

Curriculum Vitae

FRANK GARVAN

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Mathematics Department	Email Address: fgarvan@ufl.edu
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Gainesville, FL 32611-8105	Birthdate: March 9, 1955
	Last modified: April 14, 2024

RESEARCH INTERESTS

Number Theory, Combinatorics, Special Functions, Symbolic Computation

EDUCATION/EMPLOYMENT

2000 – present Professor of Mathematics, University of Florida
1994 – 1999 Associate Professor of Mathematics, University of Florida
1990 – 1993 Assistant Professor of Mathematics, University of Florida
1991 NSERC International fellow, Dalhousie University, Halifax
1988 – 1990 Postdoctoral Research Fellow, Macquarie University, Sydney, Australia
1987 – 1988 Postdoctoral Fellow, I.M.A., University of Minnesota, Minneapolis
1986 – 1987 Visiting Assistant Professor of Mathematics, University of Wisconsin, Madison
1985 – 1986 Mathematics Instructor, Pennsylvania State University, York Campus
1986 Ph.D. Pennsylvania State University, Mathematics (advisor: George Andrews)
1982 M.Sc. University of New South Wales, Kensington, Australia, Mathematics
(advisor: Mike Hirschhorn)
1978 – 1980 High School Teacher, New South Wales, Australia
1977 Dip.Ed. University of New South Wales, Kensington, Australia, Education
1976 B.Sc. University of New South Wales, Kensington, Australia, Mathematics (with honours)

HONORS AND GRANTS

May 2022 NSF-CBMS Regional Conference Principal Lecturer,
The University of Texas Rio Grande Valley
2019 – 2022 University of Florida Term Professor
2014 – 2019 Simons Foundation Collaboration Grant (ref. 318714) (\$35,000),
Mar 2016 Invited Address, American Mathematical Society (AMS),
Spring Southeastern Sectional Meeting, University of Georgia, Athens
2016 – 2017 The 2016 Gainesville International Number Theory Conference (ALLADI60),
held March 17–21, 2016. Funded by NSF (\$45,000), NSA (\$15,000),
PSU (\$6,000) and Number Theory Foundation (\$5,000).
Total external funding \$71,000.
2012 – 2013 Ramanujan 125 Conference held November 5-7, 2012
Funded by NSF (DMS 1206696, \$15,000) and the NSA (ref. H98230-12-0297, \$15,000)
Total external funding \$30,000.
2009 – 2012 CoPI for NSA Grant (ref. H98230-09-1-0051) (\$131,450),
Some Problems in the Theory of Partitions
2006 – 2009 CoPI for NSA Grant (ref. H98230-07-1-0011) (\$123,380),

- 2004 – 2005 Some Problems in the Theory of Partitions
Special Year in Number Theory and Combinatorics
Funded by NSF (DMS 0412622), NSA and The Number Theory Foundation.
Total award \$35,000.
- 2003 – 2004 Number Theory and Combinatorics in Physics Conference
Funded by NSF (DMS 0242148), NSA and The Number Theory Foundation.
Total award \$20,000.
- 1998 – 2001 NSF grant (ref. DMS-9870052) (\$77,895)
Combinatorial, Differential & Modular Partition Problems
- 1999 – 2000 Symbolic Computation, Number Theory, Special Functions, Physics
and Combinatorics Conference
Funded by NSF (DMS-9976638), NSA and The Number Theory Foundation.
Total award \$12,000.
- 1995 TIP (Teaching Improvement Project) Award
- 1992 – 1995 NSF grant (ref. DMS-9208813) (\$60,408)
Dedekind's eta-function, combinatorics, congruences and approximations

PROFESSIONAL ACTIVITIES

- 2006 – present Managing Editor of The Ramanujan Journal (Springer)
- 2020 – present Section Editor (Springer)
Srinivasa Ramanujan — His Life, Legacy, and Mathematics
- 2020 – present Member of the Advisory Board of
Journal of Algebraic Combinatorics, Springer
- Jan 2020 Organizer (with Chris Jennings-Shaffer) of
AMS Special Session on Interactions Among Partitions,
Basic Hypergeometric Series, and Modular Forms,
Denver, Colorado
- Nov 2019 Organizer (with Dennis Eichhorn, UC Irvine and
Brandt Kronholm, University of Texas, Rio Grande Valley) of AMS
Special Session on Partition Theory and Related Topics, Gainesville
- Jul 2019 Member of the Scientific Committee for the
15th International Symposium on Orthogonal Polynomials, Special
Functions and Applications (OPSFA), Johannes Kepler University
and the Research Institute for Symbolic Computation (RISC),
Hagenberg, Linz, Austria
- Jul 2017 Member of the Program Committee for the 29th international
conference on Formal Power Series and Algebraic Combinatorics
(FPSAC), London (United Kingdom)
- 2014 Member of the Number Theory Review Panel for NSA Proposals
- 2009 Member of the Number Theory Review Panel for NSA Proposals
- 2007 Member of the Number Theory Review Panel for NSA Proposals

