

CURRICULUM VITAE

2-20-09

RONALD NELSON UMBLE, Ph.D.
Professor of Mathematics
MU ID#: M00065243

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

South Philadelphia High School, Philadelphia, PA
Student teacher, Spring 1972

Undergraduate Courses Taught

Remedial Mathematics
College Algebra
Trigonometry
Precalculus Mathematics
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

14. Sean Evans
Thesis: "New Examples of A_∞ -Bialgebras,"
May 08.
13. Daniel Kravatz
Thesis: "Diagonal Approximations on an n -
gon and the Cohomology Ring of Closed
Compact Orientable Surfaces," May 08.
12. John Gemmer
Thesis: "The Generalized Brachistochrone
Problem," May 06; Recognized at MathFest

2006 as one of two outstanding undergraduate papers in applied mathematics.

11. Stephen Weaver.
Thesis: "Computing the S-U Diagonal on Permutahedra," May 05.
10. Andrew Baxter.
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.
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.
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.
Thesis: "The Angle Trisection Problem," May 1991.
2. Dean Balach.
Thesis: "Simplicial Homology, May 1987.
1. Cynthia Cuddy
Thesis: "Balloons and Other Surfaces: The Euler Characteristic and Simplicial Homology," May 1987.

Ph.D. Thesis Committees

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

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 (five chapters written and classroom tested), 14th revision.
- New/Revised Program/Course Proposals Authored**
- MATH 457 -- Elementary Differential Geometry
University approval: Spring 1986
First offered: Spring 1988
- MATH 220 -- Introduction to Mathematical Proof
University approval: Fall 1988
First offered: Spring 1989

Approved as a writing "W" course: Summer 1990

MATH 242 – 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:

Papers Written with Students

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, submitted May 2008; 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

19. "Generalizations of the Brachistochrone Problem," (with J. Gemmer and M. Nolan) submitted, May 2008, arXiv:math-ph/0612052
18. "Tensor Products of A_∞ -Bialgebras and the Cohomology of Finite Abelian Groups," (with Mikael Vejdemo-Johansson), in preparation
17. "Higher Homotopy Hopf Algebras Found: A Ten Year Retrospective," Proceedings of the conference in honor of M. Gerstenhaber and J. Stasheff, to appear; arXiv:709.3436.
16. "The Hopf A_∞ -Coalgebra $H_*(Z, n; Z_p)$," (with A. Berciano), in preparation.
15. "Some Naturally Occurring Examples of A_∞ -Bialgebras," (with A. Berciano), submitted June 2007; arXiv:0706.0703.
14. "The Category of A_∞ -Bialgebras and Applications," (with Samson Sanedlidze), in preparation.
13. "Periodic Orbits of Billiards on an Equilateral Triangle," (with Andrew Baxter), Am. Math. Monthly, **115** (8) (2008) 479-491; arXiv:math.DS/0509292.
12. "Matrads, Matrahedra, and A_∞ -Bialgebras,

(with Samson Sanedlidze), J. Homology, Homotopy and Applications, to appear, arXiv:math.AT/0508017.

11. "Structure Relations in Special A_∞ -Bialgebras," J. Mathematical Sciences, **152** (3), (2008) 443-450; arXiv:math.AT/0506446.
10. "Minimal Paths on Some Simple Surfaces with Singularities," (with J. Mohler), Pi Mu Epsilon J., **12** (8) (2008) 461-472; arXiv:math.DG/0401096.
9. "The Biderivative and A_∞ -Bialgebras," (with S. Sanedlidze), J. Homology, Homotopy and Applications, **7** (2) (2005) 161-177.
8. "A Diagonal on the Permutahedra, Multiplihedra and Associahedra," (with S. Sanedlidze) Journal of Homology, Homotopy and Applications, **6** (1) (2004) 363-411.
7. "A Diagonal on the Associahedra," (with S. Sanedlidze), preprint math.AT/0011065, 2000.
6. " 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.
5. "Obstructions to Deformations of DG Modules," (with T. Armstrong) Proceedings of the American Mathematical Society **129** (12) (2001) 3447-3452.
4. "In Search of Higher Homotopy Hopf Algebras," unpublished preprint.
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.

