

SEMINAR NOTICE

*Department of Physics and Engineering Physics
University of Saskatchewan*

SPEAKER: Dr. Gord Sarty
Department of Psychology

TOPIC: *MRI as an example of Quantum Engineering*

DATE: Tuesday January 24th, 2023

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

PLACE: *Physics 103*

Abstract:

The term quantum engineering generally focuses around the design of quantum computers, but MRI is an excellent example of quantum mechanics applied to engineering. It works by exciting proton spins in water molecules in a patient's body, spatially encoding them by phase according to systematic applications of RF pulses and magnetic field configurations. The engineering needed is both old and new. On one hand, an application of simple Ham radio technology is used to make the small MRI prototypes now in my lab. This direction will hopefully lead to a proliferation of MRIs to nearly every medical clinic situation around the world. On the other hand, the use of new quantum materials - which is definitely not Ham radio technology - promises MRI designs that are ever smaller, conceptually different in function and more sensitive. In this lecture, I will talk about both the small simple MRIs that I am building now and about the work we have been doing with diamonds as a quantum material to serve as very sensitive magnetometers for application to future MRI designs.