

Curriculum Vitae of Christine A. Kelley

Department of Mathematics
University of Nebraska-Lincoln
Lincoln, NE 68588
www.math.unl.edu/~ckelley2

Tel: (402) 472-3731
Fax: (402) 472-8466
e-mail: ckelley2@math.unl.edu

Citizenship: United States

Research Interests: Coding theory and applied discrete mathematics. In particular, design and analysis of codes on graphs and decoding algorithms, algebraic coding theory, and coding for flash memory storage.

Education:

May 2006: Ph.D. in Mathematics, University of Notre Dame, Indiana.
Thesis: *Pseudocodewords, Expander Graphs, and the Algebraic Construction of Low-Density Parity-Check Codes*
Thesis advisor: Professor Joachim Rosenthal.

May 2003: M.S. in Mathematics, University of Notre Dame, Indiana.

June 2001: Certificate of Advanced Study in Mathematics, with Merit.
Part III of the Mathematical Tripos
Cambridge University, England.

May 1999: B.S. in Mathematics, University of Puget Sound, Washington.
Budapest Semesters in Mathematics, Hungary, Fall 1998.

Positions Held:

Harold and Esther Edgerton Assistant Professor, Department of Mathematics, University of Nebraska-Lincoln, 08/10 - present.

Assistant Professor, Department of Mathematics, University of Nebraska-Lincoln, 08/07 - present.

VIGRE Arnold Ross Assistant Professor, Department of Mathematics, The Ohio State University, Columbus, Ohio, 01/07 - 06/08. (On leave from UNL in 2007-2008 year)

Postdoctoral Fellow, The Fields Institute for Research in the Mathematical Sciences, Toronto, Ontario, 07/06 - 12/06.

Teaching and Research Assistant, Department of Mathematics, University of Notre Dame, Indiana, 08/01 - 05/06. The 2004-2005 year was spent at the Institute of Mathematics, University of Zürich, Switzerland.

Student Research Assistant, Los Alamos National Laboratory, New Mexico, 08/99 - 08/00.

Publications: The following publications are all refereed, with the exception of [5] and [17]. Papers [5] and [17] were invited.

24. K. Haymaker, C. A. Kelley. Geometric WOM codes and coding strategies for multi-level flash memories. To be submitted to a Special Issue of *Designs, Codes, and Cryptography* in November 2011.
23. C. A. Kelley. Algebraic design and implementation of protograph codes using non-commuting permutation matrices. 20 pages. Submitted.

