

Department of Mathematics
City University of Hong Kong

Colloquium

Organised by Prof. F. Cucker and Prof. M. Ismail

Stationary Stokes and Navier-Stokes Equations

by

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Abstract : We consider the incompressible stationary Stokes (S) and Navier-Stokes (NS) equations with Dirichlet boundary conditions (homogeneous or possibly inhomogeneous) in a first part. In order to solve (NS), we use a Galerkin method with compactness arguments and a fixed point theorem. Since the pressure term is hidden in the variational formulations, the theorem of De Rham will be used.

In a second part, we consider the case of non-standard boundary conditions. More specifically, the boundary conditions are assumed to be of two different types. Either the pressure and the tangential component of the velocity are given on the boundary, or the normal component of the velocity and the tangential component of the vorticity are given on the boundary.

Variational formulations, equivalent to (S) and (NS), are presented. Existence and uniqueness results, depending in particular on the geometrical properties of the domain, are provided.*

* Joint work with Maria Angeles Rodriguez Bellido, University of Sevilla (Spain) and Nour El-Houda Seloula, University of Pau (France)

Date : 29 March 2011 (Tuesday)
Time : 4:30pm – 5:30pm
Venue : Room B6605 (College Conference Room)
Blue Zone, Level 6
Academic Building
City University of Hong Kong

(Tea, coffee and cookies will be provided at the College Conference Room in B6605 before the colloquium from 4:00 to 4:30pm. Please come and join us.)

**** All interested are welcome ****

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