## Institut für Geometrie und Topologie

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## Submanifolds with small normal curvatures

## 3. Juli 2025– 16:15 Uhr Raum 7.530

Abstract: Recent work by M. Gromov and A. Petrunin deals with the question: Given a closed smooth manifold M, minimize the maximum normal curvatures among all immersions of M into (high-dimensional) Euclidean spaces, under the constraint that the image lies in a closed ball of radius one.

Replacing this constraint with the condition that the (extrinsic) diameter is at most two, one arrives at a different, but still natural, question.

The result I will present is a first step in the exploration of this new question, namely: For any immersed submanifold M with diameter at most two, the maximum normal curvature is at least one, and equality holds if and only if M is diffeomorphic to a sphere or (real / complex / quaternion / octonionic) projective space, embedded either as an affine sphere, or as a "Veronese" variety.

Time allowing, I will discuss: (1) a generalization to submanifolds of spheres and hyperbolic spaces, (2) the proof, which uses A. Schur's "Bow" Lemma and K. Sakamoto's classification of submanifolds with planar geodesics, and (3) natural open questions.



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