1067-65-832 **Michael J. Neilan*** (neilan@math.lsu.edu), Mathematics, Center for Computation and Technology, Louisiana State University, Baton Rouge, LA 70803. *A unified approach to construct and analyze finite element methods for the Monge-Ampère equation.*

The Monge-Ampère equation is a fully nonlinear second order PDE that arises in various applications such as differential geometry, meteorology, reflector design, economics, and optimal transport. Yet despite its prevalence in many application areas, numerical methods for the Monge-Ampère equation is still in its infancy. In this talk, I will discuss a unified approach to construct and analyze various finite element methods for the Monge-Ampère equation. First, I will show that a key feature to develop convergent discretizations is to construct schemes with a stable linearization. I will then describe a methodology to construct finite elements that inherit this trait and provide two examples: C^0 finite element methods and discontinuous Galerkin methods. I will then briefly show how to prove the well-posedness of such methods as well as derive optimal order error estimates. (Received September 16, 2010)