CURRICULUM VITAE

Florian K. Richter

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arXiv: www.arxiv.org/a/richter_f_1

PROFESSIONAL APPOINTMENTS

Tenure Track Assistant Professor Sep. 2021 – present
École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland.

IAS Member Sep. 2022 – Mar. 2023
Institute for Advanced Study, Princeton NJ, USA.

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

EDUCATION

Doctor of Philosophy, Aug. 2018
The Ohio State University, Columbus OH, USA.

Master of Advanced Studies, Jun. 2011
University of Cambridge, Cambridge, UK.

Bachelor of Science, Jul. 2010
Technische Universität Wien, Vienna, Austria.

RESEARCH AREAS

Ergodic Theory, Topological & Symbolic Dynamics, Additive & Arithmetic Combinatorics, Ramsey Theory, Multiplicative Number Theory

PUBLICATIONS[1]

[28] "*Asymptotic independence of $\Omega(n)$ and $\Omega(n+1)$ along logarithmic averages*", Dimitrios Charamaras, Florian K. Richter
submitted, 44 pages.
arXiv: 2412.17583

[27] "*Problems on infinite sumset configurations in the integers and beyond*", Bryna Kra, Joel Moreira, Florian K. Richter, Donald Robertson
to appear in Bulletin of the American Mathematical Society, 37 pages.
arXiv: 2311.06197

[26] "*Interpolation sets for dynamical systems*", Andreas Koutsogiannis, Anh N. Le, Joel Moreira, Ronnie Pavlov, Florian K. Richter
Transactions of the American Mathematical Society, Vol. 378 (2025), Nr. 2, pp. 1373–1400.
Doi: 10.1090/tran/9300

[25] "*A proof of Erdős's $B+B+t$ conjecture*", Bryna Kra, Joel Moreira, Florian K. Richter, Donald Robertson
Communications of the American Mathematical Society, Volume 4 (2024), pp. 480–494.
Doi: 10.1090/cams/34

[24] "*On the local Fourier uniformity problem for small sets*", Adam Kanigowski, Mariusz Lemańczyk, Florian K. Richter, Joni Teräväinen
International Mathematics Research Notices, Volume 2024, Issue 15, pp. 11488–11512.
Doi: 10.1093/imrn/rnae134

[1] All authors are assumed to have contributed equally and are listed alphabetically; please confer the culture statement of the AMS for more details on this issue.

[23] "*On the maximal spectral type of nilsystems*", Ethan Ackelsberg, Florian K. Richter, Or Shalom
Proceedings of the American Mathematical Society, Series B, Vol. 11 (2024), pp. 469–480 .
Doi: 10.1090/bproc/229

[22] "*Infinite Sumsets in Sets with Positive Density*", Bryna Kra, Joel Moreira, Florian K. Richter, Donald Robertson
Journal of the American Mathematical Society, Volume 37 (2024), pp. 637–682.
Doi: 10.1090/jams/1030

[21] "*Additive and geometric transversality of fractal sets in the integers*", Daniel Glasscock, Joel Moreira, Florian K. Richter
Journal of the London Mathematical Society, Volume109 (2024), Issue 5, e12902.
Doi: 10.1112/jlms.12902

[20] "*Multiple ergodic averages along functions from a Hardy field: convergence, recurrence and combinatorial applications*", Vitaly Bergelson, Joel Moreira, Florian K. Richter
Advances in Mathematics, Volume 443 (2024), 109597.
Doi: 10.1016/j.aim.2024.109597

[19] "*Zero-one laws for eventually always hitting points in mixing systems*", Dmitry Kleinbock, Ioannis Konstantoulas, Florian K. Richter
Mathematical Research Letters, Volume 30 (2023), Number 3, pp. 765–805.
Doi: 10.4310/MRL.2023.v30.n3.a7

[18] "*Disjointness for measurably distal group actions and applications*", Joel Moreira, Florian K. Richter, Donald Robertson
Ergodic Theory and Dynamical Systems, Volume 43 (2023), Issue 6, pp. 1952–1979.
Doi: 10.1017/etds.2022.19

[17] "*A combinatorial proof of a sumset conjecture of Furstenberg*", Daniel Glasscock, Joel Moreira, Florian K. Richter
Combinatorica, Volume 43 (2023), pp. 299–328.
Doi: 10.1007/s00493-023-00008-9

[16] "*Uniform distribution in nilmanifolds along functions from a Hardy field*", Florian K. Richter
Journal d'Analyse Mathématique, Volume 149 (2023), pp. 421–483.
Doi: 10.1007/s11854-022-0253-0

