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NEXT - A new setup to study Neutron-rich Exotic, heavy, nuclei produced in multinucleon Transfer reactions

Thursday, 23 October 2025 09:20 (20 minutes)

The NEXT setup [1] has been designed and built to study Neutron-rich, heavy, EXotic nuclei produced in multinucleon Transfer reactions. NEXT is a new experiment at the PARTREC facility in Groningen which has been recently installed in a dedicated beamline at the AGOR cyclotron [2]. The AGOR cyclotron at PARTREC is capable to deliver highly intense heavy ion beam at energies well suited for multinucleon transfer reactions at and above the Coulomb barrier.
NEXT consists of a solenoid pre-separator. Within the field of a 3-tesla strong, superconducting solenoid magnet heavy transfer products are separated from their light counterparts [3] and focused towards a gas-catcher [4]. The ions are extracted through a radiofrequency carpet into a novel ring-ion guide and buncher [5] from where they are injected into a MultiReflection Time-of-Flight Mass Spectrometer [6] for precision mass measurement and sample preparation for background free mass spectrometry. Thus, even very long-lived, heavy transfer products can be identified and studied with NEXT.
Our contribution will provide an overview of the NEXT setup and a report on the first beam on target experiments performed in summer 2025.

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