


CONTACT INFORMATION

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EDUCATION

PhD in Mathematics	2016–2020
<i>Charles University, Faculty of Mathematics and Physics</i>	
PhD thesis: Definable graphs	
Supervisor: David Chodounský	

Mgr in Mathematics (finished with honors)	2014–2016
<i>Charles University, Faculty of Mathematics and Physics</i>	
Master thesis: Between homogeneity and rigidity	
Supervisor: Wiesław Kubiś	

Bc in Mathematics (finished with honors)	2011–2014
<i>Charles University, Faculty of Mathematics and Physics</i>	
Bachelor thesis: From asymptotic density to the Riemann-zeta function	
Supervisor: Bohuslav Balcar	

RESEARCH INTERESTS

Descriptive set theory, combinatorics, random processes.

SELECTED PUBLICATIONS

5. Measurable Vizing's Theorem, *submitted*, 2023.
4. (with S. Brandt, Y. Chang, C. Grunau, V. Rozhoň, Z. Vidnyánszky) Deterministic Distributed algorithms and Descriptive Combinatorics on Δ -regular trees, *submitted*, 2022.
3. (with S. Brandt, Y. Chang, C. Grunau, V. Rozhoň, Z. Vidnyánszky) On Homomorphism Graphs, *submitted*, 2021.
2. (with V. Rozhoň) Local Problems on Grids from the Perspective of Distributed Algorithms, Finitary Factors, and Descriptive Combinatorics, *accepted Advances in Mathematics*, 2023.
1. (with O. Pikhurko) Measurable versions of Vizing's Theorem, *Advances in Mathematics* 374 (2020), 107378, 40 pp.

AWARDS

- Mary Ellen Rudin Young Researcher Award 2022
- Faculty of Science, Engineering and Medicine PostDoc Prize 2021 (University of Warwick)
- Josef Hlávka Prize 2018
- Award of the Dean for the best Master thesis of 2016
- Award of the Dean for the best Bachelor thesis of 2014

ALL PUBLICATIONS (IN REVERSED CHRONOLOGICAL ORDER)

Preprints

28. (with C. T. Conley and Oleg Pikhurko) Local version of Vizing's theorem for multi-graphs, *submitted*, 2023.
27. Measurable Vizing's theorem, *submitted*, 2023.
26. (with Z. Vidnyánszky) Ramsey, expanders, and Borel chromatic numbers, *submitted*, 2022.
25. (with S. Brandt, Y. Chang, C. Grunau, V. Rozhoň, Z. Vidnyánszky) Deterministic Distributed algorithms and Descriptive Combinatorics on Δ -regular trees, *preprint*, 2022.
24. (with S. Brandt, Y. Chang, C. Grunau, V. Rozhoň, Z. Vidnyánszky) On Homomorphism Graphs, *submitted*, 2021.
23. (with V. Rozhoň) Classification of Local Problems on Paths from the Perspective of Descriptive Combinatorics, *submitted*, 2021, extended abstract appeared at **EURO-COMB** 2021.
22. (with O. Pikhurko) Large Deviation Principles for Block and Step Graphon Random Graph Models, *preprint*, 2021.
21. Borel equivalence relations induced by actions of tsi Polish groups, *submitted*, 2021.

Publications (published, to appear, accepted)

20. (with V. Rozhoň) Local Problems on Grids from the Perspective of Distributed Algorithms, Finitary Factors, and Descriptive Combinatorics, *accepted Adv. Math.* (2023)
19. (with R. Greenfeld, V. Rozhoň, T. Tao) Measurable tilings by abelian group actions, *accepted IMRN* (2022).
18. (with C. T. Conley and Oleg Pikhurko) Divisibility of spheres with measurable pieces, *accepted L'Enseignement Mathématique* (2022).
17. (with I. Rocha) Fractional Isomorphism of Graphons, *to appear Combinatorica* (2022).

16. (with Z. Vidnyánszky) Tall F_σ subideals of tall analytic ideals, *accepted Proc. Amer. Math. Soc.* (2020).

2022

15. (with S. Brandt, Y. Chang, C. Grunau, V. Rozhoň, Z. Vidnyánszky) Local Problems on Trees from the Perspectives of Distributed Algorithms, Finitary Factors, and Descriptive Combinatorics, **13th Innovations in Theoretical Computer Science Conference**, Art. No. 29, 26 pp., LIPIcs. Leibniz Int. Proc. Inform., 215, Schloss Dagstuhl. Leibniz-Zent. Inform., Wadern, 2022.
14. Approximate Schreier decorations and approximate König's line coloring Theorem, **Annales Henri Lebesgue** 5 (2022), 303–315.
13. (with M. Doležal, J. Hladký, I. Rocha, V. Rozhoň) Cut distance identifying graphon parameters over weak* limits, **J. Combin. Theory Ser. A** 189 (2022), Paper No. 105615, 57 pp.

