



NUSTAR monthly Seminar

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<https://indico.gsi.de/event/19300/>

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Seminarroom theorie SB3 3.170a**

<https://gsi-fair.zoom.us/j/63654095436>

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Present status of shell-model calculations with microscopic effective interactions

The nuclear shell model (SM) is widely considered the basic theoretical tool for the microscopic description of nuclear structure properties. During 70 years from its introduction by Mayer and Jensen, it has been successfully applied for investigating a variety of phenomena, largely contributing to our understanding of nuclear structure.

Within the SM, the complex nuclear many-body problem is simplified by considering as active only a limited number of nucleons interacting in a reduced model space, and therefore effective SM Hamiltonians are needed to account for the neglected degrees of freedom.

While the SM has been used predominantly in a phenomenological context, large efforts have been made to develop microscopic effective interactions based on realistic interactions between nucleons.

In this seminar, I will give an overview of the derivation of the effective SM Hamiltonian within many-body perturbation theory, and then I will show results of some selected studies to show the merit as well as the limits of calculations using this approach. Particular attention will be focused on the impact of 3N forces on the structure properties of light and medium-mass nuclei within the SM.

Convener: M. Gorska-Ott
Secretary: R. Krause / D. Press
Organized by: T. Dickel