22. J. Cummings, C. A. Kelley. On the independence and domination numbers of replacement product graphs. 12 pages. Submitted.
21. K. Haymaker, C. A. Kelley. Coding strategies for reliable storage in multi-level flash memories. *Proceedings of the International Castle Meeting on Coding Theory and Applications (3ICMCTA)*, Cardona, Spain, 7 pages, September 2011.
20. C. A. Kelley, J. Kliever. Algebraic constructions of graph-based nested codes from protographs. *Proceedings of the IEEE International Symposium on Information Theory*, Austin, TX, 5 pages, double-column, June 2010.
19. C. A. Kelley. Minimum distance and pseudodistance lower bounds for generalized LDPC codes. *International Journal of Information and Coding Theory*, Special Issue on Algebraic and Combinatorial Coding Theory: in Honour of the retirement of Vera Pless. 23 pages. Spring 2010.
18. C. Kelley, D. Sridhara, J. Rosenthal. Zig-zag and replacement product graphs and LDPC codes. *Advances in Mathematics of Communications*, 26 pages, November 2008.
17. C. A. Kelley, On codes designed via algebraic lifts of graphs, *Proceedings of the 46th Annual Allerton Conference on Communication, Control, and Computing*, 8 pages, Monticello, IL, September 2008.
16. C. Kelley, J.L. Walker. LDPC codes from voltage graphs. *Proceedings of International Symposium on Information Theory*, 6 pages, double-column, Toronto, Canada, July 2008.
15. C. Kelley, D. Sridhara. Pseudocodewords of Tanner Graphs. *IEEE Transactions on Information Theory*, vol. 53, no. 11, pp. 4013-4038, double-column, November 2007.
14. J. Rosenthal, C. Kelley, D. Sridhara. Systems theoretic questions in coding theory. *Proceedings in Applied Mathematics and Mechanics*, ICIAM, 3 pages, Zürich, Switzerland, October 2007.
13. C. Kelley, D. Sridhara. Eigenvalue bounds on the pseudocodeword weights of expander codes. *Advances in Mathematics of Communications*, vol. 1, no. 3, pp. 287-306, August 2007.
12. C. Kelley, D. Sridhara. On the pseudocodeword weight and parity-check matrix redundancy of linear codes. *Proceedings of IEEE Information Theory Workshop*, 6 pages, double-column, Lake Tahoe, California, September 2007.
11. C. Kelley, D. Sridhara, J. Rosenthal. Tree-based construction of LDPC codes having good pseudocodeword weights. *IEEE Transactions on Information Theory*, vol. 53, no. 4, pp. 1460-1478, double-column, April 2007.
10. C. Kelley, D. Sridhara. Pseudocodeword weights for non-binary LDPC codes. *Proceedings of IEEE International Symposium on Information Theory*, 6 pages, double-column, Seattle, Washington, July 2006.
9. D. Sridhara, C. Kelley. LDPC coding for the three-terminal erasure relay channel. *Proceedings of IEEE International Symposium on Information Theory*, 6 pages, double-column, Seattle, Washington, July 2006.
8. D. Sridhara, C. Kelley, J. Rosenthal. Tree-based construction of LDPC codes. *Proceedings of IEEE International Symposium on Information Theory*, 5 pages, double-column, Adelaide, Australia, September 2005.
7. C. Kelley, D. Sridhara. Structure of pseudocodewords in Tanner graphs. *Proceedings of IEEE International Symposium on Information Theory and Applications*, 6 pages, double-column, Parma, Italy, October 2004.
6. C. Kelley, D. Sridhara, J. Xu, J. Rosenthal. Pseudocodeword weights and stopping sets. *Proceedings of IEEE International Symposium on Information Theory*, p.150, double-column, Chicago, June 2004.
5. C. Kelley, J. Rosenthal, D. Sridhara. Some new algebraic constructions of codes from graphs which are good expanders. *Proceedings of Allerton Conference on Communication, Control, and Computing*, pp.1280-1289, Monticello, IL, October 2003.

4. E. Byrne, C. Kelley, C. Monico, J. Rosenthal. Non-linear codes for belief propagation. *Proceedings of IEEE International Symposium on Information Theory*, p.43, double-column, Japan, June 2003.
3. D. Pickard, L. Lovatt, M. Novelli, P. Ripley, C. Kelley, I. Bigio, S. Brown. Diagnosis of dysplasia in Barrett's oesophagus with in-situ elastic-scattering spectroscopy. *Optical Biopsy and Tissue Optics*, SPIE vol. 4161, November 2000.
2. P. Ripley, I. Rose, C. Kelley, I. Bigio, D. Pickard, G. Briggs, L. Lovatt, S. Brown. A comparison of artificial intelligence techniques for spectral classification in the diagnosis of human pathologies based upon optical biopsy. *Optical Society of America Biomedical Topical Meeting*, Miami, FL, April 2000.
1. I. Bigio, S. Brown, G. Briggs, C. Kelley, S. Lakhani, D. Pickard, P. Ripley, I. Rose, C. Saunders. Diagnosis of breast cancer using elastic-scattering spectroscopy: preliminary clinical results. *Journal of Biomedical Optics*, Opt.5 Vol.5, April 2000.

Note on the order of authors: All papers have the authors ordered alphabetically except for [6], [11], and [18] where the advisor is listed last, and papers [8] and [9] where the intended speaker was listed first. Moreover, on papers [1] - [3], I did the data analysis for the research and did not participate in the actual writing of the papers.

