

**Extreme Matter Institute EMMI
&
International Research Network for Exotic Femto Systems EFES**

First EMMI-EFES workshop on neutron-rich exotic nuclei EENEN 09

- Realistic effective nuclear forces for neutron-rich nuclei -

9 -11 February 2009, GSI Darmstadt

Japanese – German topical workshop

In a microscopic ab initio treatment of the low-energy nuclear many-body problem the degrees of freedom are the c.m.-positions of the baryons and their internal degrees of freedom, like spin, isospin or strangeness. The derivation of the forces among the baryons from the underlying QCD in the framework of chiral perturbation theory has become the most promising approach. But also potentials based on meson exchange and phenomenological potentials are still in use. Common to all realistic two-body potentials is their successful reproduction of the nucleon-nucleon scattering data including the $T=1$ neutron-neutron channel. These potentials together with suitable many-body approaches should therefore provide predictive power for exotic neutron-rich nuclei and help to set up reliable equations of state for neutron matter in the universe.

The workshop focuses on the transformation of realistic forces to realistic effective forces that retain the phase-shifts and deuteron properties ("realistic") but are adapted ("effective") to low-momentum many-body Hilbert spaces that cannot represent short-range correlations.

Unitary transformations like in the Unitary Correlation Operator Method (UCOM) or in the Similarity Renormalization Group (SRG) are not only appropriate for that but are also expected to help constraining density-matrix functionals of mean-field models when extrapolating to large isospin densities and low baryon densities.

This Japanese-German workshop should also investigate the possibility to establish further collaborations on the nuclear research objectives outlined above.

For further information and registration contact

Hans Feldmeier, h.feldmeier-at-gsi.de
Takaharu Otsuka, otsuka-at-phys.s.u-tokyo.ac.jp