JUNO started Data Taking !
26/08/2026

The ULB JUNO group is delighted to share an important milestone for JUNO, the world's largest underground neutrino detector. After ten years of design and construction, the JUNO experiment started data taking on 26 August 2025, with the central detector fully filled with 20,000 tonnes of liquid scintillator.

"This is a key moment for the JUNO Collaboration and for the ULB JUNO group", says Barbara Clerbaux, Principal Investigator of the ULB JUNO group. *"The JUNO Collaboration brings together about 700 researchers from 74 institutions. It is rewarding to see our combined expertise converging in such a beautiful detector that will serve the global physics community for decades. The large detector is designed to collect an unprecedented sample of neutrino interactions from a variety of sources. Neutrinos —neutral, extremely light, and very weakly interacting particles— remain among the least understood in physics. JUNO will perform crucial measurements to improve our understanding of their properties and to address fundamental questions in particle physics and astroparticle physics. Exciting discoveries lie ahead."*

The ULB joined the JUNO experiment in 2015 and has actively contributed to the construction of the detector. The ULB JUNO group, based at the IIHE (Interuniversity Institute for High Energies), took responsibility for developing the back-end cards (BECs) of the electronics readout system, covering design, testing, production, and installation. This is a crucial element of the experiment, as it allows to trigger the most interesting events that will be stored and analyzed. "After a decade-long journey from initial concept to final implementation, it's deeply rewarding to see the 180 BEC electronics boxes we developed at ULB now operational underground. Witnessing this critical component successfully integrate into JUNO's detector system feels like completing an essential piece of an extraordinary scientific and engineering puzzle", explains Ing. Dr. Yifan Yang, who designed, tested, and commissioned the BECs, together with Pierre-Alexandre Petitjean (former PhD student), Feng Gao (postdoctoral researcher), and Benoît Denègre (engineer).

The ULB JUNO team is actively involved in physics analysis preparation, detector commissioning, and calibration, and is analyzing the very first data. Marta Colomer Molla (Chargé de recherche FNRS) and Amina Kathun (postdoctoral researcher), together with students, play a key role in optimizing the detection of atmospheric neutrinos in JUNO. Marta Colomer has the important responsibility to coordonate the atmospheric neutrino analysis group of the collaboration. The group is additionally engaged in the detection of neutrinos from potential core-collapse supernova events and contributes to an international alert network. Finally the ULB team participates in detector calibration, using reference signals from natural radioactivity as well as external sources placed inside the detector. "*It is amazing to now see the detector*

working and recording high-quality data! It was exciting to observe the first cosmic muons passing through the detector. We can now control this background and maintain it at a stable rate. We have also successfully recorded the first neutrinos from nuclear power plants, with their characteristic prompt and delayed signals, which will be essential for studying neutrino oscillation phenomena", says Marta Colomer.

