DAVID PENGELLEY

Vita
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davidp@nmsu.edu
https://sites.google.com/view/davidpengelley/david-pengelley

PRIMARY SCHOLARSHIP INTERESTS

Algebraic Topology: Sometimes called rubber-sheet geometry, topology studies global features of shapes, like holes and twisting, that endure despite stretching, as if the shape is made of rubber. Applications include particle physics, the large-scale structure of the universe, and industrial robotics.

Teaching and Learning via Primary Historical Sources: While teaching with primary texts is common in the humanities, it has been very uncommon in mathematics. In 1988 I began teaching with primary historical sources, wishing students to gain the rich advantages they provide. I have co-developed two honors courses based entirely on primary sources, co-created a graduate course on the role of history in teaching mathematics, and am collaborating on implementing student projects based on primary sources in mathematics for a variety of majors and levels. I have published an inquiry-based number theory textbook anchored around the manuscripts of Sophie Germain from two centuries ago.

History of Mathematics: Teaching with primary sources has led to several research projects in history of mathematics, and I now present and publish regularly in this area as well.

Alternative Teaching Methodologies: I have replaced lecturing with an active classroom in which students do reading and writing in advance, preparatory warmup exercises, engage in active in-class work, and final homework. This has evolved into an inquiry-based learning pedagogy.

Student Research Projects in the Calculus Curriculum: In 1987 I began engaging calculus students with several two-week 'research projects' each semester. Such projects alter fundamentally students' views of what mathematics is all about, and build their self confidence in what they can achieve through imaginative thinking.

EDUCATION

University of California, Riverside, 1970–71.

B.A., Mathematics, University of California, Santa Cruz, 1973.

Oxford University Mathematical Institute, 1978–79.

Ph.D., Mathematics, University of Washington, 1980.

LANGUAGES

English (native), German (fluent), French and Swedish (fair), Spanish (beginning).

POSITIONS HELD

C.L.E. Moore Instructor, Massachusetts Institute of Technology, 1980–82.

Assistant and Associate Professor, New Mexico State University, 1982–85; 85–95.

Member, Mathematical Sciences Research Institute, Berkeley, on sabbatical leave, 1988–89.

Sabbatical visitor, University of Washington, 1995–96.

Professor, New Mexico State University, 1995–2011.

Professor Emeritus, New Mexico State University, 2012–

Courtesy Professor, Oregon State University, 2015–

FELLOWSHIPS / HONORS / AWARDS

Regents' Scholarship, University of California, 1971–73.

Highest Honors, B.A., University of California, 1973.

National Science Foundation Graduate Fellowship, University of Washington, 1975–78.

Dissertation Scholarship, Oxford, English-Speaking Union, 1978–79.

Fulbright-Hays Scholarship, Mathematical Institute, Oxford, 1978–79.

Doctoral Dissertation Fellowship, University of Washington, 1979–80.

Featured in Mathematical Association of America president's address and *UME Trends* newsletter for calculus projects innovation, 1989–90.

Burlington Research Foundation Faculty Achievement Award, 1990.

Featured in *Science* article "At state schools, calculus reform goes mainstream" (Vol. 260, pp. 484–485).

Featured in NMSU's *Page One, Panorama,* and *College Research* newsletters, and KRWG radio and television for calculus projects program, 1991.

Featured in calculus reform article in National Science Foundation's *Mosaic* magazine, 1991.

Featured in *Chronicle of Higher Education* for Honors General Education courses and calculus projects program, 1992.

Panelist on live NSF national satellite videoconference *Meeting the Challenge, Calculus Renewal*, 1993.

Award for Distinguished College or University Teaching of Mathematics, Mathematical Association of America, Southwestern Section, 1993.

Instructor, NSF/MAA *Institute for History of Mathematics and Its Use in Teaching*, a summer program for college teachers, Washington, DC, 1996.

Keynote speaker at conference on *The Changing Undergraduate Mathematics Curriculum*, Osage Beach, Missouri, 1997

Mil Gracias award from New Mexico State University Intramurals for work as faculty advisor to the NMSU Student Badminton Club, 1998.

Featured speaker in mathematics for University Honors Week at Northern Arizona University, 1999.

Keynote Speaker, annual meeting of the Washington/Oregon Associations of Mathematics at Two Year Colleges, Stevenson, Washington, 2001.

Invited Hour Address, Mathematical Association of America, Joint Mathematics Meetings, San Diego, 2002.

Instructor, graduate course on *History of Mathematics in Mathematics Education*, National Swedish Graduate School in Mathematics Education, Uppsala, Sweden, 2003.

Plenary speaker, *18th British Topology Meeting*, Manchester, England, 2003.

Studio interview for *Inventors Imperfect: Sophie Germain*, BBC Radio 4, Manchester, England, 2003.

Inaugural speaker, Arizona Mathematics Undergraduate Conference, 2004.

Featured in NMSU's Research Newsletter, the Round Up newspaper, and university press release for expanded program and NSF funding for learning discrete mathematics and computer science via primary historical sources, 2007.

Faculty Outstanding Achievement Award, College of Arts and Sciences, New Mexico State University, 2007.

Featured in *Joint Mathematics Meetings: A Woman Who Counted*, by Barry Cipra, in *Science, 15 February 2008,* for work on Sophie Germain's manuscripts on Fermat's Last Theorem, 2008.

Featured in *Math Trek : An Attack on Fermat,* and *Math Trek : A Mathematical Tragedy*, columns by Julie Rehmeyer in *Science News Online*, February 21 and 25, 2008.

Award for Distinguished College or University Teaching of Mathematics, Mathematical Association of America, Southwestern Section, 2008.

Instructor, *Study the Masters: Using Primary Historical Sources in Teaching and Research in Mathematics*, summer short course for college teachers, Mathematical Association of America Ohio Section, 2008.

Keynote plenary speaker, *HPM 2008, quadrennial conference of the International Study Group on History and Pedagogy of Mathematics*, Mexico City, 2008.

Deborah And Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics, Mathematical Association of America, 2009.

Interview on *NMSU Aggie Almanac*, KRWG-TV, April 2, 2009.

Kieval Endowment Lecturer, Southern Oregon University, 2009.

Westhafer Award for Excellence in Teaching, New Mexico State University, 2009.

Outstanding Workshop Award, New Mexico State University Teaching Academy, 2009–2010.

2010 New Mexico Professor of the Year, Carnegie Foundation for the Advancement of Teaching.

Academy for Learning in Retirement, invited public lectures, Las Cruces, NM, 2011.

NMSU Regents, presentation as part of President's address, 2011.

Kieval Endowment Lecturer, Humboldt State University, 2011.

Featured in NMSU *Teaching Excellence* promotional video, 2011.

Closing plenary address, *Legacy of R. L. Moore Conference*, Austin, 2013.

Presentations for new fellows, *Project NExT* (New Experiences in Teaching) professional development workshop for new Ph.D.s, Hartford, 2013.

2014 Lonseth Lecturer, Oregon State University.

Interview on *The Joy of Mathematics* (with Stuart Kelter), for Delving In, Las Cruces Community Radio KTAL 101.5 FM, available at `https://www.lccommunityradio.org/archives`, 2020.

SCHOLARSHIP AREAS AND PUBLICATIONS

Mathematical Research: For around four decades most of my mathematical research has been in algebraic topology. Topology, sometimes called "rubber-sheet geometry", studies qualitative global features of geometric shapes. Qualitative global features are those that endure despite any stretching of a shape, as if it is made of rubber. These features include holes in objects, and any twisting of the object back on itself. For example, consider the global hollow nature of a sphere, or the "hole" through a donut (torus), or the half-twist in a Möbius strip. Algebraic topology develops modern algebraic methods for global study of shapes, especially in high-dimensional and infinite-dimensional situations, where visualization is no longer possible. Applications include particle physics, the large-scale structure of the universe, and industrial robotics.

1. Self-dual orientable embeddings of K_n, *Journal of Combinatorial Theory B* **18** (1975), 46–52.
2. Index four orientable embeddings and case zero of the Heawood conjecture (with M. Jungerman), *Journal of Combinatorial Theory B* ***26*** (1979), 131–144.
3. The homotopy type of MSU, *American Journal of Mathematics* **104** (1982), 1101–1123.
4. The mod two homology of MSO and MSU as A-comodule algebras, and the cobordism ring, *Journal of the London Mathematical Society* (2) **25** (1982), 467–472.
5. The A-algebra structure of Thom spectra: MSO as an example, *Current Trends in Algebraic Topology, London, Ontario, 1981*, pp. 511–513, *Canadian Mathematical Society Conference Proceedings* **2**, Part 1 (1982).
6. $H^*(MO < 8 >; Z/2)$ is an extended A_2^*-coalgebra, *Proceedings of the American Mathematical Society* **87** (1983), 355–356.
7. The homology of $MSpin$ (with V. Giambalvo), *Mathematical Proceedings, Cambridge Philosophical Society* **95** (1984), 427–436.
8. Fractal structures in H_*BO and their applications to cobordism (with V. Giambalvo and D. Ravenel), *Lefschetz Centennial Conference, Mexico City, 1984*, pp. 43–50, *Contemporary Mathematics* **58** Part II (1987).

9. A fractal-like algebraic splitting of the classifying space for vector bundles (with V. Giambalvo and D. Ravenel), *Transactions of the American Mathematical Society* **307** (1988), 433–455.

10. p-adic congruences between binomial coefficients (with V. Giambalvo and R. Mines), *Fibonacci Quarterly* **29** (1991), 114–119.

11. Stabilizing the lower operations for mod 2 cohomology (with T. Bisson and F. Williams), in *Homotopy Invariant Algebraic Structures: A Conference in Honor of J. Michael Boardman* (ed. J-P Meyer et al), pp. 39–47, *Contemporary Mathematics* 239, American Mathematical Society, 1999.

12. Sheared algebra maps and operation bialgebras for mod 2 homology and cohomology (with F. Williams), *Transactions of the American Mathematical Society* **352** (2000), 1453–1492.

13. A global structure theorem for the mod 2 Dickson algebras, and unstable cyclic modules over the Steenrod and Kudo-Araki-May algebras (with F. Peterson and F. Williams), *Mathematical Proceedings of the Cambridge Philosophical Society* **129** (2000), 263–275.

14. Global structure of the mod two symmetric algebra, $H^*(BO; F_2)$, over the Steenrod Algebra (with F. Williams), *Algebraic and Geometric Topology* **3** (2003), 1119-1138.

15. The global structure of odd-primary Dickson algebras as algebras over the Steenrod algebra (with F. Williams), *Mathematical Proceedings of the Cambridge Philosophical Society* **136** (2004), 67–73.

