BOSTON UNIVERSITY

Boston University College of Arts & Sciences Center for Space Physics

2021-2022 SPACE PHYSICS SEMINAR SERIES

Global Magnetohydrodynamics Modeling of Solar Wind and Coronal Mass Ejections: Testing Theories, Improving Forecasts, and Application to Solar Analogs

The broad topic of space weather represents the constantly changing physical conditions in the near-Earth environment, which is significantly influenced by the solar wind, coronal mass ejections (CMEs), and Solar Energetic Particles (SEPs). Due to their critical importance to space weather prediction, significant efforts have been made in developing physics-based solar wind and CME/SEP models. In the first part of this talk, I will present our recent efforts of high-fidelity solar eruption modeling from the Sun to Earth, which illustrates the new capability for space weather forecast. I will also emphasize how the unique information provided by the advanced modeling, when combined with observations, could facilitate our understanding of fundamental processes in space and astrophysics. In the second part of this talk, I will discuss how the knowledge about our own star could help for exploration of exo-solar systems and habitable worlds in the

universe. Especially, how the limited stellar observation (comparing with the solar case) can be used to constrain the wind and CME parameters. Finally, I would like to discuss the path forward with the upcoming cutting-edge observations on ground (e.g., DKIST) and in space (e.g., Parker Solar Probe, Solar Orbiter, JWST, MUSE), as well as newly emerged machine learning techniques to facilitate both solar and stellar discoveries.



Monday, February 28th

4:00-5:00 p.m. 725 Commonwealth Ave | Room 502 Meng Jin SETI Institute & LMSA Lab