Grants and Awards:

- NSA Young Investigator Grant (\$29,930), Spring 2011 - Spring 2013.
- 2010 Harold and Esther Edgerton Junior Faculty Award (\$5,000), University of Nebraska-Lincoln. Awarded annually to one faculty member (across all disciplines) in the third year of the tenure track for excellence in research and teaching.
- 2010 Research Development Fellow, University of Nebraska-Lincoln.
- NSF EPSCoR First Award (\$20,000), 2009-2010.
- AWM travel grant (\$1850), July 2008.
- MAA Project NExT Fellow, 2008-2009.
- Fellowship, The Fields Institute, 2006.
- ISIT travel grants 2004, 2006; ITW travel grant 2007; IMA travel awards 2007.
- Notre Dame Graduate Assistantship, 2001-2004, 2005-2006.
- University of Zürich Graduate Assistantship, 2004-2005.
- Center for Applied Mathematics Graduate Fellowship, University of Notre Dame, 2003-2004.
- Cambridge Commonwealth Trust Overseas Bursary, 2000-2001.
- Trustee Scholarship for Academic Achievement, University of Puget Sound, 1995-1999.
- University of Puget Sound Grant, 1997-1999.

Academic Visits:

- Invited academic guest to the Institute of Mathematics, University of Zürich, Switzerland, October 24 - November 24, 2011.
- Invited academic guest to the Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland, August 1 - September 30, 2011. Participated in the "Combinatorial, Algebraic and Algorithmic Aspects of Coding Theory" thematic program at the Centre Interfacultaire Bernoulli.

Invited Talks: (Conferences with limited, invitation-only attendance are indicated by †.)

36. University of Hawaii, Coding Theory Seminar, TBA (50 minutes), Honolulu, March 2012.
35. AMS Special session on Mathematical Coding Theory and its Industrial Applications, TBA (20 minutes), AMS Sectional meeting, Honolulu, Hawaii, March 2012.
34. University of Basel, Coding Theory Seminar, “Designing codes from lifts of graphs” (50 minutes), Switzerland, September 2011.
33. Texas Tech University, Department of Mathematics Colloquium, “Designing codes algebraically from lifts of graphs” (50 minutes), Lubbock, TX, March 2011.
32. *Combinatorial Potlatch 2010*, Western Washington University, December 2010. “Codes designed from algebraic lifts of graphs” (50 minutes). The Potlatch is a one-day conference that has three talks only (all invited), and is designed to encourage interaction among researchers on combinatorics topics.
31. Plenary speaker at *Math on the Northern Plains Conference for Undergraduates*, “Codes on graphs and the quest for good codes”, (50 minutes), Morningside College, Iowa, April 2010.
30. AMS Special session on Advances in Algebraic Coding Theory, AMS sectional meeting, “Lower bounds on the minimum distance and pseudodistance of generalized LDPC codes using graph connectivity” (20 minutes), Lexington, KY, March 2010.
29. Keynote speaker at Math Days for Women, University of South Dakota, “Fun in Cryptography: a look at how to send and protect secret messages” (75 minutes), September 24, 2009.
28. AMS Special session on Recent Trends in Coding Theory, “Ordinary and permutation voltage graph based codes” (20 minutes), AMS Joint Meetings, Washington, D.C., January 2009.
27. AMS Special session on Codes over Rings, “Recent results on codes designed from permutations” (25 minutes), AMS sectional meeting, Kalamazoo, MI, October 2008.
26. Mini-conference on Discrete Mathematics, Clemson University, “Codes designed via algebraic lifts of graphs” (50 minutes), Clemson, SC, October 2008.
25. Special session on Emerging Applications of Coding Theory, Allerton Conference on Communication, Control, and Computing, “On codes designed via algebraic lifts of graphs” (25 minutes), Illinois, September 2008.
24. University of Zürich, Applied Algebra Seminar, “A voltage graph framework for LDPC codes” (50 minutes), Zürich, Switzerland, May 2008.
23. Ohio University, Department of Mathematics Colloquium, “A voltage graph framework for LDPC codes” (50 minutes), Athens, OH, April 2008.
22. University of Kentucky, Algebra and Geometry Seminar, “An introduction to Low-Density Parity-Check codes” (50 minutes), Lexington, KY, April 2008.
21. AMS Special Session on Algebraic Coding Theory, “Pseudocodeword weights and the parity-check matrix redundancy of linear codes” (20 minutes), Bloomington, IN, April 2008.
20. † Mathematisches Forschungsinstitut Oberwolfach, “A voltage assignment approach to the analysis of LDPC codes” (30 minutes), Coding Theory Workshop, Germany, December 2007.
19. University of Puget Sound, Science Colloquium, “Codes on graphs and the quest for good codes” (50 minutes), Tacoma, WA, February 2007.
18. University of Nebraska - Lincoln, Mathematics Department Colloquium, “Pseudocodeword-based iterative decoding analysis of LDPC codes” (50 minutes), January 2007.
17. AMS Special Session on Coding Theory and Its Applications, “Pseudocodeword weights of codes from expander graphs” (20 minutes), AMS Joint Mathematics Meetings, New Orleans, January 2007.
16. Workshop on Coding and Systems, “Pseudocodeword weights of expander codes” (30 minutes), Zürich, Switzerland, December 2006.
15. University of Zürich, Applied Algebra Seminar, “Pseudocodeword weights of non-binary LDPC codes” (50 minutes), December 2006.
14. Occidental College, Mathematics Department Colloquium, “Codes on Graphs” (50 minutes), March 2006.