16. The odd-primary Kudo-Araki-May algebra of algebraic Steenrod operations, and invariant theory (with F. Williams), in *Proceedings of the School and Conference in Algebraic Topology (The Vietnam National University, Hanoi, 9–20 August 2004)*, editors John Hubbuck, Nguyen H V Hung and Lionel Schwartz, *Geometry and Topology Monographs* **11** (2007), 217–244. DOI: 10.2140/gtm.2007.11

17. Beyond the hit problem: Minimal presentations of odd-primary Steenrod modules, with application to $CP(\infty)$ and BU (with F. Williams), *Homology, Homotopy and Applications* **9** (2007), 363–395.

18. Unstable module presentations for the cohomology of real projective spaces (with F. Williams), *Homology, Homotopy, and Applications* **12** (2010), 11–26.

19. A new action of the Kudo-Araki-May algebra on the dual of the symmetric algebras, with applications to the hit problem (with F. Williams), *Algebraic and Geometric Topology* **11** (2011), 1767–1780.

20. The Hit Problem for $H^*(BU(2); F_p)$ (with Frank Williams), *Algebraic & Geometric Topology* **13** (2013), 2061–2085.

21. Sparseness for the symmetric hit problem at all primes (with F. Williams), *Mathematical Proceedings of the Cambridge Philosophical Society* **158** (2015), 269–274.

22. How efficiently can one untangle a double-twist? Waving is believing! (with Daniel Ramras), *The Mathematical Intelligencer* **39** (2017), 27–40. Preprint, videos, and animations are available at `http://www.math.iupui.edu/~dramras/double-tip.html`.

History of Mathematics: Teaching with primary historical sources has led me to a number of research projects in history of mathematics, and I now present and publish regularly in this area as well. For instance, one collaborative project is based on the unpublished French archive manuscripts of Sophie Germain (1776-1831), the first woman whom we know did important original research in mathematics. My discoveries demonstrate that the importance of her research greatly raises her current stature, especially her work on Fermat's Last Theorem, perhaps the most famous longstanding problem in mathematics of the past several centuries.

1. Eisenstein's misunderstood geometric proof of the Quadratic Reciprocity Theorem (with R. Laubenbacher), *College Mathematics Journal* **25** (1994), 29–34 (at `https://sites.google.com/view/davidpengelley/history`).

2. Gauß, Eisenstein, and the "third proof" of the Quadratic Reciprocity Theorem: Ein kleines Schauspiel (with R. Laubenbacher), *Mathematical Intelligencer* **16** (1994), 67–72 (at `https://sites.google.com/view/davidpengelley/history`).

3. Lagrange and the solution of numerical equations (with R. Laubenbacher and G. McGrath), *Historia Mathematica* **28** (2001), 220–231.

4. Excerpts on the Euler-Maclaurin summation formula, from *Institutiones Calculi Differentialis* by Leonhard Euler, translated by David Pengelley, 28 pages, 2001, published at `https://sites.google.com/view/davidpengelley/history` and The Euler Archive, `http://www.math.dartmouth.edu/~euler/`, 2004.

5. The bridge between the continuous and the discrete via original sources, in *Study the Masters: The Abel-Fauvel Conference, 2002* (ed. Otto Bekken et al), pp. 63–73, National Center for Mathematics Education, University of Gothenburg, Sweden, 2003.

6. Dances between continuous and discrete: Euler's summation formula, in *Proceedings, Euler 2K+2 conference, Rumford, Maine, 2002* (ed. Robert Bradley and Ed Sandifer), Euler Society, 2003.

7. Excerpt from a letter of Monsieur Lame to Monsieur Liouville on the question: Given a convex polygon, in how many ways can one partition it into triangles by mean of diagonals?, translation of an article from *Journal de Mathématiques Pures et Appliquées* (1838), 2 pages, 2004, published at `https://sites.google.com/view/davidpengelley/history.`

8. Did Euclid need the Euclidean algorithm to prove unique factorization? (with Fred Richman), *American Mathematical Monthly* **113** (2006), 196–205.

9. Dances between continuous and discrete: Euler's summation formula, in *Euler at 300: An Appreciation* (editors Robert E. Bradley, Lawrence A. D'Antonio, C. Edward Sandifer), Mathematical Association of America, 2007, pp. 169–190.

10. "Voici ce que j'ai trouvé:" Sophie Germain's grand plan to prove Fermat's Last Theorem (with R. Laubenbacher), *Historia Mathematica* **37** (2010), 641–692; doi:10.1016/j.hm.2009.12.002; preprint at `https://arxiv.org/abs/0801.1809v3` and `https://sites.google.com/view/davidpengelley`

11. Sophie's Diary, by Dora Musielak (book review), *Mathematical Intelligencer* **32**, no. 3 (2010), 62–64.

12. Mathematics Emerging: A Sourcebook 1540–1900, by Jacqueline Stedall, invited book review, *Notices, American Mathematical Society* **58** (2011), 815–819.

13. Quick, does 23/67 equal 33/97? A mathematician's secret from Euclid to today, *American Mathematical Monthly* **120** (2013), 867–876.

14. Prime Mystery: The Life and Work of Sophie Germain, by Dora Musielak (book review), *MAA Reviews*, 2015. http://www.maa.org/publications/maa-reviews/prime-mystery-the-life-and-m

15. What does 'less than or equal' really mean? (with G. Bezhanishvili), *American Mathematical Monthly* **122** (2015), 983–989.

16. Sophie Germain: Revolutionary Mathematician, by Dora Musielak (book review), *MAA Reviews*, 2020, https://maa.org/press/maa-reviews/sophie-germain-revolutionary-mathematician.

17. How did Fermat discover his theorem?, preprint at https://arxiv.org/abs/2502.11165, 2025.

Teaching and Learning via Primary Historical Sources: In 1988 I began teaching mathematics with primary historical sources, wishing students to gain the rich advantages they can provide. While this approach is common in the humanities, it had been uncommon in mathematics. I have developed two honors courses based entirely on primary sources, and published books of annotated primary sources for them. I have created a graduate course in mathematics education, on the role of history in teaching mathematics, am collaborating in implementing student projects based on primary sources in discrete mathematics and in other courses for a variety of majors and levels in both mathematics and computer science, and have published a number theory textbook based on the manuscripts of Sophie Germain. These endeavors have received longstanding National Science Foundation funding, and I have presented several invited national and international minicourses on this approach.

1. Honors mathematics in the liberal arts curriculum (with R. Laubenbacher), *National Honors Report* **10** (1989), 21–22.

2. Great problems of mathematics: A course based on original sources (with R. Laubenbacher), *American Mathematical Monthly* **99** (1992), 313–317
(at https://sites.google.com/view/davidpengelley/history).

3. Great theorems: The art of mathematics; A course based on original sources (with R. Laubenbacher), *Newsletter of the International Study Group on the History and Pedagogy of Mathematics*, #28 (March 1993), 9–10.

4. Mathematical masterpieces: teaching with original sources (with R. Laubenbacher), *Vita Mathematica: Historical Research and Integration with Teaching* (ed. R. Calinger), pp. 257–260, Mathematical Association of America, 1996.
(at https://sites.google.com/view/davidpengelley/history).

5. Recovering motivation in mathematics: Teaching with original sources (with R. Laubenbacher and M. Siddoway), *Undergraduate Mathematics Education Trends* **6,** No. 4 (September, 1994), parts of pages 1,7,13
(at https://sites.google.com/view/davidpengelley/history).

6. *Mathematical Expeditions: Chronicles by the Explorers* (with Reinhard Laubenbacher), 275 page book in the series Undergraduate Texts in Mathematics / Readings in Mathematics, Springer-Verlag, New York, 1999, revised second printing, 2000.
(excerpts and reviews at https://sites.google.com/view/davidpengelley/history).

7. *Teaching with Original Historical Sources in Mathematics* (with Reinhard Laubenbacher), a resource web site,
`https://sites.google.com/view/davidpengelley/history`, 1999–

8. Paskutinė Fermat teorema [Fermat's Last Theorem] (with R. Laubenbacher), *Alpha Plius Omega* **8**, #2 (1999), 4–18.

9. A graduate course on the role of history in teaching mathematics, in *Study the Masters: The Abel-Fauvel Conference, 2002* (ed. Otto Bekken et al), pp. 53–61, National Center for Mathematics Education, University of Gothenburg, Sweden, 2003.

10. Arthur Cayley and the first paper on group theory, in *From Calculus to Computers: Using the Last 200 Years of Mathematical History in the Classroom* (eds. R. Jardine and A. Shell), pp. 3–8, Mathematical Association of America, 2005.

11. A project in algorithms based on a primary historical source about Catalan numbers (with I. Pivkina, D. Ranjan, K. Villaverde), Special Interest Group in Computer Science Education, Association of Computing Machinery, *Proceedings (refereed) of the Thirty-Seventh SIGCSE Technical Symposium on Computer Science Education*, a refereed national conference, 37 (2006), p. 318 ff.

12. A multi-week project on mathematical induction and combinatorics for university students, based on Pascal's Traité du Triangle Arithmetique, in the *Mini-Workshop on Studying Original Sources in Mathematics Education*, Oberwolfach Report No. 22/2006, Mathematisches Institut Oberwolfach, 2006.

13. *Mathematical Masterpieces: Further Chronicles by the Explorers* (with A. Knoebel, R. Laubenbacher, J. Lodder), 333 page book, Springer Verlag, New York, 2007.
(excerpts and reviews at `https://sites.google.com/view/davidpengelley/history`).

14. Historical Projects in Discrete Mathematics and Computer Science (with J. Lodder, J. Barnett, G. Bezhanishvili, D. Ranjan, H. Leung), book chapter (refereed) in *Resources for Teaching Discrete Mathematics* (editor B. Hopkins), MAA Notes **74**, Mathematical Association of America, Washington, DC, 2009, pp.163–276. Also at
`https://sites.google.com/view/davidpengelley/hist_projects.`

15. Teaching with primary historical sources: Should it go mainstream? Can it?, in *Recent Developments in Introducing a Historical Dimension in Mathematics Education* (eds. V. Katz and C. Tzanakis), Mathematical Association of America, Washington, D.C., 2011, 1–8.

16. Designing student projects for teaching and learning discrete mathematics and computer science via primary historical sources, (with J. Barnett, J. Lodder, I. Pivkina, D. Ranjan), in *Recent Developments in Introducing a Historical Dimension in Mathematics Education* (eds. V. Katz and C. Tzanakis), Mathematical Association of America, Washington, D.C, 2011, 189–201.

17. Teaching number theory from Sophie Germain's manuscripts: a guided discovery pedagogy, *Proceedings, HPM 2012, Quadrennial meeting of the International Study Group on the Relations Between History and Pedagogy of Mathematics*, Daejeon, Korea, 2012, 103–113.

