The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

Rigidity of the Navier-Stokes equations

by

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Abstract

An old and challenging problem asks whether bounded mild ancient solutions of the 3 dimensional Navier-Stokes equations are constants. While the full 3 dimensional problem seems out of reach with known methods, several leading experts expressed their belief that the following conjecture should be true. For incompressible axially-symmetric Navier-Stokes equations (ASNS) in three dimensions:

bounded mild ancient solutions are constants.

Understanding of such solutions could play useful roles in the study of global regularity of solutions to the ASNS. In this talk, we will present a proof of this conjecture in the case that u is periodic in z. To the best of our knowledge, this seems to be the first result on this conjecture without unverified decay condition. It also shows that periodic solutions are not models of possible singularity or high velocity region. Some partial result in the non-periodic case is also given.

Date: **7 May 2019 (Tuesday)**
Time: **2:00 p.m. – 3:00 p.m.**
Venue: **TU801, The Hong Kong Polytechnic University**

*** * * ALL ARE WELCOME * ***