9th Northern German Differential Geometry Day

(Hamburg – Hannover – Kiel)

Christian-Albrechts-Universität zu Kiel – Friday, June 8, 2018

Programme

10:15 – 11:00, R. 423 (Konferenzraum)
Arrival / Welcome / Coffee

11:00 – 11:50, R. 424 (Kleiner Hörsaal)
Lothar Schiemanowski (Kiel)
Blow up criteria for geometric flows on surfaces

12:00 – 13:30
Lunch Break

13:45 – 14:35, R. 424 (Kleiner Hörsaal)
David Lindemann (Hamburg)
Properties of the moduli space of complete connected
projective special real manifolds and resulting curvature bounds

14:45 – 15:35, R. 424 (Kleiner Hörsaal)
Andreas Ott (Heidelberg)
Higgs bundles and pleated surfaces

15:35 – 16:15, R. 423 (Konferenzraum)
Coffee Break

16:15 – 17:15, R. 424 (Kleiner Hörsaal)
Colloquium
Dorothee Schüth (HU Berlin)
On the heat coefficients of geodesic polygons

Conference venue	Christian-Albrechts-Universität zu Kiel Mathematisches Seminar Ludewig-Meyn-Str. 4, 24118 Kiel Lecture Hall R. 424
Organizers	Roger Bielawski (Leibniz Universität Hannover) Vicente Cortés (Universität Hamburg) Jens Heber (Christian-Albrechts-Universität zu Kiel) Lynn Heller (Leibniz Universität Hannover) Klaus Kröncke (Universität Hamburg) Knut Smoczyk (Leibniz Universität Hannover) Hartmut Weiß (Christian-Albrechts-Universität zu Kiel)
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Abstracts

Lothar Schiemanowski (Kiel):
Blow up criteria for geometric flows on surfaces (11:00 – 11:50)

I discuss a general approach to proving blow up criteria for geometric flows on surfaces. Following Buzano and Rupflin, a curve of metrics can be split into a curve of constant curvature metrics and a conformal factor. A new compactness theorem for families of metrics on closed surfaces and an analysis of the equations arising for the conformal factor are then combined to give blow up criteria. These techniques will be applied to the harmonic Ricci flow and the spinor flow.

David Lindemann (Hamburg):
Properties of the moduli space of complete connected
projective special real manifolds and resulting curvature bounds (13:45 – 14:35)

A projective special real (short: PSR) manifold $\mathcal{H} \subset \mathbb{R}^{n+1}$ is a hyperbolic centro-affine hypersurfaces that is contained in the level set of a hyperbolic homogeneous cubic polynomial. PSR manifolds are the scalar manifolds in 5d supersymmetry coupled to gravity, and they appear as level sets in the Kähler cone of Calabi-Yau 3-folds. I will present new results about the moduli space of complete connected PSR manifolds, where two PSR manifolds are equivalent if they are related by a linear transformation of the ambient space. These results allow the definition of a deformation theory for complete connected PSR manifolds and imply certain global curvature bounds. For complete connected PSR surfaces, that is dim $\mathcal{H} = 2$, I will describe how to find explicit bounds for the scalar curvature which hold for all such surfaces and are furthermore optimal.

Andreas Ott (Heidelberg):
Higgs bundles and pleated surfaces (14:45 – 15:35)

I will discuss the asymptotic geometry of solutions to Hitchin's self-duality equations in terms of harmonic maps and hyperbolic geometry. This is joint work with Jan Swoboda, Richard Wentworth and Mike Wolf.

Dorothee Schueth (HU Berlin):
On the heat coefficients of geodesic polygons (16:15 – 17:15)

The heat invariants of a compact Riemannian manifold are the coefficients which appear in the asymptotic expansion of its heat trace, and are therefore determined by the eigenvalue spectrum of the Laplace operator. They are expressible in terms of the curvature of the manifold. In this context, we review old and new results and questions surrounding the intriguing interplay between spectrum and curvature, with an emphasis on geodesic polygons in surfaces.