BOSTON UNIVERSITY

Boston University College of Arts & Sciences Center for Space Physics

2022—2023 SPACE PHYSICS SEMINAR SERIES

Jupiter's auroras, magnetosphere-ionosphere coupling and magnetospheric dynamics from HST and Juno

The Juno mission, and associated Earth-based observations, have presented an unprecedented opportunity to reveal the processes occurring in Jupiter's magnetosphere. I will present simultaneous Juno and Hubble Space Telescope of Jupiter's far-ultraviolet auroras obtained as part of a programme of observations covering 3 years of Juno's Extended Mission. I will show that the intensity of Jupiter's dawnside main auroral emission is strongly correlated with the simultaneous radial current as observed by Juno, and also that bright, expanded dusk-side southern main emission is associated with large-scale convection dynamics, dusk-side main emission arcs are associated with field-aligned currents, and equatorward diffuse emission and patches are associated with plasma injections in the middle magnetosphere occurring within intervals of enhanced plasma density, ongoing interchange motion and magnetospheric convection. These results shed light on the relation between the main auroral emission and magnetosphere-ionosphere coupling currents, and radial force balance in the magnetosphere. I will also briefly show the results of an analysis of the large-scale azimuthal fields at intermediate ~10 RJ radial distances. I will show that the mean fields are consistent with distributed downward polar currents ~23 MA that close via upward currents in the middle magnetosphere region, and that fields at given colatitude are strongly modulated at the planetary period. This is proposed to be due to the offset between spin and magnetic poles.

Thursday, Februrary 16th

4:00-5:00 p.m.

CAS 502

Jon Nichols

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