



**PURDUE UNIVERSITY**

**Department of Mathematics Colloquium**

Speaker: Professor Allan Greenleaf, University of Rochester  
Title: "An FIO Calculus for Seismic Imaging, or Hunting for Oil with Folds and Crosscaps"  
Date: Tuesday, February 27, 2007  
Time: 4:30 P.M.  
Place: MATH 175

**Abstract**

Seismic imaging consists of trying to obtain information about the interior of the Earth from seismic experiments at the surface. In these, impulses are generated at arrays of acoustic sources, and measurements of acoustic pressure are collected at other arrays of receivers. Physically realistic models need to include multipathing, or caustics, the simplest and most prevalent of which are those of fold type. I will describe recent progress on understanding a linearized seismic imaging problem which comes up in offshore oil exploration. Fold caustics give rise to scattering operators that are outside of the standard Fourier integral operator (FIO) calculus. Nevertheless, one can obtain composition theorems and Sobolev space estimates for them.

This is joint work with Raluca Felea and Malabika Pramanik.

**Refreshments will be served in the Math Library Lounge, 4:00 P.M.**