On the Trojan asteroid sample and return mission via solar-power sail – an innovative engineering demonstration

J. Kawaguchi[1], O. Mori[1], Y. Shirasawa[1], and M. Yoshikawa[1]

[1]Japan Aerospace Exploration Agency (JAXA)

The science and engineering communities in the world are seeking what comes next. Especially for asteroids and comets, as those objects lie in relatively far area in our solar system, and new engineering solutions are essential to explore them. JAXA has studied the next-step mission since 2000, a solar-power sail demonstrator combining the use of photon propulsion with electric propulsion, ion thruster, targeting the untrodden challenge for the sample return attempt from a Trojan asteroid around the libration points in the Sun-Jupiter system. The Ikaros spacecraft was literally developed and launched as a preliminary technology demonstration. The mission will perform in-situ measurement and on-site analysis of the samples in addition to the sample return to the Earth, and will also deploy a small lander on the surface for collecting surface samples and convey them to the mother spacecraft. From a scientific point of view, there is an enormous reward in the most primitive samples containing information about the ancient solar system and also about the origin of life in our solar system. JAXA presently looks for international partners to develop and build the lander. The presentation will elaborate the current mission scenario as well as what we think the international collaboration will be.

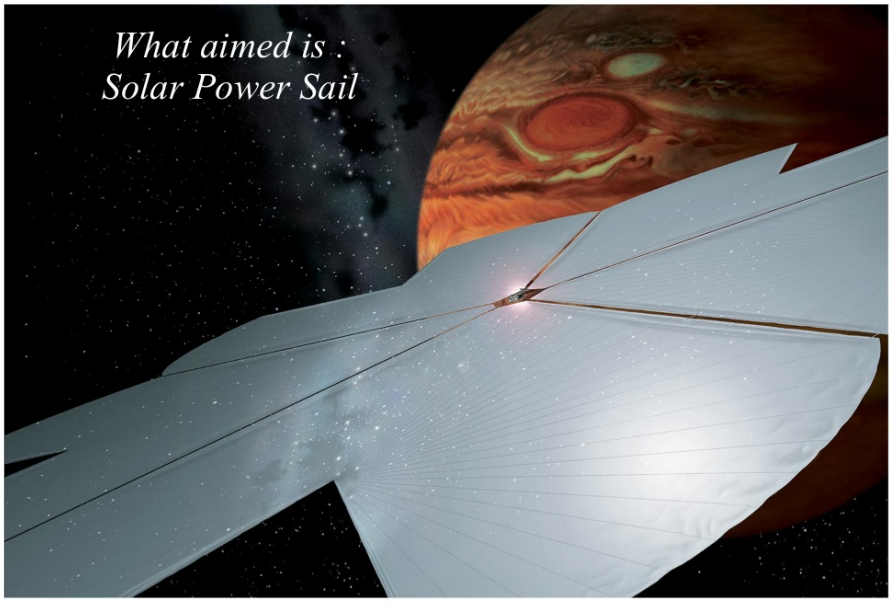

Figure: A solar-power sail flying to Jupiter.