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University of California Santa Barbara [www.math.ucsb.edu/~jon.mccammond/](http://www.math.ucsb.edu/~jon.mccammond/)  
Santa Barbara CA 93106
- RESEARCH INTERESTS Geometric group theory, discrete geometry and combinatorics, exceptional mathematics
- EDUCATION B.A. Mathematics, Bethel College, North Newton, Kansas, 1988  
B.S. Physics, Bethel College, North Newton, Kansas, 1988  
B.A. German, Bethel College, North Newton, Kansas, 1988  
Ph.D. Mathematics, University of California, Berkeley, 1991
- DISSERTATION Title: “The word problem for Burnside semigroups: a positive solution for  $a \geq 6$ ”  
Committee members: John Rhodes (chair), John Stallings, Latif Zadeh
- PROFESSIONAL EMPLOYMENT Instructor, Chabot College, Hayward, California, 1991-1997  
Visiting Assistant Professor, Texas A&M University, 1997-1999  
Assistant Professor, Texas A&M University, 1999-2002  
Assistant Professor, UC Santa Barbara, 2002-2004  
Associate Professor, UC Santa Barbara, 2004-2006  
Full Professor, UC Santa Barbara, 2006-present
- VISITING POSITIONS
- Université de Bourgogne, Dijon, France, June 2005
  - Mathematical Sciences Research Institute (MSRI), Berkeley, California, Fall 2007
  - Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea, September 2011
  - Universität Bielefeld, Bielefeld, Germany, June 2015
- PUBLICATIONS
1. “The word problem for Burnside semigroups: a positive solution for  $a \geq 6$ ”, Dissertation, University of California, Berkeley, 1991.
  2. “The Solution to the Word Problem for the Relatively Free Semigroups Satisfying  $T^a = T^{a+b}$  with  $a \geq 6$ ,” *International Journal of Algebra and Computation* **1** (1991), pp. 1–32.
  3. “Gaps in Categories,” in J. Rhodes, editor, *Monoids and Semigroups with Applications*, pp. 83–85. World Scientific, Singapore, 1991.
  4. “Gaps Between Connected Finite Graphs” (with R. Baldinger), *International Journal of Algebra and Computation* **2** (1992), pp. 19–32.
  5. “Gaps in the Categories of Finite Directed and Finite Transitive Graphs” (with R. Baldinger), *International Journal of Algebra and Computation* **8** (1998), pp. 35–60.
  6. “The Burnside Groups and Small Cancellation Theory,” in C.M.Campbell et.al., editors, *Groups St Andrews 1997 in Bath, II*, vol. **261** LMS Lecture Notes Series, Cambridge University Press, 1999, pp. 538–559.

7. “Integrating Polynomials in Secant and Tangent,” *American Mathematical Monthly*, **106**, (1999), 856–859.
8. “A General Small Cancellation Theory,” *International Journal of Algebra and Computation*, **10** (2000), pp. 1–172.
9. “Three-generator Artin groups of large type are biautomatic,” (with T. Brady) *Journal of Pure and Applied Algebra*, **151** (2000), pp. 1–9.
10. “Normal forms for free aperiodic semigroups,” *International Journal of Algebra and Computation*, **11** (2001) pp.581–625.
11. “The pure symmetric automorphisms of a free group form a duality group,” (with N. Brady, J. Meier, A. Miller) *Journal of Algebra* **246** (2001) 881–896.
12. “Fans and ladders in small cancellation theory,” (with D. Wise) *Proceedings of the London Mathematical Society* **84** (2002), no. 3, 599–644.
13. “Curvature testing in 3-dimensional metric polyhedral complexes,” (with M. Elder) *Experimental Mathematics* **11** (2002), no. 1, 143–158.
14. “Rigidity of Coxeter groups and Artin groups” (with N. Brady, B. Muehlherr, and W. Neumann) *Geometriae Dedicata* **94** (2002), no. 1, 91–109.
15. “Combinatorial conditions that imply word-hyperbolicity for 3-manifolds” (with M. Elder and J. Meier) *Topology* **42** (2003), no. 6, 1241–1259.
16. “Local-to-asymptotic topology for cocompact CAT(0) complexes” (with N. Brady and J. Meier) *Topology and its Applications* **131** (2003), no. 2, 177–188.
17. “Bounding edge degrees in triangulated 3-manifolds,” (with N. Brady and J. Meier) *Proceedings of the American Mathematical Society* **132** (2004), no. 1, 291–298.
18. “The hypertree poset and the  $\ell^2$ -Betti numbers of the motion group of the trivial link,” (with J. Meier) *Mathematische Annalen* **328** (2004), no. 4, 633–652.
19. “CAT(0) is algorithmic,” (with M. Elder) *Geometriae Dedicata* **107** (2004), no. 1, 25–46.
20. “Coherence, local quasiconvexity, and the perimeter of 2-complexes,” (with D. Wise) *Geometric and Functional Analysis* **15** (2005), 859–927.
21. “Non-commutative Groebner bases for the commutator ideal,” (with S. Hermiller) *International Journal of Algebra and Computation* **16** (2006), 187–202.
22. “Noncrossing partitions in surprising locations,” *American Mathematical Monthly* **113** (2006) 598–610.
23. “The length spectrum of a compact constant curvature complex is discrete,” (with N. Brady) *Geometriae Dedicata* **119** (2006) 159–167.
24. “The integral cohomology of the group of loops” (with C. Jensen and J. Meier) *Geometry and Topology* **10** (2006), 759–784.
25. “ $h$ -vectors of generalized associahedra and noncrossing partitions” (with C. Athanasiadis, T. Brady and C. Watt) *International Mathematics Research Notices*, (2006), Article ID

