BepiColombo – a pair of spacecraft visit Mercury

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In February 2006, BepiColombo has been confirmed as the planetary mission of ESA's Cosmic Vision Programme. This mission to Mercury has been defined as a joint project between ESA and the Japanese Aerospace Exploration Agency (JAXA). BepiColombo consists of two orbiters, the Mercury Planetary Orbiter (MPO) and the Mercury Magnetospheric Orbiter (MMO), each in a dedicated orbit to study the planet and its magnetosphere. The MPO/MMO complement will be launched together on a single Soyuz-Fregat 2-1B in August 2013 and arrive at Mercury in August 2019. The 6 years cruise phase is achieved with a combination of 7 fly-bys (moon, 2 Venus, 4 Mercury) and solar electric propulsion. The scientific payload of BepiColombo comprises 11 instruments/instrument packages on the MPO and 5 instruments/instrument packages on the MMO. Together, the measurements of the two spacecraft will provide the detailed information necessary to understand the process of planetary formation and evolution in the hottest part of the proto-planetary nebula as well as the similarities and differences between the magnetospheres of Mercury and the Earth. The MPO is a three-axis-stabilized and nadir-pointing module, which will focus on a global characterization of Mercury through the investigation of its interior, surface, exosphere and magnetosphere. Its low-eccentricity polar orbit will provide excellent spatial resolution over the entire planet surface. In addition, the MPO will address fundamental physics questions as Mercury's orbit provides a unique way to test General relativity and other competing theories of gravity. The MMO is a spinning spacecraft dedicated to studies of Mercury's wave and particle environment of the planet from an eccentric orbit. Major effort was put into optimizing the scientific return by defining the payload complement such that individual measurements can be interrelated and complement each other. The status of the BepiColombo mission will be given with special emphasis on the MPO and its payload complement.