18. Projects for students of discrete mathematics via primary historical sources: Euclid on his algorithm (with J. Barnett, J. Lodder), *Proceedings, HPM 2012, Quadrennial meeting of the International Study Group on the Relations Between History and Pedagogy of Mathematics*, Daejeon, Korea, 2012, 279–294.

19. Primary Historical Sources in the Classroom: Discrete Mathematics and Computer Science (with J. Barnett, G. Bezhanishvili, H. Leung, J. Lodder, I. Pivkina, D. Ranjan, M. Zack), *Loci: Convergence* (July 2013), Mathematical Association of America, DOI:10.4169/loci003984, `http://www.maa.org/publications/periodicals/convergence/primary-historical-sources-in-the-classroom-discrete-mathematics-and-computer-science.`

20. Sums of Powers in Discrete Mathematics: Archimedes Sums Squares in the Sand, *Loci: Convergence* (July 2013), Mathematical Association of America, DOI:10.4169/loci003986, `http://www.maa.org/publications/periodicals/convergence/sums-of-powers-in-discrete-mathematics-archimedes-sums-squares-in-the-sand`

21. Euclid's Algorithm for the Greatest Common Divisor (with J. Lodder and D. Ranjan), *Loci: Convergence* (July 2013), Mathematical Association of America, DOI:10.4169/loci003985, `http://www.maa.org/publications/periodicals/convergence/euclids-algorithm-for-the-greatest-common-divisor`

22. Figurate Numbers and Sums of Numerical Powers: Fermat, Pascal, Bernoulli, *Loci: Convergence* (July 2013), Mathematical Association of America, DOI:10.4169/loci003987, `http://www.maa.org/publications/periodicals/convergence/figurate-numbers-and-sums-of-numerical-powers-fermat-pascal-bernoulli`

23. The Pedagogy of Primary Historical Sources in Mathematics: Classroom Practice Meets Theoretical Frameworks (with J. Barnett and J. Lodder), *Science & Education* **23** (2014), 7–27. DOI 10.1007/s11191-013-9618-1.

24. Teaching and Learning Mathematics from Primary Historical Sources (with J. Barnett, J. Lodder), *PRIMUS* (Problems, Resources, and Issues in Mathematics Undergraduate Studies) **26** (2016), 1–18.

25. Teaching Discrete Mathematics Entirely From Primary Historical Sources, (with J. Barnett, G. Bezhanishvili, J. Lodder), *PRIMUS* (Problems, Resources, and Issues in Mathematics Undergraduate Studies) **26** (2016), 657–675.

26. Enticement to College Mathematics via Primary Historical Sources, in *The Courses of History: Ideas for Developing A History of Mathematics Course*, eds. Amy Shell-Gellasch and Dick Jardine, Mathematical Association of America, 2018, pp. 233–243.

27. Capstone Mathematics from Primary Historical Sources, in *The Courses of History: Ideas for Developing A History of Mathematics Course*, eds. Amy Shell-Gellasch and Dick Jardine, Mathematical Association of America, 2018, pp. 29–38.

28. Teaching Discrete Mathematics, Combinatorics, Geometry, Number Theory, (or Anything) from Primary Historical Sources, in *The Courses of History: Ideas for Developing A History of Mathematics Course*, eds. Amy Shell-Gellasch and Dick Jardine, Mathematical Association of America, 2018, pp. 337–349.

29. *Number Theory Through the Eyes of Sophie Germain: An Inquiry Course*, 202 page book, MAA Press, American Mathematical Society, 2023.

Alternative teaching methodologies: I have replaced lecturing with an active classroom in which students do advance reading, writing, warmup exercises, active in-class work, and final homework, evolving into an inquiry-based learning model.

1. *Comments on Classroom Dynamics* (translated into Greek), published in *Phi,* Issue 6, November, 2009, pp. 105–106 (editor Vasillios Viskadourakis), Piraeus, Greece. Also in English at `https://sites.google.com/view/davidpengelley/history`.

2. Beating the lecture-textbook trap with active learning and rewards for all, *Notices of the American Mathematical Society* **64** (2017), 903–905.

   `http://www.ams.org/publications/journals/notices/201708/rnoti-p903.pdf`.

3. Evidence-based Teaching: How do we all get there? (with Dev Sinha), *FOCUS (Newsmagazine of the Mathematical Association of America)* **39** (#4), Aug/Sep 2019, 20–23.

4. From lecture to active learning: Rewards for all, and is it really so difficult?, *College Mathematics Journal* **51** (2020), 13–24; preprint at `https://sites.google.com/view/davidpengelley/history`; also at `arxiv.org`.

Student Research Projects in the Calculus Curriculum: In 1987 I began engaging calculus students with several two-week 'research projects' each semester. The projects alter fundamentally students' views of what mathematics is all about, and build their self confidence in what they can achieve through imaginative thinking. With National Science Foundation funding and the involvement of other faculty this has grown to become standard in all our calculus instruction, and has had national and international impact, in part through a published book with 100 calculus projects for teaching. Projects are now a standard part of many calculus programs and materials nationwide, and NMSU is known as an originator of this innovation.

1. Student research projects in the calculus curriculum (with M. Cohen, E. Gaughan, A. Knoebel, D. Kurtz), chapter in *Priming the Calculus Pump: Innovations and Resources* (ed. Thomas Tucker), pp. 159–173, MAA Notes **17**, Mathematical Association of America, 1991.

2. Discovering calculus through student projects, *Undergraduate Mathematics Education Trends* **3**, #3 (August 1991), reprinted in *You're the Professor, What Next?: Ideas and Resources for Preparing College Teachers* (ed. Bettye Anne Case), p. B–III–55, MAA Notes #35, Mathematical Association of America, 1994.

3. *Student Research Projects in Calculus* (with M. Cohen, E. Gaughan, A. Knoebel, D. Kurtz), 216 page book, Mathematical Association of America, 1992.

4. Student perceptions in learning calculus (with M. Cohen, M. Conley, E. Gaughan, A. Knoebel, D. Kurtz, C. Stuessy), *International Journal of Mathematics Education in Science and Technology* **23** (1992), 175–192.

5. From projects to themes: The evolution of calculus classes at New Mexico State University (with D. Kurtz), section in booklet for *National Science Foundation calculus workshops program*, Macalester College, 1992, 1993, 1994, and chapter of same title in Viewer's Guide for *Meeting the Challenge, Calculus Renewal*, National Science Foundation national satellite video workshop to 225 sites, University Television, California State University, Long Beach, 1993.

6. Making calculus students think with research projects (with M. Cohen, A. Knoebel, D. Kurtz), chapter in *Mathematical Thinking and Problem Solving* (ed. Alan Schoenfeld), pp. 193–208, Lawrence Erlbaum Associates, Inc., 1994.

7. A case study of a partnership of equals: calculus meets precalculus (with A. Knoebel, D. Kurtz), *Preparing for a New Calculus* (ed. Anita Solow), pp. 117–120, Mathematical Association of America, 1994.

8. Calculus Gems: Brief Lives and Memorable Mathematics, by George Simmons, extended book review, *American Mathematical Monthly* **101** (1994), 374–380.

9. Towards Active Processes for Teaching and Learning (with M. Gehrke), *Calculus: The Dynamics of Change*, pp. 20–23, MAA Notes **39**, Mathematical Association of America, 1996.

EXTERNAL GRANT FUNDING

Small Spectra Associated With Connective Cobordism, National Science Foundation, 1981–83.

Student Research Projects in the Calculus Curriculum (with M. Cohen, E. Gaughan, A. Knoebel, D. Kurtz), National Science Foundation, 1988–91, $242,217.

A Model Program Using Student Research Projects in Calculus and Differential Equations (with M. Cohen), National Science Foundation, 1990–93, $120,000.

Teacher Enhancement Through Student Research Projects (with D. Finston, E. Gaughan, A. Knoebel, D. Kurtz), National Science Foundation, 1990–94, $451,606.

Teaching With Original Sources in Mathematics (with R. Laubenbacher), National Science Foundation, 1994–96, $88,774.

Recovering Motivation: Using Primary Historical Sources in High School Mathematics Teaching (with R. Laubenbacher), New Mexico Center for Teaching Excellence, 1995, $1,000.

Mathematics Training for High School Teachers (with R. Laubenbacher), Eisenhower Program, Las Cruces Public Schools, 1995, $1,700.

A Capstone Course: Learning Mathematics Through Original Sources (with A. Knoebel, R. Laubenbacher, J. Lodder), National Science Foundation, 1997–2000, $52,797.

Teaching Discrete Mathematics via Original Historical Sources (with G. Lodder, G. Bezhanishvili, H. Leung, D. Ranjan), National Science Foundation, 2003–2006, $74,432.

Collaborative Research: Learning Discrete Mathematics and Computer Science via Primary Historical Sources (with G. Bezhanishvili, H. Leung, J. Lodder, I. Pivkina, D. Ranjan), National Science Foundation, 2008–2012, $434,317.

INTERNAL GRANT FUNDING

Homotopy Theory, Special Research Assignment, New Mexico State University, Fall 1986.

Homotopy Theory, Minigrant Award, New Mexico State University, 1986–87.

Great Theorems: The Art of Mathematics, Special Teaching Assignment, New Mexico State University, 1987–88.

Special Visitor Year in Algebraic Topology and Algebraic K-theory (with 5 colleagues), Arts and Sciences Research Center, New Mexico State University, 1989.

Sophie Germain's Rediscovered Work on Fermat's Last Theorem (with R. Laubenbacher), Arts and Sciences Research Center, New Mexico State University, 1994, $500.

Enhancing the Monograph and Periodical Collections in the Mathematical Sciences and their Applications for all Populations of Library Users (with B. Olberding), NMSU Library Bond Proposal, 2004, $75,000.

Learning Discrete Mathematics via Historical Sources (with H. Leung, D. Ranjan, J. Lodder, G. Bezhanishvili, I. Pivkina), NMSU Information Sciences and Security Systems Cluster, 2006, $8,000.

GRADUATE STUDENT MENTORING (at NMSU unless otherwise noted)

Michael Goar, M.A., 1997, led to published paper *Olivier and Abel on series convergence: an episode from early 19th century analysis*, Mathematics Magazine **72** (1999), 347–355.

Kathe Kanim, M.A. 2002, led to two published papers: *Proof without words: How did Archimedes sum squares in the sand?*, Mathematics Magazine **74** (2001), 314–315, and *Proof without words: The Sum of Cubes—An Extension of Archimedes' Sum of Squares*, Mathematics Magazine.**77** (2004), 298–299.

Elaine Cohen, Ph.D. student, 2000–2005.

