

Plenarvortrag

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Dynamical vs. Thermodynamical (In-)stabilities of Black Holes — ●STEFAN HOLLANDS — Institut für Theoretische Physik, Universität Leipzig, Brüderstr. 16, Leipzig D-04103

Black holes have long been known to have properties that are in striking analogy to the zeroth, first, and second law of thermodynamics. It is an intriguing question whether further analogies of this nature also exist in the context of stability questions. For instance, if an ordina-

ry laboratory type system possesses a negative heat capacity (positive eigenvalue of the Hessian of the entropy), then a homogeneous equilibrium state of the system cannot be stable, but will turn into another one with an inhomogeneous energy density. Do statements of this nature still hold for black holes? In this talk, I will show that the answer to this question is in the affirmative, and that thermodynamic considerations in fact give useful information about the stability properties of highly complicated black hole solutions that are difficult to extract by other, more explicit, methods.