Evolution of convex hypersurfaces by curvature flows

Prof. Dr. Carlo Sinestrari (University of Rome "Tor Vergata")

It is well known that a compact convex hypersurface evolving by mean curvature flow shrinks to a point in finite time and converges to a round sphere after rescaling. This result has been generalized to other flows where the speed is given by other functions of the principal curvatures, sometimes under more restrictive conditions on the initial data.

In this talk we consider the volume-preserving version of the flow with speed given by a power of the mean curvature. We show that, for general convex initial data, the flow exists for all times and converges to a sphere. Thus, the flow enjoys better properties than in the standard (non volume-preserving) case, where the analogous property is only known if the cuvatures of the initial hypersurface are sufficiently close to each other. The proof exploits the improvement of the isoperimetric ratio which holds in the volume-preserving case.