Contribution ID: **25** Type: **Talk**

Generalized Geodesic Equations from Planck Scale Deformed Dispersion Relations

Tuesday 1 July 2025 14:20 (20 minutes)

Modified dispersion relations gives an effective way to incorporate Planck-scale effects into particle kinematics and quantum gravity phenomenology. These effects can be encoded in Hamilton functions and it goes beyond the standard quadratic dependence on the four-momentum. This leads to nontrivial modifications in the geodesic equations for point particles. In this talk, I explore the consequences of a broad class of deformed Hamiltonians of the form $H(x,p) = H(g(p,p), A(p))$, where $g(p,p) = g^{ab}(x)p_a p_b$ and $A(p) = A^a(x)p_a$ which generalize both Finsler-type and kappa-Poincaré-inspired models.
My goal is to understand how these Hamiltonians modify the usual geodesic equations that describe the motion of point particles. By reinterpreting Hamilton's equations geometrically, I show how the additional structure, especially the linear momentum term, gives rise to corrections that could capture quantum gravitational effects in a covariant way. This provides a flexible and powerful framework to describe particle propagation on curved spacetimes and gives a way to connect these models to future observations.

Author: JUTHY, Zubaida Karim (University of Bremen)

Presenter: JUTHY, Zubaida Karim (University of Bremen)

Session Classification: Tuesday Parallel 1 - A106

Track Classification: Contributed talks