

## CURRICULUM VITAE

January 2021

NAME: James Mc Laughlin

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PRESENT RANK: Professor

DEPARTMENT: Mathematics, West Chester University, West Chester, PA 19383.

### EDUCATION:

University of Illinois at Urbana-Champaign, IL (UIUC)	2002	PhD
University College, Dublin, Ireland	1996	MSc
Queen's University, Belfast, N.Ireland	1982	PGCE
University of Ulster, N.Ireland	1979	BSc

### WORK EXPERIENCE:

West Chester University, PA.	Professor	2015 – 2020
West Chester University, PA.	Associate Professor	2010 – 2015
West Chester University, PA.	Assistant Professor	2005 – 2010
Trinity College, Hartford, CT.	Visiting Assistant Professor	2002 – 2005
UIUC	Teaching Assistant	1996 – 2002
University College, Dublin, Ireland	Teaching Assistant	1994 – 1996
Various high schools, Dublin, Ireland	Mathematics Teacher	1992 – 1994

TEACHING:

## A. Courses Taught:

- Fall 2002 - MAT 132: Calculus II
  - MAT 231: Calculus III
- Spring 2003 - MAT 253: Number Theory
  - MAT 325: Special Topics in Continued Fractions (seminar)
- Fall 2003 - MAT 107: Elements of Statistics
  - MAT 131: Calculus I
- Spring 2004 - MAT 132: Calculus II
  - MAT 325: Special Topics in Continued Fractions (seminar)
- Fall 2004 - MAT 125: Functions and Limits
  - MAT 107: Elements of Statistics
  - MAT 205: Abstraction and Argument
- Spring 2005 - MAT 253: Number Theory
  - MAT 325: Special Topics in Continued Fractions (seminar)
- Fall 2005 - MAT 121: Statistics
  - MAT 151: Introduction to Discrete Mathematics
  - MAT 411: Algebra I
- Spring 2006 - MAT 105: College Algebra and Trigonometry
  - MAT 151: Introduction to Discrete Mathematics
  - MAT 414: Number Theory
- Summer 2006 - MAT 108: Brief Calculus
  - MAT 121: Statistics
- Fall 2006 - MAT 121: Statistics
  - MAT 151: Discrete Mathematics
  - MAT 411: Algebra I
- Spring 2007 - MAT 105: College Algebra and Trigonometry
  - MAT 121: Statistics
  - MAT 151: Introduction to Discrete Mathematics
- Summer 2007 - MAT 107: College Algebra
  - MAT 108: Brief Calculus
- Fall 2007 - MAT 107: College Algebra
  - MAT 411: Algebra I
- Spring 2008 - MAT 105: College Algebra and Trigonometry
  - MAT 414: Number Theory
  - MAT 405:  $Q$ -Series
- Summer 2008 - MAT 108: Brief Calculus
  - MAT 105: College Algebra and Trigonometry

- MAT 107: College Algebra
- MAT 411: Algebra I
- Spring 2009 - MAT 105: College Algebra and Trigonometry
  - MAT 151: Introduction to Discrete Mathematics
  - MAT 405: Cryptography
  - MAT 595: Cryptography
- Summer 2009 - MAT 107: College Algebra
  - MAT 110: Precalculus
- Fall 2009 - MAT 105: College Algebra and Trigonometry
  - MAT 110: Precalculus
  - MAT 161: Calculus I
- Spring 2010 - MAT 103: Introduction to Mathematics
  - MAT 107: College Algebra
  - MAT 161: Calculus I
- Summer 2010 - MAT 161: Calculus I
  - MAT 414: Theory of Numbers
- Fall 2010 - MAT 107: College Algebra
  - MAT 151: Introduction to Discrete Mathematics
  - MAT 161: Calculus I
- Spring 2011 - MAT 161: Calculus I
  - MAT 162: Calculus II
  - MAT 405: Special Topics (Cryptography)
- Summer 2011 - MAT 161: Calculus I
  - MAT 411: Algebra I
- Fall 2011 - MAT 110: Precalculus
  - MAT 162: Calculus II
  - MAT 200: Nature of MAT
- Spring 2012 - MAT 161: Calculus I
  - MAT 405: Special Topics (Integer Partitions)
  - MAT 595: Topics in MAT (Graduate Integer Partitions)
- Summer 2012 - MAT 411: Algebra I
  - MAT 414: Theory of Numbers
  - Thesis I
- Fall 2012 - MAT 107: College Algebra
  - MAT 311: Linear Algebra
  - MAT 413: Computer Algebra
  - MAT 595: Topics in MAT (Graduate Computer Algebra)
  - Thesis II

