



Michigan **Engineering**
Atmospheric,
Oceanic and
Space Sciences

The Ralph B. Baldwin Award in Astronomy, Astrophysics and Space Science Lecture



Friday, September 14, 2007
3:30 – 4:30 p.m.
Room 2246, Auditorium
Space Research Building

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Examining the High-Latitude Thermosphere and Ionosphere Using a Global Model

ABSTRACT:

The thermosphere and ionosphere are two overlapping regions of the atmosphere that are tightly coupled in many ways, including chemistry, momentum transference, and heating due to velocity differences. To examine the coupling between thermosphere and ionosphere, the new developed 3-Dimensional Global Ionosphere-Thermosphere Model (GITM) is used to explore responses to magnetospheric and solar forcing in the coupled thermosphere-ionosphere system. First, the impact of solar activity and geomagnetic activity on the neutral wind has been thoroughly quantified. Secondly, we have examined the effect of the vertical ion convection on the electron density at high-latitudes, which has been ignored in most situations. Then, the thermosphere-ionosphere coupling is studied by quantifying the effects of oscillating electric fields on the Joule heating, the primary driver of global ionospheric storms. Finally, the non-hydrostatic effect on the thermosphere has been examined for the first time.

Reception immediately following.