2021

12. (with S. Geschke and B. D. Miller) Scrambled Cantor sets, **Proc. Amer. Math. Soc.** 149 (2021), no. 10, 4461–4468.
11. (with M. Doležal, J. Hladký, I. Rocha, V. Rozhoň) Relating the cut distance and the weak* topology for graphons, **J. Combin. Theory Ser. B** 147 (2021), 252–298.

2020

10. (with O. Pikhurko) Measurable versions of Vizing's Theorem, **Advances in Mathematics** 374 (2020), 107378, 40 pp.
9. σ -lacunary actions of Polish groups, **Proc. Amer. Math. Soc.** 148 (2020), no. 8, 3583–3589.
8. (with M. Hrušák) No minimal tall Borel ideal in the Katětov order, **Fund. Math.** 248 (2020), no. 2, 135–145.

2019

7. (with C. Uzcategui) Bases and selectors for tall families, **J. Symb. Log.** 84 (2019), no. 1, 359–375.

Research before starting PhD

6. (with D. Chodounský, V. Fischer) On the length of maximal free sequences in $\mathcal{P}(\omega)/fin$, **Arch. Math. Logic** 58 (2019), no. 7-8, 1035–1051.
5. (with S. Gabrielyan, J. Kakol, L. Zdomskyy) Topological properties of function spaces over ordinals., **Rev. R. Acad. Cienc. Exactas Fís. Nat. Ser. A Math. RACSAM** 111 (2017), no. 4, 1157–1161.
4. (with S. Gabrielyan, J. Kakol, L. Zdomskyy) The Ascoli property for function spaces, **Topology Appl.** 214 (2016), 35–50.
3. An example of a Fraïssé class without a Katětov functor, **Appl. Categ. Structures** 26 (2018), no. 1, 1–6.
2. A rigid Urysohn-like metric space, **Proc. Amer. Math. Soc.** 145 (2017), no. 9, 4049–4060.
1. Ultrafilter extensions of asymptotic density, **Comment. Math. Univ. Carolin.** 60 (2019), no. 1, 25–37.

PROFESSIONAL EXPERIENCE

MSCA Global Fellow – Masaryk University and UCLA	since 2023
Research Assistant – Mathematics Institute, University of Warwick	2019–2023
Student Researcher – Institute of Mathematics CAS	2015–2019
Student Researcher – Institute of Computer Science CAS	2018

RESEARCH VISITS

- Cornell University, US, visiting student, host S. Solecki, March–May 2019
- Warwick University, UK, host O. Pikhurko, November 2018
- Bernoulli center, Lausanne, Switzerland, Thematic semester in descriptive set theory, participant, June 2018
- Kurt Gödel Research Center, University of Vienna, Austria, AKTION program fellow, supervisor B. Miller, March–May 2018
- National Autonomous University of Mexico, Mexico, host M. Hrušák, May 2017
- Universität Hamburg, Germany, host S. Geschke, March 2016 (3 weeks)

FUNDING

- *Marie Skłodowska-Curie Global Postdoctoral Fellowship* project BORCA, Principal Investigator, approx 170 000 EUR, Horizon 2020 of the European Commission, 2023
- *Charles University Student Grant* no. 900119, Principal Investigator, equiv. 6000 EUR, Grant Agency of Charles University (GAUK), 2019
- *AKTION grant*, scholarship to visit KGRC at the University of Vienna for 3 months, 2018

TEACHING EXPERIENCE

- *Functional analysis I*, instructor, 30 hours, approx 130 students, Warwick, Term 1, 2023-2024
- *Distributed Computing, Random Processes and Descriptive Combinatorics*, Warwick, Term 1, 2022-2023

STUDENTS:

- Nicholas Andrew Hodge, **Improved Bounds on the Sunflower Lemma**, *Msc Thesis*, University of Warwick, 2021-2022.

