

## Exploration of Jupiter and Trojan Asteroids

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Aiming at the launch and arrival in 2020s, study of Japanese mission for Jupiter and Trojan asteroids started by a working group in JAXA.

Europa Jupiter System Mission (EJSM) is an international mission to explore and Jupiter, its satellite and environment. EJSM consists of (1) The Jupiter Europa Orbiter (JEO) by NASA, (2) the Jupiter Ganymede Orbiter (JGO) by ESA, (3) the Jupiter Magnetospheric Orbiter (JMO) studied by JAXA. (4) A Europa lander is also studied by Roscosmos.

JAXA is studying solar power sail for deep space explorations following a successful ion engine mission Hayabusa. This is not only a solar sail (photon propulsion) but also include very efficiency ion engines where electric power is produced solar panels within the sail. An engineering mission IKAROS (Interplanetary Kite-craft Accelerated by Radiation Of the Sun) will be launched in 2010 together with Venus Climate Orbiter PLANET-C. A mission with a large (100m-scale) solar power sail can transfer a large payloads to Jovian system. Currently we are studying a mission to Jupiter and one (or two) of Trojan asteroids, which are primitive bodies with information of the early solar system as well as raw solid materials of Jovian system. As the main spacecraft flies by Jupiter, it will deployed a JMO spinner around Jupiter.

Currently proposed instruments on board JMO are magnetometers, low-energy plasma spectrometers, medium energy particle detectors, energetic particle detectors, electric field / plasma wave instruments, a dust detector, an ENA imager, and EUV spectrometer. Proposed instruments on board Trojan spacecraft are cameras, IR spectrometers, XRS, a laser altimeter, and a surface vehicle (if rendez-vous with the target is possible). An instrument for measuring cosmic background is also proposed.

Together with plasma instruments on board JEO and JGO, JMO will investigate the fast and huge rotating magnetosphere to clarify the energy procurement from Jovian rotation to the magnetosphere, to clarify the interaction between the solar wind the magnetosphere. JMO will clarify the characteristics of the strongest accelerator in the solar system. JMO will investigate the role of Io as a source of heavy ions in the magnetosphere.

The mission will be launched by H-IIA in early 2020s. It will take 4-6 years to Jupiter and 5 years more to a Trojan astreiod around L4.