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The strange world of the neutrino

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The neutrino, proposed by Pauli in 1930, was detected in a reactor experiment in 1953 by Reines and Cowan. The electron neutrino has two more cousins viz. those associated with the muon and tau lepton. The first indications that neutrinos oscillate into other flavours was from solar neutrino measurements. However unambiguous evidence for this phenomenon was seen in measurements with the 50 kiloton water Cerenkov detector at Kamioka. Accelerator based long baseline experiments have confirmed neutrino oscillations and provided precise measurements of some of the neutrino parameters such as mixing probability and mass squared difference. Indications that the smallest mixing angle θ_{13} is non-zero may make possible measurements of CP violation in the neutrino sector and also allow the ordering of the 3 masses. It is here that the proposed Iron Calorimetric detector (ICAL), at the India based Neutrino Observatory underground laboratory, has a discovery potential. I will also discuss briefly the faster-than-light neutrino velocity measurement, by the OPERA collaboration, which has attracted a lot of attention in the recent past.

ALL ARE WELCOME