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Physics prospects of JUNO

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The Jiangmen Underground Neutrino Observatory (JUNO) is the first multi-kton liquid scintillator detector to come on scene in 2021. It will have 20 kt target mass and an overburden of 1900 m.w.e. It is currently under construction near Kaiping in the Guangdong province in southern China, at a strategic baseline of 53 km from two nuclear power plants. The main physics goal is to determine the neutrino mass ordering within six years of run time with a significance of 3-4 sigma. The energy resolution is designed to be better than 3% @ 1 MeV and the non-linearity of the energy scale must be known with better than 1% precision. This excellent detector performance, combined with large volume, further broadens the JUNO potential both in neutrino, as well as in astro-particle physics. JUNO can improve the precision on solar oscillation parameters and the atmospheric mass splitting below 1% and allows for the study of geoneutrinos, solar neutrinos, and neutrinos from core-collapse supernovae. Furthermore, it has the potential to search for dark matter, diffuse supernova background and sterile neutrinos, proton-decay, and non-standard interactions. This talk will give an overview on the JUNO physics potential.

Collaboration name

JUNO

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