THE INVERSE MEAN CURVATURE FLOW AND CONVEX FREE BOUNDARY HYPERSURFACES IN THE UNIT BALL

(joint work with Benjamin Lambert, Uni Konstanz, Germany)

Usually the inverse mean curvature flow in $\mathbb{R}^{n+1}$ drives a convex hypersurface to infinity. In this talk we will consider the convex inverse mean curvature flow of a topological disk with a free boundary Neumann condition, namely the flow is supposed to remain perpendicular to the unit sphere from the inside. Despite the strong singularity of the linearised equation, in [2] we could show that the flow converges in finite time to the embedding of a flat disk in the norm of $C^{1,\beta}$, $0 < \beta < 1$. In this talk we present the main ingredients of the proof of this result and also show how this behaviour can be used to deduce a geometric inequality for free boundary convex hypersurfaces, compare [1].

References

[1] Ben Lambert and Julian Scheuer, *A geometric inequality for convex free boundary hypersurfaces in the unit ball*, to appear in Proc. Amer. Math. Soc., preprint available at arxiv:1606.06138, 2016.

[2] ———, *The inverse mean curvature flow perpendicular to the sphere*, Math. Ann. **364** (2016), no. 3, 1069–1093.