

JOINT TUFTS/MIT COSMOLOGY SEMINAR

*The Large-Scale Structure Renormalization
Group: Bridging the Gap Between QFT
and Cosmology*

Henrique Rubira
Technical University of Munich

Major improvements in the theoretical aspects of Cosmology have been possible in recent years due to QFT-inspired methods, such as the effective field theory of large-scale structure (EFTofLSS). In this talk, I will explore further connections between high-energy physics and cosmology. I will present a systematic approach to renormalizing the galaxy bias parameters using path integrals and a finite cutoff scale Λ . I will derive the differential equations of the Wilson-Polchinski renormalization group that describe the evolution of the finite-scale bias parameters with Λ , analogous to the β -function running in QFT. I will then discuss how the RG-flow of EFTofLSS can lead to improvements in the extraction of cosmological parameters and also serve as a tool for sanity checks.

Tuesday, November 21, 2023, 2:30 pm

Cosman Seminar Room

Center for Theoretical Physics

Building 6C, Room 6C-442

Massachusetts Institute of Technology