



Department of Physics and Astronomy Presents

Prairie Universities Physics Seminar Series

Study of Aurora Borealis with the SuperDARN radars



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Thursday March 30th, 2017
1:40 pm, Room C640, U Hall

Lecture Abstract:

The aurora borealis is a regular phenomenon in the sky of the Canadian Arctic. It is caused by energetic electrons and protons precipitating into the upper atmosphere from near-Earth space. The aurora is only one process amongst a myriad of others occurring when the solar wind, with an embedded magnetic field, interacts with the Earth's magnetic dipole. Although direct measurements in space are needed to quantify the physics of these processes, observations with numerous ground-based instruments have been, and will continue to be, an important source of scientific knowledge about the aurora and connections between the Sun and Earth.

Over the last four decades, significant contributions to aurora studies have been made by coherent auroral radars operating at HF and VHF frequencies, which range from tens to hundreds of megahertz. One of the most successful radar experiments is the Super Dual Auroral Radar Network (SuperDARN), currently involving scientists from ten nations. The University of Saskatchewan's space science group has been part of the SuperDARN effort since its beginning in the early 1990s.

In my presentation, I will first tell a story of how military radars used for tracking airplanes evolved into instruments useful for studying the aurora borealis. I will then review our current understanding of the processes occurring in near-Earth space with an emphasis on plasma circulation in the ionosphere and beyond, an area where SuperDARN contributions are most important. Finally, I will show some recent results illustrating the advantage of the SuperDARN radars in monitoring and quantifying space weather.

EVERYONE IS WELCOME