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Design and Status of the JUNO experiment

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The next-generation experiment JUNO, expected to begin operation in 2021, will advance the capability of reactor neutrino experiments to determine neutrino mass ordering and precisely measure several neutrino mixing parameters. JUNO also has rich physics programs on supernova-neutrinos, solar-neutrinos, geo-neutrinos, proton decays and exotic searches. JUNO has one 20-kton liquid-scintillator (LS) central detector, two redundant muon veto systems, complementary calibration systems, and FADC readout electronics system. The designed energy resolution of 3%/sqrt(E) is expected to be achievable with the high photocathode coverage and highly transparent liquids. Here the design and new technical advances of JUNO will be introduced, with particular focus on the progress of central detector, the production and testing of high-efficiency MCP-PMT, strategy for highly transparent and radio-pure LS, comprehensive energy calibration program, progress of electronics and veto system, etc.

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