ABSTRACTS

Equidistribution and Arithmetic Dynamics

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Stability of Certain Higher Degree Polynomials

by

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We study the stability of $f(z) = z^d + \frac{1}{c}$ for $d \geq 3$, $c \in \mathbb{Z} \setminus \{0\}$. We show that whenever $f(z)$ is irreducible, all its iterates are irreducible over $\mathbb{Q}$, that is, $f(z)$ is stable over $\mathbb{Q}$ for infinite values of d.

Joint work with R. Sarma and H. Sharma

Several aspects of Dynamical Mahler measure

by

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The Mahler measure of a multivariable polynomial or rational function P is given by the integral of $\log |P|$ where each of the variables moves on the unit circle and with respect to the Haar measure. We consider a dynamical generalization of Mahler measure and present dynamical analogues of various results from the classical Mahler measure as well as examples of formulas allowing the computation of the dynamical Mahler measure in certain cases.

Joint work with Carter, Manes, Miller, and Mocz

Basins of infinity and Böttcher maps

by

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Can we determine the complex polynomial dynamics from the dynamics in the basin of infinity in $\mathbb{C}$? An (obvious) answer is no. Now we restrict the coefficients to be algebraic and consider all the archimedean and nonarchimeadean basins of infinity, we may ask if the polynomial dynamics is determined by the dynamics in all the above basins of infinity. I will talk about the case of unicritical polynomials.

Joint work with H. Fu

On totally real PCF parameters

by

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An algebraic number is called totally real if its minimal polynomial splits completely over $\mathbb{R}$. In this talk, I will discuss a finiteness result of totally real algebraic numbers c such that the uncritical polynomial $f_c(x) = x^2 + c$ is **P**ost-**C**ritically **F**inite (i.e., the orbit of 0 under f_c-iteration is finite). This is based on joint work (in preparation) with Clayton Petsche. Our approach relies upon potential-theoretical features of the classical Mandelbrot set and a property of zeros of a monic Jacobi polynomial.

Joint work with Clayton Petsche

An Inner Product on Adelic Measures

by

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We define an inner product on a vector space of adelic measures over a number field. When restricted to the subspace of adelic measures with total mass zero, the norm induced by our inner product agrees with the mutual energy pairing considered by Favre & Rivera-Letelier and by Fili. We find that the norm of the canonical adelic measure associated to a rational map is commensurate with the Arakelov height on the space of rational functions with fixed degree. As a consequence, the Arakelov–Zhang pairing of two rational maps f and g can be bounded from below as a function of g.

Joint work with Clay Petsche

Points on Tri-Involutive K3 Surfaces

by

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Let W be a surface in $\mathbb{P}^1 \times \mathbb{P}^1 \times \mathbb{P}^1$ given by the vanishing of a $(2,2,2)$ form. The three projections $W \to \mathbb{P}^1 \times \mathbb{P}^1$ are double covers that induce three non-commuting involutions on W. Let G be the group of automorphisms of W generated by these involutions. We investigate the G-orbit structure of the points of W. In particular, we study G-orbital components over finite fields and finite G-orbits in characteristic 0.

Joint work with Elena Fuchs, Matthew Litman, and Austin Tran

Torsion values of sections on elliptical billiards and diophantine problems in dynamics

by

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We shall consider "sections" of elliptic families, and especially their "torsion values". For instance, what can be said of the complex numbers b for which $(2, \sqrt{2(2-b)})$ is torsion on the Legendre curve $y^2 = x(x-1)(x-b)$? In particular, we shall recall results of "Manin-Mumford type" and focus to illustrate some applications to elliptical billiards. Finally, if time allows we shall frame these issues as special cases of a general question in arithmetic dynamics, which can be treated with different methods, depending on the context.

(Most results refer to work with Pietro Corvaja and David Masser.)