

A Low Cost Approach to Close-up Examination of Multiple Near Earth Asteroids. J. F. McCarthy¹, ¹Orbital Sciences.

Abstract: In this paper we describe a Discovery-class mission concept combining a small, inexpensive, but capable solar electric propulsion spacecraft with low cost launch vehicles to provide close-up examination of near Earth Asteroids. Our concept promises to enable rendezvous and close-up examination of multiple near Earth asteroids within the cost cap of NASA's Discovery program. Near Earth asteroids exhibit a wide range of spectra, suggesting a diversity of surface composition and properties. If we were able to examine at close range a significant number of near Earth asteroid types, the results would be interesting from several perspectives. First, we would better understand the characteristics of the asteroid classes, which might shed light on questions of their origins. Second, since human exploration of a near Earth asteroid is currently contemplated by NASA, hard data on the surface properties would be invaluable in mission planning. However, to date the cost of visiting a single asteroid has been comparable to mission cost caps.