Contribution ID: **4** Type: **Lecture**

Neutrino Physics - part 2

Wednesday 10 October 2012 11:30 (1h 30m)

In these lectures, I discuss three aspects of neutrino physics: neutrino oscillations, neutrino mass, and neutrino astrophysics. In neutrino oscillations, the recent measurement of the mixing angle theta13 has opened the possibility to discover leptonic CP violation, which would motivate the possibility that the baryon asymmetry of the universe is connected with neutrino physics. I discuss the current understanding of neutrino oscillations and briefly comment on the future perspectives. As far as neutrino mass is concerned, I focus on questions such as: Are massive neutrinos to be interpreted as physics beyond the Standard Model? What model ingredients are needed if neutrino mass is connected with physics as the TeV scale, and thus potentially observable at the LHC? What kind of "new physics" may be showing up in the neutrino sector only? What does the discovery of a large theta13 mean for the theory of flavor? In neutrino astrophysics, I highlight the possibility to test the sources of the ultra-high energy cosmic rays with neutrinos, and I illustrate how neutrino oscillations in the Sun work.

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