

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 $p \leq q(x) \leq \frac{Np}{N-p}$, 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 $N \geq 3$ 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 $|x| \rightarrow 0$ 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 show 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 sub-critical 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.