INTERNSHIP PROPOSAL

(One page maximum)

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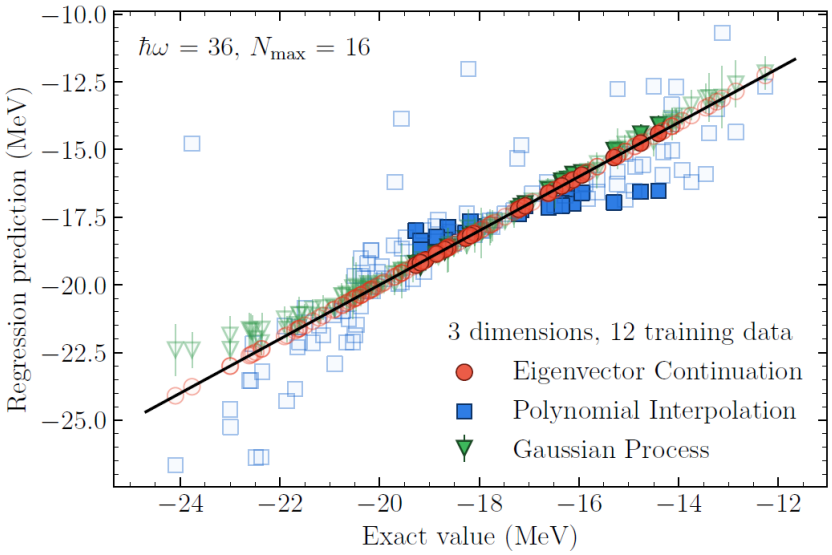
Thesis possibility after internship: NO
Funding: NO If YES, which type of funding:

Eigenvector Continuation in Nuclear *Ab Initio* Methods

Eigenvector Continuation (EC) is based on the idea of leveraging the information contained in a small number of known solutions (eigenvectors) of a system's Hamiltonian to predict the solutions in a broader parameter space. This approach is especially useful when dealing with systems where exact solutions are difficult or computationally expensive to obtain. In this project, we will apply EC to *ab initio* nuclear many-body calculations using the no-core shell model with continuum (NCSMC) approach, which aims to predict nuclear structure and reactions directly from fundamental forces and provide a unified treatment of a wide range of nuclear phenomena (bound and unbound states, scattering and reaction observables). EC can significantly reduce the computational cost by narrowing down the necessary subspace for solving the many-body Schrödinger equation. Additionally, EC provides an efficient framework for exploring the effects of varying parameters, thereby improving the accuracy of uncertainty estimates in nuclear theory predictions.



S. König et. al. Physics Letters B 810 (2020) 135814

Please, indicate which speciality(ies) seem(s) to be more adapted to the subject:

Condensed Matter Physics: ~~YES~~/NO Soft Matter and Biological Physics: ~~YES~~/NO
Quantum Physics: ~~YES~~/NO Theoretical Physics: YES/~~NO~~