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Teleparallel relativity

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The principle of relativity is the requirement that the equations describing the laws of physics have the same form in all admissible frames of reference. To complete realisation of the principle required the recent refinement of Einstein's theories of gravity, since they did not distinguish the admissible reference frames (but confused reference frames with coordinate systems). The new canonical theory is presented as a unification of the "geometrical trinity of gravity", a triad of alternative geometrical formulations and the corresponding alternative interpretations of the gravitational interaction. Applications to black holes and cosmology will be discussed. The canonical theory provides the unique consistent definition of relativistic energy, thus resolving a long-standing foundational problem in physics and paving the way for general-relativistic quantum mechanics.

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