Neutron-rich nuclei and neutron matter investigated with radioactive beams

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The understanding of nuclear properties is fundamental for many areas of physics including in particular nuclear astrophysics. The advent of large-scale facilities producing beams of “exotic” short-lived nuclei has allowed to enter new regions of the nuclear chart and to investigate properties and reactions of nuclei with extreme neutron-to-proton ratios. The experimental determination of how nuclear properties evolve as a function of their nucleonic composition allows thereby stringent tests of modern nuclear theory, and provides the basis for the understanding of astrophysical processes. The experimentally most challenging frontier is to reach the most neutron-rich nuclei, both the light nuclei at and beyond the drip line, as well as neutron-rich heavy nuclei. The talk will select a few topics related to the physics at the neutron dripline and to the relation of properties of neutron-rich nuclei and neutron matter.