

SPICA (Space Infrared Telescope for Cosmology & Astrophysics): a mission optimized for mid- and far-infrared astronomy

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We present a conceptual design of the infrared astronomical mission SPICA, which is a unique mission with a cooled, large telescope.

We propose to cool a 3.5 m class telescope down to 4.5 K by combination of moderate-size mechanical cryogenic coolers with the help of effective radiative cooling. In other words, the SPICA will not carry huge amount liquid Helium, and thereby we can reduce the total weight dramatically. We plan to use the Japanese H-IIA launching vehicle, which can put this class of mission into a halo orbit around one of the Sun-Earth Lagrangian libration points (L2), where radiative cooling becomes very effective.

The cooled, large telescope makes the SPICA mission optimum for high-resolution mid- to far-infrared observations with unprecedented sensitivity. We propose to cover the wavelength range of 5 - 200 μm with two focal plane instruments.

Since the telescope of the SPICA is cooled to 4.5 K, the SPICA mission is complementary with FIRST, which focuses longer wavelength region with a warmer telescope.

The target launch year of SPICA is 2010.