

Near-Earth Asteroid Tracking (NEAT): First Year Results

E. F. Helin, D. L. Rabinowitz, S.H. Pravdo, K.J. Lawrence,
Jet Propulsion Laboratory

The successful detection of Near-Earth Asteroids (NEAs) has been demonstrated by the Near-Earth Asteroid Tracking (NEAT) program at the Jet Propulsion Laboratory during its first year of operation. The NEAT CCD camera system is installed on the U. S. Air Force 1-m GEODSS telescope in Maui, Using state-of-the-art software and hardware, the system initiates nightly transmitted observing script from JPL, moves the telescopes for successive exposures of the selected fields, detects moving objects as faint as $V = 20.5$ in 40s exposures, determines their astrometric positions, and downloads the data for review at JPL in the morning. The NEAT system is detecting NEAs larger than $\sim 200\text{m}$, comets, and other unique objects at a rate competitive with current operating systems, and bright enough for important physical studies on moderate-sized telescopes.

NEAT has detected over 10,000 asteroids over a wide range of magnitudes, demonstrating the excellent capability of the NEAT system. Fifty-five percent of the detections are new objects and over 900 of them have been followed on a second night to receive designation from the Minor Planet Center. 14 NEAs (9 Amors, 4 Apollos, and 1 Aten) have been discovered since March 1996. Also, 2 long period comets and 1996 PW, an asteroidal object with an orbit of a long-period comet, with an eccentricity of 0.992 and orbital period of ~ 5900 years.

Program discoveries will be reviewed along with analysis of results pertaining to the discovery efficiency, distribution on the sky, range of orbits and magnitudes.