

SEMINAR NOTICE

*Department of Physics and Engineering Physics
University of Saskatchewan*

SPEAKER: Dr. Barbara Szpunar
Department of Physics & Engineering Physics

TOPIC: *Enhanced Accident Tolerant Nuclear Fuels and Small Modular Reactor for Saskatchewan.*

DATE: Tuesday September 20th

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

PLACE: *Physics 103*

Abstract:

We need clean energy! Nuclear reactors do not generate greenhouse gases but there are still safety issues. For example, nuclear fuel may melt because its thermal conductivity degrades with increasing temperature.

There are new efforts on developing enhanced accident tolerant nuclear fuel. We can make nuclear reactors safer by using alternative fuels.

In this seminar, we demonstrate that the large electronic thermal conductivity of metallic fuels: UN and ThN which do not decrease with temperature makes them possible candidates for a safer alternative nuclear fuel.

We confirm that while the electronic heat capacity coefficient (γ) is linearly dependent on the electron density of states at Fermi energy, such a simple relation could not be used to determine the electronic heat conductivity, which is high for ThN even though its γ is low.

We will discuss the small modular reactor BWRX-300, which was selected by SaskPower for Saskatchewan. In the present design, it uses conventional fuel, but enhancements are possible by using evolutionary enhanced accident nuclear fuel. We are well prepared at USASK to be part of such innovative research.