[구GC-01] Difference in the spatial distribution between H_2O and CO_2 ices in M 82 found with AKARI

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Interstellar ices (e.g., H_2O, CO_2, and CO ices) are formed on the surface of dust grains in dense molecular clouds. In a near-infrared spectrum, we can observe deep absorption features particularly due to H2O ice at 3.05 ㎛ and CO_2 ice at 4.27 ㎛. These interstellar ices have many pieces of information on the interstellar environment. Among various ices, CO_2 ice is one of the most important ones as a probe of the interstellar environment. That is because CO_2 ice is a secondary product unlike H_2O and CO ices which are primarily formed on dust grains. Past studies for CO_2 ice in nearby galaxies were performed only for the galactic center in a few galaxies. In order to utilize the information from CO_2 ice effectively, it is valuable to perform mapping observations of ices on a galactic scale.

With AKARI, we obtain the spatially-resolved near-infrared (2.5-5.0㎛) spectra for the central ~1 kpc region of the nearby starburst galaxy M 82. These spectra clearly show the absorption features due to interstellar H_2O and CO_2 ices, and we created their column density maps. As a result, we find that the spatial distribution of H_2O ice is significantly different from that of CO2 ice; H_2O ice is widely distributed, while CO_2 ice is concentrated near the galactic center. Our result for the first time reveals spatial variations in CO_2/ H_2O ice abundance ratio on a galactic scale, suggesting that the ice-forming interstellar environment changes within a galaxy. In this presentation, we discuss the cause of the variations in the ice abundance ratio.

[구GC-02] Star formation and TDGs in the debris of interacting systems.

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Star formation beyond the galaxy discs and the principles governing it have attracted a lot of recent attention and the advent of ultraviolet (UV) and mid-infrared (MIR) telescopes like the GALEX and Spitzer have enabled major advances in such studies. In order to study the HI gas properties such as the morphology, kinematics and column density distributions, and their correlation with the star forming zones, especially in the tidal bridges, tails and debris, we carried out an HI survey of a set of Spitzer-observed interacting systems using the Giant Metrewave Radio Telescope (GMRT). Here we present results from three of these systems, Arp86, Arp181 and Arp202. In Arp86, we detect excellent star-gas correlation in the star forming tidal bridges and tails. In Arp181, we find the two interacting galaxies to be highly gas depleted and the entire gas of the system is found in the form of a massive tidal debris about 70 kpc from the main galaxies. In all three cases, Arp86, Arp181 and Arp202, the tidal debris seem to host ongoing star formation. We also detect three new candidate tidal dwarf galaxies (TDG) in these systems with large quantities of gas associated with them.