BOSTON UNIVERSITY

Boston University College of Arts & Sciences
Center for Space Physics

2020—2021 SPACE PHYSICS SEMINAR SERIES

Wide-field UV imaging of Earth's dynamic exosphere by NASA's GLIDE mission

One of the most significant gaps in our knowledge of Earth's near-space environment concerns its outermost neutral atmosphere, a region known as the exosphere. The exosphere plays a critical role in mediating Earth's response to solar forcing and in permanent atmospheric evolution through the gravitational escape of its constituent hydrogen atoms. Reliable characterization of its spatial structure and temporal variability is notoriously difficult, owing mainly to the challenges of global and routine sensing over its vast extent, which ranges from ~500 kilometers above Earth's surface to more than 150,000 km, about halfway to lunar orbit. I will begin my talk with a brief overview of the successes and limitations of the many space-based attempts to investigate the exosphere to date – on platforms ranging from large NASA missions to Cubesats, from vantages spanning low earth orbit to deep space, and using various sensing techniques, including direct mass spectrometry, ultraviolet spectroscopy, and optical tomography. I will end by introducing a new mission that is ideally suited for exospheric sensing: GLIDE (Global Lyman-alpha Imager of the Dynamic Exosphere). GLIDE was recently selected for development as a NASA Solar Terrestrial Probes Science Mission of Opportunity, which will be deployed to the Earth-Sun L1 Lagrangian equilibrium point via rideshare with the IMAP launch in 2025. From this distant vantage, GLIDE will obtain wide-field, high-resolution, and high-cadence images of ultraviolet exospheric emission and significantly advance our understanding of the nature and origin of exospheric structure and variability.

Thursday, March 11th

4:00-5:00 p.m.

See website for Zoom information

Lara Waldrop

University of Illinois in Urbana-Champaign