Chandra Science Highlight

G21.5-0.9: A Supernova Remnant about 25,000 light years from Earth

Chandra X-ray Observatory ACIS image.

This image shows the remnant of a supernova explosion. A central bright cloud of high-energy electrons is surrounded by a distinctive shell of hot gas. The shell is due to a shock wave generated as material ejected by the supernova plows into interstellar matter.

- Although many supernovae leave behind bright shells, others, such as the Crab Nebula, do not.
- G21.5-0.9 long considered to be a supernova remnant without a shell until 150 hours of archival Chandra data were combined to reveal the shell.
- The absence of a detectable shell around this and similar supernova remnants had led some astronomers to speculate that another, weaker type of explosion had occurred. This hypothesis now seems unlikely, and it is probable that every supernova produces a strong shock wave.
- The faintness of some supernova shells is most likely due to the explosion occurring in a low density region, which could have existed before the star was formed, or mass loss from the pre-supernova star could have created a low-density cavity around the star.

(Credit: NASA/CXC/U.Manitoba/H. Matheson & S. Safi-Harb)