SEMINAR NOTICE

Department of Physics and Engineering Physics
University of Saskatchewan

SPEAKER: Dr. Gareth Perry, Candidate for Faculty Position
Assistant Professor, Center for Solar-Terrestrial Research
Department of Physics, New Jersey Institute of Technology

TOPIC: Remote Sensing the Magnetosphere-Ionosphere-Thermosphere System Using High Frequency Radio Waves

DATE: **Thursday**, March 6, 2025

TIME: 3:30-4:30 p.m.

PLACE: Rm. **103**, Physics Building

ABSTRACT: Remote sensing of the terrestrial magnetosphere-ionosphere-thermosphere (M-I-T) system using radio waves has been integral to the development of our understanding of the solar-terrestrial system, including the discovery of the ionosphere. However, studying the ionosphere with radio techniques, such as radar, presents numerous challenges. These challenges stem, in part, from the inherent complexity of the medium—the ionosphere, a weakly coupled plasma—and the pervasive presence of irregularities, which arise from the nature of the ionospheric plasma and the effects of space weather and the dynamic M-I-T system of which it is a part.

This presentation will focus on two remote sensing techniques operating in the High Frequency (HF; 3–30 MHz) portion of the radio spectrum. The first technique utilizes transmissions from amateur radio enthusiasts, commonly known as "hams," while the second involves the Super Dual Auroral Radar Network (SuperDARN), of which the University of Saskatchewan is a pioneering member. A general outline of both techniques will be presented, and their ability to provide complementary and compelling insights into the dynamics of various aspects of the M-I-T system will be discussed. Additionally, this presentation will outline the results of scientific studies guided by three science questions: how does space weather affect radio linkages vital to our society; how are space weather processes connected to ionospheric irregularities at high latitudes; and how accurate are remote sensing techniques of the high-latitude ionosphere, and how can they be improved? The presentation will conclude with a brief description of SuperDARN's future contributions to addressing these questions.

Coffee and Donuts will be served in the Physics lounge at 2:45 pm. for those attending the seminar.