Nonlinear Analysis in OCU

Date : March 14 (Wed.), 2018, 15:00–17:30

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

—Program—

15:00 − 15:25: Megumi Sano (Osaka City Univ., D3)

title: *Minimization problem on generalized critical Hardy inequalities*:

abstract: In this talk, we consider the existence and non-existence of minimizer on a minimization problem associated with the best constant of generalized critical Hardy inequalities. And I will talk about an open problem and some observation.

15:30 − 15:55: Yohei Toyoda (Osaka, D2)

title: *The behavior of blow-up solution for Boltzmann-Poisson equation with probability measure*

abstract: In this talk we consider the minimizing sequence for some energy functional which is associated with the following Boltzmann-Poisson equation.

$$-\Delta v = \lambda \int_{I_+} \frac{\alpha e^{\alpha v}}{\int_\Omega e^{\alpha v} dx} \mathcal{P}(d\alpha) \quad \text{in } \Omega, \quad v = 0 \quad \text{on } \partial\Omega,$$

where $\Omega \subset \mathbb{R}^2$ is a smooth bounded domain, $\lambda > 0$ is a constant and $\mathcal{P}(d\alpha)$ is a Borel probability measure on $I_+ = [0, +1]$. If such a sequence blows up, we derive some estimate which is related to the behavior of solution near the blow-up point. Moreover, we study the two-intensities case for $\mathcal{P}$ to consider the sufficient condition for this estimate. This is joint work with Professor Suzuki in Center for Mathematical Modeling and Data Science, Osaka University.

16:00 − 16:25: Masato Hashizume (Osaka City Univ., D3)

title: *Minimization problem on the Hardy-Sobolev inequality*:

abstract: We consider minimization problem on the Hardy-Sobolev inequality in the interior singularly case. In this case, existence and non-existence depend on the scale of the domain. In addition to existence and non-existence, we consider symmetry property of the minimizer.

16:40 − 17:30: Filomena Feo (Universitá di Napoli "Parthenope")

title: *A symmetrization result for fractional nonlocal Ornstein-Uhlenbeck equation*:

abstract: In this talk, the fractional nonlocal Ornstein-Uhlenbeck equation is analyzed. More precisely, for $0 < s < 1$, we consider the following Dirichlet problem

$$\begin{cases} (-\Delta + x \cdot \nabla)^s u = f, & \text{in } \Omega, \\ u = 0, & \text{on } \partial\Omega, \end{cases}$$

where Ω is a possibly unbounded open subset of $\mathbf{R}^n$, $n \geq 2$. The aim is to derive the concentration comparison estimate for solutions using Gaussian symmetrization techniques. As a consequence, L^p and $L^p(\log L)^\alpha$ regularity estimates in terms of the datum f are obtained by comparing u with half-space solutions. The appropriate functional settings for this nonlocal equation and its corresponding extension problem are also presented.

This talk is based on a joint work with P. R. Stinga and B. Volzone.