CURRICULUM VITAE

JOHN BRITTAIN LITTLE

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PERSONAL DATA

- Born January 15, 1956, Elmira, NY; U.S. citizen
- Single

EDUCATION

Haverford College	1972-1976	B.A., major in mathematics, 1976
Yale University	1976-1980	Ph.D. in mathematics, 1980
Harvard University	1979-1980	Visiting scholar

ACADEMIC HISTORY

1978-1979	Graduate Teaching Assistant	Yale University
1980-1986	Assistant Professor of Mathematics	College of the Holy Cross
1986-present	Associate Professor of Mathematics	College of the Holy Cross
1993-94	Visiting Fellow	Cornell University, Mathematical Sciences Institute
Spring 2003	Visiting Fellow	Mathematical Sciences Research Institute, Berkeley CA

COURSES TAUGHT

Abstract Algebra, Algebraic Structures, Applied Mathematics, Calculus (all of the different courses offered at Holy Cross), Calculus on Manifolds, Combinatorics, Complex Analysis, Data Structures, Discrete Mathematics, FYP: The Mathematics of Order and The Mathematics of Chaos, History and Development of Mathematical Ideas, Introduction to Computing (using FORTRAN and Pascal), Linear Algebra, Numerical Analysis, Ordinary Differential Equations, Principles of Analysis, Probability and Statistics, Real and Abstract Analysis, Seminar in Algebra, Seminar in Coding Theory, Seminar in Computational Commutative Algebra and Algebraic Geometry, Seminar in Lie Groups, Seminar on Representation Theory of Finite Groups and Compact Lie Groups, Seminar in Riemann Surfaces and Algebraic Curves, Topics in Mathematics–Symmetry, Topics in Topology.

THESES AND UNDERGRADUATE RESEARCH PROJECTS

1. 1987-1988: Kathryn Furio's Fenwick Scholar thesis.
2. 1995-1996: Greg Yurasek's College Honors thesis.
3. 1996-1997: Robert O'Connell's Mathematics Honors thesis
4. 1997-1998: Erin Ronan's College Honors thesis
5. 1998-1999: Jennifer Paulhus's College Honors thesis
6. 1999-2000: Kenneth Marino's Mathematics Honors thesis
7. 2000-2001: Rachael Carbonneau's College Honors thesis
8. 2004-2005: Ryan Schwarz's Mathematics Honors thesis
9. 1983-present: served as a reader for 9 other Fenwick, College Honors, and Mathematics Honors theses.
10. 1991: Supervised an REU group of 5 students at the NSF Regional Geometry Institute at Mount Holyoke College
11. 1992: Supervised an REU group of 4 students at the NSF Regional Geometry Institute at Amherst College.
12. 1998: Supervised a group of 12 students in Gröbner bases seminar at the Summer Institute in Mathematics for Undergraduates (SIMU) at the University of Puerto Rico in Humacao.
13. 1999: Supervised a group of 12 students in Gröbner bases seminar at the Summer Institute in Mathematics for Undergraduates (SIMU) at the University of Puerto Rico in Humacao.
14. 2001: Supervised a group of 12 students in coding theory seminar at the Summer Institute in Mathematics for Undergraduates (SIMU) at the University of Puerto Rico in Humacao.

PRINCIPAL RECENT SERVICE

College Service

1. Committee on Tenure and Promotion, 1989-1991
2. Chair of the *ad hoc* committee on the Hewlett-Mellon Presidential Discretionary Fund, spring 1993.
3. Departmental Academic Affairs Council Representative, 1995-1997 (served on Committee on Nominations and Elections 1995-1996, and as AAC Secretary, 1996-1997)
4. Chair, APAC AAC Working Group 3, spring 1997
5. Chair, Department of Mathematics and Computer Science, 1997-2000.
6. Finance and Planning Council, January 2001-June 2002.
7. Curriculum Review Study Group on Honors Programs, December 2003-present.
8. College Curriculum Committee, 2004-present.

Department Service

1. Departmental Colloquium Chair, 1994-1995
2. Coordinator for HA 408 PC Lab, 1997-2002
3. Department webmaster, 1998-present.
4. Calculus Workshop Director, 2000-2002, 2005-present.
5. Continuously involved with other department members in hiring committees, curriculum study committees, and other departmental working groups (too many to list individually)

GRANTS

1. Co-PI with D. Cox (Amherst College) and D.O'Shea (Mount Holyoke College) on NECUSE (Pew Charitable Trusts) grant in 1988 for $35,000 entitled *Computational Algebraic Geometry.*
2. Co-PI with E. Cattani (University of MA), M. Conway (Longmeadow HS), D. Cox (Amherst College), R. Currier (Smith College), T. Garrity (Williams College), K. Hoffman (Hampshire College), and D. O'Shea (Mount Holyoke College) on a three year (1990-1993) NSF grant DMS-9013220 for $1,425,835, entitled *Geometry in the Machine Age: A Regional Geometry Institute.*
3. Co-PI with D.Cox (Amherst College) and D.O'Shea (Mount Holyoke College) on NSF Undergraduate Course and Curriculum Development (CCD) grant (1996-7) DUE-9666132, for $45,004, entitled *Computational Algebra and Geometry.*

