

ASCA OBSERVATIONS OF LUMINOUS INFRARED STARBURST GALAXIES

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We present recent results of X-ray observations of two luminous infrared galaxies, NGC3690+IC694 (Arp299) and NGC1614 obtained by the Japanese X-ray astronomical satellite *ASCA*. Both galaxies have quite high infrared luminosity ($> 10^{11} L_{\odot}$) and strong evidence of merger.

NGC3690+IC694(Arp299): The 0.5-10 keV spectrum of Arp299 is quite similar to that of the typical starburst galaxy, M82. Emission lines from heavy elements (e.g. Mg, Si, S etc.) are clearly seen in the spectrum, which means the existence of a thermal hot plasma in this galaxy. We tried spectral fitting with a three component model, which consists of the 2 kT Raymond-Smith (RS) component with variable abundance plus an hard component. Derived temperatures of the soft- and mid-components are similar to those of M82, and an apparently lower abundance of Fe than other elements in this galaxy is typical of what is seen in starburst galaxies. Although the X-ray luminosity of Arp299 is an order of magnitude higher than nearby starburst galaxies, the X-ray to far-infrared luminosity ratio ($L_X/L_{\text{FIR}} \sim 10^{-4}$) is similar to typical values of starbursts. The hard-component which shows very high temperature (> 10 keV) is also seen in the spectra of both M82 and NGC253. These observational characteristics imply that Arp299 would be a typical starburst galaxy, and the huge far-infrared luminosity could be explained only by the starburst phenomenon.

NGC1614: Since photon statistics are limited, only a one-component model was used for spectral fitting, and both a power-law model and a 1kT RS model are acceptable for this galaxy. However, the X-ray luminosity and the derived L_X/L_{FIR} are almost comparable with those of Arp299, and thus, we conclude that NGC1614 would also be a pure starburst galaxy.