

CURRICULUM VITAE

1-31-2012

RONALD NELSON UMBLE, Ph.D.

Professor of Mathematics

MU ID#: M0065243

South Philadelphia High School, Philadelphia, PA

Student teacher, Spring 1972

Born: 19 March 1950

Excellent health

Married with two children

Spouse: Diane Zimmerman Umble, Ph.D.
Daughter: Kathryn Elizabeth, born 10-15-83
Son: Eric Christian Umble, born 4-2-91

Residence

1845 Conestoga Avenue
Lancaster, PA 17602

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URL: <http://www.millersville.edu/~rumbler>

Education

University of North Carolina, Chapel Hill, NC
Ph. D., Algebraic Topology, May 1983.
Dissertation: "A Computer Assisted Study of
Meta-stable Primitivity in Finite H-towers"
Dissertation Advisor: James D. Stasheff

University of Virginia, Charlottesville, VA
M. S., Mathematics, May 1974.
Thesis: "Relative Unoriented Bordism
Theories"
Thesis Advisor: Robert E. Stong

Temple University, Philadelphia, PA
A. B., Mathematics, May 1972.
Teaching Certification: Secondary
Education

Lancaster Mennonite High School, Lancaster, PA
Diploma, 1968

Teaching Experience

Millersville University of Pa., Millersville, PA
Professor of Mathematics
1984 - present
Tenured: May 1989
Promoted to full rank: May 1990

Hesston College, Hesston, KS
Professor and Chair, Department of
Mathematics and Computer Science 1975 –
1984 (on leave for graduate study 1979-1981)

University of North Carolina, Chapel Hill, NC
University Teaching Fellow, 1980 - 1981
Teaching Assistant, 1979 - 1980

Blue Ridge Comm. College, Weyers Cave, VA
Instructor of Developmental Mathematics,
1974 - 1975

University of Virginia, Charlottesville, VA
Teaching Assistant, 1973-1974

Undergraduate Courses Taught

Remedial Mathematics
College Algebra
Trigonometry
Precalculus
Math for the Liberal Arts
Math for Elementary School Teachers I
Elementary Probability
Introduction to Statistics
Intuitive Calculus
Finite Mathematics
A User's Guide to Microcomputers
Introduction to Computer Science
Structured Programming
Engineering Computations (FORTRAN)
ASSEMBLER Programming
Calculus for Management, Life & SS
Differential Calculus
Integral Calculus
Multivariable Calculus
Introduction to Mathematical Proof
Matrix Algebra
Linear Algebra I
Linear Algebra II
Survey of Geometry
Transformational Geometry
Ordinary Differential Equations
Abstract Algebra I
Abstract Algebra II
Real Variables I
Real Variables II
Elementary Differential Geometry
Pedagogy Seminar in Transformational Geometry
Point-Set Topology
Independent Studies in Abstract Algebra
Independent Studies in Topology
Independent Studies in Geometry

Graduate Courses Taught

Linear Algebra for Teachers
Problem Solving Seminar
Abstract Algebra for Teachers
Foundation of Mathematics
Transformational Geometry for Teachers
Classical Field Theory
Point-set Topology

Theses and Research Projects Directed

Theses and Research Projects Directed

15. Morgan Schreffler
Honors Thesis: "Fixed Point Theorems in
Mathematics," May 2011.
14. Sean Evans
Honors Thesis: "2-in/3-out A_∞ -Bialgebras,"
May 2008.
13. Daniel Kravatz
Honors Thesis: "Diagonal Approximations
on an n -gon and the Cohomology Ring of
Closed Compact Orientable Surfaces," May

2008.

12. John Gemmer
Honors Thesis: "The Generalized Brachistochrone Problem," May 2006; Recognized at MathFest 2006 as one of two Outstanding undergraduate papers in applied math.

11. Stephen Weaver
Honors Thesis: "Computing the S-U Diagonal on Permutahedra," May 2005.

10. Andrew Baxter
Honors Thesis: "Periodic Orbits in Triangular Air Hockey," May 05; Winner of EPADEL 2005 student paper competition. Published in American Mathematical Monthly, June 2008.

9. Nicole Osborn
Research project: "Transformational Geometry in 3-Space," Fall 2004.

8. Joel Mohler
Honors Thesis: Distance Minimizing Paths on Certain Simple Flat Surfaces With Singularities, Dec 02; 2003; Winner of EPADEL 2003 student paper competition. Published in Pi Mu Epsilon J., Spring 2008.

7. Heather Armstrong
Research project: "Archimedean Solids and the Euler Characteristic," Spring 2001.

6. Sheila Haller
Honors Thesis: The Ornamental Groups of the Plane," May 06.

5. Michael Fisher
Research project: "MIRA Constructible Numbers and Angle Trisection," Spring 1995

4. Trina Bishop
Research project: "Obstructions to Deformations of DG k-Modules," Published in Proc. AMS, 129 No. 12 (2001), 3447-3452.

3. Susan Raught
Honors Thesis: "The Angle Trisection Problem," May 1991.

2. Dean Balach
Honors Thesis: "Simplicial Homology," May 1987.

1. Cynthia Cuddy
Honors Thesis: "Balloons and Other Surfaces: The Euler Characteristic and Simplicial Homology," May 1987.

Ph.D. Thesis Committees

4. Member, Examination Jury for Helena Molina-Abril's Ph.D. dissertation defense, University of Seville, Seville, Spain, June 2012

3. Member, Examination Jury for Mikael Vejdemo Johansson's Ph.D. dissertation defense, Friedrich Schiller University, Jena, Germany, July 2008.

2. Member, Examination Jury for Ainhoa Berciano Alcaraz's Ph.D. dissertation defense, University of Seville, Seville, Spain, October 2006.

1. President, Examination Jury for Maria José Jiménez's Ph.D. dissertation defense, University of Seville, Seville, Spain, June 2003.

Undergraduate Research Seminars Directed

5. "Periodic Orbits on a 30-30-120 Triangle," Ben Baer, David Brown, Faheem Gilani, John Pavoncello, Spring 2012
4. "Polygons that Tessellate the Plane When Reflected in Their Edges," Andrew Hall, Matthew Kirby, Joshua York, Spring 2009.
3. "Double Bubbles in the Three-Torus," N. Brubaker, S. Carter, S. Evans, D. Kravatz, S. Linn, S. Peurifoy, R. Walker, Spring 2007. Published in Math Horizons, April 2008.
2. "Periodic Orbits on a Triangular Air Hockey Table," A. Baxter, J. Gemmer, S. Laverty, S. Weaver, Spring 2003.
1. "Distance Minimizing Paths on a Soup Can," H. Armstrong, J. Mohler, A. Panofsky and R. Painter, Spring 2001.

Student Presentations Supervised

51. Daniel Kravatz.
"Diagonal Approximations on an n -gon and the Cohomology Ring of Closed Compact Orientable Surfaces," MU Research Conference, April 2008.
- 49-50. Sean Evans.
"New A-infinity Bialgebra Operations," EPADEL, Cedar Crest College, April 2008
MU Research Conference, April 2008
- 43-48. N.Brubaker, S. Carter, S. Evans, D. Kravatz, S. Linn, S. Peurifoy, R. Walker
"Double Bubble Experiments in a Three-Torus,"
MU Research Conference, April 2008
Poster: MU SSM, April 2008.
EPADEL, Cedar Crest College April 2008
Moravian Student Mathematics Conference, February 2008
Poster: MU SSM, October 2007
MAA Student Speaker: MathFest 2007, San Jose, CA, Aug. 07.
- 42-47. Andrew Baxter.
"Periodic Orbits in Triangular Air Hockey,"
Talk: MathFest 2005
Talk: Math Awareness Month, MU Apr. 05
Talk: MU Undergraduate Research Conf., Apr. 05
Poster: MU SSM Apr 05
Poster: MU SSM, Oct 04

