Planetary x-ray auroras

R. Gladstone

Southwest Research Institute, San Antonio, TX 78228-0510, USA (rgladstone@swri.edu / Phone: 210-522-3581)

X-rays have been observed from many solar system objects (i.e., Venus, Earth & Moon, Mars, Jupiter & several Galilean satellites, Saturn & its rings, lots of comets, and the heliopause). However, only Jupiter and Earth are currently known to emit auroral x-rays (although there is a hint of such emission from Saturn). X-ray auroras on Earth are primarily bremsstrahlung emissions produced by precipitating electrons and have been studied extensively at higher energies from spacecraft (e.g., Polar/PIXIE). Recent observations of Earth's x-ray aurora by Chandra provide a much higher resolution look at the lower energy portion of this bremsstrahlung. X-ray auroras on Jupiter are produced by the precipitation of energetic O and S ions from a source region just inside the magnetopause (rather than from just outside the Io Plasma Torus, as was originally believed). Recent work suggests that precipitating electron bremsstrahlung also contributes to Jupiter's x-ray aurora at higher ($>$2 keV) energies. This talk will review the recent observations of soft x-ray auroras on Earth and Jupiter.