

Fakultät für Mathematik



HABILITATIONSVORTRAG

EINLADUNG

Dr. Martin Bauer
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„Right-invariant metrics on the diffeomorphism group“

“Right-invariant metrics on the diffeomorphism group“

Abstract:

The interest in right invariant metrics on the diffeomorphism group is fueled by its relations to hydrodynamics. Arnold noted in 1966 that Euler's equations, which govern the motion of ideal, incompressible fluids, can be interpreted as geodesic equations on the group of volume preserving diffeomorphisms with respect to a suitable Riemannian metric. Since then other PDEs arising in physics have been interpreted as geodesic equations on the diffeomorphism group or related spaces. Examples include Burgers' equation, the KdV and Camassa-Holm equations or the Hunter-Saxton equation.

Another important motivation for the study of the diffeomorphism group can be found in its appearance in the field of computational anatomy and image matching: the space of medical images is acted upon by the diffeomorphism group and differences between images are encoded by diffeomorphisms in the spirit of Grenander's pattern theory. The study of anatomical shapes can be thus reduced to the study of the diffeomorphism group.

Using these observations as a starting point, I will consider the class of Sobolev type metrics on the diffeomorphism group of a general manifold M . I will discuss the local and global well-posedness of the corresponding geodesic equation, study the induced geodesic distance and present selected numerical examples of minimizing geodesics.

**Vortrag: Donnerstag, 25. Juni 2015,
12.00 Uhr -12.50 Uhr**

**Ort: Fakultät für Mathematik,
SR 12, 2. OG, Oskar-Morgenstern-Platz 1**

Andreas Cap
Harald Rindler