

RUBIN OBSERVATORY LSST: STATUS, NEO EXPECTATIONS, AND COMMUNITY READINESS

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ABSTRACT

The Rubin Observatory is a new U.S. NSF/DOE-funded facility on Cerro Pachón, Chile, housing the 8.4m Simonyi Survey Telescope. The Observatory is expected to be completed and commissioned by November 2024. Over a ten-year period Rubin will execute the Legacy Survey of Space and Time (LSST). Enabled by its 9.6 square degree field of view, a 3.2 Gigapixel camera, and a cadence covering the sky every 3-4 days to median single-exposure depths of $r \sim 24$ mag, the LSST will deliver a large catalog of Solar System objects. Based on simulations, this catalog will include 5M+ new main-belt asteroids, 200,000+ Jupiter Trojans, 40,000+ TNOs, and tens of ISOs (among others).

The LSST will also deliver the most comprehensive survey of NEOs, PHAs, and imminent impactors to date. Simulations indicate yields of over 100,000+ NEAs, $O(1-10)$ imminent impactors per year, $O(100)$ temporarily captured objects, and a census of over 80% of the PHA population by mid 2030s. These discoveries will come with precise astrometry (10mas systematics limited), photometry (<1% systematics limited), understood selection functions, as well as 10-100+ observations per object, all allowing for detailed population studies.

This talk will open with an update on Rubin construction status and projections for discovery yields. I will argue that the opportunities for planetary defense will be significant. However, with the jump in discovery rates will also come significant challenges for the world-wide community: from coordination of observations, strained follow-up capacity, to reaction procedures for imminent impactors. I will offer thoughts on these and potential solutions. With operations less than two years away, now is an excellent time to make our community ready for Rubin's contribution to NEO discovery.

Comments:

We'd prefer this contribution to be given as an oral presentation.