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Ultrarelativistic Limit of Gravity, Spacelike Singularities and E(10)

mercredi 13 octobre 2021 12:00 (30 minutes)

Einstein's theory admits interesting limits with different causal structures obtained by letting the speed of light go to infinity (Galilean or "non-relativistic" limit) or to zero (Carrollian, or "ultrarelativistic" limit). In the latter case, instead of the hyperbolic partial differential equations of general relativity and the elliptic differential equations of Newton's theory, the dynamical equations become ordinary differential equations with respect to time. The ultrarelativistic limit turns out to be relevant near spacelike (cosmological) singularities when spatial gradients become subdominant. The resulting differential equations possess a remarkable interpretation in terms of infinite-dimensional Kac-Moody algebras. The talk will discuss work pursued in collaboration with Thibault Damour on this topic, as well as some aspects of Carroll invariant theories.

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