69705, 1–28. (electronic)

26. “The Euler characteristic of the Whitehead automorphism group of a free product,” (with C. Jensen and J. Meier) *Transactions of the American Mathematical Society*, **359** (2007), 2577–2595.
27. “Locally quasiconvex small cancellation groups” (with D. Wise) *Transactions of the American Mathematical Society*, **360** (2008), 237–271.
28. “Order independence in asynchronous cellular automata” (with M. Macauley and H. Mortveit) *Journal of Cellular Automata* **3** (2008), 37–56.
29. “Constructing non-positively curved spaces and groups” in *Geometric and cohomological methods in group theory*, London Mathematical Society Lecture Note Series **358** (2009), 162–224.
30. “Geometric presentations for pure braid group” (with Dan Margalit), *Journal of Knot Theory and its Ramifications* **18** (2009), 1–20.
31. “Braids, posets and orthoschemes” (with T. Brady) *Algebraic and Geometric Topology* **10** (2010), 2277–2314.
32. “Windmills and extreme 2-cells” (with D. Wise) *Illinois Journal of Mathematics* **54** (2010), 69–87.
33. “Combinatorial descriptions of multi-vertex 2-complexes” *Illinois Journal of Mathematics* **54** (2010), 137–154.
34. “Dynamics groups of asynchronous cellular automata” (with M. Macauley and H. Mortveit) *Journal of Algebraic Combinatorics* **33** (2011), 11–35.
35. “Bounding reflection length in an affine Coxeter group” (with T. Kyle Petersen) *Journal of Algebraic Combinatorics* **34** (2011) 711–719.
36. “Triangles, squares and geodesics” (with Rena Levitt), *International Journal of Algebra and Computation* **22** (2012), 34 pages.
37. “Artin groups of euclidean type” (with Robert Sulway), *Mathematisches Forschungsinstitut Oberwolfach Report* **49** (2012) 2964–2966.
38. “Factoring euclidean isometries” (with N. Brady) *International Journal of Algebra and Computation* **25** (2015), 325–347.
- TO APPEAR 39. “The BNS-invariant for the pure braid groups” (with N. Koban and J. Meier), to appear in *Groups, geometry and dynamics*, (15 pages).
40. “The structure of euclidean Artin groups” to appear in the proceedings of the Durham conference (survey article) (34 pages).
41. “Braid groups and euclidean simplices” (with E. Leyton Chisholm) to appear in the Springer-INDAM proceedings of the Cortona conference, (21 pages).
42. “Dual euclidean Artin groups and the failure of the lattice property” to appear in the *Journal of Algebra*, (41 pages).

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- SUBMITTED
43. “Artin groups of euclidean type” (with R. Sulway), 57 pages.
  44. “The infinite cyclohedron and its automorphism group,” (with A. Fossas Tenas), 18 pages.
  45. “Curvature and computation” (expository), 10 pages.
  46. “The exceptional symmetry” (short note), 8 pages.
- SHORT COURSES
- “Constructing nonpositively curved spaces and groups”, 4 hour talks, LMS Durham Symposium on geometry and cohomology in group theory, Durham, England, July 2003
  - “The geometry of groups defined geometrically”, 4 hour talks, Workshop on geometric methods in group theory, Fields Institute, Ottawa, Canada, August 2006
  - “Coxeter groups and Artin groups”, 4 hour talks, Centre international de rencontres mathématiques (CIRM), Luminy, France, February 2007
  - “Coxeter groups”, 15 hour talks, Korea Advanced Institute of Science and Technology (KAIST), Daejon, South Korea, September 2011
  - “Euclidean Artin groups”, 2 hour talks, LMS–EPSRC Durham Symposium on geometric and cohomological group theory, Durham, England, August 2013
- INVITED  
RESEARCH  
PRESENTATIONS
1. “The solution of the word problem for the Burnside semigroups,” Marquette Symposium on Semigroup Theory and Its Applications, Marquette University, March 1991
  2. “General versions of small cancellation theory,” Topology Festival, Cornell University, May 1998
  3. “Extending Stallings’ algorithm to 2-complexes,” AMS-IMS-SIAM Joint Summer Research Conference on Geometric Group Theory and Computer Science, Mt. Holyoke College, July 1998
  4. “Curvature and quasiconvexity in geometric group theory, II: quasiconvexity,” Wasatch Topology Conference, Park City, Utah, August 1999
  5. “Curvature and quasiconvexity in geometric group theory, I: curvature,” Wasatch Topology Conference, Park City, Utah, August 1999
  6. “The curvature of posets associated to the braid groups,” International Conference on Geometric and Combinatorial Methods in Groups and Semigroups, Lincoln, Nebraska, May 2000
  7. “Calculating the curvature of concrete complexes,” SUNY-Albany Topology and Group Theory conference, Albany, New York, Oct 2000
  8. “Algorithmic aspects of nonpositive curvature,” CRM Groups and Low-dimensional topology conference, Montreal, Canada, July 2001
  9. “A new class of nonpositively-curved 3-manifolds,” Spring topology conference, Austin, Texas, March 2002
  10. “A geometric approach to semigroup theory,” AMS-UMI Joint meeting in Pisa, Italy, June 2002
  11. “A geometric approach to semigroup theory,” International Conference on Semigroups and Groups, Porto, Portugal, June 2002
  12. “The role of curvature in combinatorics,” Conference on topological and geometric combinatorics, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, April 2003
  13. “Finding parking when not commuting,” Workshop in Geometric Topology, Park City, Utah, June 2003
  14. “Expansions of semigroups,” International meeting on Semigroup Theory and Related

