

Hannah Alpert | Auburn University

Title: Macroscopic versions of Gromov's scalar curvature conjecture

Abstract: Gromov conjectured in 1983 that if an n -manifold has large positive scalar curvature at every point, then it can be mapped to an $(n-2)$ -complex with every fiber of the map having small diameter. We consider a "macroscopic" version of the conjecture, where the scalar curvature hypothesis is replaced by supposing that every ball of radius 10 has small volume and that every loop in a ball of radius 1 is null-homotopic in the concentric ball of radius 2 . For a macroscopic claim such as this one, the available approaches avoid geometric analysis and instead use a few elementary tools. We describe these tools and give partial results on the macroscopic conjecture. Joint work with Alexey Balitskiy and Larry Guth.