



Contribution ID: 716

Type: **Parallel Talk**

Overview of knowns and unknowns in the standard three-neutrino framework

Thursday, 6 July 2017 14:30 (30 minutes)

A global analysis of neutrino masses and mixings, performed within the standard three-neutrino framework, is presented. The combination of current data coming from oscillation experiments, neutrinoless double beta decay searches, and cosmological surveys, provides interesting constraints on the known mass-mixing parameters, as well as intriguing hints on the unknown ones. Concerning the latter, we confirm previous hints favoring nonmaximal θ_{23} mixing, and nearly maximal leptonic CP violation. We also find that the so-called normal ordering (NO) of neutrino masses appears to be somewhat favored with respect to inverted ordering (IO) at the level of ~ 2 sigma, mainly by neutrino oscillation data (especially atmospheric), corroborated by cosmological data in some cases. Detailed constraints are obtained via the χ^2 method, by expanding the parameter space either around separate minima in NO and IO, or around the absolute minimum in any ordering. Implications for upcoming oscillation and non-oscillation neutrino experiments, including beta-decay searches, are also discussed. [Main reference paper: arXiv:1703.04471]

Experimental Collaboration

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Session Classification: Neutrino physics

Track Classification: Neutrino Physics