[15] "*Dynamical generalizations of the Prime Number Theorem and disjointness of additive and multiplicative semigroup actions*", Vitaly Bergelson, Florian K. Richter
Duke Mathematical Journal, Volume 171 (2022), Number 15, pp. 3133–3200.
Doi: 10.1215/00127094-2022-0055

[14] "*On Katznelson's Question for skew product systems*", Daniel Glasscock, Andreas Koutsogiannis, Florian K. Richter
Bulletin of the American Mathematical Society, Volume 59 (2022), Number 4, pp. 569–606.
Doi: 10.1090/bull/1764

[13] "*A new elementary proof of the Prime Number Theorem*", Florian K. Richter
Bulletin of the London Mathematical Society, Volume 53 (2021), Issue 5, pp. 1365–1375.
Doi: 10.1112/blms.12503

[12] "*Structure of multicorrelation sequences with integer part polynomial iterates along primes*", Andreas Koutsogiannis, Anh N. Le, Joel Moreira, Florian K. Richter
Proceedings of the American Mathematical Society, Volume 149, (2021), Number 1, pp. 209–216.
Doi: 10.1090/proc/15185

[11] "*A decomposition of multicorrelation sequences for commuting transformations along primes*", Anh N. Le, Joel Moreira, Florian K. Richter
Discrete Analysis, 2021:4, 27 pages.
Doi: 10.19086/da.22056

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

[09] "*A Structure Theorem for Level Sets of Multiplicative Functions and Applications*", Vitaly Bergelson, Joanna Kułaga-Przymus, Mariusz Lemańczyk, Florian K. Richter
International Mathematical Research Notices, Volume 2020 (2020), Issue 5, pp. 1300–1345.
Doi: 10.1093/imrn/rny040

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

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

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

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

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

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

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

GRANTS

SNSF Starting Grant (TMSGI2_211214/1), Principal Investigator — 2023 – 2027
5-year Starting Grant from the Swiss National Science Foundation; Title: *"Ergodic Methods in Number Theory"*.

IAS Member — 2022 – 2023
My visit at IAS in 2022/23 was supported by the National Science Foundation under Grant No. DMS-1926686.

AIM SQuaRE Collaborative Grant, co-Principal Investigator — 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).

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

Research Awards

2025 Frontiers of Science Awards Feb. 2025
The Frontiers of Science Awards are prizes presented by the International Congress of Basic Sciences (ICBS) to honor major breakthroughs in Mathematics, Physics, or Theoretical Computer and Information Sciences. In 2025 I received two Frontiers of Science Awards in recognition of the paper entitled *"A proof of a sumset conjecture of Erdős"* and the paper entitled *"Infinite sumsets in sets with positive density"* jointly with Bryna Kra, Joel Moreira, and Donald Robertson.

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.

Teaching Awards

Golden Polysphere Award Oct. 2024
I received the the *2024 Polysphère d'or (Golden Polysphere)* award for outstanding teaching. This prize is the highest award a professor can receive directly from the students at EPFL.

Best Teacher in the Mathematics Section Aug. 2024
For the academic year 2023/24, I received the EPFL award for best teacher in the mathematics section.

Research Talks

Colloquium	**University of Bern**	Sep. 2024
Additive Combinatorics Conference	**ICMS, Edinburgh**	Aug. 2024
Groups and Geometry Seminar	**University of Geneva**	Nov. 2023
New England Dynamics Seminar	**Brown University**	Dec. 2023
Pointwise Ergodic Theory & Connections	**King's College, London**	Jun. 2023
Nilpotent structures in topological dynamics, ergodic theory and combinatorics	**MRCC Bedlewo, Poland**	Jun. 2023
Number Theory Seminar	**IST Austria**	May 2023
Korea Online Ergodic Theory Seminar	**Postech, Korea**	May 2023
Graduate Research Opportunities for Women	**Max-Planck Institute, Bonn**	Apr. 2023
Special Year Workshop	**IAS, Princeton**	Mar. 2023
Combinatorics seminar	**MIT**	Feb. 2023
Colloquium	**Northwestern University**	Feb. 2023
Combinatorics Student Seminar	**Princeton University**	Jan. 2023
Online Analysis Research Seminar (OARS)	**Online Seminar**	Dec. 2022
Ergodic Theory and Dynamical Systems Seminar	**Northwestern University**	Nov. 2022
Dynamics Seminar	**University of Illinois at Chicago**	Nov. 2022
Seminar	**IAS, Princeton**	Sep. 2022
ULTRAMATH Conference	**Università di Pisa**	Jun. 2022
Ergodic Theory Seminar	**ETH Zürich**	Apr. 2022
Colloquium	**UMass Lowell**	Feb. 2022
Ergodic Theory and Analysis Seminar	**Rutgers University**	Feb. 2022
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

PhD students

- **Dimitrios Charamaras**, 2021- 2025 (anticipated)
- **Felipe Osiel Hernández Castro**, 2023- 2027 (anticipated)

Teaching Experience

Below is a list of university courses that I have taught.

