

**ICTS**

INTERNATIONAL
CENTRE *for*
THEORETICAL
SCIENCES

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS String Seminar

Title : Quantum Gravity in Asymptotically Flat Spacetimes from Unstable D-Branes

Speaker : Roji Pius (IMSc, Chennai)

Date : Thursday , 01 October 2026

Time : 02:00 PM (IST)

Abstract : We present a non-perturbative formulation of quantum gravity in asymptotically flat spacetimes using Witten's cubic open string field theory (OSFT) on unstable D-branes. Because the massless spin-2 spectrum of closed string theory naturally constitutes quantum gravity, we establish this connection by mapping on-shell closed string excitations directly to gauge-invariant operators in OSFT, realizing a concrete flat-space analogue of the AdS/CFT correspondence. By evaluating the OSFT correlation functions of these operators perturbatively around the tachyon vacuum, we successfully recover the all-orders genus expansion of the closed string S-matrix for the associated states. This demonstrates that closed string theory—and thus quantum gravity—emerges dynamically from the open string tachyon vacuum, establishing Witten's OSFT as a fully calculable, non-perturbative framework for flat-space quantum gravity.

Venue : Feynman Lecture Hall

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

Meeting ID: 880 9276 6911

Passcode: 232322