- Spring 2013 - MAT 104: Introduction to Applied Mathematics
  - MAT 414: Number Theory
  - MAT 405: Cryptography
- Summer 2013 - MAT 108: Brief Calculus
  - MAT 311: Linear Algebra
- Fall 2013 - MAT 110: Precalculus
  - MAT 161: Calculus I
  - MAT 411: Algebra I
- Spring 2014 - MAT 162: Calculus II
  - MAT 261: Calculus III
  - MAT 514: Graduate Number Theory
- Summer 2014 - MAT 107: College Algebra
  - MAT 311: Linear Algebra
- Fall 2014 on Sabbatical
- Spring 2015 - MAT 108: Brief Calculus
  - MAT 325: Computational Mathematics
  - MAT 415: Cryptography
- Summer 2015 - MAT 311: Linear Algebra
  - MAT 411: Abstract Algebra
- Fall 2015 - MAT 107: College Algebra
  - MAT 411: Algebra I
  - MAT 515: Graduate Algebra I
- Spring 2016 - MAT 108: Brief Calculus
  - MAT 411: Abstract Algebra
  - MAT 516: Graduate Algebra II
- Summer 2016 - MAT 311: Linear Algebra
  - MAT 411: Algebra I
- Fall 2016 - MAT 131: Precalculus
  - MAT 411: Algebra I
  - MAT 413: Computer Algebra
- Spring 2017 - MAT 311: Linear Algebra
  - MAT 412: Algebra II
  - MAT 405: Cryptography
- Summer 2017 - MAT 143: Brief Calculus
  - MAT 311: Linear Algebra
- Fall 2017 - MAT 151: Discrete Mathematics
  - MAT 411: Algebra I
  - MAT 515: Graduate Algebra I
- Spring 2018 - MAT 151: Discrete Mathematics

- MAT 516: Graduate Algebra II
- Summer 2018 - MAT 151: Discrete Mathematics
  - MAT 311: Linear Algebra
- Fall 2018 - MAT 151: Discrete Mathematics
  - MAT 411: Algebra I
  - MAT 413: Computer Algebra
- Spring 2019 MAT 151: Discrete Mathematics
  - MAT 415: Cryptography
- Summer 2019 - MAT 151: Discrete Mathematics
  - MAT 311: Linear Algebra
- Fall 2019 - MAT 151: Discrete Mathematics
  - MAT 411: Algebra I
  - MAT 413: Computer Algebra
- Spring 2020 MAT 151: Discrete Mathematics
  - MAT 415: Cryptography

- B. Undergraduate Research - Summer 2004, with Saiying He  
 - Fall 2007 - Summer 2009, with Eric Werley

- B. Graduate Research - Supervised two Masters Thesis  
 Ricky Sparks A Collection of Basic Hypergeometric Identities, completed May 2013  
 Sam Reed - "A Different Way to Look at the Inverse Regular Quintic Galois Problem", Sam has still to finish the write-up.

