

# **Constraints on Neutron Star Cooling using Chandra Observations of PSR B1509-58 and PSR B1951+32**

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The cooling of young neutron stars is poorly understood because of our lack of knowledge on the physics of matter at ultrahigh densities. Temperature measurements for neutron stars of different ages thus provide strong constraints on models for structure of their interiors. We have used high-time resolution Chandra HRC observations of PSR B1509-58 ( $P=150$  ms) and PSR B1951+32 ( $P=39$  ms) to measure their off-pulse emission and obtain upper limits on their surface temperatures. The high spatial resolution of Chandra allows us to separate the pulsars from their surrounding nebulae. PSR B1509-58 shows significant off-pulse emission similar to the Crab pulsar and possibly indicates the presence of unpulsed nonthermal emission. We compare our temperature limits to other pulsars and use them to provide constraints on neutron star cooling models.