CURRICULUM VITAE

Personal Data

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Birthdate:	28 July 1955
Marital Status:	Married

Education

B.A. (magna cum laude with highest honors in Mathematics), Harvard College, 1977

M. A., University of California at San Diego, 1979

Ph.D., University of California at San Diego, 1982   Thesis Supervisor: Harold M. Stark

Experience

Assistant Professor of Mathematics, University of Maine at Orono, 1982-85

4. *Stark's conjecture and abelian L-functions with higher order zeros at s* = 0, Advances in Math. **66** (1987), 62–87.

5.

76 (2007), 545–555.

23. *L-values and the Fitting Ideal of the Tame Kernel for Relative Quadratic Extensions*, Acta Arith. **131.4** (2008), 389–402.

24. *Values at s=-1 of L-Functions for Multiquadratic Extensions of Number Fields, and the Fitting Ideal of the Tame Kernel*, International Journal of Number Theory **5** (2009) 383–405.

25. *Functorial Properties of Stark Units in Multiquadratic Extensions* (with B. A. Tangedal), in "Proceedings of the 8th Algorithmic Number Theory Symposium," Springer Lecture Notes in Computer Science, Volume 5011 (2008), 253–267.

26. *Annihilation of Motivic Cohomology Groups in Cyclic 2-Extensions* (with M. Kolster), Ann. Sci Math. Quebec. **32** (2008), 175–187.

27. *L-values for Biquadratic Extensions and the Fitting Ideal of the Tame Kernel*, Ann. Sci. Math. Quebec **34** (2010), 109–118.

28. *L-functions at the origin and annihilation of class groups in multiquadratic extensions*, Acta Arith. **154.2** (2012) 173–185.

29. *L-functions for quadratic characters and annihilation of motivic cohomology groups*, Canadian Math. Bulletin **58.3** (2015) 620–631.

30. *Twisted zeta functions of quaternion orders*, J. Number Theory **160** (2016), 32–43.

31. *Zeta functions and ideal classes of quaternion orders*, Rocky Mountain J. Mat83-11.9551Td(28.)

$86,000 National Security Agency Research Grant: *Iwasawa Invariants* (with D. Dummit), 1990-92

$4,200 National Science Foundation EPSCoR Workshop Grant: *Algebraic Number Theory* (with D. Dorman, D. Dummit, R. Foote, and L. Simons); 1990–91

$12,000 from Deutsche Forschungsgemeinschaft Grant to Lehrstuhl Buchmann, University of Saarland, Germany: *Guest Professor*, 1992-93

$50,000 National Security Agency Research Grant: *Numerical Verifications of Stark's Conjectures and Refinements of the Associated Units* (with D. Dummit); 1992-94

$52,000 National Security Agency Research Grant: *Investigations of Stark's Conjecture* (with D. Dummit and B. Tangedal); 1996-97

$31,850 National Science Foundation Research Grant: *Stark Units* (with D. Dummit); 1996-99

$69,641 National Security Agency Research Grant: *A Generalization of the Abelian Stark Conjecture* (with D. Dummit); 1999-2001

$5,000 Number Theory Foundation Grant for *International Conference on Stark's Conjectures and Related Topics*; 2002

$15,000 National Science Foundation Conference Grant for *International Conference on Stark's Conjectures and Related Topics* (with Cristian Popescu); 2002

$75,403 National Security Agency Research Grant: *Refinements of the Abelian and Non-Abelian Stark Conjecture* (with D. Dummit); 2003-2005

$50,000 National Security Agency Conference Grant for *Algorithmic Number Theory Symposium VI*; 2004.

Invited Addresses

1. Lecture "Brumer-Stark for Abelian Fields," NSF Summer Conference on Special Values of L-Functions, University of New Hampshire, Durham, 6/28/82.
2. Colloquium "Stark's Conjectures for L-Series," University of New Brunswick, Fredericton, 3/4/83.
3. Seminars "Brumer-Stark for Multiquadratic Extensions" and "Stark's Conjecture over Real Quadratic Base Fields," Laval University, Quebec, 2/4/84.
4. Colloquium "Forecasting Arithmetic with L-Functions," University of Massachusetts, Amherst, 4/4/85.
5. Lecture "Stark's Conjecture and Multiquadratic Extensions," Quebec-Ontario Mathematics Meeting, Laval University, Quebec, 4/7/85.
6. Seminar "Stark's Conjecture and Higher Order Zeroes," University of Vermont, Burlington, 5/9/85.
7. Colloquium "L-Functions, Higher Arithmetic and Hilbert's 12th Problem," University of Vermont, 5/10/85.
8. Seminar "Brumer-Stark for Abelian Fields," McGill University, Montreal, 2/27/86.
9. Colloquium "Kummer's Contribution to a 1962 Conjecture," University of Vermont, 2/28/86.

