Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

Fakultät für
Mathematik, Informatik
und Naturwissenschaften

Kolloquium über Reine Mathematik

Einladung zu einem Vortrag

Dienstag, 21. Januar 2025

17 Uhr, Geom H4

Prof. Dr. Christian Bär (Universität Potsdam)

Title:
Counterintuitive approximations

Abstract:.

The Nash-Kuiper embedding theorem is a prototypical example of a counterintuitive approximation result: any short (but highly non-isometric) embedding of a Riemannian manifold into Euclidean space can be approximated by isometric C^1-embeddings. As a consequence, any surface, no matter how large, can be isometrically C^1-embedded into an arbitrarily small ball in $\mathbb{R}^3$. For C^2-embeddings this is impossible due to curvature restrictions.

I will present a general result which allows for approximations by functions satisfying strongly overdetermined equations on open dense subsets. This will be illustrated by three examples: Lipschitz functions with surprising derivative, surfaces in 3-space with unexpected curvature properties, and a similar statement for abstract Riemannian metrics on manifolds. Our method is based on “cut-off homotopy”, a concept introduced by Gromov in 1986.

This is based on joint work with Bernhard Hanke.

Vor dem Vortrag (ab 16.30 Uhr) stehen im Foyer vor Hörsaal H4 Kaffee und Tee bereit.