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Mean curvature flow through neck-singularities

In this talk, I will explain our recent work showing that mean curvature flow through neck-singularities is unique. The key is a classification result for ancient asymptotically cylindrical flows that describes all possible blowup limits near a neck-singularity. In particular, this confirms Ilmanen's mean-convex neighborhood conjecture, and more precisely gives a canonical neighborhood theorem for neck-singularities. Furthermore, assuming the multiplicity-one conjecture, we conclude that for embedded two-spheres mean curvature flow through singularities is well-posed. The two-dimensional case is joint work with Choi and Hershkovits, and the higher-dimensional case is joint with Choi, Hershkovits and White.