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Supernovae Neutrinos: Oscillation and Phenomenology.

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Supernovae (SN) are one of the highest energetic astrophysical events. Almost all the enormous energy (10^(53) ergs) released during such an event is emitted in terms of neutrinos. These neutrinos while free streaming out of the SN will undergo flavor oscillations. Apart from the usual MSW oscillations the SN neutrinos will have nonlinear flavor evolution due to neutrino-neutrino interactions. These oscillations can generate unique signatures under different oscillation scenarios. Thus opening the possibility of rich phenomenology in the earth based neutrino detectors for a future galactic SN burst. Moreover, the absence of such a galactic event in near future will increase the importance of detecting the diffuse background of neutrinos from all past supernovae. Detection of such a relic background of SN neutrinos will push the frontier of astrophysical neutrinos to cosmic distances.

Summary

Primary author(s) : Dr. CHAKRABORTY, Sovan (Max plank for Physics)

Presenter(s) : Dr. CHAKRABORTY, Sovan (Max plank for Physics)

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