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## Non-relativistic transport from frame-indifferent kinetic theory

*vendredi 26 juillet 2024 14:30 (30 minutes)*

I will present the application of Newton-Cartan geometry to the kinetic theory of gases in gravitational fields. Starting with an introduction to the basics of Newton-Cartan geometry, I will examine the motion of point particles within this framework, leading to a detailed analysis of kinetic theory and the derivation of conservation equations. The equilibrium distribution function will be explored, culminating in a practical example involving a rotating gas in a gravitational field. Further, we will develop covariant hydrodynamics equations and extend our analysis through a gradient expansion approach to assess first-order constitutive relations. This allows us to derive the viscous transport for rotating gases in a consistent way. Finally, we will address the frame-dependence paradox, presenting a novel resolution that explains apparent discrepancies in the literature. Our construction resolves a fifty-year-old debate about the frame-indifferent formulation of kinetic theory.

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