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Applications and Frontiers in Surface Subgroups

In 2009 V. Markovic and the speaker proved that there are ubiquitous nearly geodesic surface subgroups in the fundamental groups of closed hyperbolic 3-manifolds. Since then there have been many attempts—and some noteworthy successes—to extend these results to other settings, including lattices in other Lie groups, nonuniform lattices, δ -hyperbolic groups, and the mapping class group. After a review of the fundamental principles and methods, I will try to describe some of the successes, some of the difficulties, and some of the applications of these kinds of results.