### RESEARCH:

#### A. Published Papers:

- [1] *Polynomial Continued Fractions* (With D. Bowman) - Acta Arith. **103** (2002), no. 4, 329–342.
- [2] *On the Divergence of the Rogers-Ramanujan Continued Fraction on the Unit Circle* (With D. Bowman) - The Transactions of the American Mathematical Society **356** (2004), no. 8, 3325–3347.
- [3] *Polynomial Solutions to Pell's Equation and Fundamental Units in Real Quadratic Fields* - J. London Math. Soc. (2) **67** (2003), no. 1, 16–28.
- [4] *Multi-variable Polynomial Solutions to Pell's Equation and Fundamental Units in Real Quadratic Fields* - Pacific J. Math. **210** (2003), no. 2, 335–349.
- [5] *On The Divergence in the General Sense of  $q$ -Continued Fractions on the Unit Circle* (With D. Bowman) - Communications in the Analytic Theory of Continued Fractions **11** (2003), 25–49.

- [6] *A Theorem on Divergence in the General Sense for Continued Fractions* (With D. Bowman) - The Journal of Computational and Applied Mathematics **172**, no. 2, pp 363–373.
- [7] *Combinatorial Identities Deriving from the  $n$ -th Power of a  $2 \times 2$  Matrix* - Integers **4** (2004), A19, 14 pp. (electronic).
- [8] *Real Numbers with Polynomial Continued Fraction Expansions* (with Nancy Wyshinski) - Acta Arith. **116** (2005), no. 1, 63–79.
- [9] *A Convergence Theorem for Continued Fractions of the Form  $K_{n=1}^{\infty} a_n/1$*  (with Nancy Wyshinski) - The Journal of Computational and Applied Mathematics, Volume **179**, Issues 1–2, 1 July 2005, Pages 255–262, containing the proceedings from the Conference on Orthogonal Functions and Related Topics, Roros, Norway, August 2003
- [10] *Ramanujan and the Regular Continued Fraction Expansion of Real Numbers* (with Nancy Wyshinski) - The Mathematical Proceedings of the Cambridge Philosophical Society, Volume **138** - Issue 03 - May 2005, pp 367 - 381.
- [11] *Powers of a matrix and combinatorial identities* (with B. Sury) - INTEGERS: The Electronic Journal of Combinatorial Number Theory **5** (2005), A13, 9 pp.
- [12] *The Convergence and Divergence of  $q$ -Continued Fractions outside the Unit Circle* (With D. Bowman) - The Rocky Mountain Journal of Mathematics **36** (2006), no. 3, 799–809.
- [13] *The Convergence behavior of  $q$ -Continued Fractions on the Unit Circle* (With D. Bowman) - The Ramanujan Journal **12** (2006), no. 2, 185–195.
- [14] *Further Combinatorial Identities Deriving from the  $n$ -th Power of a  $2 \times 2$  Matrix* (with Nancy Wyshinski) - Discrete Applied Mathematics **154** (2006), no. 8, 1301–1308.
- [15] *Continued Fractions with Multiple Limits* (With D. Bowman) - Advances In Mathematics Volume **210** (2007), no. 2, 578–606.
- [16] *A  $q$ -continued fraction* (with Doug Bowman and Nancy Wyshinski) - International Journal of Number Theory Volume **2** (2006), no. 4, 523–547.
- [17] *Continued Fractions and Generalizations with Many Limits: A Survey.* (with Doug Bowman) - In the Proceedings of the Conference on Diophantine Analysis and Related Fields, Keio University, Yokohama, JAPAN, 7–10 March, 2006, published as Seminar on Mathematical Sciences, **35**, Keio University, Department of Mathematics, Yokohama (2006), 19–38.
- [18] *Some remarks on the number of points on elliptic curves over finite prime field.* (with Saiying He) - Bull. Austral. Math. Soc. **75** (2007), no. 1, 135–149.
- [19] *Some more Long Continued Fractions, I* (with Peter Zimmer) - Acta Arith. **127** (2007), no. 4, 365–389.
- [20] *Ramanujan and Extensions and Contractions of Continued Fractions* (with Nancy Wyshinski) - The Ramanujan Journal, **14** (2007), no. 3, 389–404.
- [21] *Symmetry and specializability in the continued fraction expansions of some infinite products* - The Journal of Number Theory, **127** (2007), no. 2, 184–219.
- [22] *Some Observations on Khovanskii's Matrix Methods for extracting Roots of Polynomials* (with B. Sury) - INTEGERS: The Electronic Journal of Combinatorial Number Theory **7** (2007), A48, 12 pp.

