Planetary sciences expected by the next-generation infrared astronomical satellite GREX-PLUS

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GREX-PLUS (Galaxy Reionization EXplorer and PLanetary Universe Spectrometer) is a mission candidate for a JAXA's strategic L-class mission to be launched in the 2030s. Its primary sciences are two-fold: galaxy formation and evolution and planetary system formation and evolution. The GREX-PLUS spacecraft will carry a 1.2 m primary mirror aperture telescope cooled down to 50 K. The two science instruments will be onboard: a wide-field camera in the 2-8 μm wavelength band and a high resolution spectrometer with a wavelength resolution of 30,000 in the 10-18 μm band. The GREX-PLUS wide-field camera aims to detect the first generation of galaxies at redshift $z > 15$. The GREX-PLUS high resolution spectrometer aims to identify the location of the water "snowline" in protoplanetary disks. Both instruments will provide unique data sets for a broad range of scientific topics including galaxy mass assembly, origin of supermassive blackholes, infrared background radiation, molecular spectroscopy in the interstellar medium, transit spectroscopy for exoplanetary atmospheres, planetary atmospheres in the Solar system objects, and so on.
In this presentation, we will review the sciences of protoplanetary disks, planet formation, exoplanets, and the solar system which are expected to be realized with GREX-PLUS.

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