BOSTON UNIVERSITY

Boston University College of Arts & Sciences
Center for Space Physics

2019—2020 SPACE PHYSICS SEMINAR SERIES

Quantifying Radiation Belt Electron Precipitation and Its Effect on Atmosphere

High-energy particles precipitating into the atmosphere from space could change the chemistry and composition of Earth's atmosphere. While the atmospheric impacts from auroral electrons, solar protons and galactic cosmic rays are well studied, the effects of electrons from the near-Earth Van Allen radiation belt remain uncertain. In this work, we study the radiation belt electron precipitation to quantify the loss of trapped particles in the magnetosphere and to understand their impact to the atmosphere. We combine measurements from Van Allen Probes near the equator and FIREBIRD-II CubeSat at low-Earth orbit, to estimate the spatial and temporal variations of the electron precipitation flux and energy spectrum. Then we use global climate models (NCAR-WACCM) to simulate the middle and upper atmosphere with radiation belt electron inputs. The ultimate goal is to quantify the contribution of energetic electron precipitation to the production of reactive odd nitrogen (NOx) in the stratosphere and mesosphere and its resulting impact on ozone (O3).

Thursday, February 13th

3:30-4:30 p.m.

725 Commonwealth Ave | Room 502

Chia-Lin Huang

University of New Hampshire