The Hong Kong University of Science and Technology

Department of Mathematics

Mathematics Colloquium

Breakthroughs in fluids since Leray's time

By

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Abstract

Derived in 1820s, the Navier-Stokes equations (NSEs) govern the motion of fluid flows. In 1930s, Leray established the theory of weak solutions for the NSEs and raised some questions, many of which still remain open. One renowned question regards the appearance of singularity of weak solutions in finite time, which lies at the heart of the most exciting developments in fluid dynamics. The well-posedness problem, particularly in Leray-Hopf space, is also eminent and unanswered.

The talk will review some major breakthroughs towards resolving the afore-mentioned problems. The emphasis will be on some recent groundbreaking work, sparked by empirical laws in physics and techniques from other fields in mathematics, in particular, the convex integration techniques. We will also discuss some ongoing interest in various problems and new perspectives opened up by these techniques.

Date: **Thursday, 21 February 2019**

Time: **3:00 p.m. – 4:00 p.m.**

Venue: **Room 4475, Academic Building (near Lifts 25-26), HKUST**

All are welcome!