1077-35-736 **Jared Speck***, Department of Mathematics, Massachusetts Institute of Technology, 77 Massachusetts Ave, Room 2-163, Cambridge, MA 02139-4307. *Global Stability Results for Relativistic Fluids in Expanding Spacetimes.*

In this talk, I will discuss the future-global nonlinear behavior of relativistic fluids evolving in expanding spacetimes. I will focus on how the global behavior of the fluid is affected by both the expansion rate and the fluid equation of state. This topic is physically relevant for the following reasons: i) Experimental evidence indicates that our spacetime is expanding. However, there is a debate over the precise rate. ii) In cosmology, fluids are often used to model the "normal" matter content of our universe. This talk is further motivated by the following prior results: a) In Minkowski spacetime, D. Christodoulou showed that non-zero uniform fluid solutions are unstable. More precisely, arbitrarily small perturbations of their initial data can lead to finite-time shock formation. b) In contrast, I. Rodnianski and I showed that under some often-made assumptions on the equation of state, the non-zero uniform solutions are future-stable when the fluid is irrotational and the expansion rate is exponential; such a rate can be generated by including a positive cosmological constant in Einstein's equations. Furthermore, I recently removed the assumption of irrotationality. This talk concerns expansion rates in between 0 and exponential without the irrotationality assumption. (Received September 11, 2011)