

Joshua D. Laison

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Research Interests

Graph theory, discrete and computational geometry, and combinatorics, including geometric representations of graphs and ordered sets, and algorithmic and algebraic graph theory.

Education

Ph.D. Mathematics, June 2001, Dartmouth College, Hanover, NH

Advisor: Kenneth P. Bogart

Dissertation: Tube Representations of Ordered Sets

A.M. Mathematics, June 1999, Dartmouth College, Hanover, NH

B.A. Mathematics, June 1996, Oberlin College, Oberlin, OH

Honors in Mathematics

Minors in Computer Science and English

Teaching Experience

Assistant Professor, Willamette University, 2007-present

College Colloquium Living Mathematics: The Greatest Discoveries of the Last 30 Years; Contemporary Mathematics; Statistics (2); Calculus 1 (2); Foundations of Advanced Mathematics (3); Linear Algebra; Geometry; Graph Theory

Research with undergraduate students:

- Prime distance graphs with Andrea Walker and Professor Colin Starr
- Obstacle numbers of graphs with Hannah Alpert and Christina Koch (NSF Research Experience with Undergraduates summer program)

Visiting Assistant Professor, St. Olaf College, 2006-2007

Principles of Statistics (2); Calculus 2; Multivariable Calculus; Abstract Algebra 1 (2)

Research with undergraduate students:

- Visibility graphs with Karin Gilje
- Partitions of 0-1 matrices with William Voorhees and Professors Kristina Garrett and Olaf Hall-Holt

- Non-greedy and semi-greedy graph pebbling with Nathan Clement, Bjorn Paulson, and Thomas McConville

Visiting Assistant Professor, Colorado College, 2002-2006

Probability and Statistics (6); Mathematical Explorations (2); Calculus 1 (3); Calculus 2 (3); Calculus 3; Linear Algebra (3); Abstract Algebra 1; Number Theory; Geometry; Graph Theory; Combinatorics; Research in Mathematics; Topics in Graph Theory; Knot Theory; Independent study in Advanced Linear Algebra; Independent Study in Algebraic Topology

Research with undergraduate students:

- Line segment contact graphs with Jacob Siedlik
- Bar k -visibility graphs with Bernadette Hoatam
- Critical graph pebbling with Courtney Gibbons and Erick Paul
- Subspace intersection graphs with Yulan Qing
- Ringel's conjecture with Courtney Gibbons, Yulan Qing, and Professor John Watkins
- Obstacle numbers of graphs with Arden Brookstein, Richard Marcus, and Andrew Ravits (as part of the Research in Mathematics course)
- Minimal lattice shapes with Patrick Bergeron, Peter Finn, and Eason Jostad (as part of the Research in Mathematics course)
- Critical sets in 0-1 matrices with Tra Ho and Sarah Switzer (as part of the Research in Mathematics course)
- Fixing numbers of graphs and groups with Courtney Gibbons (Funded through a summer faculty-student collaborative research grant and senior distinction project)
- Lattice point visibility with Michelle Schick (senior distinction project)
- Dual unfoldings of polyhedra with Lucian Wilson and Professor John Watkins (senior distinction project)

Visiting Assistant Professor, Kenyon College, 2001-2002

Pre-calculus; Calculus A (2); Discrete Mathematics and Combinatorics; Topics in Contemporary Mathematics

Research with undergraduate students:

- Graph coloring with Stephanie TerMeer (senior thesis project)

Lecturer, Dartmouth College, 1998-2001

Calculus with Algebra (2); Independent Study in Graph Theory; The World According to Mathematics

Teaching Assistant, Dartmouth College, 1996-1998

Introduction to Calculus; Calculus of One and Several Variables

Teaching Assistant, The Center for Talented Youth, Johns Hopkins University, 1996

