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A Quantum Description of Wave Dark Matter

Tuesday, 19 August 2025 14:00 (20 minutes)

In this talk, I will outline a fundamentally quantum description of bosonic dark matter. Following a quantum optics-inspired approach, I will show the density matrix of dark matter, which takes a mixed Gaussian form over a coherent state basis. This formalism also allows a precise description of quantities related to dark matter coherence. I will further give a continuous description of dark matter through the wave-particle transition, where the density fluctuation in various scales evolves between the two limits, showing a unique behavior near the boundary of these descriptions.

Primary author: CHEONG, Dhong Yeon (Yonsei University)

Presenter: CHEONG, Dhong Yeon (Yonsei University)

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