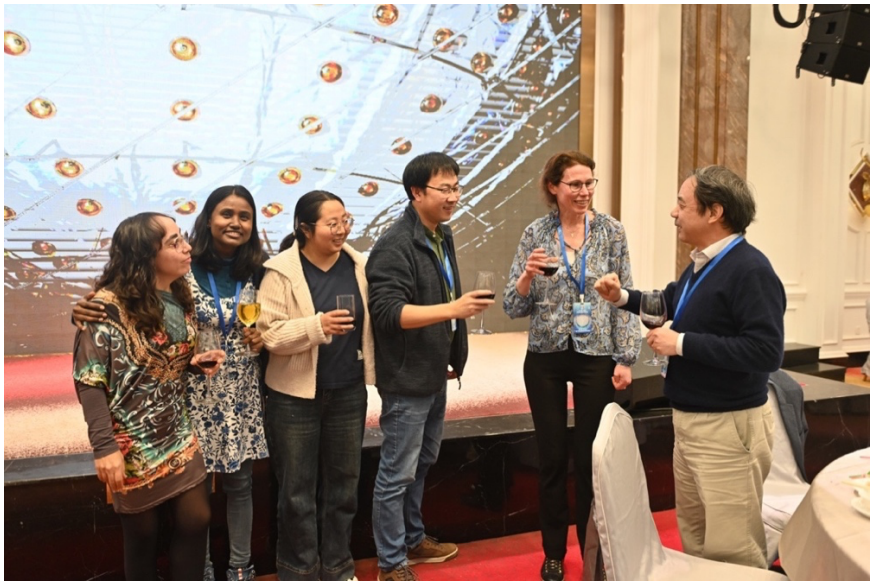

Fig.1 : Part of the JUNO ULB team at the January 2025 JUNO Collaboration meeting.
From left to right : Marta Colomer Molla, Amina Khatun, Feng Gao, Yifan Yang, Barbara Clerbaux, and the JUNO spokesperson Yifang Wang.

Fig.2 : Part of the JUNO ULB team in the JUNO central detector in construction in July 2023.
From left to right : Pierre-Alexandre Petitjean, Barbara Clerbaux and Yifan Yang.

Fig.3 : ULB team at the JUNO site.

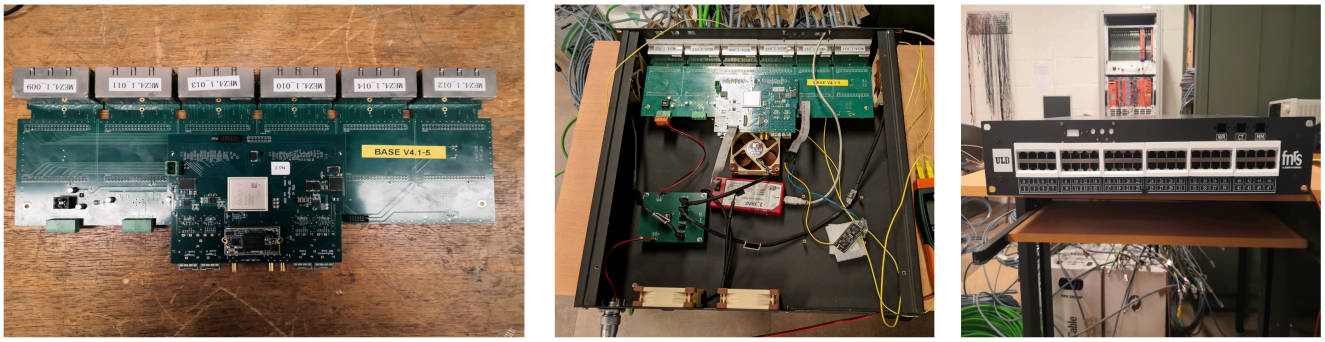

Figure 4 : Left: the baseboard of the BEC developed at the ULB (prototype version 4) with the TTIM (trigger timing interface mezzanine) on top of the baseboard and 6 mezzanine cards plugged under the baseboard; Middle: overview of the box with BEC baseboard, TTIM and mezzanines cards (top of the figure), the dedicated small power board and the 5 fans (two on the sides, two at the rear and one in the center); Right: front panel of the box with the 6x8 connectors.

