Curriculum Vitae

Florian K. Richter

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arXiv: www.arxiv.org/a/richter_f_1

Professional Appointments

Tenure Track Assistant Professor, Chair of Ergodic Theory, Sep. 2021 – present
École Polytechnique Fédérale de Lausanne, Lausanne VD, Switzerland.

Postdoctoral Researcher, Boas Assistant Professor of Mathematics, Sep. 2018 – Aug. 2021
Northwestern University, Evanston IL, USA.

Education

Doctor of Philosophy, The Ohio State University, Columbus OH, USA. Aug. 2018
Advisor: Vitaly Bergelson
Thesis Title: *"The dichotomy between structure and randomness and applications to combinatorial number theory"*

Master of Advanced Studies, University of Cambridge, Cambridge, UK. Jun. 2011
Part III Essay Advisor: Ben Green
Part III Essay Title: *"An ergodic theoretical approach to Szemerédi's Theorem"*

Bachelor of Science, Technische Universität Wien, Vienna, Austria. Jul. 2010
Advisor: Michael Kaltenbäck
Thesis Title: *"Weakly continuous operator semigroups and Krein's Theorem"*

Research Interests

Dynamical Systems
– Ergodic Theory
– Topological & Symbolic Dynamics
Combinatorics
– Additive Combinatorics & Combinatorial Number Theory
– Ergodic Ramsey Theory
Number Theory
– Multiplicative Number Theory
– Theory of Uniform Distribution & Metric Number Theory

Publications

[21] Daniel Glasscock, Joel Moreira, Florian K. Richter, *"A combinatorial proof of a sumset conjecture of Furstenberg"*
submitted, 26 pages.
arXiv: 2107.10605

[20] Daniel Glasscock, Joel Moreira, Florian K. Richter, *"Additive and geometric transversality of fractal sets in the integers"*
submitted, 51 pages.
arXiv: 2007.05480

[19] Vitaly Bergelson, Joel Moreira, Florian K. Richter, "*Multiple ergodic averages along functions from a Hardy field: convergence, recurrence and combinatorial applications*"
submitted, 38 pages.
arXiv: 2006.03558

[18] Joel Moreira, Florian K. Richter, Donald Robertson, "*Disjointness for measurably distal group actions and applications*"
submitted, 28 pages.
arXiv: 1708.01934

[17] Dmitry Kleinbock, Ioannis Konstantoulas, Florian K. Richter, "*Zero-one laws for eventually always hitting points in mixing systems*"
submitted, 27 pages.
arXiv: 1904.08584

[16] Vitaly Bergelson, Florian K. Richter, "*Dynamical generalizations of the Prime Number Theorem and disjointness of additive and multiplicative semigroup actions*"
to appear in Duke Mathematical Journal, 47 pages.
arXiv: 2002.03498

[15] Daniel Glasscock, Andreas Koutsogiannis, Florian K. Richter, "*On Katznelson's Question for skew product systems*"
to appear in Bulletin of the AMS, 31 pages.
arXiv: 2106.11393

[14] Florian K. Richter, "*Uniform distribution in nilmanifolds along functions from a Hardy field*"
to appear in Journal d'Analyse Mathématique, 45 pages.
arXiv: 2006.02028

[13] Florian K. Richter, "*A new elementary proof of the Prime Number Theorem*"
to appear in Bulletin of the London Mathematical Society, 7 pages.
arXiv: 2002.03255

[12] Andreas Koutsogiannis, Anh N. Le, Joel Moreira, Florian K. Richter, "*Structure of multicorrelation sequences with integer part polynomial iterates along primes*"
to appear in Proceedings of the AMS, early version available online.
Doi: 10.1090/proc/15185

[11] Anh N. Le, Joel Moreira, Florian K. Richter, "*A decomposition of multicorrelation sequences for commuting transformations along primes*"
Discrete Analysis, 2021:4.
Doi: 10.19086/da.22056

[10] Vitaly Bergelson, Joel Moreira, Florian K. Richter, "*Single and multiple recurrence along non-polynomial sequences*"
Advances in Mathematics, Volume 368 (2020), 107146.
Doi: 10.1016/j.aim.2020.107146

[09] Joel Moreira, Florian K. Richter, Donald Robertson, "*A proof of a sumset conjecture of Erdős*"
Annals of Mathematics, Volume 189 (2019), Number 2, pp. 605–652.
Doi: 10.4007/annals.2019.189.2.4

