

Amanda Redlich

EDUCATION

Ph.D. Mathematics, MIT

Adviser: Peter Shor

B.A. Mathematics, University of Chicago,

Student, Budapest Semesters in Mathematics,

POSITIONS HELD

Assistant professor, University of Massachusetts Lowell, Sept. 2019 - present
[on leave Sept. 2019-Jan. 2020, Sept. 2022-Jan. 2023]

Visiting teaching professor, University of Massachusetts Lowell, Sept. 2018 - May 2019

Visiting assistant professor (sabbatical position), Tufts University, Sept. 2016-May 2017

Assistant professor, Department of Mathematics, Bowdoin College, July 2013 - June 2018

Postdoctoral fellow, Network science and graph algorithms, Institute for Computational and Experimental Research in Mathematics, Brown University, February 2014-May 2014

Postdoctoral associate, Department of Mathematics, Rutgers University, September 2010 - May 2013

Research intern, Tata Research Development and Design Centre, Pune, India, Summer 2008

RESEARCH INTERESTS

Combinatorics, randomized algorithms.

PUBLICATIONS

- D. Galvin, P. Marmorino, E. McMillon, JD Nir, A. Redlich: *Two strategies for counting H -colorings of trees*, in preparation.
- K. Collins, D. Galvin, C. Kelley, E. McMillon, A. Redlich: *Characterizing Graphs as Algebraic Squares*, in preparation.
- William K. Moses Jr., Amanda Redlich and Frederick Stock, *Agents and Adversary: Categorizing BROADCAST-friendly graphs*, in preparation.
- Amanda Redlich: *Power laws and power-of-two-choices*, in preparation.
- Pranav Garg, Annie Raymond, Amanda Redlich: *Non-trivial squares and Sidorenko's conjecture*, forthcoming, Electronic Journal of Combinatorics.

- William K. Moses Jr., Amanda Redlich and Frederick Stock, *Brief Announcement: Broadcast via Mobile Agents in a Dynamic Network: Interplay of Graph Properties & Agents*, 4th Symposium on Algorithmic Foundations of Dynamic Networks (SAND 2025), 17:1–17:5, Leibniz International Proceedings in Informatics (LIPIcs).
- M. R. Kotturu, S. V. Movahed, K. Jerath, P. Robinette, A. Redlich, R. Azadeh: *Relational Weight Optimization for Enhancing Team Performance in Multi-Agent Multi-Armed Bandits*, Proceedings of the Fourth Modeling, Estimation, and Control Conference (MECC 2024).
- William K. Moses Jr., Amanda Redlich: *Dispersion, Capacitated Nodes, and the Power of a Trusted Shepherd*, ICDCN '24: Proceedings of the 25th International Conference on Distributed Computing and Networking, January 2024, Pages 400–405, <https://doi.org/10.1145/3631461.3632310>.
- J. Augustine, W. K. Moses Jr., A. Redlich, E. Upfal: *Balanced allocation: Patience is not a virtue*, SIAM Journal on Computing, 51-6 (2022), pp. 1743 - 1768.
- Amanda Redlich: *A power-of-two-choices unbalanced allocation process*, SIAM J. Discrete Math, 31-1 (2017), pp. 477-488.
- Robert DeMarco, Amanda Redlich: *Graph decomposition and parity*, J. Graph Theory 82 (4): 374-386 (2016).
- J. Augustine, W. K. Moses Jr., A. Redlich, E. Upfal: *Balanced allocation: Patience is not a virtue*, Proceedings of the Twenty-Seventh Annual ACM-SIAM Symposium on Discrete Algorithms, (2016) 655-671.
- Robert DeMarco, Jeffry Kahn, Amanda Redlich: *Modular statistics for subgraph counts in sparse random graphs*, Electronic J. of Combinatorics 22(1): P1.37 (2015).
- Shabnam Beheshti, Amanda Redlich: *Remarks on combinatorial aspects of the KP Equation*, Proceedings of the Second International Conference on Nonlinear and Modern Mathematical Physics, AIP Conf. Proc. 1562, 5 (2013).
- S. Patil, S. Roy, J. Augustine, A. Redlich, A. Deshpande, M. Gharote, S. Lodha, A. Mehrotra, H. Vin: *Minimizing Testing Overheads in Database Migration Lifecycle*. Proceedings of 16th International Conference on Management of Data (COMAD), 2010.
- Igor Pak, Amanda Redlich: *Long cycles in abc-permutations*. Functional Analysis and Other Mathematics 2(1): 87-92 (2008).
- David Eisenstat, Gary Gordon, Amanda Redlich: *Combinatorial properties of a rooted graph polynomial*. SIAM J. Discrete Math. 22(2): 776-785 (2008)
- D. Eisenstat, J. Feder, G. Francos, G. Gordon, A. Redlich: *Expected rank and randomness in rooted graphs*. Discrete Applied Mathematics 156(5): 746-756 (2008)

SERVICE

- NSF panelist
- AMS Library Committee member
- Referee for:
 - ACM-SIAM Symposium on Discrete Algorithms
 - ACM Symposium on Principles of Distributed Computing
 - The American Mathematical Monthly
 - Annals of Probability
 - Discrete Mathematics
 - IEEE International Conference on Distributed Computing Systems
 - SIAM Undergraduate Research Online
- Reviewer for Mathematical Reviews/MathSciNet
- Co-organizer of UML Mathematics Colloquium, Sept. 2021-present
- Member of UML KCS Research, Innovation, & Strategic Planning Team.

