

COLLOQUIUM
UNIVERSITY OF PITTSBURGH
FRIDAY, OCTOBER 24, 2008
704 THACKERAY HALL
4:00 P.M.

PROFESSOR NADER MASMOUDI
COURANT INSTITUTE OF MATHEMATICAL SCIENCES
NEW YORK UNIVERSITY

BOUNDARY LAYERS AND HOMOGENIZATION

ABSTRACT: The goal of the talk is to discuss two related problems. The first one is the homogenization in polygonal domains and the second is about the derivation of the Navier boundary condition using the theory of homogenization.

Getting higher order corrections in the theory of (periodic) homogenization requires a very good understanding about what is happening at the boundary. This leads to boundary layer problems that can be solved using a quasi-periodic setting.

For the second problem, we consider the Navier-Stokes equation in a domain with rough boundaries. The small irregularity is modeled by a small amplitude and small wavelength boundary with typical lengthscale $\epsilon \ll 1$. Using boundary layer theory, we prove that the high order approximation leads to a Navier boundary condition.

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