[08] Daniel Glasscock, Andreas Koutsogiannis, Florian K. Richter, "*Multiplicative combinatorial properties of return time sets in minimal dynamical systems*"
Discrete and Continuous Dynamical Systems, Volume 39 (2019), Number 10, pp. 5891–5921.
Doi: 10.3934/dcds.2019258

[07] Vitaly Bergelson, Joanna Kułaga-Przymus, Mariusz Lemańczyk, Florian K. Richter, *"A generalization of Kátai's orthogonality criterion with applications"*
Discrete and Continuous Dynamical Systems, Volume 39 (2019), Number 5, pp. 2581–2612.
Doi: 10.3934/dcds.2019108

[06] Vitaly Bergelson, Joanna Kułaga-Przymus, Mariusz Lemańczyk, Florian K. Richter, *"Rationally almost periodic sequences, polynomial multiple recurrence and symbolic dynamics"*
Ergodic Theory and Dynamical Systems, Volume 39 (2019), Issue 9, pp. 2332–2383.
Doi: 10.1017/etds.2017.130

[05] Joel Moreira, Florian K. Richter, *"A spectral refinement of the Bergelson-Host-Kra decomposition and new multiple ergodic theorems"*
Ergodic Theory and Dynamical Systems, Volume 39 (2019), Issue 4, pp. 1042–1070.
Doi: 10.1017/etds.2017.61

[04] Vitaly Bergelson, Joanna Kułaga-Przymus, Mariusz Lemańczyk, Florian K. Richter, *"A Structure Theorem for Level Sets of Multiplicative Functions and Applications"*
International Mathematical Research Notices, rny040 (2018).
Doi: 10.1093/imrn/rny040

[03] Vitaly Bergelson, Florian K. Richter, *"On the density of coprime tuples of the form $(n, \lfloor f_1(n)\rfloor, \dots, \lfloor f_k(n)\rfloor)$, where $f_1, \dots, f_k$ are functions from a Hardy field"*
Number Theory – Diophantine Problems, Uniform Distribution and Applications, Festschrift in Honour of Robert F. Tichy's 60th Birthday, Springer International Publishing (2017), pp. 109–135.
Doi: 10.1007/978-3-319-55357-3_5

[02] John H. Johnson, Florian K. Richter, *"Revisiting the Nilpotent Polynomial Hales-Jewett Theorem"*
Advances in Mathematics, Volume 321 (2017), pp. 269–286.
Doi: 10.1016/j.aim.2017.09.033

[01] Joel Moreira, Florian K. Richter, *"Large subsets of discrete hypersurfaces in $\mathbb{Z}^d$ contain arbitrarily many collinear points"*
European Journal of Combinatorics, Volume 54 (2016), pp. 163–176.
Doi: 10.1016/j.ejc.2015.12.012

Grants

NSF Grant (DMS-1901453), Principal Investigator — 2019 – 2022
3-year research grant awarded by the National Science Foundation, Division of Mathematical Sciences, Analysis program; Title: *"Investigations in Combinatorics and Number Theory via Ergodic Theoretic Methods"*.

AIM SQuaRE collaborative grant — 2021 – 2024
American Institute of Mathematics – Structured Quartet Research Ensembles; 3-year collaborative grant with D. Glasscock (UMass Lowell), A. Koutsogiannis (Aristotle University of Thessaloniki), J. Moreira (University of Warwick), and D. Robertson (Manchester University).

Awards & Honors

Louise B.C. Vetter Award — Oct. 2017
Competitive research award sponsored by the Ohio State chapter of the Phi Kappa Phi Honor Society. I was selected from a pool of Ohio State Graduate School Presidential Fellows for excellence in research.

The Ohio State Presidential Fellowship Apr. 2017
Prestigious research award given to graduate students by the Ohio State University Graduate School. Fellows are selected through a university-wide competition led by a faculty committee. This award provided a generous stipend and full tuition support for a twelve month period.

Two Special Graduate Assignments (SGAs) Nov. 2014 & Nov. 2015
Awarded by the Mathematics Department of the Ohio State University based on academic merit, these semester-long research fellowships provided stipends and tuition without teaching obligations.

