Ronald Pavlov

Contact Information

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Education

Ph.D. in Mathematics from the Ohio State University, 2007.
Dissertation: "Some Results on Recurrence and Entropy," supervised by Vitaly Bergelson

Current Position

Professor, University of Denver, **September 2020 - present**

Previous Positions

Associate Professor, University of Denver, **September 2014 - September 2020**

Assistant Professor, University of Denver, **September 2010 - August 2014**

Postdoctoral Fellow, University of British Columbia, **August 2007 - August 2010**

Research Interests

Dynamical systems and ergodic theory, specifically symbolic dynamics

Awarded Funding

- PI, Simons Collaboration Grant number 637141, title "Topics in Symbolic Dynamics," dates Sep. 2019 - Aug. 2025 (includes 1-year extension). Funded in amount of $42,000.
- PI, NSF grant number DMS-1500685, title "Topics in Symbolic Dynamics," dates Jun. 2015 - May 2018. Funded in amount of $161,416.
- Co-PI (with Nic Ormes), NSF Proposal numbers DMS-1700530, DMS-1418490, DMS-1113584, for Pingree Park Dynamical Systems Workshops 2017, 2014, 2011. Funded in amounts of $25,000 each.

Awards and Honors

- Sole recipient of university-wide Pioneer award for University of Denver faculty: 2016
- Nominated as University of Denver Faculty Career Champion: 2017
- Nominated for divisional awards for Excellence in Teaching (2012, 2015, 2016, 2023), Excellence in Research (2018), Outstanding Junior Faculty (2012)
- Sole recipient of Postdoc Teaching Award at UBC Mathematics Department: 2008
- Winner of Graduate Teaching Award at Ohio State University Mathematics Department: 2006

University Service

- Serving as DU math department Undergrad Associate Chair: 2022-2023, 2024-present
- Serving on executive committee of DU Faculty Senate: 2023-present
- Serving on DU Faculty Senate: 2016-2018, 2020-present
- Supervising DU math department's Putnam Exam Practice Sessions: 2010-present
- Served as University of Denver calculus coordinator: 2018-2020
- Served as director of University of Denver Math (tutoring) Center: 2017-2020
- Designed and oversaw DU math department's exhibit for STEMosphere K-7 outreach event: 2015
- Organized DU math department's Analysis and Dynamics Seminar: 2012-2014

Professional Service

- Serving on AMS-Simons grant review committee: 2024-2026
- Refereeing for various journals (approx. $8-10$ per year), including Proc. London Math Society, Trans. of the AMS, Ergodic Theory Dynam. Systems, Forum Math. Sigma: 2010-present
- Served on Program Committee and refereed proceedings volume for AUTOMATA (International Workshop on Cellular Automata and Discrete Complex Systems): 2011 and 2017
- Reviewed for Mathematical Reviews (approx. $2-3$ per year): 2012-2023
- Co-organized Dynamics portion of Spring Topology and Dynamics Conference: 2025
- Co-organized special session at Mathematical Congress of the Americas: 2025
- Co-organized special sessions at various AMS meetings: 2016, 2019, 2022
- Co-organized 5-day workshop 'Symbolic Dynamical Systems' at BIRS-Oaxaca: 2019
- Co-organized 4th-6th Pingree Park Dynamics Workshops (with Nic Ormes): 2011, 2014, 2017

