Meeting: 1003, Atlanta, Georgia, SS 4A, AMS-SIAM Special Session on Theoretical and Computational Aspects of Inverse Problems, I

1003-49-1329 **Tilmann Glimm*** (`tglimm@emory.edu`), Department of Physics, 400 Dowman Drive, Atlanta, GA 30322. *Monge-Ampère equations, design of reflector systems and min cost flow problems: Theory and numerics.*

We consider the geometrical optics problem of constructing a system consisting of two reflectors which transforms a plane wave front with given intensity into an output plane wave front with prescribed output intensity. Mathematically, this is equivalent to solving a nonlinear equation of Monge-Ampère type.

In this talk, we show how a discretized version of the problem is equivalent to the min cost flow problem on a bipartite graph. The solutions of the discretized problems converge to the solution of the continuous problem when the grid size of the discretization goes to zero.

We present numerical solutions based on min cost flow algorithms and compare them to other numerical solution techniques for equations of Monge-Ampère type.

This talk is partly based on joint work with V. Oliker. (Received October 04, 2004)