The NASA New Millennium Program: Flight Validation of New Technologies for 21st Century Science

David Crisp

NASA has ambitious plans for space science and Earth observations during the first decade of the 21st century. A broad range of new spacecraft and measurement technologies is needed to support these plans within the context of existing budget and schedule constraints. The New Millennium Program (NMP) supports these efforts by identifying, accelerating, and flight-validating revolutionary spacecraft and instrument technologies that could enhance the science return of future missions, while reducing their cost and risk. The current NMP mission lineup includes two Deep Space (DS) and two Earth Orbiting (EO) missions. The first Deep Space mission, DS1, will launch in July, 1998. This mission will validate solar electric propulsion along with 11 other advanced technologies as it flies past Asteroid 3352 McAuliffe, the planet Mars, and Comet P/West-Kohoutek-Ikemura. The DS2 Mission consists of a pair of micro penetrators that will be launched in January 1999 as a piggyback payload on the Mars Surveyor '98 Lander. These small, low-cost penetrators will demonstrate a single-stage passive atmospheric entry system and a high-impact landing system designed to deliver the science payload up to 1 meter below the Martian surface. This mission will also validate a single-chip telecom system, a suite of miniaturized in-situ scientific instruments, and other innovative packaging technologies. The first Earth Orbiting Mission, EO1, is scheduled for a May 1999 launch. This mission will demonstrate an advanced land imaging system that could lead to substantial cost reductions in future Landsat Orbiters. The second NMP Earth Orbiting mission, EO2, will provide the first opportunity to validate a space-based wind lidar system. This low-cost mission will be carried to orbit as a Hitchhiker payload on the Space Shuttle. The status of these missions will be summarized in this presentation. The processes for mission definition, technology selection, and science involvement in the NMP will also be reviewed.