NASA'S NEAR-EARTH OBJECT PROGRAM OFFICE.

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In 1998, NASA formed the Near-Earth Object Program Office at JPL to provide a focal point for NASA's efforts to discover and monitor the motions of asteroids and comets that can approach the Earth. This office was charged with 1.) facilitating communication between the near-Earth object (NEO) community and the public, 2.) helping coordinate the search efforts for NEOs, 3.) monitoring the progress in finding NEOs at NASA-supported sites, and 4.) monitoring the future motions of all known NEOs and cataloging their orbits. There are far more near-Earth asteroids (NEAs) than near-Earth comets and one of the driving motivations for NASA's NEO Program is the Spaceguard Goal to find 90% of the NEAs larger than one kilometer by 2008. While the total population of NEAs is not clearly established, the consensus opinion seems to be that the total population of NEAs larger than one kilometer is about 1000 (with a range of perhaps 800 – 1200). By April 2002, nearly 60% of the total population of large NEAs had been discovered and while the discovery rate will likely drop off as the easy ones are found, these early discovery efforts are encouraging. The five NASA-supported NEO discovery teams are the Lincoln Laboratory Near-Earth Asteroid Research effort (LINEAR, Grant Stokes, Principal Investigator), the Near-Earth Asteroid Tracking team at JPL (NEAT, Eleanor Helin, P.I.), the Lowell Observatory Near-Earth Object Search (LONEOS, E. Bowell, P.I.), and two discovery teams near Tucson Arizona – the Spacewatch effort (R. McMillan, P.I.) and the Catalina Sky Survey group (S. Larson, P.I.). Mention should also be made of the Japanese Spaceguard discovery site at Bisei Japan (S. Isobe, P.I.). A substantial portion of the critical follow-up observations necessary to secure the orbits of NEOs and provide information on their physical characteristics is provided by a group of very sophisticated amateur astronomers who might better be described as unfunded professionals.

After nearly two years in development, the JPL SENTRY system has been brought on line to provide automatic updates of near-Earth asteroid (NEA) orbits and to predict future close Earth approaches along with their associated impact probabilities. For those NEAs that can approach the Earth, a Palermo Scale risk number is computed based upon the object's impact probability at a particular time, the energy upon impact and the time interval before the potential impact. A Palermo Scale number larger than zero implies the predicted impact event has risen above the expected background level of impacts that could occur between now and the predicted time of impact from all NEAs of the same size or larger. Computed Palermo Scale values are used to prioritize automatic Monte Carlo numerical integration runs to determine robust impact probabilities for those NEAs where a future impact cannot be ruled out – usually because of poor orbits and/or close planetary encounters. Our interactive web site at http://neo.jpl.nasa.gov will allow the user access to the latest information on NEOs including coming close Earth approaches, the risk page for poorly determined orbits, the progress toward meeting the Spaceguard Goal, links to the web sites of the NEO search teams, the rationale for studying NEOs, space missions to NEOs, as well as information on the characteristics, future motions, orbits and orbital movies for well over 120,000 comets and asteroids.