

# Properties of Interstellar PAHs in the Milky Way and in Nearby Galaxies

I. Sakon,<sup>1</sup> T. Onaka,<sup>1</sup> H. Kaneda,<sup>2</sup> Y. Okada,<sup>2</sup> and T. Nakagawa<sup>2</sup>

<sup>1</sup>*Department of Astronomy, Graduate School of Science, University of Tokyo,  
7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033 Japan*

<sup>2</sup>*Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency,  
3-1-1 Yoshinodai Sagami-hara, Kanagawa 229-8510, Country*

The ubiquitous infrared (UIR) bands are a family of emission bands that have been observed ubiquitously in various astrophysical environments including planetary nebulae, reflection nebulae, HII regions (see [1] for a review), general interstellar medium and cirrus clouds (e.g., [2], [3], [4]) not just in our Galaxy but also in external galaxies (e.g., [5], [6]). It is widely accepted that the carriers of these bands contain polycyclic aromatic hydrocarbons (PAHs; [7]) or PAH-like molecular groups (i.e. QCCs; [8]). Indeed, [9] has recently reported that the observed UIR spectra are closely reproduced by a mixture of theoretically calculated infrared spectra of PAHs with different size distribution, charge state and the precise chemical composition of the contributing molecules. However, it still remains uncertain how we could interpret the observed variations in the spectra of UIR bands and how we could understand the evolution of interstellar PAHs. For this purpose, close collaboration among the laboratory experiments as well as the theoretical calculations on the infrared spectra of PAH related materials and the observations of UIR spectra in various environments are indispensable.

AKARI, the Japanese Infrared Satellite, has been playing an important role in this field presenting a number of near- to mid-infrared spectra of ISM in our Galaxy and in nearby galaxies. In this presentation I will introduce some of AKARI's latest observational results and their impacts on the studies of interstellar PAHs.

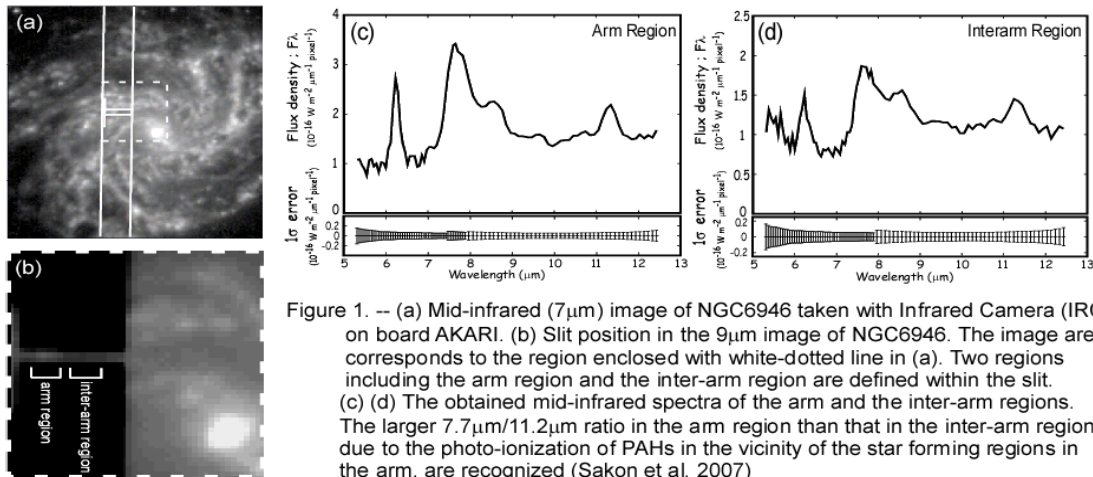


Figure 1. -- (a) Mid-infrared (7 $\mu$ m) image of NGC6946 taken with Infrared Camera (IRC) on board AKARI. (b) Slit position in the 9 $\mu$ m image of NGC6946. The image area corresponds to the region enclosed with white-dotted line in (a). Two regions including the arm region and the inter-arm region are defined within the slit. (c) (d) The obtained mid-infrared spectra of the arm and the inter-arm regions. The larger 7.7 $\mu$ m/11.2 $\mu$ m ratio in the arm region than that in the inter-arm region, due to the photo-ionization of PAHs in the vicinity of the star forming regions in the arm, are recognized (Sakon et al. 2007)

## References

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