Contribution ID: **20** Type: **Talk**

Neutrino astrophysics with JUNO

Friday 18 March 2016 11:55 (20 minutes)

The Jiangmen Underground Neutrino Observatory (JUNO) is an international project centered on a 20 kt liquid scintillator neutrino detector currently under construction about 730 m below the surface at a location close to Kaiping, China. Its expected start of data taking is around 2020. The experiment primarily aims for a determination of the neutrino mass ordering with more than three sigma significance and precision measurements of neutrino oscillation parameters
by investigating reactor electron anti-neutrino disappearance over a
~53 km long baseline. Besides that, the project based on a liquid scintillator measurement device of unprecedented size also features a rich physics program around low-energy astrophysical neutrinos, which is the main topic of this talk: In case of a galactic core-collapse supernova at 10 kpc distance, the high-statistics neutrino signal (>7000 events) provides detailed energy-, time- and flavor-resolved information on the cosmic incident. Depending on the performance to reject the critical background from neutral-current interactions of atmospheric neutrinos, there might be even a chance to get a positive signal on the three-sigma level for the diffuse supernova neutrino background after ten years of measurement. Moreover, the large target mass, the low energy threshold, and the very high energy resolution of JUNO make the liquid scintillator detector attractive for solar neutrino observations. With dedicated efforts to realize the required low background conditions, measurements of neutrinos from the Sun with JUNO can probe the transition region between vacuum-dominated and MSW-dominated neutrino oscillations. Moreover, such measurements can also help to resolve the solar metallicity problem.

Primary author: Mr LORENZ, Sebastian (Johannes Gutenberg-Universität Mainz)

Presenter: Mr LORENZ, Sebastian (Johannes Gutenberg-Universität Mainz)

Session Classification: Talks

Track Classification: Neutrino Physics