10. Lecture "Abelian L-Functions and a Refinement of Stark's Conjecture," Ohio State - Denison Math. Conf., Denison University, Granville, OH, 5/9/86.
11. Lecture "Higher Order Zeros of Abelian L-functions," Workshop on Artin L-functions, University of Montreal, 11/14/86.
12. Seminar "Principal Homogeneous Spaces and Descent," University of Maine, Orono, 3/19/87.
13. Lecture "Leopoldt's Conjecture in Parameterized Families," International Number Theory Conference, Laval University, Quebec, 7/6/87.
14. Colloquium "Kummer's Contribution to a 1962 Conjecture," University of British Columbia, Vancouver, 1/14/88.
15. Seminar "Algebraic and Analytic Aspects of Iwasawa's Lambda Invariant," University of British Columbia, Vancouver, 1/15/88.
16. Lecture "Computation of Iwasawa Lambda Invariants," First Conference of the Canadian Number Theory Association, Ban , Alberta 4/26/88.
17. Lecture "Computation of Iwasawa Lambda-Invariants," AMS Summer Workshop on Computational Number Theory, Bowdoin College, Maine, 7/12/88.
18. Colloquium "Primality and Factorization via Gauss' Theory of Quadratic Forms," Dartmouth University, New Hampshire, 9/28/88.
19. Seminar "Iwasawa Invariants over Imaginary Quadratic Fields," University of Toronto, 2/28/90.
20. Colloquium "When Does Continuity Mean Divisibility?" Middlebury College, Vermont, 3/13/90.
21. Colloquium "When Does Continuity Mean Divisibility?" St. Michael's College, Vermont, 4/19/90.
22. Lecture "Iwasawa Invariants over Imaginary Quadratic Fields," Seaway Number Theory Conference, SUNY Bu alo, 6/1/90.
23. Lecture "Computation of Stable Iwasawa Invariants," Workshop on Computational Number Theory, Oberwolfach, Germany, 7/12/91.
24. Seminar "Semisimple Iwasawa Modules," Five College Number Theory Seminar, Amherst College, Massachusetts, 11/12/91.
25. Seminar "Semisimple Iwasawa Modules," University of Saarland, Germany, 10/26/92.
26. Seminar "Semisimple Iwasawa Modules," University of Besançon, France, 1/21/93.
27. Seminar "The Extended Riemann Hypothesis in Computational Number Theory," Computer Science Department, University of Saarland, Germany, 2/12/93.
28. Seminar "The Extended Riemann Hypothesis in Computational Number Theory," University of Düsseldorf, Germany, 3/10/93.
29. Seminar "Semisimple Iwasawa Modules," University of Bordeaux, France, 3/25/93.
30. Seminar "Stable Iwasawa Invariants," University of Turku, Finland, 5/12/93.
31. Seminar "Semisimple Iwasawa Modules," University of Turku, Finland, 5/13/93.
32. Seminar "Stable Iwasawa Invariants," University of Saarland, Germany, 6/7/93.
33. Seminar "Class Numbers as Determinants," Berlin Technical University, Germany, 6/23/93.

34. Seminar "Class Numbers as Determinants," Masarykovy University, Brno, Czech Republic, 6/29/93

35. Lecture "Relative Class Numbers as Determinants," Fields Institute Conference on L-functions, University of Waterloo, Ontario, 3/23/94.

