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Jupiter Icy Moons Explorer: JUICE

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JUICE is an ESA's L-class mission to Explore Jupiter Icy Moons. JUICE was mission adopted in November 2014. It will be launched in 2022, arrive at Jupiter in 2030 and be inserted into Ganymede orbit in 2032. The science objectives of JUICE is to understand (1) emergence of habitable worlds around gas giants and (2) Jupiter system as an archetype for gas giants. Three Japanese groups were selected to provide part of the three science instruments RPWI, GALA, and PEP/JNA. Two Japanese groups were also selected as science Co-I of two instrument groups JANUS and J-MAG. JUICE is the first mission for ISAS/JAXA to participate to foreign large science mission as a junior partner who will provide part of the science instruments. JUICE will observe Jupiter system from Jupiter orbit in order to understand Jupiter system as an archetype for gas giants. JUICE will make observation of 3 of the 4 Galilean satellites, Europa, Ganymede, and Callisto in order to understand the emergence of habitable worlds around gas giants. JUICE will be launched by Arian-5. The Dry mass of JUICE is about 1800kg and the fuel is about 2900kg. The required Delta-V is about 2700m/s. JUICE is a three-axis stabilized spacecraft with solar cell paddle of about 70m2 that will generate approximately 700W power. The mass and power allocated to science instrument is 104kg and 150W, respectively. X band and Ka band are used for satellite-ground communications. After 7.5 years of interplanetary transfer and Earth-Venus-Earth-Earth gravity assists JUICE will be inserted into an orbit around Jupiter in January 2030. JUICE will make observation of all the three Jupiter icy Moons that potentially have subsurface ocean under the icy crust. After inserted into Ganymede orbit in 2032, JUICE will make detailed observation of the largest Icy Moon in the solar system. Taking into account all the data to be obtained by 5 instruments that JUICE-JAPAN will participate, Japanese team will be able to contribute to most of the major science objectives relating with planet Jupiter (JANUS), Jupiter magnetosphere (PEP/JNA, RPWI, and J-MAG), and Icy Moons (GALA, J-MAG, and JANUS). JUICE-JAPAN Working Group (WG) was established in September 2013. JUICE-JAPAN WG submitted a proposal for ISAS/JAXA small project in February 2014. JUICE-JAPAN WG passed the MDR in September 2014. JUICE-JAPAN is now preparing for the SRR. After SRR, SDR is scheduled in the end of 2015, PDR is scheduled in 2016 and CDR is scheduled in 2017.

Keywords: Jupiter, Ganymede, Satellite Exploration