

MARIA A. AXENOVICH



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Institute for Algebra and Geometry
Department of Mathematics
Karlsruhe Institute of Technology
76131 Karlsruhe, Germany

RESEARCH AREA combinatorics and graph theory, with emphasis on extremal graph and set theory, structural graph theory and poset theory.

EDUCATION

1990 – 1993 Undergraduate Studies, Novosibirsk State University, Russia
1994 – 1999 PhD (1999) University of Illinois at Urbana-Champaign, (adviser Zoltán Füredi), MSc (1996)

PROFESSIONAL EXPERIENCE

May 2012	-	present	Professor , Speaker of the IAG, Karlsruhe Institute of Technology
Oct. 2015	-	Oct. 2017	Speaker, Institute for Algebra and Geometry (IAG), KIT
May 2012	-	Dec. 2012	Professor , Iowa State University
Aug. 2006	-	May 2012	Associate Professor , Iowa State University
Aug. 2000	-	Aug. 2006	Assistant Professor , Iowa State University
Aug. 2000	-	May 2004	Research Associate , Ames Laboratory
Aug. 1999	-	Aug. 2000	Postdoctoral Associate , Ames Laboratory
Aug. 1994	-	June 1999	Teaching/Research Assistant , U. of Illinois at Urbana- Champaign
Jan. 1999	-	Mar. 1999	Visiting Scientist , Institute of Mathematics, Oxford University, UK
Jan. 1998	-	Jun. 1998	Visiting Scientist , Institute of Mathematics, Budapest, Hungary
Sep. 1993	-	May 1994	Mathematics Tutor , University of Alaska

AWARDS and HONORS

2000-2001 Faculty Development Grant, Iowa State University
2002, 2004 & 2007 NSF Association for Women in Mathematics (AWM) travel grant
2006 Excellence in teaching Award, College of Liberal Arts and Sciences, Iowa State
2008-2009 Research grant, National Security Agency, *Extremal combinatorics and applications to computer science*, \$30,000
2009-2011 Research grant, National Science Foundation, Mathematical Sciences (DMS), *Extremal problems on hereditary properties and partitions of combinatorial Structures* (jointly with Co.-PI R. Martin), \$175,000
2019 Teaching award of the Carl Benz School of Engineering, KIT
2021 DFG grant 207,800€, *Homogeneous sets in combinatorial structures under local constraints*

LIST OF PUBLICATIONS

1. Aksenovich, M. A. On conductivity and recognizability of π -circuits. *Metody Diskretn. Anal.* 52, 15-21 (1992) (in Russian).
2. Axenovich, M., Fon-Der-Flaass, D., Kostochka, A., On set systems without weak 3- Δ -subsystems. *Discrete Math.* 138, 57-62 (1995).
3. Axenovich, M., Füredi Z., Mubayi, D. On generalized Ramsey theory: the bipartite case. *J. Combin. Theory Ser. B* 79 (2000), no. 1, 66-86
4. Axenovich, M., A. Generalized Ramsey problem. *Discrete Math.* 222 (2000), no. 1-3, 247-249.
5. Axenovich, M., Kündgen, A. On a generalized anti-Ramsey problem. *Combinatorica*, 21 (3) (2001), 335-349.
6. Axenovich, M., Füredi Z., Embeddings of graphs in two-irregular graphs. *Journal of Graph Theory*, 36 (2001), no. 2, 75-83.
7. Müller, A., Luban, M., Schröder, C., Modler, R., Kögerler, P., Axenovich, M., Schnack, J., Canfield P.C., Bud'ko, S., Harrison, N., Classical and quantum magnetism in giant Keplerate magnetic molecules. *European Journal of Chemical Physics and Physical Chemistry*, vol. 2 (2001), 517-521. Plus cover page 471
8. Axenovich, M., Luban, M., Exact ground state of the classical Heisenberg model for giant molecular magnets. *Phys. Rev. B* 63, 100407 (2001).
9. Axenovich, M., On interval numbers of planar graphs. *Congressus Numerantium* 159 (2002), 77-94.
10. Axenovich, M., Füredi Z., Exact bounds on the sizes of covering codes. *Designs, Codes and Cryptography*, 30 (2003), 21-38.
11. Axenovich, M., On multiple coverings of the infinite rectangular grid with balls of constant radius. *Discrete Mathematics*, 268 (2003), 31-48.
12. Axenovich, M. A note on graph coloring extensions and list colorings. *Electronic Journal of Combinatorics*, 10 (2003), no. 1, Note 1, 5 pp. (electronic).
13. Axenovich, M., Jiang, T., Tuza, Zs., Local anti-Ramsey numbers of graphs. Special issue on Ramsey theory (invited publication), *Combinatorics, Probability and Computing*, 12 (2003), 495-511.
14. Axenovich, M., Fon-der-Flaass D., On rainbow arithmetic progressions, *Electronic Journal of Combinatorics*, 11 (2004).
15. Axenovich, M., Jiang, T., Kündgen, A., Bipartite anti-Ramsey numbers of cycles and path covers in bipartite graphs. *Journal of Graph Theory*, 47 (2004), 9-28.
16. Axenovich, M., Jiang T., Anti-Ramsey numbers for small complete bipartite graphs. *Ars Combinatoria* 73 (2004), 311-318.
17. Axenovich, M., Jamison, R., Pattern Ramsey numbers, *Graphs and Combinatorics*, 21 (2) (2005), 145-160.
18. Axenovich, M., Martin, R., Avoiding patterns in matrices via small number of changes, *SIAM Journal of Discrete Mathematics*, Vol 20 Number 1 (2006), 49-54.
19. Axenovich, M. On transversals in vertex-partitions of graphs. *Electronic journal of Combinatorics*, 13(1), 2006, R36.
20. Axenovich, M., Martin, R. On small cycles in a hypercube. *Discrete Mathematics*, V. 306, Issue 18, (2006), 212-218.
21. Axenovich, M., Martin, R., Sub-Ramsey numbers for arithmetic progressions. *Graphs and Combinatorics*, Volume 22, Number 3, (2006), 297-309.
22. Axenovich, M., Martin, R., On the strong chromatic number of graphs. *SIAM Journal of Discrete Mathematics*, *SIAM J. Discrete Math.* 20 (2006), no. 3, 741-747.
23. Axenovich, M., Martin, R., On weighted Ramsey numbers, *Australasian Journal of Combinatorics*, 38 (2007), 179-194.
24. Axenovich, M., Harborth, H., Kemnitz, A., Möller, M., Schiermeyer, I. Rainbows in the hypercube. *Graphs Combin.* 23 (2007), no. 2, 123-133.

