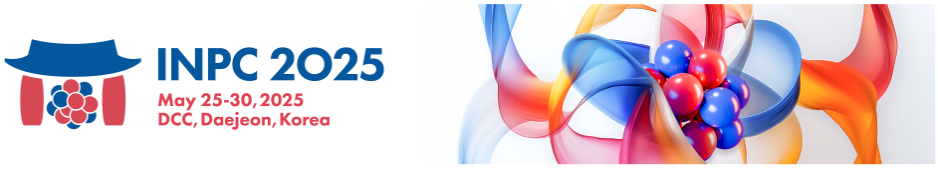

Contribution ID: **336** Type: **Plenary Talk (Invitation Only)**

Probe element synthesis in star by deep underground nuclear astrophysics JUNA experiments

Thursday, 29 May 2025 08:30 (30 minutes)

The Jinping Underground experiment for Nuclear Astrophysics (JUNA) is located in the ultra-low background environment of the China Jinping Underground Laboratory (CJPL). JUNA aims to study crucial stellar energy reactions in star evolution through direct experiments. In 2020, JUNA installed a high-current accelerator at the mA level based on an ECR source, along with high-efficiency BGO and 3He detectors. This setup allows JUNA to measure key nuclear reactions with 10-13 b sensitivity using beam exposures of a few hundred Coulombs. The Run 1 experiments include 25Mg(p,γ)26Al, 19F(p,αγ)16O, 19F(p,γ)20Ne, 13C(α,n)16O, 12C(α,γ)16O, and 18O(α,γ)20Ne, achieving improved precision and measurements closer to the Gamow window. These precise reaction rates offer valuable insights for high-precision astrophysics simulations. The highlights, upgrades, and Run 2 plans of JUNA experiments will be presented.

Primary author: LIU, Weiping (Southern University of Science and Technology/China Institute of Atomic Energy)

Presenter: LIU, Weiping (Southern University of Science and Technology/China Institute of Atomic Energy)

Session Classification: Plenary Session

Track Classification: Nuclear Astrophysics