

20th Galway Topology Colloquium

23rd – 25th July 2018

Monday 23rd July:

- 10:00 – 11:00:** Reception at Watson building
- 11:00 – 12:00:** *Distributionally chaotic pairs in shift spaces (Magdalena Forýs-Krawiec)*
- 12:00 – 13:30:** Lunch
- 13:30 – 14:10:** *TBA (Robin Knight)*
- 14:10 – 14:50:** *The Auslander-Yorke dichotomy revisited (Joel Mitchell)*
- 14:50 – 15:20:** Break
- 15:20 – 16:00:** *Orbital shadowing, internal chain-transitivity and ω -limit sets (Chris Good)*

Tuesday 24th July:

- 10:00 – 11:00:** *The property of Kelley and continua (Sergio Macías)*
- 11:00 – 11:20:** Break
- 11:20 – 12:00:** *Topological entropy of irregular sets in dynamical systems with shadowing property (Magdalena Forýs-Krawiec)*
- 12:00 – 13:30:** Lunch
- 13:30 – 14:10:** *On the periodic points of the random period doubling substitution (Scott Balchin)*
- 14:10 – 14:50:** *The Ellis semigroup of constant length substitution (Petra Staynova)*
- 17:00 – 21:00:** Jazz festival
- 21:00 – 22:30:** Conference meal at The Canal House, Gas Street Basin

Wednesday 25th July:

- 10:00 – 11:00:** *The property of Kelley and continua (Sergio Macías)*
- 11:00 – 11:20:** Break
- 11:20 – 12:00:** *Continua without non-block points (Daron Anderson)*
- 12:00 – 13:30:** Lunch
- 13:30 – 14:10:** *Induced dynamics on function spaces (Robert Leek)*
- 14:10 – 15:10:** *A menagerie of non-cut points in continua (Paul Bankston)*

Distributionally chaotic pairs in shift spaces

Magdalena Foryś-Krawiec, University of Ostrava, Czech Republic

Monday 23rd July, 11:00 – 12:00

In 1975 T. Y. Li and J. A. Yorke published their paper Period three implies chaos concerning chaotic behaviour of dynamical systems. It was the first time when the definition of Li-Yorke pairs appeared for the pairs of points which are proximal but non-asymptotic and dynamical systems containing such pairs were called chaotic in Li-Yorke sense.

Afterwards the natural questions were raised on conditions for a dynamical system to have one Li-Yorke pair, finite subset of such pairs or uncountable subset of such pairs.

In the talk I will present some classical results in the field as well as the modification of Weiss-Katznelson method of constructing uniformly rigid and proximal shift space over an infinite alphabet $[0, 1]$. I will show that the original construction can be modified to provide some additional dynamical properties of the shift space, in particular we may use it to construct an uniformly rigid, proximal shift space with DC2 pair.

Topological entropy of irregular sets in dynamical systems with shadowing property

Magdalena Foryś-Krawiec, University of Ostrava, Czech Republic

Tuesday 24th July, 11:20 – 12:00

For a continuous function $\Phi : X \rightarrow \mathbb{R}$ and for every $x \in X$ we define the sum $1/n \sum_{i=0}^{n-1} \Phi(T^i x)$ as the Birkhoff average. That sum converges for a set of x with a full T -invariant measure – those points are called Φ -regular. The complementary set, denoted by $I_\Phi(T)$, is called Φ -irregular, while the set

$$I(T) = \bigcup_{\Phi \in \mathcal{C}(X, \mathbb{R})} I_\Phi(T)$$

is called irregular set.

The talk presents some results of our research on the value of topological entropy for irregular sets. In particular we focus on dynamical systems (X, T) with shadowing property and we show that the value of topological entropy of irregular set in such spaces can be bounded from below by the value of topological entropy for some chain recurrent class $Y \subset X$.

The property of Kelley and continua

Sergio Macías, Institute of Mathematics, National University of Mexico

Tuesday 24th July, 10:00 – 11:00, &

Wednesday 25th July, 10:00 – 11:00

J. L. Kelley defined a property as a sufficient condition to guarantee the contractibility of some of the hyperspaces of metric continua. It turns out that this property has been very important in the study of not only hyperspaces but metric continua too. In 1999 W. J. Charatonik and W. Makuchowski defined the now known property of Kelley for Hausdorff continua. Charatonik presented a homogeneous Hausdorff continuum without the property of Kelley, showing that this property does not generalize to the Hausdorff case, and Makuchowski generalized some local connectedness properties to hyperspaces of Hausdorff continua. We plan to present the Hausdorff version of several theorems known in the metric case.

Continua without non-block points

Daron Anderson, NUI Galway

Wednesday 25th July, 11:20 – 12:00

The point x of the continuum X is called a non block point to mean the complement of x has a dense continuum component. Metric continua always have two or more non-block points. We present examples of indecomposable non-metric continua that have no non-block points. The examples are Stone-Čech remainders of the half line and similar spaces under the set-theoretic axiom Near Coherence of Filters.

