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Surveying of the Solar System

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Strategy

Some populations of objects in the solar system are poorly known, and the long-range goal of this program is to improve that situation. For instance, we are working with Drs. C. J. and I. van Houten of the Leiden Observatory in a continuation of the Palomar-Leiden Survey to investigate the statistics of Trojan asteroids. We are also developing new techniques of sky surveillance by scanning with CCD, particularly for the discovery of near-Earth asteroids.

Progress and Accomplishments

We are observing full time during the dark half of each month with the Spacewatch Telescope which is the 91-cm Newtonian reflector of the Steward Observatory on Kitt Peak. This telescope became usable for the discovery of near-Earth asteroids when the 2048 x 2048 CCD, with pixel size 27 microns, became available. This Tektronix CCD is now in operation with a Solbourne work station and sophisticated software. We are finding typically 2,000 main-belt asteroids and two near-Earth asteroids per month; only the latter are followed with astrometry.

Projected Accomplishments

The discovery of near-Earth asteroids is to be further improved by refinements in software, operation, and design of new equipment.

Publications

Gehrels, T. (1991). Scanning with Charge-Coupled Devices. Space Science Reviews, in press.

Rabinowitz, D. L. (1991). Detection of Earth-approaching Asteroids in Near Real-Time. Astron. J., in press.

van Houten, C. J., van Houten Groeneveld, I., Wisse-Schouten, M., Bardwell, C., Green, D.W.E., and Gehrels, T. (1991). The Second Palomar-Leiden Trojan Survey. Icarus, in press.