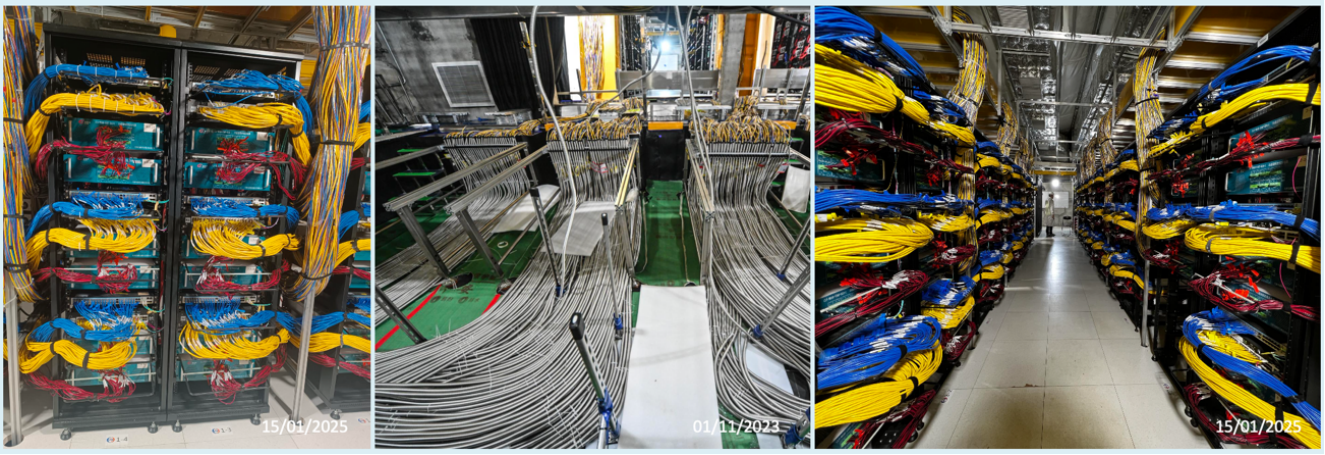

Fig.5 : JUNO underground electronics rooms, where the 180 ULB BEC are placed.