Papers Presented at Professional Meetings

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 Permutahedral Sets," Conference on Algebraic Models of Topological Spaces and Fibrations, International School of Physics and Mathematics, Tbilisi, Republic of Georgia, September 2002
 12. "Permutahedra, 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)**
34. "Tessellations Generated by Reflections," Dickenson College Mathematics Colloquium, April 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 $H_*(Z, n; Z_3)$,"

- 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
- Research Consulting and Visitorships**
- Visitor and consultant: Friedrich-Schiller University-Jena, Jena, Germany, June 2008
- Visitor and consultant: University of the Basque Country, Leioa, Spain, June 2007, July 2008.
- Visitor and consultant: University of Seville, Seville, Spain, January 2002, June 2003, October 2006
- Visitor: University of North Carolina, Chapel Hill, NC, Spring Semester 2000
- Consultant: NSF Consultation on Symbolic Computation, University of North Carolina, October 1985
- Local Colloquium Lectures**
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
- 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 Conferences and Professional Meetings

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
- External Program Reviewer, Lebanon Valley College Dept. of Mathematical Sciences, October 2008
- External Program Reviewer, Messiah College Dept. of Mathematical Sciences, March 2008
- External Promotion & Tenure Reviewer
 Dr. Leyla Batacki, Dept. of Math.
 Elizabethtown College, Fall 2007
- Coordinator, Tetrahedral Geometry/Topology Seminar, Spring 2003 – present
- Member, Executive Board, Eastern PA and Delaware Section of the Mathematical Association of America, 1995-1998
- Millersville University**
- Commencement marshal, May 2008,
 December 2008
- 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 - present
Member, School of Science and Math Curriculum Committee, Spring 1996
Member, Honors Perspectives Committee, 1988-90

Departmental Committees:

Chair, Math Assessment Committee, 2003-present
Chair, Promotion & Tenure Committee, 2003-04
Chair, Wickersham Hall Renovation Committee 1998-99
Chair, Graduate Curriculum Committee, 1989-present
Chair, Dept. Strategic Directions Committee, 1989-94
Chair, Social Committee, 1987-93
Chair, Math Faculty Search Committee, 1987-88, 90-91, 93-94, 2001-02.
Chair, UCC Subcommittee on Geometry, 1988-89
Member, Social Committee, 1993-present
Member, Wickersham Hall Renovation Committee 1999-2006
Member, Math Awareness Month Committee, 1995-present
Member, Math Faculty Search Committee, 1986-88, 90-91, 93-94, 97-98, 2001-02, 02-03, 04-05, 09-10
Member, Evaluation Committee, 1993-96, 97-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, MU/F&M Colloquium speaker, 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. Angela Gibney, U. Penn. November 07
Coordinator, TGTS Lecturer in Mathematics, Dr. Frank Morgan, Williams College, April 07
Coordinator, MU/F&M Colloquium speaker, Dr. Frank Morgan, Williams College, April 07
Coordinator, TGTS Lecturer in Mathematics, Dr. Andrew Hicks, Drexel Univ., March 07
Coordinator, TGTS Lecturer in Mathematics, Dr. Barbara Nimersheim, F&M, Feb 07
Coordinator, TGTS Lecturer in Mathematics, Dr. Ainhoa Berciano, Univ. of the Basque Country, Jan 07
Coordinator, MU/F&M Colloquium speaker, Dr. Ainhoa Berciano, Univ. of the Basque Country, Jan 07
Coordinator, TGTS Lecturer in Mathematics, Dr. John McCleary, Vassar College Nov 06
Coordinator, MU/F&M Colloquium speaker, Dr. John McCleary, Vassar College Nov 06
Coordinator, TGTS Lecturer in Mathematics, Dr. James D. Stasheff, U. Penn, Oct 06
Coordinator, TGTS Lecturer in Mathematics, Dr. Scott Walck, Lebanon Valley College, Sept 06
Coordinator, TGTS Lecturer in Mathematics: Dr. David Yetter, KSU, Spring 2006.
Coordinator, Visiting Lecturer in Mathematics: Dr. David Richeson, Dickinson C., Apr 06
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, Franklin and Marshall College, Lancaster, PA, 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

49. Sabbatical leave, 2009-2010 academic year
48. Released time ¼ reduction to support research on “Applications of A_{∞} Bialgebras,” Spring 2009
47. Research Grant: \$240
To support research on “Applications of A_{∞} 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-infinity 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-infinity 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 Activ. 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-infinity Hopf Algebras" at the Lehigh Gometry/ 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-infinity 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-Presnet 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. James D. Stasheff, Professor Emeritus,
University of North Carolina, Chapel Hill,
NC 27514
Dr. Robert T. Smith, Chair, Dept. of Mathematics,
Millersville University, Millersville, PA
17551
Dr. Charles G. Denlinger, Professor Emeritus,
Millersville University, Millersville, PA
17551
Dr. Edward Shane, Dean, School of Science and
Mathematics, Millersville University,
Millersville, PA 17551.

