



Cosmological Correlators

IHES Summer School

IHES, July 6-17, 2026

Week 1:

Scott Melville

Introduction to Cosmological Correlators

These lectures will introduce:

- 1) what are cosmological correlators and why are they challenging,
- 2) in-in (Schwinger-Keldysh) techniques for computing correlators,
- 3) in-out (wavefunction) techniques for computing correlators,
- 4) how to interpret their analytic structure.

The aim is to establish the basic formalism behind perturbative calculations and the vocabulary commonly used, to prepare students for the more advanced topics in the school.

Enrico Pajer

Effective Field Theory of Cosmological Perturbations

Charlotte Sleight and Massimo Taronna:

Cosmological Bootstrap

Matias Zaldarriaga and Marko Simonovic:

Effective Field Theory of Large Scale Structure

Week 2:

Dionysios Anninos

Quantum Gravity in de Sitter Space

I plan to discuss quantum features of $\Lambda > 0$ theories.

An emphasis will be placed on the nature of the de Sitter horizon, Euclidean gravity methods, and the construction of theoretical toy models.

Time permitting we will also discuss timelike decorations and their role in cosmology.

Claudia de Rham and Andrew Tolley:

Positivity in Cosmology

Scott Dodelson

Connecting Theory to Observations

Raffaele Tito D'Agnolo:

Beyond-the-Standard-Model meets Cosmological Correlators"

- 1) Basics of the cosmological collider
- 2) BSM signatures at the cosmological collider
- 3) Introduction to the electroweak hierarchy problem and its cosmological signatures (if time permits).