

Daya Bay Collaboration Awarded 2023 High Energy and Particle Physics Prize by European Physical Society

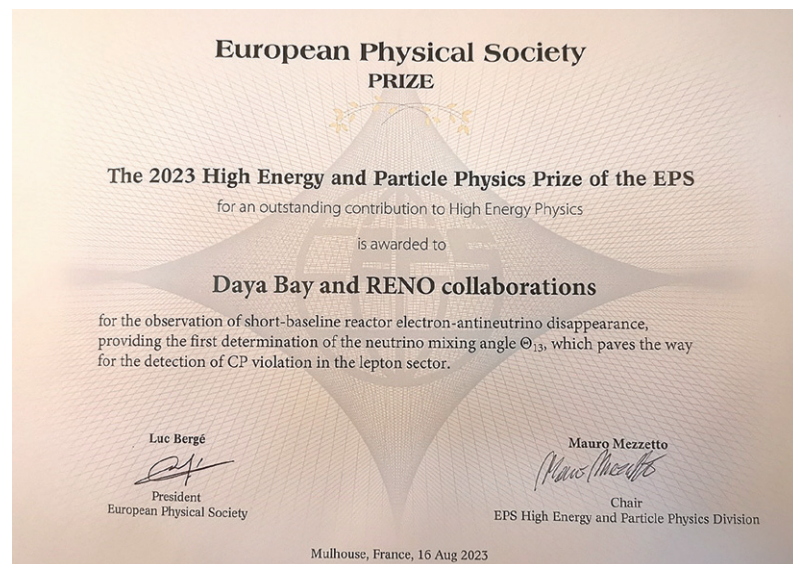
China's Daya Bay collaboration and the RENO collaboration of South Korea were jointly awarded the 2023 High Energy and Particle Physics Prize of the European Physical Society (EPS) at a ceremony in Hamburg, Germany on August 21.

Prof. WANG Yifang, initiator of the experiment in China and current director of the Institute of High Energy Physics (IHEP) of the Chinese Academy of Sciences (CAS), accepted the award on behalf of the Daya Bay collaboration.

The citation noted that the prize was awarded for the observation of short baseline reactor electron-antineutrino disappearance, providing the first determination of the neutrino mixing angle θ_{13} , which paves the way for the detection of CP violation in the lepton sector.

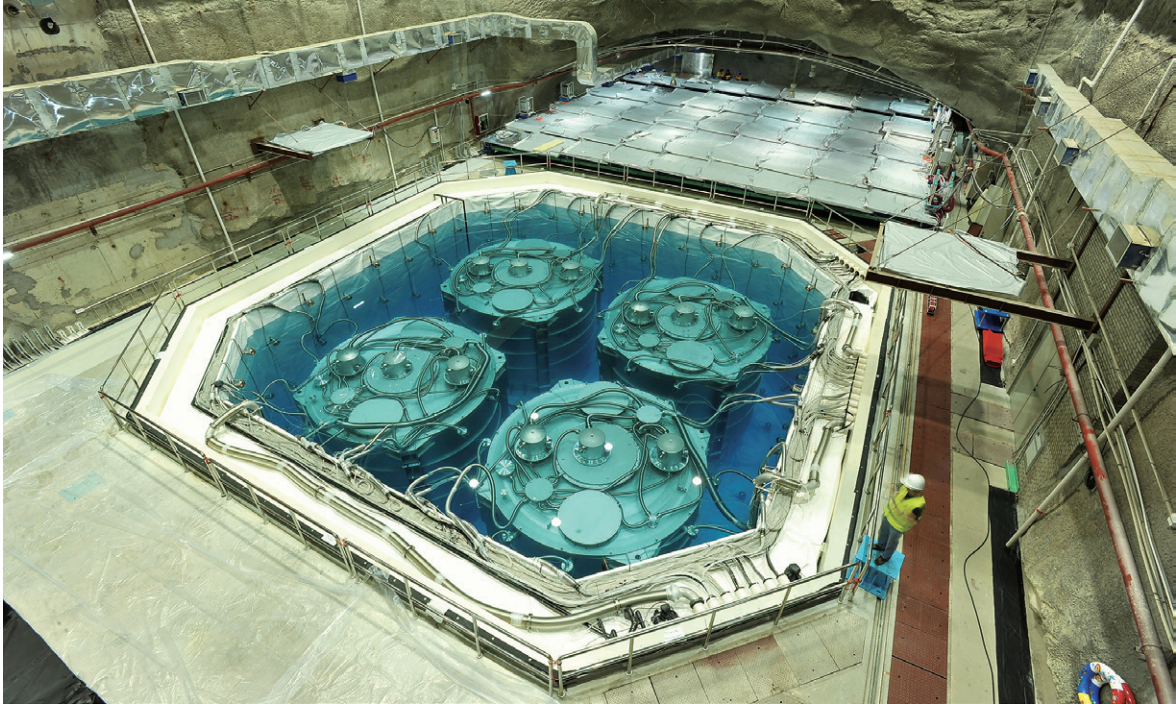
The Daya Bay and RENO collaborations shared the award, which was conferred during the 2023 European Physical Society High Energy Physics Conference, together with Swedish scientist Cecilia Jarlskog, who won the honor for her discovery of an invariant measure of CP violation in both quark and lepton sectors.

The Daya Bay Experiment announced the discovery of a new pattern of neutrino oscillation and measured the corresponding mixing angle θ_{13} on March 8, 2012. The measurement was later confirmed by the RENO collaboration in South Korea. This discovery is of great significance for understanding the complete picture of neutrino oscillation, understanding the "mystery of the disappearance of antimatter" in the universe, searching for and identifying cosmological and new physics models, and determining the future direction of



neutrino research. This achievement has received various important awards at home and abroad, including the Panofsky Prize, the Breakthrough Prize in Fundamental Physics, the Nikkei Asia Prize, the Pontecorvo Prize, the First Prize of the National Awards in Natural Sciences of China, and the Future Science Prize.

The High Energy and Particle Physics Prize is the highest award granted by EPS in the field of high energy and particle physics. It was established in 1989 and is awarded biennially to individuals or collaboration groups who have made outstanding contributions in the field of high energy physics experiments, theory, or technology. A total of 34 individuals and six collaboration groups have been recognized by the 17 awards that have been



Antineutrino detectors submerged in water pools at the site of the Daya Bay experiment in Guangdong, China. (Image by IHEP)

presented so far. Among the individual winners, 12 have also received the Nobel Prize in Physics.

The Daya Bay collaboration recently further updated their measurement of the mixing angle θ_{13} to a much better resolution with a paper published in the journal *Physical Review Letters*. The experiment also made a series of accurate measurements on the energy spectrum of the neutrinos from the reactor, and identified the anomaly – this basically excluded the possibility for the existence of sterile neutrinos in a large range of energies.

With honors, the site of Daya Bay experiment closed on December 12, 2020, and the experiment for neutrino detection and exploration will be taken over by its successor, the Jiangmen Underground Neutrino Observatory (JUNO) located nearby. The construction for the new Observatory kicked off in 2015 and is expected to complete in early 2024. Once put into operation, it will offer a new window into the mass sequence of neutrinos and their oscillation parameters, leading to more discoveries on the frontiers of neutrino astrophysics.