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## Relativistic Brueckner-Hartree-Fock Theory: an ab initio Approach for Finite Nuclei

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Most investigations of collective vibrations in medium-heavy and heavy nuclei are based on nuclear density functional theory. Very successful relativistic and non-relativistic functionals are available nowadays. However, most of them are phenomenological functionals. Therefore it is important to study the connection of such functionals to ab-initio nucleon-nucleon forces. Non-relativistic Brueckner-Hartree-Fock theory was a starting point of ab-initio investigations in nuclear structure in the fifties and sixties. However, it failed because three-body forces were not included at that time. Later it was found that relativistic Brueckner-Hartree-Fock (RBHF) theory can reproduce the saturation properties of nuclear matter. In this contribution, we discuss recent developments of RBHF theory for infinite nuclear matter finite nuclei, particularly applications for neutron stars.

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