COLLOQUIUM
UNIVERSITY OF PITTSBURGH
FRIDAY, SEPTEMBER 12, 2008

704 THACKERAY HALL

4:00 P.M.

PROFESSOR MARSHALL SLEMROD

DEPARTMENT OF MATHEMATICS

UNIVERSITY OF WISCONSIN-MADISON

A FLUID DYNAMIC FORMULATION OF THE ISOMETRIC EMBEDDING PROBLEM IN DIFFERENTIAL GEOMETRY

ABSTRACT: The isometric embedding problem is a fundamental problem in differential geometry. A longstanding problem is considered in this paper to characterize intrinsic metrics on a two-dimensional Riemannian manifold which can be realized as isometric immersions into the three-dimensional Euclidean space. A remarkable connection between gas dynamics and differential geometry is discussed. It is shown how the fluid dynamics can be used to formulate a geometry problem. The equations of gas dynamics are first reviewed. Then the formulation using the fluid dynamic variables in conservation laws of gas dynamics is presented for the isometric embedding problem in differential geometry.

Refreshments served at 3:30 p.m.
in the Math Dept. COMMON ROOM, Thackeray 705