



An assessment study for a NEO mission

M.A. Barucci (1), W. Kofman (2), R. Francis, D.Moura, P. Chazalnoel (3), J. Brucato (4), E. Dotto (5), J. Biele, S. Ulamec, A. Harris, S. Mottola (6), A.J.Ball, S.F. Green (7), C. Engrand (8) G. Valsecchi, A. Coradini (9) E. Sylvie (10) A. Morbidelli (11), O. Gasnault (12), A. Nathues, F. Goesmann (13), E. DeMarchi (14), A. Rossi (15), J.P. Barriot (16), G. Manhés (17).

(1) Obs.Paris, LESIA, France, (antonella.Barucci@obspm.fr, Fax: +33.145077110, Tel : +33.145077775), (2) LPG, Grenoble, Fr, (3) CNES, Fr, (4) INAF, Naple, I, (5) INAF, OAR, I, (6) DLR, De, (7) Open University, UK, (8) CSNSM, Fr, (9) IASF, I, (10) ASI, I, (11) Nice Obs., Fr, (12) CERS, Toulouse, Fr, (13) MPI, Lindau, De, (14) Tecnomare, It, (15) ISTI, I, (16) CNES, Fr, (17) IDGP, Fr

The NEOs are representative of the population of asteroids and dead comets thought to be similar to the ancient planetesimal swarms that accreted to form the planets. The chemical investigation of NEOs having primitive characteristics is thus essential in the understanding the planet formation and evolution. They carry records of the solar system's birth/early phases and the geological evolution of small bodies in the inter-planetary regions. Moreover, collisions of NEOs with Earth represent a serious hazard to life. For all these reasons the exploration and characterization of these objects are particularly interesting and urgent.

NEOs are interesting and highly accessible targets for scientific research and robotic exploration. Within this framework, a mission including an orbiter and a lander to the primitive double object (1996 FG3) is under study, in collaboration with different European countries (France, Italy, Germany and United Kingdom) and related Space Agencies. The principal objective is to characterize the chemical-physical surface properties by in-situ analysis and to define its internal structure by radar tomographer.

This type of mission, studied to fit within limited resources and cost, appears clearly to have the potential to revolutionize our understanding of primitive materials and

to provide us the information needed to develop strategies to protect the Earth from impactors.

The current phase 0 activities are to be ended in spring 2006 and a larger cooperation is viewed to enter in the next phases.