

# Properties of dust and PAHs in early-type galaxies

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Early-type galaxies (ETGs) are known to possess much smaller amounts of dust and polycyclic aromatic hydrocarbons (PAHs) than late-type galaxies, because the interstellar environments in ETGs are hostile against survival of dust (i.e., X-ray plasma) while low-mass old stars cannot efficiently supply dust into the interstellar space. Yet recent mid- and far-infrared (IR) observations, including Spitzer, AKARI, and Herschel, have shown that some ETGs contain a considerable amount of dust and PAHs, while their supply channels are not fully understood.

With the AKARI mid- and far-IR all-sky surveys, we performed a systematic study of dust and PAHs in ETGs in order to reveal their origins. From AKARI, 2MASS, and WISE data, we derived near- to far-IR spectral energy distributions for each sample ETG and fitted them by a model to estimate their dust mass, dust temperature, and PAH luminosity. We also obtained near-IR spectra for some of our ETG sample with AKARI, which show SiO/CO absorption features likely related to the photospheric component of low-mass O-rich stars. Based on the above results, we discuss the properties and possible origins of dust and PAHs in ETGs.