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New Computational Methods for Matrix Models and the holographic principle

Wednesday, December 3, 2025 2:00 PM (1 hour)

The ability to numerically simulates holographic models based on matrix models in their relevant parameter regions is of paramount importance to gain new insights into how the gauge-gravity correspondence is realized away from analytical regimes.
New numerical techniques developed for studying quantum many-body physics are being applied to matrix models. I will describe tensor network methods and quantum algorithms applied to simplified version of the BMN and BFSS models (with and without fermions) and I will show some numerical experiments using trapped-ion quantum computers.
Moreover, I will show how deep learning methods can also be used to study the quantum properties of small matrix models.
If time permits, I will move away from matrix models to show an example of a quantum computation experiment of the SYK model.

Presenter: RINALDI, Enrico

Session Classification: Session