

Finsler spacetimes, observer space and Cartan geometry

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Finsler spacetimes, which generalize the notion of Finsler spaces to metrics with indefinite signature, and Cartan geometries appear as very different geometric structures. While the former are characterized by a parametrization invariant length measure for curves, the latter are described by a Lie algebra valued connection form on the total space of a principal bundle. In my talk I show a construction which allows to obtain a particular Cartan geometry from a Finsler geometry. The central ingredient in this construction is the so-called observer space, i.e., the space of future unit timelike vectors defined by a Finsler spacetime, which serves as the base space of the Cartan geometry. The Cartan connection is then obtained from the Cartan linear connection on the Finsler spacetime. I show how this construction allows to relate different notions between both geometries, in particular the notion of invariance under group actions, and discuss its relevance to applications in gravitational physics.