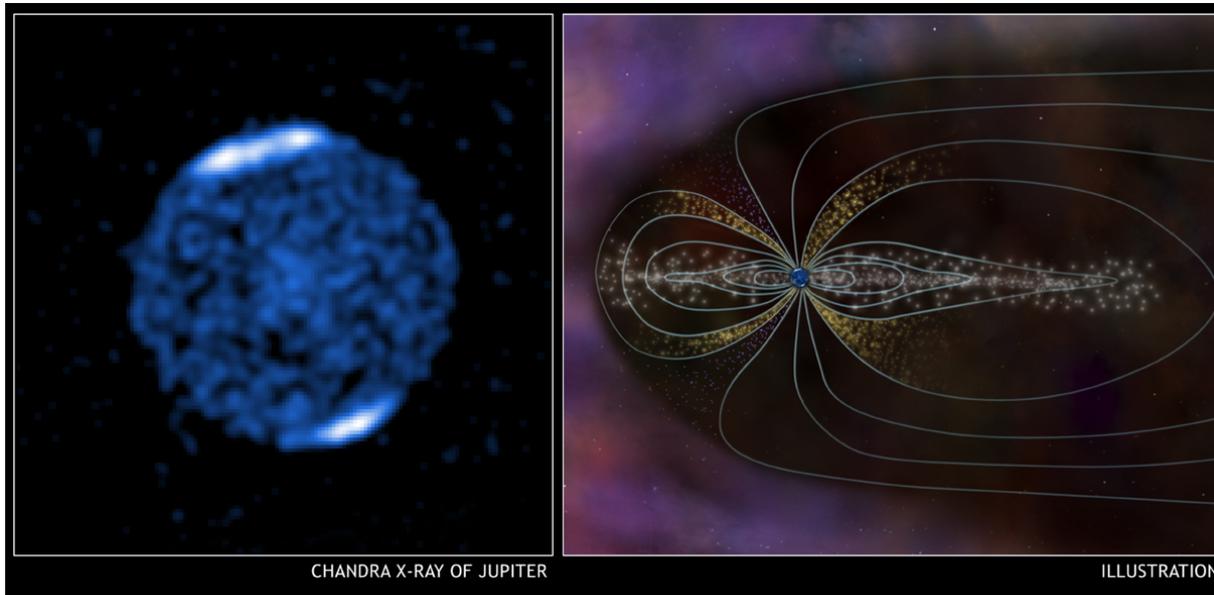




Chandra Science Highlight

Chandra Probes High-Voltage Auroras on Jupiter



CHANDRA X-RAY OF JUPITER

ILLUSTRATION

Scale: About 1.3 arcmin per side

Jupiter shows intense X-ray emission associated with auroras in its polar regions (Chandra image on left). Extended monitoring by Chandra showed that the auroral X-rays are caused by highly charged ions colliding with atoms in the atmosphere above Jupiter's poles (illustration on right).

(Credit: X-ray: NASA/CXC/MSFC/R.Elsner et al.
Illustration: CXC/M.Weiss)

- Chandra observations show that the auroral X-ray spectra consist of line emission consistent with high-charge states of ions of oxygen and other elements.
- The charge state distribution of the oxygen ions (O VII and O VIII) implied by the measured auroral X-ray spectra strongly suggests that the ions have undergone additional acceleration to energies of about 16 million electron volts.
- Combined X-ray ultraviolet observations favor a scenario wherein ions originate from deep within the magnetosphere, are transported out near the boundary and are then accelerated along field lines into the polar cap.

Reference: R. Elsner, et al. 2005. J. Geophys. Res. 110, A01207