of these may be Np^{238}. In fact they found delayed fission in more than half the isotopes they studied.

Robert Vandenbosch and K. L. Wolf of the University of Washington[4] reported at the November American Physical Society meeting that they found spontaneous-fission isomers in Pu^{236}, Pu^{237}, Pu^{239} and Pu^{240}.

The phenomenon may be related to the double-humped potentials suggested by Allan Bromley, J. A. Kuehner and E. Almqvist[5] to explain the quasi-molecular states they observed in the inverse-fission situation (in which two carbon nuclei interact).

Now that this type of isomerism turns out to be so widespread, the suggestion that it can be explained by a double-humped fission barrier looks increasingly good to many nuclear physicists.

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Interstellar Isotopic Abundance Of Carbon Agrees with Earth's

The C^{12}/C^{13} ratio in the interstellar medium has been measured by Victor J. Bortolot of Columbia University and Patrick Thaddeus of the Goddard Institute for Space Studies (and reported in the January issue of *Astrophys. J. Letters*). They find the ratio to be 82 with an upper limit of 137 and a lower limit of 67; the ratio on earth is 89.

Because the observed interstellar value agrees with the terrestrial one, Thaddeus explains, we can conclude that carbon-rich stars contribute very little to the interstellar medium. (In these rather cool stars, which burn carbon in the CNO bi-cycle, the C^{12}/C^{13} ratio is known to be approximately 4). Furthermore, the agreement suggests that the composition of the interstellar medium has been extremely stable for as long as the earth has been around.

Bortolot and Thaddeus took 25 high-quality spectra at the Lick 120-inch (3-meter) telescope and integrated the data to improve signal-to-noise ratio. They found, in addition to the strong 423.2-nanometer line from $(C^{12}H)^+$, a weak line shifted the amount expected for $(C^{13}H)^+$.

Until recently isotopic abundance in the interstellar medium had not been measured. Sander Weinreb (now at the National Radio Astronomy Observatory) showed a few years ago that the H^1/D^2 ratio must be greater than 10^4. In their observations of hydroxyl radicals, Alan Barrett and Alan Rogers found that the O^{16}/O^{18} ratio is roughly the same as the terrestrial value, 490.

Short-Period Pulsar Slows By 38 Nanoseconds Per Day

A pulsar found last fall near the Crab Nebula, already remarkable for its short 0.033-sec period, appears to be slowing down. The observation gives new support to the neutron-star explanation for the rapidly pulsing radio sources.

D. W. Richards reported from Cornell's radio observatory in Puerto Rico that the period of pulsar NP 0532 had lengthened by 1.26 microseconds from 20 Oct. to 22 Nov.

Thomas Gold of Cornell suggested last May that a plasma cloud spun by a rotating neutron star at its core could approach the velocity of light at its edges. Relativistic effects could account for the emissions, and rotation would account for the period. Because a neutron star is small enough to rotate once per millisecond, he suggested looking for pulsars with periods shorter than those known last May. Because friction should slow the rotation of the neutron star and its plasma cloud, he suggested looking for a pulsar that was slowing down. NP 0532 meets both conditions.

Interstellar Medium Shows It Contains Ammonia, Too

Ammonia molecules have been observed in the interstellar medium by Charles H. Townes, David M. Rank, Albert C. Cheung, William J. Welch and Douglas Thornton of the University of California, Berkeley (*Phys. Rev. Letters* **21**, 1701, 1968). The 1.25-cm emission probably comes from a dense cloud of 3-minute angular diameter in which strong OH absorption had previously been reported, according to the Berkeley group.

The observers used the new 20-foot millimeter-wavelength radio telescope at Berkeley's Hat Creek Station.

Infrared Background Radiation Found Higher than Expected

Rocket-flight measurements of the far-infrared night-sky background radiation have yielded results 30 times higher than predictions based on the 3-K cosmic background radiation found at microwave frequencies. The observed flux corresponds to a blackbody temperature of 8.3 K.

Kandiah Shivanandan of the Naval Research Laboratory and James R. Houck and Martin O. Harwit of Cornell reported results in the spectral range 0.4–1.3 mm (*Phys. Rev. Letters* **21**, 1460, 1968). Further rocket measurements are under way.

IN BRIEF

The highest known superconducting transition temperature is now 20.7 K—for a multiphase system of niobium, aluminum and germanium. The experiment was done by Bernd T. Matthias, of Bell Telephone Laboratories and the University of California, San Diego (La Jolla), E. Corenzwit and G. W. Hull Jr of Bell, G. Arrhenius, R. Fitzgerald and H. L. Luo of La Jolla, and W. H. Zachariasen of the University of Chicago.

Pioneer IX, launched 8 Nov., is measuring solar plasma, individual particles and the magnetic field propagated by the sun. Nearly two years after launch the satellite will pass behind the sun (as seen from earth), allowing analysis of how the solar corona affects the satellite's radio signals.

Solar radio waves, particularly those caused by storms, will be studied by a University of Massachusetts team directed by G. Richard Huguenin. Observations will be made at the Harvard Radio Astronomy Station at Fort Davis, Texas.

Mexico's first nuclear reactor, a TRIGA Mark III, went critical 8 Nov. at the Nuclear Energy Commission center near Mexico City.

The Low-Intensity Testing Reactor at Oak Ridge National Laboratory was shut down 10 Oct. after nearly 20 years of service. Officials said technical obsolescence, not old age, led to the decision. □