1097-35-6 **Peter A. Perry*** (peteraperry@gmail.com), Department of Mathematics, 715 Patterson Office Tower, University of Kentucky, Lexington, KY 40506-0027. *Determinants in Two-Dimensional Inverse Scattering.*

This talk concerns inverse scattering in two space dimensions and its application to solving completely integrable, dispersive nonlinear PDE's.

In the 1960's, Faddeev introduced Complex Geometric Optics (CGO) solutions: scattering solutions at fixed energy with asymptotic behavior parameterized by a complex parameter k. The CGO solutions determine the *scattering transform*, which linearizes completely integrable flows associated with the Schrodinger or Dirac-type problem.

For given k, the CGO solutions need not be unique. The set of k for which non-uniqueness occurs is called the *exceptional set* and corresponds to those k for which a certain Fredholm operator is not invertible.

A nonempty exceptional set leads to singularities in the scattering transform and such phenomena as rational solitons or blow-up in finite time for the solutions to the corresponding completely integrable PDE's. In this talk we will apply the Banach-space renormalized determinant developed by Gohberg, Goldberg, and Krupnik in the 1990's to constrain the exceptional set and prove that completely integrable flows for the Davey-Stewartson II and Novikov-Veselov equations at zero energy are isospectral. This work is in part joint with Russell Brown and Michael Music. (Received August 31, 2013)