

Daniel W. Cranston

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Department of Computer Science
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Research Interests

Graph theory and algorithm design; in particular, structural and extremal graph theory and graph coloring.

Academic Appointments

- 2020–present **Virginia Commonwealth University**; Associate Professor of Computer Science (with tenure).
2015–2020 **Virginia Commonwealth University**; Associate Professor of Mathematics (with tenure).
2016–2017 **Johns Hopkins University**; Visiting Associate Professor of Applied Math and Statistics.
2009–2015 **Virginia Commonwealth University**; Assistant Professor of Mathematics.
2007–2009 **Center for Discrete Math and Theoretical Computer Science (DIMACS) and Bell Labs**; Rutgers University and Murray Hill, N.J. Postdoctoral Fellow.

Education

- 1999–2007 **University of Illinois at Urbana-Champaign**:
Ph.D. in Computer Science, May 2007. Advisor: Douglas West.
Thesis: Coloring and Labeling Problems on Graphs.
M.S. in Computer Science, January 2004. Advisor: Jeff Erickson.
M.S. in Applied Mathematics, Optimization and Algorithms, December 2000.
1996–1999 **Greenville College**:
B.A. Major in Mathematics, magna cum laude, May 1999. Honors program.

Grant Activity

- 2016–2018 *Improved bounds for edge coloring simple graphs: the structure of edge-critical graphs*, NSA Young Investigator Award (\$40,000)
2015–2017 *Strengthening Brooks' Theorem: Improved upper bounds on the chromatic number of a graph*, NSA Young Investigator Award (\$40,000)

Editorial Work

- 2018–present Managing Editor, Australasian Journal of Combinatorics
2018–present Editorial Board, Journal of Graph Theory
2019–present Editorial Board, Discussiones Mathematicae Graph Theory

Awards and Honors

- 2014, 2017, Nominated for VCU Humanities and Sciences
2018, 2019 Excellence in Scholarship Award (one nomination per department)
2009–2010 Fellow of AMS Project NExT (Professional Development Program)

Publications

H-index 14 and 738 citations in Google Scholar as of 24 July 2020. Copies of these papers can be downloaded from https://arxiv.org/a/cranston_d_1.html.

Papers Submitted for Publication

- [58] Daniel W. Cranston and Matthew P. Yancey. *Vertex Partitions into an Independent Set and a Forest with Each Component Small*.
- [57] Daniel W. Cranston, Hudson Lafayette, and Landon Rabern. *Coloring (P_5, gem) -free graphs with $\Delta - 1$ colors*.

