Focused Workshop on dimension drop for analytic Iterated Function Systems

Schedule

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<tr><th>Time</th><th>Monday</th><th>Tuesday</th><th>Wednesday</th><th>Thursday</th></tr>
<tr><td>09:30–10:00</td><td></td><td rowspan="2">Leclerc</td><td rowspan="2">Joint work</td><td rowspan="2">Joint work</td></tr>
<tr><td>10:00–10:30</td><td>Welcome coffee</td></tr>
<tr><td>10:30–11:00</td><td rowspan="2">Kolossváry</td><td colspan="3">Coffee break</td></tr>
<tr><td>11:00–11:30</td><td rowspan="2">Banaji</td><td rowspan="2">Joint work</td><td rowspan="2">Joint work</td></tr>
<tr><td>11:30–12:00</td><td rowspan="3" colspan="3">Lunch break</td></tr>
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<tr><td>13:30–15:00</td><td>Feng</td><td>Baker</td><td>Joint work</td><td>Joint work</td></tr>
<tr><td>15:00–15:30</td><td colspan="4">Coffee break</td></tr>
<tr><td>15:30–16:30</td><td>Hochman</td><td rowspan="2">Open problems</td><td rowspan="2">Joint work</td><td rowspan="2">Summary</td></tr>
<tr><td>16:30–17:30</td><td>Ren</td></tr>
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After the talks on Monday there will be a reception with wine and cheese.

Titles and abstracts

Simon Baker

Title: *Spectral gaps and Fourier decay*

Abstract: I will explain why an analytic IFS that is not conjugated to a self-similar IFS has the property that all of its stationary measures have polynomial Fourier decay. The first part of the talk will explain how the non-conjugate condition gives a suitable spectral gap. The second part will explain why this spectral gap result gives polynomial Fourier decay. This will be based upon joint work with Tuomas Sahlsten and another joint work with Osama Khalil and Tuomas Sahlsten.

Amlan Banaji

Title: *Fourier decay for conjugate-to-linear self-conformal measures*

Abstract: We work in the setting of an IFS of real-analytic conformal contractions which is not self-similar but is conjugate to a self-similar IFS by an analytic diffeomorphism (the

non-conjugate case will be considered in Simon Baker's talk). Self-conformal measures for such IFSs can be realised as nonlinear pushforwards of self-similar measures, and under mild assumptions such self-conformal measures have polynomial Fourier decay. We will describe the proof of this Fourier decay, using as a black box the fact that (barring trivial obstructions) self-similar measures have polynomial Fourier decay outside a very sparse set of exceptional frequencies. The goal of this talk is to give a fairly complete proof for measures in the line; in this setting we obtained the result in joint work with Simon Baker but will present an argument closer to the proof from a simultaneous paper of Algom-Chang-Wu-Wu. Time permitting, we will indicate the additional difficulties which arise in the plane and how they can be overcome (joint work with Han Yu).

Zhou Feng

Title: *Dimension of overlapping self-conformal measures on the plane*

Abstract: We present the proof that, under exponential separation and certain essentially necessary conditions ruling out geometric obstructions, the dimension of a planar self-conformal measure attains its natural upper bound. Being detailed and considerate is our goal and hope. This is joint work with Ariel Rapaport.

Michael Hochman

Title: *TBA*

Abstract: TBA

István Kolossáry

Title: *The dual IFS and exponentially separated analytic IFSs on* $\mathbb{R}$

Abstract: The talk will introduce the dual IFS of an analytic IFS on the line, some of its main properties and show how strong separation of the dual IFS implies exponential separation of the original analytic IFS. Plan to show some concrete examples to which it can be applied and also some limitations. Based on joint work with Balázs Bárány and Sascha Troscheit.

Gaétan Leclerc

Title: *How the dual IFS relates to exponential mixing.*

Abstract: The goal of this talk is to explain how the dual IFS and its properties can be used to prove exponential mixing for some hyperbolic flows. We will introduce Dolgopyat's estimates ($\sim$1998) and prove them in a toy example. The strategy used will be adapted from a remark of Jialun Li ($\sim$2020). We will also discuss a Frostman regularity result for the dual attractor under

weak hypothesis on the base IFS: a nonlinearity hypothesis called "UNI", typically equivalent to the base (analytic) IFS not being conjugated to an affine IFS.

Haojie Ren

Title: *L^q Dimensions of Self-Conformal Measures for Exponentially Separated Analytic IFSs on $\mathbb{R}$*

Abstract: In this talk, I will discuss joint work with Pablo Shmerkin and Shunsuke Usuki. We prove a classification theorem for the L^q dimensions of self-conformal measures generated by exponentially separated real analytic IFSs on $\mathbb{R}$. This extends earlier results of Shmerkin in the linear case and Usuki in the Möbius case to the analytic setting.