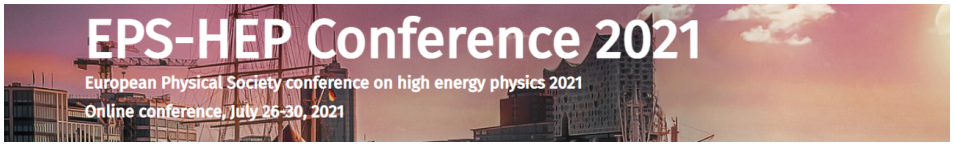

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JUNO potential in non-oscillation physics

Monday 26 July 2021 15:15 (20 minutes)

The Jiangmen Underground Neutrino Observatory (JUNO) is a next-generation liquid scintillator experiment being built in Guangdong province in China. JUNO's target mass of 20 kton will be contained in a 35.4 m acrylic vessel, itself submerged in a water pool, under about 650 m of granite overburden. Surrounding the acrylic vessel are 17612 20" PMTs and 25600 3" PMTs. The main goal of JUNO, whose construction is scheduled for completion in 2022, is a 3-4σ determination of the neutrino mass ordering (MO) using reactor neutrinos within six years, as well as a precise measurement of θ_{12}, δM^2_{21}, and δM^2_{31}.
JUNO's large target mass, low background, and dual calorimetry, leading to an excellent energy resolution and low threshold, allows for a rich physics program with many applications in neutrino physics. The large target mass will allow for high-statistics solar-, geo-, and atmospheric neutrino measurements. JUNO will also be able to measure neutrinos from galactic core-collapse supernovae, detecting about 10,000 events for a supernova at 10 kpc, and achieve a 3σ discovery of the diffuse supernova neutrino background in ten years. It can also study non-standard interactions e.g. proton decay, indirect dark matter searches, and probe for lorentz invariance violations. This talk will cover this extensive range of non-oscillation topics on which JUNO will be able to shed light.

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Collaboration / Activity

JUNO

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