36. Seminar "Introduction to Stark's Conjectures," Laval University, Quebec, 3/20/95.

37. Special Session Talk "Computations Related to Stark's Conjecture," Burlington (Vermont) Mathfest, 8/6/95.

38. Special Session Talk "Computational Evidence for Stark's Conjecture," Fifth Conference of the Canadian Number Theory Association, Carleton University, Ottawa, Canada, 8/20/96

39. Seminar "The Story of Base Change for the Brumer-Stark Conjecture," Brown University, Providence, RI, 9/22/97.

40. Seminar "The Story of Base Change for the Brumer-Stark Conjecture," Laval University, Quebec City, Canada, 12/12/97.

41. Invited Address, "Stark's Question and Popescu's Conjecture," Conference on Constructive Number Theory, Laval University, Quebec City, Canada, 7/6/98.

42. Seminar "Stark's Question and Popescu's Conjecture," University of Texas at Austin, Austin, TX 9/9/99.

43. Seminar "Stark's Question and Popescu's Conjecture," University of Colorado, Boulder, CO, 4/4/00.

44. Special Session Talk "Stark's Conjecture in Multiquadratic Extensions, Revisited," American Mathematical Society Regional Meeting, Lafayette, Louisiana, 4/16/00.

45. Contributed Conference Talk "Stark's Conjecture in Multiquadratic Extensions, Revisited," Journees Arithmetiques, Lille, France, 7/5/01.

46. Lecture "Popescu's Conjecture in Multiquadratic Extensions," Quebec-Maine Number Theory Conference, Orono, Maine, 10/4/03.

47. Invited Address "Popescu's Conjecture in Multiquadratic Extensions," Eighth Conference of the Canadian Number Theory Association, Toronto, 6/21/04.

48. Lecture "L-functions of Multiquadratic Extensions at $s = -1$ and Annihilation of the Tame Kernel," Workshop on Stark's Conjectures, University of Montreal, 11/1/05.

49. Lecture "L-functions of Multiquadratic Extensions at $s = -1$ and Annihilation of the Tame Kernel," Five College Number Theory Seminar, Amherst College, Massachusetts, 3/28/06.

50. Seminar "Values at $s = -1$ of L-functions for Multiquadratic Extensions and Annihilation of the Tame Kernel," University of California at San Diego Number Theory Seminar, 11/9/06

50. "Dedekind Zeta Functions at $s = -1$ and the Fitting ideal of the Tame Kernel in a Relative Quadratic Extension of Number Fields," University of California at Irvine Number Theory Seminar, 2/13/07

51. Seminar "Dedekind Zeta Functions at $s = -1$ and the Fitting ideal of the Tame Kernel in a Relative Quadratic Extension of Number Fields," University

of California at San Diego Number Theory Seminar, 3/15/07

52. Plenary Address "Galois Module Structure Analogies between Ideal Class Groups and the Tame Kernel," Palmetto Number Theory Seminar, College of Charleston, South Carolina, 9/9/07.

53. Lecture "Dedekind Zeta Functions at $s = -1$ and the Fitting ideal of the Tame Kernel in a Relative Quadratic Extension of Number Fields," Quebec-Maine Number Theory Conference, Orono, Maine, 9/30/07.

54. Seminar "Dedekind Zeta Functions at $s = -1$ and the Fitting ideal of the Tame Kernel in a Relative Quadratic Extension of Number Fields," Front Range Number Theory Seminar, Colorado State University, Fort Collins, CO, 4/3/08.

55. Lecture "Embedding Biquadratic Extensions of Number Fields in Dihedral extensions, and the Tame Kernel as a Galois Module," Quebec-Maine Number Theory conference, Orono, Maine, 10/3/09.

56. Special Session Talk: "L-functions at the origin and annihilation of S-class groups in multiquadratic extensions," American Mathematical Society Spring Western Section Meeting, Honolulu, Hawaii, 3/3/12.

57. Invited Talk "L-functions at $s = -1$ and annihilation of S-tame kernels in multiquadratic extensions," Hawaii Conference on Algebraic Number Theory, Algebraic Geometry, and Modular Forms, Honolulu, Hawaii, 3/7/12.

58. Invited Talk "Zeta Functions of Orders in Quaternion Algebras," Mini-Conference on Number Theory, University of Maine, Orono, Maine, 6/23/14.

59. Invited Talk "Zeta Functions and the Finiteness of the Number of Ideal Classes in Quaternion Orders," Quebec-Maine Number Theory Conference, University of Laval, Quebec City, Canada, 9/27/14.