- Talk: Moravian Student Math Conf.,
Moravian College, Mar. 04.
41. Stephen Weaver.
“Computing the S-U Diagonal on
Permutahedra,”
Talk: Math Awareness Month, MU, Apr. 05.
- 31-40. John Gemmer.
“The Generalized Brachistochrone
Problem,”
Poster: MU SSM, May 06
Talk: Physics Educators Conf., Apr. 06
Poster: MU Student Research Conf., Apr. 06
Talk: EPADEL Student Paper Session,
Villanova U., Nov. 05
Talk: SSM Advisory Board
Oct. 26, 2005.
Poster: MU SSM Oct. 05.
MAA Student Speaker: MathFest 2005,
Albuquerque, NM, Aug. 05.
Talk: MU Undergraduate Research
Conference, Apr. 05.
Poster: MU SSM Apr. 05;
Talk: Math Awareness Month, MU, Apr. 05.
- 23-30. A. Baxter, J. Gemmer, S. Laverty, S. Weaver,
“Periodic Orbits in Triangular Air Hockey,”
Poster: MU SSM, May 04.
Talk: Student Math Conf, Moravian
College, Mar. 04
Talk: SSM Alumni and Retired Faculty,
Dec. 03
Poster: MU SSM, Nov 03
Talk: MAA Student Paper Session,
MathFest 2003, Boulder CO.,
Aug. 03 (Baxter/Weaver
Outstanding Presentation \$150)
Talk: MU SSM Research Recognition
Ceremony, May 03
Talk: EPADEL Student Paper Session,
Wilkes University, Apr 03;
Talk: Math Awareness Month, MU, Apr 03.
- 15-22. Joel Mohler.
“Distance Minimizing Paths on a Conical
Drinking Cup with Lid,”
Poster: SSM MU, Apr 03
Poster: AMS Student Poster Session,
Baltimore, Jan. 03.
Poster: SSM MU, Dec 02
Poster: SSM MU, Oct, 02
Talk: EPADEL Student Paper Session, U.
Penn, Oct. 02;
Talk: MU Colloquium, Fall 02
Poster: SSM MU, May 02
Talk: Math Awareness Month, MU, Apr 02
- 8-14. H. Armstrong, J. Mohler, A. Panofsky, R.
Painter.
“Distance Minimizing Paths on a Circular
Can”
Talk: Moravian Undergraduate Math Conf.,
Bethlehem PA, Mar. 02.
Talk: EPADEL Student Paper Session,
Lehigh U., Bethlehem PA, Oct. 01
Talks I, II, III, IV: MathFest 2001, Madison,
WI, Aug. 01; (Panofsky
Outstanding presentation \$150)
Talk: Math Awareness Month, MU, Apr. 01
7. Heather Armstrong.
“Archimedean Solids and the Euler
Characteristic,”
Talk: MU Colloquium, Spring 2001.
- 5-6. Sheila Haller.
“The Ornamental Groups of the Plane,”
Talk: MU Colloquium talk, Spring 96
Talk: EPADEL Student Paper Session,
MU, Spring 1996.
4. Michael Fisher.
“MIRA Constructible Numbers and Angle
Trisection,”
Talk: MU Colloquium, Spring 1995
3. Trina Armstrong
“Obstructions to Deformations of DG k-
Modules,”
Talk: MU Colloquium, Apr. 1995
2. Dean Balach.
“Simplicial Homology,”
Talk: MU Colloquium, May 1987
1. Cynthia Cuddy
“Balloons and Other Surfaces: The Euler
Characteristic and Simplicial
Homology,”
Talk: MU Colloquium, Apr. 1987

Student Awards

5. Andrew Baxter
2005 EPADEL Prize
Best undergraduate paper:
“Combinatorial properties of billiards on an
equilateral triangle.”
4. John Gemmer
2005 SIAM Student Research Prize
\$150 cash award for best undergraduate
research paper in applied mathematics:
“The generalized Brachistochrone problem”
3. Joel Mohler
2003 EPADEL Prize
Best undergraduate paper:
“Geodesics on a conical drinking cup with
lid.”
2. Andrew Baxter and Stephen Weaver
MathFest 2001
\$150 cash award for their presentation:
“Periodic orbits in triangular air hockey.”
1. Ellen Panofsky
MathFest 2001
\$150 cash award for her presentation:
“Distance minimizing paths on a circular
can that cross the rim twice.”

Cooperative Education Students Supervised

- Dean Balach
NASA, Summer 1987
- Timothy Wiegand
TELENET, Summer 1988

Lecture Notes Created

“Computational Homology: An Algorithm,” text material for Independent Study in Topology, Spring 1987

“Elementary Differential Geometry, text material for course by same name,” Spring 2003 (4th revision).

Book in Preparation

Transformational Plane Geometry (six chapters written; five classroom tested).

New/Revised Program/Course Proposals Authored

MATH 457 -- Elementary Differential Geometry
University approval: Spring 1986
First offered: Spring 1988

MATH (220) 310 -- Introduction to Math.Proof
University approval: Fall 1988
First offered: Spring 1989
Approved as a writing "W" course: Summer 1990

MATH (242) 342 – Linear Algebra I
Expanded from 3 to 4 credits
University Approval: 1986
First offered: Fall 1986

Masters in Mathematics Education (M.Ed.)
University Approval:
First implemented:

Publications Written with Students

6. “Edge Tessellations and Stamp Folding Puzzles” (with M. Kirby), Mathematics Magazine, **84** (2011) 283–289; arXiv: 0908.3257.
5. “Double Bubble Experiments in the Three-Torus,” N. Brubaker, S. Carter, S. Evans, D. Kravatz, S. Linn, S. Peurifoy, R. Walker, Math Horizons, April 2008, 18-21.
4. “Generalizations of the Brachistochrone Problem,” J. Gemmer, Pi Mu Epsilon J., **13** (4) (2011) 207-218, arXiv:math-ph/0612052.
3. “Periodic Orbits of Billiards on an Equilateral Triangle,” Andrew Baxter, Am. Math. Monthly, **115** (8) (2008) 479-491; arXiv:math.DS/0509292.
2. “Minimal Paths on Some Simple Surfaces with Singularities,” J. Mohler, Pi Mu Epsilon J., **12** (8) (2008) 461-472; arXiv:math.DG/0401096.
1. “Obstructions to Deformations of DG Modules,” T. Armstrong, Proceedings of the American Mathematical Society **129** (12) (2001) 3447-3452.

Publications

25. “Non-operadic Operations on Loop Cohomology,” J. Math. Sci., in press; arXiv:1108.5693
24. “Edge Tessellations and Stamp Folding Puzzles” (with M. Kirby), Mathematics

Magazine, **84** (2011) 283–289.

23. “Using A-infinity Operations to Distinguish Between 4D Digital Images,” (with P. Real and H. Molina-Abril), in preparation.
22. “Computing the A_∞ -Coalgebra Structure on Homology (with H. Molina-Abril, M. J. Jiménez and P. Real), in preparation.
21. “Morphisms of A_∞ -Bialgebras and Applications,” (with S. Saneblidze), J. Homology, Homotopy and Appl., to appear; arXiv: 1106.5090.
20. “Tensor Products of A-infinity Algebras with Homotopy Inner Products” (with T. Tradler), Trans AMS, to appear; arXiv: 1102.0047.
19. “Computing Cup Products on Cellular Complexes” (with R. Gonzalez-Diaz), submitted January 2011.
18. “ A_∞ -Bialgebras of Type (m,n) ,” (with A. Berciano), submitted June 2009; arXiv:0908.0674.
17. “Edge Tessellations and Stamp Folding Puzzles” (with M. Kirby), Mathematics Magazine, **84** (2011) 283–289; arXiv: 0908.3257.
16. “Cup Products on polyhedral Approximations of 3D Digital Images” (with R. Gonzalez-Diaz and J. Lamar), Lecture Notes in Computer Science, **6636** (2011), 107-119.
15. “Generalizations of the Brachistochrone Problem,” J. Gemmer, Pi Mu Epsilon J., **13** (4) (2011) 207-218, arXiv:math-ph/0612052.
14. “Matrads, Biassociaheda, and A_∞ -Bialgebras, (with Samson Saneblidze), J. Homology, Homotopy and Appl., **13** (1) (2011) 1–57; arXiv:math.AT/0508017.
13. “Higher Homotopy Hopf Algebras Found: A Ten Year Retrospective,” Higher Structures in Geometry and Physics in honor of M. Gerstenhaber and J. Stasheff, Cattaneo, Giaquinto and Xu Eds., Progress in Math. 287, Birkhauser, New York, 2011, 343-362; arXiv:709.3436.
12. “Some Naturally Occurring Examples of A_∞ -Bialgebras,” (with A. Berciano), J. Pure and Applied Algebra, **215** (2011) 1284–1291; arXiv:0706.0703.
11. “Open Questions Related to A_∞ -Structures in a Computational Framework,” (with A. Berciano and M. J. Jiménez), Contribuciones Científicas en honor de Mirian Andres Gomez, Lamban and Rubio, eds, Universidad de La Rioja, Servicio de Publicaciones, 2010, 171-177.
10. “Periodic Orbits of Billiards on an

Equilateral Triangle,” (with Andrew Baxter), Am. Math. Monthly, **115** (8) (2008) 479-491; arXiv:math.DS/0509292.

