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Search of neutron-rich superdeformer, superheavy K-isomer, superfast rotor, and chiral wobbler with RIBF and GRETINA

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Nuclear physics has entered a new phase of research with radioactive beams in the 21st century. The scope of the study is originally aimed at the dripline regions, but the study of neutron-rich and proton-rich systems, weakly-bound systems such as halo nuclei are currently the primary targets for the investigation. High-spin nuclear structure physics was developed thanks to the heavy ion collision and subsequent neutron-evapolation reactions. In the 1980s and 1990s', many new forms of exotic excited states were discovered such as superdeformation and magnetic rotation. However, it is still far from completion in understanding the structure of these high-spin states. For example, the decaying mechanism from super to normal deformed states is still unclear. Many of bandheads of discovered superdeformed bands are unidentified. With a combination of GRETINA and RIBF, we can enjoy a new opportunity to go for the study of new physics: high-spin states with radioactive beams. In my talk, I would like to discuss what kind of new high-spin physics can be investigated with this new fascilities, for example, neutron-rich superdeformation, superheavy K-isomers, ultra-fast high-spin states over $100\hbar$, and more exotics 3D rotating states such as wobbling and chiral rotation.