



国立研究開発法人理化学研究所 仁科加速器科学研究センター  
第329回 RIBF核物理セミナー  
RIKEN Nishina Center for Accelerator Based Science  
The 329th RIBF Nuclear Physics Seminar

## Clusters in Nuclear Matter and Heavy Nuclei

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Correlations are an essential feature in systems of strongly interacting nucleons. Often they are not considered explicitly in the widely-used mean-field models for nuclear matter and nuclei. Many-body correlations can be represented in such approaches effectively as new degrees of freedom, i.e., clusters. They modify the thermodynamic properties and composition of nuclear matter and are important for the equation of state in astrophysical applications, e.g., the structure of neutron stars or the simulation of core-collapse supernovae or neutron-star mergers. The formation of clusters at low densities can also affect the surface properties of heavy nuclei and can be investigated experimentally. In this talk, a description of nuclear matter and heavy nuclei using a generalized relativistic density functional is presented. An extension of the approach is discussed to include two-body correlations at supra-saturation densities in order to consider short-range correlations in an effective way.

**Nov. 21<sup>st</sup> (Tue), 2023 13:30 ~**  
**via Zoom Meeting**



\* The talk will be given in English language.

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