Jon Chaika

Current Position:

Associate Professor	University of Utah.	2015-
Assistant Professor	University of Utah	2013-2015

Past Position:

L.E. Dickson Instructor/NSF Postdoc	University of Chicago	2010-2013

Education:

Graduate Student in Mathematics Rice University 2005-2010
Advisor: Michael Boshernitzan
Thesis: Interval exchange transformations: topological mixing, Hausdorff dimensions for ergodic measures and disjointness

Ph.D in Mathematics	Rice University	2010
M.A. in Mathematics	Rice University	2007
B.S. in Mathematics	University of Iowa	2001-2005

Interests:

Ergodic theory of interval exchanges, flows on flat surfaces and Teichmüller geodesic flow. Diophantine approximation.

Awards:

Distinguished Research Award $10,000	U Utah	2022
Joint invited sectional talk	ICM	2022
NSF Standard Grant $209,453		2021
Simons Fellowship $112,016		2020
Poincare Chair	IHP	2017
Sloan Fellowship $50,000		
NSF Career grant		2015-

$447,002		
NSF Standard Grant		2013-2015
$269,944		
Warnock Chair	University of Utah	2012-2018
NSF Postdoc		2010-2013
$135,000		
CODY Postdoc		2010
Tracy Thomas Award	Rice University	2007-2009
Watts Fellowship	Rice University	2005

Invited visits:

Dynamics: Top. and Numbers.	Hausdorff Institute	Spring 2020
Group Actions and numbers	Newton Instiute	June 2014
Dynamics and Numbers	Max Planck Institute	July 2014
Mod spaces of Riem surfaces	PCMI	July 2011

Papers:

1) *Every transformation is disjoint from almost every IET.* Ann. of Math. 2012 arxiv:0905.2370

2) *Diophantine properties of IETs and general systems: quantitative proximality and connectivity* (with M. Boshernitzan). Inventiones 2013 arxiv:0910.5412

3) *There exists a topologically mixing IET.* ETDS 2012 arxiv:0910.3986

4) *Shrinking targets for IETs: Extending a Theorem of Kurzweil.* GAFA 2011 arxiv: 0910.2694

5) Borel-Cantelli sequences (with M. Boshernitzan). J. Analyse 2012 arxiv: 0910.5412

6) *The distribution of gaps for saddle connection directions* (with J. Athreya). GAFA 2012 arxiv:1012.4298

7) *Omega recurrence in cocyles* (with D. Ralston). ETDS 2014. arxiv:1109.2999

8) *Schrödinger Operators defined by interval exchange transformation* (with D. Damanik and H. Krüger). Journal of Modern Dynamics 2009 arxiv:08093230

9) *Hausdorff dimension for ergodic measures of interval exchange transformations.* Journal of Modern Dynamics 2008 arxiv:0807.2231

10) *Skew products over rotations with exotic properties*. Geo. Ded. 2014 arxiv: 1105.3633

11) *Winning games for bounded geodesics in the moduli space of quadratic differentials* (with Y. Cheung and H. Masur). Journal of Modern Dynamics 2013 arxiv:1109.5976

12) *Every transformation is disjoint from almost every non-classical exchange* (with V. Gadre). Geo. Ded. 2014 arxiv: 1110.2474

13) *Topological mixing for some residual sets or interval exchange transformations* (with J. Fickenscher) Comm. Math. Phys 2015 arxiv:1304.8127

14) *The gap distribution of slopes of the golden L.* (with J. Athreya and S. Lelievre) Contemp Math 631 arxiv:1308:42.03

15) *The Hausdorff dimension of non-uniquely ergodic direction in H(2) is almost*

