EBERHARD KARLS UNIVERSITÄT TÜBINGEN

Mathematisch-Naturwissenschaftliche Fakultät

**Fachbereich Mathematik
AB Geometrische Analysis,
Differentialgeometrie und
Relativitätstheorie**

Oberseminar
Geometrische Analysis, Differentialgeometrie und Relativitätstheorie

Am Donnerstag, den 17.10.2024 spricht um **14 Uhr s.t.** im Raum **S9 (C6H05) und über Zoom**

Vindula Kumaranayake
(Universität Münster)

über das Thema

Rigidity Theorems in General Relativity: Birkhoff's Theorem via Existence and Uniqueness of Quasilinear Hyperbolic PDEs

In this talk, I begin by assuming the existence of a spherically symmetric solution to the Einstein vacuum equations and proceed to derive a system of hyperbolic partial differential equations (PDEs) that the metric components satisfy in null coordinates. Then I establish the local existence and uniqueness of solution for this system of hyperbolic PDEs using the Banach Fixed Point Theorem, demonstrating that the system is well-posed in an appropriate function space. Furthermore, by prescribing suitable data in the Kruskal spacetime, we obtain a proof of Birkhoff's theorem, which states that any spherically symmetric vacuum solution must be locally isometric to the Schwarzschild solution. Time permitting, I will also discuss the Lichnerowicz theorem and Israel's theorem regarding the uniqueness of static, asymptotically flat spacetime solutions.

Den Zoom-Link erhalten Sie per E-Mail von Martina Neu.

For participating online, please sign up by sending an email to Martina Neu.

Hierzu wird herzlich eingeladen.

Rodrigo Avalos, Carla Cederbaum, Gerhard Huisken, zusammen mit Jan Metzger (Potsdam)