Refereed Journal Publications

- [56] Daniel W. Cranston and Matthew P. Yancey. *Sparse Graphs are Near-bipartite*. SIAM Journal on Discrete Math. To appear.
- [55] Daniel W. Cranston and Jiaao Li. *Circular Flows in Planar Graphs*. SIAM Journal on Discrete Math. Vol. 34(1), 2020, pp. 497–519.
- [54] Ilkyoo Choi, Daniel W. Cranston, and Théo Pierron. *Degeneracy and Colorings of Squares of Planar Graphs without 4-Cycles*. Combinatorica. To appear.
- [53] Neal Bushaw and Daniel W. Cranston. *A Note on Bootstrap Percolation Thresholds in Plane Tilings using Regular Polygons*. Australasian J. Combinatorics. Vol. 74(3), 2019, pp. 486–497.
- [52] Daniel W. Cranston and Landon Rabern. *The Hilton–Zhao Conjecture is True for Graphs with Maximum Degree 4*. SIAM Journal on Discrete Math. 33(3), 2019, pp. 1228–1241.
- [51] Daniel W. Cranston. *A Characterization of $(4,2)$ -Choosable Graphs*. Journal of Graph Theory. Vol. 92(4), December 2019, pp. 460–487.
- [50] Daniel W. Cranston. *Acyclic Edge-coloring of Planar Graphs: Δ Colors Suffice when Δ is Large*. SIAM Journal on Discrete Math. Vol. 33(2), 2019, pp. 614–628.
- [49] Daniel W. Cranston. *Proper Distinguishing Colorings with Few Colors for Graphs with Girth at Least 5*. Electronic Journal of Combinatorics. Vol. 25(3), 2018, #P3.5.
- [48] Marthe Bonamy, Daniel W. Cranston, and Luke Postle. *Planar Graphs of Girth at least Five are Square $(\Delta + 2)$ -Choosable*. Journal of Combinatorial Theory, Series B. Vol. 134, 2019, pp. 218–238. **Among 25 “most downloaded” JCTB papers (March 2019)**.
- [47] Daniel W. Cranston and Landon Rabern. *Planar Graphs are $9/2$ -colorable*. Journal of Combinatorial Theory, Series B. Vol. 133, 2018, pp. 32–45. **Among 24 “most downloaded” JCTB papers (from December 2018 through February 2019)**.
- [46] Daniel W. Cranston and Landon Rabern. *Beyond Degree Choosability*. Electronic Journal of Combinatorics. Vol. 24(3), 2017, #P3.29.
- [45] Daniel W. Cranston and Landon Rabern. *Short Fans and the $5/6$ Bound for Line Graphs*. SIAM Journal on Discrete Math. Vol. 31(3), 2017, pp. 2039–2063.
- [44] Daniel W. Cranston and Landon Rabern. *List-coloring Claw-free Graphs with $\Delta - 1$ colors*. SIAM Journal on Discrete Math. Vol. 31(2), 2017, pp. 726–748.
- [43] Daniel W. Cranston and Landon Rabern. *Edge Lower Bounds for List Critical Graphs, via Discharging*. Combinatorica. Vol. 38(5), October 2018, pp. 1045–1065.
- [42] Daniel W. Cranston and Landon Rabern. *Subcubic Edge Chromatic Critical Graphs have Many Edges*. Journal of Graph Theory. Vol. 86(1), September 2017, pp. 122–136.
- [41] Daniel W. Cranston and Douglas B. West. *An Introduction to the Discharging Method via Graph Coloring*. Discrete Math. Vol. 340, no. 4, April 2017, pp. 766–793.
Extended version: *A Guide to the Discharging Method*. At: <https://arxiv.org/abs/1306.4434v1>
- [40] Daniel W. Cranston and Robert Jaeger. *Coloring Squares of Planar Graphs with no 4-cycles and no 5-cycles*. Journal of Graph Theory. Vol. 85(4), August 2017, pp. 721–737.
- [39] Daniel W. Cranston, Luke Postle, Chenxiao Xue, and Carl Yerger. *Modified Linear Programming and Class 0 Bounds for Graph Pebbling*. J. Combinatorial Optimization. 34(1), July 2017, pp. 114–132.