- [23] *Rogers-Ramanujan-Slater Type Identities* (with Andrew Sills and Peter Zimmer) - Electronic Journal of Combinatorics **15** (2008) #DS15, 59 pp.
- [24] *Ramanujan-Slater Type Identities Related to the Moduli 18 and 24* (with Andrew Sills) - The Journal of Mathematical Analysis and Applications **344/2** (2008) 765-777.
- [25] *Some identities between basic hypergeometric series deriving from a new Bailey-type transformation* (with Peter Zimmer) - The Journal of Mathematical Analysis and Applications , **345/2** (2008) 670-677.
- [26] *Some more identities of the Rogers-Ramanujan type* (with D. Bowman and A. Sills) - The Ramanujan Journal Volume **18**, Issue 3 (2009), Page 307-325
- [27] *Some new Families of Tasoevian- and Hurwitzian Continued Fractions* - Acta Arith. **135** (2008), no. 3, 247-268.
- [28] *Some Implications of the WP-Bailey Tree* (with P. Zimmer) - Advances in Applied Mathematics Volume **43**, Issue 2, August 2009, pp 162-175 .
- [29] *Rogers-Ramanujan Computer Searches* (with A. Sills and P. Zimmer) - Journal of Symbolic Computation Volume **44**, Issue 8, August 2009, pp 1068-1078
- [30] *Lifting Bailey Pairs to WP-Bailey Pairs* (with A. Sills and P. Zimmer) - Discrete Mathematics **309** (2009), pp. 5077-5091.
- [31] *Combinatorics of Ramanujan-Slater Type Identities* (with Andrew Sills) - Combinatorial Number Theory, Proceedings of the 'Integers Conference 2007', Carrollton, Georgia, USA, October 24-27, 2007, 125139, Walter de Gruyter, Berlin, 2009.
- [32] *An Identity Motivated by an Amazing Identity of Ramanujan* - The Fibonacci Quarterly 48 (2010), no. 1, 34-38.
- [33] *General WP-Bailey Chains* (with Peter Zimmer) - The Ramanujan Journal 22 (2010), no. 1, 11-31.
- [34] *Some new Transformations for Bailey pairs and WP-Bailey Pairs* - Central European Journal of Mathematics 8 (2010), no. 3, 474-487.
- [35] *Continued Fraction Proofs of m-versions of Some Identities of Rogers - Ramanujan-Slater Type* (with Doug Bowman and Nancy Wyshinski) - The Ramanujan Journal 25, Number 2, 203-227.
- [36] *Some Applications of a Bailey-type Transformation* (with Peter Zimmer) - The International Mathematical Forum Vol. 5, 2010, no. 61-64, 3007-3022.
- [37] *A New Summation Formula for WP-Bailey Pairs* - Applicable Analysis and Discrete Mathematics (AADM) 5 (2011), 67-79.
- [38] *Some implications of Chu's  $_{10}\psi_{10}$  extension of Bailey's  ${}_6\psi_6$  summation formula* (with Andrew Sills and Peter Zimmer) - Online Journal of Analytic Combinatorics (OJAC) Issue 5, 2010.
- [39] *Hybrid Proofs of the q-Binomial Theorem and other identities* (with Dennis Eichhorn and Andrew Sills) - Electronic Journal of Combinatorics Volume 18(1), 2011, P60.
- [40] *Polynomial Generalizations of two-variable Ramanujan type identities* (with Andrew Sills) - Electronic Journal of Combinatorics Volume 18(2), 2011, P15.