9. “Structure Relations in Special A_∞ -Bialgebras,” J. Mathematical Sciences, **152** (3), (2008) 443-450; arXiv:math.AT/0506446.
8. “Minimal Paths on Some Simple Surfaces with Singularities,” (with J. Mohler), Pi Mu Epsilon J., **12** (8) (2008) 461-472; arXiv:math.DG/0401096.
7. “The Biderivative and A_∞ -Bialgebras,” (with S. Sanedlidze), J. Homology, Homotopy and Applications, **7** (2) (2005) 161-177.
6. “A Diagonal on the Permutahedra, Multiplihedra and Associahedra,” (with S. Sanedlidze) Journal of Homology, Homotopy and Applications, **6** (1) (2004) 363-411.
5. “ A_∞ -Structures: An ISPM Conference Theme,” (with T. Lada) International School in Physics and Mathematics Annual Report 2000, UNESCO Venice Office and The Georgian Academy of Sciences, (2001) 38-40.
4. “Obstructions to Deformations of DG Modules,” (with T. Armstrong) Proceedings of the American Mathematical Society **129** (12) (2001) 3447-3452.
3. “The Deformation Complex for Differential Graded Hopf Algebras,” J. of Pure and Applied Algebra **106** (1996) 199-222.
2. “Rational Spaces with Cohomology of Stunted Projective Space,” (with G. Lupton), The Canadian Journal of Mathematics **44** (6) (1992) 1241-1261.
1. “Homotopy Conditions that Determine Rational Homotopy Type,” Journal of Pure and Applied Algebra **60** (2) (1989) 205-217.

Unpublished Manuscripts

2. “A Diagonal on the Associahedra,” (with S. Sanedlidze), preprint math.AT/0011065, 2000.
1. “In Search of Higher Homotopy Hopf Algebras,” unpublished manuscript, 1996.

Papers Presented at Professional Meetings

31. “Non-operadic Operations on Loop Cohomology”, Satellite Conference on Homotopy Theory, M.I.T., Jan.5, 2012
30. “Non-operadic Operations on Loop Cohomology”, International Conference on Modern Algebra and its Applications, U. Batumi, Rep. of Georgia, Sept. 19-25, 2011
29. “Tensor Products of A-infinity Algebras with Higher Homotopy Inner Products,” AMS Special Session on Physically Inspired Higher Homotopy Algebra, College of the

Holy Cross, Worcester, MA, April 9-10, 2011

28. “ A_∞ -Bialgebras of Type (m,n) ,” Contributed paper, Joint Math Meetings, San Francisco, January 2010
27. “On the Transfer of Structure from Chains to Homology,” British Topology Meeting, Univ. of Leicester, September 2009.
26. “Computing the Transfer of A_∞ -Structure from Chains to Homology,” Advanced School on Algebraic Geometry and Homotopy Theory, Univ. of Seville, September 2009
25. “On the Transfer of Multiplicative Structure from Chains to Homology,” Lehigh Geometry-Topology Conference, June 2009
24. “The Homology of a DG Bialgebra is an A_∞ -Bialgebra,” AMS Meeting #1048: 2009 Spring Southeastern Section Meeting, NCSU, Raleigh, North Carolina, April 2009
23. “Matrads, Matrahedra and A_∞ -Bialgebras,” Workshop on Algebraic Structures in Geometry & Physics, U. Leicester, England July 2008
22. “Examples of A_∞ -Bialgebras,” (A. Berciano, presenter) XIV Encuentro de Topología, Granada, Spain, November 2007
21. “Some Naturally Occurring Examples of A_∞ -Bialgebras,” Lehigh Geometry-Topology Conference, October 2007
20. “The Hopf A_∞ -Coalgebra $H_*(Z,n;Z_3)$,” International Conference on Homology Theories, K-Theory, and Homotopy Theory, Tbilisi, Rep. of Georgia, May 2007.
19. “Applications of A_∞ -Bialgebras,” AMS Special Session on Moduli Spaces, U. Conn., Storrs, October 2006
18. “The A_∞ -Bialgebra Matron and its Polytopes,” Lehigh Geometry/Topology Conference, Lehigh University, Bethlehem, PA, June 2006.
17. “Structure Relations in Special A_∞ -Bialgebras,” AMS Special Session on Homotopy Theory honoring Don Davis and Martin Bendersky on their 60th birthdays, U. Del. Apr. 3, 2005.
16. “The Interaction Between A_∞ -Algebra Operations and a Coassociative Coproduct,” Conference on Algebraic Models of Topological Spaces and Fibrations, International School of Physics and Mathematics, Tbilisi, Republic of Georgia, Sept. 2004
15. “The Biderivative and A_∞ -Hopf Algebras,” AMS Special Session on Homotopy Algebra, Seville, Spain, June 2003
14. “Permutahedral Sets,” AMS Special Session on

Homotopy Theory, Baltimore, January 2003

13. "A Diagonal on the Associahedra and Permutohedra Sets," Conference on Algebraic Models of Topological Spaces and Fibrations, International School of Physics and Mathematics, Tbilisi, Republic of Georgia, September 2002
12. "Permutohedra, Associahedra and A_∞ -Hopf Algebras," Lehigh Geometry/Topology Conference, Lehigh University, Bethlehem, PA, June 2001
11. "A Diagonal on the Associahedra and A_∞ -Hopf Algebras," Conference on Algebraic Models of Topological Spaces and Fibrations, International School of Physics and Mathematics, Tbilisi, Republic of Georgia, September 2000
10. "In Search of Higher Homotopy Hopf Algebras," Conference on Higher Homotopy Structures in Topology and Mathematical Physics, Vassar College, Poughkeepsie, NY, June 1996.
9. "The Deformation Complex for Differential Hopf Algebras," Joint Meetings of the AMS-MAA-SIAM, Cincinnati, Ohio, January 1994.
8. "Deformation Theory and Rational H-spaces," AMS Special Session on Algebraic Topology, AMS Regional Meeting, Lehigh University, Spring 1992.
7. "Rational Homotopy Types with the Rational Cohomology of Stunted Complex Projective Space," AMS Special Session on Algebraic Topology, AMS Regional Meeting, Penn State University, Spring 1990.
6. "A Spectral Sequence for Classifying Rational Homotopy Type," Centennial Celebration of the AMS, Providence, R.I., Summer 1988
5. "A Spectral Sequence for Classifying Rational Homotopy Type," Lehigh Geometry/Topology Conference, Lehigh University, June 1988
4. "An Algorithm for Computing the Kernel of Transgression mod 2," Conference on Computers in Geometry and Topology, University of Illinois at Chicago, Spring 1986
3. "A Symbolic Solution of mod 2 Linear Vector Equations," Johns Hopkins University, Regional meeting of the AMS, Spring 1986
2. "An Alternative to Row Reduction for mod 2 Systems of Equations," MAA Kansas Section Meeting, Bethel College, N. Newton, KS, March 1984.

