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Yekaterina Epshteyn* (epshteyn@math.utah.edu), Department of Mathematics, The University of Utah, Salt Lake City, UT 84124. *Polycrystalline Materials and Evolution of Grain Boundaries Network.*

Cellular networks are ubiquitous in nature. Most technologically useful materials arise as polycrystalline microstructures, composed of a myriad of small crystallites or grains, separated by interfaces, or grain boundaries. The energetics and connectivity of the grain boundaries network plays a crucial role in determining the properties of a material across a wide range of scales. During the coarsening, or growth, process, an initially random grain boundary arrangement reaches a steady state that is strongly correlated to the interfacial energy density. In this talk, we will discuss recent progress on mathematical modeling and analysis of the grain boundaries network's evolution in polycrystalline materials. This is joint work with P. Bardsley, K. Barmak, E. Eggeling, M. Emelianenko, D. Kinderlehrer, C. Liu, M. Mizuno and S. Ta'asan. (Received January 31, 2018)