JOURNALS REFEREED

Acta Arithmetica
Aequationes Mathematicae
Bulletin of the Australian Mathematical Society
Bulletin of the London Mathematical Society
Canadian Journal of Mathematics
Constructive Approximation

Crelle's Journal
Discrete Mathematics
Electronic Journal of Combinatorics
Indian Journal of Mathematics
International Journal of Number Theory
Involve
Israel Journal of Mathematics
Journal de Théorie des Nombres de Bordeaux
Journal of Algebra
Journal of Combinatorial Theory, Series A
Journal of Computational and Applied Mathematics
Journal of Integer Sequences
Journal of Mathematical Analysis and Applications
Journal of Number Theory
Journal of Symbolic Computation
Journal of the Australian Mathematical Society
Journal of the London Mathematical Society
Methods and Applications of Analysis
Proceedings of the American Mathematical Society
Proceedings of the London Mathematical Society
Rocky Mountain Journal
The Ramanujan Journal
Transactions of the American Mathematical Society
Turkish Journal of Mathematics

PUBLICATIONS

73. F. G. Garvan and Rishabh Sarma, *New symmetries for Dyson's rank function*, Ramanujan J. (2024), to appear.
72. Krishnaswami Alladi, Howard S. Cohl, Frank G. Garvan, Mourad E. H. Ismail, and Hjalmar Rosengren, *Preface [Special issue in memory of Richard Askey—Part 1]*, Ramanujan J. **61** (2023), no. 1, 1–6. [MR4584512](#)
71. F. G. Garvan, *A new approach to the Dyson rank conjectures*, Ramanujan J. **61** (2023), no. 2, 545–566. [MR4588607](#)
70. Rong Chen and F. G. Garvan, *A proof of the mod 4 unimodal sequence conjectures and related mock theta functions*, Adv. Math. **398** (2022), Paper No. 108235. [MR4388951](#)
69. Rong Chen and F. G. Garvan, *Congruences modulo 4 for weight 3/2 eta-products*, Bull. Aust. Math. Soc. **103** (2021), no. 3, 405–417. [MR4255544](#)
68. Dandan Chen, Rong Chen, and Frank Garvan, *Congruences modulo powers of 5 for the rank parity function*, Hardy-Ramanujan J. **43** (2020), 24–45. [MR4298484](#)
67. Frank Garvan, *A tutorial for the maple eta package*, arXiv preprint [arXiv1907.09130](#) (2019).
66. Alexander Berkovich, Frank G. Garvan, and Hamza Yesilyurt, *Ramanujan's circular summation, t -cores and twisted partition identities*, J. Math. Anal. Appl. **479** (2019), no. 1, 773–788. [MR3987059](#)
65. Frank G. Garvan, *New fifth and seventh order mock theta function identities*, Ann. Comb. **23** (2019), no. 3-4, 765–783. [MR4039562](#)

