Matthew C. Russell
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Education

Ph.D., Mathematics
Rutgers, the State University of New Jersey, Piscataway, New Jersey, May 2016
Thesis: Using experimental mathematics to conjecture and prove theorems in the theory of partitions and commutative and non-commutative recurrences.
Advisors: Vladimir Retakh and Doron Zeilberger.

M.S., Statistical Data Science
Texas A&M University, December 2025

B.S., Mathematics-Interdisciplinary and Physics, summa cum laude
Taylor University, Upland, Indiana, May 2010

Positions held

University of Illinois Urbana-Champaign

Lecturer of mathematics	spring 2022 – spring 2024

Rutgers, The State University of New Jersey

Assistant teaching professor of mathematics	fall 2018–fall 2021
Teaching instructor of mathematics	fall 2016–spring 2018
Teaching assistant	fall 2012–spring 2016
Torrey fellowship	fall 2010–spring 2012

Papers

Integer partitions and q-series:

- M. C. Russell, "On a pair of three-colored (mod 10) partition identities", submitted. Preprint: `arXiv:2509.07169`
- S. Kanade, M. C. Russell, "Tight cylindric partitions", submitted. Preprint: `arXiv:2508.15113`
- S. Kanade, M. C. Russell, S. Tsuchioka, S. O. Warnaar, "Remarks on the conjectures of Capparelli, Meurman, Primc and Primc", submitted. Preprint: `arXiv:2404.03851`
- M. C. Russell, "A refinement of and a companion to MacMahon's partition identity", *Electronic Journal of Combinatorics* **32** (2025) *no. 1*, Paper 1.4, 10 pp.
- M. C. Russell, "Companions to the Andrews-Gordon and Andrews-Bressoud identities, and recent conjectures of Capparelli, Meurman, Primc, and Primc", submitted. Preprint: `arXiv:2306.16251`
- K. Baker, S. Kanade, M. C. Russell, C. Sadowski, "Principal subspaces of basic modules for twisted affine Lie algebras, q-series multisums, and Nandi's identities", *Algebraic Combinatorics* **6** (2023), 1533–1556.
- S. Kanade, M. C. Russell, "Completing the A_2 Andrews-Schilling-Warnaar identities", *International Mathematics Research Notices* (2023), Issue 20, October 2023, Pages 17100–17155.

- S. Kanade, A. Milas, M. C. Russell, "On certain identities involving Nahm-type sums with double poles", *Advances in Applied Mathematics* **143** (2023), paper No. 102452, 34 pp.
- S. Kanade, M. C. Russell, "On q-series for principal characters of standard $A_2^{(2)}$-modules", *Advances in Mathematics* **400** (2022), paper no. 108282, 24 pp.
- T. Coelho, J. Kim, M. C. Russell, "A complete generalization of Göllnitz's "big" theorem". *Ramanujan Journal* **55** (2021), 73–102.
- S. Kanade, D. Nandi, M. C. Russell, "A variant of `IdentityFinder` and some new identities of Rogers-Ramanujan-MacMahon type", *Annals of Combinatorics*, **23** (2019) *no. 3–4*, 807–834.
- S. Kanade, M. C. Russell, "Staircases to analytic sum-sides for many new integer partition identities of Rogers-Ramanujan type", *Electronic Journal of Combinatorics* **26** (2019) *no. 1*, Paper 1.6, 33 pp.
- S. Kanade, K. Kurşungöz, M. C. Russell, "An open problem of Corteel, Lovejoy, and Mallet". In: G. E. Andrews, F. Garvan (eds), Analytic Number Theory, Modular Forms and q-Hypergeometric Series. ALLADI60 2016. *Springer Proceedings in Mathematics & Statistics*, **221**, 343–370.
- S. Kanade, J. Lepowsky, M. C. Russell, A. V. Sills, "Ghost series and a motivated proof of the Andrews-Bressoud identities", *Journal of Combinatorial Theory, Series A* **146** (2017), 33–62.
- B. Coulson, S. Kanade, J. Lepowsky, R. McRae, F. Qi, M. C. Russell and C. Sadowski, "A motivated proof of the Göllnitz-Gordon-Andrews identities", *Ramanujan Journal* **42** (2017) *no. 1*, 97–129.
- S. Kanade, M. C. Russell, "`IdentityFinder` and some new identities of Rogers-Ramanujan type", *Experimental Mathematics* **24** (2015) *no. 4*, 419–423.

