The "effervescent" spiral galaxy NGC 2403

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Abstract

We have detected diffuse soft X-ray emission (0.5 to 1 keV) from the disk of the spiral galaxy NGC 2403 with Chandra. This diffuse emission (with a total luminosity of $\sim 10^{38}$ erg s^{-1} and a temperature of 2-8 $\times$ 10^6 K) is well separated from the numerous bright point sources. NGC 2403 is a luminous spiral with a high rate of star formation and it represents one of the few cases of disk galaxies with diffuse X-ray emission known to-date. Recent HI observations have revealed a disk full of HI holes and the presence of an extended HI halo with high velocity gas and a significant inflow towards the central regions of the galaxy. H_α line spectroscopy has indicated huge outflows of ionized gas. All these new results and the present detection of a diffuse, hot X-ray emitting gas component, point at a very active disk-halo connection and to galactic fountain types of phenomena. This emerging picture of NGC 2403 as an "effervescent" spiral galaxy is likely to become a prototype for the entire class of late-type spirals with active star formation.

CATEGORY: NORMAL GALAXIES