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## Final results of the CUPID-Mo $0\nu\beta\beta$ experiment

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CUPID-Mo was a demonstrator for CUPID, a next generation neutrinoless double beta decay experiment. It consisted of an array of 20 enriched Lithium Molybdate cryogenic calorimeters equipped with 20 Germanium light detectors for particle identification. As well as providing an important demonstration of the detector technology, CUPID-Mo has achieved a series of world leading physics results. The discrimination of  $\alpha$  from  $\beta/\gamma$  particles enabled CUPID-Mo to reach the lowest ever background index for a bolometric  $0\nu\beta\beta$  decay experiment. This resulted in a world leading limit on  $0\nu\beta\beta$  decay in  $^{100}\text{Mo}$ . We will also present the results of a topological analysis of double beta decays to  $^{100}\text{Ru}$  excited states, with a measurement of the  $2\nu\beta\beta$  decay to 1st  $0^+$  excited states and new world leading limits on other processes. The very high signal to background ratio of  $2\nu\beta\beta$  decay to the ground state enables a range of further physics studies. We will present the most precise measurement of the  $2\nu\beta\beta$  decay to the ground state in any isotope, and studies of new physics beyond the Standard Model which could distort the spectral shape of the  $2\nu\beta\beta$  spectrum:  $0\nu\beta\beta$  with Majoron emission,  $2\nu\beta\beta$  decay with emission of Bosonic neutrinos and Lorentz invariance violation.

### Submitted on behalf of a Collaboration?

Yes

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