**8th Northern German Differential Geometry Day**

**(Hamburg – Hannover – Kiel)**

**Leibniz Universität Hannover, June 30, 2017**

# PROGRAMME

- 11:00 – 12:00     Lynn Heller
  (Leibniz Universität Hannover)
  **Constrained Willmore Minimizers**
  Seminar room: a 320

- 12:00 – 14:30     Lunch

- 14:30 - 15:30     Kael Dixon
  (Université libre de Bruxelles)
  **Ambitoric 4–Manifolds:**
  **from a local to a global classification**
  Lecture hall: Bielefeldsaal b 305

- 15:30 – 16:00     Coffee

- 16:00 – 17:00     Matthias Ludewig
  (Max-Planck-Institut für Mathematik Bonn)
  **The Mass of Conformal Laplacians**
  Lecture hall: Klaus Fröhlich Hörsaal b 302

Organisers:
Vicente Cortés, Klaus Kröncke (Universität Hamburg)
Jens Heber, Hartmut Weiß (Christian-Albrechts-Universität zu Kiel)
Roger Bielawski, Knut Smoczyk (Leibniz Universität Hannover)

Lynn Heller
**Constrained Willmore Minimizers**

I consider immersed tori minimizing the Willmore energy under the constraint of prescribed conformal class. The Willmore conjecture, solved by Marquez and Neves, shows that the Clifford torus minimizes the Willmore energy in the class of all immersions, and thus it clearly also minimizes the energy in its

conformal class – the square class. The only other case where the constrained Willmore minimizers are determined (by Ndiaye and Schätzle) is for rectangular conformal classes in a small neighborhood of the square class, where the homogenous tori minimize. In my talk I want to show how to construct more generic candidate surfaces and prove that they are indeed constrained Willmore minimizers near the square class.
------------------------------------

Kael Dixon

Ambitoric 4-Manifolds:
from a local to a global classification
Roughly speaking, a 4-manifold is ambitoric if it is equipped with the structure of a toric manifold in two different way with opposite orientations. I will describe how, in the Einstein case, these are Riemannian analogues of Petrov type D space-times. I will then describe my thesis work extending a local classification of such structures to a globalone with natural completeness hypotheses.
-----------------------------------

Matthias Ludewig
**The Mass of Conformal Laplacians**

We introduce the notion of the mass of conformal powers of the Laplacian, which is a certain spectral invariant connected to the ADM mass of an associated asymptotically flat manifold. One of its main features is that in odd dimensions, the mass — although it is a global invariant — transforms locally under a conformal change. The mass also seems to capture several global geometric and topological features of the manifold. Here we discuss several recent results.