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The bounded diameter conjecture for 2-convex mean curvature flow

In this talk I address the bounded diameter conjecture for the mean curvature flow of smooth 2-convex hypersurfaces in $\mathbb{R}^{n+1}$. In joint work with Robert Haslhofer, we prove that the intrinsic diameter of the evolving hypersurfaces is controlled, up to the first singular time, in terms of geometric information of the initial hypersurface. Moreover, this diameter estimate leads to sharp L^{n-1} estimates for the curvature at each time.

Our estimates extend to mean curvature flow with surgery, which allows us to obtain the optimal L^{n-1} estimate even for a level set flow starting from a smooth 2-convex hypersurface. This improves the $L^{n-1-\epsilon}$ curvature estimate that was previously established in work of Head and Cheeger-Haslhofer-Naber.