Pulsar Encyclopedia Article

Pulsar

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Pulsar

Pulsars are astronomical objects which appear to emit short and regular bursts of radio waves. In 1967, graduate student Jocelyn Bell Burnell was conducting a study designed to detect quasars using radio astronomy for her professor Antony Hewish, when she detected a strange radio source.

After careful analysis, Hewish and Bell ruled out local sources of interference, and by February 1968, Hewish and Bell had identified four similar sources of the signals. At first, Hewish thought that the signals might be coming from extraterrestrial beings, but he soon reasoned, as did Thomas Gold, that the signals were likely to be the "signatures" of neutron stars.

A neutron star is created when a massive star explodes as a supernova, leaving a core made up of only neutrons (the electrons and protons are forced together under tremendous gravitational pressure and become neutrons).

What remains is a small remnant of the original star only 30 kilometers (18 miles) across, yet so dense that a thimbleful would weigh 100,000,000 tons. Such an object spins anywhere from 30 times per second to once every four seconds. It has an intense magnetic field which traps particles surrounding the star. These particles create two beams of radiation pouring out from each of the star's two magnetic poles. If one of these beams happens to sweep across our line of sight, the neutron star becomes something of a cosmic lighthouse as we see it from Earth.