BOSTON UNIVERSITY

# Boston University College of Arts & Sciences
# Institute for Astrophysical Research

## 2019—2020 ASTROPHYSICS SEMINAR SERIES

## Probing the heliospheric interface with low energy cosmic rays

The Sun and its system of planets are immersed in a giant gaseous bubble called the heliosphere. The solar wind and its embedded turbulent magnetic field represent an obstacle for galactic cosmic rays passing through the heliosphere thus preventing many of them from reaching Earth. Voyager 1 and 2 discoveries made past the turn of the century have revealed that the region beyond the termination shock, known as the heliosheath, features enhanced magnetic field barriers and is very effective at deflecting a significant fraction (as much as 50%, for energies below a few hundred MeV) of incoming cosmic-ray particles. Because of their high mobility, cosmic rays' fluxes and anisotropies carry an imprint of the medium they have traveled through prior to detection by a spacecraft that allows us to use these particles as probes of heliospheric regions far away from the Voyager trajectories. Since the Voyager 1 first encounter with the termination shock we have learned much about the topology of magnetic fields in the heliosheath, at the heliopause (the magnetic boundary of the solar system) and beyond, inside a warm partially ionized hydrogen cloud that represents our local galactic environment. I will review the most interesting science results related to cosmic ray observations by the Voyagers and discuss their possible interpretations with theory and computer models.

**Monday, March 2nd**

3:30 - 4:30 p.m.

725 Commonwealth Ave | Room 502

**Vladimir Florinski**

University of Alabama-Huntsville