- [38] Daniel W. Cranston and Landon Rabern. *Planar Graphs have Independence Ratio at least $3/13$* . Electronic Journal of Combinatorics. Vol. 23(3), 2016, #P3.45.
- [37] Daniel W. Cranston and Landon Rabern. *Painting Squares in $\Delta^2 - 1$ Shades*. Electronic Journal of Combinatorics. Vol. 23(2), 2016, #P2.50.
- [36] Daniel W. Cranston and Landon Rabern. *Graphs with $\chi = \Delta$ have Big Cliques*. SIAM Journal on Discrete Math. Vol. 29(4), 2015, pp. 1792–1814.
- [35] Daniel W. Cranston and Landon Rabern. *The Fractional Chromatic Number of the Plane*. Combinatorica. Vol. 37(5), October 2017, pp. 837–861.
- [34] Daniel W. Cranston and Landon Rabern. *A Note on Coloring Vertex-transitive Graphs*. Electronic Journal of Combinatorics. Vol. 22(2), 2015, #P2.1.
- [33] Daniel W. Cranston and Landon Rabern. *Brooks' Theorem and Beyond*. J. Graph Theory. Vol. 80(3), November 2015, pp. 199–225.
- [32] Daniel W. Cranston and Landon Rabern. *Coloring a graph with $\Delta - 1$ colors: Conjectures Equivalent to the Borodin-Kostochka Conjecture that Appear Weaker*. European J. Comb. Vol. 44, Part A, February 2015, pp. 23–42.
- [31] Daniel W. Cranston, Yuchang Liang, and Xuding Zhu. *Regular Graphs of Odd Degree are Antimagic*. Journal of Graph Theory. Vol. 80(1), September 2015, pp. 28–33.
- [30] Daniel W. Cranston, Rok Erman, and Riste Škrekovski. *Choosability of the Square of a Planar Graph with Maximum Degree Four*. Australasian Journal of Combinatorics. Vol. 59(1), June 2014, pp. 86–97.
- [29] Daniel W. Cranston and Riste Škrekovski. *Sufficient Sparseness Conditions for G^2 to be $(\Delta + 1)$ -choosable when $\Delta \geq 5$* . Discrete Applied Math. Vol. 162(10), January 2014, pp. 167–176.
- [28] Daniel W. Cranston and Candace M. Kent. *On the Boundedness of Positive Solutions of the Difference Equation $x_n = \max \left\{ \frac{A_{n-1}^1}{x_{n-1}}, \frac{A_{n-1}^2}{x_{n-2}}, \dots, \frac{A_{n-1}^t}{x_{n-t}} \right\}$ with Periodic Parameters*. Applied Mathematics and Computation. Vol. 221, 2013, pp. 144–151.
- [27] Daniel W. Cranston and Suil O. *Hamiltonicity in Connected Regular Graphs*. Information Processing Letters Vol. 113, 2013, pp. 858–860.
- [26] Daniel W. Cranston, Sogol Jahanbekam, and Douglas B. West. *1,2,3-Conjecture and 1,2-Conjecture for Sparse Graphs*. Discussiones Mathematicae Graph Theory. Vol. 34(4), 2014, pp. 769–799.
- [25] Daniel W. Cranston, Jaehoon Kim, and William B. Kinnersley. *New Results in t -tone Coloring*. Electronic Journal of Combinatorics. Vol. 20(2), 2013, #P17.
- [24] Daniel W. Cranston and Landon Rabern. *Coloring Claw-free Graphs with $\Delta - 1$ Colors*. SIAM Journal on Discrete Math. Vol. 27(1), 2013, pp. 534–549.
- [23] Daniel W. Cranston, William B. Kinnersley, Suil O, and Douglas B. West. *Game Matching Number of Graphs*. Discrete Applied Math. Vol. 161(13–14), 2013, pp. 1828–1836.
- [22] Daniel W. Cranston, William B. Kinnersley, Kevin G. Milans, Gregory J. Puleo, and Douglas B. West. *Chain-making Games in Grid-like Posets*. Journal of Combinatorics. Vol. 3(4), 2012, pp. 633–650.
- [21] Jane Butterfield, Daniel W. Cranston, Gregory J. Puleo, Douglas B. West, and Reza Zamani. *Revolutionaries and spies: Spy-good and Spy-bad Graphs*. Theoret. Comput. Sci. Vol. 463, 2012, pp. 35–53.
- [20] Daniel W. Cranston, Anja Pruchnewski, Zsolt Tuza, and Margit Voigt. *List-colorings of K_5 -minor-free Graphs with Special List Assignments*. J. of Graph Theory. Vol. 71(1), September 2012, pp. 18–30.
- [19] Daniel W. Cranston, Clifford Smyth, and Douglas B. West. *Revolutionaries and Spies on Trees and Unicyclic Graphs*. Journal of Combinatorics. Vol. 3(2), 2012, pp. 195–206.
- [18] Daniel W. Cranston, Nitish Korula, Tim LeSaulnier, Kevin Milans, Chris Stocker, Jennifer Vandenburg, and Douglas B. West. *Overlap Number of Graphs*. Journal of Graph Theory. Vol. 70(1), May 2012, pp. 10–28.
- [17] Daniel W. Cranston and Gexin Yu. *Linear Choosability of Sparse Graphs*. Discrete Math. Vol. 311, no. 17, 6 September 2011, pp. 1910–1917.
- [16] Daniel W. Cranston, Seog-Jin Kim, and Gexin Yu. *Injective Colorings of Graphs with Low Average Degree*. Algorithmica. Vol. 60(3), July 2011, pp. 553–568.