Inductive Reasoning

Coursework on Teaching

- Project NExT Workshop on Teaching an Introductory Statistics Course, MathFest (National Summer Meetings of the Mathematical Association of America), Madison WI, July 2008
- College Colloquium Workshop on Teaching Writing, Willamette University, May 2008
- MAA Minicourse on Getting Students Involved in Undergraduate Research, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, Atlanta GA, January 2005
- NSF Workshop on Teaching Introductory Combinatorics by Guided Discovery, Dartmouth College, August 2003
- Project NExT Workshop on Teaching an Introductory Statistics Course, MathFest (National Summer Meetings of the Mathematical Association of America), Boulder CO, July 2003
- Graduate Teaching Seminar, Dartmouth College, Summer 1998
- Mathematics Education, Oberlin College, Spring 1995
- Adopt a Classroom Workshop, Oberlin College, Spring 1995
- Practicum in Tutoring, Oberlin College, Fall 1994

Publications

1. **Seeing Dots: Explorations on the Visibility of Lattice Points**
with Michelle Schick, *Mathematics Magazine* (2007) 274–282
2. **Bar k -Visibility Graphs**
with Alice Dean, William Evans, Ellen Gethner, Mohammad A. Safari, and William T. Trotter, *Journal of Graph Algorithms and Applications* **11** (2007) no. 1, 45-59.
3. **Bar k -Visibility Graphs: Bounds on the Number of Edges, Chromatic Number, and Thickness**
with Alice Dean, William Evans, Ellen Gethner, Mohammad A. Safari, and William T. Trotter, in Patrick Healy and Nikola S. Nikolov, editors, *Graph Drawing*, volume 3843 of *Lecture Notes in Computer Science*, Springer-Verlag, Berlin, 2006. Revised papers from the 13th International Symposium on Graph Drawing (GD2005), Limerick, Ireland, September 2005.
4. **Tube Representations of Ordered Sets**
Order **21** (2004), no. 3, 209-232.
5. **Free Triangle Orders**
Order **20** (2003), no. 2, 99-108. (cover article)
6. **Comparability Invariance Results for Tolerance Orders**
with Kenneth P. Bogart, Garth Isaak, and Ann N. Trenk, *Order* **18** (2001), no. 3, 281-294.
7. **Unit and Proper Tube Orders**
to appear in *Order*
8. **Fixing Numbers of Graphs and Groups**
with Courtney R. Gibbons, to appear in the *Electronic Journal of Combinatorics*

9. **Dual Unfoldings of Polyhedra**
with John J. Watkins and Lucian Wilson, to appear in *Congressus Numerantium*
10. **Triangle, Parallelogram, and Trapezoid Orders**
with Kenneth P. Bogart and Stephen P. Ryan, submitted to *Order*, August 2008
11. **Subspace Intersection Graphs**
with Yulan Qing, submitted to *Discrete Mathematics*, August 2006
12. **Critical Pebbling Numbers of Graphs**
with Courtney R. Gibbons and Erick J. Paul, submitted to *Discrete Mathematics*, September 2004
13. **Fixing Numbers of Kneser Graphs**
with Karen L. Collins, in preparation
14. **More Directions in Visibility Graphs**
with Ellen Gethner, in preparation
15. **Ramsey Numbers of Unit Disc Graphs**, with Ellen Gethner and Alice Dean, in preparation
16. **0-1 Latin Square Graphs**, with David Neel, in preparation
17. **Circulant Prime Distance Graphs**, with Colin Starr and Andrea Walker, in preparation
18. **Obstacle Numbers of Graphs**, with Hannah Alpert and Christina Koch, in preparation

Expository Articles

19. **My Experiences Researching With Undergraduate Mathematicians: The Collaboration Model**
in Joseph A. Gallian, editor, *Proceedings of the Conference on Promoting Undergraduate Research in Mathematics*, American Mathematical Society, 2007

Service to Willamette

- Faculty colloquium committee, 2008–2009
- Faculty TGIF committee, chair 2008–2009, member 2007–2008
- Panelist, Kaneko Conversation on the Transformative Classroom: Challenges and Joys of an Inclusive Pedagogy, March 2008

Professional Activities

Grants and Awards

- Mentor for the National Science Foundation funded Willamette Valley Research Experience for Undergraduates and Teachers Consortium for Research in Mathematics, Summer 2008