ACADEMIC AWARDS

- Graduated from Haverford College *magna cum laude*, with departmental honors in mathematics.
- Phi Beta Kappa, Haverford College, 1975
- O'Leary Faculty Recognition Award, Holy Cross, 2002
- Swords Medal (25 years of service), 2005

PRINCIPAL MATHEMATICAL INTERESTS

Algebraic Geometry, Commutative Algebra, Computational Methods, Applications in Algebraic Coding Theory and Signal Processing

RECENT TALKS

1. *Symbolic Algebra Techniques in Algebraic Coding Theory*, NSA Computational Algebra Seminar, Fort Mead, MD, 8/8/1995
2. *The Algebraic Structure of Some AG Goppa Codes*, 33rd Annual Allerton Conference on Communication, Control, and Computing, University of Illinois, Urbana-Champaign, IL, 10/1/1995

3. *Error-Correcting Codes from Algebra and Geometry*, Boston University Undergraduate Mathematics Club, 2/26/1996
4. *Applications to Coding Theory*, AMS Short Course on Applications of Computational Commutative Algbra, at Joint Mathematics Meetings in San Diego, CA, 1/10/1997
5. *Gröbner Bases and Integer Programming*, in MAA Short Coure on Computational Commutative Algebra and Applications, at Joint Mathematics Meetings in Baltimore, MD, 1/10/1998
6. *Canonical Curves and the Petri Scheme*, 33 Years of Gröbner Bases Conference at RISC-Linz, Austria, 2/20/1998
7. *Signal Processing and Commutative Algebra*, in SIMU Colloquium, University of Puerto Rico at Humacao, 7/20/2000
8. *Solving the Selesnick-Burrus Filter Design Equations*, in AMS Special Session on Commutative Algebra and Applications, Sectional Meeting in Hoboken, NJ, 4/29/2001
9. *Applications of Computational Commutative Algebra in Signal Processing*, Grostat V Conference, Tulane University, New Orleans, LA, 9/4/2001
10. *Applications of Computational Algebraic Geometry in Signal Processing*, Memorial Conference for Ruth Michler, Annapolis, MD, 10/28/2001
11. *Counting the Number of Solutions of A System of Polynomial Equations*, SIMU Colloquium, University of Puerto Rico at Humacao, 6/21/2002
12. *An Application of Symbolic Computational Algebra in Signal Processing*, Fields Institute SCA2002 Conference, University of Western Ontario, London, Ontario, Canada, 7/15/2002
13. *Order Domains*, UC Berkeley/MSRI Computational Algebra Seminar, 2/10/2003.
14. *Error-Correcting Codes from Algebra and Geometry*, Loyola Marymount University Mathematics Colloquium, 3/20/2003.
15. *An Application of Symbolic Computational Algebra in Signal Processing*, MSRI Resultants Seminar, 3/26/2003.
16. *Order Domains*, Tulane University Mathematics Colloquium, 4/24/2003.
17. *Order Domains*, MSRI Commutative Algebra Seminar, 4/28/2003.
18. *Error-Correcting Codes from Algebra and Geometry*, Texas A&M University Algebra-Combinatorics Seminar, 7/10/2003.
19. *Error-Correcting Codes from Algebra and Geometry*, Minicourse at SACNAS Annual Meeting, 10/2/2003.
20. *Order Domains and Generalized Goppa Codes*, AMS Special Session on Coding and Design-Theoretic Applications of Polynomials, Joint Mathematics Meetings, Phoenix, AZ, 1/7/2004.
21. *Applications of Computational Commutative Algebra in Statistics*, Clemson University Algebra and Discrete Math Seminar, 2/5/2004.
22. *Error-Correcting Codes from Algebra and Geometry*, Minicourse at SACNAS Annual Meeting, 9/25/2004.
23. *An Introduction to Computational Commutative Algebra and an Application in Statistics*, WPI Mathematics Department Colloquium, 1/14/2005.
24. *An Introduction to Computational Commutative Algebra and an Application in Statistics*, Oberlin College Mathematics Colloquium, 5/5/2005.

25. *Symmetry in Music*, Mathematics Institute at SACNAS Annual Meeting, 10/1/2005.

