1056-53-187 **Arvind S. Rao*** (`arao@math.uiowa.edu`), Department of Mathematics, 14 Maclean Hall, Iowa City, IA 52242. *Weak Solutions to a Degenerate Monge-Ampère Type Equation on Kähler Surfaces.*

In the context of moment maps and diffeomorphisms of Kähler manifolds, Donaldson introduced a fully nonlinear Monge-Ampère type equation. Among the conjectures he made about this equation is that the existence of solutions is equivalent to a positivity condition on the initial data. Weinkove later affirmed Donaldson's conjecture using a gradient flow for the equation in the space of Kähler potentials of the initial data. The case when the initial data is merely semipositive and the domain is a closed Kähler surface is the topic of my thesis and this talk. I will show how regularity techniques for degenerate Monge-Ampère equations, specifically those coming from pluripotential theory, are used to prove the existence of a unique, bounded, weak solution. A Nakai criterion, due to Lamari and Buchdahl, guarantees that the solution is smooth away from some curves of negative self-intersection. (Received August 13, 2009)