- Atkinson Research Grant, Willamette University College of Liberal Arts, Summer 2008
- Professional research expense award to work with David Neel, Willamette University College of Liberal Arts, March 2008
- Professional research expense award to work with Ellen Gethner, Willamette University College of Liberal Arts, February 2008
- Grant from the Natural Sciences Division, Colorado College, to attend the 13th International Symposium on Graph Drawing, Limerick, Ireland, September 2005
- Van Vleck Visiting Scholar, Wesleyan University Mathematics and Computer Science Department, November 2005
- Colorado College Faculty-Student Collaborative Research Grant with Courtney Gibbons, summer 2005
- Grant from the Dean of the College, Colorado College, to fund Graph Theory class trip to the 36th International Southeastern Conference on Graph Theory, Combinatorics, and Computing, Florida Atlantic University, March 2005
- Grant from the Natural Sciences Division, Colorado College, to attend the 35th International Southeastern Conference on Graph Theory, Combinatorics, and Computing, Florida Atlantic University, March 2004
- Third place, American Mathematical Society T-shirt Caption Contest, January 2006
- Funded participant, AMS-NSA Conference on Promoting Undergraduate Research in Mathematics, September 2006
- Funded participant, 6th and 8th Annual Legacy of R. L. Moore Conferences, March 2003 and March 2005
- Funded participant, NSF Workshop on Teaching Introductory Combinatorics by Guided Discovery, Dartmouth College, August 2003
- Funded participant, AMS-IMS-SIAM Summer Research Conference on Graph Coloring and Symmetry, Mount Holyoke College, July 2002
- Project NExT (New Experiences in Teaching) Fellow, 2002-2003
- Graduate Fellowship, Dartmouth College, 1996-2001
- Sigma Xi National Honor Society
full membership, Dartmouth College, 2001
associate membership, Oberlin College, 1996

Sessions, Panels, Conferences, and Seminars

- Co-organizer, Project NExT Panel on Finding Your n th Job for $n > 1$, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, Washington D.C., [January 2009]
- Organizer and Chair, Invited Speaker Session on Graph Theory with Connections to Geometry and Topology, MathFest (National Summer Meetings of the Mathematical Association of America), Madison, WI, July 2008
- Co-organizer, Young Mathematicians' Network Town Meeting, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, San Diego, CA, January 2008

- Session Chair, AMS Session on Combinatorics III, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, San Diego, CA, January 2008
- Participant, Mathematics Faculty Seminar on Elliptic Curves, Willamette University, Fall 2007
- Presenter, Course Preview Night, Mathematics Department, Willamette University, November 2007
- Panelist, Graduate School Information Night, Mathematics Department, Willamette University, October 2007
- Co-organizer, Project NExT Panel on Publishing Undergraduate Research and Expository Articles, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, New Orleans, LA, January 2007
- Co-organizer, Young Mathematicians' Network Panel on Career Opportunities for Mathematics Majors, MathFest (National Summer Meetings of the Mathematical Association of America), Knoxville, TN, August 2006
- Co-organizer and Presenter, Special Session in Memory of Kenneth P. Bogart, SIAM Conference on Discrete Mathematics, Victoria, Canada, June 2006
- Co-organizer and Presenter, SIAM Special Session on Representations of Graphs, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, San Antonio, TX, January 2006
- Co-organizer, MAA Panel on Professional Development Opportunities, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, San Antonio, TX, January 2006
- Panelist, Project NExT Panel on Negotiating with the Administration, MathFest (National Summer Meetings of the Mathematical Association of America), Albuquerque, NM, August 2006
- Co-organizer and Presenter, Project NExT Swap Session on Calculus Labs and Projects, MathFest (National Summer Meetings of the Mathematical Association of America), University of Colorado Boulder, July 2003
- Faculty mentor, Third Annual Young Mathematicians Conference, Columbus, OH, August 2005
- Session chair, Third Annual Young Mathematicians Conference, Columbus, OH, August 2005
- Faculty advisor, Pew Mid-states Science and Mathematics Consortium Undergraduate Research Symposium, Washington University, November 2004
- Co-Director, Pikes Peak Regional Undergraduate Mathematics Conference, Colorado College, February 2005
- Co-Director, Rocky Mountain Discrete Math Days, Colorado College, August 2004
- Co-Director, Rocky Mountain Section Meeting of the MAA, Colorado College, April 2004
- Organizer, Mathematics Department Colloquium Series, Colorado College, 2002-2005
- Participant, Mathematics, Statistics, and Computer Science Department Stat Chat Meetings, St. Olaf College, 2006-2007

