Holomorphic Dynamics Meeting

12th January 2026, University of Nottingham

Programme

13.10–14.00	Adam Epstein (Warwick) *Title tba*
14.00–14.25	Ayesha Bennett (Cambridge) *Shrinking target and recurrence for non-autonomous systems*
14.30–14.55	Julia Münch (Liverpool) *Extending rational expanding Thurston maps*
15.00–15.45	Tea & coffee break (Physics Building, Room C29)
15.45–16.35	Daniel Meyer (Liverpool) *Quasivisual approximations, metrics, and semi-hyperbolic maps*
16.40–17.30	Lasse Rempe (Manchester) *Maverick capacity*

All talks to take place in the Physics Building, Room B13.

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Abstracts

Adam Epstein — *TBA*

Ayesha Bennett — *Shrinking target and recurrence for non-autonomous systems*

Study of zero-one laws for the shrinking target and recurrence set are classically motivated from Diophantine approximation, but more recently have been utilised in transcendental dynamics. I will present a new, non-autonomous zero-one law for the shrinking target set of a general system, and also an autonomous zero-one law for the recurrence set of a natural subclass of inner functions. We will examine the proof strategy of both, and understand the key obstacles to upgrading the recurrence result to the non-autonomous setting.

Julia Münch — *Extending rational expanding Thurston maps*

Uniformly quasi-regular maps are a nice class to study if one aims to extend results of complex dimensions in the plane to real higher dimensions. However uniform quasi-regularity is a strong assumption and it is not trivial to find examples. Our construction provides maps such that each point can be iterated finitely many times without leaving the domain and for these iterates the constant is uniform. We will explain how to extend rational expanding Thurston maps f defined on the Riemann sphere S^2 to a mapping F that is defined on a set A containing S^2 in its interior to a map that is uniformly quasi-regular for all admissible iterates.

In the second part of the talk we will treat an application of this construction that is motivated by Sullivan's dictionary. Sullivan's dictionary provides an analogy between objects, conjectures and theorems in complex dynamics and the study of Kleinian groups. The aim of the talk is to explain a construction of a space-filling curve that arises as the boundary of an immersed and severely folded plane as well as from the dynamics of f. The analogous object from the Kleinian groups side is the Cannon-Thurston map, that is a Group-invariant Peano curve.

Daniel Meyer — *Quasivisual approximations, metrics, and semi-hyperbolic maps*

The topology and geometry of some metric space S may often be described by a sequence of covers $\{\mathbf{X}^n\}$ that becomes finer as $n \to \infty$. Each $\mathbf{X}^n$ then is a coarse picture of S, where the resolution increases with n.

A *quasivisual approximation* (qv-approximation) is such a sequence of covers $\{\mathbf{X}^n\}$ that satisfies certain natural conditions. Closely related to this concept are *quasisymmetric maps*, which preserve ratios of distances up to a fixed multiplicative factor. A map between metric spaces maps a qv-approximation to a qv-approximation if and only if it is a quasisymmetry.

Given a qv-approximation, we may define the *tile graph* Γ. Here the vertices are all the sets $X^n \in \mathbf{X}^n$, for any $n \in \mathbb{N}$. Distinct sets X^n, Y^k are joined by an edge if $X^n \cap Y^k \neq \emptyset$ and $|n-k| \leq 1$. Then Γ is Gromov-hyperbolic and its boundary at infinity is naturally quasisymmetric to S. Conversely, if the tile graph is Gromov-hyperbolic for some sequence of covers $\{\mathbf{X}^n\}$, we may construct a qv-approximation from $\{\mathbf{X}^n\}$.

In a dynamical setting, a sequence of covers may be constructed by starting with some cover $\{\mathbf{X}^1\}$ and defining $\mathbf{X}^n$ as the pullback of $\mathbf{X}^1$ by the $(n-1)$-th iterate. In the setting of rational maps g, we show that such a dynamical sequence of covers is quasivisual if and only if g is semi-hyperbolic.

This is joint work with Mario Bonk and Mikhail Hlushchanka.

Lasse Rempe — *Maverick capacity*

Let f be a transcendental entire function. An *escaping wandering domain* is a connected component U of the Fatou set of f that is not eventually periodic and on which the iterates tend to infinity. Rippon and Stallard proved that the set of escaping points on the boundary of U have full harmonic measure. In 2014, Bishop asked whether non-escaping points on the boundary (which we call *maverick points*) even have logarithmic capacity zero with respect to U, which is a much stronger condition. We give an example that shows that the answer is negative in general, but show that the answer is positive when all iterates of f are univalent on U.

This is joint work with Martí-Pete and Waterman.