MIKHAIL LAVROV

Department of Mathematics
Kennesaw State University
Marietta, GA 30060

mlavrov@kennesaw.edu
https://facultyweb.kennesaw.edu/mlavrov/

Research interests	Probabilistic and extremal combinatorics, Ramsey theory, and random graphs.
Affiliation	ASSISTANT PROFESSOR OF MATHEMATICS, Kennesaw State University. August 2020–present.
	J.L. DOOB POSTDOC, University of Illinois at Urbana-Champaign. August 2017–May 2020.
Education	CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania. Ph.D., Mathematics, 2017.
	DUKE UNIVERSITY, Durham, North Carolina. Bachelor of Science, Mathematics, 2011. Bachelor of Arts, Computer Science, 2011. Graduated with High Distinction in Mathematics; GPA 3.821.

Publications

A Hall-type condition for path covers in bipartite graphs
(with J. Vandenbussche) Submitted. `arXiv:2310.05248`.

Online Ramsey numbers of ordered paths and cycles
(with F. Clemen and E. Heath) Submitted. `arXiv:2210.05235`.

Monochromatic connected matchings in 2-edge-connected multipartite graphs
(with J. Balogh, A. Kostochka, and X. Liu) Journal of Graph Theory, vol. 100, no. 3, 2022.
`DOI:10.1002/jgt.22797`, `arXiv:1905.04653`.

Longest cycles in 3-connected hypergraphs and bipartite graphs
(with A. Kostochka, R. Luo, and D. Zirlin) Journal of Graph Theory, vol. 99, no. 4, 2022.
`DOI:10.1002/jgt.22762`, `arXiv:2004.08291`.

A strengthening of the Erdős–Szekeres theorem
(with J. Balogh, F. Clemen, and E. Heath) European Journal of Combinatorics, vol. 101,
2022. `DOI:10.1016/j.ejc.2021.103456`, `arXiv:2006.03703`.

Long monochromatic paths and cycles in 2-edge-colored graphs with large minimum degree
(with J. Balogh, A. Kostochka, and X. Liu) Combinatorics, Probability, and Computing,
vol. 31, no. 1, 2022. `DOI:10.1017/S0963548321000201`, `arXiv:1906.02854`

Conditions for a bigraph to be super-cyclic
(with A. Kostochka, R. Luo, and D. Zirlin) Electronic Journal of Combinatorics, vol. 28,
no. 1, 2021. `DOI:10.37236/9683`, `arXiv:2006.15730`.

Making K_{r+1}-free graphs r-partite
(with J. Balogh, F. Clemen, B. Lidický, and F. Pfender) Combinatorics, Probability, and
Computing, 2020. `DOI:10.1017/S0963548320000590`, `arXiv:1910.00028`.

Long monochromatic paths and cycles in 2-edge-colored multipartite graphs
(with J. Balogh, A. Kostochka, and X. Liu) Moscow Journal of Combinatorics and Number Theory, vol. 9, no. 1, 55-100, 2020. `DOI:10.2140/moscow.2020.9.55`, `arXiv:1905.04657`.

Ordered size Ramsey number of paths
(with J. Balogh, F. Clemen, and E. Heath) Discrete Applied Mathematics, vol. 276, 13-18, 2020. `DOI:10.1016/j.dam.2019.02.002`, `arXiv:1810.08325`.

Monochromatic Hilbert cubes and arithmetic progressions
(with J. Balogh, G. Shakan, and A. Wagner) Electronic Journal of Combinatorics, vol. 26, no. 2, 2019. `DOI:10.37236/7917`, `arXiv:1805.08938`.

Distance-uniform graphs with large diameter
(with M. Lavrov, P. Loh, and A. Messegué) SIAM Journal on Discrete Mathematics, vol. 33, no. 2, 994–1005, 2019. `DOI:10.1137/17M115791X` `arXiv:1703.01477`.

An upper bound for the Hales-Jewett number $HJ(4,2)$
(single author) SIAM Journal on Discrete Mathematics, vol. 30, no. 2, 1333-1342, 2016. `DOI:10.1137/15M1016485`, `arXiv:1504.02753`.

Increasing Hamiltonian paths in random edge orderings
(with P. Loh) Random Structures and Algorithms, vol. 48, no. 3, 588-611, 2016. `DOI:10.1002/rsa.20592`, `arXiv:1403.0948`.

Improved upper and lower bounds on a geometric Ramsey problem
(with M. Lee and J. Mackey) European Journal of Combinatorics, vol. 42, 135-144, 2014. `DOI:10.1016/j.ejc.2014.06.003`, `arXiv:1304.6910`.

On the game chromatic number of sparse random graphs
(with A. Frieze and S. Haber) SIAM Journal on Discrete Mathematics, vol. 27, no. 2, 768-790, 2013. `DOI:10.1137/120861953`, `arXiv:1201.0046`.

On the $S^1 \times S^2$ HOMFLY-PT invariant and Legendrian links
(with D. Rutherford) Journal of Knot Theory and Its Ramifications, vol. 22, no. 8, 1350040, 2013. `DOI:10.1142/S0218216513500405`, `arXiv:1206.5437`.

