COLLOQUIUM
UNIVERSITY OF PITTSBURGH
FRIDAY, SEPTEMBER 9, 2016

704 THACKERAY HALL
3:30 P.M.

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FLUID FLOW AT HIGH REYNOLDS NUMBERS

ABSTRACT: I will discuss how to model (incompressible) fluid flows at low viscosity or high Reynolds numbers. The Reynolds number measures the relative strength of convection with respect to dissipation. Such flows model turbulence phenomena.

In particular, I will discuss the so-called zero-viscosity limit, that is, whether inviscid flows can approximate well viscous flows, in the presence of walls. No slip at rigid walls for viscous flows leads to the appearance of a boundary layer, a thin region near the wall where large gradients can form and the flow is potentially violent. The layer can detach from the boundary, a phenomenon called layer separation, which gives rise to a turbulent wake and vortex shedding. Layer separation and production of vorticity at walls are some of the most important mechanisms for forcing and mixing in flows.

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