



Sommersemester 2020

**Oberseminar
Geometrische Analysis, Differentialgeometrie und Relativitätstheorie**

Am Donnerstag, den 16.04.2020 spricht um 14 Uhr c. t. per Videoübertragung

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über das Thema

On the evolution of hypersurfaces along their inverse spacetime mean curvature

We introduce a new inverse curvature flow on asymptotically flat Initial Data sets (M, g, K) . In General Relativity, such a triple (M, g, K) arises naturally as a spacelike hypersurface of a Lorentzian manifold (L, h) with induced metric g and second fundamental form K , where (L, h) models an isolated gravitating system governed by Einsteins Equations. In the setting of General Relativity, Huisken–Ilmanen provided a proof of the famous Riemannian Penrose Inequality on time-symmetric ($K \equiv 0$), asymptotically flat Initial Data sets satisfying additional physically reasonable assumptions using a weak notion of inverse mean curvature flow. Similar to inverse null mean curvature flow introduced by Moore, inverse spacetime mean curvature flow attempts a generalization of inverse mean curvature flow to non-time symmetric Initial Data sets. We develop the theory of both classical and weak solutions, where the latter are defined as solutions of a comparison principle. The main result presented in this talk is the existence of weak solutions to inverse spacetime mean curvature flow in maximal Initial Data sets. We further study the development of jump times of weak solutions, which in particular, as an application to General Relativity, yields under further assumptions the existence of apparent generalized horizons. This is joint work with Gerhard Huisken.

Hierzu wird herzlich eingeladen. Bei Interesse bitte per E-Mail an angelika.spoerer-schmidle@uni-tuebingen.de anmelden, um den Link zur Videoübertragung zu erhalten.

C. Cederbaum, G. Huisken