- Topics, Braga, Portugal, June 2003
15. “Noncrossing partitions for arbitrary Coxeter groups,” Institute for Advanced Studies / Park City Mathematics Institute on Geometric Combinatorics, Park City, Utah, July 2004
  16. “The integral cohomology of the group of loops and a conjecture of Brownstein and Lee,” Sixth UCB-UCSB Algebra Day, June 2005
  17. “Artin groups and polytopes” Wasatch topology conference, Park City, Utah, June 2005
  18. “Coxeter groups and Artin groups in geometric group theory,” Flavors of Groups, Banff Workshop, Banff, Canada, November 2005
  19. “Pulling apart orthogonal groups to find continuous braids,” Conference on Geometric Group Theory, Centre de recherches mathématiques, Montreal, Canada, July 2006
  20. “The Intrinsic Geometry of Groups,” *Modern Mathematics: An Introduction to 2007-08 Programs at MSRI*, SACNAS conference, Tampa, Florida, October 2006
  21. “Instability in Triangle-Square Complexes,” Topics in geometric group theory conference: CAT(0) cubical and systolic complexes, Mathematical Research and Conference Center, Bedlewo, Poland, June 2007
  22. “Instability in Triangle-Square Complexes”, Introductory conference, geometric group theory program, Mathematical Sciences Research Institute, Berkeley, California, October 2007
  23. “Points in the plane and loops in space”, Bay Area Discrete Math Day (BAD Math), Google, Inc., Mountainview, California, October 2007
  24. “Pulling apart orthogonal groups to find continuous braids”, Deux journées de théorie géométriques des groupes à Orsay, Paris, France, December 2007
  25. “Small type Coxeter groups acting on hyperbolic space”, Spring Topology and Dynamics conference, geometric group theory session, Gainesville, Florida, March 2009
  26. “Braids, posets and orthoschemes”, AMS Special session on geometric group theory, Western sectional meeting, San Francisco, California, April 2009
  27. “Braid groups and buildings”, Geometric and combinatorial methods in groups and semi-groups, Lincoln, Nebraska, May 2009
  28. “Braid groups and buildings”, Hamilton Geometry and Topology Workshop on Computational and Algorithmic Geometry, Dublin, Ireland, September 2009
  29. “Pulling apart orthogonal groups to find continuous braids”, Southern California Algebra Conference, UCLA, Los Angeles, California, December 2009
  30. “Braid groups and buildings”, New directions in geometric group theory Brisbane, Australia, December 2009
  31. “Pulling apart orthogonal groups to find continuous braids”, California Lie theory workshop, Santa Barbara, California, March 2010
  32. “Braid groups and buildings”, London Mathematical Society Workshop on Geometry, Analysis and Logic of Groups, Newcastle upon Tyne, England, April 2010
  33. “Posets and curvature”, 22nd International Conference on Formal Power Series and Algebraic Combinatorics, San Francisco, California, August 2010
  34. “Hyperbolic Coxeter groups and their finite simple cousins”, Workshop on Geometric Group Theory, Goa, India (ICM Satellite), August 2010
  35. “Hyperbolic Coxeter groups and their finite simple cousins”, *AMS Special session on topology and combinatorics*, Eastern sectional meeting, Syracuse, New York, October 2010
  36. “Factoring euclidean isometries”, AMS Special session on Geometric Group Theory and Dynamics, Western sectional meeting, Las Vegas, Nevada, April 2011
  37. “Dual euclidean Artin groups”, Geometric group theory conference, the Technion, Haifa,

Israel, June 2011

38. “Artin groups of Euclidean type”, Conference on Théorie de Garside; état de l’art et perspectives, Université de Picardie-Jules Verne, Cap Hornu, France, May 2012
39. “Artin groups of Euclidean type”, Mini-Workshop on Cohomology Rings and Fundamental Groups of Hyperplane Arrangements, Wonderful Compactifications, and Real Toric Varieties, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, October 2012
40. “The structure of euclidean Artin groups”, Geometric groups on the gulf, Pensacola, Florida, March 2014
41. “The structure of euclidean Artin groups”, Conference of configuration spaces: geometry, topology and representation theory, Cortona, Italy, September 2014

