPACE SCIENCES

Venus vs. the solar wind



Understanding the mysteries of the atmosphere of Venus will require knowledge of the degree to which the charged particles of the solar wind do or do not get in to affect it. Data from at least five spacecraft—Mariners 5 and 10 and Soviet Veneras 4, 6 and 9—have indicated a well-developed shock front where the solar wind is deflected around the planet. Analysis of those data, however, now suggest that the front is close enough to the planet that there is "a significant influx of solar wind plasma into the Venus ionosphere."

So reports Christopher T. Russell of the University of California at Los Angeles in the Feb. 1 JOURNAL OF GEOPHYSICAL RESEARCH. None of the spacecraft crossed the shock front at a point directly between Venus and the sun, but a profile of the front can be constructed by plotting each crossing's distance from the sun and from the sun-Venus line. "The shock," Russell concludes, "is too close to the planet for all the solar wind flux to be deflected around the planet in the limited distance between the shock and the ionosphere." The "nose" of the blunt, roughly conical front is about 0.2 times the radius of Venus above the planet's surface, he calculates, adding that it would have to be about twice that far away for no ionospheric absorption to take place.

Mariner 10's data, in fact, seem to have indicated that, at the time of its crossings, the front was closer still to the planet. It was so close that, in Russell's reconstruction, the skirt of the cone seen by Mariner 10 does not flare out from Venus until it is halfway back from the subsolar point to the terminator. This could indicate a variation in the standoff distance with time, perhaps due to changes in the angle between the interplanetary magnetic field and that of the ionosphere of Venus.

Voyager: Name trek

In selecting the name "Voyager" for the upcoming Mariner Jupiter-Saturn mission (SN: 3/12/77, p. 166), a NASA committee considered more than 100 suggestions. Criteria were that the name be interesting, evocative of movement, and in "the spirit of adventure." It is interesting to imagine the inspirations for some of the submitted names. Here, except for additional suggestions from within the committee, is the list:

Advancer, Advantage, Advent, Altair, Antares, Argo, Argonaut, Argosy, Argus, Astro, Brigantine, Caravan, Caravelle, Challenger, Columbus, Cosmos, Courier, Cruiser, Discovery, Emigrant, Endeavor, Engager, Entropy, Epic, Examiner, Focus, Forager, Forerunner, Frontiersman, Galaxy, Galileo, Genesis, Harbinger, Harpoon, Herald, Hyperion, Indicator, Inquirer, Inspector, Intrepid, Javelin, Lancer, Leader, Magellan, Marathon, Mariner Outbound, Messenger, Migrant, Migrator, Monitor, Narrator, Navigator, Nomad, Observer, Odyssey, Orion, Outbound, Outlook, Outreach, Patrol, Perceiver, Pilgrim, Planet Trek, Precursor, Prospector, Pulsar, Quasar, Quest, Reach, Reconnoiter, Saga, Scanner, Schooner, Searcher, Seeker, Sleuth, Sounder, Starship, Starship Saturn, Teleview, Terra, Traveller, Trek, Trekker, Vantage, Vaquero, Vector, Vega, Venture, Viewpoint, Visitation, Vista, Voyager, Vulcan, Wanderer, Wayfarer, Zeus.