On the periodic points of the random period doubling substitution

Scott Balchin, University of Warwick, with Dan Rust and Philipp Gohlke

Tuesday 24rd July, 13:30 – 14:10

One can extend the notion of a substitution system by allowing the substitution rule of a letter to be taken from a finite set of words equipped with a probability distribution. The subshifts associated to such systems behave very differently to their deterministic counterparts. In particular, one can show that under the shift action, there are either no periodic words, or a dense set of periodic words.

In this talk, we will discuss the computational algorithm used for finding the possible periodic words of the so called random period doubling substitution. This is joint work with Dan Rust and Philipp Gohlke.

A menagerie of non-cut points in continua

Paul Bankston, Marquette University

Wednesday 25th July, 14:10 – 15:10

In a continuum X , point c lies between points a and b if every subcontinuum of X containing $\{a, b\}$ contains c as well. Borrowing from convexity theory, we say that c is an extreme point of X if whenever c is between points a and b , it must be the case that either a is between c and b or b is between a and c . Extreme points are non-cut points, but they can also be weak cut points. We examine, raising more questions than answers, how extreme points relate to other kinds of non-cut points. Chiefly we focus on non-block points and some of their close kin.

Orbital shadowing, internal chain-transitivity and ω -limit sets

Chris Good, University of Birmingham, with Jonatham Meddaugh

Monday 23rd July, 15:20 – 16:00

Let $f : X \rightarrow X$ be a continuous map on a compact metric space, let ω_f be the collection of ω -limit sets of f and let $\text{ICT}(f)$ be the collection of closed internally chain transitive subsets. Provided that f has shadowing, it is known that the closure of ω_f in the Hausdorff metric coincides with $\text{ICT}(f)$. In this paper, we prove that $\omega_f = \text{ICT}(f)$ if and only if satisfies Pilyugin's notion of orbital limit shadowing. We also characterize those maps for which $\overline{\omega_f} = \text{ICT}(f)$ in terms of a variation of orbital shadowing.

Induced dynamics on function spaces

Robert Leek, University of Birmingham, with Chris Good

Wednesday 25th July, 13:30 – 14:10

In this talk, I will discuss the interplay between a (discrete topological) dynamical system (X, f) and the induced dynamics on function spaces of real-valued continuous functions, where the system map is right / pre-composition by f .

The Auslander-Yorke dichotomy revisited

Joel Mitchell, University of Birmingham, with Chris Good and Robert Leek

Monday 23rd July, 14:10 – 14:50

The Auslander-Yorke dichotomy states that a minimal system on a compact metric space is either equicontinuous or witnesses sensitive dependence on initial conditions. We give a generalisation of this result using topological equicontinuity, as defined by H. L. Royden.

The Ellis Semigroup of Constant Length Substitution Systems

Petra Staynova, University of Leicester

Tuesday 24th July, 14:10 – 14:50

The Ellis semigroup is a useful tool in topological dynamics which captures the asymptotic properties of a dynamical system. However, concrete calculations of this semigroup are still very few. In particular, there are few examples of systems having two minimal ideals. In this talk, we will give a characterization of a large class of constant length substitution systems which have two minimal ideals in their semigroup, and discuss the number of possible minimal idempotents. No prior knowledge of the Ellis semigroup is assumed.

Birmingham Jazz Festival

20th – 29th July 2018

Sunday 22nd July:

- 12:30 – 14:30:** Budapest Ragtime Orchestra (Mailbox, 7 Commercial Street)
- 14:00 – 16:00:** The Jake Leg Jug Band (Edwardian Tea Rooms, Birmingham Museum and Art Gallery)
- 15:00 – 17:00:** Ricky Cool and The In Crowd (Brasshouse, 44 Broad Street)
- 16:00 – 18:00:** C Jam (The Canal House, Gas Street Basin)
- 16:00 – 18:00:** New Orleans Jump Band (1000 Trades, 16 Frederick Street)
- 17:30 – 19:30:** The Jake Leg Jug Band (Slug & Lettuce, Brindleyplace)
- 18:00 – 20:00:** Budapest Ragtime Orchestra (O'Neill's, Broad Street)
- 19:00 – 21:00:** Art Themen Quartet (All Bar One, Brindleyplace)

Monday 23rd July:

- 19:00 – 21:00:** Kim Cypher Quartet (The Ivy, 67 – 71 Temple Row)
- 19:30 – 21:30:** Chris Bowden (Coast to Coast, Brindleyplace)
- 19:30 – 21:30:** Sounds Like Poetry, Sounds Like Jazz (Holiday Inn lobby, Hill Street)

Tuesday 24th July:

