

PULSAR PLANETS

Like a lighthouse beacon, the pulsar beams a signal toward Earth 162 times a second. Although the signal is not from an intelligent alien race, it contains an astounding message: there are planets in orbit around this remnant of an exploded star.

"We have two planets for sure and more are quite probable," says Aleksander Wolszczan, of Cornell University's National Astronomy and Ionosphere Center. Wolszczan and Dale Frail, of the National Radio Astronomy Observatory in Socorro, New Mexico, detected the likely planetary system in February 1990 at the Arecibo Observatory, a 1,000-foot radio telescope in Puerto Rico.

Currently, the search for other planets around stars hinges on a barely noticeable cosmic dance. As planets revolve around a star, the star is set off balance and wobbles from side to side as it travels around the Milky Way galaxy. Scientists can observe this slight motion using precise instruments. Using a pulsar's clockwork radio signal, however, Wolszczan says the procedure becomes even more accurate in determining the existence of possible planets. Wolszczan and Frail found slight inconsistencies in the radio pulses emitted from the pulsar, known as PSR 1257+12. The pulsar is a rotating neutron star—the collapsed core of a star that exploded more than a billion years ago. Although this stellar cinder is only about 12 miles in diameter, it is 1.4 times more massive than the Sun. The pulsar and its suspected planets are 1,600 light-years from Earth.

These days, unless you are fortunate enough to subscribe to a cable company that carries NASA Select, television coverage of space shuttle missions is usually limited to ten-second sound bites on the evening news. If you really want your "Space-TV," your best bet might be to subscribe to ShuttleVision, a monthly video magazine that offers complete coverage of every shuttle flight, with profiles of the astronauts and updates of future missions. The 60-minute video also offers feature stories about NASA and the space program. Upcoming shows will focus on the maiden flight of the space shuttle Endeavour, scheduled for launch this summer. The program is taped on-location at various sites throughout the country, including the Kennedy Space Center, the Smithsonian Air & Space Museum and Edwards Air Force Base. "One of our goals is to take the viewers to the NASA facilities and show them the behind-the-scenes aspects of the space program that they wouldn't normally see on television," says Richard Horrman, ShuttleVision's executive producer. For more information about the monthly video magazine, write to: ShuttleVision, P.O. Box 92012, Industry, California 91715-2012, or call (818) 333-9378. ■



SHUTTLEVISION

The team analyzed over 4,000 observations of the pulsar and found that some of the radio waves reached Earth about three-thousandths of a second later than expected, while others arrived about three-thousandths of a second earlier. The scientists concluded that the pulsar was wobbling back and forth in a gravitational tug-of-war that suggested the presence of at least two planets. Both of the planets seem to have a mass



about three times that of Earth. One of the planets is believed to orbit the pulsar at a distance of about 44 million miles with an orbital period of 66.6 Earth days. The second is thought to orbit at a distance of about 32 million miles with an orbital period of 98.2 Earth days.

The scientists also detected another slight wobble in the pulsar when comparing the data gathered at Arecibo with observations made at the Very Large Array telescope facility in New Mexico. The additional wobble indicates that a third planet may orbit the pulsar at a distance comparable to Earth's.

The planets are about the same size and have orbital positions similar to the Sun's inner planets—Mercury, Venus and Earth—but the similarities end there. The planets are most likely barren and lifeless; a result of the inhospitable environment produced by the pulsar. The pulsar does not emit much light or heat, but it blasts the planets with intense radiation and subatomic particles.

One of the questions raised following the discovery is how the planets survived the cataclysmic explosion that formed the pulsar. Some scientists have speculated that material from a companion star that once orbited the pulsar was sucked up by the rotating neutron star, leaving behind enough material to form planets.

Evidence points to the existence of other pulsar planets. However, not every discovery pans out. British astronomer Andrew Lyne reported last July the possibility of a Uranus-sized body orbiting another pulsar. The University of Manchester radio astronomer retracted his discovery during an emotional speech at the American Astronomical Society meeting in January. While rechecking his data, Lyne found that he had made a slight error in accounting for Earth's location. After correcting the error, which would not have made a difference in most calculations, the pulsar planet vanished.

—John R. Williams