Osama Ta'ani, Ph.D. doctoral dissertation student, 2009–2011. Doctoral dissertation, August, 2011, *An Analysis of the Contents and Pedagogy of Al-Kashi's 1427 Key to Arithmetic (Miftah Al-Hisab)*. I coadvised Osama Ta'ani with Patricia Baggett.

Deepak Basyal, Ph.D. doctoral dissertation student, 2013–2015. Doctoral dissertation, July, 2015, *A 1933 Nepali Mathematics and Astrology Book "Śiśubodha Taraṅginī II": Translation and Commentary on Mathematics Chapters*. I coadvised Deepak Basyal with Patricia Baggett.

Samantha Smith, Ph.D. student, final oral exam, 2018, Oregon State University.

Michael Lopez, Masters student, final oral exam, 2019, Oregon State University.

Naveen Somasunderam, Ph. D. student, teaching, research and publication advising, 2019, Oregon State University.

Julissa Valenciano. Masters student, final oral exam, 2020, Oregon State University.

Matthias Merzenich, Ph.D. student, final oral exam, 2020, Oregon State University.

Sarah Hagen, Ph. D. student, teaching, research and publication advising, 2020, Oregon State University.

Branwen Schaub, Ph. D. student, reviewing Ph.D. research publications, 2021, Oregon State University .

FACULTY AND GRADUATE STUDENT MENTORING

Individually mentored 35 faculty and graduate teaching assistants at 12 colleges and universities on their adaptation of my active learning pedagogy to their own teaching, 2018–20.

CURRICULUM DEVELOPMENT

New Honors courses based on studying primary mathematical sources; certified for University General Education:

Great Theorems: the Art of Mathematics (HON411G/MATH411G) (with R. Laubenbacher and others), 1987–2011.

Spirit and Evolution of Mathematics (HON275G/MATH275G) (with R. Laubenbacher and others), 1989–2011.

Student research projects in the calculus curriculum (with four colleagues), including institutionalization in our courses, 1987–1992.

New graduate course *The Role of History in Teaching Mathematics* (MATH 561) (with R. Laubenbacher), 1995–2011.

Teaching discrete mathematics via primary historical sources (with seven NMSU colleagues in mathematics and computer science, developing materials for 6 courses), 2003–2012.

A number theory course (MATH 455/505) based on the research manuscripts of Sophie Germain, 2011.

OTHER PROFESSIONAL ACTIVITIES

Resource web site development: *Teaching with Original Historical Sources in Mathematics,* `https://sites.google.com/view/davidpengelley/history`, 1999–present.

Selected mathematical presentations:

The mod two homology of MSO and MSU as A-comodule algebras, and the cobordism ring, Algebraic and Geometric Topology Splinter Group, British Mathematical Colloquium, London, England, 1979, and Session on Cobordism Theory at Conference on Current Trends in Algebraic Topology, London, Ontario, 1981, and Seminars at Oxford University, University of Western Ontario, University of Washington, 1979, Rutgers University, 1980.

A 2-primary decomposition of the Thom spectrum MSU, Seminars at Oxford University, University of Western Ontario, 1979, Rutgers University, 1980, Massachusetts Institute of Technology, 1981.

Index four orientable embeddings and case zero of the Heawood Conjecture, Combinatorics Splinter Group, British Mathematical Colloquium, London, England, 1979.

A 2-primary splitting for MSU, American Mathematical Society section meeting, Kent, Ohio, 1979.

Cobordism rings of manifolds, stable homotopy theory, and Thom spectra, Colloquia at University of Washington, University of Waterloo, 1979, Vanderbilt University, Duke University, New Mexico State University, Lehigh University, 1982.

Map color theorem, Graduate Colloquium, University of Washington, 1980.

The homotopy type of MSU, Session on Homotopy Theory at Conference on Current Trends in Algebraic Topology, London, Ontario, 1981.

The A-algebra structure of Thom spectra: MSO as an example, Seminar, Massachusetts Institute of Technology, 1981, and Special Session of Annual Joint Mathematics Meetings, Cincinnati, 1982.

Cellular homology, Intersession lectures at Massachusetts Institute of Technology, 1982.

Graphs, surfaces, and map coloring, Colloquia at Williams College, Smith College, Mount Holyoke College, Colby College, Haverford College, 1982, and talk to national mathematics undergraduate honor society $\pi\mu\epsilon$, New Mexico State University, 1986.

Comodules and Hopf algebras in algebraic topology, Colloquium, University of Connecticut, 1983.

The homology of $MSpin$, Conference and Workshop on Algebraic Topology, Canadian Mathematical Society, St. John's, Newfoundland, 1983, and Seminar, University of Washington, 1983.

A surprising splitting of $H_*(BO; Z/2)$ over the Steenrod algebra, Special Session on Algebraic Topology, Annual Joint Summer Mathematics Meetings, Eugene, Oregon, 1984.

Fractal structures in H_*BO and their applications to cobordism, University of Washington Topology Emphasis Quarter, 1985.

A fractal-like splitting of the classifying space for vector bundles, Special Session on Homotopy Theory, Annual Joint Mathematics Meetings, New Orleans, 1986.

Fractal-like structure in the homology of classifying spaces for vector bundles, Seminars at Northwestern University, Massachusetts Institute of Technology, Johns Hopkins University, 1986.

Elementary number theory and binomial coefficients, Colloquium, New Mexico State University, 1986.

Fractal-like splittings of $H_*(BO; Z/2)$, Conference on Artin's Braid Group, Santa Cruz, California, 1986.

An algebraic splitting for the connected covers of BO, International Conference on Algebraic Topology, Arcata, California, 1986.

Fractal-like structure in algebraic topology, Colloquia at University of Washington, Johns Hopkins University, New Mexico State University, 1986, University of New Mexico, 1988, University of California, Santa Cruz, 1989.

Fun with binomial coefficients, national mathematics undergraduate honor society $\pi\mu\epsilon$, New Mexico State University, 1987 and 1989.

Fractal-like structure in BO, Seminar, University of California, Berkeley, 1988.

Fun with binomial coefficients: Divisibility and congruences, Undergraduate Mathematics Club, University of Rochester, 1991.

Fractal-like splittings of the classifying space for vector bundles, Ontario Topology Seminar, Hamilton, Ontario, Canada, 1991.

p-local lifts of Steenrod reduced powers and their conjugates, Seminar, University of Toronto, 1991.

The algebra of lower-indexed homology and cohomology operations, New Mexico Geometry and Topology Seminar, New Mexico State University, 1994.

The lower Steenrod algebra and its dual: a new view, Homotopy Theory session, Annual Meeting of the Canadian Mathematical Society, Vancouver, 1995, and Topology Seminar series, University of Washington, 1995.

The Hopf algebra of mod 2 homology and cohomology operations and its dual, Workshop on Stable Homotopy Theory, Fields Institute for Research in the Mathematical Sciences, Toronto, Canada, 1996.

A global structure theorem for the mod two Dickson algebras, and unstable cyclic modules over the Steenrod and Kudo-Araki-May algebras, International Conference in Algebraic Topology, Isle of Skye, Scotland, 2001.

Global structure theorems for unstable algebras over the Steenrod algebra, Special Session on Homotopy Theory, Joint Mathematics Meetings, Baltimore, 2003, and Topology Seminar, University of Oregon, 2003, and at Invariant Theory Conference, University of Göttingen, 2003.

Unstable algebras over the Steenrod algebra, Main speaker, 18th British Topology Meeting, Manchester, England, 2003.

The algebraic Steenrod algebra and invariant theory, Topology seminar, University of Oregon, and poster presentation, International Conference in Algebraic Topology, Isle of Skye, Scotland, 2005.

Global structure of algebras of invariants over the Steenrod algebra and its generalizations, Special Session on Invariant Theory, Joint Mathematics Meetings, San Antonio, 2006.

Unstable module presentations for the cohomology of real projective spaces, Special Session on Homotopy Theory and Higher Categories, Joint Mathematics Meetings, Washington, D.C., 2009, and Conference on Algebraic Topology, Group Theory and Representation Theory, Sabhal Mòr Ostaig, Isle of Skye, Scotland, 2009.

The Beauty of Mathematics, Old and New (with Pat Morandi): *Topology,* one of four public lectures for the Academy for Learning in Retirement, Las Cruces, NM, 2011.

Applying the Kudo-Araki-May algebra to minimal cohomology presentations, algebras of invariants, and the hit problem for symmetric algebras, Topology seminar, University of Rochester, 2011.

How efficiently and beautifully can one untangle a doubletwist in 3-space? Waving is believing!, Mathematics colloquium, New Mexico State University, 2014, and Topology seminar, Oregon State University, 2014.

Symmetry, strings, and the most beautiful untangling of a double twist, Mathematics colloquium and $\pi\mu\epsilon$ induction ceremony presentation, Oregon State University, 2014.

The global structure of Dickson algebras of polynomial invariants, Topology Seminar, Oregon State University, 2016.

How is a projective space fitted together?, Mathematics colloquium, New Mexico State University, 2012; and Mathematics colloquium, Oregon State University, 2016, and Topology seminar, U. of Oregon, 2017.

How to wrestle the Steenrod algebra with your bare hands, and win! Tackling unstable modules over the Steenrod algebra, Homotopy Theory Seminar, U. of Oregon, 2017.

A quaternionic unraveling of the double-twist in three-space, Topology Seminar, Oregon State U., 2017, and AMS Special Session on Quaternions, Joint Mathematics Meetings, San Diego, 2018.

How efficiently can one untangle a double-twist? Waving is believing!, opening invited address (60 mins), Mathematical Association of America, Pacific Northwest Section annual meeting, Corvallis, 2016, and in AMS Special Session on Algebraic Topology, AMS Western Section Meeting, Portland, 2018, and Geometry-Topology seminar, Oregon State University, 2018, Topology seminar, Univ. of Washington, 2018, Topology seminar, New Mexico State University, 2024.

All tangled up and searching for the beauty of symmetry, presentation to 50 middle school students for UW Math Day, Univ. of Washington, 2018, and to 100 middle school students at MathPath residential summer program, Reed College, 2018.

How can symmetries of a rectangle, tethered up to homotopy, provide a physical model for the quaternion group? Generalizations? (with Bill Bogley), AMS Special Session on Quaternions, Joint Mathematics Meetings, Jan. 2019, Baltimore.

