

1st DynAtrois Meeting

Wednesday, September 3 to Friday, September 5, 2025 – Dijon

René Baire Room, 4th floor

	Wednesday 3	Thursday 4	Friday 5
9h		9h-10h F. Ledrappier	9h-10h30 M. Abboud
10h		Coffee break	Coffee break
11h		10h30-12h J. Poineau GADT seminar	11h-12h F. Ledrappier
12h			
13h			
14h		13h30-15h M. Abboud	
15h	14h-15h F. Ledrappier	Coffee break	
16h	15h-16h M. Abboud	15h30-16h30 L. Kaufmann	
17h	Coffee break	16h30-17h30 M. Luo	
18h	16h30-17h30 Y. Zhang		

Mini-courses:

- Marc Abboud – *Introduction to Moriwaki heights*
- François Ledrappier – *Invariance principle in dynamics*

Research talks:

- Muhan Luo – *Equidistribution of saddle periodic points of Hénon-like maps*
- Lucas Kaufmann – *Exponential equidistribution of periodic points for endomorphisms of $\mathbb{P}^k$*
- Jérôme Poinneau – *Degenerations of complex analytic invariants and valiative compactifications*
- Yugang Zhang – *Algebraic families of weakly polarized endomorphisms*

Abstracts

Marc Abboud (Univ. de Neuchâtel)

Introduction to Moriwicki heights

Abstract

In arithmetic dynamics, the theory of heights developed by Weil has been quite useful in proving a lot of important results. Over a number field K , it is now a classical theory. Using Arakelov geometry we can see a height as a sum of “local heights” given by all the possible absolute values of K . One of the most useful results is the Northcott property for heights associated to ample line bundles: a set of points of bounded heights and bounded degrees is necessarily finite. The other important result is the results on arithmetic equidistribution of points of small heights. If now K is finitely generated over $\mathbb{Q}$, one way to develop the theory of heights is to use geometric heights. The downside is that Northcott property does not hold anymore because one has to deal with problems of isotriviality. One way to explain this is because geometric heights only use local heights coming from geometric absolute values of K . Moriwicki heights is a nice analog to Weil heights because it uses local heights coming from both geometric and arithmetic absolute values. The Northcott property is satisfied for Moriwicki heights and the equidistribution of small points as well. In this mini-course, I will recall the theory of Weil heights using Arakelov geometry and explain Moriwicki heights. I will show one application by proving the following result of Baker–DeMarco: If two endomorphisms of the projective line $\mathbb{P}^1$ of degrees > 1 have infinitely many preperiodic points in common then they have the same set of preperiodic points. The proof of Baker–DeMarco uses a specialisation argument to deal with a field with transcendence over $\mathbb{Q}$, we will use Moriwicki heights for the proof instead.

François Ledrappier (Univ. Notre Dame-Sorbonne Univ.-CNRS)

Invariance Principle in Dynamics

Abstract

Let m be a probability measure with finite support on real matrices. We consider the independent product of these matrices, each chosen according to the law m . Hillel Furstenberg showed in 1973 that the Lyapunov exponents of this random product are distinct, unless there exists an invariant measure for m -almost every matrix for their action on the projective space.

The invariance principle in dynamics is a broad generalization to cocycles over measure-preserving transformations. Under conditions to be specified, if the exponents are distinct, then something is invariant. Artur Avila and Marcelo Viana have developed this theme and studied many examples.

In this mini-course, we will recall what Lyapunov exponents are and illustrate this invariance principle with some examples.

Muhan Luo (Nat. Univ. of Singapore)

Equidistribution of Saddle Periodic Points of Hénon-like Maps

Abstract

We prove that under the natural assumption over the dynamical degrees, the saddle periodic points of a Hénon-like map in any dimension equidistribute with respect to the equilibrium measure. Our work generalizes results of Bedford–Lyubich–Smillie, Dujardin, and Dinh–Sibony, along with improvements of their techniques. We also investigate some fine properties of Green currents associated with the map. This is a joint work with Qi Zhou.

Lucas Kaufmann (Univ. d’Orléans)

Exponential Equidistribution of Periodic Points for Endomorphisms of $\mathbb{P}^k$

Abstract

It is known since the works of Lyubich in dimension 1 and Briend–Duval in any dimension that the periodic points of a holomorphic endomorphism of $\mathbb{P}^k$ equidistribute towards its equilibrium measure. In this talk I will present a result concerning the speed of convergence. This is a joint work with H. de Thélin and T.-C. Dinh.

Jérôme Poineau (Univ. de Caen Normandie)

Degenerations of Complex Analytic Invariants and Valuative Compactifications

Abstract

In the first part, we will present a non-archimedean method to study the asymptotic behavior of certain analytic invariants of meromorphic families of complex varieties, following works of Berkovich, Favre, Boucksom–Jonsson, etc. To do this, we will introduce the notion of a hybrid Berkovich space, containing both complex and non-archimedean spaces.

In the second part, building on ideas of Morgan–Shalen, Thuillier, Fantini, etc., we will explain how the previous method fits into a general framework of compactifications of complex algebraic varieties by valuation spaces. We will illustrate this construction with two examples: the moduli space of rational maps and the moduli space of curves.

Yugang Zhang (Univ. Paris-Saclay)

Algebraic Families of Weakly Polarized Endomorphisms

Abstract

For a complex algebraic family of weakly polarized endomorphisms, one can define the corresponding canonical height function. We show that there is a gap in the values of this function near zero. As an application, we establish a conjecture of Kawaguchi and Silverman for loxodromic automorphisms of projective surfaces defined over a complex function field.