- [15] Daniel W. Cranston, Seog-Jin Kim, and Gexin Yu. *Injective Colorings of Sparse Graphs*. Discrete Math. Vol. 310, no. 21, 6 November 2010, pp. 2965–2973.
- [14] Yuehua Bu, Daniel W. Cranston, Mickaël Montassier, André Raspaud, and Weifan Wang. *Star Coloring of Sparse Graphs*. Journal of Graph Theory. Vol. 62(3), November 2009, pp. 201–219.
- [13] Daniel W. Cranston and Gexin Yu. *A New Lower Bound on the Density of Vertex Identifying Codes for the Infinite Hexagonal Grid*. Electronic Journal of Combinatorics. Vol. 16(1), 2009, #R113.
- [12] Daniel W. Cranston. *Multigraphs with $\Delta \geq 3$ are Totally- $(2\Delta - 1)$ -Choosable*. Graphs and Combinatorics. Vol. 25(1), May 2009, pp. 35–40.
- [11] Daniel W. Cranston. *Edge-choosability and Total-choosability of Planar Graphs with no Adjacent 3-cycles*. Discussiones Mathematicae Graph Theory. Vol. 29(1), 2009, pp. 163–178.
- [10] Daniel W. Cranston and Douglas B. West. *Classes of 3-regular Graphs that are $(7,2)$ -edge-choosable*. SIAM Journal on Discrete Math. Vol. 23(2), April 2009, pp. 872–881.
- [9] Charles Mullins and Daniel W. Cranston. *Research at ASMSA Based on the DIMACS Biomath Program*. DIMACS Series in Discrete Math and Theoretical Computer Science. Vol. 76, pp. 221–226.
- [8] Michael O. Albertson, Daniel W. Cranston, and Jacob Fox. *Crossings, Colorings, and Cliques*. Electronic Journal of Combinatorics. Vol. 16(1), 2009, #R45.
- [7] Daniel W. Cranston. *Regular Bipartite Graphs are Antimagic*. J. of Graph Theory. Vol. 60, March 2009, pp. 173–182. **Among 10 “most cited” recent JGT publications (as of August 2011).**
- [6] Wenjie He, Lingmin Zhang, Daniel Cranston, Yufa Shen, Guoping Zheng. *Choice Number of Complete Multipartite Graphs $K_{4,3*2,2*(k-6),1*3}$ and $K_{3*3,2*(k-5),1*2}$* . Discrete Math. Vol. 308, no. 23, 6 December 2008, pp. 5871–5877.
- [5] Daniel W. Cranston. *Nomadic Decompositions of Complete Bidirected Graphs*. Discrete Math. Vol. 308, no. 17, 6 September 2008, pp. 3982–3985.
- [4] David P. Bunde, Erin W. Chambers, Daniel W. Cranston, Kevin Milans, and Douglas B. West. *Pebbling and Optimal Pebbling in Graphs*. Journal of Graph Theory. Vol. 57, March 2008, pp. 215–238.
- [3] Daniel W. Cranston and Seog-Jin Kim. *List-coloring the Square of a Subcubic Graph*. Journal of Graph Theory. Vol. 57, January 2008, pp. 65–87.
- [2] Daniel W. Cranston, I. Hal Sudborough, and Douglas B. West. *Short Proofs for Cut-and-Paste Sorting of Permutations*. Discrete Math. Vol. 307, no. 22, 28 October 2007, pp. 2866–2870.
- [1] Daniel W. Cranston. *Strong Edge-coloring of Graphs with Maximum Degree 4 using 22 Colors*. Discrete Math. Vol. 306, no. 21, 6 November 2006, pp. 2772–2778.

Published Problems

- [P1] Daniel W. Cranston and Douglas B. West. *Bulgarian Solitaire*. Problem 11712, Problems Section of American Mathematical Monthly, June–July 2013.

Talks

over 155 talks in 8 countries, including 5 Canadian provinces and 31 United States

Colloquium Presentations

- May 2018 *Bootstrap Percolation in Tilings with Regular Polygons*. PME Induction. Randolph-Macon.
- Sep. 2017 *Edge-coloring Graphs and Multigraphs*. Math Department Colloquium. William & Mary.
- Apr. 2015 *Planar graphs are $\frac{9}{2}$ -colorable*. Math Department Colloquium. George Mason.
- Mar. 2015 *Planar graphs are $\frac{9}{2}$ -colorable*. Math Department Colloquium. William & Mary.
- Mar. 2015 *Planar graphs are $\frac{9}{2}$ -colorable*. Applied Math and Stat. Dept. Seminar. Johns Hopkins.
- Feb. 2015 *Planar graphs are $\frac{9}{2}$ -colorable*. Math Department Colloquium. George Washington U.
- Mar. 2013 *A Proof of Bertrand’s Postulate*. Undergrad Math Club. Wesleyan U.
- Feb. 2013 *Revolutionaries and Spies*. Math Department Colloquium. Howard U.
- Mar. 2012 *Revolutionaries and Spies*. Math Department Colloquium. William & Mary.

- Oct. 2011 *A Proof of Bertrand's Postulate*. Student Colloquium Series. Louisiana State U.
 Oct. 2011 *Moore Graphs: Beauty is Rare*. Student Colloquium Series. Louisiana State U.
 Mar. 2011 *A Proof of Bertrand's Postulate*. Math Coffee. Davidson College.
 Apr. 2010 *Reducibility and Discharging: An Introduction by Example*. Colloquium. US Naval Academy.
 Apr. 2009 *Coloring and List-coloring of Graphs*. Math Department Colloquium. William & Mary.
 Apr. 2008 *Reducibility and Discharging: Introduction by Example*. CS Colloquium. Rutgers, Camden.