Presentations on history of mathematics:

Gauß, Eisenstein, and the "third" proof of the Quadratic Reciprocity Theorem: Ein kleines Schauspiel, Colloquium, New Mexico State University (with R. Laubenbacher), 1993, and Featured Dramatic Presentation at Annual Joint Mathematics Meetings (with R. Laubenbacher), Cincinnati, 1994, and theatrical performance for the Preparing Future Faculty forum of the Pew Foundation, University of Washington (with V. Warfield), 1996, and Honors Week performance at Northern Arizona University, 1999, and Mathematics Colloquium at Humboldt State University, 2000, and Mathematics Colloquium, Uppsala University, Uppsala, Sweden, 2003, and at Homotopie Theorie Tagung, Mathematisches Forschungsinstitut Oberwolfach, 2003, and at Invariant Theory Conference, University of Göttingen, 2003, and invited hour speaker, annual meeting of the Southern California Mathematical Association of America, 2004.

Eisenstein's misunderstood geometric proof of the Quadratic Reciprocity Theorem, AMS-MAA Special Session on History of Mathematics (with R. Laubenbacher), Joint Mathematics Meetings, San Antonio, 1993.

Sophie Germain's contribution to Fermat's Last Theorem: Some unanswered questions, Special Session on History of Mathematics (with R. Laubenbacher), International Joint Mathematics Meetings, Vancouver, Canada, 1993.

Sophie Germain's contribution to Fermat's Last Theorem: A reevaluation, AMS-MAA? Special Session on History of Mathematics, Joint Mathematics Meetings, San Francisco, 1995.

'Here is what I have found:' the forgotten manuscripts of Sophie Germain on Fermat's Last Theorem, banquet address, annual Southwestern Section meeting, Mathematical Association of America, El Paso, 1995.

'Voici ce que j'ai trouvé:' Sophie Germain's forgotten manuscripts on Fermat's Last Theorem, Colloquium, University of Washington, 1996.

'Voici ce que j'ai trouvé': Sophie Germain's undiscovered work on Fermat's Last Theorem, Honors Week presentation, Northern Arizona University, 1999, and at Humboldt State University, 2000.

Voici ce que j'ai trouvé: Sophie Germain's rediscovered manuscripts on Fermat's Last Theorem, Keynote Speaker, annual meeting of the Washington/Oregon Associations of Mathematics at Two Year Colleges, Stevenson, Washington, 2001.

The bridge between the continuous and the discrete via original sources, Study the Masters: The Abel-Fauvel conference, Kristiansand, Norway, 2002.

Organizer and leader, Seminar on original historical sources, Humboldt State University, Arcata, 2003.

Inventors imperfect: Sophie Germain, BBC Radio 4, studio interview in Manchester, UK, for national broadcast November 12, 2003.

Algebraic Solution of Equations, High School Mathematics Contest Awards Ceremony, New Mexico State University, May 2004.

'Voici ce que j'ai trouve' (Here is what I have found): Sophie Germain's rediscovered manuscripts on Fermat's Last Theorem', Inaugural speaker, Arizona Mathematics Undergraduate Conference, 2004.

Did Euclid need the Euclidean algorithm to prove unique factorization?, Colloquium, New Mexico State University, October 2004; Colloquium, University of Arizona, November 2004, AMS-MAA Special Session on History of Mathematics, Joint Mathematics Meetings, San Antonio, 2006.

Quadratic forms à la Fermat, Euler, Lagrange, and Legendre, Part I: Did Fermat inspire Euler to discover the Quadratic Reciprocity Law for prime numbers?, Colloquium, New Mexico State University, 2005.

Did Fermat inspire Euler to discover the Quadratic Reciprocity Law for prime numbers?, AMS Session on History of Mathematics, Joint Mathematics Meetings, New Orleans, 2007.

Dances between continuous and discrete: Euler's summation formula, colloquium, New Mexico State University, 2000, and Euler 2K+2 conference, Rumford, Maine, 2002, and colloquium at Humboldt State University, Arcata, 2003, and Basic Notions seminar, University of Oregon, 2005, and colloquium for Claremont Center for the Mathematical Sciences, Pomona College, 2008.

Sophie Germain's Manuscripts on Fermat's Last Theorem: A Further Evaluation of their Scope, Depth, and Original Techniques, Mathematics Colloquium, New Mexico State University, October, 2007, and AMS-MAA Special Session on History of Mathematics, Joint Mathematics Meetings, San Diego, 2008.

Kieval Endowment Lectures at Southern Oregon University, May 2009. Public lectures:

Did Euclid Need the Euclidean Algorithm to Prove Unique Factorization?;

Dances Between Continuous and Discrete: Euler's Summation Formula;

Voici ce que j'ai trouvé (Here is What I Have Found): Sophie Germain's Grand Plan for Proving Fermat's Last Theorem

Sophie Germain's grand plan for proving Fermat's Last Theorem, Mathematical Association of America Invited Address, Joint Mathematics Meetings, San Diego, 2002, and mathematics colloquium, New Mexico State University, 2002, and Colorado State University - Pueblo, 2010, and U. of Texas, El Paso, 2011.

The Beauty of Mathematics, Old and New (with Pat Morandi): *"Voici ce que j'ai trouvé:" Sophie Germain's grand plan to prove Fermat's Last Theorem,* one of four public lectures for the Academy for Learning in Retirement, Las Cruces, NM, 2011.

So you think you understand fractions? Enter Euclid to shake you up, Mathematics colloquium, Humboldt State University, 2011.

Voici ce que j'ai trouvé (Here is what I have found): Sophie Germain's grand plan for proving Fermat's Last Theorem, Kieval endowment lecture, Humboldt State University, 2011; Undergraduate mathematics club, University of Rochester, October, 2011; Keynote speech, New Mexico Mathematics Association of Two Year Colleges annual meeting, Las Cruces, NM, May 2012.

Quick, does 23/67 equal 33/97? A mathematician's secret from Euclid to today, History and Pedagogy of Mathematics Americas meeting, University of California, Berkeley, 2012.

So You Think You Understand Fractions? Quick, Does 23/67 Equal 33/97? A Mathematician's Secret from Euclid to Today, Mathematics colloquium, New Mexico State University, 2012, and Mathematics colloquium, U. of Texas, Arlington, 2013.

Sophie Germain - Math's Hidden Woman, for "Celebrating women in the STEM fields" week, Women's Studies Institute, Metropolitan State University – Denver, 2013.

Sophie Germain's grand plan to prove Fermat's Last Theorem, Mathematics colloquium, Metropolitan State University – Denver, 2013.

Sophie Germain's grand plan to prove Fermat's Last Theorem, 2014 Lonseth Lecture, Oregon State University, 2014.

Did Euclid understand fractions? Do we understand Euclid?, Dean's 50th anniversary lecture, St. John's College, Santa Fe, New Mexico, 2014.

So you think you understand fractions? Quick, does $23/67 = 33/97$?, Mathematics Colloquium, Oregon State U., 2017.

What does 'less than or equal' really mean?, Mathematics colloquium, New Mexico State University, 2015, and Mathematics colloquium, Oregon State University, 2018.

"Voici ce que j'ai trouvé": Did Sophie Germain (almost) prove Fermat's Last Theorem?, Number Theory seminar, University of Rochester, 2011; Mathematics colloquium, New Mexico State University, 2012, Mathematics colloquium, University of Oregon, 2018.

Why and how did Fermat discover his theorem?, Number Theory Seminar, Oregon State University, 2020.

Sophie Germain's Grand Plan to Prove Fermat's Last Theorem, Mathematics colloquium, Oregon State University, sponsored by the Association for Women in Mathematics, for International Women in Mathematics Day, 2020; recording available at `https://media.oregonstate.ed`

How and why did Fermat discover his theorem? A hands-on investigation, New Mexico State University colloquium, March 2021.

So you think you understand fractions?, colloquium for Research Experiences for Undergraduates program at Oregon State U., 2017, 2020, 2021.

So you think you understand fractions? Quick, does 23/67 equal 33/97? A mathematician's secret from Euclid to today, for Western Oregon University $\pi\mu\epsilon$ induction ceremony, June 2021.

How did Fermat discover his theorem?, AMS Special Session on History of Mathematics, Joint Mathematics Meetings, Seattle, 2025.

Dedekind had his cuts, Cantor had Cauchy sequences, but what about Weierstrass? The mysterious "third construction" of the real numbers in the nineteenth century, Mathematics colloquium, Oregon State University, 2025.

Presentations on teaching with primary historical sources:

Great problems of mathematics: A course based on original sources, in Special Session on Using History in the Teaching of Mathematics, Annual Joint Mathematics Meetings, San Francisco, 1991, and Special Session on A Toolbox for Liberal Arts Mathematics Courses, Annual Joint Mathematics Meetings, Baltimore, 1992.

The joy of reading original mathematical sources: Area and the development of the definite integral over two millennia, Colloquia at St. Olaf College and Carleton College, 1991.

Reading original sources in the history of mathematics, national mathematics undergraduate honor society $\pi\mu\epsilon$, New Mexico State University, 1991.

Finding the area inside a curve: A tour of original mathematical sources spanning two millennia, Mathematics Awards Ceremony lecture, University of Connecticut, and Mathematics Awareness Week speaker, Trinity University, 1992.

Sums of powers and the origin of Bernoulli numbers: Works by Fermat, Pascal, Bernoulli, and a pinch of Euler, Mathematics Majors Seminar, Trinity University, San Antonio, 1992.

Great theorems: The art of mathematics; A course based on original sources, International Conference on the History and Pedagogy of Mathematics, Toronto, 1992, and Special Session on Capstone Courses for the Mathematics Major (with R. Laubenbacher), Annual Joint Mathematics Meetings, San Antonio, 1993.

Recovering motivation and soul in mathematics: Teaching with original sources, Special Session on Research in Undergraduate Mathematics Education, Annual Joint Mathematics Meetings, Cincinnati, 1994.

Recovering motivation and soul in the mathematics curriculum: Teaching with original sources, Colloquium (with R. Laubenbacher), New Mexico State University, 1994, and Colloquium, University of Washington, 1995.

Using history in teaching our mathematics courses, Colloquium, New Mexico State University, 1998.

A graduate course on the role of history in teaching mathematics, Study the Masters: The Abel-Fauvel conference, Kristiansand, Norway, 2002

The bridge between the continuous and the discrete via original sources, MAA Contributed Paper Session on Incorporating History of Mathematics in the Mathematics Classroom, Annual Joint Mathematics Meetings, Baltimore, 2003.

Pascal's 'Treatise on the Arithmetical Triangle', Colloquium, New Mexico State University, 2004.

Pascal's 'Treatise on the Arithmetical Triangle': Teaching discrete mathematics via original historical sources, MAA poster session on NSF-funded undergraduate education programs, Joint Mathematics Meetings, Atlanta, 2005 and San Antonio, 2006.

Primary sources in the classroom: Blaise Pascal in discrete mathematics and Arthur Cayley in abstract algebra, MAA Session on Using History in Teaching Mathematics, Joint Mathematics Meetings, San Antonio, 2006.

