

Christian Pfeifer

II Institute for Theoretical Physics, University of Hamburg

Finsler extension of Einstein gravity

Authors: C. Pfeifer, M. Wohlfarth

I present an extension of Einstein gravity based on the use of Finsler geometry which generalizes Lorentzian metric geometry. The definition of Finsler spacetimes is presented in some detail and it will be discussed that these are nice generalizations of Lorentzian metric spacetimes, which admit all structures necessary for physics: causality, observers, their measurements, field theories and dynamics consistent with general relativity. The dynamical theory of Finsler spacetimes is constructed from a well defined action principle, the Field equation is obtained by variation and it reduce to the Einstein equations in the case the Finsler spacetime is a Lorentzian metric spacetime. A specific first order spherical symmetric solution of this Finsler gravity theory turns out to be a refinement of the well known Schwarzschild solution of general relativity and can in principle be compared with experimental data in the solar system.