**UNIVERSITY OF NOTRE DAME**
**DEPARTMENT OF PHYSICS**

# NUCLEAR SEMINAR

Monday, January 29

## *Neutron star seismology: damping of oscillation modes via phase conversion*

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The standard picture for the composition of neutron stars assumes that they are composed of neutrons and protons, embedded in a gas of electrons and muons. Current observations of neutron star masses and radii are not yet fully convincing to rule out possibilities of exotic phases through phase transition, such as quark matter in their densest cores.

In this talk, I will discuss an interesting feature of neutron stars with a quark matter core: capability of damping density oscillations, arising from periodic conversion between nuclear matter and quark matter. I will show that this damping mechanism is powerful enough to saturate oscillatory modes e.g. r-modes at tiny amplitude, which is compatible with currently available observations of neutron star spin frequencies and temperatures that otherwise cannot be explained in the standard scenario of purely-hadronic matter.

**4 pm – 5 pm**

**Nuclear Science Laboratory**

**124 Nieuwland Science Hall**

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All interested persons are cordially invited to attend

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Refreshments will be served prior to the seminar in room 124