Institute of Mathematics
Academia Sinica

Department of Mathematics
National Taiwan University

Lakeside Lectures

Speaker: Shih-Hsien Yu (National University of Singapore)

Title: Weak solutions for compressible Navier-Stokes equations.

Abstract:

There have been important progresses during the 1960-1990's on the well-posedness theory for Navier-Stokes equations in the gas dynamics, done mostly by the Japanese School of Itaya, Kawashima, Matsumura, Nishida and others. Since 1990's weak solutions are constructed by P.L. Lions, D. Hoff, E. Feireisl and others, but without the well-poseness theory. Basic to these works is the L2 analysis, starting with the entropy estimate.

This talk gives a new approach for the construction of weak solutions for isentropic Navier-Stokes equations. The construction is to turn the partial differential equations into integral equations and implicit functionals. Basic to the approach is the explicit analysis of the Green's function for the Navier-Stokes equations as well as for the linear diffusion equation with viscosity coefficient of bounded total variation. The approach yields the well-posedness theory in the L1 and BV norms. This talk aims at giving the general audience the general line of thought and key ideas of this approach.

Date: April 29 (Mon), 2019

Time: 14:00-15:00

Venue: Room 202, Astro-Math Building (NTU Campus)

Refreshment: 13:30

Organizers: Yi-Chiuan Chen, Yi-Fan Yang