Cyclotron Colloquium on Friday, April 18, 2014, at 11:00 am in Room 300

Refreshments will be served at 10:45 am

Title:

The neutron star in Cassiopeia A and what it is telling us?

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Abstract:

The neutron star in Cassiopeia A (Cas A) is now 333 years old and is the youngest known star from which thermal emission for over a decade has been observed. Initial reports from the analysis of archival data indicated Cas A's surface temperature to be about two million degrees, but that it has declined by about 4% over ten years. The high surface temperature and the unusually large rate of its decrease were attributed (simultaneously by two independent groups) to neutron superfluidy and proton superconductivity in the core of Cas A. These quantum phenomena set in when the temperature drops below some critical value, which causes copious emission of neutrions which cools the star. The possibility of degradation of detectors aboard the Chandra observatory and associated modifications in calibrations have been recently addressed by independent groups analyzing data from all detectors on Chandra. Varying levels of drop in the surface temperature, from about 3% to none at all have been reported. In this talk, the import of these observations on the thermal evolution of Cas A will be discussed. The need for continual observations of Cas A with Chandra, as long it is able to, will be stressed.