25. Axenovich, M., Balogh, J., Graphs having small number of sizes on induced k -subgraphs. *SIAM J. Discrete Math.* 21 (2007), no. 1, 264-272 (electronic).
26. Axenovich, M., Martin, R., Avoiding rainbow induced subgraphs in vertex colorings, *Electronic Journal of Combinatorics*, 15 (1), (2008) 23 pages (electronic)
27. Axenovich, M., Martin, R., Kezdy, A., Editing distance of graphs. *Journal of Graph Theory*, Volume 58, Number 2 (2008), 123-138.
28. Axenovich, M., Iverson, P., Edge-colorings avoiding rainbow and monochromatic subgraphs, *Discrete Mathematics*, 308 (2008), no. 20, 4710-4723.
29. Axenovich, M., Manske, J., On monochromatic homothetic subsets of a rectangular grid *Electronic Journal of Combinatorics*, Volume 8 (2008), electronic.
30. Axenovich, M., Sackett C. Induced rainbow subgraphs in edge-colored graphs *Australas. J. Combin.* 44 (2009), 287-296.
31. Axenovich, M., Roy, S. On minimal winning coalitions in voting games, *Social Choice and Welfare*, published online, June 2009.
32. Axenovich, M. When do three longest paths have a common vertex? *Discrete Mathematics, Algorithms and Applications* Volume:1, Issue: 1 (2009), 115-120.
33. Axenovich, M., Choi, J., On colorings avoiding a rainbow cycle and a fixed monochromatic subgraph, *Electronic Journal of Combinatorics* 17(1), 2010.
34. Axenovich, M., Choi, J., A note on monotonicity of mixed Ramsey numbers, *Discrete Mathematics* 311 (2011), 2020-2023.
35. Axenovich, M., Manske, J., Martin, R., Extremal functions for Q_2 in a Boolean lattice, *Order*, Online First, 14 March 2011.
36. Axenovich, M., Lastrina, M., Hutchinson J., Extending list colorings in planar graphs, *Discrete Mathematics*, 311 (12), (2011), 1046-1056.
37. Axenovich, M., Lastrina, M., Choi J., Stanton, B., Smith, J., McKay, T., On the chromatic number of subsets of the Euclidean plane, *Graphs and Combinatorics*, online November 2012.
38. Axenovich, M., Ozkahya, L. On homometric sets in graphs, *Australasian Journal of Combinatorics*, 55 (2013), 175-187.
39. Axenovich, M., Martin, R., Multicolor and directed edit distance, *Journal of Combinatorics*, Vol 2., 4, (2011), 525-556.
40. Axenovich, M., Beveridge, A., Hutchinson, J., West, D., On visibility numbers in directed graphs, *SIAM J. Discrete Math.* 27 (2013), no. 3, 1429-1449.
41. Axenovich, M., Osang, G., Rutter, I., Bifork forests in balanced bipartite graphs, *Discrete Applied Mathematics*, 161(2013), 1363-1366.
42. Axenovich, M., Person, Y., Puzyrnina. S., Regularity lemma and twins in sequences, *JCTA*, 120 (2013), 733-743.
43. Axenovich, M., Osang, G., Unavoidable subtrees, *Discrete Mathematics*, 313 (2013), 924-930.
44. Walzer, S., Axenovich, M., Ueckerdt, T., Clumsy packings with polyominoes, *Comput. Geom.* 47 (2014), no. 1, 52-60.
45. Axenovich, M., Gyarfás, A., Liu, H., Mubayi, D., Multicolor Ramsey numbers for triple systems, *Discrete Mathematics*, 322 (2014), 69--77.
46. Axenovich, M., Martin, R., Ueckerdt, T., Twins in graphs, *European Journal of Combinatorics*. 39 (2014), 188-197.
47. Axenovich, M., Knauer, K., Stumpp, J., Ueckerdt, T. On-line and size anti-Ramsey numbers, *Journal of Combinatorics*. 5 (2014), no. 1, 87-114.
48. Axenovich, M., Voigt, M., Harant, J., Przybilo, J., On sum-distinguishing labelings of graphs, *Discrete Applied Mathematics*, 205 (2016), 1-7.
49. Axenovich, M., Ueckerdt, T., Density of range capturing hypergraphs, *J. Comput. Geom.* 7 (2016), no. 1, 1-21.
50. Axenovich, M., Cherubini, E., Ueckerdt, T., Spectrum of mixed bi-uniform hypergraphs, *Graphs and Combinatorics* 32 (2016), no. 2, 453-461.
51. Axenovich, M., Rollin, J., Brooks Type Results for Conflict-Free Colorings and $\{a, b\}$ -factors in graphs, *Discrete Mathematics* 338 (2015), no. 12, 2295-2301.

