

Mathematics institute
 University of Warwick
<https://warwick.ac.uk/fac/sci/math/people/staff/moreira/>

Zeeman Building
 Coventry CV4 7AL
E-mail: joel.moreira@warwick.ac.uk

CURRENT
 OCCUPATION

- **University of Warwick**, Coventry, UK
 - Assistant Professor 2019-present

PREVIOUS
 OCCUPATION

- **Northwestern University**, Evanston, IL, USA
 - Boas Assistant Professor 2016-2019

EDUCATION

- **The Ohio State University**, Columbus, OH
 - Ph.D. in Mathematics. Advisor: [Vitaly Bergelson](#) August 2016
 - Thesis title: [Partition regular polynomial patterns in commutative semigroups.](#)
- **University of Coimbra**, Coimbra, Portugal
 - B.S. with distinction, [Mathematics](#) July 2009

GRANTS

- *ERC Starting Grant* Dynamical Approaches to Number Theory and Additive Combinatorics, financed by UKRI 2022
- *NSF grant DMS-1700147* on *Dynamical Aspects of Ramsey Theory* 2017-2020
 - Principal Investigator.

AWARDS AND
 HONORS

- *Michael Brin Dynamical Systems Prize for Young Mathematicians* 2020
- *Presidential Fellowship* 2015-2016
 - Awarded by the Graduate School at Ohio State University
- *Fellowship “Novos Talentos em Matemática”* 2006-2008
 - Fellowship awarded by the [Calouste Gulbenkian Foundation](#)

5Involve

OTHER
 EXPERIENCE

- One week of intensive group research at a *ICMS research in Groups* program 9/2023
- Three weeks of intensive group research at an *AIM SQuaRE* 2022-2024
- *Young Researchers in Mathematics Program* 7/2022
 - co-advised an undergraduate research project
- *AGRA IV - Part 2 (Remotely)* 6/2022

- co-lectured a minicourse in Ergodic Ramsey theory (in Portuguese)
- *Co-organizer of the Ergodic Theory and Dynamical Systems Seminar at University of Warwick* 2020-
- *Summer course at ShanDong University* 2020
 - 7 online lectures on Ergodic Ramsey Theory
- *Teaching assistant for the MRC on dynamical systems* 2017
- *Co-organizer of the Dynamical Systems Seminar at Northwestern University* 2016-2019
- *Taught a mini-course at the Summer School in Combinatorics in Universidade Nova, Lisbon* 2017
 - 5 lectures on Arithmetic Ramsey Theory
- *Teaching assistant at the Dynamical Systems Summer School in Lisbon* 2015
 - Teacher assistant for 3 mini-courses in dynamical systems
- *Rasor-Bareis-Gordon Competition committee, OSU* 2014 to 2016
 - Designed the exams
- *Portuguese Mathematics Olympiad committee* 2008-2010
 - Designed the exams

PUBLICATIONS

- **Partition regularity of Pythagorean pairs**, with Nikos Frantzikinakis and Oleksiy Klurman. Submitted, preprint available at <https://arxiv.org/abs/2309.10636>
- **Averages of completely multiplicative functions over the Gaussian integers – a dynamical approach**, with Sebastian Donoso, Anh Ngoc Le and Wenbo Sun. Submitted, preprint available at <https://arxiv.org/abs/2309.07249>
- **A proof of Erdős’s $B + B + t$ conjecture**, with Bryna Kra, Florian K. Richter and Donald Robertson. Submitted, preprint available at <https://arxiv.org/abs/2206.12377>
- **Infinite Sumsets in Sets with Positive Density**, with Bryna Kra, Florian K. Richter and Donald Robertson. *J. Amer. Math. Soc.*, DOI: <https://doi.org/10.1090/jams/1030>, Published electronically: August 11, 2023. Available at <https://arxiv.org/abs/2206.01786>
- **A combinatorial proof of a sumset conjecture of Furstenberg**, with Daniel Glasscock and Florian K. Richter. *Combinatorica* **43** (2023), no. 2, 299–328. Available at <https://arxiv.org/abs/2107.10605>
- **Additive averages of multiplicative correlation sequences and applications**, with Sebastian Donoso, Anh Ngoc Le and Wenbo Sun. *J. Anal. Math.* 149 (2023), no 2, 719–761. Available at <https://arxiv.org/abs/2101.02832>
- **Additive and Geometric transversality of fractal sets in the integers**, with Daniel Glasscock and Florian K. Richter. Submitted, preprint available at <https://arxiv.org/abs/2007.05480>
- **Multiple ergodic averages along functions from a Hardy field: convergence, recurrence and combinatorial applications**, with Vitaly Bergelson and Florian K. Richter. Submitted, preprint available at <https://arxiv.org/abs/2006.03558>

