Chandra Observation of Diffuse Gas and LMXBs in the Elliptical Galaxy NGC 4649 (M60)

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Abstract

We present *Chandra* observations of discrete sources and diffuse emission in the X-ray bright elliptical NGC 4649. We find 165 X-ray sources, most of which are LMXBs associated with NCG 4649. We compare the source locations to *Hubble* Space Telescope (HST) observations of a region to the northwest of the galactic center and find that roughly 45% of the X-ray sources are identified with globular clusters. We will also present findings on the luminosity function, variability, and X-ray colors of the discrete sources, as well as a spectral analysis of the sources, the diffuse emission, and the total emission. If the diffuse gas is due to stellar mass loss, one expects the abundances of the diffuse emission to match that of the stars, augmented by ejecta from Type Ia supernovae. Previous work shows that the abundances in the hot gas are lower than would be expected following this argument. There are several possible explanations for this discrepancy. We present findings on the emission mechanisms, based on spectra, and abundance gradients of the diffuse emission in the context of distinguishing amongst these competing theories. We also investigate the relationship between the cool gas and the hotter gas by evaluating the possible spatial correlation of dust lanes and optical emission line filaments with enhanced X-ray emission. NGC 4649 has a nearby companion galaxy, the Sab galaxy NGC 4647. We place upper limits on the X-ray emission from this galaxy and on the Type Ia supernova SN1979a it contains.

CATEGORY: NORMAL GALAXIES