BOSTON UNIVERSITY

Space Physics Seminar
Thursday, February 4, 2016

What can X-rays tell us about the Jovian Magnetosphere? Results from a recent Hisaki/Chandra campaign to study the Jovian Aurora and Io Plasma Torus

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3:15 pm
Refreshments
CAS Room 500

3:45 pm
Seminar
CAS Room 502

Abstract:

Jupiter was detected as a bright X-ray source by the Einstein observatory (mid-80s), but the nature of the emission was unknown until the launch of the Chandra X-ray Observatory. Early observations with Chandra demonstrated that there were at least two distinct components to this emission. The majority of the X-ray flux originated at or near the magnetic poles, with the remainder co-incident with the Jovian disk. The magnetic field lines at the auroral X-ray spots map to the outer magnetosphere, suggesting that this emission is related to an interaction of the Solar wind with the Jovian magnetosphere. Spectral and energetic arguments suggest that this emission is due to charge-exchange emission from highly ionized species accelerated by electric fields aligned with the magnetic field. Whether these ions originate from the IPT or from the Solar wind is still an open question.

In 2014 we conducted a 2 week observing campagn of Jupiter using the Hisaki EUV spectrometer, Chandra, and XMM-Newton. The goal of this campaign was to compare variations in the electron auroral emissions and the IPT seen with Hisaki with the ion aurora seen with Chandra and XMM-Newton to better understand energy and matter transport through the Jovian magnetosphere and determine the origin of the ions responsible for the auroral X-ray emission. In this presentation, I will summarize previous X-ray observations of the Jovian aurora, describe our joint observing campaign with Hisaki/Chandra and present results, outline our future plans to observe Jupiter with Hisaki and Chandra in conjunction with Juno, and illustrate the scientific potential for an X-ray instrument on a future Jovian mission.

Next Week

- TBD

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