52. Axenovich, M., Rollin, J., Ueckerdt, T., Conditions on Ramsey non-equivalence, *Journal of Graph Theory*, 86(2), (2017), 159-192.
53. Axenovich, M., Ueckerdt, T., Weiner, P., Splitting Planar Graphs of Girth 6 into Two Linear Forests with Short Paths, *Journal of Graph Theory* 85(3), (2017), 601-618.
54. Axenovich, M. Repetitions in graphs and sequences, *Recent Trends in Combinatorics* (2016), 63-83.
55. Axenovich, M., Walzer S., Boolean lattices: Ramsey properties and embeddings, *Order* (2016), 1-12.
56. Axenovich, M., Goncalves, D., Rollin, J., Ueckerdt, T., The k -strong induced arboricity of a graph, *European Journal of Combinatorics*, 67, (2018), 1-20.
57. Axenovich, M., Karrer, A., High girth hypergraphs with unavoidable monochromatic or rainbow edges, *Discussiones Mathematicae Graph Theory*, 42, (2022), 471-484.
58. Axenovich, M., Rollin, J., Ueckerdt, T., Chromatic number of ordered graphs with forbidden ordered subgraphs, *Combinatorica*, , (2017), 1-23.
59. Axenovich, M., Duerrschnabel, D., Subsets of vertices of the same size and the same maximum distance, *Theory and Applications of Graphs: Vol. 5 : Iss. 2* , (2018), Article 7.
60. Axenovich, M., Goldwasser J., Lydicky B., Martin, R., Offner, D., Talbot, J., Young, M., Polychromatic colorings on the integers, *Integers* 19 (2019), Paper No. A18, 17 pp.
61. Axenovich, M., Goldwasser J., Hansen, R., Lydicky B., Martin, R., Offner, D., Talbot, J., Young, M., Polychromatic colorings of complete graphs with respect to 1-, 2-factors and Hamiltonian cycles, *Journal of Graph Theory*, Vol.87, Issue 4, (2018), 660-671.
62. Axenovich, M., Rollin, J., Ueckerdt, T., The chromatic number of ordered graphs with constrained conflict graphs, *Australasian Journal of Combinatorics*, vol.69, p.74 (2017)
63. Axenovich, M., Doerr, P., Rollin, J., Ueckerdt, T., Induced and weak-induced arboricities, *Discrete Mathematics*, Volume 342, Issue 2, (2019), 511-519.
64. Axenovich, M., Csikos, M., Induced saturation of graphs, *Discrete Mathematics*, Volume 342, Issue 4, (2019), 1195-1212.
65. Axenovich, M., Kaufmann, A., Yuster, R., Clumsy packings of graphs, *Electronic Journal of Combinatorics*, (2019) Volume 26, Issue 2.
66. Axenovich M., Gorgol, I., On induced Ramsey numbers for multiple copies of graphs, *Journal of Graph Theory*, v. 95 (2020), 398–409.
67. Axenovich, M., Gyarfás, A., A note on Ramsey numbers for Berge- G hypergraphs, *Discrete Mathematics*, (2019) Volume 342, Issue 5, 1245-1252.
68. Axenovich, M., Winter, C., A note on saturation for Berge- G hypergraphs, *Graphs and Combinatorics*, (2019), Volume 35, Issue 4, 933-939.
69. Axenovich, M., Thomassen, C., Schade, U., Ueckerdt, T., Planar Ramsey graphs, *Electronic Journal of Combinatorics*, (2019) Volume 26, Issue 4.
70. Axenovich, M., Offner, D., Tompkins, C., Long path and cycle decompositions of even hypercubes, *European Journal of Combinatorics*, Volume 95, (2021), article 103320.
71. Axenovich, M., Tompkins, C., Weber, L., Large homogeneous subgraphs in bipartite graphs with forbidden induced subgraphs, *Journal of Graph Theory* 97 (2021), 34--46.
72. Axenovich, M., Sereni, J.-S., Snyder, R., Weber, L., Bipartite independence number in graphs with bounded maximum degree, *SIAM Journal on Discrete Mathematics* 35(2) (2021), 1136–1148.
73. Axenovich, M., Gorgol, I., Induced Ramsey number for a star versus a fixed graph, *Electronic Journal of Combinatorics*, Volume 28, Issue 1 (2021).
74. Axenovich, M., Snyder, R., Weber, L. The Erdős-Hajnal conjecture for three colors and triangles, *Discrete Math.* 345 (2022), no. 5, Paper No. 112791, 22 pp.
75. Axenovich, M., Martin, R. Splits with forbidden subgraphs, *Discrete Mathematics* Volume 345, Issue 2, (2022), Paper No. 112689, 8 pp.
76. Axenovich, M., Girao, A., Snyder, R., Weber, L., Strong complete minors in digraphs, *Combinatorics, Probability and Computing* 31, (2022), 489–506.
77. Axenovich, M., Caro, Y., Yuster, R., Sum distinguishing number of sparse hypergraphs, *European Journal of Combinatorics*, 112 (2023), Paper No. 103712, 16 pp.
78. Axenovich, M., Weber, L., Absolutely avoidable order-size pairs for induced subgraphs, *Journal of Combinatorics*, Vol. 15, No. 1 (2024), pp. 41-57.