- **Structure of multicorrelation sequences with integer part polynomial iterates along primes**, with Andreas Koutsogiannis, Anh N. Le and Florian K. Richter. *Proceedings of the American Mathematical Society* 149 (2021), no. 1, 209–216. Available at <https://arxiv.org/abs/2004.11835>
- **A decomposition of multicorrelation sequences for commuting transformations along primes**, with Anh N. Le and Florian K. Richter. *Discrete Anal.* (2021), no. 4, 27 pp. Available at <https://arxiv.org/abs/2001.11523>
- **On Rado conditions for nonlinear Diophantine equations**, with Jordan M. Barrett and Martino Lupini. *European J. Combin.* 94 (2021), Paper no. 103277, 20 pp. Available at <https://arxiv.org/abs/1907.06163>
- **Optimal lower bounds for multiple recurrence**, with Sebastian Donoso, Anh Ngoc Le and Wenbo Sun. *Ergodic Theory Dynam. Systems* 41 (2021), no. 2, 379–407. Available at <https://arxiv.org/abs/1809.06912>
- **A proof of a sumset conjecture of Erdős**, with Florian K. Richter and Donald Robertson. *Annals of Mathematics*, (2) 189 (2019), no. 2, 605–652. Available at <https://arxiv.org/abs/1803.00498>
- **Single and multiple recurrence along non-polynomial sequences**, with Vitaly Bergelson and Florian K. Richter. *Advances in Mathematics* 368 (2020), 107–146. Available at <https://arxiv.org/abs/1711.05729>
- **Disjointness for measurably distal group actions and applications**, with Florian K. Richter and Donald Robertson. *Ergodic Theory Dynam. Systems* 43 (2023), no 6, 1952–1979. Available at <https://arxiv.org/abs/1708.01934>
- **A spectral refinement of the Bergelson-Host-Kra decomposition and new multiple ergodic theorems**, with Florian K. Richter. *Ergodic Theory Dynam. Systems* 39 (2019), no. 4, 1042–1070. Available at <https://arxiv.org/abs/1609.03631>
- **Monochromatic sums and products in \mathbb{N}** . *Annals of Mathematics*, (2) 185 (2017), no. 3, 1069–1090. Available at <https://arxiv.org/pdf/1605.01469.pdf>
- **Van der Corput’s difference theorem: some modern developments**, with Vitaly Bergelson. *Indag. Math. (N.S.)* 27 (2016), no. 2, 437–479. Available at <http://arxiv.org/abs/1510.07332>.
- **Measure preserving actions of affine semigroups and $\{x+y, xy\}$ patterns**, with Vitaly Bergelson. *Ergodic Theory Dynam. Systems* 38 (2018), no. 2, 473–498. Available at <http://arxiv.org/abs/1509.07574>.
- **Large subsets of discrete hypersurfaces in \mathbb{Z}^d contain arbitrarily many collinear points**, with Florian K. Richter. *European J. Combin.* 54 (2016), 163–176. Available at <http://arxiv.org/abs/1501.07550>
- **New polynomial and multidimensional extensions of classical partition results**, with Vitaly Bergelson and John H. Johnson. *Journal of Combinatorial Theory, Series A*, 147 (2017), 119–154. Available at <http://arxiv.org/abs/1501.02408>
- **A conditional construction of restricted isometries**, with Afonso S. Bandeira and Dustin G. Mixon. *Int. Math. Res. Not.* 2017, no. 2, 372–381., Available at <http://arxiv.org/abs/1410.6457>
- **Derandomizing restricted isometries via the Legendre symbol**, with Afonso S. Bandeira, Matthew Fickus and Dustin G. Mixon. *Constr. Approx.* 43 (2016), no. 3, 409–424. Available at <http://arxiv.org/abs/1406.4089>.

- **Ergodic theorem involving additive and multiplicative groups of a field and $\{x + y, xy\}$ patterns**, with Vitaly Bergelson. *Ergodic Theory Dynam. Systems* 37 (2017), no. 3, 673–692. Available at <http://arxiv.org/abs/1307.6242>.
- **Usando probabilidades para aproximar funções por polinômios** (in Portuguese), chapter in the book *Números, Cirurgias e Nós de Gravata: 10 Anos de Seminário Diagonal no IST*, 2013.

