

# JOINT TUFTS/MIT COSMOLOGY SEMINAR

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## *Rare Processes during Inflation: CMB Hotspots and Early Galaxies*

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Superheavy particles can be produced during the inflationary era of the primordial Universe. Owing to their large mass, they are produced rarely. However, once produced, they can give rise to significant perturbations in the spacetime metric around their locations. Such perturbations eventually give rise to overdensities in the primordial plasma. I will describe two late-time signatures of such overdensities: (i) hotspots on the cosmic microwave background, and (ii) anomalously massive early galaxies. I will also describe a recent search with the Planck data and evaluate the prospects of high-redshift galaxy surveys, and show how these constitute one of the unique probes of particle physics at very high energies.

**Tuesday, February 24, 2026, 2:30 pm**

Zoom link will be distributed to joint cosmology seminar mailing list. See <https://cosmos.phy.tufts.edu/mailman/listinfo/cosmology-seminar> to join.

**Massachusetts Institute of Technology**