



**ASTROPHYSICS
SEMINAR SERIES**

**"Properties of the Interstellar Medium Surrounding the
Sun and Nearby Stars"**

**Seth Redfield
Wesleyan University**

**Monday, September 16, 2013
Refreshments at 3:15pm in CAS 500
Talk begins at 3:30pm in CAS 502**

Abstract:

The Sun and nearby stars are surrounded by warm, partially ionized gas called the local interstellar medium (LISM). These low column density (e.g., $N(\text{HI}) \sim 10^{18} \text{ cm}^{-2}$) interstellar clouds are detectable only through high resolution optical and ultraviolet spectroscopy. Only recently have we been able to acquire enough lines of sight (i.e., hundreds) through these LISM clouds to reconstruct reasonable morphological and kinematic models of these structures. Indeed, the LISM provides an excellent opportunity to acquire accurate measurements of fundamental physical properties (e.g., temperature, turbulent velocity, dust depletion, ionization structure, small-scale structure) of the interstellar medium and observe it in three dimensions. I will present recent observations of the LISM taken with the highest resolution optical and UV spectrographs on the ground and in space, and present the latest results of our global model of the morphological and physical properties of the LISM. I hope to conclude with a discussion of how the LISM interacts directly with the stars (and planetary systems) it surrounds. The LISM dictates the structure of the heliosphere and astrospheres which in turn modulates the cosmic ray flux seen by planetary atmospheres. As more than 50% of confirmed exoplanets are within the same volume as the LISM, a comprehensive understanding of the properties of the LISM will be important as we explore questions of habitability and how exoplanetary atmospheres evolve.