

## **A Review on Physics-Specific Foundation Models: from Particles to Cosmic Surveys**

*Friday, 26 September 2025 11:50 (40 minutes)*

Foundation models - large, pretrained architectures adaptable across domains - are being explored in physics, from particle events to astrophysical data, though current evidence for their benefits and scope is mixed. This talk surveys emerging use cases, distinguishing what is empirically established from what remains speculative, with attention to embedding physical structure and constraints, and to open issues in uncertainty quantification, evaluation, and reproducibility. A particular focus is whether these models internalize world-model structure or rely primarily on task-specific heuristics and pattern matching.

**Presenter:** Dr CHO, Won Sang (IBS-CTPU-PTC)

**Session Classification:** Session 2