PUBLICATIONS AND PREPRINTS

1. *Computability of pressure for subshifts on countable amenable groups* (with C. Evans Hedges), submitted.
2. *The extended Hausdorff dimension spectrum of a conformal iterated function system is maximal* (with Andrei Ghenciu), submitted.
3. *On minimal subshifts of linear word complexity with slope less than 3/2* (with Darren Creutz), submitted.
4. *Interpolation sets for dynamical systems* (with Andreas Koutsogiannis, Anh Le, Joel Moreira, and Florian Richter), Trans. Amer. Math. Soc. **378** (2025), no. 2, 1373–1400.
5. *Minimal zero entropy subshifts can be unrestricted along any sparse set*, Ergodic Theory Dynam. Systems **45** (2025), no. 2, 566–572.
6. *Measures of maximal entropy of bounded density subshifts* (with Felipe García-Ramos and Carlos Reyes), Ergodic Theory Dynam. Systems **44** (2024), no. 10, 2960–2974.
7. *Low complexity subshifts have discrete spectrum* (with Darren Creutz), Forum Math. Sigma, **11** (2023), E96.
8. *On the structure of generic subshifts* (with Scott Schmieding), Nonlinearity, **36** (2023), no. 9, 4904–4953.
9. *Subsystem entropies of shifts of finite type and sofic shifts on countable amenable groups* (with Robert Bland and Kevin McGoff), Ergodic Theory Dynam. Systems, **43** (2023), no. 9, 2881–2914.
10. *Measure-theoretically mixing subshifts with low complexity* (with Darren Creutz and Shaun Rodock), Ergodic Theory Dynam. Systems, **43** (2023), no. 7, 2293–2316.
11. *Local finiteness and automorphism groups of low complexity subshifts* (with Scott Schmieding), Ergodic Theory Dynam. Systems, **43** (2023), no. 6, 1980–2001.
12. *Subsystems of transitive subshifts with linear complexity* (with Andrew Dykstra and Nic Ormes), Ergodic Theory Dynam. Systems, **42** (2022), no. 6, 1967–1993.
13. *On subshifts with slow forbidden word growth*, Ergodic Theory Dynam. Systems, **42** (2022), no. 4, 1487–1516.
14. *Ubiquity of entropies of intermediate factors* (with Kevin McGoff), J. Lond. Math. Soc., **104** (2021), no. 2, 865–885.
15. *The relationship between word complexity and computational complexity in subshifts* (with Pascal Vanier), Discrete Contin. Dyn. Sys., **41** (2021), no. 4, 1627–1648.
16. *On entropy and intrinsic ergodicity of coded subshifts*, Proc. Amer. Math. Soc., **148** (2020), no. 11, 4717–4731.
17. *Extender sets and measures of maximal entropy for subshifts* (with Felipe García-Ramos), J. Lond. Math. Soc, **100** (2019), no. 3, 1013–1033.
18. *On the complexity function for sequences which are not uniformly recurrent* (with Nic Ormes), Contemp. Math., **736** (2019), 125–138.
19. *One-sided almost specification and intrinsic ergodicity* (with Vaughn Climenhaga), Ergodic Theory Dynam. Systems, **39** (2019), no. 9, 2456–2480.
20. *On non-uniform specification and uniqueness of the equilibrium state in expansive systems*, Nonlinearity, **32** (2019), no. 7, 2441–2466.
21. *Factor maps and embeddings for random $\mathbb{Z}^d$ shifts of finite type* (with Kevin McGoff), Israel J. Math., **230** (2019), no. 1, 239–273.
22. *Follower, predecessor, and extender entropies* (with Thomas French), Monatsh. Math., **188** (2019), no. 3, 495–510.
23. *A characterization of the sets of periods within shifts of finite type* (with Madeline Doering), Involve, **12** (2019), no. 2, 203–220.
24. *Factoring onto $\mathbb{Z}^d$ subshifts with the finite extension property* (with Raimundo Briceño and Kevin McGoff), Proc. Amer. Math. Soc., **146** (2018), no. 12, 5129–5240.
25. *Topologically completely positive entropy and zero-dimensional topologically completely positive entropy*, Ergodic Theory Dynam. Systems, **38** (2018), no. 5, 1894–1922.

26. *Strong spatial mixing in homomorphism spaces* (with Raimundo Briceño), SIAM J. Discrete Math., **31** (2017), no. 3, 2110–2137.

27. *On factors of $\mathbb{Z}^d$ SFTs and intrinsic ergodicity* (with Kevin McGoff), Ergodic Theory Dynam. Systems, **37** (2017), no. 2, 621–645.

28. *Subshifts with slowly growing numbers of follower sets* (with Thomas French and Nic Ormes), Contemp. Math., **678** (2016), 192–203.

29. *Random $\mathbb{Z}^d$-shifts of finite type* (with Kevin McGoff), J. Mod. Dyn., **10** (2016), no. 2, 287–330.

30. *Extender sets and multidimensional subshifts*, (with Nic Ormes), Ergodic Theory Dynam. Systems, **36** (2016), no. 3, 908–923.

31. *On intrinsic ergodicity and weakenings of the specification property*, Adv. Math. **295** (2016), 250–270.

32. *Representation and poly-time approximation for pressure of $\mathbb{Z}^2$ lattice models in the non-uniqueness region*, (with Stefan Adams, Raimundo Briceño, and Brian Marcus), J. Stat. Phys. **162** (2016), no. 4, 1031–1067.

33. *An integral representation for topological pressure in terms of conditional probabilities*, (with Brian Marcus), Israel J. Math., **207** (2015), no. 1, 395–433.

34. *Entropies realizable by block gluing shifts of finite type* (with Michael Schraudner), J. Anal. Math., **126** (2015), 113–174.

35. *Classification of sofic projective subdynamics of multidimensional shifts of finite type* (with Michael Schraudner), Trans. Amer. Math. Soc., **367** (2015), 3371–3421.

36. *Entropy and measures of maximal entropy for axial powers of subshifts* (with Tom Meyerovitch), Proc. London Math. Soc., **109** (2014), no. 4, 921–945.

37. *A characterization of topologically completely positive entropy for shifts of finite type*, Ergodic Theory Dynam. Systems, **34** (2014), no. 6, 2054–2065.

