

# Coarsening in microstructure and the mass transport paradigm

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During the coarsening process, in a typical polycrystalline material, some cells or grains grow while others contract or are deleted. Historically many statistical descriptions of the process have been studied emphasizing, primarily, geometric properties such as cell size and number of facets of cells. Although very useful, these are not robust. During coarsening an orientational texture, characterized by the Grain Boundary Character Distribution (GBCD), also emerges. We discuss this from the viewpoint of a gradient flow for a Wasserstein metric and illustrate its entropic nature. We shall also attempt to give some attention to other gradient flows found ‘in the wild.’ This is joint work with P. Bardsley, K. Barmak, E. Eggeling, M. Emelianenko, Y. Epshteyn, D. Kinderlehrer, X.Y. Lu, R. Sharp, and S. Ta’asan.