everywhere 1/2 (with J. Athreya) Geom. & Top 2015. arxiv:1404.4657
16) *Every flat surface is Birkhoff and Oseledets generic in almost every direction* (with A. Eskin) Journal of Modern Dynamics 2015 arxiv:1304.8127
17) *There exists an interval exchange with a non-ergodic generic measure.* (with H. Masur). Journal of Modern Dynamics 2015 arxiv:14010.1576
18) *On the limit set in PMF of Teichmüller geodesics.* (with H. Masur and M. Wolf) Crelle's Journal 2019 arxiv:1406.0564.
19) Appendix C of *Right-angled billiards and volumes of moduli space of quadratic differentials on CP^1.* (Paper by J. Athreya, A. Eskin and A. Zorich) Annales ENS 2016 arxiv: 1212.1660
20) *A dichotomy for the stability of arithmetic progressions* (with M. Boshernitzan) Proceedings AMS 2016 arxiv:1303.4684
21) *Circle averages and disjointness in typical flat surfaces on every Teichmueller disc* (with P. Hubert). Bulletin of the London Mathematical Society 2017 arxiv: 1510.05955
22) *The set of uniquely ergodic IETs is path connected* (with S. Hensel) Ergodic Theory and Dynamical Systems 2019 arxiv:1405.0767
23) *Quantitative shrinking target properties for rotations interval exchanges and billiards in rational polygons.* (with D. Constantine) Israel Journal of Mathematics 2019. arxiv:1201.0941
24) *A smooth mixing flow on a surface with non-degenerate fixed points.* (with A. Wright) Journal of the AMS 2019. arxiv:1501.02881
25) *Logarithmic laws and unique ergodicity.* (with R. Trevino) Journal of Modern dynamics 2017 arxiv:1603.00076
26) *Horocycle flow orbits and lattice surface characterizations* (with K. Lindsey). Ergodic Theory and Dynamical System 2019 arxiv:1508.02801
27) *Ergodicity of skew products over linearly recurrent IETs* (with D. Robertson). Journal of the LMS 2019. arxiv:1709.01575
28) *Mobius disjointness for interval exchange transformations on 3 intervals* (with A. Eskin) Journal of Modern Dynamics 2019 arxiv.org/pdf/1606.02357.pdf
29) *Self-joinings for 3-IETs* (with A.Eskin) Accepted Journal of EMS.
30) *Uniform distribution of saddle connection lengths* (with D. Robertson) Journal of Modern Dynamics 2019
31) *Stationary coalescing walks on the lattice* (with A. Krishnan) Probability and related fields (2019).
32) *The set of non-uniquely ergodic d-IETs has Hausdorff codimension 1/2* (with H. Masur). Inventiones Mathematicae 2020. arxiv:1801.00770
33) *Singularity of the spectrum for smooth area preserving flows in genus two and translation surfaces well approximated by cylinders.* (with K. Fraczek, A. Kanigowski and C. Ulcigrai) Communications in Mathematical Physics (2021). arxiv: 1912.10250
34) *A prime system with many self-joinings* (with B. Kra). Journal of Modern Dynamics (2021(arxiv:1902.02421
35) *The typical measure preserving transformation is not an interval exchange transformation* (with D. Davis). Submitted arxiv:1812:10425

36) *Weakly mixing polygonal billiards* (with G. Forni). Submitted arxiv:2003.00890

37) *Tremors and horocycle dynamics on the moduli space of translation surfaces* (with J. Smillie and B. Weiss). Submitted https://arxiv.org/pdf/2004.04027.pdf

38) *Zero measure spectrum for Mulit-Frequency Schodinger operators* (with D. Damanik, J. Fillman and P. Gohlke) Journal https://arxiv.org/abs/2009.11946

39) *Path connectivity of the sets of uniquely ergodic and cobounded foliations* (with S. Hensel) arxiv1909.03668

40) *On the space of ergodic measures for the horocycle flow on strata of abelian differentials* (with O. Khalil and J. Smillie) Submitted https://arxiv.org/pdf/2104.00554.pdf

41) *Connectivity of the Gromov boundary of the free factor complex* (with M. Bestvina and S. Hensel) Submitted https://arxiv.org/pdf/2105.01537.pdf

42) *Ergodic multidimensional continued fraction algorithms.* (with A. Nogueira) arxiv:1302.5008

43) *Stationary coalescing walks on the lattice II: Entropy* (with A. Krishnan) Submitted arxiv:1909.04816.pdf

44) *The Densest Sequence in the Unit Circle* (with M. Boshernitzan). Preprint arxiv:0906.0045

45) *Towers of powers* (with M. Boshernitzan). Preprint

46) *On the Hausdorff dimensions of a singular ergodic measure for some interval exchange transformations.* Preprint arxiv: 1105.3633

47) *On the frequency of balanced times in cylinder flows* (with D. Ralston). Preprint arxiv:0908.4547

48) *Homogeneous approximation for flows on flat surfaces.* Preprint arxiv: 1110.6167

49) *[0,1] is not a minimality detector for [0,1]^2*. Preprint arxiv:0905.4276

50) *On the Minkowski diagonal function for two real numbers.* (with I. Kan and N. Moshchevitin) Diophantine analysis and related fields 2011

Papers stemming from undergraduate research:

a) *A theorem on accepted elasticity in certain local arithmetical congruence monoids.* (with M. Banister, S. Chapman and W. Meyerson). Abh. Math. Semin. Univ. Hambg. 2009.

