

Neutron Stars- March 1992

Claims for evidence of planets in orbit around other suns keep popping up. Most prove to be errors of observation of one kind or another. It has happened yet again, with a difference. To the great surprise of astronomers, the latest case involves a pulsar as the parent body. Pulsars are rapidly rotating neutron stars which can be used as clocks because of their precise rotation rate. A neutron star is all that remains after a supernova explosion tears apart a normal star and totally destroys any planets it may have. So the idea of a planet orbiting a pulsar seems absurd.

In July last year, a British team from the famous Jodrell Bank observatory announced they had found evidence of a planet orbiting a distant pulsar, PSR 1829-19, 30,000 light years away. The precisely timed radio signals from the pulsar showed rhythmic variations about every six months, suggesting a planet about ten times the mass of Earth in an orbit like that of Venus.

The announcement was greeted with scepticism by most astronomers. They had heard such claims many times before, but never with a pulsar as the central body. So several research groups worked on the problem to see whether such a bizarre situation was possible. Some rather contrived solutions emerged, such as a mysterious cloud of plasma, only a few hundred light years from Earth, which was bending the pulsar radio waves in a way related to the motion of the Earth.

Other groups worked on possible ways to put a planetary body in orbit around a pulsar. One group succeeded brilliantly. They managed to show that the coalescence of two common white dwarf stars in a close binary orbit could form a neutron star and leave enough material over to make a planet of the required size. This particular scenario had never been thoroughly explored and, given the large numbers of white dwarf stars in our galaxy, such neutron star plus planet systems should not be uncommon.

So Jodrell Bank looked like adding another "first" to its distinguished record of achievement. Alas, it was not to be. The sceptics were correct yet again. At the recent meeting of the American Astronomical Society in Atlanta, Georgia, the principal Jodrell Bank investigator announced that they had found a data reduction error in the processing of the pulsar's radio signals. The new planet disappeared in a puff of printout paper.

There are a couple of morals to the story. Astronomers down the ages have learned the value of good, healthy scepticism. This may account for why astronomers tend to lead attacks on pseudoscience.

The other moral, if you like, is the dependence of theory on observation. Even when the observations are false, as in this case, the theorists are driven to fresh spurts of creativity. The newly developed model for neutron star formation hangs together so well that radio astronomers may start a serious search for pulsars which show evidence of planets orbiting them. None have yet been found among the thousands of known pulsars, but like a lot of other strange creations in the astronomical zoo, there always has to be a first one.

link to Jodrell Bank Observatory

<http://www.jb.man.ac.uk/>

