

UNIVERSITY OF NOTRE DAME
DEPARTMENT OF PHYSICS

NUCLEAR SEMINAR

Monday, April 30

Relativistic nuclear field theory: recent developments on the proton-neutron response and on finite temperature

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Recent developments of the relativistic nuclear field theory (RNFT) on the proton- neutron response and on the finite-temperature formalism will be presented. The general framework, which advances the the Quantum Hadrodynamics beyond the one- loop approximation, is formulated in terms of the general equation of motion method for two-fermion Green functions. This provides a direct link to ab initio theories and allows for a fair assessment of the accuracy of the approach.

RNFT connects consistently the high-energy scale of heavy mesons, the medium- energy range of the pion and the low-energy domain of nuclear medium polarization effects in a parameter-free way. It will be shown how mesons and phonons build up the in-medium nucleon-nucleon interaction in the spin-isospin transfer channels, in particular, how the phonon-exchange part takes care of the leading-order retardation effects. In this framework we explore the Gamow-Teller response of neutron-rich nuclei and the proton-neutron pair transfer in $N=Z$ nuclei. The latest developments are devoted to an extension of the formalism to finite temperature and to its numerical implementation for nuclear strength functions. The results on the evolution of the dipole strength with temperature, which were recently obtained in this framework for medium- heavy nuclei, will be discussed in detail.

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