A multi-week project on mathematical induction and combinatorics for university students, based on Pascal's Traité du Triangle Arithmetique, Mini-Workshop on Studying Original Sources in Mathematics Education, Mathematisches Institut Oberwolfach, Oberwolfach, Germany, 2006.

Dances between continuous and discrete: Euler's summation formula in his own words, MAA Contributed Paper Session on Euler in the Classroom, Joint Mathematics Meetings, New Orleans, 2007.

Teaching mathematics with primary historical sources: Should it go mainstream? Can it?, keynote plenary address at HPM 2008, the quadrennial conference of the International Study Group on History and Pedagogy of Mathematics, July 14–18, 2008, Mexico City.

Number theory à la Sophie Germain: a course of guided discovery from her research manuscripts on Fermat's Last Theorem, MAA paper session on History of Mathematics and Its Uses in the Classroom, Joint Mathematics Meetings, Boston, 2012.

Empirical research on the use of history in mathematics education, panelist, HPM 2012, Quadrennial meeting of the International Study Group on the Relations Between History and Pedagogy of Mathematics, Daejeon, Korea, 2012.

Teaching number theory from Sophie Germain's manuscripts: a guided discovery pedagogy, HPM 2012, Quadrennial meeting of the International Study Group on the Relations Between History and Pedagogy of Mathematics, Daejeon, Korea, 2012.

Number theory à la Sophie Germain: a course of just-in-time guided discovery from her research manuscripts on Fermat's Last Theorem, History and Pedagogy of Mathematics Americas meeting, University of California, Berkeley, October, 2012.

Throwing away the textbook: Teaching discrete mathematics from primary historical sources, in MAA Session on Addressing the Needs of Mathematics and Computer Science Majors in Discrete Mathematics Courses, Joint Mathematics Meetings, Seattle, January 2016.

Evolution of Teaching with Primary Historical Sources (with J. Lodder, 45 mins), NSF workshop on Transforming Instruction in Undergraduate Mathematics via Primary Historical Sources (TRIUMPHS), Denver, September, 2016.

IHMT and 35+ years of teaching with primary historical sources: Influences, melding pedagogies, collaborations, and impacts on historical research, Invited paper session on "The Institute on the History of Mathematics and its Use in Teaching. 30 years of impact on education and research", MAA MathFest, Sacramento, 2025.

Minicourses/workshops presented on teaching with primary historical sources:

Recovering motivation in mathematics: teaching with original historical sources (with R. Laubenbacher), MAA minicourse, Annual Joint Mathematics Meetings, San Francisco, 1995.

Teaching with original sources in mathematics, Instructor, NSF/MAA Institute for History of Mathematics and Its Use in Teaching, Washington, D.C., 1996.

Finding Motivation for Upper Division Mathematics through Original Sources (with Jerry Lodder), MAA minicourse, Annual Joint Mathematics Meetings, San Antonio, January, 1999.

Teaching mathematics via original historical sources, multi-day national workshop for the graduate course on History of Mathematics in Mathematics Education of the National Swedish Graduate School in Mathematics Education, Uppsala University, Sweden, 2003.

Using history in teaching mathematics, for the Southern California Project NExT Program (New Experiences in Teaching), a professional development program for new faculty in the mathematical sciences, 2004.

Study the Masters: Using Primary Historical Sources in Teaching and Research (with Daniel Otero), three day Summer Short Course 2008, Ohio Section of the Mathematical Association of America, Xavier University, June 18–20, 2008.

Learning Discrete Mathematics and Computer Science via Primary Historical Sources: Student projects for the classroom, workshop presented with Janet Barnett, at HPM 2008, the quadrennial conference of the International Study Group on History and Pedagogy of Mathematics, Mexico City, July 14–18, 2008.

Learning discrete mathematics via historical projects (with Jerry Lodder), Mathematical Association of America Minicourse, Joint Mathematics Meetings, San Francisco, Jan. 13–16, 2010.

Learning discrete mathematics via historical projects (with Janet Barnett), Mathematical Association of America Minicourse, Joint Mathematics Meetings, New Orleans, Jan. 6–9, 2011.

Study the masters: Using primary historical sources in mathematics teaching (with Daniel Otero), Mathematical Association of America Minicourse, Joint Mathematics Meetings, Boston, Jan. 2012.

Workshop on the Authorship of Historical Projects, funded by the National Science Foundation, with 19 outside participants, New Mexico State University, April 16–17, 2012.

Projects for students of discrete mathematics via primary historical sources: Euclid on his algorithm (with J. Barnett, J. Lodder), HPM 2012, Quadrennial meeting of the International Study Group on the Relations Between History and Pedagogy of Mathematics, Daejeon, Korea, July, 2012.

Teaching and Learning Mathematics from Primary Historical Sources, main conference workshop (2 1/2 hrs), Mathematical Association of America, Pacific Northwest Section annual meeting, Corvallis, April 2016.

Teaching with Primary Historical Sources, Author-led preparation session for 40 faculty, mock classroom led with real students observed by 40 faculty, and faculty de-brief session (5 1/2 hrs total), NSF workshop on Transforming Instruction in Undergraduate Mathematics via Primary Historical Sources (TRIUMPHS), Denver, September, 2016.

Teaching Mathematics via Primary Historical Sources, conference minicourse (2 1/2 hrs, with J. Barnett, D. Otero), Mathematical Association of America, Pacific Northwest Section annual meeting, virtual, June 2021.

Presentations on mathematics pedagogy:

Ways to integrate student learning and assessment, Teaching Seminar, University of Washington, 1996.

Towards active processes for teaching and learning, keynote address at the conference The Changing Undergraduate Mathematics Curriculum, Osage Beach, Missouri, 1997.

Discussion of teaching styles, panelist, Colloquium, New Mexico State University, 2004.

How to beat the lecture/textbook trap!: An active student classroom via studying, reading, writing, projects, and primary historical sources, in How to Engage Students in Mathematics: Presentations by Section Teaching Award Winners, Annual Meeting of the Southwest Section of the Mathematical Association of America, El Paso, 2005.

How to beat the lecture/textbook trap!: An active classroom via advance student reading and writing, MAA Session of Presentations by the Haimo Teaching Award Recipients, Joint Mathematics Meetings, Washington, D.C., 2009.

Inquiry-Proof Instructional Techniques, panelist for Mathematical Association of America panel discussion, Joint Mathematics Meetings, New Orleans, Jan. 2011.

How to beat the lecture/textbook trap! An active classroom via student reading, writing, and preparation in advance, invited panelist for Project NExT annual meeting for new fellows, University of Wisconsin, July 2012.

How to beat the lecture/textbook trap, and then throw them both away! Melding inquiry-based alternatives for both, invited plenary address, Legacy of R. L. Moore Conference, June 2013, Austin, Texas.

Available at `http://www.youtube.com/watch?v=XVzAzeJyaPU&feature=share&list=PL7HVaYibt1knjNNERi3otgm-NWohd5m8k`

What is Inquiry-Based Learning? Why? NMSU Mathematics case studies, then discussion OR Is it as simple as ABC?, Colloquium, New Mexico State University, 2015.

How to escape the lecture/textbook trap and exchange it for active learning both in and out of class, Undergraduate Teaching Seminar, U. of Oregon, 2016.

From Lecture to Active Learning: Rewards for all, and is it really so difficult?, special faculty presentation for Dept. of Forest Ecosystems and Society, Oregon State U., 2017, and for MIT Electronic Mathematics Education Seminar, 2017, and Mathematics Colloquium, Oregon State U., 2017, and in AMS Special Session on Teaching and Learning in Undergraduate Mathematics, AMS Western Section Meeting, Portland, 2018, and Mathematics colloquium, Univ. of Washington, 2018.

Group theory via a rectangle tethered up to homotopy by strings or strip: from middle school to general education to abstract algebra, in OSU Mathematics Education Seminar, 2018, and in MAA Contributed Paper Session on Touch it, Feel it, Learn it: Tactile Learning Activities in the Undergraduate Mathematics Classroom, Joint Mathematics Meetings, Jan. 2019, Baltimore.

Evidence-based teaching: how do we all get there? Case studies and discussion (Part I), OSU Mathematics Education Seminar, March, 2019.

Evidence-based teaching: how do we all get there? Part II: Institutional and global, OSU Mathematics Education Seminar, March, 2019.

Minicourses/workshops presented on mathematics pedagogy:

Helping students become active learners in mathematics (with M. Gehrke), NSF National Chautauqua Short Course for college teachers, Austin, 1995, 1996.

Helping students become active learners in mathematics, workshop at the conference The Changing Undergraduate Mathematics Curriculum, Osage Beach, Missouri, 1997.

We lecture because they don't read, and they don't read because we lecture: how to beat the lecture/textbook trap!, workshop for NMSU Teaching Academy, 2010, 2011.

How to beat the lecture/textbook trap!: An active classroom via student reading, writing, and warmup preparation in advance, two presentations for 40 new fellows at the Project NExT (New Experiences in Teaching) professional development workshop for new Ph.D.s, Hartford, Connecticut, 2013.

How to escape the lecture/textbook trap, and exchange it for an interactively engaged classroom, workshop for NMSU Teaching Academy, 2015.

How to escape the lecture/textbook trap and exchange it for active learning both in and out of class, two part workshop, U. of New Mexico - Valencia, 2017.

How to escape the lecture/textbook trap by integrating pre-class reading, writing, and problem work with in-class active learning, NMSU Teaching Academy two-day workshops, presented twice, Nov. 2018.

Evidence-based teaching: how do we all get there?, guided discussion coorganized with Dev Sinha and Ravi Vakil, sponsored by the AMS Committee on Education, Joint Mathematics Meetings, Jan. 2019, Baltimore.

How do you ensure student buy-in?, invited presentation for Project NExT workshop on Maximizing Student Outcomes in Flipped Classrooms, Joint Mathematics Meetings, Jan. 2019, Baltimore.

Should we harmonize how we expect students to learn with how we assess their learning? in session on Aligning Practice and Assessment with Course Learning Goals, MAA PNW section annual meeting, April 2019, Portland OR.

Integrating before, during, and after class homework for effectiveness, workshop for national Project NExT Online Seminar on How to Create Effective Homework Assignments, 2020.

Challenges and opportunities for shifting our pedagogy toward evidence-based active learning methods that substantially improve student success, workshop session (with Dev Sinha), Project NExT, Pacific Northwest Section annual meeting, virtual, June 2021.

Selected presentations on student research projects in calculus:

Student research projects in the calculus curriculum, Conference on Calculus Curriculum Development, Institute for Mathematics and Applications, Minneapolis, 1988.