13. University of Texas at Dallas, Mathematics Department Colloquium, "Pseudocodewords and Iterative Decoding of LDPC Codes" (50 minutes), February 2006.
12. East Tennessee State University, Mathematics Department Colloquium, "Pseudocodewords and Iterative Decoding of LDPC Codes" (50 minutes), February 2006.
11. Virginia Commonwealth University, Mathematics Department Colloquium, "Pseudocodewords and Iterative Decoding of LDPC Codes" (50 minutes), February 2006.
10. University of North Florida, Mathematics Department Colloquium, "Pseudocodewords and Iterative Decoding of LDPC Codes" (50 minutes), February 2006.
9. University of Dayton, Mathematics Department Colloquium, "Pseudocodewords and Iterative Decoding of LDPC Codes" (50 minutes), February 2006.
8. Beloit College, Mathematics Department Colloquium, "Codes on Graphs and Iterative Decoding" (50 minutes), February 2006.
7. Buffalo State College, Mathematics Department Colloquium, "Pseudocodewords and Iterative Decoding of LDPC Codes" (50 minutes), February 2006.
6. Acadia University, Nova Scotia, Mathematics Department Colloquium, "Pseudocodewords and Iterative Decoding of LDPC Codes" (50 minutes), January 2006.
5. North Dakota State University, Mathematics Department Colloquium, "Pseudocodewords and Iterative Decoding of LDPC Codes" (50 minutes), January 2006.
4. University of Wyoming, Mathematics Department Colloquium, "A Survey of Coding Theory" (50 minutes), November 2005.
3. University of Wyoming, Algebra/Combinatorics/Number Theory Seminar, "Construction of LDPC codes having good pseudocodeword weights" (50 minutes), October 2005.
2. University of Notre Dame, Center for Applied Mathematics Colloquium, "Construction of LDPC codes with relatively few low-weight pseudocodewords" (50 minutes), September 2005.
1. San Diego State University, Math/Communications Colloquium, "Pseudocodewords and Iterative Decoding on Tanner Graphs" (50 minutes), May 2004.

