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Future Observations of Extra-solar Terrestrial Planets

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The Infrared Astronomical Satellite (IRAS, launched in 1983) opened a new era of infrared astronomy. IRAS conducted the first all-sky survey in the mid- and far-infrared wavelength, and detected 250,000 sources, including very young stars, as well as circumstellar disks around normal stars. The infrared astronomical community in Japan launched a small infrared survey mission, the Infrared Telescope in Space (IRTS) in 1995, and now promotes the ASTRO-F (Infrared Imaging Surveyor) project, which has much better sensitivity and spatial resolution than those of IRAS. ASTRO-F/IRIS is scheduled to be launched in February 2006, and is expected to detect millions of sources, which also contains tremendous samples of proto-planetary systems. Our step-by-step approach toward observations of extra-solar terrestrial planets is going into a next stage of the big projects. The SPICA mission is a future Japanese infrared astronomical satellite to explore the universe with a cooled, large telescope, which is proposed to be put into a halo orbit around S-E L2; one of the Sun-Earth Lagrangian liberation points. The target launch year is 2010-2012. The high spatial resolution and excellent sensitivities of SPICA at the thermal infrared regions are very important for observational studies on extra-solar planetary systems. JTPF project, which is a counterpart of TPF mission, is aimed to make imaging observations of extra-solar terrestrial planets at short infrared regions. We are going to present the current status of the missions in Japan and their observational plans.