79. Axenovich, M., Lefmann, H., Canonical theorems for colored integers with respect to some linear combinations, *SIAM J. Discrete Math.* 38 (2024), no. 1, 609--628.
80. Axenovich, M., Winter, C., Poset Ramsey numbers: large Boolean lattice versus a fixed poset, *Combinatorics, Probability and Computing*, 1-16, 2023
81. Axenovich, M., Benz, L., Offner, D., Tompkins, C., Generalized Turan densities in the hypercube, *Discrete Mathematics*, Volume 346, Issue 2, February 2023, 113238
82. Axenovich, M., Zheng, M. Interval colorings of graphs -- coordinated and unstable no-wait schedules, *J. Graph Theory* 104 (2023), no. 4, 757--768.
83. Axenovich, M. Extremal numbers for cycles in a hypercube, *Discrete Appl. Math.*, (2023), 1--3.
84. Axenovich, M., Clemen, F., Rainbow subgraphs in edge-colored complete graphs - answering two questions by Erdos and Tuza, *J. Graph Theory* 106 (2024), no. 1, 57--66
85. Axenovich, M., Balogh, J., Clemen, F., Weber, L., Unavoidable order-size pairs in hypergraphs -- positive forcing density, *Comb. Theory* 3 (2023), no. 3, Paper No. 15, 17 pp.
86. Axenovich, M., Winter, C. Poset Ramsey number $R(P;Q_n)$. III. N-shaped poset, *Order*, 2024
87. Axenovich, M., Girao, A., Hollom, L., Portier, J., Powierski, E., Savery, M., Tamitegama, Y., Versteegen, L., A note on interval colorings of graphs, *European Journal of Combinatorics* 120 (2024), Paper No. 103956.
88. Axenovich, M., Bradac, D., Gishboliner, L., Mubayi, D., Weber, L., Large cliques or co-cliques in hypergraphs with forbidden order-size pairs, *Combin. Probab. Comput.* 33 (2024), no. 3, 286--299
89. Axenovich, M., Martin R. R., Winter, C., On graphs embeddable in a layer of a hypercube and their extremal numbers, *Annals of Combinatorics*, 2024
90. Axenovich, M., A class of graphs of zero Turan density in a hypercube, *Combin. Probab. Comput.* 33 (2024), no. 3, 404--410
91. Axenovich, M., Weber, L. A note on multicolour Erdos-Hajnal conjecture, submitted
92. Axenovich, M. and Zimmermann, J. Induced Turan problem in bipartite graphs, accepted to *Discrete Applied Mathematics*
93. Axenovich, M. and Liu, D. Visibility in hypercubes, submitted
94. Axenovich, M. and Winter, C. Diagonal poset Ramsey numbers, submitted
95. Axenovich, M., Gaa, S., Liu, D. Chromatic Ramsey numbers and two-color Turán densities, submitted
96. Axenovich, M., Kiessle, L., Sagdeev, A., Faces of the maximal plane graphs of bounded girth, submitted

Other:

1. Axenovich, M., Zheng, M., Translation of a paper by Sevastianov "Interval colorability of the edges of a bipartite graph" (author's permission for posting granted)
2. Axenovich, M., Martin, R., A version of Szemerédi's regularity lemma for multicolored graphs and directed graphs that is suitable for induced graphs [ArXiv 1106.2871](https://arxiv.org/abs/1106.2871)

SERVICE + PROFESSIONAL INVOLVEMENT

- Organizer:
 - Special session on Extremal Graph Theory: AMS Spring Central Section Meeting, St. Paul, MN, 2010.
 - Special session on Graph Theory: AMS Spring Central Section Meeting, Iowa City, IA, 2011.
 - First Southwestern German Workshop on Graph Theory, Thomashof, Karlsruhe, August, 2018
 - Mini-symposium on Ramsey Theory, British Combinatorial Conference, August 2019
 - Workshop on Graph Theory and Combinatorics in Thuringia (online), July 2020

-Third Southwestern German Workshop on Graph Theory, Heidelberg, June, 2022

- Program Committee EuroComb 2021
- Member, review panel, National Science Foundation, Mathematical Sciences (DMS)
- Reviewer, National Security Agency
- Member, review panel for graduate schools, Austrian Science Foundation and German Science foundation
- Member, reviewer, German Science Foundation
- Referee for peer reviewing of scientific journals: Ars Combinatoria, Journal of Combinatorial Theory A, Journal of Combinatorial Theory B, Journal of Combinatorics, Probability and Computing, Journal of Graph Theory, Graphs and Combinatorics, SIAM Journal of Discrete Mathematics, Discrete Mathematics, Diskretnii Analiz i Issledovanie Operatsii, Australasian Journal of Combinatorics, Electronic Journal of Combinatorics, European Journal of Combinatorics, Integers.
- Reviewer, Mathematical Reviews 2003-2020
- Reviewer, Oberwolfach Research Institute, 2023
- Associate editor of Order
- Editor in Chief of the Electronic Journal of Combinatorics (processing about 60 papers per year) since 08/2020

Service at Iowa State University

- Member, promotion and tenure committee (2008)
- Member, College of Liberal Arts and Sciences curriculum committee (2008-present)
- Member, search committee for Director of Undergraduate Education search, 2008
- Member, search committee for Director of Calculus search, 2008
- Mentor for the preparing future faculty program (Rana Mikkelson, Fall 2006)
- Member, College of Liberal Arts and Sciences, Representative assembly committee, 2003-2008
- Member, College of Liberal Arts and Sciences, Representative assembly executive committee, 2005-2006
- Member, search committee, faculty search in probability 2003/2004
- Member, lecturer's evaluation and promotion committee, Fall 2003, Spring 2004
- Member, graduate committee, admission subcommittee 2000-2002
- Organizer, Combinatorics and Algebra Seminar in 2001-2002, 2003
- Organizer, Discrete Mathematics Seminar in 2010-2011

Service at Karlsruhe Institute of Technology

- Coordinator of Master's of Mathematics (English) program, head of admissions, 2018-2024
- Responsible for coordination of Mathematics Curriculum at the International Department, Carl Benz School of Engineering, KIT
- Spokesperson/director for the Institute of Algebra and Geometry 2015 – 2017, 2023-now
- Hiring committees for the successor of A. Kirsch, C.G. Schmidt, F. Herrlich, E. Leuzinger
- Hiring committee for W3-professorship in Math education
- Hiring committee for W1-professorship TU Ilmenau
- Hiring committee W1-professorship Computer Science
- Member of the Senate committee for diversity (2018-2024)
- Member of the Fakultätsrat (2015-2017, 2023+)
- Member of the senate committee on abuse of power (2021-2024)
- Promotion and tenure committee (2024)
- Chair of the hiring committee W3 Probability, NF-Last (2024-2025)

TEACHING

Courses taught at Karlsruhe Institute of Technology:

