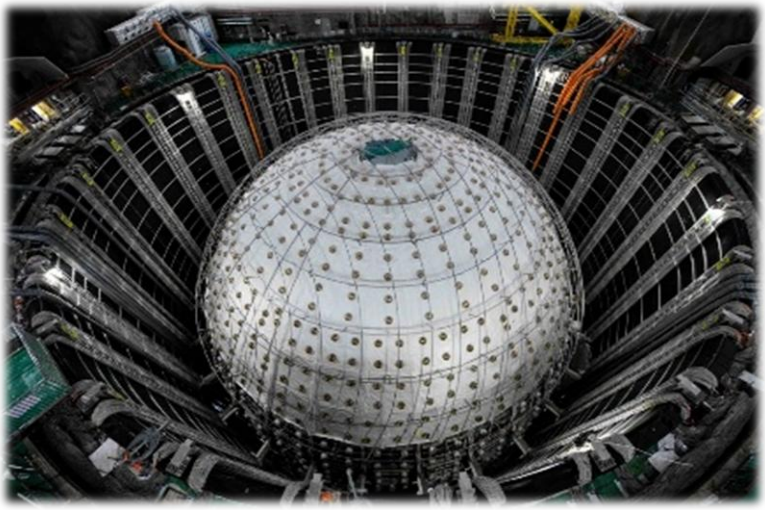
Karlsruher Institut für Technologie

KIT-Fakultät für Physik

Einladung zum Physikalischen Kolloquium

08.05.2026 Livia Ludhova, Johannes Gutenberg Universität Mainz
»First Measurement of Reactor Neutrino Oscillations with JUNO«
Einführung: R. Engel



Abstract: Neutrino oscillations are a fundamental quantum phenomenon demonstrating that neutrinos have non-zero mass and that the Standard Model in its minimal form must be extended. Their precise measurement plays a central role in particle physics and astroparticle physics, providing unique insight into the properties of neutrinos and their role in the Universe.

The Jiangmen Underground Neutrino Observatory (JUNO) in China, after more than 15 years from concept to full realization, started taking data in August 2025. With its 20-kiloton liquid scintillator target, JUNO is the first multi-kiloton liquid scintillator detector and has been designed to combine its large size with unprecedented energy resolution. This unique combination enables the observation of the fine oscillation pattern of reactor antineutrinos and opens a new level of precision in neutrino oscillation measurements.

In this talk, I will present the first oscillation results obtained during the initial phase of data taking. With only 59 days of data, JUNO has already achieved a world-leading precision measurement of the solar oscillation parameters $\sin^2\theta_{12}$ and Δm^2_{21}, demonstrating the excellent performance of the detector. I will discuss the detector, analysis strategy, and physics implications of these results. Finally, I will outline JUNO's broader scientific program, spanning precision measurements of reactor neutrino oscillations and a wide range of topics in astroparticle physics. These results establish the foundation for JUNO's future precision neutrino physics program.

Der Vortrag findet **am Freitag, den 08. Mai 2026 um 15:45 Uhr im Otto-Lehmann-Hörsaal**, Physik-Flachbau (Geb. 30.22), KIT-Campus Süd statt.

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