OTHER INVITED  
PRESENTATIONS

1. “The tea-kettle on the table by the stove: a talk in honor of Dr. Arnold M. Wedel,” Bethel College Fall Festival, October 1997
2. “From Differential Geometry to Word Hyperbolic Groups: A combinatorial approach to an analytic concept,” Mathematics Graduate Student Organization, Texas A&M University, October 1998
3. “Roots, ratios, and Ramanujan,” Pi Mu Epsilon, Texas University, April 2001
4. “Metric trees in topology, geometry, and group theory,” Workshop in Linear Analysis and Probability, College Station, Texas, August 2001
5. “From Differential Geometry to Word Hyperbolic Groups: A combinatorial model of an analytic concept”, Survey talk, University of California, Santa Barbara, October, 2002
6. “Non-crossing partitions in surprising locations,” Eastern Pennsylvania and Delaware Section of the MAA, November 2004
7. “Square dancing in the pure braid group,” Putnam reunion, Bethel College, Kansas, March 2005
8. “Regular polytopes are everywhere,” Graduate student colloquium, University of California, Santa Barbara, September 2006
9. “Mission Impossible: learning what cannot be done,” Sigma Xi lecture, Lafayette College, Easton, Pennsylvania, September 2006
10. “Keeping your research program active,” *Project Next panel discussion*, Joint Math Meetings, New Orleans, Louisiana, January 2007
11. “Roots, Ratios and Ramanujan,” Sigma Xi Invited Lecture, Southern Oregon University, Ashland, Oregon, May 2007
12. “Using Curvature to average trees,” Kieval Lecture Series Talks, Southern Oregon University, Ashland, Oregon, May 2007
13. “Non-crossing partitions in surprising locations,” Kieval Lecture Series Talks, Southern Oregon University, Ashland, Oregon, May 2007
14. “Roots, ratios and Ramanujan”, Southern California-Nevada sectional meeting of the American Mathematical Society, Anaheim, California, October 2007
15. “Roots, ratios and Ramanujan”, California Mathematics Council Community Colleges South, Anaheim, California, March 2008
16. “Repetition and Insight”, Inaugural Frank S. Brenneman Lecture Series, Tabor College, Hillsboro, Kansas, April 2009
17. “Symmetry and Abstraction”, Inaugural Frank S. Brenneman Lecture Series, Tabor College, Hillsboro, Kansas, April 2009
18. “Repetition and Insight: roots, ratios and Ramanujan”, Undergraduate mathematics seminar, Bowdoin College, Brunswick, Maine, May 2009

19. "Repetition and Insight: roots, ratios and Ramanujan", Undergraduate mathematics seminar, Colby College, Waterville, Maine, May 2009
20. "Regular polytopes and Coxeter groups", REU Colloquium, University of California Santa Barbara, Santa Barbara, California, June 2011
21. "Repetition and Insight", REU Colloquium, University of California Santa Barbara, Santa Barbara, California, June 2012
22. "The geometry of Coxeter groups and Artin groups", *Geometric groups on the gulf*, Pensacola, Florida, March 2014
23. "Symmetry and abstraction", UCSB Spring Insight, University of California Santa Barbara, Santa Barbara, California, April 2014
24. "Repetition and Insight", Honor's week speaker, Northern Arizona University, Flagstaff, Arizona, April 2015

CONFERENCE  
PRESENTATIONS

1. "A general small cancellation theory approach to the Burnside groups," SUNY-Albany Topology and Group Theory Conference, Albany, October 1996
2. "Torus knots and Artin groups of large type," London Sussex Southampton Topology Conference and Geometric Group Theory Workshop, University of Southampton, July 1997
3. "Small cancellation theory and the Burnside groups," Groups St. Andrews 1997 in Bath, University of Bath, August 1997
4. "Torus knots and Artin groups of large type," SUNY-Albany Topology and Group Theory Conference, Albany, New York, October 1997
5. "Coherence of groups and the perimeter of 2-complexes," International conference on algorithmic problems in groups and semigroups, University of Nebraska-Lincoln, May 1998
6. "Coherence of groups and the perimeter of 2-complexes," International conference on nonpositive curvature in group theory, topology, and geometry, Vanderbilt University, May 1998
7. "The perimeter of 2-complexes and the coherence of groups," Computational and Geometric Aspects of Modern Algebra, Heriot-Watt University, Edinburgh, Scotland, July 1998
8. "Biautomaticity of various Artin groups," SUNY-Albany Topology and Group Theory Conference, Albany, New York, October 1998
9. "The coherence and quasiconvexity of Coxeter groups," Special session on combinatorial topology, Joint Math Meetings, San Antonio, January 1999
10. "Fans, ladders, and the coherence of groups," Geometric groups on the gulf conference, Mobile, Alabama, May 1999
11. "Fans, ladders, and the coherence of groups," Symposium on computation in group theory and geometry, Warwick, England, July 1999
12. "The curvature of posets associated to the braid groups," International conference on geometric and combinatorial group theory, Haifa, Israel, June 2000
13. "An algorithm to detect a nonpositively-curved metric simplicial complex," Special session on geometric group theory, New Orleans, Louisiana, January 2001
14. "Algorithmic aspects of nonpositive curvature," AMS-SMF Joint Meeting, Special session on geometric group theory, Lyon, France, July 2001
15. "Cube complexes for groups and manifolds," AMS special session on geometric and combinatorial group theory, Montreal, Canada, May 2002
16. "Cube complexes for groups and manifolds," AMS special session on geometry and topol-

