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# The AGATA physics campaign at Legnaro National Laboratories

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In April 2022, AGATA, the European Ge-array at the forefront of gamma detection technology [1,2] was installed at LNL. Based on the new concept of gamma-ray tracking, it can identify the gamma interaction points (pulse shape analysis) and reconstruct via software the trajectories of the individual photons (gamma-ray tracking). Shortly thereafter a physics campaign has started using stable beams ranging from hydrogen to lead, delivered by the Tandem-ALPI-PIAVE accelerator complex at energies from 20-25 MeV/u (lightest ions) to about 7-8 MeV/u (heaviest ions). In the first phase AGATA has been coupled to the PRISMA heavy-ion magnetic spectrometer to access the study of exotic nuclei produced in multi-nucleon transfer and fusion-fission reactions. Different silicon detector arrays for light charged particles and ions have also been used. The physics cases under study involve shell evolution and configuration mixing in key regions of the nuclear chart, such the N=20 island of inversion and the nuclei around the doubly-magic 78Ni, quadrupole and octupole shapes and collectivity across a wide range of nuclear masses, as well as measurements of astrophysical interest. Several Coulomb-excitation experiments investigated shape coexistence along the Z=40 and Z=50 lines. In this presentation, the current status of the physics campaign and its main results will be discussed.

[1] A. Akkoyun et al., NIM A 668, 26 (2012)
[2] J.J. Valiente-Dobón et al., NIM A 1049, 168040 (2023).

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