Emergent Cosmology from Matrix Theory

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The BFSS (Banks, Fischler, Shenker and Susskind) matrix model is a proposed non-perturbative definition of superstring theory. It is a quantum mechanical model of nine $N \times N$ Hermitean matrices (no background space). Recent work has shown that in the large $N$ limit, a continuous space with three large and six small dimensions emerges. We show that thermal fluctuations in a high temperature state of this model yield scale-invariant spectra of cosmological perturbations and gravitational waves. Thus, the BFSS matrix model may yield both emergent space and an emergent early universe phase.

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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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