Winter 2011-2012: Graph Theory, Advanced Mathematics-I
Summer 2012: Advanced Mathematics-II, seminar on graph theory
Winter 2012-2013: Advanced Mathematics-I, extremal set theory seminar,
Summer 2013: Research semester.
Winter 2013-2014: Graph Theory, Advanced Mathematics I.
Summer 2014: Advanced Mathematics II.
Winter 2014-15: Advances Mathematics I, Proseminar on proofs from the book.
Summer 2015: Advanced Mathematics II
Winter 2015-16: Graph Theory
Summer 2016: Extremal Graph Theory
Winter 2016-17: Advanced Mathematics I
Summer 2017: Combinatorics and Advanced Mathematics II
Winter 2017-18: Graph Theory
Summer 2018: Research semester
Winter 2018-19: Advanced Mathematics I
Summer 2019: Advanced Mathematics II , seminar on Algebraic methods in combinatorics
Winter 2019-20: Graph Theory, seminar on Extremal Set Theory
Summer 2020: Combinatorics, seminar of Probabilistic Methods in Combinatorics
Winter 2020-21: Advanced Mathematics I, seminar Extremal Problems in Combinatorics
Summer 2021: Advanced Mathematics II, proseminar Topics in Discrete Mathematics
Winter 2021-22: Graph Theory, seminar Extremal set theory
Summer 2022: Combinatorics, seminar Topics in Graph Theory
Winter 2022-23: research semester
Summer 2023: Advanced Mathematics II, proseminar Proofs from the Book
Winter 2023: Graph Theory, seminar Algebraic methods in Combinatorics
Summer 2024: Combinatorics, seminar Extremal Set Theory
Winter 2024-25: Linear Algebra I

Courses taught at Iowa State University:

Math 165 - Calculus I
Math 201 - Introduction to proofs
Math 266 - Ordinary differential equations
Math 267 - Ordinary differential equations with Laplace transforms
Math 304 - Combinatorics
Math 307 - Theory of matrices
Math 314 - Graph Theory
Math 317 - Linear algebra
Math 607, 690I - Graduate graph theory
Math 610 - research experience for graduate students (discrete geometry)

Fall 2010:	Math 165 (2 sections)	Spring 2011	Math 267
Fall 2009:	Math 307, Math 607	Spring 2010	Math 610
Fall 2008:	Math 304, Math 307	Spring 2009	Math 201, Math 266
Fall 2007:	Math 607, Math 307	Spring 2008	Math 201, Math 307
Fall 2006:	Math 317, Math 201	Spring 2007	Math 307 (2 sections)
Fall 2005:	Math 266, Math 607	Spring 2006	Math 314
Fall 2004:	Math 307	Spring 2005	Math 307
		Spring 2004	Math 307, Math 317

Fall 2003:	Math 690I	Spring 2003	Math 267 (2 sections)
		Spring 2002	Math 314
Fall 2001:	Math 267 (2 sections)	Spring 2001	Math 266
Fall 2000:	Math 267 (2 sections)		

Diploma studies advisor of:

- Jonathan Rollin (May 2013) Conflict-free colorings of graphs and hypergraphs
- Judith Stumpp (May 2013) Online and size anti-Ramsey numbers
- Enrica Cherubini (December 2014) Coloring mixed hypergraphs
- Pascal Schmitt (May 2017) Disjoint repeated patterns in edge-colored graphs and digraphs
- Stefan Kindler (August 2018) Random planar graphs (Student-teacher degree)

Master studies advisor of:

- Stefan Walzer (2015) Ramsey variant of the 2-dimension of posets
- Fabian Stroh (2016) Weighted gain games on graphs (main advisor T. Ueckerdt)
- Annette Karrer (2016) Colorability of uniform hypergraphs without monochromatic and rainbow edges
- Ursula Schade (2017) Ramsey properties of planar graphs
- Anika Kaufmann (2017) Clumsy packing of the hypercube
- Robert Slomian (2017) Chromatic numbers of graphs under subgraph constraints
- Dominik Dürrschnabel (2018) Distance structure of graphs
- Tamar Mirbach (2019) Multicolor Turan numbers
- Sacha Stoll (2019) On subgraphs with minimum degree restrictions
- Christian Ortlieb (2020) c-chromatic number of hypergraphs
- Chrtian Kouekam (2021) Universal graphs (co-advised with Torsten Ueckerdt)
- Laurin Benz (2021) Generalized Turan densities in the hypercube
- Frithof Marquardt (2022) Cycle structure of hypercubes
- Yen Le (2022) Generalized Ramsey problems
- Christian Koenig (2023) Disjoint queen configurations
- Nora Almasi (2023) Ramsey turn-around numbers
- Jerome Sommerfeld (2024+) Induced and weak Ramsey numbers

Bachelor studies advisor of:

- Georg Osang (2011-2012) Unavoidable trees and forests in graphs
- Stefan Walzer (2012) Clumsy packing of polyominoes
- Christoph Karg (2012) Clique graphs
- Fabian Stroh (2013) Kneser graphs
- Anika Kaufmann (2014) Clumsy packing of complete graphs.
- Jennifer Weidelich (2014) Vertex-distinguishing numbers of bipartite graphs.
- Valentin Braun (2014) On-line chromatic number of graphs.
- Pascal Weiner (2015) Improper colourings of graphs.
- Dominik Dürrschnabel (2017) Homometric sets in graphs.
- Agnes Grünwald (2016) Induced Ramsey numbers of graphs.
- Sascha Stohl (2016) On face-restricted colorings of planar graphs.
- Philip Doerr (2017) Induced arboricity of planar graphs. (co-advised by Torsten Ueckerdt)
- Tamar Mirbach (2017) Ramsey turnaround numbers - a variant of On-line Ramsey numbers.
- Christian Ortlieb (2017) Balanced colorings and generalized Ramsey numbers.
- Christian Kouekam (2017) On ordered Ramsey numbers. (co-advised by Jonathan Rollin)
- Oussama Bouasis (2017) On signed graphs: balance, reversal, and densification
- Frithjof Marquardt (2018) Bounding chromatic number of graphs with forbidden induced subgraphs

(co-advised by Yelena Yuditsky)