b) *On a result of James and Niven concerning unique factorization.* (with M. Banister, S. Chapman and W. Meyerson). Elem. Math. 2007

c) *On the arithmetic of arithmetical congruence monodies.* (with M. Banister, S. Chapman and W. Meyerson). Colloq. Math. 2007

Grants not listed under awards: (all awarded for conferences with co-organizers)

Major Thematic Program at the Fields Institute $350,000 CAD from Fields +$50,000 USD from NSF

Wasatch topology 2 grants totaling $82,545

Rocky mountain dynamics conference $24,000

Service:

At Utah:

Co-organized math part of ACCESS course the past 3 years (a signature program of the college of sciences at Utah, over the summer largely for incoming undergraduate women in STEM. I taught a mini-course on fractals, organized speakers, etc.), Organized qualifying exams, Ad Hoc committee to revamp early graduate program,

Graduate recruitment committee, Putnam committee (National math competition-organized weekly

problem sessions), Hiring committee, Undergraduate committee, Graduate admissions committee,

instructorship committee, Graduate student faculty representative, Co-organizer of Max Dehn seminar

(local research seminar), organized local working seminars, course coordinator 2270-80, Chair of Ad-hoc RPT committee.

Profession:

Co-organized Semester long program in Fields Institute 2018 (organized a summer school, research conference, taught a class, mentored two postdocs, found funding for SAGE days), MRC Snowbird 2017 (week long research community where I suggested problems to two groups of students, one leading to a paper accepted in the Journal of the European Math Society),

Wasatch topology conference, AMS Special session Salt Lake City, UT 2016, Rocky mountain dynamical systems conference, 2013 AMS special session in Ames, IA, CIRM conference on Teich space billiards and IETs in 2017, Co-organizing a memorial conference for Boshernitzan, One week mentoring of Summer research cluster,

Teaching a summer school in Bologna Spring 2022, Taught mini-course in 3rd Houston summer school on dynamical systems, Taught a minicourse 2018 Hamilton conference on Ratner's theorems, Taught weeklong course at Hausdorff Institute winter school, organized online learning seminar, Refereeing, NSF Panels

Mentoring:

Postdoctoral: Osama Khalil (currently a postdoc at Utah)
Ioannis Konstantuolas (currently researcher in Uppsala)
Donald Robertson (currently Neumann fellow in pure mathematics at Manchester)

Graduate: Carlos Ospina (passed oral exam)
Rebekah Eichberg (passed oral exam)
Matt Smith (PhD 2020 expected)
Leonard Carapezza (PhD Summer 2018)

Mackenzie Simper (undergraduate research Spring 2016)
Rebecca Hardenbrook (undergraduate research Fall 2017)

Invited Talks:

Translation surfaces and their connections U Houston Colloquium Spring 2021
A strange limit of hor. erg. meas. in a stratum of trans. surf. Clemson Analysis 2021

A strange limit of hor. erg. meas. in a stratum of trans. surf. Texas Geom & Dynam. sem. Fall 2021

Translation surfaces and their connections Tata Inst Random. Geometry Colloquium Fall 2021

The Gromov boundary of the free factor graph is path connected Summer Surf. Summer 2021

A strange limit of hor. erg. meas. in a stratum of trans. surf. Wisconsin Dynam. sem. Spring 2021

There exists a weakly mixing billiard in a polygon Oklahoma Dynam sys working seminar Fall 2020

There exists a weakly mixing billiard in a polygon Warwick dynamics seminar Spring 2020

There exists a weakly mixing billiard in a polygon. Horowitz seminar Tel Aviv Jan. 2020

A prime system with many and big self joinings UT Austin dynamics seminar Fall 2019

A prime system with many and big self joinings Maryland Dynamics seminar Fall 2019

Horocycle orbits on strata of trans. surf. Oberwolfach Summer 2019

A prime system with many and big self joinings Parabolic dynam Summer 2019

Horocycle orbits on strata of trans. surf. Lemanczyk conf Bedlewo Summer 2018

Horocycle orbits on strata of trans. surf. Mirzakhani memorial Stanford Spring 2018