1. "Aspects of the Moebius Transformation," Summer meeting of Pi Mu Epsilon, Dartmouth College, Hanover, NH, Summer 1972

Invited Lectures (Seminars, Colloquia, Special Events)

50. "On the Transfer of Multiplicative Structure from Chains to Homology," Penn State U. Topology/Geometry Seminar, March 2012.
49. "Mathematical Research Experiences for Undergraduates at Millersville University," MAA Eastern PA and Delaware Section Meeting, Bryn Mawr College, November 19, 2011.
48. "Matradic Operations on Loop Cohomology," Deformation Theory Seminar, Univ. of Pennsylvania, August 2011.
47. "Mathematical Research Experiences for Undergraduates at Millersville University," MU Math Club, November 2010.
46. "Tensor Products of A -infinity Algebras with Higher Homotopy Inner Products," Deformation Theory Seminar, Univ. of Pennsylvania, October 2010.
45. "Mathematical Research Experiences for Undergraduates at Millersville University," Hesston College Science and Mathematics Symposium, Hesston College, Sept. 2010.
44. "On the A_∞ -Bialgebra Structure of Loop Space Homology," Algebra Seminar, Univ. of Seville, May 2010.
43. "On the A_∞ -Bialgebra Structure of Loop Space Homology," Topology Seminar, Univ. of Stockholm, May 2010.
42. "On the A_∞ -Bialgebra Structure of Loop Space Homology," Deformation Theory Seminar, Univ. of Pennsylvania, March 2010.
41. "Edge Tessellations and the Stamp Folding Problem," Mathematics Colloquium, Vassar College, February 2010.
40. "On the A_∞ -Bialgebra Structure of Loop Space Homology," Topology Seminar, Stanford Univ., January 2010.
39. "Edge Tessellations and the Stamp Folding Problem," Mathematics Colloquium, Eastern Mennonite Univ., November 2009.
38. "New Projects in Digital Image Recognition," Digital Topology Seminar, Univ. of Seville, October 2009
37. "Computing the Transfer of A_∞ -Structure from Chains to Homology," Digital Topology Seminar, Univ. of Seville, September 2009
36. "On the Pullback of Multiplicative Structure Along a Quasi-Isomorphism," Institute of

Mathematics of the Academy of Sciences of the Czech Republic, Topology seminar, Prague, Czech Republic, May 2009

35. "Tessellations Generated by Reflections," Dickenson College Mathematics Colloquium, April 2009.
 34. "On the Pullback of Multiplicative Structure Along a Quasi-Isomorphism," Deformation Theory Seminar, Univ. of Pennsylvania, March 2009
 33. "Matrads, Matrahedra and A_∞ -Bialgebras," Topology/Geometry Seminar, Univ. of the Basque Country, Leioa, Spain, July 2008.
 32. "Matrads, Matrahedra and A_∞ -Bialgebras," Algebra seminar, Friedrich Schiller University, Jena, Germany, July 2008.
 31. "Matrads, Matrahedra and A_∞ -Bialgebras," Deformation Theory Seminar, Univ. of Pennsylvania, July 2008.
 30. "Tensor Products of A_∞ -Algebras and Group Cohomology," Penn State University Topology/Geometry Seminar, April, 2008.
 29. "Higher Homotopy Hopf Algebras Found: A Ten Year Retrospective," U. Penn Deformation Theory Seminar, September, 2007.
 28. "Some Naturally Occurring Examples of A_∞ -Bialgebras," Topology/Geometry Seminar, Univ. of the Basque Country, Leioa, Spain, June 2007.
 27. "The Hopf A_∞ -Coalgebra $H_*(\mathbb{Z}_n; \mathbb{Z}_3)$," U. Penn. Deformation Theory Seminar, March 2007.
 26. "The Combinatorics of KK ," U. Penn. Deformation Theory Seminar, August 2006.
 25. "Making the Most of graduate School," Panelist: "Undergraduate Research as a Preview of Graduate School," Lehigh University, April 2006.
 24. "The A_∞ -Bialgebra Matron and its Polytopes," U. Penn. Deformation Theory Seminar, May 2006.
 23. "Minimal Paths on a Witches Hat: An Invitation to Undergraduate Research," Susquehanna Univ., Fall 2003.
 22. "A Diagonal on the Permutahedra and Permutahedral Sets," U. Penn. Deformation Theory Seminar, Summer 2003
 - 20-21. "Canonical Cochain Operations on Permutahedra, I, II," U. Penn. Deformation Theory Seminar, Spring 2003
 19. "From GS-Cohomology to A_∞ -Hopf Algebras," U. Penn. Deformation Theory Seminar, Spring 2002
 18. " A_∞ -Hopf Algebras," Colloquium, University of Seville, January 2002.
 17. "Tensor Products in the A_∞ -Category," Colloquium, University of Seville, Jan. 02
 16. " A_∞ -Hopf Algebras," Seminar in Algebraic Topology, University of North Carolina at Chapel Hill, Spring 2000
 15. " A_∞ -Hopf Algebras," Lehigh University Mathematics Colloquium, Spring 1999
 - 13-14. "Deformations of Hopf Algebras I,II," U. Penn. Deformation Theory Seminar, Fall 1997
 12. "In Search of Higher Homotopy Hopf Algebras," U. Penn. Deformation Theory Seminar, Summer 1997
 11. "The Deformation Complex for DG Hopf Algebras," U. Penn. Deformation Theory Seminar, Spring 1993
 10. "Stokes' Theorem and a Topological Invariant," Colloquium, Messiah College, Fall 1991
 9. "Networks and the Regular Polyhedra," Colloquium, Messiah College, Fall 1991
 8. "Classical Constructibility Problems: Trisecting an Angle and Doubling a Cube," Colloquium, Bucknell University, Spring 1989
 7. "Space-time and Special Relativity," Pi Mu Epsilon Banquet, Elizabethtown College, Spring 1989.
 6. "Cohomological Obstructions to Multiplications," Job Talk, James Madison University, Spring 1984
 5. "Tiling Space Shuttles and Other Objects," Job Talk, Millersville University, Spring 1984
 4. "Networks and the Regular Polyhedra," Colloquium, Eastern Mennonite College, Fall 1984
 3. "Seminar in Differential Geometry," Bethel College, N. Newton, KS, Spring 1983
 2. "Seminar in Topology," Bethel College, N. Newton, KS, Spring 1982
 1. "What is Topology?" Colloquium, Eastern Mennonite Univ., Spring 1981
- Local Colloquium Lectures**
45. "Non-operadic Operations on Loop Cohomology", TGTS, December 2011
 44. "Stamp Folding Puzzles: Delightful Excursions in Recreational Geometry," MU/F&M Joint Mathematics Colloquium, April 2011.
 43. "Tensor Products of A-infinity Algebras with Homotopy Inner Products," TGTS, February

- 2011.
42. "The Linear Algebra of Space-Time: Computing Length Contraction and Time Dilation Near the Speed of Light," MU/F&M Joint Mathematics Colloquium, November 2010.
 41. "Tessellations generated by reflections," MU/F&M Colloquium, March 2009.
 40. "The S-U Diagonal on Associahedra," MU/F&M Colloquium, February 2008.
 39. "Some Naturally Occurring Examples of A_∞ -Bialgebras," TGTS, October 2007
 38. "The Sierpinski Fractal and Binomial Coefficients mod 3," MU/F&M Colloquium, Spring 2007
 37. "Math Honors Theses: Past, Present and Future," MU/F&M Colloquium, Spring 2006
 36. "Non-Sigma Operads with a Twist of Matrons," Tetrahedral Geometry/Topology Seminar, Spring 2006
 35. "Drinfeld Algebras as Deformations of Hopf Algebras," Triangle Geometry/Topology Seminar, Fall 2004
 34. "Some New Cochain Operations on Permutahedra," Triangle Geometry/Topology Seminar, Fall 2004
 33. "The Combinatorics of Permutahedra," F&M College, Spring 2004
 32. "The Canonical Cup Product on a Polytope," Triangle Geometry/Topology Seminar, Spring 2003
 31. "Permutahedra Project to Associahedra," F&M College, Spring 2001
 30. "Homotopy Associativity and Planar Rooted Trees," F&M College, Fall 2000
 29. "Edge-Coloring the Cube and the Homology of a Triple Complex," F&M College, Fall 1999
 28. "Associativity Viewed Through a Topologist's Glasses," F&M College, Spring 1999
 27. "An Edge-Coloring Problem," F&M College, Fall 1998
 26. "Algebraic Homotopy Theory," MU, Spring 1998
 25. "Some Surprising Properties of 2-Dimensional k-Algebras," Spring 1997
 24. "Linear Duality and Matrix Transpose," F&M College, Fall 1995
 23. "Another Look at Associativity," F&M College, Spring 1995
 22. "Deformation Theory from Scratch," F&M College, Fall 1993
 21. "Algebraic Deformation Theory in Topology," F&M College, Fall 1992
 20. "Vector spaces, Multiplications, and Duality," MU, Spring 1992
 19. "An Elementary Proof of the Fundamental Theorem of Algebra," MU, Fall 1991
 18. "Minimal models, Perturbations, and Rational Homotopy Type," MU, Fall 1989
 17. "Classical Constructibility Problems in Geometry," MU, Spring 1989
 16. "Some Multilinear Algebra for Mathematical Physics," MU, Fall 1988
 15. "Volume of Parametrized n-Surfaces in R^m ," MU, Spring 1988
 14. "Space-time and Special Relativity," MU, Fall 1987
 13. "Algebraic Topology from a Calculus Point of View," MU, Spring 1987
 12. "Classification: A Central Mathematical Issue," MU, Fall 1986
 11. "Mathematical Text Processing with the IBM PC: An Introduction to EXACT," MU, Fall 1986
 10. "Mod 2 Linear Systems Solved Recursively," MU, Spring 1986
 9. "Recursion in Symbolic Algebra," MU, Fall 1985
 8. "The Geometry of Curves in 3-space," MU, Fall 1985
 7. "The Curvature of a Surface in 3-space," MU, Fall 1985
 6. "The Non-existence of Continuous Maps of the Disk to its Boundary," MU, Spring 1985
 5. "The Classical Lie Groups," MU, Fall 1984
 4. "The Classical Lie Algebras," MU, Fall 1984
 3. "From Euclid to Escher: Hyperbolic Geometry and Circle Limit IV," Hesston College, Fall 1983
 2. "An Invitation to Topology," Hesston College, Fall 1981
 1. "Bordism," Univ. of North Carolina, Spring 1980

Research Consulting and Visitorships

Research consultant: University of Stockholm, Stockholm, Sweden, May 2010.