- Participant, Mathematics Faculty Seminar on Bioinformatics and String Matching Algorithms, Colorado College, 2005-2006
- Participant, Mathematics Faculty Seminar on Elliptic Curves, Colorado College, 2004-2005
- Organizer, Mathematics Faculty Seminar on Polytopes, Colorado College, 2003-2004
- Participant, Mathematics Faculty Seminar on Kolmogorov Complexity, Colorado College, 2002-2003

Written Contributions

- Co-author, Summary of the Discussion Group on Helping Undergraduate Students into Graduate School, with Murli M. Gupta, in Joseph A. Gallian, editor, *Proceedings of the Conference on Promoting Undergraduate Research in Mathematics*, 2007
- Contributor, Instructor Resources for *The Heart of Mathematics, 2E*, by Edward B. Burger and Michael Starbird, published fall 2004
- Reviewer, Mathematical Reviews database, 2004–present
 - Martin Charles Golumbic, Marina Lipshteyn, Michal Stern, The k -edge intersection graphs of paths in a tree, *Discrete Appl. Math.*, 156(4):451–461, 2008.
 - S. M. Almeida, C. P. de Mello, A. Gomide, On the representation of a PI-graph, *TEMA Tend. Mat. Apl. Comput.* 8(1):1–10, 2007.
 - János Pach, Géza Tóth. How many ways can one draw a graph? *Combinatorica* 26(5):559–576, 2006.
 - Stefan Felsner, Ferran Hurtado, Marc Noy, Ileana Streinu. Hamiltonicity and colorings of arrangement graphs. *Discrete Appl. Math.*, 154(17):2470–2483, 2006.
 - Jing Huang. Representation characterizations of chordal bipartite graphs. *J. Combin. Theory Ser. B*, 96(5):673–683, 2006.
 - Prosenjit Bose, Ferran Hurtado, Eduardo Rivera-Campo, David R. Wood. Partitions of complete geometric graphs into plane trees. *Comput. Geom.*, 34:116–125, 2006.
 - Branko Grünbaum. 3-connected configurations (n_3) with no Hamiltonian circuit. *Bull. Inst. Combin. Appl.*, 46:15–26, 2006.
 - Criel Merino, Gelasio Salazar, and Jorge Urrutia. On the intersection number of matchings and minimum weight perfect matchings of multicolored point sets. *Graphs Combin.*, 21(3):333–341, 2005.
 - Wei Ho. The m -step, same-step, and any step competition graphs. *Discrete Appl. Math.*, 152(1–3):159–175, 2005.
 - Cesim Erten and Stephen G. Kobourov, Simultaneous embedding of a planar graph and its dual on the grid, *Theory Comput. Syst.* 38(3):313–327, 2005.
 - Robert E. Jamison and Henry Martyn Mulder, Constant tolerance intersection graphs of subtrees of a tree, *Discrete Math.* 290(1):27–46, 2005.
 - Alexandr Kostochka, Coloring intersection graphs of geometric figures with a given clique number, in *Towards a theory of geometric graphs*, 127–138, Contemp. Math., 342, Amer. Math. Soc., Providence, RI, 2004

Problem Solving

- Co-organizer and writer, Oregon Invitational Mathematics Tournament, Willamette University, May 2008
- Faculty advisor, Mathematics Contest in Modeling, Willamette University, February 2008
- Editor, Problem of the Week, Willamette University Mathematics Department, 2007-present
- Organizer, Fifteenth Annual Konhauser Problemfest, St. Olaf College, February 2007
- Faculty advisor, William Lowell Putnam Mathematical Competition, St. Olaf College, December 2006
- Organizer and Writer, Carlson Problem Solving Contest, St. Olaf College, October 2006
- Director, Problem Solving Group, St. Olaf College Mathematics Department, 2006-2007
- Editor, Problem of the Week, St. Olaf College Mathematics Department, 2006-2007
- Writer, Ohio Five Colleges Mathematics Competition, January 2006
- Co-organizer and writer, Thomas H. Rawles Mathematics Competition, Colorado College Mathematics Department, 2003-2006
- Co-organizer and writer, Problem of the Month, Colorado College Mathematics Department, 2003-2006
- Organizer and writer, Problem of the Week, Kenyon College Mathematics Department, 2001-2002
- Participant, Putnam Examination Study Group, Kenyon College Mathematics Department, Fall 2001

