CURRICULUM VITAE

September 2024

NAME: James Mc Laughlin

ADDRESS: Math. Dept., UNA 108, West Chester University,
West Chester, PA 19383

TELEPHONE: (610) 430-4417 (work)

E-MAIL: jmclaughlin2@wcupa.edu

WEB PAGE: Personal Faculty Page (click to follow)

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	$2015 - present$
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 (since arriving at West Chester University in Fall 2005):

Undergraduate :

- MAT 103: Introduction to Mathematics
- MAT 104: Introduction to Applied Mathematics
- MAT 105: College Algebra and Trigonometry
- MAT 107: College Algebra
- MAT 108/MAT 143: Brief Calculus
- MAT 110/MAT 131: Precalculus
- MAT 121: Statistics
- MAT 151: Introduction to Discrete Mathematics
- MAT 161: Calculus I
- MAT 162: Calculus II
- MAT 200: Nature of MAT
- MAT 261: Calculus III
- MAT 311: Linear Algebra
- MAT 325: Computational Mathematics
- MAT 405: Special Topics (Integer Partitions)
- MAT 405: Special Topics (Q-Series)
- MAT 405: Cryptography (topics course
- MAT 411: Algebra I
- MAT 412: Algebra II
- MAT 413: Computer Algebra
- MAT 414: Number Theory
- MAT 415: Cryptography

Graduate :

- MAT 514: Graduate Number Theory
- MAT 515: Graduate Algebra I
- MAT 516: Graduate Algebra II
- MAT 595: Topics in MAT (Graduate Integer Partitions)
- MAT 595: Topics in MAT (Graduate Computer Algebra)

B. Undergraduate Research - Summer 2009, with Eric Werley

B. Graduate Research - Supervised two Master's 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".

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* 2×2 *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* 2×2 *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, 125–139, 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, 503–531, 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 3–4, pp 889–906, this volume comprising the refereed confernce 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* - to appear in the refereed confernce 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* - The Ramanujan Journal 55 (2021), no. 2, 733–760.

[52] *m-Dissections of some infinite products and related identities* - The Ramanujan Journal 59, pages 313–350 (2022)

[53] Further results on Vanishing Coefficients in infinite products of the form $(q^b, q^{p-b}; q^p)_\infty^3 (q^{jb}, q^{2p-jb}; q^{2p})_\infty$ (with Peter Zimmer) - Vol. 18, No. 08, pp. 1863-1885 (2022) The International Journal of Number Theory.

[54] *Some more identities of Kanade–Russell type derived using Rosengren's method* - published online May 12 2022 in Annals of Combinatorics.

[55] *Lacunary eta quotients with identically vanishing coefficients* (with Tim Huber and Dongxi Ye) - published online (accepted January 11 2023) in International Journal of Number Theory.

[56] *On the vanishing of the coefficients of CM eta quotients* (with Tim Huber, Chang Liu, Dongxi Ye, Maiodan Yuan and Sumeng Zhang) - to appear in Proceedings of the Edinburgh Mathematical Society.

[57] *Generalizations of some q-product Identities of Ramanujan and others* (with Tim Huber and Dongxi Ye) - to appear in AMS Contemporary Mathematics Proceedings on hypergeometric functions, q-series and generalizations.

[58] *Further Results on Vanishing Coefficients in the Series Expansion of Lacunary Eta Quotients* (with Tim Huber and Dongxi Ye) - Submitted.

[59] *Dissections of lacunary eta quotients and identically vanishing coefficients* (with Tim Huber and Dongxi Ye) - Submitted.

[60] *Identical Vanishing of Coefficients in the Series Expansion of Eta Quotients, modulo 4, 9 and 25* (with Tim Huber and Dongxi Ye) - Submitted

[61] *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 $(q^a, q^{m-a}; q^m)_\infty^3 (q^b, q^{2m-b}; q^{2m})_\infty$" - Special Session on q-Series and Related Areas in Combinatorics and Number Theory, Fall Eastern Sectional Meeting of the AMS Sunday, October 4, 2020 (via Zoom)
22. "Dissections of some infinite products and related identities" - AMS Special Session on Partition Theory and Related Topics, Thursday, April 7th, 2022 (via Zoom)
23. "Some more identities of Kanade–Russell type derived using Rosengren's

method" - OPSFA-16 mini-symposium on "All things hypergeometric, q-series and their generalizations", Monday, June 13th, 2022 (via Zoom)
24. "Some Remarks on the Coefficients of Hecke Eigenforms and Chebyshev Polynomials of the Second Kind" - West Coast Number Theory, Saturday, 12/17/2022
25. "Dissections of lacunary eta quotients and identically vanishing coefficients" - AMS Special Session on Partition Theory and q-Series, January 6, 2024
26. "Identically Vanishing Coefficients in the Series Expansion of Lacunary Eta Quotients" - Seminar in Partition Theory, q-Series and Related Topics, March 7 2024 (via Zoom)

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
- Trustees' Achievement Award - 2021

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, 2019 and 2021 Joint Meetings.
Experience in using computer algebra systems like Magma, Mathematica and PARI/GP