

SEMINÁŘ OTF ÚJF, ŘEŽ

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**Ab Initio Unified Approach to
Nuclear Structure and Reactions**

Abstrakt

In recent years, significant progress has been made in ab initio nuclear structure and reaction calculations based on input from QCD employing Hamiltonians constructed within chiral effective field theory. For many applications, these interactions are further processed by the similarity renormalization group (SRG) unitary transformations to facilitate convergence. One of the recently developed approaches is the No-Core Shell Model with Continuum (NCSMC), capable of describing both bound and scattering states in light nuclei simultaneously. I will present latest NCSMC calculations of bound states and resonances of exotic nuclei such as ^{11}Be and ^{11}N and highlight the role of chiral two- and three-nucleon interactions in the description of their structure. Further, I will present our results for the structure ^6Li and ^6He as well as for $d-^4\text{He}$ scattering and $^4\text{He}-n-n$ continuum states. Finally, I will discuss applications of the NCSMC to reactions important for astrophysics, such as $^3\text{He}(\alpha, \gamma)^6\text{Be}$ and $^3\text{H}(\alpha, \gamma)^7\text{Li}$ radiative capture.

**Seminář se koná v pátek 6. 5. 2016 v 10:30 hod.
v seminární místnosti OTF ÚJF v Řeži**

A. Cieplý/otf