Selected Invited Conference and Seminar Presentations

- July 2020 *Vertex Partitions into an Independent Set and a Forest with Each Component Small*. Graphs and Optimisation Seminar (Virtual). LaBRI, France.
 Sep. 2019 *Using the Potential Method to Color Near-bipartite Graphs* (Plenary). WaterColor 2019, Waterloo Coloring Conference. U of Waterloo, Toronto.
 Sep. 2019 *Using the Potential Method to Color Near-bipartite Graphs* (Plenary). Colourings, Independence and Domination 2019. Piechowice, Poland.
 May 2019 *Circular Flows in Planar Graphs*. CanaDAM. Simon Fraser U, Vancouver.
 Mar. 2019 *Circular Flows in Planar Graphs*. (50-minute talk.) Atlanta Lecture Series in Combinatorics & Graph Theory. Georgia Tech, Atlanta.
 Mar. 2019 *Circular Flows in Planar Graphs*. AMS Sectional Meeting. Auburn U, Auburn.
 Oct. 2018 *Coloring Squares of Planar Graphs*. AMS Sectional Meeting. U of Michigan, Ann Arbor.
 Jun. 2018 *Acyclic Edge-coloring of Planar Graphs: Δ Colors Suffice when Δ is Large*. Graph Coloring Minisymposium (organizer). SIAM Disc. Math 2018. Denver, Colorado.
 Apr. 2018 *Bootstrap Percolation Thresholds in Plane Tilings using Regular Polygons*. 59th MIGHTY (Midwest Graph TheorY). West Virginia University.
 Mar. 2018 *Coloring Squares of Planar Graphs*. Combinatorics Seminar. George Washington University.
 Jan. 2018 *Acyclic Edge-coloring Planar Graphs*. Int'l Workshop on Graph Theory. Seoul, S. Korea.
 Oct. 2017 *Edge-coloring of Graphs and Multigraphs*. DiscMath Seminar. Illinois State U.
 Sep. 2017 *Acyclic Edge-coloring Planar Graphs*. Graph Theory Seminar. William & Mary.
 May 2017 *Edge-coloring Multigraphs*. 29th Cumberland Conference, Vanderbilt. (A principal speaker.)
 Apr. 2017 *List-coloring Claw-free Graphs with $\Delta - 1$ Colors*. AMS Sectional Meeting. IU, Bloomington.
 Oct. 2016 *Edge-coloring Multigraphs*. Graph Coloring Workshop. BIRS, Banff, Alberta.
 Sep. 2016 *Edge-coloring Multigraphs*. Applied Math and Stat. Dept. Seminar. Johns Hopkins.
 Jun. 2016 *Planar Graphs of Girth at least Five are Square ($\Delta + 2$)-Choosable*. Graph Coloring Minisymposium (organizer). SIAM Disc. Math 2016. Atlanta, Georgia.
 Sep. 2015 *Fractional Coloring Planar Graphs and the Plane*. Cycles and Colouring. Slovakia.
 Oct. 2014 *Painting squares with $\Delta^2 - 1$ colors*. Combinatorics Seminar. U of Rhode Island.
 Oct. 2014 *Boundedness of solutions for max-type reciprocal difference equations*. Difference Equations Seminar. U of Rhode Island.
 Jun. 2014 *Graphs with $\chi = \Delta$ have big cliques*. West Fest (honoring 60th birthday of Douglas West). Minneapolis, Minnesota.
 Jun. 2014 *Painting squares with $\Delta^2 - 1$ colors*. Graph Coloring Special Session. SIAM Disc. Math 2014. Minneapolis, Minnesota.
 Apr. 2014 *Graphs with $\chi = \Delta$ have big cliques*. Discrete Math Seminar. Arizona State U.
 Mar. 2014 *Boundedness of Solutions to Reciprocal Max-Type Difference Equations*. AMS Sectional Meeting (Special Session in Difference Equations). U of Maryland, Baltimore.
 Mar. 2014 *Graphs with $\chi = \Delta$ have big cliques*. AMS Sectional Meeting. U of Tennessee, Knoxville.
 Jan. 2014 *Graphs with $\chi = \Delta$ have big cliques*. AMS Special Session in Graph Theory (Co-organizer). Joint Meetings. Baltimore, Maryland.