Research consultant: Stanford University,
Palo Alto, CA, January 2010.

Research consultant: Charles University, Prague,
Czech Republic, April 2009, April 2010

Research consultant: Fredrich-Schiller University-
Jena, Jena, Germany, June 2008

Research consultant: University of the Basque
Country, Leioa, Spain, June 2007, July
2008, May 2010.

Research consultant: University of Seville, Seville,
Spain, January 2002, June 2003, October
2006, Fall 2009, May 2010

Visitor: University of North Carolina, Chapel Hill,
NC, Spring Semester 2000

Consultant: NSF Consultation on Symbolic
Computation, University of North Carolina,
October 1985

Workshops Led

- 9-18. "Fractals Everywhere," MU Summer Science
Training Program (track 2), each summer
1994 – 2003
8. "Fractals Everywhere," for IU-13 gifted 6-8,
MU, December, 2001
- 6-7. "Transformational Geometry: An Activity-
based Course for Teacher Preparation,"
Collaborative for Excellence in Teacher
Preparation, at MU, Spring 2001 and at
Bloomsburg University, Summer 2001.
- 4-5. "Fractals Everywhere," Project Forward Leap,
MU, Nov 99, Dec 99
3. "Transformational Geometry in the High School
Curriculum," Shippensburg University,
Summer 1999
2. "Transformational Geometry in the Middle
School Curriculum," Shippensburg
University, Summer 1999
1. "Technical Typesetting: EXACT and Your Word
Processor," PCTM Workshop, Harrisburg,
Pa., Spring 1987

Books Reviewed for Publishers

For Holt, Rinehart and Winston:
The IBM Personal Computer: Organization
and ASSEMBLY Language Programming,
by M. A. Franklin, Summer 1984

Participation in Seminars

Regular participant in the U. Penn Deformation
Theory Seminar

Regular participant in the Tetrahedral Geometry/
Topology Seminar

Participation in Conferences and Professional Meetings

77. Joint Meetings of the AMS, MAA, and SIAM,
Boston, January 2012
76. MAA Eastern PA and Delaware Section
Meeting, Bryn Mawr College, Nov. 2011
75. International Conference on Modern Algebra and
its Applications, U. Batumi, Rep. of
Georgia, Sept. 19-25, 2011
74. U. Penn Geometry Festival, April 15-17, 2011.
73. Eastern Sectional Meeting of the AMS, College
of the Holy Cross, Worcester, MA, April 9-
10, 2011.
72. Joint Meetings of the AMS, MAA, and SIAM,
San Francisco, January 2010
71. British Topology Meeting, University of
Leicester, England, September 2009
70. Advanced School on Homotopy Theory and
Algebraic Geometry, Univ. of Seville,
Spain, September 2009.
69. AMS Meeting #1048: 2009 Spring Southeastern
Section Meeting, NCSU, Raleigh, North
Carolina, April 2009
68. Joint Meetings of the AMS, MAA, and SIAM,
Washington D.C., January 2009
67. Workshop on Algebraic Structures in Geometry
& Physics, University of Leicester, England
July 2008
66. MAA Eastern PA and Delaware Section
Meeting, Cedar Crest College, April 2008
65. Moravian Student Research Conference,
February 2008
64. Lehigh Geometry/Topology Conference, Lehigh
University, October 2007
63. International Conference on Homology Theories,
K-Theory and Homotopy Theory, Tbilisi,
Rep. of Georgia, May 2007.
62. AMS Special Session on Moduli Spaces, U.
Conn., Storrs, October 2006
61. Lehigh Geometry/Topology Conference, Lehigh
University, June 2006
60. Making the Most of Graduate School
Lehigh University, April 2006.
59. MAA Eastern PA and Delaware Section
Meeting, Villanova U., November 2005
58. AMS Special Session on Homotopy Theory,
University of Delaware, Spring 2005.
57. SHEE-MA Conference, MU, Spring 2005.
56. MAA Eastern PA and Delaware Section

- Meeting, University of Delaware, November 2004
55. Conference on Algebraic Models of Topological Spaces and Fibrations, International School of Physics and Mathematics, Tbilisi, Republic of Georgia, Sept. 2004
 54. Moravian College Undergraduate Research Conference, Moravian College, March, 2004
 53. MAA Eastern PA and Delaware Section Meeting, Franklin & Marshall College, October 2003
 52. MathFest 2003, Boulder Colorado, August 2003
 51. First Annual Joint Meeting of the AMS and RSME, Seville, Spain, June 2003.
 50. Joint Meetings of the AMS-MAA-SIAM, Baltimore, January 2003
 49. MAA Eastern PA and Delaware Section Meeting, U. Penn, October 2002
 48. Conference on Algebraic Models of Topological Spaces and Fibrations, International School of Physics and Mathematics, Tbilisi, Republic of Georgia, Sept. 2002
 47. Moravian College Undergraduate Research Conference, Moravian College, March, 2002
 46. MAA Eastern PA and Delaware Section Meeting, Lehigh University, October 2001
 45. Collaborative for Excellence in Teacher Preparation, Bloomsburg University, August 2001
 44. MathFest 2001, Madison, Wisconsin, August 2001
 43. Lehigh Geometry/Topology Conference, Lehigh University, June 2001
 42. Conference on Algebraic Models of Topological Spaces and Fibrations, International School of Physics and Mathematics, Tbilisi, Republic of Georgia, Sept. 2000
 41. Joint meetings of the AMS-AMS-SIAM, Washington D.C., January 2000
 40. MAA Eastern PA and Delaware Section Meeting, Elizabethtown College, Fall 1999
 39. Joint meetings of the AMS-AMS-SIAM, Baltimore, MD, January 1998
 38. International Conference on Technology in Mathematics, Chicago, Ill. Fall 1997
 37. MAA Eastern PA and Delaware Section Careers in Mathematics Conference, Millersville University, Fall 1997
 36. MAA Eastern PA and Delaware Section Meeting, Ursinus College, Spring 1997
 35. Joint meetings of the AMS-AMS-SIAM, San Diego, California, January 1997
 34. MAA Eastern PA and Delaware Section Meeting, Delaware State University, Fall 1996
 33. Conference on Higher Homotopy Structures in Topology and Mathematical Physics, Vassar College, Poughkeepsie, NY, June 1996
 32. MAA Eastern PA and Delaware Section Meeting, Millersville University, Spring 1996
 31. MAA Eastern PA and Delaware Section Meeting, Penn State Univ. Abington-Ogontz, Fall 1995
 30. Lehigh Geometry/Topology Conference, Lehigh University, June 1995
 29. MAA Eastern PA and Delaware Section Meeting, King's College, Spring 1995
 28. MAA Eastern PA and Delaware Section Meeting, Montgomery County Comm. College, Fall 1994
 27. Lehigh Geometry/Topology Conference, Lehigh University, June 1994
 26. Joint meetings of the AMS-MAA-SIAM, Cincinnati, Ohio, January 1994
 25. MAA Eastern PA and Delaware Section Meeting, Cedar Crest College, Fall 1993
 24. Hans Rademacher Lectures in Mathematics, U. Penn., Spring 1993
 23. MAA Eastern PA and Delaware Section Meeting, Villanova University, Spring 1993
 22. MAA Eastern PA and Delaware Section Meeting, Muhlenberg College, Fall 1992
 21. AMS Regional Meeting, Lehigh University, Spring 1992
 20. Joint meetings of the MAA/AMS, Baltimore, January 1992
 19. Lehigh Geometry/Topology Conference, Lehigh University, June 1991
 18. AMS-IMS-SIAM Joint Summer Research Conference on Deformation Theory and Applications in Physics, Univ. of Mass. at Amherst, Summer 1990
 17. AMS Regional Meeting, Penn State University, Spring 1990
 16. MAA Eastern PA and Delaware Section Meeting, Millersville Univ., Fall 1989