Contributed Talks and Presentations:

- UNL Landscape Seminar (50 min.), "Some research directions in coding theory", April 2011.
- UNL Discrete Math Seminar (50 min.), "Coding for the wiretap channel", Feb. 2010.
- UNL Discrete Math Seminar (50 min.), "Hash functions and Cayley graphs", Sept. 2009.
- UNL Landscape Seminar (50 min.), "Coding theory overview & new research directions", April 2009.
- UNL Discrete Math Seminar (50 min.), "The spectral gap and expander graphs", Feb. 2009.
- UNL Department of Mathematics Colloquium (50 min.), "Algebraic constructions of codes using voltage graphs", Dec. 2008.
- UNL Discrete Math Seminar (50 min.), "0/1 polytopes and the Hirsch conjecture", Sept. 2008.
- IEEE International Symposium on Information Theory (20 min.), "A voltage graph framework for LDPC codes", Toronto, Canada, July 2008.
- IEEE Information Theory Workshop, "On the pseudocodeword weight and parity-check matrix redundancy of linear codes." (poster), Lake Tahoe, CA, Sept. 2007.
- IEEE International Symposium on Information Theory (20 min.), "Pseudocodeword weights of non-binary LDPC codes", Seattle, Washington, July 2006.
- University of Notre Dame, Expander Graphs Seminar (50 minutes), "LPS Construction of Expander Graphs", May 2006.
- Swiss Federal Institute of Technology (ETH), Advanced Topics in Discrete Mathematics Seminar, "0/1 Polytopes and the Hirsch Conjecture" (50 min.), Zürich, Switzerland, Nov. 2004.

- International Symposium on Information Theory and Applications (20 min.), “Structure of Pseudocodewords in Tanner Graphs”, Parma, Italy, Oct. 2004.
- IEEE International Symposium on Information Theory, “Pseudocodeword Weights and Stopping Sets” (20 minutes), Chicago, June 2004.
- University of Notre Dame, Expander Graphs Seminar (50 min.), “The Zig-Zag Graph Product and Expander Families”, April 2004.
- University of Notre Dame, Center for Applied Mathematics Graduate Student Research Workshop, “Algebraic Constructions of LDPC Codes” (25 min.), March 2003.
- University of Notre Dame, Graduate Student Seminar, “Algebraic Constructions of LDPC Codes” (50 min.), March 2003.
- Los Alamos National Laboratory, Bioscience and Biotechnology Division, “Computational Analysis of Tissue Optical Scattering Spectra” (50 min.), Dec. 1999.

Other Notable Conferences Attended: (Conferences with limited, invitation-only attendance are indicated by †.)

- †Trends in Coding Theory Meeting, Monte Verita Conference Center, Ascona, Switzerland, To attend in October 2012.
- †Dagstuhl Seminar on Coding Theory, Leibniz-Zentrum für Informatik, Saarbrücken, Germany, November 2011. (Dagstuhl is the computer science equivalent of Oberwolfach)
- AMS Central Section Meeting, Lincoln, Nebraska, October 2011.
- International Castle Meeting on Coding Theory and Applications (3ICMCTA), Cardona, Spain, September 2011.
- Workshop on Algebraic Coding Theory, EPFL, Lausanne, Switzerland, September 2011.
- Allerton Conference on Communication, Control, and Computing, Illinois, September 2009.
- MAA Mathfest, Portland, OR, August 2009.
- MAA Mathfest, Madison, WI, August 2008.
- Workshop on the Mathematics of DNA, its structure and interactions, Institute for Mathematics and its Applications, September 2007.
- Tutorial on the Mathematics of Nucleic Acids, Institute for Mathematics and its Applications, September 2007.
- Midwestern Graph Theory Conference (MIGHTY), Wright State University, Dayton, Ohio, May 2007.
- Workshop on Complexity, Coding and Communications, Institute for Mathematics and its Applications, April 2007.
- Cryptography: Underlying Mathematics, Provability and Foundations, The Fields Institute, Toronto, November 2006.
- Computational Challenges Arising in Algorithmic Number Theory and Cryptography, The Fields Institute, Toronto, October 2006.
- Quantum Cryptography and Computing Workshop, The Fields Institute, Toronto, October 2006.
- The 10th Workshop on Elliptic Curve Cryptography (ECC 2006), The Fields Institute, Toronto, September 2006.
- AMS Midwest Sectional Meeting, Notre Dame, Indiana, April 2006.
- AMS/MAA Joint Mathematics Meetings, San Antonio, Texas, January 2006.
- Allerton Conference on Communication, Control, and Computing, Illinois, September 2005.
- Coding Theory & Quantum Computation, University of Virginia, Charlottesville, May 2003.
- Allerton Conference on Communication, Control, and Computing, Monticello, Illinois, October 2002.
- IEEE International Symposium Information Theory, Lausanne, Switzerland, July 2002.

