For this ILT, I will take the Crab Nebula SNR, high-energy observations of which have came a long way since it was detected as X-ray source in 1963 by a proportional counter onboard the U.S. Naval Research Laboratory *Aerobee* rocket (Drake 1996). With more than 5,000 references in SIMBAD, the earliest two-dimensional X-Ray image of the nebula appears to originate from 1979 observations of *Einstein Observatory* (*HEAO-2*) which is the first fully imaging X-ray telescope put into space – refer to figure 1. *HEAO-2*'s *High Resolution Imager* operated at ~2" resolution and 0.15-3.0 keV range.

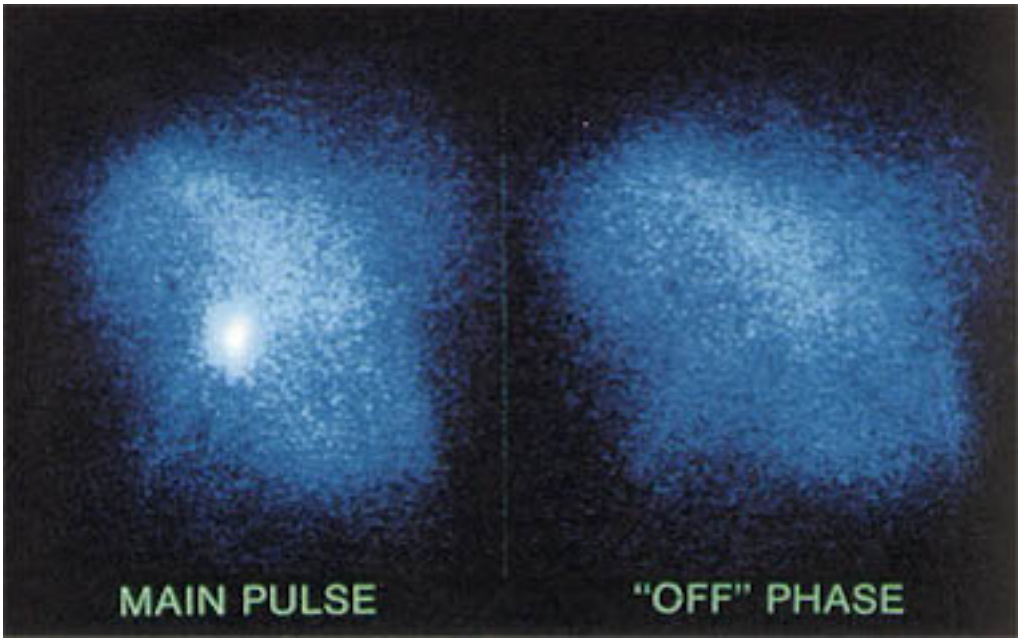

FIG. 1 – Stroboscopic view of the Crab Nebula pulsar from *Einstein*, Smithsonian Institution Photo No. 80-16234.

Germany's *ROSAT* is very similar to *Einstein* with its HRI also providing ~2" resolution – see figure 2, six years observations of which revealed significant variations in X-ray emissions (Greiveldinger & Aschenbach 1999) in the nebula.

As of the breakthrough in resolution in Crab observations, refer to the composite image, with X-ray component coming from *Chandra* observatory, shown on figure 3. *Chandra's HRC* instrument features ~0.5" resolution and 0.1-10 keV range. It enabled to see more intricate structures inside the nebula and even identify a separate category of so called pulsar wind nebulae (PWNe) with cometary or bow shock morphologies, as well as develop evolutionary models of such objects (Gaensler & Slane 2006). Chandra was the first to reveal the inner ring structure within the X-ray torus of the Crab (Weisskopf et al. 2000). For a complete Crab nebula overview, consider Hester (2008).

