

# JOINT TUFTS/MIT COSMOLOGY SEMINAR

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*Can we show that CMB  
anisotropies are of  
Quantum-mechanical origin?*

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According to the theory of cosmic inflation, the large scale structures observed in our Universe (galaxies, clusters of galaxies, Cosmic Background Microwave - CMB - anisotropy . . . ) are of quantum mechanical origin. They are nothing but vacuum fluctuations, stretched to cosmological scales by the cosmic expansion and amplified by gravitational instability. At the end of inflation, these perturbations are placed in a two-mode squeezed state with the strongest squeezing ever produced in Nature (much larger than anything that can be made in the laboratory on Earth). In this talk, we will study whether astrophysical observations could unambiguously reveal this quantum origin by borrowing ideas from quantum information theory. It will be argued that cosmic inflation is not only a successful paradigm to understand the early Universe but is also an interesting playground to discuss foundational issues in Quantum Mechanics.

**Tuesday, May 4, 2021, 2:30 pm**

Zoom link will be distributed to joint cosmology seminar mailing list. If not subscribed see <https://cosmos.phy.tufts.edu/mailman/listinfo/cosmology-seminar>

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