- Maximilian Mueller (2018) Properties of $2K_2$ -free graphs (co-advised by Yelena Yuditsky)
- Christian Winter (2018) Berge saturation of non-uniform hypergraphs
- Lauren Benz (2019) Induced arboricity of graphs: bounds and complexity
- Marie Schneider (2020) Zero-sum planar Ramsey graphs
- Paul Axmann (2021) Multicolor Erdos-Hajnal conjecture
- Michael Zheng (2021) Interval thickness of graphs
- Simon Gaa (2023) Chromatic Ramsey numbers
- Niklas Pruen (2023) The saturation problem for partially ordered sets
- Jakob Zimmermann (2024) Induced bipartite Turan problem

Ph.D. advisor of:

- Jacob Manske (2007 – 2010) Coloring and extremal problems in combinatorics
- JiHyeok Choi, (2008 – 2011) Problems in graph theory and probability
- Michelle Lastrina (2009 – 2012) List colorings and sum-list colorings problems in graphs
- Jonathan Rollin (2013-2017) Extremal and Ramsey-type questions for graphs and ordered graphs
- Monika Csikos (2016-2017) Induced saturation in graphs
- Lea Weber (2019-2024) Erdos-Hajnal problems
- Christian Winter (2021-2024) Ramsey numbers for partially ordered sets
- Dingyuan Liu (2023+)

Postdoctoral advisor of:

- Lale Ozkahya (2010-2011)
- Torsten Ueckerdt (2012-2017) received Habilitation title for his postdoctoral work
- Yelena Yuditsky (2017)
- Casey Tompkins (2018)
- Richard Snyder (2019-2021)
- Felix Clemen (2022-2024)
- Arsenii Sagdeev (2024+)

Advising other students:

- Natalia Isaeva-Petry M.S. (2001-2002)
- Eugene Yakubovich (honors program 2001-2002)
- Colleen Kaul (honors program 2003)
- Jason Juett (honors program 2004)
- Perry Iverson (honors program 2005-2006)
- Michael Dorothy (honors program 2006)
- Chelsea Sackett (honors program 2007)
- Kent Vander Velden (Gavin Naylor's graduate student in biology, 2001)
- Rich McBride (2009)

Member Program of Study Committee at Iowa State University:

- Natarajan Viswanathan (2010 Ph.D. in Electrical Computer Engineering with Chris Chu)
- Veerendra Allada (Ph.D. in Electrical Computer Engineering with Akhilesh Tyagi)
- Amy Wangsness (2005, Ph.D. in math with Leslie Hogben)
- Kriti Mukhopadhyay (2005, M.S. in math with Zhijun Wu)
- Balaji Venkatachalam (2006 M.S. in computer science with David Fernandez-Baca)
- Min Pan (2007, Ph.D. in Electrical Computer Engineering with Chris Chu)
- Douglas Ray (2007 M.S. in math with Ryan Martin)
- Chang Liu (2008 Ph.D. in computer science, adviser Lu Ruan)
- Rana Mikkelsen (2008 Ph.D. in math with Leslie Hogben)

- Elizabeth Kleiman (Ph.D. and MS in math and comp. science with Cliff Bergman 2010)
- Olga Pryporova (Ph.D. in math with Leslie Hogben, 2009)
- Jeremy Alm (Ph.D. in math with Roger Maddux)
- Mukul Bansal (Ph.D. and MS in computer science with David Fernandez-Baca 2009)
- Tracy McKay (Ph.D. 2012 in math with Ryan Martin)
- Jason Smith (Ph. D. 2012 with Ryan Martin)
- Brendon Stanton (Ph. D. 2011 in math with Ryan Martin)
- Aaron Sterling (Ph. D. in computer science with Jack Lutz)
- Sevim Simsek (Ph.D. in math with D. D'Allessandro)
- Andy Yilvesaker (Ph.D. in math with Roger Maddux 2012)
- Oktay Olmez (Ph.D. in math with Sung-Yell Song 2012)

Reviewer for Ph.D. dissertations in other universities:

- Felix Joos (2015) (adviser D. Rautenbach., U. Ulm, Germany)
- Nina Kamcev (2018) (adviser B. Sudakov, ETH Zurich, Switzerland)
- Mohammed Senhaji (2018) (adviser E. Sopena, U. Bordeaux, France)
- Thomas Schweser (2020) (adviser M. Stiebitz, U. Ilmenau, Germany)
- Safwat Nassar (2021) (adviser R. Yuster, U. Haifa, Israel)
- Li Xihe (2021) (adviser H. Broersma, U.Twente, Netherlands)
- Sarah Mark (2022) (adviser B. McKay, J. McLeod, P. Wilson.U., Canterbury, New Zealand)
- Fangfang Wu(2024) (adviser H. Broersma, U.Twente, Netherlands)

Organizing trips (with Ryan Martin and Jonathan Rollin) for graduate students to attend the following conferences:

- Spring 2014 German Mathematical Society conference in Frankfurt on Main
- Spring 2010 AMS meeting, Minneapolis-St.Paul, MN
- Spring 2009 AMS meeting, Urbana-Champaign, IL
- Fall 2007 AMS Meeting, Chicago, IL
- Fall 2005 AMS meeting, Lincoln, NE
- Fall 2004 AMS meeting, Evanston, IL

Extension:

Teaching mathematics extension class for talented second grade students in Meeker elementary school, Ames IA (logic, sets, combinatorics, geometry) (bi-weekly meetings). Participating in math open days at KIT, giving a talk for local high school teachers, Karlsruhe. Part of Uni fuer Einsteiger. One week math camp (BOGY) for a student from Helmholtz gymnasium.

