東北大学　宇宙創成物理学国際共同大学院プログラム

GP-PU (Graduate Program on Physics for the Universe）Seminar

“Introduction and application of energy-density functional theory for atomic nuclei”

by Tomohiro Oishi (YITP, Kyoto University)

Time and Date: 16:00-18:00, February 21st, 2023

Venue: Room 745, Science Complex B (H-03)

Zoom Registration for online participants:

https://us02web.zoom.us/meeting/register/tZMvd-mhqzssHNFxSGMgZUVc07UajwGb4yrT

- Abstract

Atomic nucleus is the core of atom, and is the multi-fermion system of nucleons, namely protons and neutrons. Physical properties of nuclei are essential to understand the origin of matter, fundamental interactions in nature, as well as for practical applications including nuclear industry, engineering, quantum- information science, etc. Considering the role of nuclear physics, one manifest goal is to establish the universal model, which can fully describe the physical properties of all nuclides. Toward this goal, the nuclear energy-density functional (EDF) theory is one of the promising archetypes. For practical application of nuclear EDF theory, the self-consistent mean-field (MF) calculation has been utilized. In this seminar, I review the basic properties on EDF-MF calculations for atomic nuclei. Several topics in recent progress will be also introduced. I especially discuss the relativistic version of EDF theory, collective excitations, radioactivity, and nuclear-matter properties for neutron stars.

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