Research Talks

Colloquium	**Northwestern University**	Feb. 2021
Colloquium	**Carnegie Mellon University**	Feb. 2021
Colloquium	**University of Montreal**	Jan. 2021
Colloquium	**Stony Brook University**	Jan. 2021
Colloquium	**EPFL**	Jan. 2021
Colloquium	**University of Texas at Austin**	Jan. 2021
Colloquium	**University of Notre Dame**	Jan. 2021
Colloquium	**Texas A&M**	Dec. 2020
Colloquium	**University of Manchester**	Dec. 2020
Colloquium	**University of Waterloo**	Dec. 2020
Colloquium	**Queen's University**	Nov. 2020
Midwest Virtual Dynamics Seminar	**University of Chicago**	Oct. 2020
One Day Dynamics Meeting	**CMM – Universidad de Chile**	Jun. 2020
Joint PU/IAS Number Theory Seminar	**Princeton University**	Jun. 2020
Ergodic Theory Seminar	**Nicolaus Copernicus University**	Jun. 2020
ETDS Seminar	**University of Warwick**	May 2020
Virtual Lecture Series in Dynamics	**University of Maryland**	Apr. 2020
Midwest Dynamics Day	**Northwestern University**	Mar. 2020
Number Theory Seminar	**Harvard University**	Feb. 2020
Weihnachtskolloquium	**Technische Universität Wien**	Dec. 2019
Lund Shrinking Targets Workshop	**University of Lund**	Dec. 2019
Joint Analysis Seminar of UCLA & Caltech	**UCLA**	Nov. 2019
AMS Sectional Meeting	**University of Florida, Gainesville**	Nov. 2019
Arbeitsgemeinshaft Diskrete Mathematik	**Technische Universität Wien**	Jun. 2019
Ergodic Theory Seminar	**The Ohio State University**	Apr. 2019
Arbeitsgemeinshaft Diskrete Mathematik	**Technische Universität Wien**	May 2018
Combinatorics seminar	**Brandeis University**	Apr. 2018
AMS Spring Eastern Sectional Meeting	**Northeastern University**	Apr. 2018
Complex Analysis Seminar	**Indiana University Bloomington**	Mar. 2018
Ultrafilters, Ramsey Theory and Dynamics	**University of Lyon**	Nov. 2017
Ergodic Theory Seminar	**The Ohio State University**	Sep. 2017
Max Dehn Seminar	**The University of Utah**	Sep. 2017

NU Dynamical Systems Seminar	**Northwestern University**	Oct. 2016
Mathematical Research Lecture Series	**The Ohio State University**	Aug. 2016

Teaching Experience

Boas Assistant Professor in Mathematics, Northwestern University
As a course instructor at Northwestern University, my responsibilities included preparing lesson plans, writing and grading exams, designing syllabi, mentoring and advising students, coordinating joint instructions, teaching online courses, and more.

Spring 2021	*Graduate Topics Course in Dynamical Systems* (scheduled)
Spring 2021	*Multivariable Integral Calculus for Engineering* (scheduled)
Winter 2021	*Foundations of Higher Mathematics* (scheduled)
Winter 2020	*Multiple Integration and Vector Calculus*
Fall 2019	*Multivariable Differential Calculus*
Spring 2019	*Foundations of Higher Mathematics*
Fall 2018	*Single-Variable Differential Calculus*

Northwestern Prison Education Program, Northwestern University
Held at the Stateville Maximum Security Prison in Chicago, the Northwestern Prison Education Program (NPEP) fills a vital need in Illinois by being the only Bachelor's degree awarding education program in a prison in the state offering a comprehensive liberal arts curriculum. Professors participate on a voluntary basis. In fall quarter 2019, I was the first instructor from the mathematics department to participate in the program, teaching a course in quantitative reasoning to a cohort of 21 incarcerated students.

Fall 2019	*Quantitative Reasoning*

PhD Headstart Program, The Ohio State University
In summer 2016, I co-taught a course in Real Analysis for the PhD head-start program at the Ohio State University, which is a four week intensive summer program for incoming PhD students in the mathematics department.

Summer 2016	*Real Analysis*

Graduate Teaching Associate, The Ohio State University
During my graduate studies I worked as a teaching assistant. Besides preparing and instructing semi-weekly recitation classes, this teaching associateship involved writing and grading quizzes, grading exams, maintaining weekly office hours, and facilitating evening review sessions and workshops for students.

