



## ICTS String Seminar

**Title** : Bootstrapping String-like amplitudes using Entanglement Minimization and Machine Learning

**Speaker** : Faizan Bhat (Indian Institute of Science, Bengaluru)

**Date** : Wednesday, 06 November 2024

**Time** : 3:30 PM (IST)

**Abstract** : I will present a new approach to bootstrapping string-like theories using a one-parameter family of local, crossing symmetric dispersion relations and field-definition ambiguities. This enables us to use mass-level truncation and go beyond the dual resonance hypothesis. Remarkably, we find that imposing entanglement minimization along with some low-energy constraints leads to an excellent approximation to the superstring amplitudes. We also find other interesting S-matrices that do not obey the duality hypothesis, but exhibit a transition from Regge behaviour to power law behaviour at high energies. In addition to using SDPB to impose the unitarity constraints as is typical, we also impose non-linear constraints using a Physics-Informed Neural Network (PINN). This is the first bootstrap study that uses PINNs for non-linear, constrained optimization.

Based on: [arXiv:2409.18259 \[hep-th\]](https://arxiv.org/abs/2409.18259)

**Venue** : Emmy Noether Seminar Room

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

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