

“The Wave Equation on FLRW Spacetimes”

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The Friedman–Lemaître–Robertson–Walker (FLRW) spacetime, often called the Standard Model of cosmology, describes the large-scale geometry of our universe. In this talk, we study how waves evolve and decay in this setting by analyzing solutions to the linear wave equation

$$-\frac{\partial^2 \phi}{\partial t^2} - npt^{-1} \frac{\partial \phi}{\partial t} + t^{-2p} \sum_{i=1}^n \frac{\partial^2 \phi}{\partial x_i^2} = 0, \quad \text{where } t > 0 \text{ and } p > 1.$$

Using energy methods and standard calculus tools, we obtain a precise description of the long-time behavior of solutions. We also discuss how these techniques extend to a broad class of nonlinear wave equations in the small-data regime.

Thursday, Oct. 23, 2025
4:00 - 5:20PM

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Open & Free to all students, faculty and public