

Seminar: "Geometry&Physics, DFT"

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Location: DFT seminar room

Date: Friday, 25 September 2015, 11:00 a.m.

Title: **The Generalized Uncertainty Principle and extra Dimensions**

Speaker: **Dr. Sven Köppel** (FIAS, Goethe University Frankfurt)

Abstract: "This presentation deals with recent developments in the field of short scale modified black holes (BHs). Many of the current endeavors of finding a quantum theory of gravity introduce two basic adjustments: Additional space dimensions and the existence of a minimal length of about the Planck length. According to this line of reasoning we modify the Heisenberg uncertainty relation into a generalized uncertainty principle (GUP). To evaluate the effects of the GUP in curved space, we consider a non-local gravity Lagrangian. The resulting field equations depend on a non-local operator not known a priori. We show that a particular profile of such an operator can reproduce GUP effects. Specifically we derive a GUP improved Schwarzschild metric. Even if the curvature singularity is just smoothed, the thermodynamics becomes regular, i.e., the temperature no longer diverges in the final evaporation stage and a cold black hole remnant forms. Comments about the gravity self-complete paradigm, extradimensional extensions and the analytical continuation to negative radii are offered during the talk."