

AKARI's view of interstellar matter in galaxies

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We review recent observational results on the interstellar matter in galaxies obtained by the Japanese infrared astronomical satellite AKARI.

AKARI was launched in February 2006 and started observations in May of the same year. AKARI has a 68.5 cm cooled telescope together with two focal plane instruments, which have imaging and spectroscopic capability in the wavelength range 2-180 μm . One of the most important missions of AKARI was to make an all-sky survey in six bands in the mid- and far-infrared, and AKARI also made extensive observations of specific targets in pointed modes. After liquid helium ran out in August 2007, AKARI has been making observations in the near-infrared with mechanical cryocoolers.

AKARI made systematic observations of near-by galaxies. Wide spectral coverage of AKARI enables us to deconvolve dust thermal emission in the far-infrared into two components: warm dust, which traces recent star-formation activity, and cold dust, which traces general interstellar dust. The distribution of hot dust component shows wide variety among observed galaxies, reflecting the difference of recent star-formation activity and distribution of heating sources.

Another important aspect of AKARI observations is its capability of sensitive spectroscopic observations in the near- and mid-infrared. Especially toward heavily obscured galaxies (e.g. most of ultra luminous infrared galaxies), AKARI detected absorption features due to various types of molecules. Observed absorption features show huge variety, reflecting the difference of physical conditions of interstellar matter in various types of galaxies.

Some galaxies show wide CO absorption features around 4.6 μm , which indicates the presence of hot (500-1000 K) molecular gas in these galaxies. These hot clouds could be heated by X-ray radiation from the central activity of the galaxies.

References

- [1] H. Murakami, et al., 2007, PASJ, 59, S369.
- [2] H. Kaneda, et al. 2007, PASJ, 59, S463
- [3] T. Suzuki, et al. 2007, PASJ, 59, S473