ORGANIZING CONFERENCES AND SEMINARS

- Oberwolfach mini-workshop + Oberwolfach reports *Descriptive Combinatorics, LOCAL Algorithms and Random Processes*, 2022,
- Winter school in Abstract Analysis: Set theory and topology, (scientific committee 2020,2021,2022)
- Warwick Combinatorics seminar (2020/2021, 2021/2022)

PROFESSIONAL ACTIVITIES

- *Referee/Reviews*: AMS reviews, CMUC, Fundamenta Mathematica, Proceedings of the American Mathematical Society, Journal of Combinatorial Theory B, ICALP, Combinatorics Probability Computing, Journal of Graph Theory, Advances in Mathematics, European Journal of Combinatorics, Journal of Symbolic Logic, Mathematical Logic Quarterly, Annales Henri Lebesgue

CONFERENCE AND SEMINAR TALKS

36. *Derandomization in descriptive graph combinatorics*, Descriptive Set Theory Dynamics conference, (2023, Warsaw, Poland)
35. *Descriptive graph combinatorics and distributed computing*, The 37th Summer Conference on Topology and Its Applications, plenary speaker, (2023, Youngstown, Ohio)
34. *Measurable Vizing's theorem*, Measured Group Theory, Stochastic Processes on Groups and Borel Combinatorics, (2023, CIRM, Luminy, France)
33. *Measurable Vizing's theorem*, Caltech logic seminar (online), (2023, Caltech, US)
32. *Measurable tilings*, Workshop on Borel and Measurable Combinatorics in Algebra and Dynamics, (2023, Fields Institute, Toronto, Canada)
31. *Descriptive set theory and distributed computing*, 56th Spring Topology and Dynamical Systems Conference (STDC), plenary talk, (2023, online)
30. *Measurable Vizing's theorem*, Logic seminar, (2023, University of Florida, Florida)
29. *Descriptive set theory and distributed computing*, Colloquium, (2023, University of Florida, US)
28. *Borel graphs with large Borel chromatic number*, SEALS 2023, (2023 University of Florida, US)
27. *Complexity problem in measurable combinatorics*, Nankai Logic Colloquium (online), (2022, Nankai University, China)
26. *Local Problems from the Perspective of Random Processes and Distributed Algorithms*, Workshop on Random Graphs, Combinatorial Limits, Stochastic Processes, (2022, Budapest, Hungary)
25. *Local problems from various perspectives*, Descriptive graph theory, (2022, American Institute of Mathematics, San Jose, USA)

24. *Distributed computing and descriptive combinatorics*, Algorithms Seminar, (2022, Oxford University, UK)
23. *Connections and Open Problems*, open problem session, Oberwolfach mini-workshop, (2022, Oberwolfach, Germany)
22. *Local problems on bounded degree graphs*, Combinatorial group seminar, (2021, Institute of Computer Science of the Czech Academy of Sciences, Czechia)
21. *Homomorphism graphs and Descriptive combinatorics*, Descriptive Dynamics and Combinatorics Seminar (online), (2021, McGill University, Canada)
20. *Local problems on grids*, DIMAP seminar (online), (2021, Warwick University, UK)
19. *Classification of Local Problems on Paths from the Perspective of Descriptive Combinatorics*, EUROCOMB 2021 (online), (2021, Barcelona)
18. *Descriptive combinatorics of actions of \mathbb{Z}^d* , Florida Logic seminar (online), (2021, University of Florida, USA)
17. *Distributed computing and finitary factors of iid labelings*, UBC Probability seminar (online), (2021, UBC, Canada)
16. *Large deviation principle for graphons*, EPC webinar (online), (2020)
15. *LDP for graphons*, UBC Probability seminar (online), (2020, UBC, Canada)
14. *Essentially countable Borel equivalence relations*, Caltech logic (online) seminar, (2020, Caltech, US)
13. *Measurable versions of Vizing's theorem*, Algebra and Geometry Seminar (2020, Lancaster University, UK)
12. *Polish group actions*, STUK5 mini-talk (2020, Royal Society building, London, UK)
11. *Measurable versions of Vizing's theorem*, DIMAP Seminar (2020, University of Warwick, UK)
10. *Fractional isomorphism of graphons*, Combinatorics Seminar (2019, University of Warwick, UK)
9. *Measurable versions of Vizing's theorem*, European Set Theory Conference (2019, Vienna, Austria)
8. *Vizing's theorem for graphings*, Logic Seminar (2019, Cornell University, USA)
7. *Weak* topology and graphons*, Combinatorics Seminar (2018, University of Warwick, UK)
6. *Borel ideals*, SETTOP 2018 (2018, Novi Sad, Serbia)
5. *Borel ideals*, PhDs in Logic X (2018, Prague, Czech Republic)
4. *Example of a Fraïssé class without a Katětov functor*, Research seminar UNAM (2017, Morelia, Mexico)
3. *Fraïssé classes and Katětov functors*, Prague Gathering of Logicians (2017, Prague, Czech Republic)

2. *Fraïssé-like structures*, Winter School in Abstract Analysis (2017, Hejnice, Czech Republic)
1. *Asymptotic Density in Generic Extensions*, Winter School in Abstract Analysis (2014, Hejnice, Czech Republic)