# The Pan-STARRS search for near-Earth objects

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The Pan-STARRS1 (PS1) telescope, located on Haleakala, Maui, Hawaii, is a 1.8-meter diameter wide-field survey telescope. It is equipped with the largest digital camera in the world, with almost 1.4 billion pixels, and images an area of sky of 7 square degrees. During the last 3 years, PS1 has been conducting a multipurpose survey ranging from a search for Near Earth Objects (NEOs) to cosmology. During this survey, 11 % of the observing time was dedicated to a search for NEOs. During that time, PS1 became the leading telescope in terms of discovery of NEOs and Potentially Hazardous Asteroids (PHAs). PS1 has also become an important discovery telescope for comets, and has discovered numerous main belt comets, including the recent discoveries of P/2013 P5 and P/2013 R3.

The multipurpose survey being conducted by PS1 finished in February 2014, and 100 % of the observing time on PS1 is now dedicated to a search for Near Earth Objects. The primary region that is being searched is the $60 \times 60$ degree region around opposition (subject to observability from Hawaii's latitude, and avoiding high star density regions close to the Galactic plane). The sweet spot regions close to the Sun are also being searched. The result will be a deep multi-epoch survey of the ecliptic spanning at least 3 years.

A second Pan-STARRS telescope (PS2), located adjacent to PS1, is nearing completion and will soon also be surveying the night sky for NEOs. The second telescope will allow us to survey much of the available sky on at least four epochs per month.

The much larger amount of observing time dedicated to the NEO search will allow a much more systematic survey to be conducted, and this will result in better insight into the size and orbital distribution of NEOs.

One of the strengths of Pan-STARRS is that the depth of its observations enables it to discover large undiscovered NEOs that are more distant from Earth. Pan-STARRS is less efficient at discovering small nearby NEOs that are fast moving. The small pixels in the camera and good image quality enable Pan-STARRS to discover low levels of cometary activity that may be missed by other telescopes. PS1 delivers excellent quality astrometry that is typically better than 0.15 arcsec.

Some of the solar-system discoveries coming from the initial 3-year PS1 survey will be discussed. The new survey will be described in detail, and some of the preliminary results from the first four months of the dedicated survey will be described.