SEMINAR NOTICE

Department of Physics and Engineering Physics
University of Saskatchewan

SPEAKER: Jong Hern Mun, PhD Candidate

TOPIC*:* ***The Importance of Ion Temperature Profile in Collisional Sheath Modelling.***

DATE: Tuesday November 14th, 2023

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

PLACE: ***Physics 103***

Abstract:

Plasma discharges contains two distinct zones having different physical properties, the quasi-neutral bulk plasma and the sheath [1]. In particular, the sheath has a strong impact on the discharge since it is where the plasma interacts with the boundaries, thus crucial to understand the behaviour of different plasmas such as nanoparticle creation in sputtering magnetron discharge, also observed in the coldest region of tokamaks.

In this context a new numerical model for low-temperature plasma discharges including the sheaths is currently under development. Although kinetic models and Particle-In-Cell methods are often preferred for their fidelity, they are limited by numerical resource constraints. Fluid approaches are limited by the model accuracy, but are faster and still capable of giving insights of the main physical phenomenon. In this work, we focus on 1D medium to high pressure (10 - 100Pa) direct-current argon discharges. The results are compared with PIC simulation outputs. Our results emphasize for the first time the importance of the ion temperature profile when their collisionality in the sheaths is not negligible.