



Oberseminar

Geometrische Analysis, Differentialgeometrie und Relativitätstheorie

Am Donnerstag, den **30.01.2025** spricht um **14 Uhr s.t.** im Raum **S9 (C6H05)** und über Zoom

Prof. Dr. A. Shadi Tahvildar-Zadeh

(Rutgers University)

über das Thema

Singularity Theories of Matter, Weak Second Bianchi Identity, and Bray's Mass of ZASS

The second Bianchi identity is a differential curvature identity that is satisfied on any manifold with a smooth metric. If the metric of a Lorentzian manifold solves the Einstein equations, the twice contracted version of the second Bianchi identity implies the physical laws of energy and momentum conservation for the matter field permeating the spacetime. In this talk I define a distributional version of the twice-contracted second Bianchi identity, and show that it holds for spacetimes with time-like curvature singularities, provided that these singularities are in a precise sense not too strong. The momentum and energy balance laws that follow from this assertion could potentially be used to develop a theory, first envisioned by Weyl, in which worldlines of matter particles are identified with time-like singularities of an otherwise vacuum spacetime. As a first application, a large class of spherically symmetric static Lorentzian metrics with time-like one-dimensional singularities is identified, for which the identity holds. The proof uses the machinery of zero-area singularities (ZASS) and the notion of mass for them as defined by H. Bray. This is joint work with A. Burtscher and M. Kiessling.

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)