- 17:00 – 19:00:** Duved Dunayevsky Quartet (Boston Tea Party, 30 Harborne Road)
- 19:30 – 21:30:** The Anvil Chorus (Park Regis, 160 Broad Street)

Wednesday 25th July:

- 17:00 – 19:00:** Julian Marc Stringle & Dave Newton (Boston Tea Party, 30 Harborne Road)
- 18:30 – 20:30:** The Shufflepack (The Canal House, Gas Street Basin)
- 19:30 – 21:30:** Duved Dunayevsky Quartet (1000 Trades, 16 Frederick Street)
- 19:30 – 21:30:** Jim Bashford Trio (The Blue Piano, 24 – 26 Harborne Road)
- 21:00 – 23:00:** Lucas D and The Groove Ghetto (The Jam House, 3 – 5 St. Paul's Square)

The Anvil Chorus

anvilchorus.uk

Tuesday 24th July, 19:30 – 21:30 at Park Regis, 160 Broad Street

At last year's festival the *Anvil Chorus* introduced jazz audiences to the delights of barbershop singing. The *Anvil Chorus* is the performance name of the *West Midlands Barbershop Harmony Club*, founded in 1978. The chorus consists of approximately 35 men of all ages and has regularly placed in the prestigious *BABS* convention, with a number of top ten finishes and a best placing of 3rd.

Art Themen Quartet

Sunday 22nd July, 19:00 – 21:00 at All Bar One, Brindleyplace

How many top British jazzmen spent their working lives as consultant orthopaedic surgeons and also played saxophone on *Joe Cocker's* hit *With a Little Help from my Friends*? It's surprising that the answer is as many as one, but *Art Themen* fills the bill! *Art's* musical life has taken him from the award-winning *Cambridge University Jazz Band* to touring with such blues stars as *Mick Jagger* and *Alexis Korner* to a jazz career of wonderful originality and unpredictability which has gained even more momentum in the years since he left the operating theatre behind him.

Budapest Ragtime Orchestra

Sunday 22nd July, 12:30 – 14:30 at the Mailbox, 7 Commercial Street

Sunday 22nd July, 18:00 – 20:00 at O'Neill's, Broad Street

The Great Ukulele Revival continues! Now no *Birmingham Jazz Festival* would be complete without a gathering of enthusiasts of all ages strumming away under the enthusiastic leadership of *Julian Cockshott* of *Ukulele Rocks*. Once again he is running informal workshops for all levels of ability from absolute beginners upwards.

Chris Bowden

Monday 23rd July, 19:30 – 21:30 at Coast to Coast, Brindleyplace

Saxist *Chris Bowden* first came to notice with his highly original 1996 album, *Time Capsule*, featuring his arrangements for 12-piece band. Since then he had worked widely as an arranger and proved equally popular on the Birmingham scene in a small group setting.

C Jam

Sunday 22nd July, 16:00 – 18:00 at The Canal House, Gas Street Basin

The repertoire of festival regulars C Jam ranges from cool jazz sounds to stomping blues / R & B and soul favourites. Three ex-members of the *Steve Gibbons Band* — *Brian Badhams* (keyboards and vocals), *Bob Wilson* (lead guitar/vocals) and *Brendan Day* (drums) — are joined by bassist *Frank Walker* and saxist *Sam Rogers*.

Duved Dunayevsky Quartet

[youtube.com/user/duved](https://www.youtube.com/user/duved)

Tuesday 24th July, 17:00 – 19:00 at Boston Tea Party, 30 Harborne Street

Wednesday 25th July, 19:30 – 21:30 at 1000 Trades, 16 Frederick Street

The *Duved Dunayevsky Quartet* made a big impression on their Birmingham debut last year. Israeli guitarist *Duved* spend his teens playing jazz fusion before discovering the music of *Django Reinhardt*. In 2015 he moved to Paris, leading *Duved's Hot Five* and *Duved's Pre-Bop Orchestra*. His quartet is a swing jazz group focusing on the original sound of *Django and the Hot Club* with an international line-up of Australian bassist *Leigh Barker*, Oxford-born violinist *Joanna Gardner* and Vermonter *Nick Sansome* on rhythm guitar.

The Jake Leg Jug Band

thejakelegjugband.com

Sunday 22nd July, 14:00 – 16:00 at the Edwardian Tea Rooms,

Birmingham Museum and Art Gallery

Sunday 22nd July, 17:30 – 19:30 at Slug & Lettuce, Brindleyplace

The *Jake Leg Jug Band* brings you the authentic sounds of 1920's and 1930's America — jazz, blues, gospel, ragtime — songs of murder, betrayal, gambling, liquor and redemption. The band has recorded four albums for the Lake label, all of them, including the latest, *Break a Leg*, enthusiastically received.

