SVA SEMINARIO VIDAL ABASCAL

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA FACULTADE DE MATEMÁTICAS

PL-STABILITY, FINITENESS AND DIMENSION 4

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JOINT WORK WITH GREG CHANBERS AND CURTIS PRO

Let $\mathcal{M}_{k,v,d}^{K,V,D}(n)$ denote the class of closed Riemannian n–manifolds M with

$$\begin{array}{ccccc} k & \leq & \sec M & \leq & K, \\ v & \leq & \operatorname{vol} M & \leq & V, \quad \text{and} \\ d & \leq & \operatorname{diam} M & \leq & D, \end{array}$$

Diffeomorphism Stability Question. *Given $k \in \mathbb{R}$, $v, D > 0$, and $n \in N$, let $\{M_\alpha\}_{\alpha=1}^{\infty} \subset M_{k,v,0}^{\infty,\infty,D}(n)$ be a Gromov–Hausdorff convergent sequence. Are all but finitely many of the M_αs diffeomorphic to each other?*

I will discuss on going project with Greg Chambers and Curtis Pro in which we prove that the answer to the analogous question for Piecewise Linear Stability is "yes". In dimensions ≤ 6, PL–homeomorphic manifolds are diffeomorphic, so this implies that the answer to the Diffeomorphism Stability Question is "yes" provided $n \leq 6$.

Together with Gromov's precompactness theorem and the Grove-Petersen-Wu finiteness theorem, this yields the following finiteness theorem, which was previously known in all dimensions other than 4.

Theorem: *For any $k \in R$, $v > 0$, $D > 0$, and $n \in N$ the class $M_{k,v,0}^{\infty,\infty,D}(n)$ contains only finitely many diffeomorphism types.*

Data: Martes 22 de abril de 2025

Lugar: Aula 9 da Facultade de Matemáticas, USC.

Hora: 16:00 h

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