BOSTON UNIVERSITY

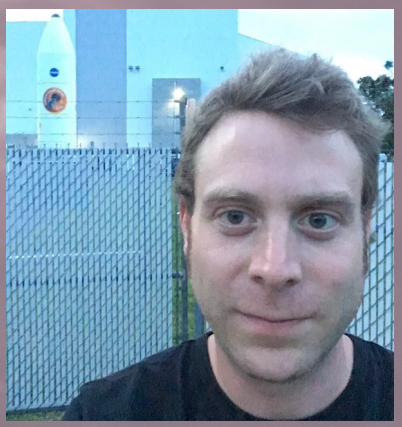
Boston University College of Arts & Sciences Center for Space Physics

2021—2022 SPACE PHYSICS SEMINAR SERIES

In-situ Observations of Collisionless Dissipation in Astrophysical Plasmas

The heating of the solar atmosphere and acceleration of the solar wind are preeminent problems with broad implications for a range of astrophysical systems. It is evident that dissipation of magnetized turbulence is likely responsible for heating in many astrophysical systems; however, these plasmas are often collisionless such that relatively complex couplings between electromagnetic fields and particles at kinetic scales are required for heating to occur. Fundamentally, these kinetic interactions give rise to the macroscopic heating and energy transfer that create the large-scale structure of the heliosphere, solar system, and other astrophysical bodies. While a number of candidate mechanisms for kinetic-scale turbulent dissipation have been proposed, in-situ observations of solar system plasmas has yet to concretely distinguish specific dynamics that govern these interactions.

NASA's Parker Solar Probe (PSP) mission, launched in 2018, provides in situ measurements of the solar atmosphere needed to finally resolve collisionless dissipation of plasma turbulence in the solar corona. Through integrating a range of measurements from multiple instruments, the mission has begun to shed light on a number of outstanding problems surrounding energy transport and plasma heating. Here we will discuss canonical nonlinear turbulence in magnetized plasma and its connection to signatures of kinetic scale dissipation observed by PSP.



Thursday, February 24th

4:00-5:00 p.m.

725 Commonwealth Ave | Room 502

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