

Visitor Sedna

A major, new comet, the Sedna, is the most distant solar system object discovered so far, says S. Ananthanarayanan.

The comet that scientists at Caltech and Yale discovered last year is at a distance of 90 Astronomical Units, or 90 times the distance (150 million kilometres) of the earth from the sun. This is also 3 times the distance from the sun of Pluto, the outermost of the sun's planets. The distant object is so icy cold that it has been named Sedna, after the goddess of the (cold) sea in Eskimo mythology.

No frequent visitor

If Halley's comet is unsociable in coming near the sun once in 76 years, Sedna orbits the sun once in 10,500 years. Unlike the regular Solar System planets, which have nearly circular orbits, Sedna, like other comets, has a highly elliptical path. Comets are thought to arise from a cloud of far off and icy objects that orbit the sun right up to the limits of the sun's influence. While the matter nearer the sun is thought to have come together and formed the planets, these remnants continue, sparse and distant, to occasionally crash towards the sun as comets.

The Oort cloud

That such a cloud of 'proto-comets' should exist was proposed in 1950 by the Dutch astronomer, Jan H Oort. Oort studied the orbits of the known comets and found that the paths showed regularities that fell into place if there was such a cloud of objects slowly orbiting the sun at very great distances. The gravitational force of other stars, or of the Oort clouds of the stars, could nudge one of these objects into an orbit that came closer to the sun. If the object approached the inner part of the Solar System, it could be trapped into a periodic orbit and become a comet. It is considered that it is objects from the inner Oort cloud that are more likely to become comets, while objects from the outer edge would be lost.

The Oort cloud extends to about 3 light years, 30 trillion kilometers from the sun. This is the limit to which we could consider the sun's gravitational pull to be important. The inner limit, of where it starts, is the limit below which the matter was gathered into planets, or swung out into the Oort cloud or into outer space. The present discovery of Sedna is thought to suggest that the Oort cloud starts much nearer the sun than earlier estimates.

Jan H Oort

In 1927 Oort founded a mathematical theory of the structure of galaxies, which confirmed a hypothesis that the central parts of a galaxy rotated faster than the outlying portions. Oort relied on observations of the movement of stars in the vicinity of the sun and showed that they conformed to the theory of different speeds of rotation.

During and after the war, Oort participated in looking for radio-frequency spectra in space and was able to map the hydrogen gas found in the Milky Way. The effort led to discovery of the spiral structure of the galaxy and also to locate its center.