- Jan. 2014 *Boundedness of Solutions to Reciprocal Max-Type Difference Equations.* AMS Special Session in Difference Equations. Joint Meetings. Baltimore, Maryland.
- Oct. 2013 *Graphs with $\chi = \Delta$ have big cliques.* Discrete Math Days of the Northeast. Wesleyan U.
- Sep. 2013 *Graphs with $\chi = \Delta$ have big cliques.* Discrete Applied Math Seminar. IL Institute of Tech.
- Sep. 2013 *Boundedness of solutions for max-type reciprocal difference equations.* Applied and Computational Math Seminar. George Mason.
- Sep. 2013 *Boundedness of solutions for max-type reciprocal difference equations.* Applied and Computational Math Seminar. VCU.
- Apr. 2013 *Coloring claw-free graphs with $\Delta - 1$ colors.* AMS Sectional Meeting. Iowa St.
- Apr. 2013 *Coloring claw-free graphs with $\Delta - 1$ colors.* East China Normal University. Shanghai, China.
- Apr. 2013 *Star coloring sparse graphs.* Zhejiang Normal University. Jinhua, China.
- Apr. 2013 *Coloring claw-free graphs with $\Delta - 1$ colors.* Zhejiang Normal University. Jinhua, China.
- Mar. 2013 *Revolutionaries and Spies on Graphs.* Applied and Computational Math. Division Seminar. National Inst. of Standards and Tech.
- Feb. 2013 *Coloring claw-free graphs with $\Delta - 1$ colors.* Discrete Math Seminar. U of Delaware.
- Feb. 2013 *Coloring claw-free graphs with $\Delta - 1$ colors.* Combinatorics, Algebra, & Geometry Seminar. George Mason U.
- Jan. 2013 *Coloring claw-free graphs with $\Delta - 1$ colors.* Discrete Math Seminar. West Virginia U.
- Jan. 2013 *Coloring claw-free graphs with $\Delta - 1$ colors.* Graph Theory Seminar. Illinois.
- Jun. 2012 *Conjectures Equivalent to the Borodin-Kostochka Conjecture that seem Weaker.* Graph Coloring Special Session (Organizer). SIAM Disc. Math 2012. Halifax, Nova Scotia.
- Feb. 2012 *Overlap Number of Graphs.* Atlanta Lecture Series in Combinatorics V. Emory.
- Oct. 2011 *Revolutionaries and Spies.* 26th Mini-conference on Discrete Math and Algorithms. Clemson.
- Oct. 2011 *Revolutionaries and Spies.* Combinatorics Seminar. Louisiana State U.
- Sep. 2011 *Linear List-coloring of Sparse Graphs.* AMS Sectional Meeting. Wake Forest.
- Sep. 2011 *List-coloring K_5 -minor-free Graphs.* Combinatorics Seminar. U of South Carolina.
- Aug. 2011 *Crossings, Colorings, and Cliques.* Crossing Numbers Workshop. BIRS, Banff, Alberta.
- June 2011 *Graph Ramsey Theory.* Research Experience for Graduate Students (REGS). Illinois.
- Apr. 2011 *Spies and Revolutionaries.* Combinatorics, Algebra, & Geometry Seminar. George Mason U.
- Mar. 2011 *Spies and Revolutionaries.* Special Session on Graph Theory. SIAM Sectional Conference. UNC-Charlotte.
- Nov. 2010 *List Coloring K_5 -minor-free Graphs.* Combinatorics Seminar. George Washington U.
- July 2010 *Maker-Breaker Games: Building a Large Chain in a Poset.* Seminar. West Virginia U.
- July 2010 *Maker-Breaker Games: Building a Large Chain in a Poset.* Research Experience for Graduate Students (REGS). Illinois.
- May 2010 *List Colorings of K_5 -minor-free Graphs with Special List Assignments.* Minisymposium on Graph Theory. AMS Sectional Meeting. New Jersey Institute of Tech.
- Apr. 2010 *Detecting a Machine Failure in a Network: Vertex Identifying Codes.* Discrete Math Seminar. U of Delaware.
- Jan. 2010 *Maker-Breaker Games: Building a Large Chain in a Poset.* SIAM Minisymposium on Graph Theory. Joint Meetings. San Francisco, California.
- Jan. 2010 *Vertex Identifying Codes.* AMS Special Session. Joint Meetings. San Francisco, California.
- Aug. 2009 *Sorting by Cut-and-Paste Moves.* Discrete Math Session. MathFest. Portland, Oregon.
- July 2009 *Injective Colorings of Sparse Graphs.* SIAM Annual Meeting. Denver, Colorado.
- May 2009 *Crossings, Colorings, and Cliques.* Graph Crossing Session. CanaDAM. U of Montreal.
- Apr. 2009 *Crossings, Colorings, and Cliques.* Combinatorics Seminar. Lafayette College.
- Mar. 2009 *Injective Colorings of Sparse Graphs.* Minisymposium on Graph Theory. AMS Sectional Meeting. Illinois.