Other mathematics:

- M. C. Russell, "Noncommutative recursions and the Laurent phenomenon", *Advances in Applied Mathematics* **64** (2015), 21–30.
- R. J. Angeles-Canul, R. Norton, M. Opperman, C. Paribello, M. Russell, C. Tamon, "Perfect state transfer, integral circulants, and join of graphs", *Quantum Information and Computation* **10** (2010), *no. 3–4*, 325–342.
- R. J. Angeles-Canul, R. Norton, M. Opperman, C. Paribello, M. Russell, C. Tamon, "On quantum perfect state transfer in weighted join graphs", *International Journal of Quantum Information* **7** (2009), *no. 8*, 1429–1445.
- M. C. Russell, J. Fraser, S. Rizzo, M. H. Veatch, "Comparing LP bounds for queueing networks", *IEEE Transactions on Automatic Control* **54** (2009), *no. 11*, 2703–2707.
- M. DeLong, M. C. Russell, J. Schrock, "Colorability and determinants of $T(m, n, r, s)$ twisted torus knots for $n \equiv \pm 1 \pmod{m}$", *Involve* **8** (2015) *no. 3*, 361–384.

Physics and chemistry:

- P. P. Samuel Russell, A. K. Maytin, M. M. Rickard, M. C. Russell, T. V. Pogorelov, M. Gruebele, "The hinge-bending landscape of an enzyme in an atomistic cytoplasm simulation", *Journal of Physical Chemistry Letters* **15** (2024), *no. 4*, 940–946.
- K. Kiers, T. Knighton, D. London, M. Russell, A. Szynkman, K. Webster, "Using $t \to b\bar{b}c$ to search for new physics", *Physical Review D* **84** (2011) *no. 7*, 074018.

Teaching experience

University of Illinois Urbana-Champaign

Course instructor:

- Calculus III: spring 2022, summer 2022, fall 2022, spring 2023, fall 2023, spring 2024

Rutgers, The State University of New Jersey

Course instructor:

- Calculus I for the mathematical and physical sciences: fall 2019, fall 2020, fall 2021
- Calculus I for the life and social sciences: fall 2021
- Multivariable calculus: summer 2016, fall 2016, fall 2018, fall 2019, fall 2021
- Calculus II for the mathematical and physical sciences: spring 2020, fall 2020, spring 2021
- History of mathematics: spring 2020
- Graph theory: spring 2017, spring 2018, spring 2019
- Introduction to real analysis: fall 2017, fall 2018, spring 2019
- Introductory linear algebra: fall 2014, spring 2015, spring 2017, summer 2018, fall 2018
- Linear optimization: summer 2015, spring 2018
- Differential equations for engineering and physics: spring 2018
- Calculus II: fall 2017
- Introduction to probability: fall 2017
- Combinatorics: summer 2014, fall 2016
- Topics in mathematics for the liberal arts: spring 2014, fall 2016

Teaching assistant — recitation and review session instructor:

- Calculus II for the mathematical and physical sciences: spring 2016
- Linear optimization: fall 2015
- Multivariable calculus: fall 2013
- Calculus I: fall 2012, spring 2013

Other:

- Co-coordinator for mathematics TA training program: spring 2017, spring 2018, spring 2019
- Summer instructional supervisor for mathematics courses: summer 2016
- Head teaching assistant for Calculus II for the mathematical and physical sciences: spring 2016
- Head teaching assistant for summer mathematical courses: summer 2015
- Topics in Mathematics Education — Geometry and Measurement (instructional assistant for course conducted by New Jersey Partnership for Excellence in Middle School Mathematics): summer 2013
- New Brunswick Saturday Scholars Academy, mathematics instructor for SAT preparation: fall 2012–spring 2014

Awards and honors

- On University of Illinois Urbana-Champaign's "List of Teachers Ranked as Excellent by Their Students": spring 2022, summer 2022, fall 2022, spring 2023, fall 2023, spring 2024
- American Mathematical Society Rutgers Student Chapter Award for Faculty (voted on by graduate students): 2019
- Rutgers School of Arts and Sciences Award for Distinguished Contribution to Undergraduate Education: 2016
- Rutgers Department of Mathematics TA Teaching Excellence Award: spring 2014

