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# Nuclear structure of exotic neutron-rich nuclei with AGATA

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The European project AGATA is the result of a combined effort of many different countries and institutions to serve the future needs of the challenging experiments at new radioactive ion beam facilities. The new concept of the gamma-ray tracking spectrometer AGATA bases its excellences in being capable of identifying the gamma interaction points (pulse shape analysis) and via software in reconstructing the trajectories of the individual photons (gamma-ray tracking). This leads to abandon the Compton suppression concept and to build therefore an array where the full 4π solid angle is covered by germanium
detectors, thereby obtaining much larger photopeak efficiency and peak-to-totalratio.
AGATA in its first implementation (the AGATA Demonstrator) has been coupled to the large-acceptance magnetic spectrometer PRISMA from 2009 until the end of 2011 at the Laboratori Nazionali di Legnaro (LNL) in a experimental campaign aimed, mainly, at the study of the properties of neutron-rich nuclei populated via multinucleon transfer or deep inelastic reactions. The experiments spanned from the Si neutron-rich isotopes nearby the island of inversion up to the heavy shapetransitional neutron-rich osmium isotopes. For many exotic nuclei, lifetime measurements were possible by using the differential Recoil Distance Doppler Shift method developed for multinucleon-transfer reactions in combination with the AGATA and PRISMA spectrometers. In this presentation, some selected results on neutron-rich nuclei studied with the AGATA Demostrator at LNL together with fort-coming implementation at GSI and SPIRAL2 radioactive ion beam facilities will be discussed.

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