Calculus Projects at NMSU, High School Principals and Counselors Conference, New Mexico State University, 1990.

Student projects in calculus: A department-wide program, Special Session on Using Projects in the First Two Years of the Curriculum, Annual Joint Summer Mathematics Meetings, Orono, Maine, 1991.

From projects to themes: The evolution of calculus classes at New Mexico State University, Poster Session, Annual Joint Mathematics Meetings, San Francisco, 1991, San Antonio, 1993, Cincinnati, 1994.

A projects-based calculus program, Colloquia at University of Rochester, University of Waterloo, University of Western Ontario, York University, University of Toronto, Queen's University, 1991.

Student research projects in calculus, Rotary Club, Las Cruces, NM, 1992.

Innovations in calculus instruction: Student projects — a department program, Colloquium, University of Connecticut, 1992.

Calculus writing projects at New Mexico State University, Hour Address, Harvard Calculus Workshop, Oklahoma State University, 1994.

Minicourses/workshops presented on student research projects in calculus:

Student research projects in calculus, Invited Workshop for the California Calculus Consortium, San Luis Obispo, California, 1990, Minicourse at Southwestern Section annual meeting, Mathematical Association of America, Las Cruces, New Mexico, 1991, Minicourse at Annual Joint Mathematics Meetings, Baltimore, 1992, Invited Minicourse for New England section, Mathematical Association of America, Springfield, Massachusetts, 1992.

Discovery Learning in Mathematics Through Group Projects, Invited Workshop at Conference on Equity Within the Classroom III: Graduating Minority Students, Michigan State Department of Education, Lansing, Michigan, 1993.

Meeting the Challenge, Calculus Renewal, live appearance on National Science Foundation National Satellite Video Workshop, to 225 sites, University Television, California State University, Long Beach, 1993.

Conference organizer:

American Mathematical Society, Far Western section, New Mexico State University, Las Cruces, NM, April 8–9, 1988 (algebraic topology special session and local arrangements co-organizer).

Discovering Calculus Through Student Research Projects, New Mexico State University, Las Cruces, NM, March 1991 (principal organizer).

Teaching with Original Sources in Mathematics, MAA Contributed Paper Session at Joint Mathematics Meetings, San Francisco, 1995 (coorganizer with R. Laubenbacher).

International conference on *Complex cobordism in homotopy theory: its impact and prospects*, Johns Hopkins University, March 2007 (coorganizer).

Treasures from the Past: Using Primary Sources in the Classroom, Mathematical Association of America contributed paper session (coorganizer), Joint Mathematics Meetings, New Orleans, Jan. 2011.

HPM 2012, Quadrennial Conference on History and Pedagogy of Mathematics, of the International Study Group on the Relations Between History and Pedagogy of Mathematics, of the International Commission on Mathematical Instruction, Daejeon, Korea, July 2012 (coorganizer).

Outreach events:

Throwing for π: Try your luck, for DaVinci Days, Corvallis, Oregon, 2018, coorganizer and exhibitor.

Appointments:

Committee on the Participation of Women, Mathematical Association of America, 1991–97; member, Committee Task Force on Micro-inequity Skits, 1993–96.

Editorial Board, Mathematics Magazine, 1995–2000.

Paper session chair, *Action Research Conference*, New Mexico Center for Teaching Excellence, Taos, June 15–17, 1995.

Subcommittee on Service Courses of the Committee on the Undergraduate Program, Mathematical Association of America, 1996–2004.

International HPM Advisory Board, International Study Group on the Relations Between History and Pedagogy of Mathematics, of the International Commission on Mathematical Instruction, 2008–

Committee on Haimo Awards for Distinguished College or University Teaching of Mathematics, Mathematical Association of America, 2010–2013.

Chair, Committee on Haimo Awards for Distinguished College or University Teaching of Mathematics, Mathematical Association of America, 2011–2013.

National Science Foundation Advisory Board for a seven institution five year NSF grant to develop numerous projects based on primary historical sources for mathematics and mathematics education major courses: *Transforming Instruction in Undergraduate Mathematics via Primary Historical Sources*, 2015–2023. Includes planning and coleading workshops, reviewing primary source projects, mentoring new authors, translating primary sources.

Subgroup on Teaching Strategies and Practices of the Mathematics Action Group of TPSE-Math (Transforming Post-Secondary Education in Mathematics), 2021–2023.

International Scientific Program Committee (ISPC) of the Tenth European Summer University on the History and Epistemology in Mathematics Education (ESU10), 20-25 July 2026 at the University of Aveiro (Portugal).

Referee:

Journal of Combinatorial Theory B.

Bulletin, Societé Mathématique de France, 1985, 86.

Transactions of the American Mathematical Society, 1986, 87.

Proceedings of the American Mathematical Society, 1985, 86, 87, 90.

Proceedings, International Conference on Algebraic Topology, Oaxtepec (1991), Contemporary Mathematics Series, American Mathematical Society, 1992.

History of Mathematics and its Use in Teaching (twice), 1997.

Journal of Pure and Applied Algebra, 1998.

Mathematics Magazine, 1996 (twice), 97 (thrice), 98 (thrice), 99 (twice), 2000 (twice).

Associate Editor (reviewed 20 papers), conference proceedings *Study the Masters: The Abel-Fauvel conference* (ed. Otto Bekken et al), 2002, Kristiansand, Norway, National Center for Mathematics Education, University of Gothenburg, Sweden, 2003.

Two papers for *Recent Developments in Introducing a Historical Dimension in Mathematics Education* (eds. V. Katz and C. Tzanakis), Mathematical Association of America, Washington, D.C, 2009.

Two papers for *On History and Epistemology in Mathematics Education*, ESU-6 conference proceedings (eds. Evelyne Barbin Manfred Kronfellner, C. Tzanakis), 2010.

Convergence, 2010, 2011.

HPM 2012, Quadrennial Meeting of the International Study Group on the Relations Between History and Pedagogy of Mathematics, Daejeon, Korea, 2012.

Science and Education, special issue on History and Philosophy of Mathematics in Mathematics Education, 2013.

Central European Journal of Mathematics, 2013.

Historia Mathematica, 2003, 2011, 2012, 2013.

NOMAD (Nordic Studies in Mathematics Education), 2013.

ESU-7: Proceedings of the 7th European Summer University on the History and Epistemology in Mathematics Education, Copenhagen, 2014 (twice).

The Mathematical Intelligencer, 1994, 97, 2016, 17.

The Role of History of Mathematics in Mathematics Education (ed. Constantinos Tzanakis), Proceedings of TSG 25 of the 13th International Congress on Mathematical Education (ICME-13, 2016, Hamburg), 2017.

PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies, 1995, 2013, 17 (twice) 18 (twice).

ESU-8: Proceedings of 8th European Summer University on History and Epistomology in Mathematics Education, Oslo, 2018 (thrice), 2019 (twice).

College Mathematics Journal, 1992, 94, 97, 98, 99, 2001, 07, 2020.

American Mathematical Monthly, 2001, 05, 06, 14 (twice), 18, 19 (twice), 2020.

New York Journal of Mathematics, 2018 (twice), 2020, 2021.

Comptes Rendues de L'Academie des Sciences, 2021.

Geometry and Topology, 2023.

Convergence, 2023.

Rocky Mountain Journal of Mathematics, 2023, 2024 (4 times).

Outside evaluator:

For promotion to full professor at another university, 1985, 92.

For tenure at another college/university, 1993 (twice), '97, 2009, '11 (twice).

External decadal reviewer, mathematics and science program, Bennington College, Bennington, Vermont, 2011.

For Ph.D. thesis at Université Pierre et Marie Curie, Paris, 2011.

MAA Instructional Practices Guide, 2018.

Reviewer:

Zentralblatt für Mathematik, 1982.

National Science Foundation, Division of International Programs, 1984.

John Wiley & Sons, book proposal, 1992.

National Endowment for the Humanities, 1992, 93.

National Science Education Standards, for National Research Council, 1993.

McGraw-Hill, book proposal, 1993, 94, 95.

Princeton University Press, book proposal, 2003.

Mathematical Association of America, book proposal, 2004, 06.

National Science Foundation, Program on Science and Society, 2008.

Enslow Publishers, book proposal, 2008.

Cambridge University Press, book proposal, 2010.

Springer Verlag, book proposal, 2014.

Children's Highlights, 2014.

MAA Press, American Mathematical Society, expert book review, 2021.

Member:

American Mathematical Society, Mathematical Association of America, Union of Concerned Scientists, Association for Women in Mathematics.

SELECTED UNIVERSITY ACTIVITIES (at NMSU unless otherwise noted)

Seminars:

Coorganizer, Seminar on Instantons, Monopoles, and Iterated Loop Spaces, Fall, 1987.

Coorganizer, Topology Seminar, 1982–88.

Presenter, Basic Notions Seminar, 1997 (twice).

Coorganizer and presentor, Mathematics Education Seminar, 1997.

Coorganizer and presenter, Historical Sources Seminar, 1997–98.

Presenter, Topology Seminar, frequently 1982–present (at NMSU and OSU).

Graduate Program:

Writer, Geometry Ph.D. Comprehensive Examination, August, 1987.

Prepared new syllabi for Topology Ph.D. Comprehensive Examination, 1987 and 1988.

Member, Department of Mathematical Sciences Ad Hoc Committee on the Graduate Program, 1987–88.

Foreign Language Examiner, 2000.

Writer, Topology Ph.D. Comprehensive Examination: August 1983, August 1985, January 1986, August 1986, August 1987, August 2000, August 2001, January 2002, August, 2006, August, 2008.

Chair, Masters' Examination Committee, mathematics: Ronald Ausbrooks, Spring 1983; Rebecca Brown, Spring 1997; Karen Price, Fall 2001; Kathe Kanim, Spring 2002; Jesus Duarte, Spring 2011.

Chair, Ph.D. Final Examination Committee, mathematics: Osama Ta'ani, Summer 2011.

Member, Graduate Committee, 2000–2002.

Member of various Masters' and Ph.D. Committees (at NMSU and OSU).

Member, Ad Hoc Mathematics Education Ph.D. Comprehensive Exam Committee, 2008–2010.

Undergraduate Mathematics Program:

Member, Ad Hoc Mathematics Major Curriculum Committee, 1985.

Member, Ad Hoc Calculus Textbook Committee, 1991–92, 2008–2009.

Coordinator (quarter time assignment), Calculus Projects Program, 1990–93.

Chair, Ad Hoc Committee on Mathematics Questions for Engineering Alumni Survey, 1993.

Capstone proposal for mathematics major, 1993.

Member, Ad Hoc Calculus Syllabus Committee, 1984–85, 1993–94.

Member, Undergraduate Curriculum Committee, 1996–97.