SELECTED AWARDS

- UMass Lowell Seed Grant: *Multi-omic network analysis of the gut-brain-immune axis* (co-PI)
July 2024-2025
- Pre-tenure Mathematics Faculty Seed Grant: *Robots Roaming Randomly, Resolving Rapidly: Efficient Dispersion on Graphs*
May 2021-December 2023
- Departmental Teaching Excellence Award
May 2021, 2024
- National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship
September 2010-July 2013

SELECTED TALKS

- WIGA Special Session: Graph Labeling and Graph Structures, AWM Research Symposium, May 2025 - *Graph polynomials: No, not that kind of polynomial*
- Special Session on Combinatorics and Graph Theory, AWM Research Symposium, May 2025 - *Dealing with catastrophe: winning strategies on dynamic graphs*
- AMS Special Session on Recent Trends on Graphs and Hypergraphs, AMS Spring Eastern Sectional Meeting, April 2025 - *Navigation in dynamic graphs: How to defeat the Acme Graph Exploder*

- AMS Special Session on Extremal and Probabilistic Combinatorics, Joint Math Meetings, Jan. 2025 - *Exploring dynamic graphs: What to do when your flights keep getting canceled*
- Math Colloquium, Providence College, Nov. 2024 - *"GPS Recalculating...": Navigation using graph theory*
- Discrete Math Seminar, Worcester Polytechnic Institute, April 2024 - *Graph crafting - structural graph theory approaches in logic, probability, and algebra*
- Spring 2023 Discrete Math Workshop, Smith College, May 2023 - *Some squares, some sum-of-squares, some Sidorenko*
- Discrete Math Seminar, UMass Amherst, April 2019 - *Grocery shopping and course selection: biased random choices on different combinatorial objects*
- Fall Central Sectional Meeting, American Mathematical Society, University of Michigan, Oct. 2018 - *Missed connections: Finding similar vertices using random walks*
- Discrete Math Days of the Northeast, University of New England, May 2018 - *Neighborhood Watch: Measuring similarity in biological networks using random walks*
- Random Walks and Metrics Minisymposium, SIAM Annual Meeting, Pittsburgh PA, July 2017 - *Generating power-law-like distributions easily: Popularity contests*
- Computer Science & Engineering Seminar, Indian Institute of Technology Madras, May 2017 - *The power of two choices when the rich get richer: multiple choice at the multiplex*
- Special Session on Extremal and Probabilistic Combinatorics, AMS Fall Central Sectional Meeting, University of St. Thomas, Oct. 2016 - *The waiting game: Balanced allocation via random choices*
- Special Session on New Developments in Graphs and Hypergraphs, AMS Fall Eastern Sectional Meeting, Bowdoin College, Sept. 2016 - *Strategic graph decompositions*
- SIAM Workshop on Network Science, Boston MA, July 2016 - *Designing exit frequency distance measures for biological networks*
- Randomized Structures and Algorithms, Carnegie Mellon University, July 2015 - *Power laws and the power of two choices*
- IAS WAM Research Seminar, Princeton NJ, May 2013 - *Gluing graphs, ungluing graphs, and first-order logic with parity*
- Applied Communication Sciences, Basking Ridge NJ, April 2013 - *Logic, parity, and counting subgraphs in random graphs*
- Princeton Discrete Mathematics Seminar, Princeton NJ, March 2013 - *Graph constructions, graph decompositions, and random graphs*
- Bell Labs Mathematics Colloquium, Murray Hill NJ, Jan. 2013 - *Unbalanced allocations and cost minimization*

ADVISING

Thesis co-adviser, Monish Reddy Kotturu (MS, CS) - UMass Lowell
Graduated July 2024

- Thesis committee, Narayana Vasistha Kandarpa (MS, CS) - UMass Lowell
Graduated May 2022
- Various Senior Seminars (topics ranging from logic to incarceration statistics) - UMass Lowell
Spring 2020 - present
- Various independent-study and honors projects - Bowdoin College
2015-2018

OUTREACH

◇ College-level

- Faculty adviser for UMass Lowell Society of Asian Scientists and Engineers
- Faculty co-adviser for UMass Lowell Math Club
- Senior seminar adviser at UMass Lowell
- River Hawk Scholars adviser (first-generation college students) at UMass Lowell
- Referee for SIAM Undergraduate Research Online
- First-generation college student advising - Bowdoin College
- Undergraduate research talks - Bowdoin College, Colby-Sawyer College, Lafayette College, Macalester College, Rutgers University, UMass Lowell, York College

◇ Pre-college

- “Knitting Knerdery” “Fractions and Food” “Web of Friends” “Zeno’s Paradox” - Creative math workshops for 7 to 13 year old students (4H, Brownies, museum visitors)
- Committee member, Association for Women in Mathematics essay contest

◇ Broader community

- “Knitting Knerdery” “Knitting and Math” “Musical Numbers: Math Goes to Bollywood” “Women in Mathematics” - general-audience presentations for 18 to 80 year olds (museums, colleges)
- “Truth Values” panelist - Central Square Theater, Cambridge MA

TEACHING

- Discrete Structures I - UMass Lowell
Fall 2018, Spring 2019, 2021, 2022, 2023, 2024, 2025

- Discrete Structures II - UMass Lowell
Fall 2020, 2021, 2023, 2024, 2025
- Calculus I - UMass Lowell
Spring 2019
- Management Calculus - UMass Lowell
Fall 2018
- Linear Algebra - Bowdoin College
Spring 2018
- Combinatorics and Graph Theory - Bowdoin College
Fall 2014, 2017
- Probability - Bowdoin College
Fall 2013, Spring 2015, Fall 2015, Spring 2016, Spring 2018
- Multivariate Calculus - Bowdoin College, Rutgers University
Fall 2011, Fall 2012, Fall 2013, Fall 2014, Spring 2015, Fall 2015, Spring 2016, Fall 2017