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CFA LECTURES

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Toward a unified description of equilibrium and dynamics of neutron star matter

- Abstract -

Correlated basis function perturbation theory and the formalism of cluster expansions have been recently employed to obtain an effective interaction from a state-of-the-art model of the nuclear hamiltonian. The approach based on the effective interaction allows for a consistent description of both the nuclear matter ground state and nucleon-nucleon scattering in the nuclear medium, the understanding of which is a prerequisite for the study of transport properties. I will report the results of calculations of different properties of nuclear and neutron matter---including the equation of state, the shear viscosity and thermal conductivity coefficients, and the superfluid gap--carried out using the effective interaction.

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