Cochair, Calculus Textbook Selection Subcommittee, 1996–97.

Chair, Undergraduate Majors/Minors Committee, 1987–88, 1990–91; member 1985–88, 1989–91, 1994–99, 2003–2005.

Advisor to Mathematics Majors, 2007–present.

Course coordinator and graduate assistant supervisor for various courses.

Member, Algebra and Pre-calculus Committee, 2007–8.

Chair, Undergraduate Curriculum Committee, 2008–2010.

Other Department Service:

Member, Ad Hoc Committee on the New Science Hall Reading Room, 1987–88.

Initiated display cases on department research and items of interest to undergraduates, 1988.

Academic liaison to featured speaker at New Mexico State University Holiday Symposium, 1990.

Member, Ad Hoc Committee on Hiring Planning, 1993–95.

Member, Ad Hoc Committee on Mathematics Education Hiring Planning, 1993–95.

Chair, Colloquium Committee, 1994–97.

Member, Advisory Committee, 1997–98.

Member, Subcommittee on Promotion to Professor, 1999.

Co-Chair, Ad Hoc Department Committee on Promotion and Tenure Revisions, 2002.

Member, Committee on Promotion of College-Track Faculty, 1997–2000, 2003–2004.

Member, Task Force on the Mathematics Learning Center, 2004.

Chair, Committee on Promotion to Professor, 2004, 2008.

Chair, Teaching Committee, 1993–98; member, 1989–2000, 2004–5.

Member, Liaison Committee Between Tenure Track and College Track Faculty, 2005–2006.

Member, Ad Hoc Committee to Define Duties of the Director of the Mathematics Success Center, 2009.

Chair, Ad Hoc Committee to Facilitate Department Head Search, 2009–2010.

Member, Ad Hoc Hiring Committee for Director of the Mathematics Success Center, 2010.

Chair, Library Liaison Committee, 2000–2002, 2003–2011.

Chair, Committee on Promotion to Professor, 2011.

Member, Teaching Committee, 2011.

University Library:

Member, College of Arts and Sciences Ad Hoc Committee on the Library, 1983–1984.

Member, University Faculty Library Committee, Spring 1986.

Member, Task Force on Library Facilities and Technology, University Library Assisted Self-Study, 1986.

Other University Service:

Member, President's Committee on College Teaching, 1989–92.

Member, University Architect's Bicycle Planning Committee, 1992.

Principal writer of successful Ethnic Diversity Grant proposal for NMSU Student Sierra Club, 1992, $1,000.

Crimson Scholar Advisor, Summer Freshman orientation, 1991–95.

Member, Promotion and Tenure Committee, Department of Philosophy, 1996.

Member, Institutional Climate Subcommittee, NMSU Strategic Planning Committee, 1997.

Faculty advisor, NMSU Student Sierra Club, 1988–1999.

Contributed to evaluation of Honors Program at request of Executive Vice-President, 1991, 99.

Member, University Westhafer Award Committee, 1999–2001.

Faculty Advisor, NMSU Greens student club, 1996–2002.

Member, College of Arts and Sciences Faculty Affairs Committee, 1999–2002.

Faculty Advisor, NMSU Badminton Club, 1996–2017.

Faculty Advisor, NMSU Save Our Environment student club, 2003–2004.

Member, College of Arts and Sciences Committee on Faculty Recognition Program, 2005–2006.

Advisory Board, STEP grant ("Science, Technology, Engineering, and Mathematics Talent Expansion Program"), College of Engineering (P.I. R. Jaquez), 2007–2011.

Member, NMSU Goldwater Scholarship Nomination Committee, 2010.

MATHEMATICS COURSES TAUGHT AT NMSU

SEMESTER	COURSE	TITLE
Fa 82	Math 191	Mathematics for Engineers and Scientists I
Fa 82	Math 541	Topology I
Sp 83	Math 192	Mathematics for Engineers and Scientists II
Sp 83	Math 542	Topology II
Sp 83	Math 501	Special Topics in Topology (reading course)
Fa 83	Math 191	Mathematics for Engineers and Scientists I
Fa 83	Math 291	Mathematics for Engineers and Scientists III
Sp 84	Math 331	Introduction to Modern Algebra
Sp 84	Math 291	Mathematics for Engineers and Scientists III
Fa 84	Math 191	Mathematics for Engineers and Scientists I
Fa 84	Math 332	Introduction to Modern Analysis
Sp 85	Math 192	Mathematics for Engineers and Scientists II
Sp 85	Math 331	Introduction to Modern Algebra
Sp 85	Math 401	Special Topics in Topology (reading course)
Fa 85	Math 291	Mathematics for Engineers and Scientists III
Fa 85	Math 541	Topology I
Sp 86	Math 192	Mathematics for Engineers and Scientists II
Sp 86	Math 542	Topology II
Sp 86	Math 401	Special Topics in Mathematical Biology
Sp 86	Math 501	Special Topics in Differential Topology
Sp 87	Math 192	Mathematics for Engineers and Scientists II
Sp 87	Math 192	Mathematics for Engineers and Scientists II
Fa 87	Math 291	Mathematics for Engineers and Scientists III
Sp 88	Honors 411/Math 401	Great Theorems: The Art of Mathematics
Sp 88	Math 291	Mathematics for Engineers and Scientists III
Su 88	Math 191	Mathematics for Engineers and Scientists I
Fa 89	Honors 275/Math 275H	Mathematics: Spirit and Method
Fa 89	Math 191	Mathematics for Engineers and Scientists I
Fa 89	Math 301	Mathematics: Spirit and Method
Sp 90	Math 291	Mathematics for Engineers and Scientists III
Fa 90	Honors 275/Math 275H	Mathematics: Spirit and Method
Fa 90	Math 600	Doctoral Research
Sp 91	Honors 411/Math 401	Great Theorems: The Art of Mathematics
Su 91	Math 300	Readings

Fa 91	Honors 275G	Spirit and Evolution of Mathematics
Fa 91	Math 520	Directed Reading
Sp 92	Honors 411/Math 401H	Great Theorems: The Art of Mathematics
Fa 92	Honors/Math 275G	Spirit and Evolution of Mathematics
Sp 93	Honors/Math 411G	Great Theorems: The Art of Mathematics
Fa 93	Honors/Math 275G	Spirit and Evolution of Mathematics
Fa 93	Math 192	Calculus and Analytic Geometry II
Sp 94	Math 110G	Mathematics Appreciation
Sp 94	Math 331	Introduction to Modern Algebra
Sp 94	Math 520	Directed Reading
Fa 94	Honors/Math 275G	Spirit and Evolution of Mathematics
Sp 95	Math 495/501	Workshop for Teachers: Using Historical Sources in Teaching Mathematics
Fa 96	Math 210G	Mathematics Appreciation
Fa 96	Hon/Math 275G	Spirit and Evolution of Mathematics
Sp 97	Math 210G	Mathematics Appreciation
Sp 97	Math 501	The Role of History in Teaching Mathematics
Fa 97	Math 191	Calculus and Analytic Geometry I
Sp 98	Math 561	The Role of History in Teaching Mathematics
Sp 98	Math 192	Calculus and Analytic Geometry II
Fa 98	Math 331	Introduction to Modern Algebra
Fa 98	Math 291	Calculus and Analytic Geometry III
Sp 99	Hon/Math 411G	Great Theorems: The Art of Mathematics
Sp 99	Math 501	Great Theorems: The Art of Mathematics
Sp 99	Math 192	Calculus and Analytic Geometry II
Fa 99	Math 541	Topology I
Fa 99	Hon/Math 275G	Spirit and Evolution of Mathematics
Fa 99	Math 520	Using History in Teaching Mathematics
Sp 00	Math 542	Topology II
Sp 00	Math 561	The Role of History in Teaching Mathematics
Fa 00	Math 541	Topology I
Fa 00	Hon/Math 275G	Spirit and Evolution of Mathematics
Sp 01	Math 542	Topology II
Sp 01	Math 332	Introduction to Analysis
Fa 01	Math 191	Calculus and Analytic Geometry I
Fa 01	Math 331	Introduction to Modern Algebra
Fa 01	Math 520	Directed Reading

Sp 02	Honors/Math 411G	Great Theorems: The Art of Mathematics
Sp 02	Math 210G	Mathematics Appreciation
Fa 02	Math 540	Directed Reading
Fa 03	Math 210G	Mathematics Appreciation
Fa 03	Hon/Math 275G	Spirit and Evolution of Mathematics
Fa 03	Math 700	Doctoral Dissertation (Elaine Cohen)
Sp 04	Math 279	Introduction to Finite Mathematics
Sp 04	Honors/Math 411G	Great Theorems: The Art of Mathematics
Sp 04	Math 700	Doctoral Dissertation (Elaine Cohen)
Fa 04	Math 279	Introduction to Finite Mathematics
Fa 04	Hon/Math 275G	Spirit and Evolution of Mathematics
Fa 05	Math 279	Introduction to Finite Mathematics
Fa 05	Math 541	Topology I
Sp 06	Math 279	Introduction to Finite Mathematics
Sp 06	Math 542	Topology II
Sp 06	Math 400	Undergraduate Research
Sp 06	Math 300	Readings
Fa 07	Hon/Math 275G	Spirit and Evolution of Mathematics
Fa 07	Math 452	Foundations of Geometry
Fa 07	Math 459	Survey of Geometry
Sp 08	Math 561	The Role of History in Teaching Mathematics
Fa 08	Math 279	Introduction to Finite Mathematics
Sp 09	CS/Math 278	Discrete Mathematics for Computer Science
Sp 09	Honors/Math 411G	Great Theorems: The Art of Mathematics
Sp 09	Math 540	Directed Reading
Sp 09	Math 700	Doctoral Dissertation (Osama Ta'ani)
Fa 09	Math 279	Introduction to Finite Mathematics
Fa 09	Math 452	Foundations of Geometry
Fa 09	Math 459	Survey of Geometry
Fa 09	Math 700	Doctoral Dissertation (Osama Ta'ani)
Sp 10	Math 331	Introduction to Modern Algebra
Sp 10	Math 453/503	Introduction to Topology
Sp 10	Math 700	Doctoral Dissertation (Osama Ta'ani)
Fa 10	Math 700	Doctoral Dissertation (Osama Ta'ani)
Sp 11	Math 331	Introduction to Modern Algebra
Sp 11	Math 455/505	Introduction to Number Theory
Sp 11	Math 700	Doctoral Dissertation (Osama Ta'ani)
Su 11	Math 700	Doctoral Dissertation (Osama Ta'ani)
Fa 11	Hon/Math 275G	Spirit and Evolution of Mathematics
Fa 11	Math 430	Combinatorial Mathematics