

Exploration of Near-Earth Asteroids (4)
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QUALITATIVE ASSESSMENT OF ASTEROID RENDEZVOUS TRAJECTORIES

Abstract

The Asteroid Redirect Mission (ARM) is an upcoming NASA mission split into two sub-missions: the Asteroid Redirect Robotic Mission (ARRM) and the Asteroid Redirect Crewed Mission (ARCM). The ARRM will characterise, capture, and redirect a near-Earth asteroid to a stable, Distant Retrograde Orbit (DRO) around the moon, likely making use of a lunar gravity assist. This placement of an asteroid in a lunar orbit is a feasible, cost-effective solution to allow astronauts during the subsequent ARCM to visit, explore, and study an asteroid while demonstrating technologies that will enable future manned missions to Mars. The research presented investigates the attributes and orbits of the asteroid chosen for assessment for both sub-missions to evaluate feasible rendezvous trajectories and timeline options for such missions.