



# Einladung zum Mathematischen Kolloquium mit Vor-Kolloquium

**16:00 - 16:45 Uhr Vor-Kolloquium im N14** für Studierende und Promovierende, moderiert von Herrn Jason Ledwidge“

"I will recall some elementary properties of the linear wave equation on flat and on black hole spacetimes"

Es spricht am

Montag, den 04.12.2017, um 17:15 Uhr

***Dr. Gustav Holzegel***

*(Imperial College London)*

über das Thema

## **„The Stability of Black Holes“**

In October, the Nobel Prize in Physics was awarded for the detection of gravitational waves. These waves have been produced by the merger of two black holes, 1.3 billion light years away.

While we are very far from a mathematical understanding of the interaction of two black holes within Einstein's theory of general relativity, significant progress has been made understanding the dynamics of one black hole near equilibrium (stability). Already here very difficult mathematical challenges arise both from the non-linear nature of the Einstein equations and from the interplay of the intricate black hole geometries with the PDE analysis.

I will first describe the mathematical notion of a black hole and then report on progress that has been made in the last decade on the analysis of black hole spacetimes. This will include describing some of the techniques from geometry and the theory of hyperbolic partial differential equations that have been developed in the context of the stability problem.

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Der Hauptvortrag 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.