15. Conference on Computers in Mathematics, M.I.T., Cambridge, Mass., Summer 1989
14. Lehigh Geometry/Topology Conference, Lehigh University, June 1989
13. MAA Eastern PA and Delaware Section Meeting, Univ. of PA, Spring 1989
12. U.S. - U.S.S.R. Symposium on Mathematics and its Applications to Physics, U. Penn., Fall 1988
11. Centennial Celebration of the AMS, Providence, R.I., Summer 1988
10. Lehigh Geometry/Topology Conference, Lehigh University, June 1988
9. Hans Rademacher Lectures in Mathematics, U. Penn., Spring 1988
8. Joint meetings of the AMS-MAA-SIAM, Atlanta, GA, January 1988
7. MAA Eastern PA and Delaware Section Meeting, F&M College, Fall 1987
6. Lehigh Geometry/Topology Conference, Lehigh University, June 1987
5. Joint Meetings of the AMS-MAA-SIAM, San Antonio, TX, January 1987
4. AMS Regional Meeting, Johns Hopkins University, Spring 1986
3. Lehigh Geometry/Topology Conference, Lehigh University, June 1986
2. Conference on Computers in Geometry and Topology, University of Illinois at Chicago, Spring 1986
1. MAA Eastern PA and Delaware Section Meeting, Temple University, Fall 1985

In-service Workshops Attended

- “Diversity: Building a High Performance Community,” February 2008.
- “On the Development and Implementation of Web-based Courses,” Summer 1998
- “On Cultural Diversity,” June 1993.

Service Activities

Professional

- Referee for Professional Journals
 American Mathematical Monthly
 Forum Mathematicum
 Journal of Pure and Applied Algebra
 Mathematische Annalen
 Transactions of the AMS
 Journal of Homology, Homotopy, and Appl.

Coordinator, Tetrahedral Geometry/Topology

Seminar, Spring 2003 – present

Member, Promotion and Tenure Review Committee, MU Dept. of Physics, Spring 2012

Chair, External Program Reviewer, Lebanon Valley College Dept. of Mathematical Sciences, October 2008

Chair, External Program Reviewer, Messiah College Dept. of Mathematical Sciences, March 2008

External Reviewer for Tenure & Promotion to Associate Professor. Dr. Bogdan Doychinov, Dept. of Math. Elizabethtown College, Fall 2010

External Reviewer for Promotion to Professor Dr. David Lyons, Dept. of Math. Lebanon Valley College, Spring 2009

External Reviewer for Promotion to Professor Dr. James Hughes, Dept. of Math. Elizabethtown College, Fall 2009

External Reviewer for Tenure & Promotion to Associate Professor. Dr. Leyla Batacki, Dept. of Math. Elizabethtown College, Fall

Member, Executive Board, Eastern PA and Delaware Section of the Mathematical Association of America, 1995-1998

Millersville University

Commencement marshal, May 2008, December 2008, May 2009

University-wide Committees:

- Chair, MU Self-Study Working Group #3: Integrity Spring 2008-Spring 2009.
- Member, Andre Watts Steering Committee, Fall 2005 – Spring 2006
- Chair, Task Force on Adult Continuing Education, Fall 2003 – Spring 2006
- Member, Task Force on Adult Continuing Education, Spring 2003
- Member, University Honors Committee, 1997-2002
- Member, Commission on Cultural Diversity, 1995-99; Secretary/Treasurer, 1996-97; Treasurer, 1997-99
- Member, Commencement Speaker Committee, 1993-95
- Member, Undergraduate Course and Program Review Committee, 1985-87, 1989-91
- Member, Ad Hoc Computer Upgrade Committee, 1986

School of Science and Math Committees:

- Member, Wickersham Hall Renovation Committee, Spring 2003 - 2006
- Member, SSMA Advancement Committee, Fall 2003 – Spring 2009
- Member, School of Science and Math Curriculum Committee, Spring 1996
- Member, Honors Perspectives Committee, 1988-90

Departmental Committees:

Chair, Math Assessment Committee, 2003-2008

Chair, Promotion & Tenure Committee, 2003-04
 Chair, Wickersham Hall Renovation Committee
 1998-99
 Chair, Graduate Curriculum Committee, 1989-
 2009
 Chair, Dept. Strategic Directions Committee,
 1989-94
 Chair, Social Committee, 1987-93
 Chair, Math Faculty Search Committees,
 1987-88 (Dr. Dorothee Blum)
 1990-91 (Dr. Ximena Catepillan)
 1993-94 (Dr. Bruce Ikenaga)
 2001-02 (Dr. Roxana Costinescu)
 Chair, UCC Subcommittee on Geometry, 1988-89
 Member, Math Assessment Committee, 2008-09
 Member, Social Committee, 1993-2009
 Member, Wickersham Hall Renovation Committee
 1999-2006
 Member, Math Awareness Month Committee, 1995-
 2009
 Member, Math Faculty Search Committee,
 1986-87 (Dr. Robert Smith)
 1987-88 (Dr. Dorothee Blum)
 1990-91 (Dr. Ximena Catepillan)
 1993-94 (Dr. Bruce Ikenaga)
 2001-02 (Dr. Roxana Costinescu)
 2004-05 (Dr. Antonia Cardwell)
 2006-07 (Dr. Elizabeth Sell)
 2008-09 (Dr. Zhigang Han)
 Member, Evaluation Committee, 1993-96, 97-
 Spring 2009, Fall 2010 - present
 Member, Math Curriculum Committee, 1984-90
 Member, Dept. Strategic Directions Committee,
 1986-88
 Member, UCC Subcommittees:
 On the content of geometry courses, Fall
 1993
 On the content of advanced calculus, Fall
 1989
 On Computers in Math Instruction, Fall
 1988
 On Business Calculus, Fall 1988
 For Selection of Calculus Text, Spring 1988
 For Revitalization of the M.Ed. Program,
 1988-89
 Member, High School Math Contest Committee,
 1985-94

Other assignments and projects:

Coordinator, TGTS Lecturer in Mathematics,
 Dr. Robert Christ, U. Penn, April 2012.
 Coordinator, MU Math Honors and Awards Banquet
 Speaker, Dr. Alissa Crans, April 2012.
 Coordinator, MU/F&M Math Colloquium Speaker,
 Dr. Micah Miller, Southern Connecticut
 State U., March 2012.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Janet Talvacchia, Swarthmore College,
 Feb. 2012.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. John Terilla, CUNY, Nov., 2011.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Paul Melvin, Bryn Mawr College,
 October 2011.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Dusa McDuff, Columbia Univ., April
 2011.
 Coordinator, MU/F&M Math Colloquium Speaker,
 Dr. Ryan Martin, Iowa State Univ.,
 November 2010.

