GR 3: Schwarze Löcher 2

Zeit: Montag 14:00–16:00 Raum: SFG 0140

GR 3.1 Mo 14:00 SFG 0140

Charged, Rotating Black Objects in Einstein-Maxwell-Dilaton Theory in $D \geq 5$ — Burkhard Kleihaus[1], •Jutta Kunz[1], and Eugen Radu[2] — [1]University of Oldenburg, Germany — [2]University of Aveiro, Portugal

We study black objects with non-spherical horizon topology in $D \geq 5$ dimensions, which possess $k+1$ angular momenta of equal magnitude, where $0 \leq k \leq \lfloor \frac{D-5}{2} \rfloor$. These black objects describe black rings ($k=0$) and black ringoids ($k>0$). We endow the vacuum solutions with charge by employing the Kaluza-Klein construction with an appropriate value of the dilaton coupling constant.

GR 3.2 Mo 14:20 SFG 0140

Geodesics in the 5D Myers-Perry-AdS spactime and applications to AdS/CFT — •Saskia Grunau and Hendrik Neumann — Carl von Ossietzky Universität Oldenburg

The five-dimensional Myers-Perry-Anti-de-Sitter spacetime describes a black hole which is characterized by its mass, two independent rotation parameters and the negative cosmological constant. In the context of AdS/CFT it can be associated with a four dimensional conformal field theory on the boundary. Here we study the 5D Myers-Perry-AdS spactime using geodesics. Therefore we derive the equations of motion and solve them in terms of the Weierstraß functions. We analyze the geodesic motion in detail and give a list of all possible orbits. Furthermore we discuss the appliction of geodesics in the AdS/CFT correspondence. In particular, geodesics can be related to two-point correlators.

GR 3.3 Mo 14:40 SFG 0140

Analytic solutions of the geodesic equation for $U(1)^2$ dyonic rotating black holes — •Kai Flathmann and Saskia Grunau — Institut für Physik, Universität Oldenburg, D- 26111 Oldenburg, Germany

In this talk we present the equations of motion of test particles and light of the six parameter $U(1)^2$ dyonic rotating black hole family and its solutions. One special feature of this spacetime is the 2-dimensional curvature singularity, which shape varies from ring singularities to toroidal like structures. The equations of motion can be derived from the Hamilton-Jacobi equation and are solved in terms of derivatives of the hyperelliptic Kleinian σ function. We use parametric diagrams and effective potentials to characerize the radial and latitudinal motion and present a list of possible orbit types.

GR 3.4 Mo 15:00 SFG 0140

Hairy black holes in the general Skyrme model — •Olga Kichakova[1], Yakov Shnir[2], Christoph Adam[3], and Andrzej Wereszczynski6[4] — [1]University of Oldenburg, Germany — [2]BLTP, JINR, Dubna, Russia — [3]Santiago de Compostela University, Spain — [4]Jagiellonian University, Poland

We study the existence of hairy black holes in the generalized Einstein-Skyrme model. It is proven that in the BPS model limit there are no hairy black hole solutions, although the model admits gravitating (and flat space) solitons. Furthermore, we find strong evidence that a necessary condition for the existence of black holes with Skyrmionic hair is the inclusion of the Skyrme term L_4. As an example, we show that there are no hairy black holes in the $L_2 + L_6 + L_0$ model and present a new kind of black hole solutions with compact Skyrmion hair in the $L_4 + L_6 + L_0$ model.

GR 3.5 Mo 15:20 SFG 0140

Magnetized AdS black holes and solitons in Einstein-Maxwell-Chern-Simons theory — •Jose Luis Blazquez-Salcedo — Oldenburg University, Oldenburg, Germany

In this talk we present a new class of AdS black holes and solitons in D=5 Einstein-Maxwell-Chern-Simons theory. These objects are cohomogeneity-1 solutions, which asymptotically approach an AdS_5 space-time. The black holes are characterized by their mass, equal magnitude angular momenta, electric charge, and the magnitude of the magnetic potential at the AdS boundary. The solitons appear as deformations of the magnetized AdS background. We investigate the connection between the black holes and the solitons and we study how their thermodynamic properties change under this transition.

GR 3.6 Mo 15:40 SFG 0140

First steps in calculating supermassive objects (black holes) using TOV equation — •Jürgen Brandes — Karlsruhe, Germany

Lorentz interpretation (LI of GRT) predicts supermassive objects without event horizon and therefore they are different from black holes of classical GRT [1]. Possibly, these differences become observable by the Event Horizon Telescope and BlackHoleCamp projects. To assist this process, supermassive objects are calculated using the TOV equation which has no singularities if LI of GRT is applicated. The talk discusses the first steps and can be followed on www.grt-li.de.

[1] J. Brandes, J. Czerniawski: *Spezielle und Allgemeine Relativitätstheorie für Physiker und Philosophen - Einstein- und Lorentz-Interpretation, Paradoxien, Raum und Zeit, Experimente*, 4. Aufl., VRI 2010