

## GR 18: Numerische Relativitätstheorie

Zeit: Freitag 12:00–12:30

Raum: SFG 0140

GR 18.1 Fr 12:00 SFG 0140

**Solving Elliptic Equations by Hyperbolic Relaxation**  
— ●HANNES RÜTER and BERND BRÜGMANN — Theoretisch-Physikalisches Institut, Friedrich-Schiller-Universität Jena, Deutschland

It will be demonstrated how hyperbolic evolution codes can be used to solve elliptic equations by the hyperbolic relaxation method. We present applications to typical numerical relativity initial data problems, i.e. scalar fields and binary neutron star systems. For the hyperbolic evolution we employ the pseudo-spectral numerical relativity code `bamps`.

GR 18.2 Fr 12:15 SFG 0140

**Discontinuous Galerkin methods in general relativistic neutron star simulations** — ●MARCUS BUGNER, DAVID HILDITCH, HANNES RÜTER, and BERND BRÜGMANN — Theoretical Physics Institute, University of Jena, 07743 Jena, Germany

After the successful combination of Discontinuous Galerkin (DG) and pseudo-spectral methods for matter plus spacetime simulations, we present further extensions of our method. Targeting a reliable high-order algorithm, we put special focus on our shock capturing method and show the latest convergence results for fully general relativistic systems. Furthermore, we investigate the scalability of our numerical implementation.