RECENT ADVANCES IN THE THEORY OF MULTI-PHASE MEAN CURVATURE FLOWS

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Abstract. Arising as the gradient flow of the area functional, the mean curvature flow (MCF) is one of the most studied geometric flows, both for its intrinsic geometric interest and for the applications. In particular, its "multi-phase" version describes the evolution in time of grain boundaries: namely, the interfaces separating different grains or phases in a material (e.g. a polycrystal) and subject to a potential energy of surface tension type.

In this talk, I will introduce a measure-theoretic notion of weak solution for MCF which is particularly well suited to treat such kind of singular evolution problems (canonical Brakke flows), and I will discuss some recent advances in the corresponding existence theory as well as its strong ties to the theory of minimal surfaces.

Based on joint works with Yoshihiro Tonegawa (Tokyo Institute of Technology).

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