- Jan. 2009 *Entire- $(\Delta + 4)$ -choosability of Plane Graphs with $\Delta \geq 8$.* SIAM Minisymposium on Graph Theory, I. Joint Meetings, Washington, D.C.
- Oct. 2008 *Colorings, Crossings, and Cliques.* Discrete Math Seminar. Columbia U.
- June 2008 *$(7,2)$ -edge-choosability of 3-regular Graphs.* Minisymposium on Graph Coloring. SIAM Disc. Math. U of Vermont, Burlington.
- May 2008 *How to Compute Jacobians More Efficiently.* 2008 SIAM Optimization: Minisymposium on Graph Coloring for Computation of Sparse Jacobians and Hessians. Boston, Massachusetts.
- Mar. 2008 *Discharging and Reducibility: An Introduction by Example.* Math Seminar. Montclair State.
- Mar. 2008 *Star Coloring Planar Graphs with High Girth.* Discrete Math Seminar. Princeton.
- Mar. 2008 *Discharging and Reducibility: Introduction by Example.* Discrete Math Seminar. Delaware.
- Feb. 2008 *Regular Bipartite Graphs are Antimagic.* Combinatorics Seminar. CUNY.
- Nov. 2007 *Discharging and Reducibility: An Introduction by Example.* Workshop on Algorithms, Combinatorics, and Geometry. U of North Texas.
- Oct. 2007 *List-coloring the Square of a Subcubic Graph.* AMS Regional Meeting. Depaul U.
- Mar. 2007 *List-coloring the Square of a Subcubic Graph.* Seminar. Bell Labs, Murray Hill, N.J.
- Mar. 2007 *List-coloring the Square of a Subcubic Graph.* Seminar. DIMACS Center, Rutgers.
- Mar. 2007 *Coloring and List-coloring of Graphs.* Discrete Math Seminar. Iowa State U.
- Oct. 2006 *List-coloring the Square of a Subcubic Graph.* Graph Theory Seminar. Georgia Tech.
- Oct. 2006 *List-coloring the Square of a Subcubic Graph.* DiscMath Seminar. Illinois State.
- Mar. 2006 *List Edge-colorability of Planar Graphs with no Kites.* DiscMath Seminar. Illinois State.

Contributed Conference Presentations

- Sep. 2010 *List Coloring K_5 -minor-free Graphs.* Cycles and Colourings. High Tatras, Slovakia.
- June 2010 *List Coloring K_5 -minor-free Graphs.* SIAM Conference on Discrete Math. Austin, Texas.
- May 2010 *List Coloring K_5 -minor-free Graphs.* 23rd Cumberland Conference. U of Mississippi.
- Aug. 2008 *$(7,2)$ -edge-choosability of 3-regular Graphs.* Fete of Comb. and CS. Keszthely, Hungary.
- July 2008 *$(7,2)$ -edge-choosability of 3-regular Graphs.* Midsummer Workshop on Combinatorics. Charles University, Prague, Czech Republic.
- May 2008 *$(7,2)$ -edge-choosability of 3-regular Graphs.* 21st Cumberland Conference. Vanderbilt.
- May 2007 *Regular Bipartite Graphs are Antimagic.* 20th Cumberland Conference. Emory.
- May 2007 *Regular Bipartite Graphs are Antimagic.* 44th MIGHTY. Wright State U.
- Dec. 2006 *List-coloring the Square of a Subcubic Graph.* Midwest Theory Day. Purdue University.
- Nov. 2006 *List-coloring the Square of a Subcubic Graph.* 43rd MIGHTY. Ind.-Purdue U. at Fort Wayne.
- June 2006 *Edge-choosability of Planar Graphs with no Two Adjacent Triangles.* SIAM Conference on Discrete Mathematics. U of Victoria, British Columbia.
- Apr. 2006 *Edge-choosability of Planar Graphs with no Two Adjacent Triangles.* DIMACS/DIMATIA/Renyi Combinatorial Challenges Meeting. DIMACS, Rutgers.
- Dec. 2005 *Edge-choosability of Planar Graphs without Kites.* Theory Day. U of Wisconsin at Milwaukee.
- May 2005 *Strong Edge-coloring Graphs with $\Delta = 4$ using 22 Colors.* Graph Theory with Altitude (in honor of Joan Hutchinson's 60th Birthday). U of Colorado at Denver.
- May 2005 *Strong Edge-coloring Graphs with $\Delta = 4$ using 22 Colors.* Midwest Theory Day. UIUC.
- Dec. 2004 *Sorting Permutations by Shifts, Flips, and Shift-Flips.* Midwest Theory Day. Depaul.