Jim Bashford Trio

jimbashford.co.uk

Wednesday 25th July, 19:30 – 21:30 at The Blue Piano, 24 – 26 Harborne Road

The trio features three top Midlands-based musicians: *Jim Bashford* on drums, with guitarist *Simon King* and organist *Matt Ratcliffe*. Together they play a groove-infused jazz that incorporates blues, funk and Latin.

Julian Marc Stringle & Dave Newton

julianmarcstringle.com

davidnewton.biz

Wednesday 25th July, 17:00 – 19:00 at Boston Tea Party, 30 Harborne Road

Described by *Sir John Dankworth* as 'an immense talent', *Julian Marc Stringle* made an early impact on the jazz scene, appearing on television with *Acker Bilk* at the age of 14 and leading the acclaimed *Young Jazz* while still a teenager. Julian's career since then has taken in appearances with many of the top British bands and musicians, an extended stay with *Digby Fairweather's* excellent *Half Dozen*, leadership of his own Latin-influenced *Dream Band* and any number of CD's under his own name. Julian has received the *British Jazz Award* for clarinet and Birmingham audiences will remember his inspired clarinet and tenor sax playing on the 2015 *Lady Sings the Blues* concert and recording.

Dave Newton is one of the UK's most individual, versatile and technically assured pianists, always at ease in solo and duo situations, but a perfect fit for one of those little big bands *Alan Barnes* loves to put together or, as at last year's Birmingham festival, the swinging Dixieland to mainstream of the *Lower Broad Street Philharmonic*. Many times a winner of the *British Jazz Award* for piano, Dave has been at the top of his profession for many years.

Kim Cypher Quartet

kimcypher.co.uk

Monday 3rd July, 19:00 – 21:00 at The Ivy, 67 – 71 Temple Row

Kim Cypher appears at Birmingham as part of her *Make Believe* album tour. One of the UK's most exciting saxophonists, vocalists and composers, Kim has developed her own 'funky' style of saxophone playing built upon influences of such players as *Maceo Parker*, *Pee Wee Ellis*, *Andy Sheppard* and *Courtney Pine*. Kim performs an eclectic mix of music spanning many genres in a style best described as 'funky saxophonist meets 1940s jazz singer'. Her second CD features her with many top British jazz musicians, including *Dave Newton*.

Lucas D and The Groove Ghetto

[facebook.com/Lucas-D-And-The-Groove-Ghetto-483522491689313](https://www.facebook.com/Lucas-D-And-The-Groove-Ghetto-483522491689313)

Wednesday 25th July, 21:00 – 23:00 at The Jam House, 3 – 5 St. Paul's Square

Lucas D and The Groove Ghetto are a 6 piece instrumental acid jazz outfit playing eclectic tunes and film scores from the 60's / 70's right up to contemporary jazz funk. Featuring some of Birmingham's favourite musicians, they are known for creating captivating grooves.

New Orleans Jump Band

<http://www.jumpband.es/> Sunday 22nd July, 16:00 – 18:00 at 1000 Trades, 16 Frederick Street

The *New Orleans Jump Band* was formed by five musicians in Sotogrande 27 years ago. Over the years they have played for the *King of Spain*, opened *Real Madrid's* training facility, backed *Kenny Ball* in Spain and been the subject of a two-page spread in *Hola* magazine. The band's

leader, *Mike Izatt* on banjo, has been one of three ever-presents, with *Jona Molbeck* (sousaphone) and *Stewart Napier* (clarinet). In 2017 the band decided to retire, but the lure of Birmingham was too much and the re-formed quintet will be assembling from Spain, Scotland, China (trombonist *Andy Peacock*) and the West Country (trumpeter *David Gorodi*).

Ricky Cool and The In Crowd

rickycoolandtheincrowd.co.uk

Sunday 22nd July, 15:00 – 17:00 at Brasshouse, 44 Broad Street

One of the most entertaining front men in the business, *Ricky Cool* has toured with the likes of *Billy Connolly* and shared a stage with *George Harrison*. His current dynamic group, *The In Crowd*, with a mix of rhythm and blues, ska, bluebeat and soul, recently starred at the *City of Derry Jazz and Big Band Festival*.

The Shufflepack

Wednesday 25th July, 18:30 – 20:30 at The Canal House, Gas Street Basin

The Shufflepack plays groovy shuffling blues in the classic style, from Chicago to the West Coast. The music of *Muddy Waters*, *Jimmy Reed* and the rest, with some original songs in there, too, guarantees a stomping, foot-tapping session

Sounds Like Poetry, Sounds Like Jazz

Monday 23rd July, 19:30 – 21:30 at Holiday Inn lobby, Hill Street

MC Phil Thomson introduces a spoken word evening at the Holiday Inn featuring guest poets and open mic. This is poetry with attitude, poetry in the jazz genre and maybe just poetry. Open mic on request — book your place half an hour before the start.