Professional Organizations

- Founding member, Pi Mu Epsilon, Willamette University Chapter
- American Mathematical Society
- Mathematical Association of America
- Editorial Board, Young Mathematicians' Network

Other

- Secondary reviewer, Technically Speaking National Science Foundation Course, Curriculum and Laboratory Improvement grant, Spring 2008
- Participant, AMS Minicourse on the History of Combinatorics, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, San Diego, CA, January 2008
- Mentor, Employment Center Applicant Resumé Help Desk, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, San Diego, CA, January 2008
- Reviewer, Young Mathematicians Conference, August 2007
- Reader, College Board Advanced Placement Calculus Exam, 2006-2008
- Advanced Placement Calculus Course Auditor, 2007-2008

- Graduate School Advisor, Colorado College Mathematics Department, 2003-2006
- Organizer, Mathematics Department Game Night, Willamette University, 2007-present
- Organizer, Mathematics, Statistics, and Computer Science Department Game Night, St. Olaf College, 2006-2007
- Organizer, Mathematics Department Game Night, Colorado College, 2004-2006
- Judge, MAA Undergraduate Poster Session, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, 2003-2005
- Member, Calculus Focus Group, Key College Press, MathFest (National Summer Meetings of the Mathematical Association of America), Providence, RI, August 2004
- Member, Calculus Focus Group, W.H. Freeman Publishers, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, Phoenix, AZ, January 2004
- Member, Calculus Text Evaluation Committee, Colorado College Mathematics Department, 2002-2003
- Member, Calculus Text Evaluation Committee, Kenyon College Mathematics Department, 2001-2002
- Director, Mathematica Technical Support, Dartmouth College Mathematics Department, Fall 1997
- Chair, Mathematics Department Tea Committee, Dartmouth College, 1997-1998

Presentations

- **Symmetry Breaking in Graphs**

1. Willamette Valley REU-RET, Willamette University, August 2008

- **Pebbling a Graph**

2. Mathematics Department Colloquium, University of Portland, April 2008
3. Faculty Colloquium, Willamette University, September 2007
4. Invited Speaker, Math Club, Wesleyan University, Middletown, CT, November 2005
5. Invited Speaker, MathPath Summer Program for gifted middle school students, Colorado College, July 2005
6. Mathematics Department Colloquium, Colorado College, February 2003
7. Mathematics Department Colloquium, Kenyon College, September 2001
8. Invited speaker, Ohio Five Colleges Speakers Circuit, Oberlin College, November 2001

- **Dual Unfoldings of Polyhedra**

9. 39th International Southeastern Conference on Graph Theory, Combinatorics, and Computing, Florida Atlantic University, March 2008

- **My Experiences Researching With Undergraduate Mathematicians: The Collaboration Model**

10. MAA Contributed Paper Session on Research and Professional Development Activities for Math Majors I, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, San Diego, CA, January 2008
- **The Weierstrass \wp -function**
 11. Mathematics Department Elliptic Curves Seminar, Willamette University, November 2007 (2 talks)
- **Critical Pebbling Numbers of Graphs**
 12. AMS Contributed Paper Session on Combinatorics, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, San Diego, CA, January 2008
 13. Mathematics Department Colloquium, Colorado College, September 2004
- **Count on the Platonic Solids**
 14. Mathematics Department Colloquium, Willamette University, October 2007
- **Classification of Subspace Intersection Graphs**
 15. Project NExT/Young Mathematician's Network Poster Session, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, New Orleans, LA, January 2007
- **Fixing Numbers of Graphs**
 16. Mathematics, Statistics, and Computer Science Department Research Seminar, St. Olaf College, November 2006 (2 talks)
 17. Summer Science Research Group Meeting, Colorado College, July 2005
- **My Favorite Intersection Graphs**
 18. Mathematics, Statistics, and Computer Science Department Colloquium, St. Olaf College, October 2006
- **Generalizations of Bar Visibility Graphs**
 19. Invited Speaker, Special Session in Memory of Kenneth P. Bogart, Society of Industrial and Applied Mathematics Conference on Discrete Mathematics, Victoria, Canada, June 2006
- **Bar k -Visibility Graphs**
 20. Invited Speaker, 13th International Symposium on Graph Drawing, Limerick, Ireland, September 2005
 21. Invited speaker, Graph Theory with Altitude: Conference in Honor of Joan P. Hutchinson on the Occasion of her 60th Birthday, University of Colorado at Denver, May 2005
 22. Project NExT/Young Mathematician's Network Poster Session, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, Atlanta, GA, January 2005
 23. Rocky Mountain Discrete Math Days, Colorado College, August 2004

