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Neutrinoless Double Beta Decay

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Neutrinoless double beta decay is a hypothetical process where an atomic nucleus decays with the emission of two electrons and no neutrinos. The observation of this process would have significant physical implications. It would imply that absolute lepton number is violated and that neutrinos are Majorana particles. It can also provide a measurement of the absolute mass scale of the neutrino. This talk will review the theory of neutrinoless double beta decay, as well as previous, current and future experimental efforts to detect this extremely rare process.