AUSHANG

FREIE UNIVERSITÄT BERLIN
Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Mittwoch, 16. April 2014, 10.00 Uhr

Ort: Arnimallee 7, Hinterhaus, Raum 140, 14195 Berlin

Disputation über die Doktorarbeit von

Herrn Felix Jachan

Thema der Dissertation:
Flächeninhaltserhaltender Willmore-Fluss
im asymptotisch Schwarzschildschen

Thema der Disputation:
Rotational symmetry of steady gradient Ricci solitons

Abstract: Ricci solitons play an important role in singularity analysis for the Ricci Flow. They correspond to self-similar solutions of the flow, i.e. to solutions which evolve only by rescalings and intrinsic diffeomorphisms while retaining their 'shape'. If the scale of the solution stays constant, the soliton is said to be steady. Ricci solitons arise as certain blow up limit manifolds near singularities of the Ricci Flow and thus, a classification of solitons is essential for a thorough understanding of singularities.

The simplest example of a steady 3-D Ricci soliton is flat, Euclidean space. There are also non-flat examples; Bryant [2] constructed a non-flat metric on R^3 which constitutes a steady Ricci soliton.
Moreover, this soliton is rotationally symmetric and it can be shown that it is unique in the class of steady, nonflat, rotationally symmetric solitons.

Recently, Brendle [1] was able to prove rotational symmetry for a large class of non-flat steady ricci solitons, which implies that all of these solitons have to be isometric to Bryant's soliton. Brendle only assumes the regarded solitons to be non-collapsed - that is, to have a lower bound on the ratio between volume and diameter of certain geodesic balls. His proof involves intricate estimates within the fields of PDE theory and geometry and eventually leads to construction of killing vector fields at infinity.

In this talk, we sketch Brendle's proof and give a glimpse of variants and generalizations of his result.

[1] S. Brendle, Rotational symmetry of self-similar solutions to the Ricci flow, Invent. Math. 197:731-764 (2013).
[2] R. Bryant, Ricci flow solitons in dimension three with SO(3)-symmetries. Available at www.math.duke.edu/~bryant/3DRotSymRicciSolitons.pdf.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Dr. F. Schulze