Coordinator, TGTS Lecturer in Mathematics,
 Dr. Ethan Berkove, Lafayette College,
 November 2010.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. John Meier, Lafayette College, October
 2010.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Gary Kennedy, Ohio State Univ.,
 September 2010.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. David Richeson, Dickinson College,
 April 2010.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. David Hurtubise, Penn State Univ. at
 Altoona, December 2009.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Ainhoa Berciano, Univ. of the Basque
 Country, July 2009.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. William Kronholm, Swarthmore
 College, April 2009.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Samuel Smith, St. Joseph's Univ.
 March 2009.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Ralph Gomex, Swarthmore College,
 February 2009.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. James Hughes, Elizabethtown College,
 December, 2008.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Christopher Steacker, Messiah College,
 November 2008.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. David Lyons, Lebanon Valley College,
 October 2008.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Matthew Miller, Bucknell Univ.
 September 2008.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Thomas Hunter, Swarthmore College.
 May 2008.
 Coordinator, MU/F&M Colloquium speaker,
 Dr. Christopher Steacker, Messiah College,
 April 2008.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. David Richeson, Dickenson College.
 April 2008
 Coordinator, MU/F&M Colloquium speaker,
 Dr. Mikael Johansson, Friedrich Schiller
 Univ., Jena, Germany, March 2008.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Bogdan Doytchinov, Elizabethtown
 College, February 29, 2008.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Michael McCooey, F&M College,
 February 1, 2008
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Angela Gibney, U. Penn.
 November 30, 2007
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Elizabeth Sell, Millersville Univ.
 November 2, 2007
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. John Carter, F&M College, September
 2007.
 Coordinator, TGTS Lecturer in Mathematics,
 Dr. Frank Morgan, Williams College,
 April 2007
 Coordinator, MU/F&M Colloquium speaker,

Dr. Frank Morgan, Williams College,
April 2007

Coordinator, TGTS Lecturer in Mathematics,
Dr. Andrew Hicks, Drexel Univ.,
March 2007

Coordinator, TGTS Lecturer in Mathematics,
Dr. Barbara Nimersheim, F&M College,
February 2007

Coordinator, TGTS Lecturer in Mathematics,
Dr. Ainhoa Berciano, Univ. of the Basque
Country, Jan 2007

Coordinator, MU/F&M Colloquium speaker,
Dr. Ainhoa Berciano, Univ. of the Basque
Country, Jan 2007

Coordinator, TGTS Lecturer in Mathematics,
Dr. John McCleary, Vassar College
Nov 2006

Coordinator, MU/F&M Colloquium speaker,
Dr. John McCleary, Vassar College
Nov 2006

Coordinator, TGTS Lecturer in Mathematics,
Dr. James D. Stasheff, U. Penn, Oct 2006

Coordinator, TGTS Lecturer in Mathematics,
Dr. Scott Walck, Lebanon Valley College,
Sept 2006

Coordinator, TGTS Lecturer in Mathematics:
Dr. David Yetter, Kansas State Univ.,
Spring 2006.

Coordinator, Visiting Lecturer in Mathematics:
Dr. David Richeson, Dickinson C., April
2006

Coordinator, TGTS Lecturer in Mathematics:
Dr. Atish Bagchi, CCP, Spring 2006.

Coordinator, Visiting Lecturer in Mathematics:
Dr. Neil Stoltzfus, LSU, Fall 2005.

Coordinator, Visiting Lecturer in Mathematics:
Dr. Donald Davis, Lehigh U., Fall 2005.

Coordinator, Visiting Lecturer in Mathematics:
Dr. Herman Gluck, U. Penn, Fall 2005.

Coordinator, TGTS Lecturer in Mathematics:
Dr. Kenneth Brakke, Susquehanna U.,
Spring 2005.

Coordinator, TGTS Lecturer in Mathematics:
Dr. David Johnson, Lehigh U. Spring 2005.

Coordinator, TGTS Lecturer in Mathematics:
Dr. Alexander Wilce, Susquehanna U.
Spring 2004

Coordinator, Visiting Lecturer in Mathematics:
Dr. Annalisa Crannell, F&M College,
Spring 2004.

Coordinator, Visiting Lecturer in Mathematics:
Dr. Dennis DeTurck, University of
Pennsylvania, Philadelphia, PA, Spring
2003.

Coordinator, Visiting Lecturer in Mathematics:
Dr. William Dunham, Muhlenberg College,
Allentown, PA, Spring 2002.

Coordinator, Visiting Lecturer in Mathematics:
Dr. Frank Morgan, Williams College,
Williamstown, MA, Spring 2001.

Coordinator, Visiting Lecturer in Mathematics:
Dr. Alexander Ulyanov, Univ. of PA,
Philadelphia, PA, Spring 2001

Coordinator, 5th annual Math Honors and Awards
Banquet, Spring 1999

Coordinator, Visiting Lecturer in Mathematics:
Dr: Rhonda Hughes, Bryn Mawr College,
Bryn Mawr, PA, Spring 1999.

Coordinator, Visiting Lecturer in Mathematics:

Dr. Frank Morgan, Williams College,
Williamstown, MA, Spring 1999

Coordinator, 4th annual Math Honors and Awards
Banquet, Spring 1998

Coordinator, Visiting Lecturer in Mathematics:
Dr. William Dunham, Muhlenberg College,
Allentown, PA, Spring 1998

Coordinator, MAA Eastern PA & Delaware Section
Biennial Careers in Math
Conference at MU, Fall 1997

Coordinator, 3rd annual Math Honors and Awards
Banquet, Spring 1997

Coordinator, Visiting Lecturer in Mathematics:
Dr. Doris Schattschneider, Moravian College,
Bethlehem, PA, Spring 1997.

Coordinator, Wickersham Hall showcase upgrade,
Spring 1996

Coordinator, 2nd annual Math Honors and Awards
Banquet, Spring 1996

Coordinator, MAA EPADEL section meeting at
MU, Spring 1996.

Coordinator, 1st annual Math Honors and Awards
Banquet, Spring 1995

Coordinator, Visiting Lecturer in Mathematics:
Dr. David Flesner, Gettysburg College,
Spring 1995.

Coordinator, Visiting Lecturer in Mathematics:
Dr. James Stasheff, UNC Chapel Hill, Fall
1992

Coordinator, MAA EPADEL section meeting at
MU, Fall 1989

Coordinator, Visiting Lecturer in Mathematics:
Dr. George Exner, Bucknell University, Fall
1989

Coordinator, Scholar in Residence: Dr. James
Stasheff, UNC Chapel Hill, Fall 1988

Coordinator, Visiting Lecturer in Mathematics:
Mr. Dennis Melvin, NASA, Fall 1987

Coordinator, Visiting Lecturer in Mathematics:
Dr. Dennis DeTurck, Univ. of PA, Spring
1987

Coordinator, Visiting Lecturer in Mathematics:
Dr. Lucille Meissner, Hamilton
Technologies, Fall 1986

Coordinator, Visiting Lecturer in Mathematics:
Dr. Donald Hooley, Univ. of Iowa, Fall
1986

Coordinator, Visiting Lecturer in Mathematics:
Dr. Skip Thompson, Oak Ridge Labs,
Spring 1986

Coordinator, Visiting Lecturer in Mathematics:
Dr. Nathan Habegger, Yale Univ., Spring
1985

