

# GEOMETRIC ANALYSIS SEMINAR

**“Concavity of the arrival time and applications to curve shortening flow.”**

**Theodora Bourni**  
(University of Tennessee, Knoxville)

Abstract: In a breakthrough paper, X.J. Wang in 2011, proved that any compact, convex, ancient solution to mean curvature flow either sweeps out the whole space or lies in a slab region. His result is based on showing that the time-of-arrival function for such a solution is concave. In this talk we will show that this concavity property holds for a large class of flows and we will present a connection between this property and Harnack inequalities for hypersurface flows. Finally, we will use Wang's dichotomy theorem to provide a new geometric proof of the classification of convex ancient solutions to curve shortening flow, shown by Daskalopoulos, Hamilton and Sesum, and extend this classification to the non-compact case. This work is partly joint with Langford and partly with Langford and Tinaglia.

**Wednesday, September 18<sup>th</sup>, 2019**  
**MIT, Room 2-131**  
**Time: 4:00 PM**



Massachusetts  
Institute of  
Technology