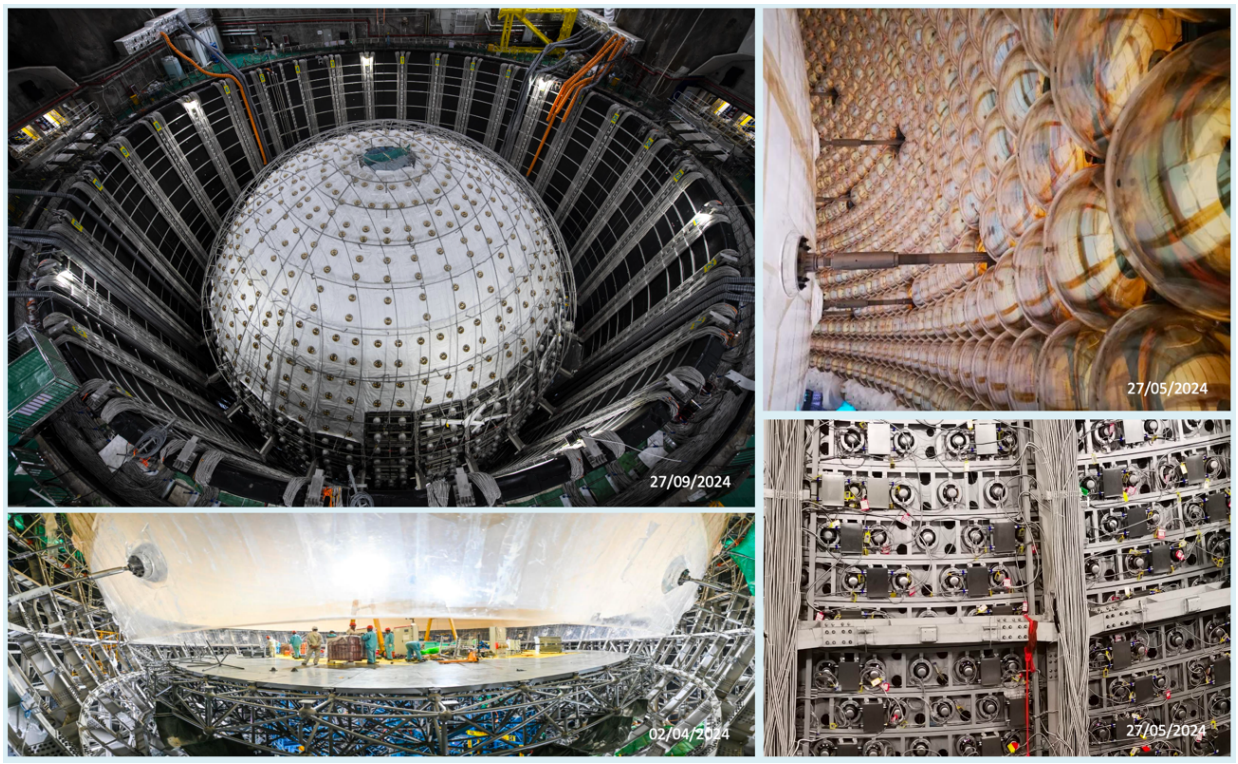

Fig.6 : JUNO central detector in construction.

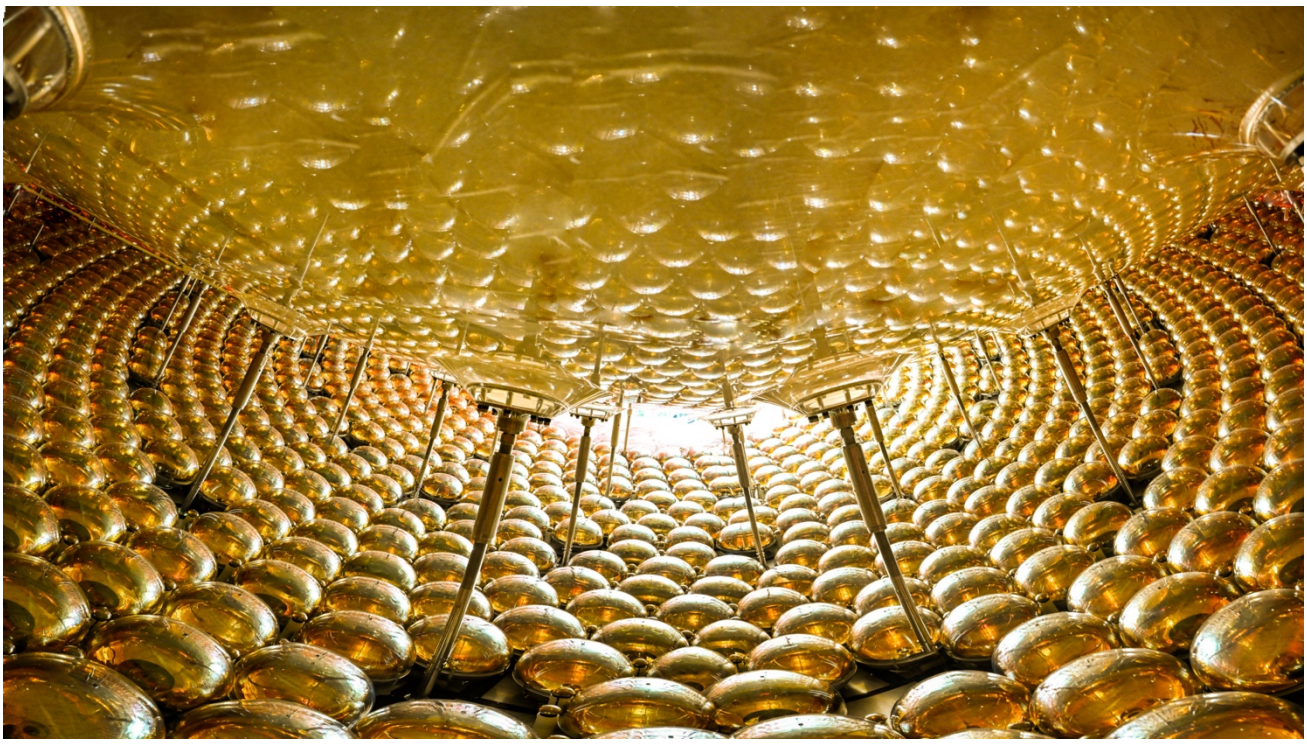

Fig.7 : JUNO central acrylic sphere with its support bars, surrounded by the large photomultipliers tubes (PMTs).