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Neutrinoless Double Beta Decay: A Search for Lepton-Number Violation

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The search for neutrinoless double-beta decay of certain even-even nuclei is likely to have a significant impact on our understanding of some of the remaining unknown fundamental neutrino characteristics within the next few decades. Observation of this decay would establish the Majorana nature of the neutrino and set the absolute mass scale of neutrinos. I will present the physics case for the current and next generation searches. I will also review the status of the field, focusing primarily on current generation experiments that are running, or have recently produced results, such as the EXO, GERDA and Kamland-Zen experiments.