

UARC/NASA NEAR EARTH OBJECT SMALL SPACECRAFT SUMMER STUDY PROGRAM. E. Asphaug¹, G. T. Delory², D. Korycansky¹, F. Marchis^{3,4}, I. de Pater³, J. Hines⁵, P. Worden⁵ and the 2008 S4P Summer Students, ¹Department of Earth and Planetary Sciences, University of California, Santa Cruz, 1156 High St., Santa Cruz, CA 95064, USA; ²Space Sciences Laboratory, University of California, 94720 Berkeley, USA; ³Department of Astronomy, University of California, 94720 Berkeley, USA; ⁴SETI Institute, Carl Sagan Center, 515 N. Whisman Rd, Mountain View CA 94043, USA, ⁵NASA-Ames Research Center, Moffett Field, CA 94035-1000, USA.

Near-Earth Objects (NEOs) come closer to Earth than any other celestial body, and are therefore readily attainable by inexpensive spacecraft. This summer, a dozen students have been competitively selected to participate in a 10-week program to develop and test mission ideas for small spacecraft exploration of Near-Earth Objects (NEOs). We will present the results of this summer study to date.

The summer program has three goals:

- Develop and test rigorously one or two concepts for NEO small spacecraft exploration that are expected to lead to competitive mission proposals or flight opportunities.
- Integrate Bay Area expertise related to this promising new area of small spacecraft mission design using NASA Ames Research Center as the hub.
- Train the next generation of scientists, engineers and project managers who will design and lead upcoming missions to NEOs and other solar system bodies.

We know less of the origin, evolution, and geophysical behavior of NEOs than we know of the Moon or Mars, despite their petrologic representation in many thousands of meteorites. It appears that we are on the verge of making a deep scientific connection that will revolutionize our understanding of the early solar system, and this stimulates the imagination. Obtaining more detailed knowledge of NEOs is also of considerable pragmatic importance. These bodies, mostly asteroids, some comets are the most valuable resource in space, possessing raw materials for fabrication and oxygen extraction, volatiles for propulsion, and agricultural soils and water. They also constitute a much publicized hazard.

Action of any kind begins with a basic scientific understanding, and the next step is a campaign of inexpensive spacecraft missions. The underlying theme of our summer study is found in NASA Strategic Sub-goal 3C: Advance scientific knowledge of the origin and history of the solar system and the hazards and resources present as humans explore space.

Students from the 2008 University Affiliated Research Center (UARC) 2008 Small Spacecraft Summer Study Program (S4P) at NASA Ames will be present at this poster.