GR 7: Schwarze Löcher

Zeit: Mittwoch 16:45–19:05 Raum: A214

GR 7.1 Mi 16:45 A214

Asymptotically flat charged rotating dilaton black holes in higher dimensions — Ahmad Sheykhi, •Masoud Allahverdizadeh, Yosof Bahrampour, and Majid Rahnama — shahid bahonar kerman university,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 of Horne and Horowitz [J.H.Horne, G.T. Horowitz, Phys. Rev. D 46 (1992) 1340]. 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 7.2 Mi 17:05 A214

Rotating Einstein-Maxwell-Dilaton Black Holes — Burkhard Kleihaus[1], •Jutta Kunz[1], Francisco Navarro-Lerida[2], and Jan Viebahn[3] — [1]Universität Oldenburg — [2]Universidad Complutense de Madrid — [3]Universität Kiel

We construct numerically asymptotically flat rotating black holes in Einstein-Maxwell-dilaton theory in 4 and higher dimensions for arbitrary dilaton coupling constant. We focus on higher odd dimensions and equal angular momenta, where the angular dependence can then be treated explicitly. We discuss the global and horizon properties of these black holes and compare to the Einstein-Maxwell and Kaluza-Klein cases. In 4 dimensions the black holes can carry both electric and magnetic charge, giving rise to counterrotating horizons beyond a critical value of the dilaton coupling strength.

GR 7.3 Mi 17:25 A214

Charged black objects in Kaluza-Klein theory — •Eugen Radu, Burkhard Kleihaus, and Jutta Kunz — Universität Oldenburg

We construct charged static black strings and $p-$brane solutions in a theory of gravity in $D-$dimensions coupled with a dilaton and an antisymmetric form by using a Harrison-type transformation. The seed vacuum solutions we use correspond to uplifted Kaluza-Klein black strings and black holes in $D-p$ dimensions. We argue that the thermodynamics of these solutions can be derived from those of the vacuum configurations. New charged nonuniform black strings rotating in a single plane are studied in a perturbative approach for $D = 5, 6$ dimensions.

GR 7.4 Mi 17:45 A214

The power of Poincaré invariance concerning black hole binary interaction — •Steven Hergt, Gerhard Schäfer, and Jan Steinhoff — FSU Jena, TPI, Max-Wien Platz 1, Germany

The fulfillment of the space-asymptotic Poincaré algebra is used to derive new higher-order-in-spin interaction Hamiltonians for binary black holes in the Arnowitt-Deser-Misner canonical formalism almost completing the set of the formally second post-Newtonian order spin-interaction Hamiltonians involving nonlinear spin terms.

GR 7.5 Mi 18:05 A214

Hamiltonians from the Stress-Energy Tensor — •Jan Steinhoff, Steven Hergt, and Gerhard Schäfer — Theoretisch-Physikalisches Institut, Friedrich-Schiller-Universität, Max-Wien-Platz 1, 07743 Jena, Germany

We show how Hamiltonians for spinning black holes can be derived from the stress-energy tensor. The Hamiltonians fits into the canonical formalism of Arnowitt, Deser, and Misner and are given in their transverse-traceless gauge. All post-Newtonian next-to-leading order spin effects up to quadratic order in spin for binary black holes are presented in Hamiltonian form.

GR 7.6 Mi 18:25 A214

Lorentz-Verletzung und Schwarze Löcher — Gerold Betschart, •Elisabeth Kant und Frans R. Klinkhamer — Institut für Theoretische Physik, Universität Karlsuhe

Es werden Schwarze Löcher in der lorentz-verletzenden modifiezierten Maxwell-Theorie diskutiert. Besondere Aufmerksamkeit gilt möglicherweise auftretenden multiplen Ereignishorizonten und Implikationen für den zweiten Hauptsatz der Thermodynamik Schwarzer Löcher.

GR 7.7 Mi 18:45 A214

Fuzzy Black Holes — •Peter Schupp — Jacobs–Universität Bremen

The quantization of the geometry of classical black hole solutions, e.g. as a toy model for the study of quantum gravitational effects, leads to discrete "fuzzy" geometries. We discuss some examples in 3 and 4 dimensions with space-time and space-space noncommutativity.