

SMALL BODY SCIENCE WITH WISE/NEOWISE: AN UPDATE. A. Mainzer¹, J. Bauer^{1,2}, T. Grav³, J. Masiero¹, R. Cutri², R. S. McMillan⁴, R. Walker⁵, and E. L. Wright⁶ ¹Jet Propulsion Laboratory, Pasadena, CA, USA, ²Infrared Processing and Analysis Center, California Institute of Technology, ³Planetary Science Institute, Tucson, AZ, USA, ⁴Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ, USA, ⁵Monterey Institute for Astronomy, Monterey, CA, USA, ⁶University of California, Los Angeles, USA.

Introduction: NASA's Wide-field Infrared Survey Explorer (WISE) mission imaged the entire sky in infrared wavelengths, with survey operations beginning on January 14, 2010 [1]. The 7.5 months of survey data were collected in four wavelengths, 3.4, 4.6, 12 and 22 μm ; by October 1, 2010, all of the solid hydrogen used to cool the instrument had been depleted. The survey continued until February 1, 2011 using the two shortest wavelengths only. The NEOWISE project enhanced the WISE data processing pipeline to mine the survey data for moving objects and has yielded thermal infrared measurements of more than 158,000 asteroids [2]. More than 34,000 new asteroids have been discovered by NEOWISE to date. By analyzing preliminary thermal model fits, NEOWISE has provided new constraints on the population of near-Earth objects down to 100 m in diameter. We have also confirmed completion of the Congressional "Spaceguard" goal for NASA's near-Earth object program to identify 90% of all of the near-Earth asteroids larger than 1 km in diameter [3].

Future Plans: The first data release of the four band WISE data collected during the fully cryogenic portion of the mission will be released in March, 2011 [4]. These data have been processed using the best available calibration data products and represent the final release of the four band data. The data collected during the post-cryogenic portion of the mission have been processed using a set of preliminary calibration products derived during the survey operations. The NEOWISE project will begin processing the post-cryogenic data using updated calibration products that will bring the photometric and astrometric quality of the data to the same level of quality as the four band data.

The project will also deliver to the community a set of additional data products that will facilitate solar system science. The WISE Moving Object Processing System (WMOPS) will be optimized to allow detection of more moving objects in the dataset and will be rerun on all of the data. Stacked images will be created for the ~500,000 known asteroids and comets. Finally, a catalog of physical properties for the small bodies detected by WISE/NEOWISE will be created and delivered to NASA's Planetary Data System. These additional data products will be delivered to the science community over the next 2.5 years.

We will also present an update of the small body science results from WISE/NEOWISE, focusing on the near-Earth object population.

References:

- [1] Wright et al. (2010) *AJ*, **140**, 1868. [2] Mainzer et al. (2011) *ApJ*, **731**, 53. [3] Mainzer et al. (2011) *ApJ* **743**, 156. [4] Cutri et al. (2011) *WISE Explanatory Supplement*.