Contribution ID: **11** Type: **Talk**

The 3+1 formalism in torsion and nonmetricity-based theories of gravity

Thursday 10 April 2025 17:30 (20 minutes)

We present recent advancements in the 3+1 formalism within two reformulations of general relativity: the teleparallel equivalent of general relativity, and the symmetric teleparallel equivalent of general relativity. Both theories are based on the torsion and nonmetricity of a flat connection, respectively, and their Lagrangians are expressed in terms of the torsion scalar T and the nonmetricity scalar Q. These differ from the Ricci scalar R of general relativity by boundary terms. The bulk equations of motion in these theories are equivalent to those of Einstein's gravity; however, the fundamental fields comprehend not only the tetrad or the metric but also gauge degrees of freedom encoded in the connection. This inclusion can alter the canonical structure and the gauge sector of the 3+1 evolution. We investigate Hamilton's equations of these reformulations of general relativity to facilitate future research on the strong hyperbolicity of the dynamical equations, and to explore novel reformulations of the numerical relativity framework.

Author: GUZMAN, Maria Jose (University of Tartu, Estonia)

Presenter: GUZMAN, Maria Jose (University of Tartu, Estonia)

Session Classification: Contributed talks

Track Classification: Mathematics