Coordinator, Purchase of microcomputers for
mathematics faculty, Fall 1987

Coordinator, Production of Dept Honor Plaques,
1986

Advisor, Graduate School in Mathematics, 1986-

Advisor, Math Club, 1985-1987

Hesston College

Chair, Dept. of Math & Computer Science,
1975-84

Chair, Natural Science Division, 1982-83

Director, Engineering Program, 1981-84

Chair, Religious Life Committee, 1981-82

Member, Foundation Studies II (General Science)
teaching team, 1975-84

Advisor, Math Club, 1975-84

Awards and Grants

Millersville University Faculty Grants

53. Overseas Travel-To-Present Grant: \$400
To present invited presentation entitled "Non-operadic Operations on Loop Cohomology", International Conference on Modern Algebra and its Applications, U. Batumi, Rep. of Georgia, Sept. 19-25, 2011
52. Travel-To-Present Grant: \$309.60
To present invited presentation entitled "Mathematical Research Experiences for Undergraduates at Millersville University," Hesston College Science and Math Symposium, October 2010.
51. Overseas Travel-To-Present Grant: \$250
To present invited paper entitled "A-infinity Bialgebras and Applications," Stockholm University Mathematics Colloquium, May 2010.
50. Overseas Travel-To-Present Grant: \$240
To present invited paper entitled "On the Transfer of Structure from Chains to Homology," British Topology Meeting, Univ. of Leicester, September 2009.
49. Sabbatical Leave, 2009-2010 academic year
48. Released time $\frac{1}{4}$ reduction to support research on "Applications of A-infinity Bialgebras," Spring 2009
47. Research Grant: \$240
To support research on "Applications of A-infinity Bialgebras," Fall 2008
47. Overseas Travel-To-Present Grant: \$500
To present invited paper entitled "Matrads, Matrahedra, and A_∞ -Bialgebras," Workshop on Algebraic Structures in Geometry & Physics, U. Leicester, England, July 2008
46. Research Grant: \$340
To support research on "Applications of A_∞ -Bialgebras," Spring 2008
45. Travel-To-Present Grant: \$315
To present paper entitled "Some Naturally Occurring Examples of A_∞ -Bialgebras," Lehigh Geometry/Topology Conference, October 2007
44. Overseas Travel-To-Present Grant: \$150
To present paper entitled "Some Naturally Occurring Examples of A_∞ -Bialgebras," Geometry/Topology Seminar, University of the Basque Country, Leioa, Spain, June 2007
43. Overseas Travel-To-Present Grant: \$500
To present paper entitled "Some Naturally Occurring Examples of A_∞ -Bialgebras," International Conference on Homology Theories, K-Theory and Homotopy Theory, Tbilisi, Rep. of Georgia, Summer 2007
42. Special Academic/Admin. Activities Grant: \$375
- Participation in an Advanced Research Seminar at U. Penn., Spring 2007
41. Research Grant: \$436
Participation in an Advanced Research Seminar at U. Penn., Spring 2006
40. Released Time Grant: 3 credits
To investigate A_∞ -Bialgebras and Their Applications, Spring 2007 semester.
39. Travel-To-Present Grant: \$337
To present invited paper entitled "Structure Relations in Special A_∞ -Bialgebras," AMS Special Session on Homotopy theory, Univ. of Delaware, April 05.
38. Research Grant: \$280
To prepare a manuscript entitled "The Category of A_∞ -Bialgebras and Applications," for publication, Spring 2005.
37. Released Time Grant: 3 credits
To prepare a manuscript "The Category of A_∞ -Bialgebras and Applications" For publication, Spring 2005 semester.
36. Research Grant: \$210
To participate in the Seminar on Deformation Theory, U. Penn., 2003-04
35. Noonan Fund Grant: \$478
To fund student travel to MathFest 2003, Summer 2003.
34. Travel-To-Present Grant: \$350
To present paper entitled "The Biderivative and A_∞ -Hopf Algebras," at AMS Special Session on Homotopy Algebra, Seville, Spain, June 2003.
33. Research Grant: \$210
To fund travel to U. Penn and participate in collaborative research on A_∞ -Hopf Algebras, Spring 2003
32. Travel-To-Present Grant: \$250
To present paper entitled "Permutahedral Sets" at the AMS Sepcial Session Homotopy Theory, Baltimore, MD, January 2003
31. Travel-To-Present Grant: \$450
To present paper entitled "A Diagonal on the Permutahedra and Permutahedral Sets" at the International School of Physics and Mathematics, Tbilisi, Rep. of Georgia, September 2003.
30. Special Academic Activity Grant: \$300
To participate in Maria José Jiménez's Ph.D. dissertation defense at the Univ. of Seville, Seville, Spain, June 2003.
29. Special Academic Activ. Grant: \$475
To accompany four students presenting results of their research at MathFest 2001, Madison, WI
28. Travel-To-Present Grant: \$62

- To present paper entitled " A_∞ -Hopf Algebras" at the Lehigh Geometry/ Topology Conference, Lehigh University, June 2001
27. Released-Time Grant: 3 credit hrs.
To support research in theoretical mathematics, Fall semester 2001
26. Travel-To-Present Grant: \$375
To present paper entitled "A Diagonal on the Associahedra and A_∞ -Hopf Algebras" at the International School of Physics and Mathematics, Tbilisi, Rep. of Georgia, Fall 2000
25. Sabbatical Leave, Spring 2000
24. Research Grant: \$408
To support research in theoretical mathematics, Fall 1999
23. Released-Time Grant: 3 credit hrs.
To support research in theoretical mathematics, Spring semester 1999
22. Special Academic Activities Grant: \$190
To participate in minicourses at the 10th Annual International Conference on technology in Collegiate Mathematics, Chicago, Fall 1997
21. Research Grant: \$563
To support ongoing research in theoretical mathematics, Fall 1997
20. Travel-To-Present Grant: \$133.35
To present paper entitled "In Search of Higher Homotopy Hopf Algebras" at the Conference on Higher Homotopy Structures in Topology and Mathematical Physics", Vassar College, June 1996
19. Research Grant: \$487
To support research project entitled "Algebraic Models of Geometric Objects," Spring 1994
18. Travel-To-Present Grant: \$338
To present paper entitled "The Deformation Complex for Differential Graded Hopf Algebras" at the Joint Meetings of the AMS and MAA, Cincinnati, Ohio, January 1994.
17. Research Grant: \$301
To support research project entitled "Computer Methods in the Classification of High Dimensional Shapes," Spring 1994
16. Released-Time Grant: 3 credit hrs.
To support research project entitled "Computer Methods in the Classification of High Dimensional Shapes," Spring 1994
15. Publication Grant: \$700
To publish paper entitled "Rational Homotopy Types with the Rational Cohomology of Stunted Complex Projective Space," Fall 1992
14. Research Grant: \$750
- To support research activities during sabbatical leave, Fall 1991
13. Sabbatical Leave, Fall 1991
12. Travel-To-Present Grant: \$205
To present paper entitled "Rational Homotopy Types with the Rational Cohomology of Stunted Complex Projective Space," Spring 1990
11. Publication Grant: \$150
To publish paper entitled "Homotopy Conditions that Determine Rational Homotopy Type," Spring 1990
10. Released-Time Grant: 3 credit hrs.
To support research project entitled "A Computer Assisted Study of the Combinatorial Structure of Manifolds," Fall 1989
9. Research Grant: \$500
To support research project entitled "A Computer Assisted Study of the Combinatorial Structure of Manifolds," Fall 1989
8. University Scholars-in-Res. Program: \$1250
To support lectures in mathematical physics by Dr. James D. Stasheff, UNC Chapel Hill, Fall 1988
7. Medal Fund Grant: \$300
To support participation in the Centennial Celebration of the AMS, Providence, R.I., Spring 1988
6. Special Academic Activ. Grant: \$300
To support participation in AMS-IMS-SIAM Joint Summer Research Conference on Deformation Theory and Applications in Physics, U. of Mass at Amherst, Amherst, MA, Summer 1990
5. Travel Grant: \$50
To support participation in the Conference on Geometry and Topology, Lehigh University, Bethlehem, PA., June 1988
4. Travel Grant: \$300
To support participation in the Joint Meetings of the AMS-MAA-SIAM, Atlanta, Georgia, Winter 1988
3. Travel Grant: \$40
To support participation in the Conference on Computers in Geometry and Topology, University of Illinois at Chicago, Spring 1986
2. Research Grant: \$500
To support research project entitled "A Software System for Computer Assisted Research in Algebraic Topology", Spring 1986
1. Released-Time Grant: 6 credit hrs.

To support research project entitled "A Software System for Computer Assisted Research in Algebraic Topology", Spring semester 1986

Hesston College

CDC Educational Computing Grant: \$40,000
To support computer based education in the engineering sciences, Fall 1983

NSF-ISEP grant #78-12739: \$17,000
To support computer science education, Spring 1979

University of North Carolina

University Teaching Fellowship: 1980-81

Temple University

Pi Mu Epsilon Pennsylvania Zeta Chapter Student Paper Competition:
\$50 first prize, Spring 1972
Paper: "Aspects of the Moebius Transformation"

Delegate to the Pi Mu Epsilon National Meeting at Dartmouth College, Summer 1972

Professional and Honorary Memberships

The Mathematical Association of America
The American Mathematical Society
Pi Mu Epsilon – Pennsylvania Zeta Chapter
(National Math Honor Society)

Community Service

Asst. Varsity Softball Coach , Lancaster Mennonite School, Spring 06.

Coach (softball), Strasburg-Willow St. Baseball/Softball Assoc., Summer 2002/2003

Coach (softball), Lancaster Prowlers, Fall 2001

Coach (soccer), Chapel Hill YMCA Youth Soccer, Spring 2000

Coach (soccer), Lampeter-Strasburg Youth Soccer, Fall 1999-2000

Coach (softball), Strasburg-Willow St. Baseball/Softball Assoc., Fall 2000

Vice President, Lampeter-Strasburg Little League Board of Directors, 97-98

Coach (softball), Lampeter-Strasburg Little League, Spring 1996 – Spring 1998

Treasurer, Advisory Committee, Millersville International House, 88-91

Member, Musser Park Association, Lancaster, Pa., 85-90

References

Dr. Delray Schultz, Chair, Department of Mathematics, Millersville University, Millersville, PA 17551

Dr. Robert T. Smith, Dean, School of Science and Mathematics, Millersville University, Millersville, PA 17551

Dr. James D. Stasheff, Professor Emeritus, University of North Carolina, Chapel Hill, NC 27514