

## Gas Dynamics of NGC 4472

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Abstract - We present preliminary results from a 100 ks XMM-Newton observation of the hot gas in the nearby massive early-type galaxy NGC 4472. This galaxy is the central member of a group of galaxies that is believed to be falling into the Virgo cluster. We find several structures in the gas indicative of a previous epoch of nuclear activity and of a complex interaction with the ICM of the Virgo cluster. First, we detect two pairs of cool filaments that extend 25 kpc to the east and southwest of the nucleus. One of these filaments was detected in an earlier Chandra observation and is known to have a sharp, well-defined interface with the ambient medium. These filaments are likely the remnants of cold gas that has been entrained by buoyant radio bubbles from a previous epoch of nuclear activity. Second, we detect complex temperature structure of the central few kpc of the gas. We find a region of cooler gas to the southeast of the nucleus, in the opposite direction to the infall of NGC 4472 into the Virgo cluster. This cannot be the direct result of ram pressure stripping by the Virgo cluster gas as the gas density of NGC 4472 is far too large. More likely it is the result of subsonic gas motions in the core induced by the merger. This result is supported by the detection of multiple surface brightness discontinuities in the gas in the short Chandra observation. Finally, we present radial abundance profiles for the elements of O, Si, S, and Fe and discuss their implications.

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