ogy, Salt Lake City, Utah, October 2002

17. "Hypertrees, the pure symmetric automorphism groups, and their  $\ell^2$ -Betti numbers," Wasatch topology conference, Park City, Utah, June 2002
18. "Existence of CAT(0) structures for finite-type Artin groups," RSME-AMS Joint Meeting, Special session on geometric methods in group theory, Seville, Spain, June 2003
19. "Garside structures for free groups (and other Artin groups)," Special session on geometric group theory, AMS Sectional Meeting, Binghamton, New York, October 2003
20. "Hypertrees and the  $l^2$  betti numbers of the pure symmetric automorphism groups", AMS Special session on Asymptotic aspects of group theory, Athens, Ohio, March 2004
21. "Garside structures for (some more) Artin groups", Conference on geometric group theory , Bedlewo, Poland, April 2004
22. "Non-crossing partitions for arbitrary Coxeter groups", Institute for Advanced Studies / Park City Mathematics Institute on Geometric Combinatorics, Park City, Utah, July 2004
23. "An introduction to Garside structures," *American Institute of Mathematics*, conference on braid groups, clusters and free probability, Palo Alto, California, January 2005
24. "Square dancing in the pure braid groups", *AMS Special session on curvature in group theory and combinatorics*, Santa Barbara, April 2005
25. "Artin groups in a continuous context," *AMS Special session on Geometric Methods in Group Theory and Semigroup Theory*, Lincoln, Nebraska, October 2005
26. "Möbius inversion and combinatorial curvature", *AMS Special session on geometric combinatorics*, Cincinnati, Ohio, October 2006
27. "Dual presentations for Artin groups," *AMS Special session on geometric group theory*, Joint Math Meetings, New Orleans, Louisiana, January 2007
28. "Bounding reflection length in an affine Coxeter group", *AMS Special session on algebraic combinatorics*, Western sectional meeting, March 2012

#### COLLOQUIA

1. "From differential geometry to word hyperbolic groups: a combinatorial approach to an analytic idea," Special Colloquium, University of Kentucky, Lexington, Kentucky, February 1998
2. "Roots, ratios, and Ramanujan," Lafayette College, Easton, Penn., October 1998
3. "From differential geometry to word hyperbolic groups: a combinatorial approach to an analytic idea," Graduate Student Colloquium, Texas A & M University, October 1998
4. "Constructing compact cores in negatively-curved 3-manifolds", Rice University, December 1998
5. "Constructing compact cores in negatively-curved 3-manifolds", State University of New York, Binghamton, February 1999
6. "Constructing compact cores in negatively-curved 3-manifolds", University of California, Davis, January 1999
7. "General versions of small cancellation theory", Texas A&M University, January 1999
8. "Calculating curvatures of concrete complexes", Vanderbilt University, September 2000
9. "Calculating curvatures of concrete complexes", Karcher Colloquium, University of Oklahoma, October 2000
10. "Calculating curvatures of concrete complexes", University of Texas, December 2000
11. "Algorithmic aspects of curvature", University of California, Santa Barbara, March 2002
12. "Constructing non-positively curved spaces and groups", California Polytechnic State University, San Luis Obispo, May 2004
13. "Artin groups and polytopes," Equipe Algebre-Géométrie-Topologie, Université de Bour-

gogne, Dijon, France, June 2005

14. "From Coxeter to Artin and his braids", San Francisco State University, San Francisco, California, October 2007
15. "Reflections and braids", Claremont Colleges Mathematics Colloquium, Claremont, California, February 2012

#### SEMINAR TALKS

1. "Small cancellation theory and the Burnside groups I" Topics in Automata Theory, University of California, Berkeley, Spring 1995
2. "Small cancellation theory and the Burnside groups II" Topics in Automata Theory, University of California, Berkeley, Spring 1995
3. "General small cancellation theory and the Burnside groups I," Geometric Group Theory Seminar, University of California, Berkeley, Spring 1995
4. "General small cancellation theory and the Burnside groups II," Geometric Group Theory Seminar, University of California, Berkeley, Spring 1995
5. "General small cancellation theory and the Burnside groups III," Geometric Group Theory Seminar, University of California, Berkeley, Spring 1995
- 6 "Small cancellation theory and the Burnside groups," Algebra Seminar, San Jose State University, April 1996
7. "A general small cancellation theory approach to the Burnside groups," Geometric Group Theory Seminar, University of California, Berkeley, California, October 1996
8. "Artin groups of large type," Geometric Group Theory Seminar, University of California, Berkeley, California, March 1997
9. "Braid groups, torus knots and Artin groups of large type," Topology Seminar, University of Texas, Austin, Texas, November 1997
10. "The perimeter of 2-complexes and the coherence of groups," Topology Seminar, University of Michigan, Ann Arbor, Michigan, February 1998
11. "General versions of small cancellation theory," Topology Seminar, The Ohio State University, Columbus, Ohio, February 1998
12. "The geometry and topology of Artin groups and braid groups," Topology Seminar, Rutgers University, Newark, New Jersey, October 1998
13. "The perimeter of 2-complexes and the coherence of groups," Topology Seminar, University of California, Santa Barbara, November 1998
14. "The combinatorial Gauss-Bonnet theorem and the consequences of curvature in group theory," Group theory seminar, University of Nebraska, Lincoln, April 1999
15. "An asymptotically sharp theorem about the coherence and local quasiconvexity of 2-complexes," Topology Seminar, University of Texas, Austin, November 1999
16. "The perimeter of 2-complexes and the coherence of groups," Topology Seminar, University of Porto, Porto, Portugal, November 1999
17. "Normal forms for free aperiodic groups," Semigroup seminar, University of Porto, Porto, Portugal, November 1999
18. "Rigidity of Coxeter groups," Topology seminar, Vanderbilt University, Nashville, September 2000
19. "Calculating the curvature of concrete complexes," Topology seminar, State University of New York, Binghamton, October 2000
20. "Rigidity of Coxeter groups," Topology seminar, University of Oklahoma, Norman, October 2000
21. "Rigidity of Coxeter groups," Magnus group theory seminar, CUNY-graduate center, New York, February 2001

