

Integrated Research on Complex Dynamics

Conference

The following conference is hosted by RIMS (Research Institute for Mathematical Sciences) of Kyoto University.

Organizer: Hiroki Sumi (Osaka University)

Date : January 23, 2012, 14:45– January 27, 2012, 12:15.

Place : No. 420 room, Research Institute for Mathematical Sciences, Kyoto University.

Kitashirakawa-Oiwake cho, Sakyo-ku, Kyoto. (Kyoto city bus, “Kyodai-Nogakubumae” or “Kitashirakawa” bus stop)

Program

January 23

14:45–15:45

Tomoko Shinohara (Tokyo Metropolitan College of Industrial Technology)
Indeterminacy sets of rational maps and dimension of the invariant sets

16:00–17:00

Volodymyr Nekrashevych (Texas A & M Univ.)
Symbolic dynamics and self-similar groups
Abstract: I will describe how theory of finite automata and self-similar groups can be used to study symbolic dynamics of expanding maps (e.g. sub-hyperbolic rational functions), semi-conjugacies between them, and their combinations (like mating or tuning). Some explicit examples will be described.

January 24

9:45–10:45

Koh Katagata (National College of Tech.)
Qualitative theory of differential equations and complex dynamics

11:00–12:00

Shunsuke Morosawa (Kochi Univ.)
Residual Julia sets of Blaschke products
In this talk, we consider dynamics of certain Blaschke products and show some properties of their residual Julia sets and buried points.

13:30–14:30

Mitsuhiro Shishikura (Kyoto Univ.)
A proof of Jacobson’s theorem by using the Yoccoz puzzle

14:45–15:45

Kohei Ueno (Toba National College of Maritime Technology)
Dynamics and weights of polynomial skew products on \mathbb{C}^2
Abstract: We consider the dynamics of polynomial skew products on \mathbb{C}^2 . By putting suitable weights, we show the existence of the Green functions on some regions, which naturally induces the weighted Green functions that are well behaved on \mathbb{C}^2 . Moreover, if the weight is positive, then it relates to the dynamics of the extended rational map on the weighted projective space.

- 16:00–17:00 Yusuke Okuyama (Kyoto Institute of Tech.)
The density problem on repelling periodic points of non-archimedean rational functions
Abstract: It is an open problem whether the repelling periodic points are dense in the classical Julia set of a rational function over non-archimedean fields. In this talk, we give a partial positive answer to this question based on a study of “logarithmic equidistribution” on Berkovich projective line over non-archimedean fields.
- January 25
- 9:10–9:30 Hirokazu Shimauchi (Tohoku Univ.)
On the coefficients of the Riemann mapping function for the exterior of the Mandelbrot set
- 9:45–10:45 Yasuaki Hiraoka (Kyushu Univ. IMI)
Rational maps and maximum likelihood decodings
- 11:00–12:00 Takato Uehara (Tohoku Univ.)
On rational surface automorphisms
- 13:30–14:30 Keiji Oguiso (Osaka Univ.)
Quartic K3 surfaces and Cremona transformations - around a question of Professor Igor Dolgachev
Abstract: We prove that there is a smooth quartic K3 surface automorphism that is not derived from the Cremona transformation of the ambient three-dimensional projective space \mathbf{P}^3 . This gives a negative answer to a question of Professor Igor-Dolgachev. We also discuss relevant problems, affirmative examples and results in other dimensions/situations.
- 14:45–15:45 Shigehiro Ushiki (Kyoto Univ. Human and Environmental Studies)
Critical points and Julia sets for complex Hénon maps
- 16:00–17:00 Tetsuo Ueda (Kyoto Univ.)
Semi-parabolic implosion in two complex variables
- January 26
- 9:45–10:45 Hiroyuki Inou (Kyoto Univ.)
”Cut-open” rabbit in parameter spaces
Abstract: The period p superattracting curve is the family of critically marked cubic polynomials with periodic marked critical points of exact period p . Milnor conjectured that there is a natural embedding of the ”cut-open” filled Julia set of a quadratic polynomial with period p critical orbit into it. I would like to discuss the dynamical meaning of such an embedding and how to construct such an embedding.
- 11:00–12:00 Tomoki Kawahira (Nagoya Univ.)
Riemann surface laminations generated by complex dynamical systems

- 13:30–14:30 Shizuo Nakane (Tokyo Polytechnic Univ.)
On saddle basic sets for Axiom A polynomial skew products on \mathbb{C}^2
- 14:45–15:45 Taro Asuke (Univ. of Tokyo)
Independence and non-triviality of rigid second complex characteristic classes
- 16:00–17:00 Teisuke Jin (Kyoto Institute of Tech.)
Dynamics of Hénon map: Nevanlinna theory
- January 27
- 9:15–9:45 Shota Kojima (Rikkyo Univ.)
Extreme values of infinite compositions of quadratic polynomials
Abstract: We first consider a convergence condition for infinite compositions of entire functions. Second, we investigate extreme values of functions defined by infinite compositions of quadratic polynomials.
- 10:00–11:00 Yasushi Yamashita (Nara Woman's Univ.)
A computer experiment on primitive stable representations
Abstract: A computer experiment on primitive stable representations
In this talk, I will show some computer generated pictures of primitive stable representations introduced by Y. Minsky and compare it with Bowditch's Q-condition.
- 11:15–12:15 Hiroki Sumi (Osaka Univ.)
Stability, bifurcation and classification of minimal sets in random complex dynamics
Abstract: We consider random complex dynamics on the Riemann sphere. There are many new phenomena in random complex dynamics which cannot hold in the usual iteration dynamics of a single rational map. In this talk, we show that regarding random complex dynamics of polynomials, generically, the chaos of the averaged system disappears due to the automatic cooperation of many kinds of maps in the system (cooperation principle). Moreover, we investigate the bifurcation of limit states of one-parameter family of random complex dynamics. To show these results, we introduce classification of minimal sets of systems.

For the newest version of the program, see the following webpage:

<http://www.math.sci.osaka-u.ac.jp/~sumi/cpxdyn11meetinge.html>.

If you would like to participate in the party (January 25, evening), please send an e-mail with your name, affiliation, and e-mail address, to Hiroki Sumi: [sumi\(AT\)math.sci.osaka-u.ac.jp](mailto:sumi(AT)math.sci.osaka-u.ac.jp).
Date: January 17, 2012.