

SEMINAR NOTICE

*Department of Physics and Engineering Physics
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SPEAKER: Dr. Devin Huyghebaert
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TOPIC: *Investigating E-and D-Region Ionosphere Phenomena
Using Incoherent Scatter Radar Systems*

DATE: Tuesday January 17th, 2023

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

PLACE: *Physics 103*

Abstract:

This presentation will provide an overview of the space physics group at UiT The Arctic University of Norway in Tromsø and will describe one of the main instruments the group uses to study near Earth space phenomena - the incoherent scatter radar (ISR). ISRs have a transmit power on the order of 1 MW and are able to measure the thermal fluctuations of ionospheric plasma hundreds of km away. The signal scattered from the plasma provides details about the plasma, such as the plasma density, the electron temperature, the ion temperature, and the ion velocity. In addition to measuring plasma characteristics, ISRs can also measure meteors as they ablate in the terrestrial atmosphere and can measure neutral turbulence at the top of the mesosphere at high latitudes - where the measurements are classified as polar mesospheric echoes (PME). The focus of this presentation is on these lower thermosphere measurement capabilities of ISRs, where some recent work with E-region plasma measurements, meteor head echo tracking, and PMEs will be described and discussed.

The ISRs in the Fennoscandia region and on Svalbard are operated by the European Incoherent Scatter Scientific Association (EISCAT). EISCAT is currently in a period of transition, moving from traditional large aperture radar dishes to phased array style architectures. A new multistatic phased array incoherent scatter radar system developed by EISCAT is known as EISCAT_3D and first light operations are planned to commence this summer.