独立行政法人理化学研究所　仁科加速器研究センター
第101回RIBF核物理セミナー
RIKEN Nishina Center for Accelerator Based Science
The 101st RIBF Nuclear Physics Seminar

# Nuclear Energy Density Functionals

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Among the microscopic approaches to the nuclear many-body problem, energy density functionals (EDF) provide the most complete and accurate description of ground states and collective excitations over the whole nuclide chart. The current generation of EDFs, with parameters adjusted to reproduce empirical properties of nuclear matter and bulk properties of finite nuclei, has been applied to studies of arbitrarily heavy nuclei, exotic nuclei far from $\beta$-stability, and systems at the nucleon drip-lines.
In addition to recent advances, future challenges for nuclear EDFs will be reviewed. Arguably the most important is a fully microscopic foundation based on the underlying theory of strong interactions. When considering applications, equally important is to develop EDF-based structure models that go beyond the static mean-field approximation. Detailed predictions of excitation spectra and transition rates necessitate the inclusion of correlations related to the restoration of broken symmetries and to fluctuations of collective variables.

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*The seminar will be given in English.*

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