SPACE EXPLORATION SYMPOSIUM (A3)
Solar System Exploration (5)

Author: Dr. Charles Koeck
EADS Astrium, France

Dr. Ralph Cordey
Airbus Defence and Space Ltd, United Kingdom
Mr. Stephen Kemble
Airbus Defence and Space Ltd, United Kingdom
Dr. Ulrich Johann
Airbus DS GmbH, Germany

FROM MERCURY TO JUPITER: OVERVIEW ON SOLAR SYSTEM EXPLORATION MISSIONS AT ASTRIUM

Abstract

On June 2nd 2003, the first European planetary exploration mission, Mars Express, was launched from Baikonur and placed into its interplanetary trajectory to the Red Planet. After a 6-month cruise, the Mars Orbit Insertion manoeuvre was successfully achieved, and since then the spacecraft is providing the scientific community with world-class data about Mars atmosphere, surface and underground. In March 2004, the comet chaser Rosetta was launched from Kourou for a ten years journey to comet Churyumov - Gerasimenko. The spacecraft, presently in hibernation mode, will reach its target in May 2014, and release its Philae small lander onto the icy nucleus. In November 2005, it was Venus Express turn to leave the Earth and to head for Venus, to explore the mysteries of its violent atmosphere. Since April 2006, the spacecraft is orbiting around Venus, and provides continuously outstanding scientific observations. The spacecraft is very similar to Mars Express, modified mainly to cope with the much hotter thermal environment at Venus. It was developed is a remarkable short time of 3 years only: a first topic of the paper will present how an interplanetary missions family, initiated for the comet chaser Rosetta, was designed in such a way that its applicability to various space exploration missions was so successful. Following this series of three interplanetary missions, the European Agency pursues the exploration of our solar system. The BepiColombo mission to Mercury is presently in phase C/D, aiming at a launch in 2014. A huge technology development effort is being spent for this mission, owing to its very severe thermal and radiation environment. Applying the missions' family approach implemented with Rosetta, Mars Express and Venus Express, ESA has recently started the development phase of Solar Orbiter, a spacecraft to explore the sun and the heliosphere at short distances (0.3 AU), and hence borrowing key technologies from BepiColombo. Other ESA projects are under study, for Jupiter and its icy moons (Laplace / Juice mission), for asteroids sample return (Marco Polo-R mission), and for Mars robotic exploration. Also under study are missions to the Moon (orbiter and lander). Astrium is of course participating to these studies. It will be shown during the symposium how the lessons learnt from previous and on-going developments can be efficiently implemented for these new generation interplanetary missions.