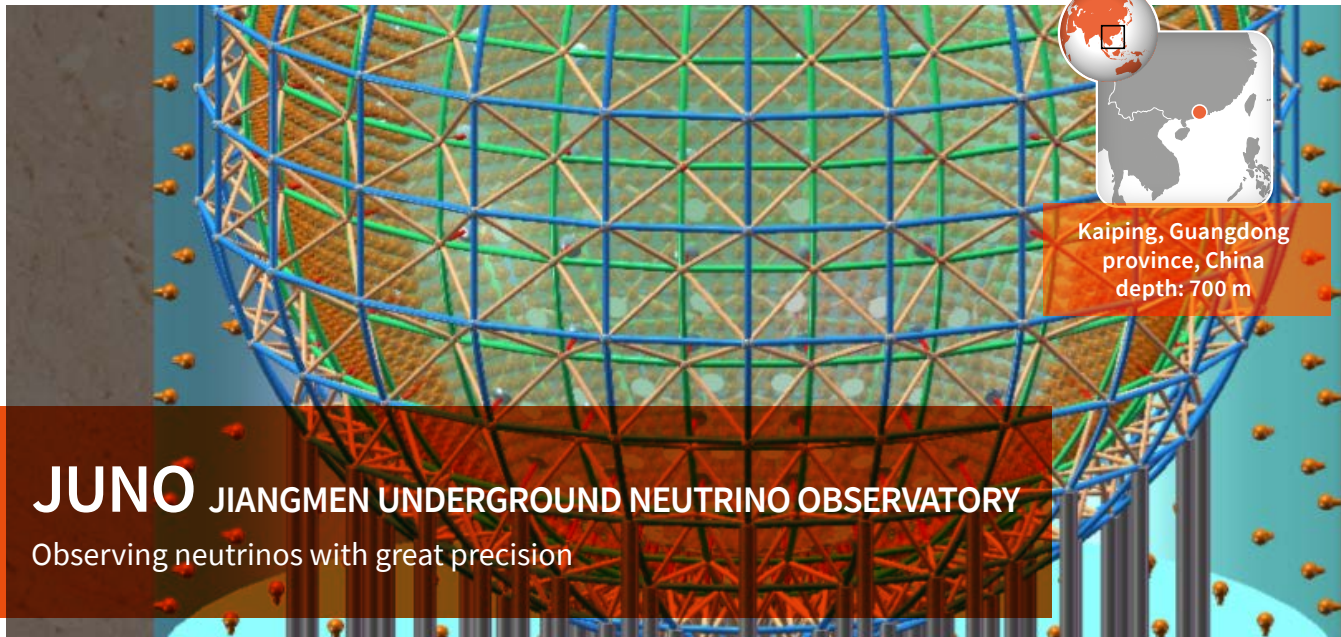


The origin, nature, masses and mixing of neutrinos



## JUNO JIANGMEN UNDERGROUND NEUTRINO OBSERVATORY

Observing neutrinos with great precision

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- **Scientific leader:** Marcos Dracos (IPHC) \*
- **Laboratories involved:** CC-IN2P3 (Lyon), CPPM (Marseille), IJCLab (Orsay), IPHC (Strasbourg), LP2i (Bordeaux), OMEGA (Paris), Subatech (Nantes)
- **Nature:** research infrastructure
- **Status:** international project under construction, mainly financed by the Chinese Academy of Sciences (CAS)
- **Website:** <http://juno.ihep.cas.cn/>

### SCIENTIFIC OBJECTIVES

JUNO is a detector of antineutrinos emitted by nuclear reactors. Its unprecedented size and accuracy will give access to the order of the masses of the three known neutrinos, and to a precise measurement of three of the five parameters describing their oscillations. These values will have implications for particle physics and cosmology. JUNO will also study neutrinos of terrestrial and extra-terrestrial origin (supernovae, atmosphere, sun), to better understand the quantity of certain radioactive elements on Earth and certain mechanisms that govern the evolution of the Universe.

### RESOURCES DEPLOYED

The detector is a transparent sphere 35.4 m in diameter, filled with 20 000 tonnes of scintillating liquid that emits light as charged particles pass by. 42 000 photomultipliers spread around it will record the events. JUNO is buried 700 m below ground so that it is not affected by the flow of cosmic particles. To detect any particles that reach it, it is immersed in a detection pool and topped with a trajectory. JUNO's energy resolution will be unprecedented: 3% for particles of 1 MeV.

**400** scientists

**35** metres in diameter

**18** participating countries

**20K** tonnes of glittering liquid

**77** institutions, 34 of which are Chinese

### IN2P3 CONTRIBUTIONS

- Improvement of the electronics of the cosmic particle trajectory (CPT).
- Preparation of the electronics for reading the 3-inch photo multipliers (sPMT)
- Participation in the selection of low radioactive materials for the construction of the detector

**2014**

End of the design phase.  
Start of international collaboration

**2015**

Construction begins

**2018**

End of sPMT mass production and testing

**2020**

End of construction work

**2021**

Installation of equipment

**2023**

End of construction and start of operation