Contribution ID: **3** Type: **not specified**

# Multi-Axion Bosenovae and Sequential Axion Emissions

*Monday 10 November 2025 14:00 (20 minutes)*

Axion particles can form gravitationally bound condensates known as axion stars. In the presence of self-interactions their collapse can trigger axion bosenovae —transient events accompanied by bursts of relativistic particle emission. We investigate such phenomena in systems composed of multiple axion fields, which can arise in various extensions of the Standard Model. Using both variational and numerical methods, we analyze the collapse dynamics and develop a framework to estimate collapse times. We explore the possibility of multiple bosenovae, where successive collapse events lead to the depletion and emission of different axion species. Our results provide a self-contained treatment of multi-axion collapse and uncover novel phenomena - time-separated, multi-frequency transients that could distinguish multi-field configurations from single-species axion stars.

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**Session Classification:** Parallel session - Cosmology I