

JOINT TUFTS/MIT COSMOLOGY SEMINAR

Gravity Waves or Gravitons from Inflation?

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The prediction of CMB B-modes from inflation typically begins with a study of the paths of photons in an expanding universe in the presence of a classical gravity wave. This gravity wave is assumed to be drawn from a stochastic bath. However, a natural mechanism for the origin of this bath is quantum graviton creation at the end of inflation, which naturally leads a squeezed vacuum state, not the coherent state of a classical wave. In an attempt to bridge this gap, several mechanisms for a quantum to classical transition have been proposed. In this talk, an alternative viewpoint will be presented in which no such transition occurs, and the gravitons remain in a non-classical state until they interact with the CMB photons. In this viewpoint, there are additional fluctuations beyond those in the stochastic bath model in that even a single graviton mode can cause Brownian motion of the photons. The correlations of the graviton fluctuations will be discussed, and it will be argued that these may induce anti-correlated CMB temperature fluctuations.

Tuesday, April 22, 2025, 2:30 pm

574 Boston Ave, Room 316

Tufts University

Refreshments at 2:00 outside the building, at the corner of
Harvard St. and Boston Ave.