Horocycle orbits on strata of trans. surf. Dynam. Sem. Northwestern Spring 2018

Horocycle orbits on strata of trans. surf. AMS sec. Vanderbilt Spring 2018

Almost every 3-IET is not simple Maryland dynam conf. Spring 2018

Horocycle orbits on strata of trans. surf. Warwick Spring 2018

The horocycle flow on strata of trans surf Pingree park. Summer 2017

Almost every 3-IET is not simple. Math Cong of Am Summer 2017

Almost every 3-IET is not simple. Lille Spring 2017

Almost every 3-IET is not simple. Torun Spring 2017

Cobounded foliations are a path connected subest of PMF Bordeaux. Spring 2017

Cobnded fol are a path connected. Seminaire Geometrie IHES Winter 2017

Almost every 3-IET is not simple. Seminaire Dynamique. Winter 2017

Hausdorff dim of not uniquely erg. IETs. Flat Seminar IHP Winter 2017

Disjointess for 3-IETs colloquium Rouen Winter 2017

Hausdorff dim of not uniquely erg. IETs Geom and dynam of mod sp IHP Winter 2017

Hausdorff dim of not uniquely erg. IETs Penn State dynam. conf Fall 2016

Disjointess for 3-IETs Prob meth in dynam and app CRN Montreal Fall 2016

Masur's log laws and unique erg. Flat surf & dynam on mod CMO Summer 2016

Hdim and new for IETs Erg, lag & comb methods in dim th ICERM Spring 2016

Masur's log laws and unique erg. Dynam seminar U Chicago Winter 2016

Isom. and disj. for IETs and flows on flat surf TexAMPS Fall 2015

A mixing C infinity on a surf w/ only non-degen. saddles MWDS Fall 2015

Isom. and disj. for IETs and flows on flat surf CIRM Summer 2015

Isom. and disj. for IETs and flows on flat surf Stanford informal geom-top Fall 2014

Isomorphism and disjointness for IETs and flows on flat surfaces Ahlfor-Bers Fall 2014

Non-uniquely ergodic IETs Number theory seminar OSU Fall 2014

Isomorphism and disjointness for IETs and flows on flat surfaces OSU Colloq Fall 2014

Non-uniquely ergodic IETs BYU Colloquium

Non-Uniquely ergodic IETs Utah GSAC

The set of uniquely ergodic 4-IETs is path connected Wasatch Top. Summer 2014

A mixing C infinity on a surf w/ only non-degen. saddles Dynam & Numb Summer 2014

Minimal and not uniquely ergodic IETs GAN Conference Summer 2014

A mixing loc. Hamil. flow on a surf w/ only non-degen. saddles UC geom/top Spring 2014

Diophantine approximation for IETs U Denver Analysis seminar Spring 2014

The limit of some Teich. geodesics in PMF Comp. dynamo sem CUNY Spring 2014

The set of uniquely ergodic 4 (or more)-IETs is path connected Rice Dynamics meeting

The set of uniquely ergodic 4 (or more)-IETs is path connected Oberwolfach Spring 2014

Minimal and not uniquely ergodic IETs ICERM Fall 2013

Minimal and not uniquely ergodic IETs Penn State dynamics conf Fall 2013

Minimal and not uniquely ergodic IETs Max Dehn seminar Fall 2013

Some results that hold on every flat surface Texas ergodic theory seminar Fall 2013

The limit of some Teich. geodesics in PMF BYU Topology seminar Fall 2013

Interval exchange transformations Univ. North Texas Colloquium Spring 2013

The set of not uniquely ergodic 4-IETs has Hdim 5/2 AMS Boulder Sectional Spring 2013

Badly approximable directions on a flat surface AMS Boulder Sectional Spring 2013

Some results that hold on every flat surface OSU ergodic theory seminar Spring 2013

Some results that hold on every flat surface Maryland dynamics conference Spring 2013

Some results that hold on every flat surface Yale Dynam. of grp actions Winter 2013

Quantitative shrinking targets Actions on param. spaces Sde Boker Winter 2013

Quantitative shrinking targets Wasatch Topology Conf. Fall 2012

Badly approx. directions on flat surfaces and PMF Princ. erg th & stat mech Spring 2012