Teaching Experience

Courses taught at the University of Nebraska-Lincoln:

Discrete Math II, Math 852, 3 credits; Spring 2011.

Geometry Matters, Math 301, 3 credits; course for pre-service teachers; Fall 2009, Spring 2011.

Discrete Math I, Math 850, 3 credits; Fall 2010.

Combinatorics and Graph Theory, Math 450, 3 credits; Spring 2010.

Topics in Coding Theory, Math 958, 3 credits; Spring 2009.

Contemporary Mathematics, Math 203, 3 credits; Fall 2008.

Graduate reading courses proctored at the University of Nebraska-Lincoln:

Introduction to Covering Codes, one student; Summer 2011.

Introduction to Coding Theory, one student; Summer 2009.

Information Theory, two students; Fall 2008.

Courses taught at The Ohio State University:

Combinatorics and Graph Theory, Math 575, 5 credits; Winter 2008, 2007.

Probability, Math 530, 3 credits; Fall 2007.

Algebra and Trigonometry, Math 148, 2 credits; Fall 2007.

Graph Theory, independent study proctor; Winter 2008.

Discrete Mathematical Models, independent study proctor; Summer 2007.

Courses taught at the University of Notre Dame:

Finite Mathematics, Math 104, 3 credits; Fall 2005, Summer 2003.

Calculus II for Pre-med, teaching assistant; Spring 2003.

Calculus I for Engineers, teaching assistant; Fall 2002.

Calculus I for Pre-med, teaching assistant; Fall 2002.

Courses taught at the University of Zürich, Switzerland:

Coding Theory, teaching assistant; Spring 2005.

Teaching Assistant, *Academic Challenge Program*, a math and science enrichment program for high school students. University of Puget Sound, Washington. Summer 1999.

Math and ESL (English as a Second Language) Tutor, Tacoma, Washington, 1997-1999.

Pedagogical Training

- Participated in *Sage: Using Open-Source Mathematics Software with Undergraduates*, an MAA Professional Enhancement Program (PREP) course, 16 contact hours, Summer 2010.
- Project NExT activities at Mathfest 2008 (August), Joint Mathematics Meeting 2009 (January), Mathfest 2009 (August).
- UNL Math Department Teaching Mentoring Program, since Fall 2008.
- Attended *2nd Annual Mini-Conference on Great Teaching*, Ohio State University, April 2008.
- Attended *Teaching Linear Algebra and Its Applications* mini-course, and *Getting Undergraduate Students Involved in Research* mini-course at the AMS Joint Meetings, January 2006.
- *Teaching Well Using Technology Certificate*, University of Notre Dame, 2005 - 2006.
- *Striving for Excellence in Teaching Certificate*, University of Notre Dame, 2005 - 2006.
- Teaching Seminar, Mathematics Department, University of Notre Dame, Spring 2001, 2002.

Advising

- *Graduate Students*
 - Kathryn Haymaker, Ph.D. student, expected graduation May 2013. Working on algebraic and combinatorial coding techniques for flash memories.
- *Undergraduate Students*
 - Jonathan Jay Cummings, graduated May 2011. I supervised his 2010-2011 Undergraduate Creative Activities and Research Experience (UCARE) project on invariants of graph products, and also his Honors Thesis, *On Invariants of Replacement Product Graphs*, for which he received highest distinction at UNL.