Generalized normal rulings and invariants of Legendrian solid torus links
(with D. Rutherford) Pacific Journal of Mathematics, vol. 258, no. 2, 393-420, 2012. `DOI:10.2140/pjm.2012.258.393`, `arXiv:1109.1319`.

Awards
UIUC List of teachers ranked as excellent (Fall 2017, Spring 2018, and Spring 2019 for Math 484; Spring 2018 for Math 412; Spring 2019, Fall 2019, and Spring 2020 for Math 482.)

Honorable mention in the William L. Putnam Math Competition (2008, 2009); member of 6th place team (2009).

Karl Menger Award from Duke University (2010). Freshman Julia Dale Prize from Duke University (2008). Recipient of Duke University's NC Mathematics Contest Scholarship (full tuition, 2007–2011).

Teaching Experience
Classes taught at Kennesaw State University:
- Math 2345: Discrete Mathematics (Spring 2023)
- Math 2390: Introduction to Logic, Sets, and Proofs (Spring 2022, Fall 2022)

- Math 3204: Calculus IV (Spring 2023, Fall 2023)
- Math 3272: Linear Programming (Fall 2022)
- Math 3322: Graph Theory (Spring 2021, Fall 2021, Spring 2022, Fall 2023)
- Math 3332: Probability and Inference (Fall 2020, Spring 2021, Fall 2021, Spring 2023)

Classes taught at the University of Illinois at Urbana-Champaign:
- Math 412: Introduction to Graph Theory (Spring 2018)
- Math 482: Linear Programming (Spring 2019, Fall 2019, Spring 2020)
- Math 484: Nonlinear Programming (Fall 2017, Spring 2018, Fall 2018, Spring 2019)

ACADEMIC COORDINATOR (2016, 2019, 2023), MENTOR (2014, 2015, 2017), and FACULTY (2018, 2020, 2021, 2022) at Canada/USA Mathcamp.

HEAD COACH (2015–2017) and COACH (2011–2014) of the Western Pennsylvania ARML math team.

TEACHING ASSISTANT for the Carnegie Mellon Mathematics department:
- Discrete Mathematics (Spring 2013, Spring 2015, Fall 2016, Spring 2017)
- Matrix Theory (Fall 2015, Spring 2016)
- Models and Methods for Optimization (Spring 2014)
- Matrix Algebra (Spring 2012)
- Calculus (Fall 2011)

STUDENT INSTRUCTOR (2010) in mathematical problem solving at Duke University.

Invited Talks   "A Hall-type condition for path covers in bipartite graphs". Discrete Math Seminar, Georgia State University (October 24, 2023)

"Hereditary condition for path covers in bipartite graphs". AMS sectional meeting, Mobile, AL. (October 14, 2023)

"How a quadratic equation solves peg solitaire". KSU math competition awards ceremony, Kennesaw, GA. (April 22, 2023)

"Online Ramsey numbers of ordered paths and cycles". AMS sectional meeting, Atlanta, GA. (March 19, 2023)

"From scheduling games to perspective geometry." KSU math competition awards ceremony, Kennesaw, GA. (April 23, 2023)

"Fantastic cycles and why we would want to find them". Discrete Math Seminar, Iowa State University (April 8, 2022)

"The mathematics of Sproutball". Math Club, Carnegie Mellon University (January 27, 2022)

"Counting comparisons in the Erdős–Szekeres theorem". Graph Theory Seminar, Georgia Institute of Technology (September 28, 2021)

Discrete Math Seminar, Kennesaw State University. (Spring 2021, and Fall 2020)

Combinatorics seminar, University of California San Diego. (November 2019)

AMS sectional meeting, Riverside, CA. (November 2019)

AMS sectional meeting, Gainesville, FL. (November 2019)

AMS sectional meeting, Madison, WI. (September 2019)

Graph theory and combinatorics seminar, University of Illinois Urbana-Champaign. (Spring 2017, Fall 2017, Fall 2018, Fall 2019, Spring 2020, Fall 2020)

Discrete mathematics seminar, Illinois State University. (2018, 2019)

Discrete seminar, Illinois Institute of Technology. (2018)

AMS sectional meeting, Columbus, OH. (2018)

Colloquium, Canada/USA Mathcamp. (2017, 2018)

Discrete mathematics seminar, Princeton University. (2017)

Undergraduate math club, Carnegie Mellon University. (2016)

Algorithms, combinatorics, and optimization seminar, Carnegie Mellon University. (2016)

Undergraduate math club, Carnegie Mellon University. (2015)

Graduate student seminar, Carnegie Mellon University. (2014)

SIAM conference on Discrete Mathematics, Minneapolis, MN. (2014)

Graduate student seminar, Carnegie Mellon University. (2013)

Conference on random structures and algorithms, Poznań, Poland. (2013)

Algorithms, combinatorics, and optimization seminar, Carnegie Mellon University. (2013)

Graduate student seminar, Carnegie Mellon University. (2012)