THE QUANTUM SPACETIME SEMINAR SERIES

Sharp boundaries for the swampland
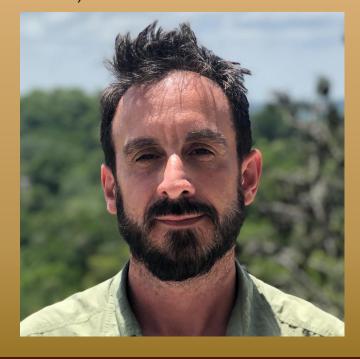(Zoom Seminar)

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Date: May 10, 2021

Time: 7.00 pm IST

Zoom link shall be shared separately

We reconsider the problem of bounding higher derivative couplings in consistent weakly coupled gravitational theories, starting from general assumptions about analyticity and Regge growth of the S-matrix. Higher derivative couplings are expected to be of order one in the units of the UV cutoff. Our approach justifies this expectation and allows to prove precise bounds on the order one coefficients. Our main tool are dispersive sum rules for the S-matrix. We overcome the difficulties presented by the graviton pole by measuring couplings at small impact parameter, rather than in the forward limit. We illustrate the method in theories containing a massless scalar coupled to gravity, and in theories with maximal supersymmetry.