The survey will also be able to generate a sample of several hundred Damocloids and Main belt comets. We will also
of Main belt asteroids below a kilometer in size, LSST will also enable us to study the Main belt precursors of the NEOs.
that may help constrain models of the transfer of comets from the inner and outer Oort Cloud. By detecting a large sample
LSST will survey a wide range of ecliptic latitudes to faint limiting magnitudes, allowing discovery of high-inclination objects
passing stars. These linkages are hard to study, as the sample sizes for many of these populations are small or non-
Supply of NEOs. Inner Oort Cloud objects transfer slowly into Centaur orbits under the influence of the galactic tide and
once thought. Main belt asteroids migrate into Near Earth Object orbits due to gravitational perturbations, replenishing the
As we learn more about the small bodies in our Solar System, it becomes clear that they are not as disparate as we had
be detected in individual images. Plutino-sized objects out to 200 AU can
Interesting objects can be then targeted for follow-up observations. For TNOs, the viewing/illumination geometry changes very slowly and the full solution of the inverse problem is not possible. However, accurate sparse photometry can be used for period determination. Moreover LSST sparse photometry can be also used for detecting (but not modeling) 'non-standard' cases like binary and tumbling asteroids. A fully synchronous binary system behaves like a single body from the photometric point of view. The binary will permit measurements of the nature of the inner and outer Oort cloud. Using high accuracy multicolor photometry, lightcurves and colors will be determined for a significant fraction of the objects detected. Through sparse lightcurve inversion, spin state and shape models will be derived for tens of thousands of main belt asteroids. Derivation of proper elements for Main Belt asteroids will greatly enlarge existing asteroid families, particularly at smaller sizes, and precise color information will facilitate further divisions.

Sparse Light Curve Inversion
Through so-called ‘sparse light curve inversion’ techniques, we expect to derive models of global shape, spin axis direction, and rotation period for about 10^4 to 10^5 main-belt and near-Earth asteroids from LSST photometry, which means that we will be able to map a substantial part of the asteroid population. Roughly speaking, once we have at least ~100 sparse brightness measurements of an asteroid over ~5 years, calibrated with a photometric accuracy of ~5%, or better, a coarse model can be derived. The sparse data inversion gives correct results also for fast (0.2-2 h) and slow (>24 h) rotators. (Durech et al. 2007)

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The Earth Impact Hazard
In December 2005 Congress directed NASA to implement a near-Earth object survey that would catalogue 90% of NEOs larger than 140m. Under the baseline survey, LSST would discover ~80% of the target population within ten years. Reaching the Congressional goal of 90% would require a modified and extended NEO-Optimized survey, dedicating 15% of survey time to higher airmass searches near sun and along the northern ecliptic. This survey option would measurably improve the current detection rate of NEOs.”