GR 3: Schwarze Löcher 2

Zeit: Montag 16:45–18:05 Raum: JUR K

GR 3.1 Mo 16:45 JUR K

$d \geq 5$ static black holes with nonspherical horizon topology — Burkhard Kleihaus, Jutta Kunz, and •Eugen Radu — Institut für Physik, Universität Oldenburg, Postfach 2503 D-26111 Oldenburg, Germany

We discuss the properties of a class of $d \geq 5$ black holes with an event horizon topology $S^2 \times S^{d-4}$. These asymptotically flat solutions are static and present a conical singularity in the bulk. For $d = 5$ they reduce to the Emparan-Reall static black ring. Asymptotically anti-de Sitter black holes with an $S^2 \times S^1$ topology of the horizon are also discussed.

GR 3.2 Mo 17:05 JUR K

Asymptotically flat charged rotating dilaton black holes in higher dimensions — Ahmad Sheykhi[1], •Masoud Allahverdizadeh[2], Yosof Bahrampour[3], and Majid Rahnama[4] — [1]Department of Physics, Shahid Bahonar University, PO Box 76175, Kerman, Iran — [2]Institut fur Physik, Universitat Oldenburg, D-26111 Oldenburg, Germany — [3]Department of Mathematics, Shahid Bahonar University, Kerman, Iran — [4]Department of Physics, Shahid Bahonar University, PO Box 76175, Kerman, Iran

we find a class of asymptotically flat slowly rotating charged black hole solutions of Einstein*Maxwelldilaton theory with arbitrary dilaton coupling constant in higher dimensions. Our solution is the correct one generalizing the four-dimensional case. In the absence of a dilaton field, our solution reduces to the higher-dimensional slowly rotating Kerr*Newman black hole solution. The angular momentum and the gyromagnetic ratio of these rotating dilaton black holes are computed. It is shown that the dilaton field modifies the gyromagnetic ratio of the black holes.

GR 3.3 Mo 17:25 JUR K

Theoretical survey of tidal-charged black holes at the LHC — Benjamin Harms[1], Roberto Casadio[2], Sergio Fabi[1], and •Octavian Micu[3] — [1]University of Alabama, Tuscaloosa, Al, USA — [2]Bologna University and INFN, Italy — [3]TU Dortmund, Germany

A family of brane-world black holes which solve the effective four-dimensional Einstein equations for a wide range of parameters related to the unknown bulk/brane physics is analysed. The study is aimed at predicting the typical behavior one can expect if such black holes were produced at the LHC. It is found that, under no circumstances, the black holes would reach the (hazardous) regime of Bondi accretion. Nonetheless, the possibility remains that black holes live long enough to escape from the accelerator (and even from the Earth's gravitational field) and result in missing energy from the detectors.

GR 3.4 Mo 17:45 JUR K

Charged Boson Stars and Black Holes — •Meike List[1], Jutta Kunz[2], Burkhard Kleihaus[2], and Claus Lämmerzahl[1] — [1]ZARM - Universität Bremen, Am Fallturm, 28359 Bremen — [2]Carl-von-Ossietzky-Universität Oldenburg, Carl-von-Ossietzky-Straße 9-11, 26129 Oldenburg

We consider boson stars and black holes in scalar electrodynamics with a V-shaped scalar potential. The boson stars come in two types, having either ball-like or shell-like charge density. We analyze the properties of these solutions and determine their domains of existence. When mass and charge become equal, the space-times develop a throat. The shell-like solutions need not be globally regular, but may possess a horizon. The space-times then consist of a Schwarzschild-type black hole in the interior, surrounded by a shell of charged matter, and thus a Reissner-Nordstrøm-type space-time in the exterior. These solutions violate black hole uniqueness. The mass of the black hole solutions is related to the mass of the regular shell-like solutions by a mass formula of the type first obtained within the isolated horizon framework.