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The CUPID 0nbb experiment

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Neutrinoless double-beta decay (0νββ) plays a crucial role in addressing some of the major outstanding issues in particle physics, including lepton number conservation and the Majorana nature of neutrinos. Over the past few decades, several efforts have sought to increase the sensitivity on the 0νββ process to target the Inverted-Ordering region of the neutrino mass spectrum. Forthcoming-generation experiments plan to fulfil this promise aiming at sensitivities beyond 1E27 years on the 0νββ half-life.
Among the employed techniques, low-temperature calorimetry has proven to be highly promising and is poised to maintain this role in the near future through the CUPID experiment. CUPID, the CUORE Upgrade with Particle IDentification, is a next-generation experiment that will search for 0νββ of 100-Mo and other rare events using Li2MoO4 scintillating bolometers. CUPID will take advantage of the experience acquired by running CUORE (Cryogenic Underground Observatory for Rare Events), the first tonne-scale bolometric array, currently operating at Laboratori Nazionali del Gran Sasso in Italy. CUPID will be hosted in the existing CUORE cryogenic infrastructure deploying 1596 scintillating Li2MoO4 crystals enriched in 100-Mo, coupled to 1710 light detectors. The simultaneous readout of heat and light, allows for particle identification and a robust rejection of the previously leading background from alpha particles.
Today, coordinated efforts have validated the main science drivers and put in place a viable procurement chain. Ongoing activities are focused on finalizing the CUPID detector design and refine its performance and physics capabilities. In the poster, we will provide an overview of the current status of CUPID and highlight the upcoming milestones in the construction of the experiment.

Poster prize

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