Understanding the evolution of galaxies in HCG92 (Stephan's Quintet) based on AKARI, Spitzer and Herschel observations

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Galaxy evolution plays a major role in the evolution of the Universe. Observations have shown that interactions with nearby galaxies have a great impact on the star-formation and nuclear activities of an individual galaxy. It is therefore important to understand the effects of interactions for the study of galaxy evolution.

Hickson Compact Groups (HCGs) provides a good collection of targets for studying interacting galaxies. The number densities of HCGs are as compact as the center of a cluster of galaxies, and 43% of HCG galaxies show tidal structures such as bridges or tails.

HCG92 (Stephan's Quintet) is the best studied compact group of galaxies and numerous observations at various wavelengths have been carried out. However, the physical properties of the interstellar dust have yet to be explored. In this work, we combined AKARI, Spitzer and Herschel data to derive their NIR to MIR spectra and fit their SED with dust models in a wide infrared range to study the properties of dust in the member galaxies.

In the HCG92c central region, there is no clear detection of the Unidentified InfraRed (UIR) feature, but the 9.7μm silicate absorption band and red continuum are observed, indicating the existance of the AGN. On the other hand, we detected a weak sign of star-formation in the outskirts of HCG92c. We also analyzed a tidal dwarf galaxy candidate ISOCAM SOURCE-B (SQ-B) and detected UIR band emission, but the derived dust temperate is low ($\sim$18K) and no other clear evidence for the star-forming activity is found at SQ-B.

In this presentation, we will discuss the impact of the interaction on the galaxy evolution based on the infrared observations of HCG92.