

Future observations of Jovian system with LAPYUTA (Life-environmentology, Astronomy, and Planetary Ultraviolet Telescope Assembly)

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Ultraviolet observation technique is one of the most powerful tools to cover wide science fields, from planetary science to astronomy. Here we propose a UV space telescope, LAPYUTA (Life-environmentology, Astronomy, and Planetary Ultraviolet Telescope Assembly), as a Japanese-leading mission, by using both many heritages of UV instruments for planetary science (e.g., Hisaki) and space telescope techniques for astronomy. We will accomplish the following four goals: (1) dynamics of our solar system planets and moons as the most quantifiable archetypes of extraterrestrial habitable environments in the universe, (2) transit spectroscopy of exoplanetary atmosphere, especially hydrogen and oxygen exosphere, to observe on-going atmospheric escaping predicted to occur on Earth-like exoplanets in the habitable zone of low temperature star system, (3) the unique UV map of the gaseous large-scale structures (LSSs) to test the structure formation scenario of the Λ cold dark matter (CDM) model and to unveil galaxy growth and feedback processes in the LSSs, and (4) the time-domain survey for transient sky in the UV wavelength to witness the first moments of high-energy events such as compact-object mergers and supernovae with a great synergy of the growing facilities of multi-messenger astronomy including gravitational-wave observatories.

Pre-phase A study of the LAPYUTA mission have just started in 2021. In this presentation, we focus on science targets of the Jovian system and show overview of this mission.

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