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22. "Rigidity of Coxeter groups," Topology seminar, Rice University, Houston, February 2001
  23. "Rigidity of Coxeter groups," Topology seminar, The Ohio State University, Columbus, Ohio, April 2001
  24. "Calculating the curvature of concrete complexes," Topology seminar, The Ohio State University, Columbus, Ohio, April 2001
  25. "Algorithmic aspects of nonpositive curvature," Group theory seminar, University of Illinois, Champagne-Urbana, Illinois, November 2001
  26. "Calculating curvatures in concrete complexes," Topology seminar, Cal Tech, Pasadena, California, March 2002
  27. "Garside structures for free groups (and other Artin groups)," Topology seminar, Columbia University, New York, New York, October 2003
  28. "The role of curvature in combinatorics," Combinatorics seminar, M.I.T., Boston, Massachusetts, October 2003
  29. "Garside-like structures for arbitrary Artin groups," Magnus group theory seminar, CUNY-graduate center, New York, November 2004
  30. "Artin groups and polytopes," Geometry and Topology seminar, Cal Tech, Pasadena, California, May 2005
  31. "Noncrossing partitions in surprising locations," Séminaire Général, Université de Bourgogne, Dijon, France, June 2005
  32. "Pulling apart orthogonal groups to find continuous braids," Geometry/Topology Seminar, University of Chicago, Chicago, Illinois, March 2006
  33. "Pulling apart orthogonal groups to find continuous braids," Claremont Topology Seminar, Pomona, California, March 2007
  34. "Pulling apart orthogonal groups", Colby-Bates-Bowdoin mathematics seminar, Bowdoin College, Brunswick, Maine, May 2009
  35. "Regular polytopes and Coxeter combinatorics", UCLA Combinatorics seminar, Los Angeles, California, March 2011
  36. "Artin groups of euclidean type", Brigham Young University Topology Seminar, December 2011
  37. "Artin groups of euclidean type", New York Group Theory Seminar, CUNY Graduate Center, New York, April 2013
  38. "The intrinsic geometry of groups", Algebra-Combinatorics-Geometry-Topology seminar, Northern Arizona University, Flagstaff, Arizona, April 2015

LOCAL SEMINAR  
TALKS

1. "Determining the complexity of finite state machines", Algebra-combinatorics seminar (TAMU), September 1999
2. "Calculating the curvature of concrete complexes", Algebra-combinatorics seminar (TAMU), November 2000
3. "Rigidity of Coxeter groups", Algebra-combinatorics seminar (TAMU), February 2001
4. "Combinatorial conditions that imply word-hyperbolicity for 3-manifolds", Topology seminar, October 2002
5. "From differential geometry to word hyperbolic groups: a combinatorial approach to an analytic concept", Survey talk, October 2002
6. "New Eilenberg-Mac Lane spaces for braid groups", Topology seminar, October 2002
7. "A combinatorial Gauss-Bonnet theorem for 2-complexes", Topology seminar, January 2003
8. "Garside structures for free groups and other Artin groups", Topology seminar, September 2003

