

## The 243th HENPIC seminar by Yue-Hang Leung, Heidelberg University, 15:30 March 5th, 2026

Title: Recent Results on Hypernuclei Production at RHIC

Abstract:

Hypernuclei provide a unique bridge between hypernuclear structure physics, heavy-ion collisions, and the properties of dense baryonic matter. In particular, the hypertriton ( $^3\Lambda\text{H}$ ), characterized by its extremely small  $\Lambda$  binding energy and extended spatial wave function, offers a sensitive probe of the hyperon–nucleon interaction. Constraining this interaction is of broad interest, especially in the context of the hyperon puzzle, where the appearance of hyperons in neutron star matter softens the equation of state in tension with observations of two-solar-mass neutron stars.

In this seminar, I will present recent measurements of hypernuclei production at RHIC over a wide range of collision energies. I will discuss how production yields, transverse momentum distributions, and collective flow observables can provide insight into the role of the hypertriton wave function and the underlying hyperon–nucleon interaction. In addition to the hypertriton, recent results on heavier hypernuclei ( $A \geq 4$ ) will also be presented. These studies form part of an ongoing effort to understand hypernuclei formation in hot and dense baryonic matter.

Brief introduction about the speaker:

Dr. Yue-Hang Leung is an experimental nuclear physicist specializing in relativistic heavy-ion collisions, with a particular focus on hypernuclei, hyperons, and the properties of dense baryonic matter. He received his B.A. in Mathematics with Physics from the University of Cambridge, followed by a Ph.D. in Physics from Stony Brook University, where he worked within the RHIC-PHENIX Collaboration on heavy-flavor and Drell–Yan measurements.

He subsequently joined Lawrence Berkeley National Laboratory as a postdoctoral researcher, contributing to the RHIC-STAR Collaboration. During this time, he led several high-impact analyses related to hypernuclei, including measurements of light hypernuclei lifetimes, yields, and collective flow—work that provided new insights into hyperon–nucleon interactions and their production mechanisms in heavy-ion collisions.

Since 2022, Dr. Leung has been a postdoctoral researcher at Heidelberg University, participating in the FAIR-CBM Collaboration in Germany. His recent efforts include the first successful reconstruction of hyperons using prototype CBM detectors, validating the performance and readiness of key hardware and software components for the full CBM experiment, which is expected to begin operations in 2028.

He currently serves in the STAR collaboration as convener for the Light-Flavor Spectra and Ultra-Peripheral Collisions physics working group.

### Summary