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TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS String Seminar

Title : Lattice bosonization of matrix quantum mechanics and $c = 1$

Speaker : Ajay Mohan (Tata Institute of Fundamental Research, Mumbai)

Date : Wednesday, 12 November 2025

Time : 3:30 PM (IST)

Abstract : Matrix models provide some of the simplest calculable setups to study emergent spacetime. Early examples of emergent space with gravity arose from the large- N limit of matrix models, most notably the emergence of two-dimensional string theory in the double-scaling limit of the $c=1$ model.

The standard collective-variable bosonization (in terms of eigenvalue density), generally believed to provide a good continuum description of large- N matrix models, is found to suffer from some problems: e.g. important finite quantities in the double-scaled $c=1$ model, such as EE and one-loop scattering amplitude, become divergent in this framework.

In this talk, I will describe these issues and present an alternate exact lattice bosonization of Matrix Quantum Mechanics that is valid for any finite N and free of aforementioned problems. I will illustrate its application to the $c=1$ model, including new results on the perturbative expansion of EE in powers of string coupling.

Venue : Emmy Noether Seminar Room

Zoom Link: <https://icts-res-in.zoom.us/j/88092766911?pwd=R3ZrVk9yeW96ZmQ4ZG9KRzVhenRKZz09>

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