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JUNO physics and background control strategy

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The Jiangmen Underground Neutrino Observatory (JUNO) is a 20 kton multi-purpose liquid scintillator detector currently being built in a dedicated underground laboratory in China, expected to start taking data in 2023. JUNO's primary physics goal is the determination of the neutrino mass ordering, with an expected significance of 3-4 sigma in about six years of data taking, by measuring the oscillation pattern of electron antineutrinos coming from two nuclear power plants at a baseline of 53 km. Besides the main physics goal, JUNO will have a very rich physics program including the measurement of neutrino oscillation parameters with a sub-percent precision, and the detection of solar and galactic core-collapse supernova neutrinos among others. To reach the proposed goals an unprecedented energy resolution of 3% at 1 MeV as well as a comprehensive energy calibration program are needed. The collaboration has also developed a strategy to keep all the radiogenic backgrounds under control before and during the construction of the detector. In this talk, the relevance of the JUNO detector design and background control strategy to the physics goals will be presented and discussed as well as the status of the construction.

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