

# SEMINAR NOTICE

*Department of Physics and Engineering Physics  
University of Saskatchewan*

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**SPEAKER:** Dr. Eric Donovan  
Department of Physics & Astronomy, University of Calgary

**TOPIC:** *Building a Magnetosphere, One Particle at a Time*

**DATE:** October 26, 2021

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

Join Zoom Meeting:

<https://usask-ca.zoom.us/j/96818469630?pwd=aGpiVUtleEJmZzBqc1Z2S042eGpiQT09>

Join by Telephone:

Local Saskatoon Dial-in Number: (639) 638-7474

Other Zoom Dial-in Numbers: <https://usask-ca.zoom.us/j/96818469630>

Join by Video Conferencing Device (SIP):

[96818469630@zoomerc.com](mailto:96818469630@zoomerc.com)

Meeting ID: 968 1846 9630

Passcode: 07412447

Telephone Passcode: 07412447

## Abstract:

Magnetosphere's exist throughout the cosmos. They are regions where a planetary or stellar magnetic field has carved a cavity out of a stellar or interstellar wind. In these plasma environments, physical processes accelerate charged particles, drive large-scale electric currents, force magnetic reconnection, and create plasma waves with scales ranging from kinetic to global. Earth's magnetosphere gives us a chance to study cosmic processes up close, in many ways the only environment where we can observe processes like reconnection with in situ observations. An important tool for understanding our and other magnetospheres is simulation. In this talk, I will explore how we can use a particularly simple 'test particle' simulation approach to explain some of the key properties of a magnetosphere. Simulating trajectories, one particle at a time, allows us to 'create' what we know as the plasmasphere, the ring current, and understand how particles are trapped on closed trajectories that can last decades (there is still Sr-90 in the inner magnetosphere, remnants of nuclear explosions set off high above the Earth by the US and Russia in the 1960s).