

Rendezvous with a near Earth object

October 25 2011



An image of the asteroid Gaspra, which is about 16 kilometers in its longest dimension. A new paper discusses the importance of finding most of the near earth asteroids, of which today only an estimated 10% are known. Credit: NASA GSFC

(PhysOrg.com) -- One of the most accessible goals for human spaceflight is a rendezvous with a Near Earth Object (NEO). NEOs are asteroids or comets whose orbits take them close to the earth's orbit. An NEO might someday collide with the earth -- and there are almost 6000 larger in diameter than about 100 meters known, with predictions that over ten times as many could exist. The impact of even a one-kilometer-sized NEO would probably destroy an average state, and this is certainly one reason to study them. From the perspective of pure science, NEOs are important nearby representatives of the early Solar System.

A manned mission to an NEO is now under study at NASA. [Human space flight](#) considerations provide an additional reason to study them. In futuristic scenarios, when they are close by their resources can be mined for spacecraft use (propellant, life support, construction materials) or commercial use. Of course such a mission would want to aim for an NEO that is (at the time of the rendezvous) fairly close to the Earth, and to minimize the fuel needed, one that is not moving too fast with respect to the Earth. This accessible class of NEOs, however, is very difficult to detect. Because their orbits are very Earth-like, their motions are very similar to the Earth's. Hence, most of the time they are in the daytime sky, not in the Earth's night shadow, and therefore they are hard to spot. Only about sixty-five are now known, leaving NASA with only a modest-sized sample from which to select characteristics of interest, like composition.

CfA astronomers Martin Elvis, and Jonathan McDowell, together with two colleagues, review the case for visiting an accessible NEO, and summarize the statistics. They estimate from NEO research that there are probably ten times as many of these accessible NEOs still to be discovered, and argue that a dedicated survey looking for them should be a NASA priority. Not only would it help identify the site of a potential future astronaut visit, such a study would also increase our understanding of NEO characteristics in general, as we use them as tracers of the conditions in the [early Solar System](#).

Provided by Harvard-Smithsonian Center for Astrophysics

Citation: Rendezvous with a near Earth object (2011, October 25) retrieved 28 April 2024 from <https://phys.org/news/2011-10-rendezvous-earth.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is

provided for information purposes only.