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Double Beta Decay and the Nature of the Neutrino¹

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The observation of neutrino oscillations firmly established non-zero neutrino mass and the existence of mass mixing. Despite this success it remains unclear whether or not neutrinos are their own anti-particles. The investigation of neutrinoless double beta decay allows to explore this question. Combined with nuclear structure calculations and assumptions on the underlying particle physics, double beta decay rates further constrain the absolute neutrino mass scale. A number of new searches for the extremely rare nuclear double beta decay is in the planning or construction phase. I will give an overview of the world wide experimental effort in this area by discussing my subjective choice of the most advanced projects.

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