

## Special P/SS Department Colloquium

### Formation of Ionospheric Storm-Enhanced Density during Geomagnetic Storms

Friday, February 28, 2014

OPS 140

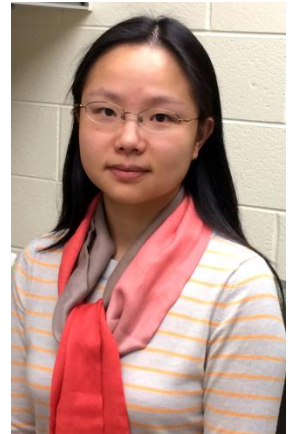
4:00 – 5:00 pm

Meet and Greet

OPS 140

3:00 – 4:00 pm

Dr. Shasha Zou  
University of Michigan



The Earth's ionosphere often exhibits significant density variations, which affect the propagation of radio signals that pass through or are reflected by the ionosphere. An important societal impact of these ionospheric modulations is the loss of phase lock and range errors in the Global Navigation Satellite Systems (GNSS) signals. Because our modern society increasingly relies on ground-to-ground and ground-to-space communications and navigation, understanding the sources of the ionospheric density variation and monitoring its dynamics during space weather events is of great practical importance. Storm-enhanced density (SED), seen in the mid-latitude and subauroral region, is one of the most prominent ionospheric density structures emerging during geomagnetic storms. It provides seed plasma population for tongue-of-ionization events and polar cap patches in the high-latitude ionosphere, and thus is of great significance to the global plasma circulation within the ionosphere and the magnetosphere. However, the formation mechanism of the high plasma density within SED remains poorly understood. In this presentation, I will discuss how the recent advances in observational techniques, such as the use of advanced modular incoherent scatter radar and Global Positioning Satellite, and the development of numerical modeling capability enable us to identify the formation mechanism of SEDs in particular and to better understand ionospheric structure and dynamics in response to geomagnetic disturbances in general.