

COLLOQUIUM
UNIVERSITY OF PITTSBURGH
FRIDAY, OCTOBER 30, 2015
704 THACKERAY HALL
3:30 P.M.

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MONOTONE SOBOLEV MAPPINGS OF
PLANNAR DOMAINS & SURFACES

ABSTRACT: An approximation theorem of Youngs (1948) asserts that a continuous map between compact oriented topological 2-manifolds (surfaces) is monotone if and only if it is a uniform limit of homeomorphisms. Analogous approximation problem for Sobolev mappings is at the very heart of the variational approach to nonlinear hyperelasticity. Such mappings naturally arise as weak limits of the energy-minimizing sequence of homeomorphisms. In the present lecture we show that monotone mappings in the Sobolev space $\mathcal{W}^{1,p}$, $1 < p < \infty$, are $\mathcal{W}^{1,p}$ -weak (also strong) limits of homeomorphisms; in fact, limits of diffeomorphisms. We then establish the existence of traction free energy-minimal deformations for p -harmonic type energy integrals. This is a joint work with Jani Onninen.

Refreshments served at 3:00 p.m.
in the Math Dept. COMMON ROOM, Thackeray 705