GR 5: Schwarze Löcher

Zeit: Dienstag 16:45–18:05 Raum: 30.45: 101

GR 5.1 Di 16:45 30.45: 101

Charged Balanced Black Rings in Five Dimensions — Burkhard Kleihaus, •Jutta Kunz, and Kirsten Schnülle — Universität Oldenburg

We present electrically charged balanced black ring solutions of pure Einstein-Maxwell theory in five dimensions. The solutions are asymptotically flat. Their tension and gravitational self-attraction are balanced by the repulsion due to rotation and electrical charge. We discuss the global and horizon properties of these solutions and show that they satisfy a Smarr relation. We address the phase diagram of these singly rotating black rings.

GR 5.2 Di 17:05 30.45: 101

Stationary Rotating Black Holes in Dilatonic Einstein-Gauss-Bonnet Theory — •Burkhard Kleihaus[1], Jutta Kunz[1], and Eugen Radu[2] — [1]University of Oldenburg — [2]School of Theoretical Physics - DIAS, Dublin, Ireland

Kerr black holes in Einstein gravity are known in closed form and well studied. String theory on the other hand suggest higher order curvature corrections to pure Einstein gravity. In the simplest four dimensional model the Gauss-Bonnet (GB) term coupled to the dilaton field is added to the Einstein action, leading to the Einstein-Gauss-Bonnet-dilaton (EGBd) theory. Black holes in EGBd theory may possess new qualitative features. In this talk the influence of the GB term on the properties of stationary rotating black holes is addressed. We show that a generalised Smarr relation holds in EGBd theory. Our results indicate that for EGBd black holes the angular momentum can exceed the extremal limit of the Kerr black hole in pure Einstein gravity. We compare the innermost stable circular orbits of EGBd black holes and Kerr black holes.

GR 5.3 Di 17:25 30.45: 101

Holographic superconductors and superfluids - effect of backreaction — •Betti Hartmann[1] and Yves Brihaye[2] — [1]School of Engineering and Science, Jacobs University Bremen, 28759 Bremen — [2]Faculte de Sciences, Universite de Mons, 7000 Mons, Belgium

Recently, the gravity-gauge theory correspondence has been used to describe so-called holographic superconductors and superfluids with the help of black holes in Anti-de Sitter space-time. In this talk, I will discuss holographic supercondutors and superfluids away from the probe limit, i.e. taking backreaction of the space-time into account. In the first part of the talk I will present our results for Gauss-Bonnet holographic superconductors in (3+1) dimensions, while the second part will deal with holographic superfluids in (2+1) dimensions where one of the spatial dimensions is compactified.

GR 5.4 Di 17:45 30.45: 101

Boson shells harboring charged black holes — •Meike List[1], Burkhard Kleihaus[2], Jutta Kunz[2], and Claus Lämmerzahl[1] — [1]ZARM - Universität Bremen, Am Fallturm, 28359 Bremen — [2]Carl-v.-Ossietzky-Universität Oldenburg, Institut für Physik, 26111 Oldenburg

We consider boson shells in scalar electrodynamics coupled to Einstein gravity. The interior of the shells can be empty space, or harbor a black hole or a naked singularity. We analyze the properties of these types of solutions and determine their domains of existence. We investigate the energy conditions and present mass formulae for the composite black hole-boson shell systems. We demonstrate that these types of solutions violate black hole uniqueness.