

# New Horizons in Solar Wind Turbulence



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Meet and Greet	Colloquium
OPS Room 144	OPS Room 140
3:15 - 3:45 pm	4:00 - 5:00 pm

Refreshments will be provided

The solar wind is a turbulent radial outflow of plasma that originates in the hot solar corona and pervades interplanetary space. The NASA Solar Probe Plus (SPP) and the European Space Agency (ESA) Solar Orbiter (SO) missions, scheduled to launch between 2017 and 2018, will explore the inner heliosphere during the following decade, providing unprecedented remote-sensing and in-situ observations of the solar wind in the near-Sun region. These historic missions will revolutionize our understanding of two of the most important and longstanding problems in heliospheric physics: 1) What are the physical mechanisms that heat the solar corona above one million degrees Kelvin?, hundreds of times hotter than the solar surface; and 2) How is the solar wind accelerated to the observed speeds of up to 800 km/s?. As it orbits around the Sun, the SPP spacecraft will gradually reach closer to the Sun coming to within 9 solar radii from the solar surface (at closest approach), which is at least 7 times closer than any other spacecraft has ever reached. I will present an overview of the state-of-the-art in the understanding of solar wind turbulence from theory, numerical simulations and existing spacecraft observations. In particular, I will discuss the most recent advances in Magnetohydrodynamics (MHD) turbulence and how they relate to the observed spectra of velocity and magnetic field fluctuations in the solar wind. I will finalize this talk by presenting my most recent work aimed at predicting the nature of the turbulence that SPP and SO will encounter and discuss currently open questions, future challenges and research opportunities ahead of the SPP and SO missions.