Quantitative shrinking targets Bloomington Geometry Workshop Spring 2012

Minimal and not uniquely ergodic IETs EIU Geom, Top & Dyn Day Spring 2012

Interval exchange transformations UIUC Colloquium Winter 2012

Badly approximable directions on flat surface Utah Max Dehn Seminar Winter 2012

Interval exchange transformations Utah Colloquium Winter 2012

Interval exchange transformations Toronto Colloquium Winter 2012

Badly approximable directions on flat surfaces Harvard Informal Dyn. sem. Fall 2011
Interval exchange transformations UIC colloquim Fall 2011
Interval exchange transformations Northwestern Dynamics seminar Fall 2011
Ergodicity of some skew products of IETs Cornell Dynamics seminar Fall 2011
Badly approximable directions on flat surfaces UIUC Erg theory seminar Fall 2011
Quantitative shrinking targets Seminaire Ernest Marseilles Summer 2011
On non-uniquely ergodic IETs Oberwolfach Spring 2011
Quantitative shrinking targets for IETs AMS Sectional Meeting Las Vegas Spring 2010
Gaps in saddle connection directions Maryland dynamics conference Spring 2010
Some Diophantine properties of IETs UIC Top, Geom, Dynam seminar Winter 2010
An introduction to IETs U Chicago Geom and Top seminar Winter 2010
Non-uniquely ergodic IETs Northwestern Dynamics seminar Fall 2010
Some skew products with exotic properties UIUC Groups seminar
Some skew products with exotic properties Pingree park Dynam. Sys Workshop Summer 2010
Some diophantine properties of IETs Syst. Dynam.: Espaces de pavages Summer 2010
Diophantine properties of IETs Hausdorff Institute Main Conference Summer 2010
Almost every pair of IETs is disjoint Seminaire ergodic Paris Summer 2010
Almost every pair of IETs is disjoint Teich seminar Marseilles Summer 2010
A Residual set of 4-IETS is Topologically Mixing Sem. Ernest Marseilles Spring 2010
Interval Exchange Transformations Dept. Colloq. U of Toronto Spring 2010
Diophantine properties of Interval Exchange Transformations and general systems Math Phys. Sem. U of Texas Spring 2010
Every Transformation is disjoint from almost every IET Workshop in dyn. sys. Penn St. Fall 2009
Universal Minimality Detectors Penn State, MASS colloq. Fall 2009
Shrinking Targets for IETs and Sequences Brandeis, Everytopic sem. Fall 2009
An introduction to IETs Brandeis, New dir. sem. Fall 2009
Every Transformation is disjoint from almost every IET Yale, Grp. act. sem Fall 2009
Shrinking Targets for IETs and Sequences Rice, Geom. & anal. seminar Fall 2009
Borel Cantelli Sequences Jena, Ger. frac. Geo. & stoch. sem. Summer 2009
Almost every pair of IETs is disjoint Texas A&M Grp. & Dyn. Spring 2008
Borel Cantelli Sequences Penn State, Cent. for geo. & dyn. Sem. Spring 2008
Borel Cantelli Sequences U of Houston, Dyn. & erg. th. sem. Spring 2008
Shrinking Targets and Related Properties Ohio State, Erg. th. & prob. sem. Spring 2008
Schrödinger Operators Defined by IETs Rice U, Geo & anal. sem. Fall 2008
Hausdorff Dimensions of Ergodic Measures of IETs U of Houston Summer 2008
Hausdorff Dimensions of Ergodic Measures of IETs Marseilles, France Summer 2008

Universal Ranges for Minimal Sequences Luminy, Fr. Sem. Ernest Summer 2008
Hausdorff Dimensions of Ergodic Measures of IETs, Rice U, Erg. th. sem., Spring 2007

Teaching Experience:

Linear algebra	Univ. Utah	Spring 2022 (2 sections)
Real analysis	Univ. Utah	Fall 2021
Complex analysis	Univ. Utah	Spring 2021
Topics in Geometry Topology	Univ. Utah	Fall 2019
Linear Algebera	Univ. Utah	Spring 2019
Complex Analysis	Univ. Utah	Spring 2019
Dynam and conn to Teich th	Fields Institute.	Fall 2018
Complex Analysis	Univ. Utah	Spring 2018
Topics in Geometry Topology	Univ. Utah	Spring 2018
Linear Algebra	Univ. Utah	Fall 2017
Real Analysis	Univ. Utah	Fall 2016
Topics in Geometry Topology	Univ. Utah	Fall 2015
Real Analysis	Univ. Utah	Fall 2015
Topics in Geometry-Topology	Univ. Utah	Spring 2014
Complex Analysis	Univ. Utah	Spring 2015
Foundations of analysis	Univ. Utah	Fall 2014
Real Analyisis	Univ. Utah	Fall 2014
Undergrad problems Seminar	Univ. Utah	Fall 2014
Topics in Geometry-Topology	Univ. Utah	Spring 2014
Real Analyisis	Univ. Utah	Fall 2013
Accelerated Analysis	Univ. Chicago	Spring 2012
Accelerated Analysis	Univ. Chicago	Fall 2011
Differential Eq. (for Bio. & Chem.)	Univ. Chicago	Spring 2011
Multivariable Calc. (for Bio. & Chem.)	Univ. Chicago	Winter 2010
Calculus III	Rice University	Summer 2008
Differential Equations	Rice University	Fall 2007
Introduction to Hardy Fields	Rice University	Spring 2007
Calculus I	Rice University	Summer 2006