

Functional Inequalities and Nonlinear Analysis in OCU

Date : October 23 (Tue.), 2018, 14:00–17:30

Place : Big Seminar Room (E408), Department of Mathematics, Osaka City University

—Program—

14:00 – 14:40: Megumi Sano (Tokyo Institute of Technology, JSPS PD)

title: *Minimization problems related to the critical Hardy inequality*

abstract: Abstract: In this talk, we consider minimization problems associated with best constants related to the critical Hardy inequality. Especially, we give an answer to an open problem mentioned by Horiuchi and Kumlin in 2012. We also show radially symmetric breaking properties of the minimizers.

14:50 – 15:30: Yohei Toyoda (Osaka University, D3)

title: *2D Trudinger-Moser inequality for Boltzmann-Poisson equation with continuously distributed multi-intensities*

abstract: In this talk we are concerned with a functional associated with the mean field limit of the point vortex distribution, that is,

$$J_\lambda(v) = \frac{1}{2} \|\nabla v\|_2^2 - \lambda \int_{I_+} \log \left(\int_{\Omega} e^{\alpha v} dx \right) \mathcal{P}(d\alpha), \quad v \in H_0^1(\Omega)$$

where $\lambda > 0$ is a constant, $\Omega \subset \mathbb{R}^2$ is a smooth bounded domain and $\mathcal{P}(d\alpha)$ is a Borel probability measure on $I_+ = [0, 1]$. We show the boundedness of J_λ from below with the extremal case for λ when $\mathcal{P}(d\alpha)$ is continuous and satisfies the suitable assumptions. This is joint work with professor Suzuki in Osaka university.

15:40 – 16:20: Noboru Chikami (Osaka University, JSPS PD)

title: *Well-posedness for Hardy-Hénon parabolic equations in Besov spaces*

abstract: We consider well-posedness for the Hardy-Hénon parabolic equation in critical Besov spaces. Linear estimates of the heat kernel involving a singular potential is established, as well as general composition estimates for a power-type nonlinearity in Besov spaces. As a byproduct of the well-posedness, the existence of a small self-similar solution is shown.

16:40 – 17:30: Michael Ruzhansky (Imperial College London)

title: *Hypoelliptic functional inequalities*

abstract: In this talk we will give a review of different types of hypoelliptic Hardy, Hardy-Sobolev, Gagliardo-Nirenberg, Moser-Trudinger, Caffarelli-Kohn-Nirenberg and other functional inequalities.