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CUORE neutrinoless double beta decay experiment

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Neutrinoless double beta decay, a rare nuclear process, if found, would confirm the Majorana nature of neutrinos. Successful observation of neutrinoless double beta decay would require a detector with substantial amount of candidate isotope, as well as excellent energy resolution and extremely low background. The CUORE (Cryogenic Underground Observatory for Rare Events) experiment aims at addressing all these challenges with low temperature bolometers. CUORE is currently being constructed underground at Laboratori Nazionali del Gran Sasso (LNGS) in Italy. It packs 988 TeO₂ crystals of 5x5x5 cm³ each, totaling 741 kg of detection mass, of which the candidate isotope Te-130 is 204 kg. The whole detector will be cooled down to a base temperature of 10 mK and the particle interaction signal will be read out from temperature rise of each crystal due to energy release. The first tower, CUORE-0, is currently taking data.

I'll give an introduction to the CUORE experiment and update on its current status.

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