Doctoral Supervisory Committees

Current committee chair (i.e. doctoral advisor) for Kathryn Haymaker.

Current committee member for:

James Carraher (advisor: Stephen Hartke)
Lauren Keough (advisor: Jamie Radcliffe)
Katherine Morrison (advisor: Judy Walker)
Zach Roth (advisor: Judy Walker)
Elena Sherman (Department of Computer Science; advisor: Matt Dwyer)

Past committee member for:

Deanna Dreher (graduated May 2010, advisor: Judy Walker)
Andrew Ray (graduated May 2011, advisor: Jamie Radcliffe)
Tyler Seacrest (graduated May 2011, advisor: Stephen Hartke)

UNL Math Department Service

- Executive Committee Member, 2011-present.
- Algebra Search Committee Member, 2011-2012.
- On committee for *Nebraska Conference for Undergraduate Women in Mathematics*, 2008-present. In charge of talk and abstract review, abstract booklets, poster session, and brochure.
- Co-writer and grader for the graduate discrete math qualifying exam, June 2011.
- Undergraduate Advisory Committee Member, 2010-2011.
- Organizer for the weekly Discrete Mathematics Seminar, Fall 2009, 2010 and Spring 2010.
- Volunteer for Math Day, 2008-2010.
- Panelist:
 - *On teaching*. Organized by Mark Walker for the math graduate teaching seminar at UNL. November 2010.
 - *Choosing and applying to graduate school*. Organized by the UNL Math Club and Women in Math Network. October, 2010.
 - *How to survive graduate school*. Organized by the UNL math graduate students for the incoming graduate students. August, 2009.
 - *Being a new faculty member*. Organized by Sylvia Wiegand for the math graduate students at UNL. April 2009.

Professional Service:

- Associate Editor for the *International Journal of Information and Coding Theory* (IJCoT), Inderscience, U.K. (since November 2011).
- On International Program Committee for the 2012 *Mathematical Theory of Network and Systems* (MTNS) Conference, Melbourne, Australia.
- Organizer of a special session on coding theory (with Judy Walker) at the AMS Sectional Meeting at UNL in October 2011.
- Judge for the Ohio State University Young Mathematicians Conference, 2011.
- Referee for:
IEEE Transactions on Information Theory
IEEE Transactions on Communications
IEEE Communications Letters
Journal of Applied Algebra
IEEE Transactions on Information Forensics & Security
Journal on Selected Areas in Communications, special issue on capacity-approaching codes
International J. on Information and Coding Theory, special issue in honour of Vera Pless
Central European Journal of Mathematics
- Referee for the following conferences: IEEE International Symposium on Information Theory (2007, 2008, 2010), IEEE Information Theory Workshop (2006), Turbo Codes Conference (2008), International Symposium on Information Theory and its Applications (2008), Applied Algebra, Algebraic Algorithms, and Error-Correcting Codes (AAECC-18) (2009), Twelfth IMA International Conference on Cryptography and Coding (2009), Mathematical Theory of Networks and Systems (2010), Military Communications Conference (MILCOM 2010), International Symposium on Turbo Codes and Iterative Information Processing (2010).
- Reviewer for AMS.

Other Service:

- 2009-2010: Partnered with a Lincoln Public School (LPS) math coach and LPS teachers to design and facilitate lessons for local sixth grade math classes that incorporate coding and cryptography. Three lessons were piloted at Culler Middle School in October 2009 and April 2010. Culler is one of the lower economic level schools in Lincoln. (08/09 - 05/10)
- Zürich Graduate Colloquium in Mathematics Co-organizer, University of Zürich and Swiss Federal Institute of Technology (ETH), Zürich, Switzerland. (08/04 - 07/05)