

Physics of RI: Recent progress and perspectives

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Introduction: The “Physics of RI: Recent Progress and Perspectives” conference¹⁾ was held from May 30 to June 1, 2022 at RIKEN RIBF, co-organized by RIKEN Nishina Center and Yukawa Institute for Theoretical Physics (YITP).

The conference adopted a hybrid format, combining in-person and Zoom participation, with approximately 40 in-person attendees, including 3 international participants, and approximately 50 online participants. The conference was held in coordination with the YITP’s long-term workshop “Mean-field and Cluster Dynamics in Nuclear Systems (MCD2022),” which focuses on the theoretical aspects of mean-field and cluster dynamics. The purpose of “Physics of RI” conference was to complement this with experimental aspects, presenting the latest experimental results obtained at the experimental facilities regarding unstable nuclei such as RIBF, along with related theoretical research, and discussing future research directions.

The conference focused on several main topics, including:

- (1) Comprehensive reports from experimental facilities including RIKEN RIBF
- (2) Fundamental properties of unstable nuclei, such as mass, lifetime, radius, and moment
- (3) Disappearance of magic numbers, shell evolution, and related gamma-ray spectroscopy experiments
- (4) Phenomena in the vicinity of drip lines and beyond, such as tetra-neutrons
- (5) Experimental and theoretical studies on cluster formation in nuclei
- (6) Experimental and theoretical studies on nuclear matter properties and EOS
- (7) Applications of nuclear technology, such as nuclear conversion
- (8) Advances in Ab-initio nuclear structure calculations

The conference resulted in several significant outcomes:

- The conference provided an opportunity for active in-person discussions, which had been limited due to the COVID-19 pandemic, fostering exchange between experimental and theoretical researchers.
- The conference provided a clear outlook on recent progress and future research directions, which holds great importance for future experimental and theoretical research at RIKEN.
- Young researchers were given opportunities for oral presentations, promoting their participation

and contribution to the field.

In conclusion, the “Physics of RI: Recent Progress and Perspectives” conference was a successful event that brought together researchers in the field of nuclear physics. The conference provided a platform for comprehensive discussions on various topics related to unstable nuclei, including experimental results, theoretical research, and future research directions. The exchange of ideas and discussions among researchers from different backgrounds facilitated the advancements in the field and promoted collaborations between experimental and theoretical researchers.

The organizers express their gratitude to RIKEN Nishina Center and its staff for their support in hosting the conference.

Reference

- 1) <https://indico2.riken.jp/event/4120/>.

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