INVITED
TALKS

- **Number Theory seminar**, Oxford 11/2023
- **Dynamics days**, IMJ-PRG, Paris 10/2023
- **Pointwise Ergodic Theory**, King's college, London 06/2023
- **Colloquium**, University of Warwick 06/2023
- **Zurich Dynamics Conference**, University of Zurich 06/2023
- **Nilpotent structures in topological dynamics, ergodic theory and combinatorics**, Banach Center, Bedlewo 06/2023
- **Combinatorics Seminar**, University of Bristol 05/2023
- **Colloquium**, Yale University 03/2023
- **Workshop on Dynamics, Discrete Analysis and Multiplicative Number Theory**, IAS Princeton 03/2023
- **Dynamical Systems Seminar**, Northwestern University 02/2023
- **Ergodic Theory Seminar**, Postech, Korea,(online) 09/2022
- **Utramath 2022**, Pisa, Italy 06/2022
- **Junior Ergodic Theory Meeting**, (3 lectures) ICMS, Edinburgh, UK 03/2022
- **ENSPM 2021**, Parallel Section in Ramsey Theory (online) 07/2021
- **Ergodic Theory Seminar**, The Ohio State University (online) 04/2021
- **Oráculo Delfos**, Coimbra, Portugal (online) 03/2021
- **Colloquium**, University of Massachusetts Lowell (online) 02/2021
- **Colóquio**, University of Coimbra (online) 01/2021
- **Dynamics Seminar**, University of Exeter (online) 10/2020
- **Young Mathematician Lecture Series**, National University of Singapore (online) 09/2020
- **Colloquium**, Open University (online) 09/2020
- **Expanding Dynamics- Creative Online Ventures in Dynamics**, online workshop 07/2020
- **Ergodic Theory and dynamical systems seminar**, University of Bristol (online) 05/2020
- **Combinatorics seminar**, University of Birmingham 12/2019
- **Discrete Analysis Seminar**, University of Cambridge 11/2019

- **Combinatorics seminar**, University of Warwick 11/2019
- **Ergodic theory and dynamical systems seminar**, University of Warwick 10/2019
- **Dynamics, Geometry and Combinatorics**, EPFL, Switzerland 10/2019
- **10th WOMBL**, University of Oxford, UK 09/2019
- **Workshop on Measurability, Ergodic Theory and Combinatorics**, University of Warwick, UK 07/2019
- **AMS Meeting - Applications of Ultrafilters and Nonstandard Methods**, University of Hawaii at Manoa 03/2019
- **Dynamical systems seminar**, Penn State University 02/2019
- **Dynamical systems seminar**, University of Houston 09/2018
- **Arithmetic Ramsey Theory in Manchester**, Manchester, UK 09/2018
- **Combinatorial and Additive Number Theory (3 lectures)**, CUNY 05/2018
- **AMS Special Session on Ergodic Theory and Dynamics in Combinatorial Number Theory**, Northeastern University, Boston 04/2018
- **Max Dehn Seminar**, University of Utah 03/2018
- **Ergodic Theory and Statistical Mechanics Seminar**, Princeton University 12/2017
- **Midwest Dynamics Conference**, Northwestern University 11/2017
- **Global Portuguese Mathematicians**, Instituto Superior Técnico, Lisbon 6/2017
- **Combinatorics Seminar**, California Institute of Technology 6/2017
- **Ergodic theory Seminar**, Ohio State University 6/2017
- **Colloquium**, Eastern Illinois University 3/2017
- **Dynamical Systems Seminar**, Penn State University 2/2017
- **Millican Colloquium**, University of North Texas 1/2017
- **Oráculo Delfos**, Coimbra, Portugal 12/2016
- **Dynamical Systems Seminar**, Northwestern University 11/2016
- **Dynamics Seminar**, University of Chicago 10/2016
- **Algorithms, Combinatorics and Optimization seminar**, Carnegie Mellon University 10/2016
- **AMS Meeting - Special Session on Zero Dimensional Dynamics**, University of Denver 10/2016
- **Combinatorics Days**, Universidade Nova de Lisboa, Portugal 7/2016
- **Seminários de Álgebra e Combinatória**, University of Coimbra, Portugal 7/2016
- **Dynamics and Probability Seminar**, Ohio State University 04/2016
- **AMS Meeting - Special Session on Ergodic Theory**, University of Memphis 10/2015

- **Combinatorics Meets Ergodic Theory**, Banff Center, Canada 7/2015
- **Oráculo Delfos**, Coimbra, Portugal 6/2015
- **AMS Meeting - Special Session on Number Theory in Ergodic Theory and Dynamical Systems**, Georgetown University 3/2015
- **Dynamics and Probability Seminar**, Ohio State University 11/2014
- **Logic, Dynamics and Interactions 2**, University of North Texas 6/2014
- **Dynamics Seminar**, Indiana University Purdue University Indianapolis 4/2014
- **Ergodic Theory Seminar**, University of Illinois Urbana Champaign 3/2014
- **Operator Algebras and Dynamics Seminar**, Naval Academy, Anapolis 3/2014
- **Dynamics Seminar**, University of Maryland 3/2014
- **Dynamics and Probability Seminar**, Ohio State University 11/2013
- **Seminário Diagonal**, Instituto Superior Técnico, Portugal 4/2010
- **Jornadas de iniciação científica**, Instituto de Matemática Pura e Aplicada, Brazil 11/2008
- **Encontro Nacional Novos Talentos**, Luso, Portugal 9/2008