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Status and Prospects of the JUNO Experiment

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The Jiangmen Underground Neutrino Observatory (JUNO) is a multi-purpose neutrino experiment currently under construction in South China. It is located 53 kilometers away from two nuclear power plants in a 700-meter-deep underground laboratory.
JUNO will be the largest liquid scintillator (LS) detector in the world, comprising 20,000 tons of ultra-pure LS filled in a 35.4-meter-diameter acrylic sphere. The vast volume will be monitored by 17,612 20-inch and 25,600 3-inch photomultiplier tubes, ensuring a photocathode coverage of 78% and providing an unprecedented energy resolution of better than 3% at 1 MeV with an absolute energy scale uncertainty lower than 1%.
The main physics goal of JUNO is the determination of the neutrino mass ordering.
The unique location of JUNO allows for the detection of oscillated electron antineutrinos from reactors at medium-baselines and enables the first-time precision measurement of two oscillation patterns in one energy spectrum. A significance of mass ordering determination exceeding 3σ is expected after six years of data taking. Simultaneously, JUNO will achieve sub-percent precision in measuring several neutrino oscillation parameters.
In addition, neutrinos from several sources, including the Sun, the Earth's interior, the atmosphere, and galactic core-collapse supernovae, can be studied. Furthermore, JUNO is in a great position to discover the diffuse supernova neutrino background, as well as to search for proton decay and other new physics beyond the Standard Model.
In this talk, I will present the current status of JUNO and discuss its physics prospects.

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