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- Planetary Defense – Recent Progress & Plans
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The First Year of the NEOWISE Restarted Mission

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ABSTRACT

NASA's Wide-field Infrared Survey Explorer (WISE) spacecraft was brought out of hibernation to resume surveying the sky at 3.4 and 4.6 microns. Operating in a terminator-following orbit, the WISE spacecraft covers the sky twice over the course of a year, with an average of ~10 exposures per region of sky for each of the two visits, so that planetary objects are often observed at several different times, over short and long time-scales, throughout their orbit. The scientific objectives of the NEOWISE reactivation mission are to detect, track, and characterize near-Earth

asteroids and comets[1,2]. The search for minor planets resumed on 2013 December 23, and has been active for over a year now. More than 10000 small bodies were observed during the first year of observations, including hundreds of NEOs for which accurate diameters can be determined. Because the survey is in the infrared, NEOWISE detects asteroids based on their thermal emission and is equally sensitive to high and low albedo objects; consequently, NEOWISE-discovered NEOs tend to be large and dark. Over the course of its three-year mission, NEOWISE will determine radiometrically derived diameters and albedos for thousands of NEOs and several tens of thousands of Main Belt asteroids. The survey will also yield the largest survey of comets in the infrared, yielding unique constraints on nucleus size, dust temperature, dust production rates, and dust particle size and age for these active bodies, while sampling their behavior over a range of in-bound and out-bound heliocentric distances. We will present our preliminary findings based on the first year of observations.

References: [1] Mainzer, A. et al. (2011) *ApJ*, 731:1, [2] Mainzer, A. et al. (2014) *ApJ*, 792:30

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