

Europe en route to the Moon: SMART-1 final preparation, launch and early flight

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Keywords: Lunar mission, technology, electric propulsion, mineralogy, geochemistry

Europe will launch its first spacecraft to the Moon in August 2003. SMART-1, the first ESA Small Mission for Advanced Research and Technology, has completed at the time of writing this abstract all the tests and is ready to be transported to the launch site, Kourou in French Guyana. The spacecraft will be launched on board an Ariane 5 vehicle together with two telecommunication satellites and will be delivered into a Geostationary transfer orbit (GTO). By means of its own electric primary propulsion system, SMART-1 will travel to the Moon by first slowly expanding the GTO, then making use of the gravitational influence of the Moon and finally being captured by the Moon in a polar elliptical orbit. The trip will last up to 18 months depending on the flight conditions.

In this paper we shall first review the main objectives of this mission: to demonstrate in flight the use of electric propulsion as main propulsion system and to make scientific observations of the Moon surface from orbit.

The payload comprises seven instruments addressing technological aspects related to the electric propulsion and plasma environment (EPDP, SPEDE), spacecraft deep space communication (KaTE), lunar science (D-CIXS, AMIE, SIR) and astronomy and solar observations (XSM).

After the Launch and Early Operations Phase (LEOP), where the spacecraft main subsystems will be commissioned, an electric propulsion in-flight validation phase will take place. The thrust phase will then start right after in order to exit as soon as possible from the dangerous radiation belt region. This thrust intensive phase will last for about two months. Depending upon the actual launch date, the presentation delivered at the conference may describe also the first part of the payload instruments commissioning phases and some preliminary results of the mission.