

Status and physics potential of JUNO

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The Jiangmen Underground Neutrino Observatory (JUNO) is a neutrino experiment under construction in a 700 m deep underground laboratory near Jiangmen in South China. The main neutrino target will consist of 20 kton of liquid scintillator held in a spherical acrylic vessel. The experiment is designed for the determination of the neutrino mass ordering, one of the key open questions in neutrino physics. This measurement will be done by studying the fine spectral structure of reactor antineutrino vacuum oscillations at a baseline of 53 km, requiring an unprecedented energy resolution of 3% at 1 MeV. The light produced by the scintillator will be seen by about 20,000 large PMTs (20") and about 25,000 small PMTs (3"). The OSIRIS detector will monitor the radio-purity of the liquid scintillator during the months-long filling of the main detector, while the unoscillated spectrum from one reactor core is planned to be closely monitored by the Taishan Antineutrino Observatory (TAO). JUNO will also significantly improve the precision of already measured neutrino oscillation parameters. Astrophysical measurements of solar, geo, supernova, DSNB, atmospheric neutrinos, as well as searches for proton decay or dark matter are also a part of the vast physics programme. The presentation will review the physics goals, design, as well as the status of the JUNO project.

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