

Title: Chandra Observation of the Mixed-Morphology Supernova Remnant W28

Author Name: Jonathan W. Keohane

Co-Authors: Rho, J. (SSC/Caltech); Borkowski, K. (NCSU)

Abstract:

We present a Chandra observation of the archetypical mixed-morphology supernova remnant (SNR) W28. The observation was performed in the ACIS-S mode (4 ACIS-S and 2 ACIS-I chips) on board the Chandra X-ray Observatory for 89 ks. W28 has a diameter of 50 arcmin and our observation covered the central and southwestern parts of the remnant. While previous ASCA/ROSAT studies of W28 showed that the plasma conditions are different from other mixed-morphology SNRs, with spectral variations seen across the remnant, these Chandra data make this less clear by revealing hard point-like X-ray emission. This source is located on the I0 chip, 20' southwest of the center and on the SNR shell. The spectrum of this hard emission is well modeled by a power law, suggesting non-thermal emission. We will discuss possible physical explanations, such as an associated synchrotron nebula or an unrelated source. In the center of the SNR lies a bright X-ray region of a few arcmin in diameter, surrounded by fainter diffuse emission with filamentary structures. No strong spectral variations are found in the central region within one ACIS chip field of view. We will discuss the high resolution X-ray image of W28 in comparison to the optical emission, and possible X-ray mechanisms for this center-filled X-ray emission and implications for other mixed-morphology SNRs.