Seminarium geometrów

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Torsion groups do not act on 2–dimensional CAT(0) complexes

Abstract: The talk is based on a joint work with Sergey Norin (McGill) and Piotr Przytycki (McGill). We show that all actions of finitely generated torsion groups on 2–dimensional CAT(0) complexes have global fixed points. The proof relies on Masur's theorem on periodic trajectories in rational billiards, and Ballmann–Brin's methods for finding closed geodesics in 2–dimensional locally CAT(0) complexes. As another ingredient we prove that the image of an immersed loop in a graph of girth 2π with length not commensurable with π has diameter $> \pi$. This is closely related to a theorem of Dehn on tiling rectangles by squares.