

SEMINAR NOTICE

*Department of Physics and Engineering Physics
University of Saskatchewan*

SPEAKER: Dr. R.G. Gillies, Department of Physics and Astronomy,
U of Calgary, PUPSS

TOPIC: *Characterizing the Ionosphere using High Frequency Radio Waves.*

DATE: Tuesday March 19th, 2024

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

PLACE: *Physics 103*

Abstract:

In our technology driven world, the impacts of 'space weather' are becoming more relevant to our day-to-day lives. Space weather, which describes the varying conditions between the Sun and the near-Earth space environment, can significantly affect both space and ground-based infrastructure necessitating an in-depth understanding to mitigate its impact. One aspect of technology affected by space weather, and specifically the behaviour of the ionized layer around the Earth called the ionosphere, is the usability of Over-The-Horizon Radars (OTHR). These radars use High Frequencies (HF) to reflect signals from the ionosphere and the ground to enable communication over thousands of kilometers. Radio waves propagating in the ionosphere experience refraction and may also be significantly absorbed depending on the plasma density in the lower ionosphere below ~90-100 km called the D-region. One instrument used to monitor and study the absorption of radio waves is a riometer. The University of Calgary is currently deploying new advanced multi-frequency riometers to various sites across Canada. Using these multi-frequency riometers to monitor known transmitter links provides information about radio wave propagation and the local ionosphere. Further, the examination of absorption measured by different wave frequencies provides insight into both HF propagation conditions and plasma theory. Overall, these new riometer instruments will provide a useful tool for diagnosing HF radio links over Canada and aiding in ionospheric and magnetospheric science.

Coffee and treats will be available in the physics lounge at 3:00pm for those attending the seminar.