Service

Selected journals refereed for:

- Advances in Mathematics
- Algebraic Combinatorics
- Annals of Combinatorics
- Journal of Combinatorial Theory, Series A

University of Illinois Urbana-Champaign:

- Member of Undergraduate Advising Committee, fall 2022–spring 2024

Rutgers, the State University of New Jersey:

- Member of Undergraduate Committee, spring 2020–fall 2021
- Chair of departmental subcommittee on Math 151 (Calculus I for the Mathematical and Physical Sciences), fall 2019–fall 2020
- Co-organized departmental Rutgers Day booth, April 2019
- Multivariable calculus guru/co-guru, fall 2018–spring 2019
- Garden State Undergraduate Mathematics Conference grader and judge, April 2019
- Co-organizer, Rutgers Experimental Mathematics Seminar, fall 2013–spring 2016

- Organizer, Rutgers Graduate Combinatorics Seminar, fall 2012–spring 2013
- Co-organizer, Rutgers Graduate Pizza Seminar, fall 2011–spring 2012

Undergraduate research

- Spring 2019: advised three students in Math 496 (Research in Mathematics)
- Spring 2019: facilitated poster presentations of four students at the Garden State Undergraduate Mathematics Conference (one of whom won an award for one of the four best posters)
- Summer 2016: co-advised two students as part of the Rutgers Mathematics Department Research Experience for Undergraduates

Selected talks

- September 2025. "Companions to the Andrews-Gordon and Andrews-Bressoud identities, and recent conjectures of Capparelli, Meurman, Primc, and Primc." Specialty Seminar in Partition Theory, q-Series and Related Topics, Michigan Technological University.
- August 2025. "Bivariate generating functions for two-row tight cylindric partitions." AMS Fall Western Sectional Meeting, Special Session on Recent Developments in Areas Influenced by Ramanujan's Mathematics, University of Denver.
- April 2025. "A refinement of, and a companion to, MacMahon's sequence-avoiding partition identity." 2025 MAA Missouri Section Meeting, Saint Louis University.
- June 2024. "A refinement of, and a companion to, MacMahon's partition identity." The Legacy of Ramanujan 2024, Pennsylvania State University.
- March 2022. "Completing the A_2 Andrews-Schilling-Warnaar identities." Specialty Seminar in Partition Theory, q-Series and Related Topics, Michigan Technological University.
- June 2018. "Bijective proofs of some new MacMahon-style partition identities." Combinatory Analysis 2018: Partitions, q-Series, and Applications, Pennsylvania State University.
- October 2017. "Fantastic identities, and where to find them." University of Denver, Graduate Mathematics Colloquium.
- January 2017. "Companions and generalizations of Göllnitz's "big" partition theorem." Joint Mathematics Meetings, AMS Special Session on Arithmetic Properties of Sequences from Number Theory and Combinatorics.
- December 2015. "Experimental mathematics and partition identities." Ursinus College Mathematics Möbius Talk.
- August 2015. "`IdentityFinder` and some new identities of Rogers-Ramanujan type." Conference on Lie Algebras, Vertex Operator Algebras, and Related Topics, University of Notre Dame.

- March 2015. "Automated exploration of Somos-like sequences, noncommutative recursions, and the Laurent phenomenon." AMS Spring Eastern Sectional Meeting, Special Session on Somos Sequences and Nonlinear Recurrences, Georgetown University.
- October 2014. "Conjecturing new partition identities with computer algebra." AMS Fall Eastern Sectional Meeting, Special Session on Experimental Mathematics in Number Theory, Analysis, and Combinatorics, Dalhousie University.
- March 2014. "Experimental mathematics and Somos sequences." Taylor University Mathematics Colloquium.
- 2011–2020. Various talks, Rutgers, The State University of New Jersey (Graduate Combinatorics Seminar, Graduate Pizza Seminar, Experimental Mathematics Seminar, Basic Notions and Research Perspectives Seminar, Rutgers Undergraduate Mathematics Association talk).