1060-51-89 **Emanuel A Lazar*** (lazar@princeton.edu), PACM, Fine Hall, Princeton University, Princeton, NJ 08544. *The topological and geometrical evolution of cellular structures.*

Cellular structures are ubiquitous throughout nature, forming the backbone of biological tissue, crystalline materials, as well as geographical partitions of land and the the large-scale structure of the universe. In many of these systems, boundaries migrate over time to minimize some energy latent in the system. While these migrations occur locally to minimize local energies, and depend greatly on the geometry of the system, they work to create global changes. Acute topological events, such as cell disappearance, are induced by gradual geometrical change.

In mean curvature flow, the velocity of every point on a surface is determined by the plane tangent to the surface at that point and by the magnitude of its mean curvature there. This geometry imposes structure on the topology of the system as much as it is shaped by it. In this paper we investigate how the geometrical and topological dynamics of these systems interact, and show how investigation of one can shed light on the other. (Received March 23, 2010)