Oberseminar Analysis und Theoretische Physik

Prof. Dr. Irina Markina, University of Bergen, Norway
Sub-Riemannian geometry on infinite dimensional manifolds

We start from the definition of an infinite-dimensional manifold with a specific choice of the underlying vector space for developing the smooth calculus. Then we define Riemannian and sub-Riemannian structures, and discuss the choice of a tool for studying geodesics on infinite-dimensional sub-Riemannian manifolds. We show that, similarly to the finite-dimensional case, there are two different, but not mutually disjoint classes of geodesics. We present geodesic equations for the class of geodesics which is a natural generalisation of classical Riemannian geodesics. We indicate possible applications to fluid mechanics and questions of controllability.

Prof. Dr. Alexander Vasiliev, University of Bergen, Norway
Euler-Arnold equations in sub-Riemannian geometry on the Teichmüller space and curve

We consider the group of orientation-preserving diffeomorphisms of the unit circle and its central extension, the Virasoro-Bott group, with their respective horizontal distributions, which are Ehresmann connections with respect to a projection to the smooth universal Teichmüller space and the universal Teichmüller curve associated to the space of normalized univalent functions. We find equations for the normal sub-Riemannian geodesics with respect to the pullback of the Kählerian metrics, namely, the Velling-Kirillov metric on the class of normalized univalent functions and the Weil-Petersson metric on the universal Teichmüller space. The geodesic equations are sub-Riemannian analogues of the Euler-Arnold equation and they lead to the CLM, KdV and other known non-linear PDEs.

Dienstag, 30.6.2015, 16:00h, Raum g005
Hauptgebäude der Leibniz Universität

Dazu laden herzlich ein:
Prof. Dr. Wolfram Bauer, Prof. Dr. Joachim Escher, Prof. Dr. Olaf Lechtenfeld,
Prof. Dr. Elmar Schrohe, Prof. Dr. Christoph Walker

Weitere Informationen finden Sie auch unter http://www.ifam.uni-hannover.de/~escher/de/os_anal.php