9. "Hypertrees and the  $\ell^{(2)}$ -Betti numbers of the pure symmetric automorphism groups", Algebra seminar, April 2004
10. "Factoring euclidean isometries", Topology seminar, October 2004
11. "A Tiki tour of geometric combinatorics and geometric group theory", Discrete geometry seminar, October 2004
12. "Factoring isometries of highly symmetric objects", Topology seminar, October 2004
13. "Permutahedra and associahedra revisited", Discrete geometry seminar, January 2005
14. "Angles in Polytopes", Discrete geometry seminar, April 2005
15. "Polytopes and duality", Discrete geometry seminar, September 2005
16. "Projective geometry and the Fano plane", Discrete geometry seminar, October 2005
17. "Simple closed curves", Discrete geometry seminar, November 2005
18. "Quantum calculus", Discrete geometry seminar, February 2006
19. "Mathieu groups and Steiner systems", Discrete geometry seminar, April 2006
20. "Loops, octonions and projective geometry", Algebra seminar, April 2006
21. "Highly symmetric graphs and diagram geometries I", Discrete geometry seminar, May 2006
22. "Highly symmetric graphs and diagram geometries II", Discrete geometry seminar, May 2006
23. "Regular polytopes are everywhere", Graduate student colloquium, September 2006
24. "As exceptional as 1,2,3", Discrete geometry seminar, November 2006
25. "Moore graphs and generalized polygons", Discrete geometry seminar, February 2007
26. "The unusual graph of Hoffman and Singleton", Discrete geometry seminar, February 2007
27. "Finite complex reflection groups", Discrete geometry seminar, March 2007
28. "Continued fractions and the golden glide", Discrete geometry seminar, April 2007
29. "Using curvature to average trees", Discrete geometry seminar, May 2007
30. "Repetitive surprises", Discrete geometry seminar, May 2007
31. "Roots, ratios and Ramanujan", Math club, May 2008
32. "Gosset's sequence of semiregular polytopes", Discrete geometry seminar, January 2009
33. "Simplices in projective space", Discrete geometry seminar, February 2009
34. "Foster's census of distance regular graphs", Discrete geometry seminar, February 2009
35. "Braids, posets and orthoschemes", Discrete geometry seminar, April 2009
36. "Permutahedra and associahedra", Discrete geometry seminar, April 2009
37. "The intrinsic geometry of groups", Graduate student colloquium, October 2012
38. "High dimensional analogs of the Platonic solids", Graduate student colloquium, October 2013
39. "Equidistant points and lines", Discrete geometry seminar, November 2013
40. "Continued fraction tricks", Discrete geometry seminar, February 2014
41. "Discrete versions of continuous mathematics", Discrete geometry seminar, April 2014
42. "Associahedra, cyclohedra and Thompson's group  $T$ ", Discrete geometry seminar, February 2015
43. "From Platonic solids to Lie groups", Graduate student colloquium, February 2015
44. "Visualizing 4-dimensional shapes", Math circle, March 2015
45. "Angles in polytopes", Discrete geometry seminar, April 2015

PROFESSIONAL  
MEMBERSHIPS

American Mathematical Society  
Mathematical Association of America

INSTITUTES  
ORGANIZED

- *MSRI semester on geometric group theory*, (co-organizer with M. Bestvina, M. Sageev,

and K. Vogtmann), Mathematical Sciences Research Institute (MSRI), Berkeley, California, Fall 2007

CONFERENCES  
ORGANIZED

- *AMS Special Session on Lattices, Coxeter groups and Buildings*, (co-organizer with K. Bux and K. Wortman), Southeastern sectional meeting, Boca Raton, Florida, October 2009
- *AMS Special Session on Curvature in group theory and combinatorics*, (co-organizer with L. Anderson, N. Brady and R. Forman), Western sectional meeting, Santa Barbara, California, April 2005
- *Braid groups, clusters and free probability*, (co-organizer with A. Nica and V. Reiner), American Institute of Mathematics, Palo Alto, California, January 2005
- *CombinaTexas: a combinatorics conference for the south-central U.S.*, (co-organizer with N. Brand, J. Kung, and C. Yan), University of North Texas, Denton, Texas, March 2002
- *CombinaTexas: a combinatorics conference for the south-central U.S.*, (co-organizer with L. Anderson) Texas A&M University, College Station, Texas, March 2001
- *CombinaTexas: a combinatorics conference for the south-central U.S.*, (co-organizer with L. Anderson), Texas A&M University, College Station, Texas, April 2000
- *AMS Special Session on Combinatorial Topology*, (co-organized with L. Anderson), Joint Mathematical Meetings, San Antonio, Texas, January 1999

FUNDING

- National Science Foundation, Principal Investigator: “Geometric Group Theory”, Standard grant DMS-9971682, 1999–2002.
- National Science Foundation, Faculty Associate: “Algebraic and Analytic Methods in the Mathematical Sciences”, Research Experience for Undergraduates, E. Letzter and A. Boggess Co-PIs, DMS-9912192, 2000–2003.
- National Science Foundation, Principal Investigator with L. Anderson (Co-PI): “CombinaTexas”, Conference grant DMS-0070834, 2000.
- Institute for Mathematics and its Applications, Principal Investigator with L. Anderson (Co-PI): “CombinaTexas 2001”, Conference grant, 2001.
- National Science Foundation, Principal Investigator with L. Anderson, N. Brady, and R. Forman Co-PIs: “The Role of Curvature in Combinatorics”, Focused Research Group DMS-0101506, 2001–2004.
- National Science Foundation, Principal Investigator: “Geometric Group Theory via Geometric Combinatorics”, Standard grant DMS-0405k783, 2004–2008.
- National Science Foundation, Principal Investigator: “Discrete and continuous geometry in group theory”, Standard grant DMS-0805716, 2008-2012.

