Detection of X-ray emission from Supernova Remnant G16.7+0.1

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Abstract

We present the first X-ray observation of the faint Galactic composite supernova remnant G16.7+0.1, obtained with the *XMM-Newton Observatory*. G16.7+0.1 was discoved during a systematic program to map small-diameter remnants with the VLA and contains the faintest known radio-selected synchrotron nebula. In the X-rays, we have discovered significant extended X-ray emission whose morphology is consistent with a pulsar wind nebula (PWN) and supernova remnant shell suggested at radio wavelengths. The PWN is detected with an XMM EPIC-MOS camera count rate of 0.045 cps, which, depending on spectral model, implies a luminosity $L_x \sim 4 \times 10^{33}$ (D/5 kpc)^2 erg s^{-1}, slightly larger than the Vela synchrotron nebula for a distance of 5 kpc. The X-ray to radio core flux ratio is then $\sim$ 10, intermediate between X-ray luminous synchrotron components such as those in the 50 ms LMC pulsar and Kes 75 (as well as the Crab), and the X-ray faint nebulae such as 3C58. This evidence strongly suggests an undiscovered pulsar; we report on our X-ray and current deep radio searches for the putative pulsar powering the PWN.

CATEGORY: SUPERNOVAE, SUPERNOVA REMNANTS AND ISOLATED NEUTRON STARS