

Small Body Populations According to NEOWISE

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Abstract

The Wide-field Infrared Survey Explorer (WISE) surveyed the entire sky in four infrared wavelengths (3.4, 4.6, 12 and 22 microns) over the course of one year. From its sun-synchronous orbit, WISE imaged the entire sky multiple times with significant improvements in spatial resolution and sensitivity over its predecessor, the Infrared Astronomical Satellite. Enhancements to the WISE science data processing pipeline to support solar system science, collectively known as NEOWISE, enabled the individual exposures to be archived and new moving objects to be discovered. When the solid hydrogen used to cool the 12 and 22 micron detectors and telescope was depleted, NASA supported the continuation of the survey in the 3.4 and 4.6 micron bands for an additional four months to search for near-Earth objects and to complete a survey of the inner solar system. In total, NEOWISE detected more than 158,000 minor planets, including >34,000 new discoveries. This mid-infrared synoptic survey has resulted in range of scientific investigations throughout our solar system and beyond. Following one year of survey operations, the WISE spacecraft was put into hibernation in early 2011. NASA has recently opted to resurrect the mission as NEOWISE for the purpose of discovering and characterizing near-Earth objects.