Courses taught at **École Polytechnique Fédérale de Lausanne (EPFL)**

Spring 2025	*Analysis II for Engineers*
Fall 2024	*Combinatorial Number Theory*
Fall 2024	*Ergodic Theory*
Spring 2024	*Analysis II for Engineers*
Fall 2023	*Combinatorial Number Theory*
Fall 2023	*Ergodic Theory*
Spring 2023	*Ergodic Theory*
Spring 2023	*Combinatorial Number Theory*
Spring 2022	*Ergodic Theory*
Fall 2021	*Combinatorial Number Theory*

Courses taught at **Northwestern University**

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

Courses I assisted with at **The Ohio State University**

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*

Courses I assisted with at **Vienna University of Technology (TU Wien)**

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

Institutional Service

Hiring Committee Work
I served on several hiring committees at various levels at EPFL, including positions for Bernoulli instructors, Tenure-Track Professors, and administrative roles.

Outreach Committee 2024 – present
I am the head of the EPFL mathematics outreach committee.

Research Service

Midwest Virtual Dynamics Seminar Organizer Spring 2020 – Fall 2021
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 – Fall 2021
Currently, I function as one of the organizers for the weekly research seminar of the NU Dynamcial Systems Research Group at Northwestern University.

Expanding Dynamics Summer School Summer 2021
Designed and instructed a graduate-level course titled ”Dynamics and Infiniatry Combinatorics” as part of the online workshop series “Expanding Dynamics – Creative Online Ventures in Dynamics”.

Conference Organizer: Ergodic Ramsey Theory Conference Nov. 2020
Online conference in honor of Viatly Bergelson’s 70^{th} birthday.

PhD Headstart Program, The Ohio State University Summer 2016
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.

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 offered expert opinions and conducted formal peer reviews of manuscripts for mathematics journals across all levels.

Outreach Service

Young Researchers in Mathematics Program 2022 – present
In summer 2022, I initiated a new program at the Bernoulli Center for Fundamental Studies offering an immersive mathematical research experience for undergraduate students. The purpose of this program is to foster enthusiasm for continued research in mathematics, guide budding mathematicians towards their first publication, and encourage students from underrepresented groups to pursue a PhD in mathematics. This is the first program of this kind in mathematics in Switzerland. To date, there have been three installments of the program: summer 2022, summer 2023, and summer 2024. Here is a link the the program's website: https://bernoulli.epfl.ch/young/.

Northwestern Prison Education Program (NPEP) Fall 2019
Held at the Stateville Maximum Security Prison, a maximum-security correctional facility for men 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. In fall quarter 2019, I was the first instructor from the mathematics department to participate in the program by designing and teaching a college-level course in mathematical literacy and quantitative reasoning to a cohort of 21 incarcerated students. Here is a link to the NPEP website.

Comité camps d'été pour gymnasiens. 2022 – present
I am part of a committee that created a new type of math camp for high school students called *Pensée Mathématique*. The program, which is organized in collaboration with EPFL's *service de promotion de l'éducation (SPE)*, ran successfully for the first time in fall 2023, and is scheduled to run again in fall 2024. Here is a link to the program's website.

Professional Affiliations

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

Media Outreach

- In 2020 the *Quanta Magazine*, an online news outlet founded by the Simons Foundation focusing on public service journalism in mathematics, published an article on my paper "A new elementary proof of the Prime Number Theorem". The article is called "Mathematicians Will Never Stop Proving the Prime Number Theorem" and is available online.
- In 2022, the *Quanta Magazine* published another article on my research, featuring my recent work on the Erdős sumset conjecture titled "From Systems in Motion, Infinite Patterns Appear". A link to the article can be found here.
- Each year the *Institute of Advanced Study* at Princeton publishes an article featuring some of the work done by members of the School of Mathematics for a broader audience. In 2023, the article concerned my work on Erdős's $B + B + t$ conjecture and is available on the IAS website.
- My work and research was also featured on Terrence Tao's prominent online blog: see here and here.