Nonlinear Analysis and Related Topics

Period : February 17 (Fri.), 2017, 13:30–17:20

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

—Program—

13:30 − 13:50: Megumi Sano (Osaka City Univ., D2)

On the compactness of the embedding from $W_{rad}^{1,p}(\mathbb{R}^N)$ to $L^{q(\cdot)}(\mathbb{R}^N)$:

abstract: We study the compactness of the embedding from $W_{rad}^{1,p}(\mathbb{R}^N)$ to $L^{q(\cdot)}(\mathbb{R}^N)$ with a variable critical exponent $p \le q(x) \le \frac{Np}{N-p}$, where $1 < p < N$. This is a joint work with M. Hashizume (Osaka City Univ., D2).

13:55 − 14:15: Masato Hashizume (Osaka City Univ., D2)

Minimization problem on the Hardy-Sobolev inequality in boundary singularity case:

abstract: We consider a minimization problem on the Hardy-Sobolev inequality. In boundary singularity case, it is known that mean curvature at origin plays a crucial role in existence of minimizer. In this talk, we investigate non-positive mean curvature case and a relation between scale of domain and existence of minimizer.

14:20 − 14:40: Yohei Toyoda (Osaka, D1)

On the compactness of the embedding $H_0^1(\Omega) \hookrightarrow L^{q(\cdot)}(\Omega)$:

abstract: In this talk, we are concerned with the compactness of the embedding

$$H_0^1(\Omega) \hookrightarrow L^{q(\cdot)}(\Omega),$$

where Ω is a bounded domain in $\mathbb{R}^N$ with $N \ge 3$ and $q(\cdot)$ is a function called a variable exponent satisfying $q(0) = 2^* = \frac{2N}{N-2}$, $q(\cdot) < 2^*$ in $\Omega \setminus \{0\}$. As the result, we shall give a necessary and sufficient condition on the decay rate of $2^* - q(\cdot)$ as $|x| \to 0$ which assures the compactness of the embedding. This is a joint work with Michinori Ishiwata (Osaka University).

15:00 – 15:40: Bernhard Ruf (University of Milan)

A heat equation with exponential nonlinearity in $\mathbb{R}^2$:

abstract: We consider a semilinear heat equation with singular initial data in L^p spaces. In $\mathbb{R}^n$, $n > 2$, there is a polynomial critical growth for the nonlinearity, and there are results of existence, non-existence, uniqueness and non-uniqueness related to this critical growth. In $N = 2$ critical growth is given by nonlinearities of exponential type. We show that similar phenomena occur for suitable exponential nonlinearities and singular initial data in certain Orlicz spaces.

15:50 – 16:30: Michinori Ishiwata (Osaka University)

On the existence of global Sobolev-bounds for time global solutions to semilinear parabolic equations of critical type:

abstract: In this talk, we will consider the existence of global in time bounds of Sobolev norms for time global solutions to a semilinear parabolic equation of critical type. We will how to obtain the existence of such bounds by using the profile decomposition method.

16:40 – 17:20: Federica Sani (University of Milan)

On Moser-type inequalities on the whole space:

abstract: The Trudinger-Moser inequality is a substitute for the well known Sobolev embedding theorem when the limiting case is considered. We discuss critical and subcritical Moser type inequalities in the whole Euclidean space which involve complete and reduced Sobolev norm. Then we introduce an optimal Lorentz-Zygmund type inequality from which a Moser type inequality can be derived.