european social fund in the czech republic
EUROPEAN UNION
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Silesian University in Opava
INVESTMENTS IN EDUCATION DEVELOPMENT

Silesian University in Opava July 10, 2014

Silesian Mathematical Summer School in Opava, September 8-12, 2014

DYNAMICAL SYSTEMS: SELECTED TOPICS

Second announcement

This activity is the third of the cycle of three summer schools on *Dynamical Systems and their Applications* organized by the Mathematical Institute in Opava during the period 2012-2014. The school is co-financed by the European Social Fund within the framework of the project *Development of Research Capacities of the Mathematical Institute of the Silesian University in Opava* [1]. For each year, the school program is designed to introduce the active researchers and doctoral students into two selected topics from the modern theory of Dynamical Systems. It includes 5 days of intensive lecturing combined with the exclusive possibility of direct communication with the leading mathematical experts. For this year, we have the following confirmed speakers:

Sergiy Kolyada (National Academy of Sciences of Ukraine)

Topological dynamics: minimality, entropy and chaos

Michal Misiurewicz (Indiana University-Purdue University Indianapolis)

Rotation theory

A more detailed description of the both courses can be found on the next pages.

Organization

The summer school will take place in Malenovice, hotel Petr Bezruč, N 49° 33′ 59.36″, E 18° 25′ 32.67″, in the foothill of Lysá Hora, the highest mountain (1 323 m above the sea level) of the MoravianSilesian Beskydy in the Eastern part of the Czech Republic. The school will last for five days with a total of 36 academic hours of lectures. The teaching will be in English. The participants who have completed the courses in their entirety will receive certificates. At the same place and at the same time the 18th Czech-Slovak Workshop on Discrete Dynamical Systems is organized. Registration for the summer school is possible from May 26, 2014 at Karel.Hasik@math.slu.cz. No registration fee is required, and the school cost includes only the lodging expenses. International participants will pay subsistence costs (accommodation and meals) 50 €

[1] For more information about the project visit http://projects.math.slu.cz/RVKMU/

per person per day on their own. There is no tuition fee. Rooms in the hotel will be reserved for registrated participants. We recommend early registration due to the limited hotel capacities. Doctoral students and academics from Czech universities (excluding Prague region) are eligible for full support from the European Social Fund under project CZ.1.07/2.3.00/20.0002.

Travel

The arrival day is Sunday, September 7, the departure day is Saturday, September 13. Visit `www.idos.cz` to plan the journey between the nearest airports (Prague, Vienna, Katowice) and Frýdlant nad Ostravic, the nearest railway station (7 km) from the hotel. For bus service between the Vienna and Katowice airports and Ostrava or Frýdek–Místek see `www.tigerexpress.eu/`.

On Sundays, the bus service No. 860345 from Frýdlant nad Ostravic to the hotel departs at 14:50 and 18:50. Taxi is available in other times.

Topological Dynamics: Minimality, Entropy and Chaos

Sergiy Kolyada

Topological dynamics is one of the central topics of the Dynamical Systems Theory. I want to present the general ideas of the discrete dynamical systems given by compact Hausdorff (metric) spaces and their continuous selfmaps.

The following topics will be considered:

Topological transitivity and minimality: Topologically transitive maps; Minimal maps; Minimal sets and spaces.
Li-Yorke sensitivity and other concepts of chaos: On chaotic interval maps; Topological chaos and Li-Yorke chaos; Li-Yorke sensitivity and weakly mixing maps; On Lyapunov numbers;
Topological entropy: Topological entropy of (nonautonomous) dynamical systems; Topological entropy of (nonautonomous) piecewise-monotone dynamical systems on the interval and applications; Group homeomorphisms and topological entropy of their elements.
Functional envelope of a dynamical system: Introduction and topological transitivity; Topological entropy of a functional envelope.

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ROTATION THEORY

MICHAŁ MISIUREWICZ

Rotation Theory has its roots in the theory of rotation numbers for circle homeomorphisms, developed by Poincaré. It is particularly useful for the study and classification of periodic orbits of dynamical systems. Its main idea is to consider limits of ergodic averages not at almost all points, like in Ergodic Theory, but for all points. I want to present the general ideas of the Rotation Theory and its applications to some classes of dynamical systems.

In particular, the following topics will be included:

- Classical rotation theory of Poincaré
- Circle diffeomorphisms
- Arnold tongues
- General rotation theory
- Rotation intervals for circle maps
- Rotation sets for torus maps
- Symbolic dynamics and rotation theory
- Center of mass
- Rotation sets for interval maps

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