ARTICLES IN REFEREED JOURNALS

1. *Translation Manifolds and the Converse of Abel's Theorem*, Compositio Mathematica, **49** (1983), 147-171.
2. *On the Converse of Abel's Theorem in Characteristic p*, Manuscripta Mathematica, **46** (1984), 27-63.
3. *Characterizing Curves on Surfaces of Special Types*, Mathematische Annalen, **271** (1985), 459-465.
4. *On Some Analogs of the Reiss Relation for Curves on Rational Ruled Surfaces*, Duke Mathematical Journal, **52** (1985), 909-922.
5. *On Lie's Approach to the Study of Translation Manifolds*, Journal of Differential Geometry, **26** (1987), 253-272.
6. *On Webs of Maximum Rank*, Geometriae Dedicata, **31** (1989), 19-35.
7. (with Kathryn Furio) *On the Distribution of Weierstrass Points on Rational Nodal Curves*, Pacific Journal of Mathematics, 144 (1990), 131-136.
8. *Distribution of Weierstrass Points on Rational Cuspidal Curves*, Canadian Mathematical Bulletin, **33** (1991), 184-189.
9. (with Chris Heegard and Keith Saints) *Systematic Encoding via Groebner Bases for a Class of Algebraic Geometric Goppa Codes*, IEEE Transactions on Information Theory, **41**, no. 6 (1995), 1752-1761.
10. (with Chris Heegard and Keith Saints) *On the Structure of Hermitian Codes*, Journal of Pure and Applied Algebra, **121** (1997), 293-314.
11. (with David Ortiz, Ricardo Ortiz-Rosado, Rebecca Pablo, and Karen Rios-Soto) *Some Remarks on Fitzpatrick and Flynn's Gröbner Basis Method for Padé Approximation*, Journal of Symbolic Computation, **35** (2003), 451-461.
12. *Solving the Selesnick-Burrus Filter Design Equations Using Compututational Commutative Algebra and Algebraic Geometry*, Advances in Applied Mathematics, **31** (2003), 463-500.
13. *On the Zeroes of Two Families of Polynomials Arising From Certain Rational Integrals*, Rocky Mountain Journal of Mathematics, **35** (2005), 1205 - 1216.
14. (with George Boros, Victor Moll, Edward Mosteig, and Richard Stanley) *A Map on the Space of Rational Functions* , Rocky Mountain Journal of Mathematics **35** (2005), 1861-1880.
15. (with Leah Gold and Hal Schenck) *Cayley-Bacharach and Evaluation Codes on Complete Intersections*, Journal of Pure and Applied Algebra **196** (2005), 91-99.
16. (with Cristina Ballantine and Sharon Frechette) *Determinants Associated to Zeta Matrices of Posets*, Linear Algebra and Its Applications **411** (2005), 364-370.

ARTICLES IN CONFERENCE PROCEEDINGS

1. *Translation Manifolds and the Schottky Problem*, Proceedings of Symposia in Pure Mathematics, **49**, part 1 (1989) 517-529.

2. *The Algebraic Structure of Some AG Goppa Codes*, Proceedings of 33rd Annual Allerton Conference on Communication, Control, and Computing, (1995) University of Illinois, 492-500.
3. *Canonical Curves and the Petri Scheme*, in *Gröbner Bases and Applications (Proceedings of "33 Years of Gröbner Bases", RISC-Linz, 1998)*, B. Buchberger, and F. Winkler, eds., London Mathematical Society Lecture Note Series 251, Cambridge University Press, 1998, 381-392.

PREPRINTS

1. *Another Connection Between Approaches to the Schottky Problem*, arXiv alg-geom/9202010.
2. *A key equation and the computation of error values for codes from order domains*, arXiv math.AC/0303299.
3. *The Ubiquity of Order Domains for the Construction of Error Control Codes*, arXiv math.AC/0304292.
4. (with Hal Schenck) *Toric surface codes and Minkowski sums*, arXiv math.AG/0507598.
5. (with Ryan Schwarz) On m-dimensional toric codes, arXiv cs.IT/0506102.

BOOK CHAPTER

1. *Applications To Coding Theory*, in *Applications of Computational Algebraic Geometry*, D. Cox and B. Sturmfels, eds. Proceedings of Symposia in Applied Mathematics, v. 53, American Mathematical Society, 1997, 143-167.

BOOKS

1. (with David Damiano) *A Course in Linear Algebra*, Orlando: Harcourt Brace Jovanovich, 1988.
2. (with David Cox, Donal O'Shea) *Ideals, Varieties, and Algorithms*, New York: Springer Verlag, 1992, second edition, 1996. (Japanese translation, 2000, Russian translation 2000.)
3. (with David Cox, Donal O'Shea) *Using Algebraic Geometry*, New York: Springer Verlag, 1998. (Japanese translation, 2000.)

OTHER PROFESSIONAL ACTIVITIES

- Reviewer for *Mathematical Reviews*
- Referee for *Journal of Pure and Applied Algebra*, *Journal of Symbolic Computation*, *IEEE Transactions on Information Theory*, *Computers and Mathematics,Advances in Applied Mathematics*
- Grant proposal reviewer for the National Science Foundation
- Book reviewer for Academic Press, W.H.Freeman, D.C.Heath, Springer Verlag

MEMBERSHIPS

American Mathematical Society
Mathematical Association of America
IEEE, Information Theory Society
SACNAS (Society for the Advancement of Chicanos and Native Americans in Science)