



Einladung zum Mathematischen Kolloquium

Es spricht am

Freitag, den 30.01.2015, um 17.15 Uhr

PD Dr. Oliver Rinne

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über das Thema

„Numerical approaches to global evolution of the Einstein equations“

A major open problem in numerical general relativity is the construction of entire asymptotically flat spacetimes including conformal infinity. This is important both for the modelling of far away sources of gravitational radiation and for the study of global properties of solutions to Einstein's equations.

With Vincent Moncrief (Yale) we developed a constrained 3+1 formulation of the Einstein equations on conformally compactified spacetime slices of constant mean curvature (CMC) approaching future null infinity. Formally singular terms in the equations at conformal infinity require special care but can be shown to attain regular limits. This scheme has been successfully implemented numerically for various applications in spherical symmetry such as the asymptotic behaviour of matter fields and critical phenomena in gravitational collapse. A first axisymmetric implementation including gravitational radiation has also been achieved. The question remains how to include spatial infinity, as the CMC surfaces are only partial (future) Cauchy surfaces. As a first step, with Georgios Doulis (AEI) we numerically constructed Cauchy data for the axisymmetric vacuum Einstein equations extending to spatial infinity based on Corvino's gluing method. The advantages of this approach for the subsequent evolution will be discussed.

Der Vortrag findet im Hörsaal N14 (M1) des Mathematischen Instituts (Gebäude C, Auf der Morgenstelle 10) statt. Zuvor wird zum Tee im Hermann-Hankel-Raum (6. Stock, ab 16 Uhr 45) eingeladen.