CONFERENCES AND SEMINAR TALKS

(invited and plenary talks are listed in **boldface**)

1. **Summer 2024, Summit 280, Turan-type problems in hypercube, Plenary talk, Budapest**
2. Summer 2024, On variants of multicolor Erdos-Hajnal conjecture, Workshop, Budapest
3. Summer 2024, Dense subgraphs of the hypercube, Graz, Austria, seminar online
4. Fall 2023, Extremal numbers in a hypercube, Kolkom, Heidelberg
5. **Summer 2023, Ramsey numbers in a Boolean lattice, Workshop on Poset Saturation, Budapest**
6. **Summer 2023, Extremal numbers in a hypercube, plenary talk, LAGOS-23, Huatulco, Mexico**
7. **Fall 2022, Order-size pairs in graphs and hypergraphs, Iowa State University, Ames, IA**
8. **Fall 2022, Unavoidable order-size pairs, plenary talk, Polish combinatorial conference, Bedlewo**
9. **Fall 2022, Forcing order-size pairs in hypergraphs, University of Oxford, UK**
10. **Spring 2022, Strong minors in digraphs, Sparse graph coalition workshop, online**
11. **Fall 2021, Unavoidable order-size pairs in graph, University of Heidelberg**

12. **Summer 2021, Sum-distinguishing numbers of hypergraphs, University of Ilmenau**
13. **Summer 2021, Sum-distinguishing number of hypergraphs, MoCCA conference, Moscow**
14. **Summer 2021, Homogeneous sets in three-colored complete graphs, Umea University seminar**
15. **Spring 2021, Induced Ramsey numbers of a fixed graph versus a large star, Georgia Tech Graph Theory seminar**
16. **Fall 2020, Homogenous sets in bipartite graphs with forbidden induced subgraphs, Iowa State University, Discrete Mathematics Seminar**
17. **Summer 2020, Rainbow arithmetic progressions, online memorial seminar of D. von-der-Flaass, Sobolev Institute of Mathematics, Novosibirsk**
18. **Fall 2019, Berge hypergraphs – saturation and Ramsey properties, DMV meeting, Karlsruhe**
19. **Fall 2019, Planar Ramsey numbers, Workshop on Zero-sum Ramsey theory, Oaxaca, Mexico**
20. **Spring 2019, Clumsy packings of graphs, Stanford University**
21. **Fall 2018, 1st Southwestern German conference on Graph Theory, Karlsruhe**
22. **Spring 2018, Induced arboricities, Budapest, Renyi Institute**
23. **Spring 2018, Induced arboricities and classes of bounded expansion, Colloquium for Combinatorics, LSE and UQM London, plenary talk**
24. **Fall 2017, Ramsey properties of Boolean lattices, CID, Poland, plenary talk**
25. **Summer 2017, Improper colorings of planar graphs, British Combinatorial Conference, plenary talk**
26. **Spring 2017, Induced forests in minor closed families of graphs, DTU, Copenhagen**
27. **Winter 2017, Improper colorings of planar graphs, University of Frankfurt**
28. **Fall 2016, Cycles and colorings: ordered graphs and hypergraphs, High Tatras workshop on cycles and colorings, plenary talk**
29. **Fall 2015, Polychromatic colorings, Ames, IA.**
30. **Summer 2015, Ramsey equivalence of graphs, Ron Graham 80th Birthday conference, Vancouver, Canada**
31. **Fall 2014, Extremal problems on Geometric Hypergraphs, Kolloquium über Kombinatorik, Ilmenau**
32. **Fall 2014, Density of Geometric Hypergraphs, AMS meeting Eau-Clair, Wisconsin**
33. **Spring 2014, Size and on-line anti-Ramsey numbers, Japans Conference on Graph Theory and Combinatorics, plenary talk**
34. **Fall 2013, Twins in Combinatorial Structures, Utrecht Graph Workshop**
35. **Fall 2013, Clumsy and aperiodic packings, Colloquium, Renyi Institute of Mathematics, Budapest**
36. **Summer 2013, Clumsy packing of polyominoes, Midsummer Combinatorial Workshop, Prague**
37. **Spring 2013, Regularity Lemma and twins in words, Séminaire CAESAR de combinatoire additive, Ecole polytechnique, Paris**
38. **Spring 2013, Twins in sequences and graphs, C5 Conference, Rathen, Germany**
39. **Spring 2013, Multicolor Ramsey numbers for triple systems, Hereditania, Rathen, Germany**
40. **Spring 2013, Antrittsvorlesung, KIT, Ramsey Properties of Combinatorial Structures, Karlsruhe, Germany**
41. **Fall 2012, Visibility in directed graphs, Kolloquium über Kombinatorik, Berlin**
42. **Summer 2012, Twins in sequences, Midsummer workshop, Prague**
43. **Spring 2012, Induced subgraphs and reconstruction, TU Berlin colloquium**
44. **Fall 2011, Edit distance in graphs and matrices, Kolloquium, Universität Ulm**
45. **Fall 2011, Ramsey-type problems, Winter Workshop for algebra and geometry, Karlsruhe Institute of Technology**
46. **Fall 2011, On unavoidable patterns in colorings, Mathematics Colloquium, Karlsruhe Institute of Technology**
47. **Fall 2011, On homometric sets in graphs, Eurocomb, Budapest, Hungary**
48. **Spring 2011, On unavoidable patterns in graphs, Cumberland Conference, Louisville, KE, plenary talk**
49. **Spring 2011, American Institute of Mathematics (AIM) workshop on hypergraph Turan problem, Palo Alto, CA**
50. **Spring 2011, On list-coloring extensions, SIAM mini-symposium, New Orleans, LS**
51. **Fall 2010, On list-coloring extensions, AMS meeting, Richmond, VA**

