

Observations of the Crab Nebula with the Chandra X-ray Observatory

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Abstract: The Crab Nebula and its pulsar has been the subject of a number of detailed observations with the Chandra X-ray Observatory. The superb angular resolution of Chandra's high-resolution telescope has made possible numerous remarkable results. We describe a number of specific studies of the Crab that I and my colleagues have undertaken. We discuss the geometry of the system, which indicates that the "inner X-ray ring", typically identified with the termination shock of the pulsar's particle wind, is most likely not in the equatorial plane of the pulsar. Other topics are the northern wisps and their evolution with time; the characterization of features in the jet to the southeast; pulse-phase spectroscopy and possible correlations with the features at other wavelengths, particularly the optical polarization; and a search for correlations of the X-ray flux with the recently-discovered gamma -ray flares.