1086-35-2870 **Xiaodong Cao** (cao@math.cornell.edu), **Bowei Liu** (boweiliu@princeton.edu), **Ian Pendleton*** (ian.pend@berkeley.edu) and **Abigail Ward** (abigailward@uchicago.edu).
Differential Harnack Estimates for Fisher's Equation.

In this talk we derive two differential Harnack estimates for positive solutions of the second order partial differential equation $f_t = \Delta f + cf(1-f)$, known as Fisher's Equation. This equation is useful as a fundamental model for reaction-diffusion equations across many fields.

If we let (M^n, g) be an n-dimensional compact Riemannian manifold with non-negative Ricci curvature and $f : M \times [0, \infty) \to \mathbb{R}$ be a positive solution to Fisher's Equation, then we derive a Harnack inequality of the form $\Delta(\log f) + \alpha|\nabla(\log f)|^2 + \beta f + \phi(t) \geq 0$, with an explicit $\phi(t)$ and bounds on α and β. By loosening the restrictions on M to complete but non-compact, we then derive a second inequality of the same general form but with a more intricate function $\phi(t)$. (Received September 25, 2012)