Lecture Series on Regularity theory for Quasilinear equations, May 1-3, 2020

Organizer: Quoc-Hung Nguyen, Institute of Mathematical Sciences, ShanghaiTech University, Shanghai, China.

The goal of lecture series is to bring together leading experts and young researchers to discuss recent developments on regularity theory for quasilinear equations. The Lectures are hosted by Institute of Mathematical Sciences, ShanghaiTech University. They will take place over Zoom.

How to use Zoom:

- Please download and setup Zoom via link: https://zoom.us/download
- Please log in with your real name.
- About 20 minutes before the lectures, the link, meeting ID and password to join the Zoom meeting will be notified on the website of Institute of Mathematical Sciences

Speakers:

- Professor Giuseppe Mingione, University of Parma, Italy.

- Professor Nguyen Cong Phuc, Louisiana State University, USA.

- Professor Sun-Sig Byun, Seoul National University, Korea.

Schedule:

- May 1:

    9:00 pm-9:50 pm (Bejing time): Giuseppe Mingione

    9:50 pm-10:40 pm (Bejing time): Sun-Sig Byun

- May 2:

    9:00 pm-9:50 pm (Bejing time) : Giuseppe Mingione

    9:50 pm-10:40 pm (Bejing time) : Nguyen Cong Phuc

- May 3:

    9:00 pm-9:50 pm (Bejing time) : Sun-Sig Byun

    9:50 pm-10:40 pm (Bejing time) : Nguyen Cong Phuc

Titles and Abstracts:

Professor Giuseppe Mingione

Title: Gradient estimates from uniformly to non-uniformly elliptic problems

Abstract: I will give an overview of pointwise gradient estimates for solutions to nonlinear elliptic problems. I will initially recall some results known for uniformly elliptic problems then turning to non-uniformly elliptic ones.

Professor Nguyen Cong Phuc

Title: Potential theory and doubly nonlinear PDEs: estimates, existence, and removable sets

Abstract: Recent advances in pointwise potential bounds and integral weighted estimates are discussed for a class of quasilinear elliptic equations with measure or distributional data. The connection of those estimates to Sobolev capacities and trace inequalities is presented. Applications include sharp existence criteria and characterizations of removable singular sets for doubly nonlinear equations of the form $-\Delta_p u = u^q + \sigma$, or $-\Delta_p u = |\nabla u|^q + \sigma$. Here $q > 0$ could be arbitrarily large, Δ_p is the p-Laplacian ($p > 1$), and σ is a measure or sometimes a general signed distribution.

Professor Sun-Sig Byun

Title: Global regularity estimates for nonlinear elliptic equations with nonstandard growth

Abstract: A general class of nonlinear elliptic equations with nonstandard growth in non-smooth domains is considered for the study of global gradient estimates of solutions.