COMPOSITIONAL DISTRIBUTION OF THE NEAR-EARTH OBJECT POPULATION. R. P. Binzel[1], F. E. DeMeo[1], M. Lockhart[1], P. Spivakovsky-Gonzalez[1], D. Polishook[1], A. Tokunaga[2], C. A. Thomas[3], A. S. Rivkin[4], S. J. Bus[5], M. Birlan[6], P. Vernazza[7]. [1]Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA 02139, rpb @ mit.edu, [2]Institute for Astronomy, University of Hawaii, 2680 Woodlawn Drive, Honolulu, HI 96822, tokunaga @ ifa.hawaii.edu, [3]Department of Physics and Astronomy, Northern Arizona University, Flagstaff, AZ 86011, Cristina.Thomas @ nau.edu, [4]Johns Hopkins University Applied Physics Laboratory, 11100 Johns Hopkins Road, Laurel, MD 20723, andy.rivkin @ jhuapl.edu, [5]Institute for Astronomy, 640 N. A'ohoku Place, Hilo, HI 96720, sjb @ IfA.Hawaii.Edu, [6]IMCCE, Observatoire de Paris, Paris 75014, France, Mirel.Birlan @ imcce.fr, [7]European Southern Observatory, Garching, Germany, pvernazz @ eso.org.

Introduction: We have obtained spectral reconnaissance measurements for more than 400 near-Earth objects (NEOs) in the Apollo, Aten, Amor categories. Interesting subsets (each consisting of more than 100 objects) include the potentially hazardous asteroid (PHA) population as well of those having spacecraft ΔVrequirements $\leq$ 7.0 km/sec. The majority of our measurements are near-infrared spectroscopy obtained through an ongoing joint observing program being conducted by MIT, the University of Hawaii, and the NASA Infrared Telescope Facility (IRTF) on Mauna Kea, Hawaii. All spectroscopic observations obtained in this campaign are being made publicly available via the website: http://smass.mit.edu/ and are also linked and publicly available through the IRTF website: http://irtfweb.ifa.hawaii.edu/. We also have available for our analysis visible spectrometry measurements for more than 200 near-Earth objects and 150 Mars-crossing asteroids from our previously published observations [1,2].

Analysis: As short-lived transient residents of the inner solar system, the source regions and ultimate fates of the near-Earth population provides intriguing questions whose answers we seek to illuminate through our measurements of physical properties. In this talk we will highlight our findings to identify: NEOs derived from the ν6 resonance, 3:1 resonance, outer main belt, and short-period comets. Our current work is also exploring the size dependence of the NEO compositional distribution as it pertains to the role of the Yarkovsky effect in delivering bodies from the main-belt to near-Earth space. We will compare the PHA population from within the overall NEO population to explore attributes of the population that not only poses the greatest risks, but also currently dominates the contribution to Earth's meteorite flux. As the most immediate observable source of meteorites, our spectral interpretation [3,4] is also used to compare the NEO flux to the meteorite flux. Finally the short dynamical timescales for planetary encounters [5] provides an opportunity for exploring geophysical mechanisms that may refresh space-weathered surfaces [6,7].

References: : [1] Binzel, R. P. et al. (2004), *Icarus* 170, 249. [2] Binzel, R. P. et al. (2004), *MAPS* 39, 151. [3] DeMeo et al. *Icarus* 202, 160-180 (2009). [4] Thomas, C. A. and Binzel, R. P. (2010). *Icarus* 205, 419. [5] Nesvorný, D. et al. (2005), *Icarus* 173, 132–152, 2005. [6] Binzel, R.P. et al. (2010), *Nature* 463, 331-334. [7] Nesvorný, D. et al. (2010), *Icarus* 209, 510-519.