AKARI (ASTRO-F): Flight performance and preliminary results

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The ASTRO-F was successfully launched on February 21, 2006 (UT), and was named AKARI. AKARI is the first Japanese satellite mission dedicated for large area surveys in the infrared wavelength region. The telescope has 69 cm aperture, and is cooled down to 6 K with super-fluid helium and mechanical coolers. The expected cryogen life is 550 days. AKARI will make the most advanced all-sky survey in the mid- and far-infrared wavelength region since the Infrared Astronomical Satellite (IRAS). The survey will be made in six wavebands and will include the first all-sky point source survey at 140 and 160 micron. The AKARI all-sky survey is expected to detect more than a half million galaxies tracing the large-scale structure of the Universe out to the redshift of unity, detecting rare, exotic extraordinarily luminous objects at high redshifts, numerous brown dwarfs, Vega-like stars, protostars, and will reveal the large-scale structure of nearby galactic star forming regions. The products planned are a bright point source catalog at the earliest stage, two or more faint source catalogues at later stage, as well as maps of extended sources. Those products are expected to be a fundamental database for the next generation of advanced observatories, for example Herschel, and JWST, and will complement the Spitzer Space Telescope by virtue of its wide sky coverage. In addition to the all-sky survey, deep imaging and spectroscopic surveys with pointed observations will also be carried out in 13 wavelength bands from 2 to 160 micron. By using this mode, two large area surveys are planned; the Large Magellanic Cloud (LMC) survey and the North Ecliptic Pole (NEP) survey. The LMC survey will cover 15 square degrees at 5 bands (3, 9, 11, 15, and 24 micron). The NEP survey consists of two sub-surveys; "NEP-Deep" and "NEP-Wide". The "NEP-Deep" will cover 0.5 square degree circular area with highest sensitivity, while "NEP-Wide" covers 6.2 square degrees circular area with modest sensitivity. We aim to perform both surveys with uniform depth for all 9 imaging bands covering 2-24ČÊm wavelengths. We also have plans various observation programs covering topics from the solar system to cosmology.