Lakehead UNIVERSITY | Department of Physics

The Department of Physics invites you to attend a thesis defense by:

AVNER FITTERMAN

entitled

"Theory and Production of Hyperpolarized Xenon Gas for Lung and Brain Magnetic Resonance Imaging"

Supervisor: Dr. Mitchell Albert

ABSTRACT:

Conventional magnetic resonance imaging (MRI) modality is based on the magnetization that is formed by the influence of a strong polarizing magnetic field on the spin of protons, typically those of water molecules within the body. In Hyperpolarized (HP) gas MRI, a dramatic increase in spin polarization is achieved using spin-exchange optical pumping (SEOP), which allows images to be obtained with a high signal-to-noise ratio (SNR). Batch-mode custom-built polarizers can serve to produce the HP gas, however, such custom-built systems require optimization in terms of pressure and temperature parameters. This study is comprised of three objectives: i) Gaining understanding regarding the physics of the nuclear polarization process of ^{129}Xe; ii) Examining experimentally the pressure and temperature dependences of the polarization, similarly to the way it was done in previous studies; iii) Exploiting this knowledge for the benefit of the optimization of the custom-built polarizer in our lab.

DATE: **THURSDAY, AUGUST 27th, 2015**

TIME: **12:00** noon

Room: **CB 4104**