

Bavarian Geometry and Topology Meeting XI

LMU München

30 January 2023

1 Schedule

10:30 - 11:00	Arrival / Refreshments
11:00 - 11:50	Stephan Stadler: Embeddedness of minimal surfaces in spaces with upper curvature bounds
12:00 - 12:50	Georg Frenck: Stable moduli spaces of high-dimensional manifolds via fold maps
13:00 - 14:00	Lunch Break
14:00 - 14:30	Coffee Break
14:30 - 15:20	Bart Van Steirteghem: Multiplicity free $U(2)$ -actions and triangles
15:30 - 16:20	Clara Löh: A new lower bound for the number of minimal geodesics
16:20 - 17:00	Coffee & Cake

2 Abstracts

Stephan Stadler: Embeddedness of minimal surfaces in spaces with upper curvature bounds

Abstract: I will discuss the following result. Let M be a Riemannian manifold and L a Jordan curve in M . We provide a sharp bound on the total curvature of L in terms of the upper sectional curvature bound of M and the filling area of L , such that any least area disc in M which fills L is embedded. The proof involves minimal surface theory in metric spaces with upper curvature bounds in the sense of Alexandrov and the result naturally extends to the setting where M itself is such a space.

Joint work with Paul Creutz.

Georg Frenck: Stable moduli spaces of high-dimensional manifolds via fold maps

Abstract: The theorem of Madsen—Weiss identifies the cohomology of the classifying space for smooth (stable) surface-bundles with the cohomology of a certain infinite loop space. This infinite loop space itself turns out to be a classifying space for so called formal surface-bundles and it was observed by Eliashberg—Galatius—Mishachev, that there is an h -principle style proof for the above theorem. Given that there is a high-dimensional analogue of the Madsen—Weiss theorem, it is natural to ask if there is an analogous h -principle style proof for that. In this talk I will explain how to obtain such a proof. The main obstacles which occur are certain singularities named fold singularities and the main work lies in removing these.
This is joint work with Moritz Meisel.

Bart Van Steirteghem: Multiplicity free $U(2)$ -actions and triangles

Abstract: Multiplicity free actions are the nonabelian generalization of symplectic toric manifolds. I will present joint work with O. Goertsches and N. Wardenski, in which we concretize F. Knop's classification of these actions in case the acting group is $U(2)$ and the momentum polytope is a triangle.

Clara Löh: A new lower bound for the number of minimal geodesics

Abstract: A minimal geodesic on a Riemannian manifold is a geodesic line that lifts to a globally isometric geodesic line on the universal covering. Bangert proved that there is a lower bound for the number of geometrically distinct minimal geodesics of closed Riemannian manifolds that is linear in the first Betti number, using the stable norm ball on the first homology. We refine this method to obtain a quadratic lower bound.
This is based on joint work with Bernd Ammann (Regensburg).