- [41] *A Hardy-Ramanujan-Rademacher-type formula for  $(r, s)$ -regular partitions* (with Scott Parsell) - The Ramanujan Journal June 2012, Volume 28, Issue 2, pp 253–271.
- [42] *On a pair of identities from Ramanujan's lost notebook* (with Andrew Sills) - Annals of Combinatorics Volume 16, Number 3 (2012), 591–607.
- [43] *A Reciprocity Relation for WP-Bailey Pairs* (with Peter Zimmer) - The Ramanujan Journal Volume 28, Number 2 (2012), 155–173.
- [44] *Further results on vanishing coefficients in infinite product expansions* - J. Aust. Math. Soc. 98 (2015), no. 1, 69-77.
- [45] *General multi-sum transformations and some implications* - The Ramanujan Journal April 2016, Volume 39, Issue 3, pp 545–565.
- [46] *Refinements of Some Partition Inequalities* - INTEGERS: The Electronic Journal of Combinatorial Number Theory 16 (2016), A66, 11 pp.
- [47] *Applications of the Heine and Bauer-Muir transformations to Rogers - Ramanujan type continued fractions* (with Jongsil Lee and Jaebum Sohn) - The Journal of Mathematical Analysis and Applications Volume 447, Issue 2, 15 March 2017, Pages 1126–1141.
- [48] *Mock Theta Function Identities Deriving from Bilateral Basic Hypergeometric Series* - Analytic number theory, modular forms and  $q$ -hypergeometric series, 503531, Springer Proc. Math. Stat., 221, Springer, Cham, 2017.  
(This volume contains the refereed conference proceedings of the 2016 Gainesville International Number Theory Conference in honour of Krishna Alladi).
- [49] *A Generalization of Schröter's Formula* - Annals of Combinatorics, November 2019, Volume 23, Issue 34, pp 889906, this volume comprising the refereed conference proceedings of Combinatory Analysis 2018, A Conference in Honor of George Andrews' 80th Birthday.
- [50] *Some Observations on Lambert series, vanishing coefficients and dissections of infinite products and series* - submitted to the refereed conference proceedings of Analytic and Combinatorial Number Theory: The Legacy of Ramanujan, A Conference in Honor Of Bruce C. Berndt's 80th Birthday, which will be published as a Special Issue of the International Journal of Number Theory (IJNT).
- [51] *New Infinite  $q$ -Product Expansions with Vanishing Coefficients* - submitted to the Ramanujan Journal.
- [52] *Asymptotics and Sequential Closures of Continued Fractions and Generalizations (with Douglas Bowman)* - submitted.

B. Book:

“Topics and Methods in  $q$ -Series” - published by World Scientific Publishing, September 2017.