24. Invited speaker, Special Session on Representations of Graphs, 35th International South-eastern Conference on Graph Theory, Combinatorics, and Computing, Florida Atlantic University, March 2004
- **05C62: The Exciting World of Geometric Graph Representations**
 25. Invited Speaker, MathPath Summer Program for gifted middle school students, Colorado College, July 2005
 26. Mathematics Department Colloquium, Colorado College, January 2005
 - **Incorporating Guided Discovery**
 27. Invited speaker, 8th Annual Legacy of R.L. Moore Conference, Austin, TX, April 2005
 - **Problems of Visibility**
 28. Invited speaker, Special Topics in Computational and Combinatorial Geometry seminar meeting, University of Colorado at Denver, September 2004
 - **Tube Graphs and Tube Orders**
 29. Rocky Mountain Discrete Math Days, University of Colorado at Denver, August 2003
 30. Invited Speaker, Discrete Math Seminar, University of Colorado at Denver, April 2003
 31. Invited speaker, DIMACS Connect Institute, Center for Discrete Mathematics and Theoretical Computer Science, Rutgers University, Piscataway, NJ, August 2001
 - **A Few Strange Things About Polytopes**
 32. Mathematics Department, Colorado College, September 2003
 - **Using LaTeX: Making Any Mathematical Writing Look Good**
 33. Abstract Algebra I course meeting, St. Olaf College, March 2007
 34. Abstract Algebra I course meeting, St. Olaf College, September 2006
 35. Research in Mathematics course meeting, Colorado College, March 2006
 36. Number Theory course meeting, Colorado College, April 2004
 37. Mathematics Department Colloquium, Colorado College, March 2003
 - **Circling the Desks: A Weekly Discussion in a Liberal Arts Mathematics Course**
 38. MAA Contributed Paper Session on Getting Students to Discuss and to Write About Mathematics, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, Baltimore, MD, January 2003
 - **Getting the Biggest Piece: An Introduction to Cake-Cutting Algorithms**
 39. Explorations in Mathematics course meeting, Colorado College, December 2005
 40. Mathematics Department Colloquium, Colorado College, September 2002
 - **Unit and Proper Tube Graphs and Orders**
 41. AMS Contributed Paper Session on Combinatorics and Graph Theory, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, San Diego, CA, January 2002

- **An Introduction to Network Flows**

42. Graduate Student Seminar, Dartmouth College, May 2001

- **Geometric Representations of Ordered Sets**

43. Invited speaker, Combinatorists of New England, Smith College, February 2001

44. AMS Contributed Paper Session on Combinatorics, National Joint Meetings of the American Mathematical Society and the Mathematical Association of America, New Orleans, LA, January 2001

45. Invited Speaker, Combinatorics Seminar, University of Vermont, November 2000

46. Graduate Student Seminar, Dartmouth College, November 2000

- **Free Triangle Orders**

47. 31st International Southeastern Conference on Graph Theory, Combinatorics, and Computing, Florida Atlantic University, March 2000

- **Comparability Invariance of Ordered Sets**

48. Combinatorics Seminar, Dartmouth College, October 1999

- **Comparability Graphs**

49. Combinatorics Seminar, Dartmouth College, March 1999

- **Keller's Conjecture: From 1930 Until the End of Time**

50. Graduate Student Seminar, Dartmouth College, February 1999

- **The Structure and Spectrum of Graphs: The Automorphism Group and Beyond**

51. Honors Presentation, Oberlin College, May 1996