52. **Summer 2010, Austin, TX**
53. Spring 2010, On networks with forbidden local structures, Colloquium talk, Karlsruhe Institute of Technology, Germany
54. Spring 2010, On induced subgraphs – editing and structure, Seminar talk , University of Minnesota, MN
55. **Spring 2010, On posets with forbidden sub-posets, AMS meeting San Francisco**
56. Fall 2009, On dense families of sets without fixed sub-families, Discrete Mathematics seminar, ISU
57. **Spring 2009, On colorings avoiding both monochromatic and rainbow subgraphs AMS meeting Urbana-Champaign**
58. Fall 2008, Dirichlet principle and beyond Graduate students seminar, ISU
59. Fall 2008, Voting games. Discrete Mathematics seminar, ISU
60. **Spring 2008, Induced subgraphs - editing, reconstructing, avoiding. CombinaTexas, plenary talk**
61. **Spring 2008, Graph colorings without rainbow and monochromatic subgraphs AMS-SIAM Joint meeting San Diego**
62. **Fall 2007, Avoiding induced subgraphs as transversals of vertex-partitions AMS Meeting De-Paul University, Chicago**
63. Spring 2007, Avoiding induced subgraphs as transversals of vertex-partitions ISU Discrete math seminar
64. Spring 2007, Saturation of cycles ISU Discrete math seminar
65. **Spring 2007, Vertex-Ramsey numbers for induced subgraphs 20th Cumberland conference, Emory University, Atlanta, GA**
66. Fall 2006, Unavoidable combinatorial structures ISU graduate colloquium
67. Fall 2006, Avoiding rainbow and monochromatic subgraphs ISU discrete mathematics seminar
68. **Fall 2006, Reconstructing graphs with small number of induced subgraphs AMS regional meeting, Fayetteville, AR**
69. **Summer 2006, Editing distance in combinatorial structures Simon Fraser University, Canada, Discrete mathematics day, plenary talk**
70. Summer 2006, Editing of graphs with applications to genetic networks The Fifth International Conference on Bioinformatics of Genome Regulation and Structure, Novosibirsk, Russia (poster presentation)
71. Spring 2006, Unavoidable patterns in colored integers University of Delaware, DE
72. Fall 2005, On graphs with small number of sizes on induced subgraphs AMS meeting, Lincoln, Nebraska
73. Fall 2005, On induced subgraphs of graphs ISU discrete mathematics seminar
74. Summer 2005, On vertex-anti-Ramsey problems in graphs, seminar talk in Sobolev Institute of Mathematics, Novosibirsk, Russia
75. **Spring 2005, Transversals in vertex-partitions of graphs Conference in Extremal Graph Theory, Pittsburg, plenary talk (supported by the conference organizers (Alladin center))**
76. **Spring 2005, Transversals in vertex-partitions of graphs Graph Theory with Altitude Conference, Denver**
77. Spring 2005, On anti-Ramsey problems in vertex-colorings of graphs ISU Discrete Math Seminar
78. **Spring 2005, On partitions in combinatorial structures ISU, math club, Pi Mu Epsilon**
79. **Fall 2004, Rainbow arithmetic progressions. University of Iowa.**
80. **Fall 2004, Partition properties of numbers and graphs. Regional mathematics meeting, Lincoln, NE, plenary talk**
81. **Fall 2004, On colored arithmetic progressions. AMS meeting in Evanston, IL**
82. Fall 2004, Short cycles in a hypercube. ISU discrete mathematics and theory of computing seminar
83. Spring 2004, On editing distance of graphs. SECGCC, Boca Raton, FL. (supported by NSF-AWM travel grant)
84. Spring 2004, On binary chromatic numbers and avoiding induced subgraphs. Graph Theory seminar, ISU
85. **Fall 2003, Patterns Ramsey results on graphs and numbers, colloquium talk, Georgetown University, Washington DC**

86. Fall 2003, On rainbow arithmetic progressions. MIGHTY XXXIII, Valparaiso, IN
 87. Fall 2000, On anti-Ramsey problems. MIGHTY XXXII, Dayton, OH
 88. Spring 2000, Application of extremal combinatorics to sequence analysis in bioinformatics. Iowa State University, Ames, IA
 89. Fall 1999, Critical subgraphs of critical graphs. Iowa State University, Ames, IA
 90. Spring 1999, Covering codes of constant radius. Iowa State University, Ames, IA
 91. Spring 1999, On generalized anti-Ramsey problems. Oxford University, Oxford, UK
 92. Fall 1998, On generalized Ramsey-type problems. MIGHTY XXX: Ball State University, Muncie, IN
 93. Fall 1998, On coloring of mixed hypergraphs. University of Illinois
 94. Spring 1998, On embeddings of graphs in 2-irregular graphs. Seminar at Sztaki, Hungarian Academy of Science, Budapest, Hungary
 95. Fall 1997, Isotropic colorings. 12th MCCCC, Indiana State University, Terre Haute
 96. **Summer 1997, Football Pool Problem, International conference on graph theory and combinatorics. Novosibirsk, Russia**
 97. Spring 1997, University of Memphis, 919th AMS Meeting
 98. Summer 1996, 8th Quadrennial Int. Conference on Graph Theory, Combinatorics, Algorithms, and Applications: WMU, Kalamazoo, MI
 99. Fall 1995, MIGHTY XXV: Illinois State University, Normal, IL
 100. Spring 1995, 8th Cumberland Conference: Nashville, TN
 101. Spring 1993, On the conductivity of p -schemes. National student conference. Novosibirsk, Russia
- AMS - American Mathematical Society meeting,
MIGHTY - Midwest Graph Theory meeting,
MCCCC - Midwestern Conference on Combinatorics, Cryptography and Computing.
ISECGC - International Southeastern Conference on Graphs, Combinatorics and Computing.

Workshops attended:

- AIM workshop on Hypergraph Turan Problem, March 2011
- ICERM workshop on Polychromatic Colorings, March 2014, Brown University
- IMA workshop on Extremal and Probabilistic Combinatorics, September 2014 Minneapolis
- Workshop on Polychromatic Colorings, Sept. 2015, Ames, IA
- BIRS-Banff, 2016
- BIRS-Oaxaca, 2019
- BIRS-Banff, 2022
- Poset saturation, Budapest, 2023
- Generalized Turan numbers, Budapest, 2024

AIM – American Institute of Mathematics

ICERM - The Institute for Computational and Experimental Research in Mathematics

IMA - Institute for Mathematics and Applications