

# The Design and Construction of the Central Detector of JUNO

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Jiangmen Underground Neutrino Observatory (JUNO) is a large-scale neutrino experiment with multiple physics goals including neutrino mass hierarchy, accurate measurement of neutrino oscillation parameters, neutrino detection from supernova, sun, and earth, etc. JUNO puts forward physically and technologically stringent requirements for its central detector (CD), including large volume of 20 kt liquid scintillator (LS), 3% energy resolution at 1 MeV, high enough scintillation light transmittance, large possible PMT coverage, low radioactive background, etc. At beginning of the detector feasibility design, the CD was designed with a variety option of schemes. At the end after many iterations, the scheme of a spherical acrylic vessel with stainless steel structure was chosen and its detailed design was optimized with manufacture prototyping and measurements. The key technologies of acrylic sphere have been successfully developed, such as low radioactivity and high transmittance manufacturing technology of acrylic panels, tensile and compressive acrylic node design with embedded stainless steel pad for supporting rod, the one-time polymerization and annealing for multiple and long bonding lines between acrylic panels, etc. Many technical challenges of stainless steel structure were solved, such as low radioactive stainless steel material, deformation and precision control, high strength stainless steel rivet bolt, high friction efficient linkage plate, and so on. The design and construction of the CD of JUNO will be introduced.

## Collaboration

JUNO

## Role of Submitter

I am the presenter

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