Spring 2017	*Multivariable Differential and Integral Calculus*
Fall 2015	*Calculus for Business*
Fall 2014	*Engineering Math A*
Spring 2014	*Calculus for Business*
Fall 2013	*Engineering Math A*
Spring 2013	*Calculus 1*
Fall 2012	*Calculus 1*

Undergraduate Teaching Associate, Technische Universität Wien
During my undergraduate studies I worked as a recitation instructor for two courses at the Institute of Discrete Mathematics and Geometry at the Vienna University of Technology.

Spring 2010	*Discrete Mathematics for Computer Sciences*
Fall 2009	*Discrete Mathematics for Computer Sciences*

Conference Participation

Midwest Dynamics Day	**Northwestern University**	[link]	Mar. 2020
8. Weihnachtskolloquium	**Technishce Universität Wien**	[link]	Dec. 2019
Lund Shrinking Targets Workshop	**University of Lund**	[link]	Dec. 2019
AMS Fall Southeastern Sectional Meeting	**University of Florida, Gainesville**	[link]	Nov. 2019
Ergodic aspects of modern dynamics	**Bedlewo Conference Center**	[link]	Jun. 2018
AMS Spring Eastern Sectional Meeting	**Northeastern University**	[link]	Apr. 2018
Ultrafilters, Ramsey Theory, and Dynamics	**Villeurbanne, Lyon**	[link]	Nov. 2017
Dynamical Systems: Smooth, Symbolic, and Measurable	**Snowbird Resort, Utah**	[link]	Jun. 2017
Ergodic Theory and its Connections with Arithmetic and Combinatorics	**CIRM, Marseille**	[link]	Dec. 2016
Midwest Dynamical Systems Meeting	**Ohio State University**	[link]	Oct. 2015
Combinatorics Meets Ergodic Theory	**BIRS, Banff**	[link]	Jul. 2015
Ergodic Theory and Combinatorics	**University of Agder**		Jun. 2015
Workshop on Dynamical Systems	**University of Maryland**	[link]	Apr. 2015
Aspects of Homogeneous Dynamics	**MSRI, Berkeley**	[link]	Feb. 2015
Midwest Dynamical Systems Meeting	**University of Michigan**		Nov. 2014
Workshop on Dynamical Systems	**Penn State University**	[link]	Oct. 2014
Informal Analysis Seminar	**Kent State University**	[link]	Mar. 2014
Combinatorics, Number Theory, and Dynamical Systems	**Erwin Schrödinger Institute**	[link]	Nov. 2012

Service

Northwestern Prison Education Program Fall 2019

I volunteered at the Northwestern Prison Education Program, where I helped organize study halls and designed and taught a college-level course in mathematical literacy at the Stateville Correctional Center, a state prison in Chicago.

Midwest Virtual Dynamics Seminar Organizer Spring 2020 – present

I help organize a virtual dynamics seminar held jointly with UoC, UIC, U. Michigan, and Indiana U. Bloomington.

Seminar Organizer at Northwestern University Fall 2018 – present

Currently, I function as one of the organizers for the weekly research seminar of the NU Dynamcial Systems Research Group at Northwestern University.

Seminar Organizer at OSU 2015 – 2018

I was an organizer of the *Ergodic Theory and Combinatorial Number Theory Seminar*, a student-lead research seminar at the Ohio State University, which met twice a week, with a consistent attendance of 10-15 participants, and educated graduate students and faculty members alike.

Peer Reviewing for International Journals

I have served as a peer reviewer for numerous high-ranking journals, including *Advances in Mathematics*, *Nonlinearity*, *Ergodic Theory and Dynamical Systems*, *Archiv der Mathematik*, and others.

Reviewer for Mathematical Reviews 2020 –
I serve on the panel of reviewers for the MR Database at MathSciNet. present

Professional Affiliations

Member of the AMS (American Mathematical Society)
Member of the OeMG (Austrian Mathematical Society)

Scholarships

Mobilitätsstipendium 2010 – 2011
Scholarship awarded by the Austrian Study Grant Department for the purpose of studying abroad at Cambridge University.

3-year Scholarship 2007 – 2010
Awarded by the Austrian Study Grant Department based on academic merit.