C. Conference Talks:

1. "Some Polynomial Solutions to Pell's Equation" - AMS Sectional Meeting at Urbana, March 18 - 21, 1999.
2. "On the Divergence of the Rogers-Ramanujan Continued Fraction on the Unit Circle" - Illinois Number Theory Conference, May 18 - 20, 2001.
3. "On the Divergence of the Rogers-Ramanujan Continued Fraction on the Unit Circle, II" - 2001 West Coast Number Theory Conference, December 16th - 20, 2001.
4. "Continued Fractions with Multiple Limits" - Conference on Orthogonal Functions and Related Topics, Roros, Norway, August 12 - 16 2003.
5. "Ramanujan and the Regular Continued Fraction Expansion of Real Numbers" - Illinois Number Theory Conference, May 21 - 22, 2004.
6. "Symmetry and Specializability in the Continued Fraction Expansions of some Infinite Products" - AMS Session on Number Theory, II, Atlanta, January 5, 2005.
7. "A  $q$ -Continued Fraction" - AMS Session on Continued Fractions, San Antonio, January 14, 2006.
8. "Some Variations of the Bailey Transform" - Illinois Number Theory Fest, May 16 - 20, 2007.
9. "Lifting Bailey pairs to WP-Bailey pairs" - Conference on Partitions,  $q$ -Series and Modular Forms University of Florida, Mar 12-16, 2008.
10. "Some new Families of Tasoevian- and Hurwitzian Continued Fractions" - AMS Special Session on Continued Fractions, Washington, January 7 - 8, 2009.
11. "General WP-Bailey Chains" - AMS Special Session on  $q$ -series and Partitions, University of Illinois at Urbana-Champaign, March 27 - 29, 2009.
12. "Continued Fraction Proofs of  $m$ -versions of Some Identities of Rogers - Ramanujan-Slater Type". - JMM, New Orleans, January 9th, 2011.
13. "Further Results on Vanishing Coefficients in Infinite Product Expansions" - Tucson, October 27th, 2012.
14. "Certain General Double-Sum Identities and Variations of WP-Bailey Chains" - JMM, San Diego, January 11th, 2013.
15. "A General Multi-sum Transformation and Some Implications" Lubbock, Texas, April 12, 2014.
16. "Refinement of Some Partition Inequalities" - West Coast Number Theory Conference, Pacific Grove, December 18, 2015.
17. "Mock Theta Function Identities Deriving from Bilateral Basic Hypergeometric Series" - The 2016 Gainesville International Number Theory Conference, University of Florida, Gainesville, March 20th, 2016.
18. "Applications of the Heine and Bauer-Muir transformations to Rogers - Ramanujan type continued fractions" - JMM, Atlanta, January 7th, 2017 (joint work with Jongsil Lee and Jaebum Sohn).
19. "Some observations on Lambert series, vanishing coefficients and dissections of infinite products and series" - Analytic and Combinatorial Number Theory: The Legacy of Ramanujan, University of Illinois, Champaign, IL, June 7, 2019.
20. "New Infinite  $q$ -Product Expansions with Vanishing Coefficients." - Special Session on Partition Theory and Related Topics Fall Southeastern Sectional

Meeting of the AMS, University of Florida, Gainesville, Florida, Saturday, November 2, 2019.

21. “Further results on Vanishing Coefficients in infinite products of the form  $(q^a, q^{m-a}; q^m)_\infty^3 (q^b, q^{2m-b}; q^{2m})_\infty$ ” - Minisymposium: Basic hypergeometric series and  $q$ -orthogonal polynomials, 2020 SIAM Annual Meeting, Toronto, Canada, July 6 - 9, 2020.

#### FELLOWSHIPS AND AWARDS:

Bateman Prize in Number Theory (shared with Kevin O’Bryant) - Spring 2002  
 Trjitzinsky Fellowship - Spring 2002  
 Trjitzinsky Fellowship - Spring 2000  
 Simons Collaboration Grant - Summer 2011 (\$35,000 spread over 5 years)  
 Faculty Academic Advisor Appreciation Award for excellence in academic advising in Spring 2013

#### MEMBERSHIPS:

The American Mathematical Society  
 The Mathematical Association of America

#### COMMITTEES:

Undergraduate Curriculum Committee (2007 - 2009)  
 Election Committee (2007 - 2009)  
 CAS Recruitment Committee (2008)  
 of Long Range Ad-Hoc Committee Spring 2012  
 Undergraduate Curriculum Committee 2010-2011, 2011-2012, 2012-2013  
 Ad-Hoc Committee (MAT105 MAT 110) Spring 2014  
 Placement Test Committee (from time with McCann) Spring 2013 Spring 2014  
 Personnel Committee 2010 - present, apart from Fall 2014 - Fall 2015

#### ADDITIONAL INFORMATION:

Organizer of a current literature seminar, beginning in Spring 2006  
 Web-master for the WCUPA Mathematics Department web page  
 Co-organizer (with Nancy Wyshinski) of a Special Session on Continued Fractions at the 2004, 2006, 2009, 2011, 2013, 2015, 2017 and 2019 Joint Meetings.  
 Experience in using computer algebra systems like Magma, Mathematica and PARI/GP