60. Invited Session Talk "Zeta Functions and the Arithmetic of Quaternion Orders," Canadian Mathematical Society Winter Meeting, Hamilton, Ontario, Canada, 12/6/14.

61. Seminar "Zeta-functions and quaternion orders I," University of North Carolina at Greensboro Number Theory Seminar, 1/28/15.

62. Seminar "Zeta-functions and quaternion orders II," University of North Carolina at Greensboro Number Theory Seminar, 2/9/15.

63. Invited Talk "L-functions for quadratic characters and annihilation of motivic cohomology groups," Workshop on Mahler Measures, Regulators, and Special Values of L-functions, Centre de Recherche Mathematiques, U. Montreal, 2/17/15.

64. Invited Talk "Computing Annihilators of Class Groups from Derivatives of L-series," Quebec-Maine Number Theory Conference, University of Maine, Orono, ME, 10/3/15.

65. Invited Talk "Quotients of Zeta-Functions for Quaternion Algebras," Quebec-Maine Number Theory Conference, Laval University, Quebec City, 10/8/16.

66. Colloquium "Are Quotients of Zeta Functions Entire?" California State University at Chico, 3/20/17.

67. Lecture "Numerical Evidence for Higher-Order Stark-Type Conjectures," Canadian Number Theory Association XV Conference, Quebec City, Canada, 7/14/18.

68. Colloquium "A Potential Game-Changer for Speedy Factoring: Schor's Algorithm," California State University at Chico, 9/21/18.
69. Invited Talk, "L-Functions for Graph Coverings and Annihilation of Graph Jacobians," West Coast Number Theory Seminar, Cal. State U. at Chico, 12/16/18.
70. Invited Talk "The Index of the Stickelberger Ideal for Graph Coverings," Hawaii Number Theory Conference HINT, Honolulu, Hawaii, 3/20/19.
71. Special Session Talk: "L-functions for Graph Coverings and Annihilation of Graph Jacobians," American Mathematical Society Spring Western and Central Section Meeting, Honolulu, Hawaii, 3/23/19.

Regional Presentations

1. Seminar "Iwasawa's Approach to Leopoldt's Conjecture," University of Vermont, Burlington, 9/25/86.
2. Seminar "Leopoldt's Conjecture in Families of Fields," Concordia University, Montreal, 12/15/86.

19. Seminar "The Story of Base Change for the Brumer-Stark Conjecture," University of Vermont, 12/10/98.
20. Seminar "Consequences of Burns' Conjecture I and II," University of Texas, Austin, 3/31/00 and 4/3/00.
21. Seminar "On Burns' Conjecture, I and II," University of Vermont, 7/7/00 and 7/10/00.
22. Seminar "Popescu's Conjecture in Multiquadratic Extensions," University of Montreal, 9/11/03.
23. Seminar "Introduction to $K_2(R)$," University of Vermont 10/7/04 and 10/21/04.
24. Seminar "A map from $K_2(F)$ to the Brauer group of F," Vermont Algebra/Number Theory Seminar, University of Vermont, Burlington VT 3/27/08.

Czechoslovak Journal of Mathematics, Journal of Symbolic Computation, Journal of Combinatorial Design, Mathematics of Computation, Proceedings of the American Mathematical Society, Transactions of the American Mathematical Society, Pacific Journal of Mathematics, Journal für die Reine und Angewandte Mathematik, Mathematica Slovaka, Proceedings of Conference of Canadian Number Theory Association 2002, Experimental Mathematics, Science in China, Rocky Mountain Journal of Mathematics, Compositio Mathematica, Proceedings of Park City Math Institute 2009, Annals Math. Quebec.

2. *Reviewing:* NSF Algebra and Number Theory Grant Program, NSERC Canada Operating Grants in Mathematics, Mathematical Reviews, Euresco conference proposal

3. *External Examiner:* Carleton University, Ottawa, Ph.D. program; Laval University, Quebec, Ph.D. program.

4. *Conference Planning:* Local Arrangements Chair for Burlington Mathfest 1995, Special Session Co-Organizer at Burlington Mathfest 1995, Co-organizer of Conference on Stark's Conjecture at Johns Hopkins University in August 2002, Co-organizer of Algorithmic Number Theory Symposium (ANTS) at University of