REVIEWING AND  
REFEREEING

Advances in Applied Mathematics  
Algebraic and Geometric Topology  
American Mathematical Monthly  
American Mathematical Society Memoir Series  
Bulletin of the London Mathematical Society  
City University of New York Research Foundation  
Commentarii Helvetici  
Communications in Algebra  
Contemporary Mathematics  
Geometriae Dedicata  
Geometry and Topology

Groups, Geometry and Dynamics  
 Georgian Mathematical Society  
 European Journal of Combinatorics  
 Formal Power Series and Algebraic Combinatorics  
 Icelandic Research Fund  
 Illinois Journal of Mathematics  
 Indiana University Mathematics Journal  
 International Journal of Algebra and Computation  
 Inventiones Mathematicae  
 Israel Journal of Mathematics  
 Israeli Science Foundation  
 Journal of Algebra  
 Journal of Algebraic Combinatorics  
 Journal of Combinatorics, Series A  
 Journal of Group Theory  
 Journal of Homotopy and Related Structures  
 Journal of Integer Sequences  
 Journal of Knot Theory  
 Journal of the London Mathematical Society  
 Journal of Pure and Applied Algebra  
 Journal of Pure and Applied Mathematics  
 Journal of Topology  
 London Mathematical Society Journal of Computation and Mathematics  
 Louisiana Board of Regents Research and Development Fund  
 MathSciNet  
 National Science Foundation  
 National Security Agency  
 New York Journal of Mathematics  
 Michigan Mathematics Journal  
 Proceedings of the American Mathematical Society  
 Proceedings of the Cambridge Mathematical Society  
 Proceedings of the London Mathematical Society  
 Proceedings of the National Academy of Sciences  
 Semigroup Forum  
 SIAM Journal of Discrete Mathematics  
 Topology  
 Topology and its Applications  
 Transactions of the American Mathematical Society

POSTDOCTORAL SCHOLARS 1. Murray Elder, Texas A&M University, 1999-2002  
 2. Azer Akhmedov, University of California, Santa Barbara, 2004-2007

DISSERTATIONS SUPERVISED 1. Woonjung Choi, Texas A&M University, 2004  
 2. Rena Levitt, University of California, Santa Barbara, 2008  
 3. Matthew Macauley, University of California, Santa Barbara, 2008  
 4. Peterson Trethewey, University of California, Santa Barbara, 2008  
 5. Ryan Ottman, University of California, Santa Barbara, 2010  
 6. Robert Sulway, University of California, Santa Barbara, 2010

7. Sonja Gallagher, University of California, Santa Barbara, 2013
8. Elizabeth Leyton Chisholm, University of California, Santa Barbara, 2015
9. Ben Coté, University of California, Santa Barbara, In Progress
10. Michael Dougherty, University of California, Santa Barbara, In Progress

DISSERTATION  
COMMITTEES

1. Stephen Schauger, Texas A&M University, 2001
2. John Learned, University of California, Santa Barbara, 2008
3. Scott Taylor, University of California, Santa Barbara, 2008
4. Ben Benoy, University of California, Santa Barbara, 2009
5. Brie Finegold, University of California, Santa Barbara, 2010
6. Jesse Liptrap, University of California, Santa Barbara, 2010
7. Elie Grano, University of California, Santa Barbara, 2012
8. Tomas Kabbabe, University of California, Santa Barbara, 2012
9. Keith Thompson, University of California, Santa Barbara, 2012
10. Liang Chang, University of California, Santa Barbara, 2013
11. Grace Kennedy, University of California, Santa Barbara, 2013
12. Stepan Paul, University of California, Santa Barbara, 2013
13. Michael Yoshizawa, University of California, Santa Barbara, 2013
14. Rob Ackermann, University of California, Santa Barbara, 2014
15. Drew Jaramillo, University of California, Santa Barbara, 2014
16. Tim Speer, University of California, Santa Barbara, 2014
17. Arielle Leitner, University of California, Santa Barbara, 2015
18. Cindy Tsang, University of California, Santa Barbara, In Progress

MASTERS  
SUPERVISED

1. Terry McDonald, Texas A&M University, College Station, Texas, 2002
2. Scott Johnson, Texas A&M University, College Station, Texas, 2002
3. Nicolas Brody, University of California, Santa Barbara, In Progress

MASTERS  
COMMITTEES

1. Matt Adams, University of California, Santa Barbara, 2011
2. Megan Maguire, University of California, Santa Barbara, 2012
3. Nathan Saritzky, University of California, Santa Barbara, 2014

SENIOR THESES

1. Kelli Carlson, Texas A&M University, College Station, Texas, 2000
2. Berkeley Churchill, University of California, Santa Barbara, 2011

UNDERGRADUATE  
RESEARCH  
SUPERVISED

1. Alexander Griffing, Texas A&M University, Summer 1999
2. Matthew Patlovany, Texas A&M University, Summer 1999
3. Jacob Talley, Texas A&M University, Summer 1999
4. Franz Freeman, University of California, Santa Barbara, Summer 2004
5. Scott Knox, University of California, Santa Barbara, Summer 2009

GRADUATE  
COURSES  
DEVELOPED

1. Automorphism groups of elementary spaces
2. Combinatorics
3. Complex reflection groups
4. Coxeter groups and Artin groups
5. Exceptional mathematics
6. Geometric group theory

7. Linear algebra and the classical groups
8. Metric vector spaces

TEACHING  
AWARDS

1. Distinguished Teaching Award, Chabot College, Hayward, California, 1992
2. Outstanding Teaching Award, Texas A&M University, College Station, Texas, 2000
3. Montague-Center for Teaching Excellence Scholar, 2000-2001
4. Mathematics Department Mochizuki Award for Outstanding Achievement in Mathematics Instruction, University of California, Santa Barbara, California, 2006
5. Mathematics Association of America Southern California-Nevada Section Teaching Award, 2007