SEMINAR NOTICE

Department of Physics and Engineering Physics
University of Saskatchewan

SPEAKER: Tanner Polischuk PhD Candidate
Department of Physics & Engineering Physics

TOPIC*:* ***Measuring the Neutron Polarization from Photo-disintegrated deuterium.***

DATE: Tuesday March 28, 2023

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

PLACE: ***Physics 103***

Abstract:

The deuteron is central to the study of nuclear physics as it is the simplest nuclear system consisting of a bound proton and neutron. Utilizing a photon to dissociate the nucleons is considered the cleanest way to probe this system, as the photon is well understood and does not add an additional nucleon to the interaction.
The theories of the nucleon-nucleon interaction contain many parameters that have been fit to known nuclear quantities and available scattering data. As such, for a wide range of observables, theory and experiment show very good agreement. However a notable exception to this is the projection of an ejected neutron's spin from the photodisintegration of deuterium.
This talk will focus on an experiment designed to measure the neutron polarization at 3 lab angles by means of a scattering asymmetry. Included is a description of the detectors, the hardware, the accelerator facility, and a simulated model in Geant4. Some analysis and results are shown for both simulated data and some data from recent commissioning tests.
This forthcoming measurement of the neutron polarization aims to rectify the disagreement between experiment and theory and allow for a better parameterization of the N-N interaction.