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Recent advances in neutrino (astro)physics

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A major step forward is occurring in our understanding of neutrino flavour conversion in media. This is due to the increase in the complexity of the modelling for neutrino propagation e.g. in supernovae, (inclusion of the neutrino-neutrino interaction, of shock waves and of turbulence). Compared to the case of our Sun, new flavour conversion phenomena have been shown to arise.

In this talk I will first emphasize with an example that their underlying physical mechanisms can be very general. The complex flavour conversion phenomena are intertwined with key unknown neutrino properties, such as

leptonic CP violation. I will summarize our recent findings on the search for indirect CP effects in supernovae and in Early Universe, at the BBN epoch.

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