38. *Shifts of finite type with nearly full entropy*, Proc. Lond. Math. Soc., **108** (2014), no. 1, 103–132.

39. *One dimensional Markov random fields, Markov chains and topological Markov fields* (with N. Chandgottia, G. Han, B. Marcus, and T. Meyerovitch), Proc. Amer. Math. Soc., **142** (2014), no. 1, 227–242.

40. *Computing bounds for entropy of stationary $\mathbb{Z}^d$ Markov random fields* (with Brian Marcus), SIAM J. Discrete Math, **27** (2013), no. 3, 1544–1558.

41. *Independence entropy of $\mathbb{Z}^d$-shift spaces* (with Erez Louidor and Brian Marcus), Acta. Appl. Math., **126** (2013), 297–317.

42. *Approximating entropy for a class of $\mathbb{Z}^2$ Markov random fields and pressure for a class of functions on $\mathbb{Z}^2$ shifts of finite type* (with Brian Marcus), Ergodic Theory Dynam. Systems, **33** (2013), no. 1, 186–220.

43. *A class of nonsofic multidimensional shift spaces*, Proc. Amer. Math. Soc. **141** (2013), no. 3, 987–996.

44. *Approximating the hard square entropy constant with probabilistic methods*, Ann. Probab. **40** (2012), no. 6, 2362–2399.

45. *Perturbations of multidimensional shifts of finite type*, Ergodic Theory Dynam. Systems **31** (2011), no. 2, 483-526.

46. *Multidimensional sofic shifts without separation and their factors* (with Michael Boyle and Michael Schraudner), Trans. Amer. Math. Soc. **362** (2010), no. 9, 4617–4653.

47. *Some Counterexamples in Topological Dynamics*, Ergodic Theory Dynam. Systems **28** (2008), no. 4, 1291–1322.

Invited talks given (last 5 years)

1. *Subshifts of very low word complexity* **Feb. 2025**
   Max Dehn seminar, University of Utah
2. *Subshifts of very low word complexity* **Oct. 2024**
   Rutgers ETA (Ergodic Theory and Analysis) seminar, Rutgers (virtual)
3. *Subshifts of very low word complexity* **Jul. 2024**
   Mini-conference on symbolic dynamics, Univ. British Columbia, Vancouver
4. *Subshifts of very low word complexity* **Apr. 2024**
   Queen Mary University dynamics seminar, London, UK
5. *Subshifts with very low word complexity* **Apr. 2024**
   University of Bristol dynamics seminar, Bristol, UK
6. *Minimal zero entropy subshifts are unrestricted along sparse sets* **Mar. 2024**
   Spring Topology and Dynamics Conference 2024, UNC Charlotte
7. *Subshifts of very low word complexity* **Jan. 2024**
   Special Session: Ergodic theory and symbolic dynamics, Joint Meetings of AMS
8. *Subshifts of very low word complexity* **Oct. 2023**
   Workshop on low complexity dynamical systems, Brin Center, Univ. Maryland
9. *Subshifts of very low word complexity* **Sep. 2023**
   Special Session: Ergodic theory of group actions, Sect. AMS meeting, U. Buffalo
10. *Subshifts with slow forbidden word growth* **May 2023**
    The Open University dynamics seminar, The Open University (virtual)
11. *Subshifts with slow forbidden word growth* **May 2023**
    Thermodynamic Formalism: Non-additive Aspects and Related Topics, Bedlewo
12. *Subshifts of very low complexity* **Apr. 2023**
    One World Numeration Seminar, virtual
13. *Subshifts of linear complexity* **Mar. 2023**
    Penn State dynamics seminar, Penn State University
14. *Nearest-neighbor tilings in one and two dimensions* **Sep. 2022**
    IUPUI colloquium, IUPUI
15. *Mixing conditions for multidimensional subshifts* **Sep. 2022**
    IUPUI graduate seminar, IUPUI
16. *Word complexity and automorphism groups for subshifts* **Apr. 2022**
    Carolina Dynamics Symposium, Furman University
17. *Word complexity and automorphism groups for subshifts* **Sep. 2021**
    IUPUI dynamics seminar, IUPUI (virtual)
18. *Ubiquity of entropies of intermediate factors* ***(plenary lecture)*** **May 2021**
    Spring Topology and Dynamical Systems 2021, Murray State University (virtual)
19. *Ubiquity of entropies of intermediate factors* **Jan. 2021**
    University of Victoria dynamics seminar (virtual)
20. *Nearest-neighbor tilings in one and two dimensions* **Dec. 2020**
    University of Massachusetts-Lowell colloquium (virtual)
21. *Ubiquity of entropies of intermediate factors* **Nov. 2020**
    Vitaly Bergelson 70th Birthday mini-conference (virtual)