GR 15: Alternative Ansätze I

Zeit: Donnerstag 18:00–18:30 Raum: HS 6

GR 15.1 Do 18:00 HS 6

Observer space of Finsler spacetimes — •Manuel Hohmann — Teoreetilise Füüsika Labor, Füüsika Instituut, Tartu Ülikool

Two different ideas to generalize our classical picture of spacetime in an observer dependent fashion will be briefly reviewed. The first idea is Finsler geometry, where the Lorentzian metric of spacetime depends on the four-velocity of an observer. The second idea is a lift of general relativity from a Lorentzian manifold to the space of observers, i.e., future timelike unit tangent vectors. It will be shown that these approaches are closely related. Constructions to obtain an observer space from a Finsler spacetime and vice versa will be discussed.

GR 15.2 Do 18:15 HS 6

Gravity - Based on Lorentzian Relativity — •Albrecht Giese — Taxusweg 15, 22605 Hamburg

In order to explain relativity, Einstein used a geometric method for the required physical calculations. Contrary to general opinion, Einstein was not the original inventor of this method, which was in fact developed about 100 years before him. The method was later given up because it turned out not to be helpful in understanding physics and to have intricate mathematical implications. However, it has now achieved high acclamation in connection with Einstein's name.

We will show that relativity can be led back from geometrization to physics. The benefits of this approach are that it is easier to grasp and has a stronger relationship with the other branches of physics. Special relativity and general relativity (i.e. gravity) can be understood and treated using classical physics and school-level mathematics to produce exactly the same results as Einstein in almost all applications. At the same time, unresolved problems like dark energy and quantum gravity can be solved.

Further information: www.ag-physics.org/gravity