Teaching Experience (at VCU unless noted)

<i>Spr. 2020</i>	Linear Algebra (two sections)
<i>Fall 2019</i>	Graph Theory I, Linear Algebra
<i>Spr. 2019</i>	Combinatorics, Linear Algebra
<i>Fall 2018</i>	Graph Coloring, Linear Algebra
<i>Spr. 2018</i>	Linear Algebra, Introduction to Proof
<i>Fall 2017</i>	Graduate Combinatorics, Multivariable Calculus
<i>Spr. 2016</i>	Graph Theory II, Multivariable Calculus
<i>Fall 2015</i>	Linear Algebra (two sections)
<i>Spr. 2015</i>	Combinatorics, Multivariable Calculus, Research Seminar
<i>Fall 2014</i>	Numerical Analysis I, Multivariable Calculus
<i>Spr. 2014</i>	Graph Coloring, Multivariable Calculus, Research Seminar
<i>Fall 2013</i>	Network Models and Graph Theory, Multivariable Calculus
<i>Fall 2012</i>	Linear Algebra, Calculus I (two sections)
<i>Spr. 2012</i>	Linear Algebra, Mathematical Expositions, Graph Theory II (co-taught)
<i>Fall 2011</i>	Linear Algebra, Mathematical Expositions
<i>Spr. 2011</i>	Graph Theory II, Mathematical Expositions
<i>Fall 2010</i>	Linear Algebra, Math Expositions, Graph Theory (co-taught), Problem Seminar (co-taught)
<i>Spr. 2010</i>	Linear Algebra, Discrete Mathematics
<i>Fall 2009</i>	Linear Algebra, Modern Mathematics, Graph Theory (co-taught)
<i>Spr. 2008</i>	Elementary Combinatorics and Probability (Rutgers)
<i>Fall 2000</i>	Calculus I (UIUC)
<i>Fall 1999</i>	Finite Mathematics (UIUC)
<i>Various</i>	Mentored 7 VCU students for research seminar and 5 for independent studies

Professional Service

- Refereed over 100 articles for: *American Mathematical Monthly*, *Australasian Journal of Combinatorics*, *Applied Math Letters*, *Ars Combinatoria*, *Ars Mathematica Contemporanea*, *Central European Journal of Mathematics*, *Combinatorica*, *Combinatorics*, *Probability & Computing*, *Contributions to Discrete Math*, *Discrete Applied Mathematics*, *Discrete Mathematics*, *Discrete Mathematics, Algorithms, and Applications*, *Discussiones Mathematicae Graph Theory*, *Electronic Journal of Combinatorics*, *European Journal of Combinatorics*, *Graph Theory Notes of New York*, *Graphs and Combinatorics*, *Information Processing Letters*, *Information Sciences*, *Journal of Combinatorial Math and Combinatorial Computing*, *Journal of Combinatorial Optimization*, *Journal of Combinatorial Theory B*, *Journal of Combinatorics*, *Journal of Graph Theory*, *Notices of the AMS*, *SIAM Journal on Discrete Math*, *Theory and Applications of Graphs*, *Utilitas Mathematica*, and a book.
- Reviewed 14 articles (Math Reviews); Reviewed 3 grant proposals (NSA); Panel Reviewer (NSF), 2015.
- Reviewed conference articles for: STOC 2014, WG 2014, EuroComb 2015
- Masters students: Bobby Jaeger, May 2015; Coleman Hall, May 2011.
- External Reviewer for Ph.D. Dissertation: Landon Rabern, Arizona State, April 2013.
- Co-organized VCU Discrete Math Seminar. 2010–2018; Organized 2019–present.
- Organized Special Sessions on Graph Coloring at Siam Discrete Math: Denver, Colorado, June 2018; Atlanta, Georgia, 2016; Halifax, Nova Scotia, 2012.
- Co-organized Sessions on Graph Theory: Joint Meetings, Baltimore, MD, Jan. 2014; AMS Sectional, Washington, D.C., Mar. 2012; AMS Sectional, Richmond, VA, Nov. 2010.
- Volunteered 14 hours as teaching assistant for *Kids on Campus*. June 2014.
- Mentored or co-mentored 6 undergraduate students at the Rutgers REU. Summer 2008.
- Coach of math team at University High School. January 2004 to May 2005.