Relativistic density functional theory for nuclear structure and dynamics

Jie Meng

School of Physics, Peking University, Beijing 100871, China

The relativistic density functional theory (DFT) , implemented with self-consistency and taking into account various correlations by spontaneously broken symmetries, provides an excellent platform for the nuclear structure and dynamics. In this talk, the ideas and general formalism of the relativistic DFT will be introduced, together with new developed approaches and applications as well as future perspectives. Topics covered include the global nuclear mass table with continuum and deformation effects, the RElativistic Configuration-interaction Density functional theory (RECD) for novel nuclear rotations and neutrinoless double beta decay, the shell-model-like approach based on the relativistic DFT to treat exactly the pairing correlations, the time-dependent relativistic DFT for shape fluctuations in chiral rotation, the entanglement and cross-section in multinucleon transfer reaction, and quantum fluctuations and dissipative mechanism in nuclear fission.