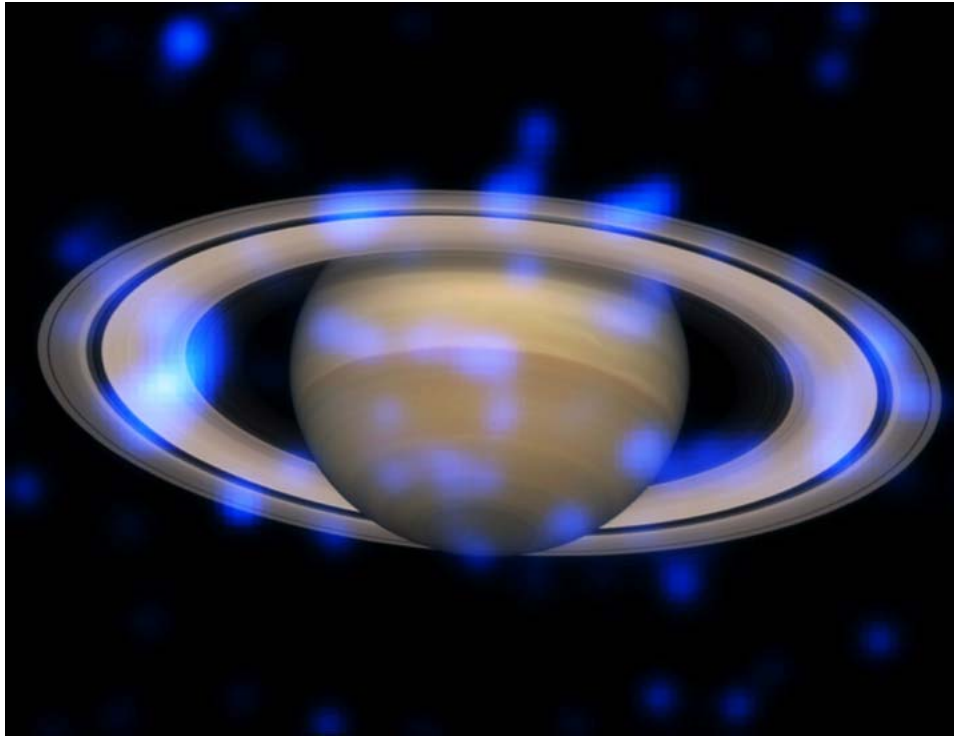




Chandra Science Highlight

Saturn's Rings Sparkle with X-rays



Chandra X-ray Observatory ACIS spectra

Chandra images reveal that the rings of Saturn sparkle in X-rays (blue dots in this X-ray/optical composite). The likely source for this radiation is the fluorescence caused by solar X-rays striking oxygen

atoms in the water molecules that comprise most of the icy rings.

(Credit: X-ray: NASA/MSFC/CXC/A.Bhardwaj et al.;

Optical: NASA/ESA/STScI/AURA)

Reference: A. Bhardwaj et al. *The Astrophysical Journal*, 627:L73, 2005 July 1

- Using the Advanced CCD Imaging Spectrometer (ACIS), the Chandra X-ray Observatory observed the Saturnian system for one rotation of the planet (37 ks) on 2004 January 20 and again on January 26-27.
- The X-ray spectrum from the rings is dominated by emission in a narrow (130 eV wide) energy band centered on the atomic oxygen K fluorescence line at 0.53 keV.
- The X-rays in the ring mostly come from the B ring (the bright white inner ring in the optical image). There is some evidence for a concentration of X-rays on the morning side (left side, also called the East ansa) of the rings. One explanation for higher X-ray brightness on the morning side is that the additional X-rays are associated with optical features called spokes. These features are due to transient clouds of fine ice-dust particles that are lifted off the ring surface - possibly by meteoroid impacts on the rings - and typically last an hour or so before disappearing.