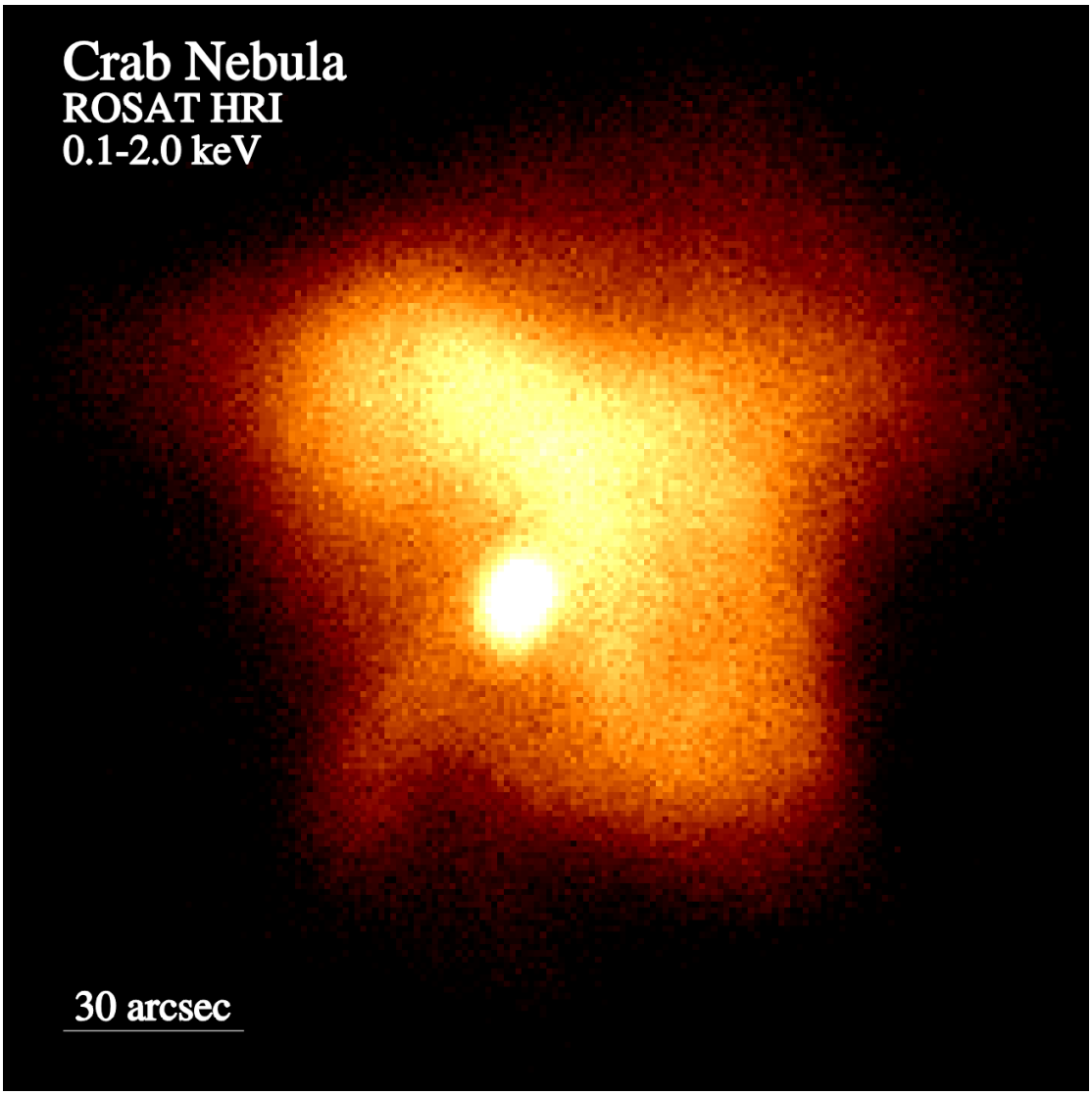

FIG. 2 – Crab Nebula from *ROSAT*.

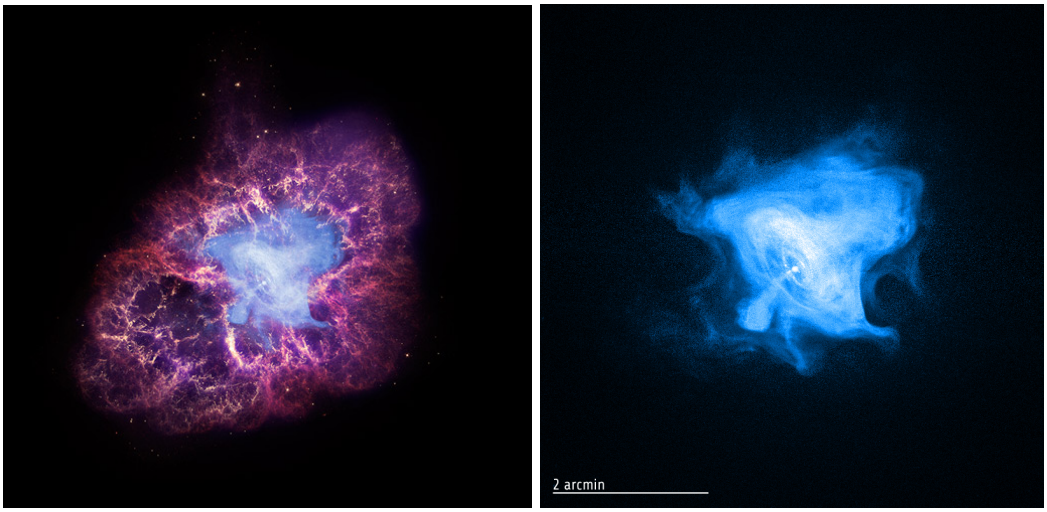

FIG. 3 – Crab Nebula. Left: Combined view, X-ray: NASA/CXC/SAO/F.Seward; Optical: NASA/ESA/ASU/J.Hester & A.Loll; Infrared: NASA/JPL-Caltech/Univ. Minn./R.Gehrz (Seward 2006). Right: X-ray view only.

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