

## Statistical Analysis of FOPT over an Extended Bandwidth as a Probe of New Physics

*Saturday, 22 November 2025 14:30 (1 hour)*

Collider-based searches for new physics are inherently limited in both energy reach and experimental precision. In contrast, first-order phase transitions (FOPTs) in the early universe can probe much higher fundamental scales, making it valuable to place observational constraints on a broad class of models. We propose a combined statistical analysis across multiple frequency bands that can set limits on FOPT signals at specific energy scales and serve as a general framework for constraining couplings and masses in a wide range of theories. In this talk, I present a concrete example using real LIGO data to derive constraints on a generic U(1) model.

**Presenter:** VELASCO SEVILLA, Liliana (Sogang University)

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