The Advanced Gamma Tracking Array (AGATA) –status and outlook

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The next generation European γ-ray detector facility, the ***"Advanced GAmma-ray Tracking Array"***(AGATA) is having a pivotal impact on European experimental nuclear physics with relevance to a wide range of topics in the field. It will be a key instrument for utilising the emerging possibilities at the next generation radioactive nuclear beam facilities, in particular for the future international accelerator Facility for Antiproton and Ion Research (FAIR) to be constructed at the present site of GSI, Darmstadt, Germany. AGATA will be a crucial part of the Nuclear Structure, Astrophysics and Reactions (NuSTAR) programme at FAIR as an integrated part of the HISPEC set-up at the Super-FRS. AGATA-type detectors will also form a key component in phase 2 of the germanium detector array being constructed for the DESPEC experiment at FAIR; DEGAS. Since the AGATA detector array is modular it will be possible to optimally exploit its unique features in different configurations by deploying it at other important future accelerator facilities such as SPIRAL2 and eventually EURISOL.
AGATA is a project based on a novel detector concept, γ-ray tracking. which enables developments of gamma-ray detector systems that are close to the "ideal" high-resolution gamma-ray detector; a solid germanium detector shell. In a gamma-ray tracking system the ambition is to measure the position and energy of every gamma-ray interaction in each germanium crystal so that the path and sequential energy loss of the individual gamma-rays can be deduced using the physical interaction mechanisms (mainly Compton scattering, pair production photoelectric effect). The realisation of such a system is based on developments in highly segmented germanium detectors and high-speed digital electronics making it possible to extract energy, time and position information for the gamma-ray interactions inside the Ge crystal from the pulse shapes induced by the movements of the charge carriers towards the external contacts.AGATA, will be an instrument of major importance for nuclear structure studies at the limits of nuclear stability, capable of measuring gamma-radiation in a very large energy range (from a few tens of keV up to 10 MeV and more), with the largest possible efficiency and with a very good spectral response. Its sensitivity for selecting the weakest signals from exotic nuclear events will be up to 2-3 orders of magnitude greater than for all current γ–ray spectrometers.
The current status of the AGATA project, with an outlook for the next physics campaigns will be given.