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Title: Cone structures and their applications to fundamental theories and discretization

Abstract:

In General Relativity, the lightcone structure satisfies a quadratic constraint and determines the spacetime metric up to a conformal factor. In this talk, we explore how (convex) cone structures can be employed to model the propagation of potentially anisotropic waves in both fundamental and classical physics. This framework includes the substitution of the Lorentzian metric with a Lorentz-Finsler one, the formulation of a Fermat principle governing wave propagation, and the derivation of a Snell-type law applicable to classical media with discontinuities as well as to discretized spacetimes. (Ongoing work with M.A. Javaloyes, S. Markvorsen, and E. Pendás-Recondo will be presented.)