

Exploration of Near Earth Asteroids (06)
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NEAR-EARTH ASTEROID OBSERVATIONS AT THE ARECIBO OBSERVATORY

Abstract

The Arecibo Observatory in Puerto Rico houses the largest single dish radio telescope on earth. The telescope is used to do research in astronomy, atmospheric, space and planetary sciences, as well as to develop state-of-the-art radio engineering technology. The scientific achievements at the Observatory obtained since its birth in 1963 are worldwide known and include works in the Binary Pulsar. In 1974, Russ Hulse and Joe Taylor discovered the binary motion of PSR 1916+13 revealing evidence that the system is losing energy by the emission of gravitational radiation, just as predicted by Einstein's theory of General Relativity. In 1993, Hulse and Taylor received the Nobel Prize in physics for "the discovery of a new type of pulsar, a discovery that has opened up new possibilities for the study of gravitation." The Arecibo Observatory has performed a series of observations and experiments in the areas of astronomy, atmospheric, and space sciences such as: Incoherent Scatter Radar and Optical Observations, G-Alfa Continuum Transit Survey, Alfa Ultra-Deep Survey, Pulsar Mass Measurement, A Search for Radio Emission from Ultracool Dwarfs, Discovering Milky Way HII Regions, Radar Detection of Six M-Class Asteroids, Measuring Two Newton-Star Masses Using Shapiro Delay, among others. The Arecibo Radar Observations of nineteen Near-Earth Asteroids Program during October, 2011-January, 2012 has produced remarkable images of Asteroid 2005 YU55 discovered by Space Watch on December 28, 2005. It has an orbital period of 1.22 years. It approached Earth within 0.85 lunar distances on November 8, 2011, when it became an extraordinary strong radar target. 2005 YU55 has an absolute magnitude of 21.9 and a diameter of about 400 meters. The Near-Earth Asteroid Program at the Arecibo Observatory has detected 271 asteroids since 1968. The history for the Asteroid Program at the Arecibo Observatory will be shown at the Global Space Exploration Conference, on May 22-24, 2012, in Washington D.C.