64. George E. Andrews and Frank Garvan (eds.), *Analytic number theory, modular forms and q -hypergeometric series*, Springer Proceedings in Mathematics & Statistics, vol. 221, Springer, Cham, 2017. [MR3773907](#)
63. Jie Frye and Frank Garvan, *Automatic proof of theta-function identities*, Elliptic integrals, elliptic functions and modular forms in quantum field theory, Texts Monogr. Symbol. Comput., Springer, Cham, 2019, pp. 195–258. [MR3889559](#)
62. F. G. Garvan, *Transformation properties for Dyson's rank function*, Trans. Amer. Math. Soc. **371** (2019), no. 1, 199–248. [MR3885143](#)
61. Frank Garvan and Michael J. Schlosser, *Combinatorial interpretations of Ramanujan's tau function*, Discrete Math. **341** (2018), no. 10, 2831–2840. [MR3843270](#)
60. F. G. Garvan, *Weighted partition identities and divisor sums*, Frontiers in orthogonal polynomials and q -series, Contemp. Math. Appl. Monogr. Expo. Lect. Notes, vol. 1, World Sci. Publ., Hackensack, NJ, 2018, pp. 239–249. [MR3791622](#)
59. F. G. Garvan and C. Jennings-Shaffer, *Exotic Bailey-Slater spt -functions II: Hecke-Rogers-type double sums and Bailey pairs from groups A , C , E* , Adv. Math. **299** (2016), 605–639. [MR3519478](#)
58. F. G. Garvan, *Congruences and relations for r -Fishburn numbers*, J. Combin. Theory Ser. A **134** (2015), 147–165. [MR3345301](#)
57. Krishnaswami Alladi, Frank Garvan, and Ae Ja Yee (eds.), *Ramanujan 125*, Contemporary Mathematics, vol. 627, American Mathematical Society, Providence, RI, 2014. [MR3308071](#)
56. F. G. Garvan, *Universal mock theta functions and two-variable Hecke-Rogers identities*, Ramanujan J. **36** (2015), no. 1-2, 267–296. [MR3296723](#)
55. Frank G. Garvan and Chris Jennings-Shaffer, *The spt -crank for overpartitions*, Acta Arith. **166** (2014), no. 2, 141–188. [MR3277048](#)
54. Frank G. Garvan and Chris Jennings-Shaffer, *Hecke-type congruences for Andrews' SPT -function modulo 16 and 32*, Int. J. Number Theory **10** (2014), no. 2, 375–390. [MR3189985](#)
53. Frank G. Garvan and James A. Sellers, *Congruences for generalized Frobenius partitions with an arbitrarily large number of colors*, Integers **14** (2014), Paper No. A7, 5. [MR3239588](#)
52. David H. Bailey, Heinz H. Bauschke, Peter Borwein, Frank Garvan, Michel Théra, Jon D. Vanderwerff, and Henry Wolkowicz (eds.), *Computational and analytical mathematics*, Springer Proceedings in Mathematics & Statistics, vol. 50, Springer, New York, 2013, In honor of Jonathan Borwein's 60th birthday, Papers from the workshop (JonFest) held at Simon Fraser University, Burnaby, BC, May 16–20, 2011. [MR3155260](#)
51. Krishnaswami Alladi, Frank Garvan, and Andrew Sills, *Preface [International Conference on q -Series, Partitions, and Special Functions in honor of Mourad Ismail for his 65th birthday and Dennis Stanton for his 60th birthday]*, Ramanujan J. **31** (2013), no. 1-2, 1–2, Held at Georgia Southern University, Statesboro, GA, March 14–16, 2011. [MR3048649](#)
50. George E. Andrews, Frank G. Garvan, and Jie Liang, *Self-conjugate vector partitions and the parity of the spt -function*, Acta Arith. **158** (2013), no. 3, 199–218. [MR3040662](#)
49. Song Heng Chan, Atul Dixit, and Frank G. Garvan, *Rank-crank-type PDEs and generalized Lambert series identities*, Ramanujan J. **31** (2013), no. 1-2, 163–189. [MR3048661](#)
48. George E. Andrews, Frank G. Garvan, and Jie Liang, *Combinatorial interpretations of congruences for the spt -function*, Ramanujan J. **29** (2012), no. 1-3, 321–338. [MR2994105](#)

47. Krishnaswami Alladi and Frank Garvan (eds.), *Partitions, q -series, and modular forms*, Developments in Mathematics, vol. 23, Springer, New York, 2012. [MR3075591](#)
46. F. G. Garvan, *Congruences for Andrews' spt-function modulo 32760 and extension of Atkin's Hecke-type partition congruences*, Number theory and related fields, Springer Proc. Math. Stat., vol. 43, Springer, New York, 2013, pp. 165–185. [MR3081040](#)
45. F. G. Garvan, *Congruences for Andrews' spt-function modulo powers of 5, 7 and 13*, Trans. Amer. Math. Soc. **364** (2012), no. 9, 4847–4873. [MR2922612](#)
44. F. G. Garvan, *Higher order spt-functions*, Adv. Math. **228** (2011), no. 1, 241–265. [MR2822233](#)
43. F. G. Garvan, *Biranks for partitions into 2 colors*, Ramanujan rediscovered, Ramanujan Math. Soc. Lect. Notes Ser., vol. 14, Ramanujan Math. Soc., Mysore, 2010, pp. 87–111. [MR2856959](#)
42. F. G. Garvan, *Congruences for Andrews' smallest parts partition function and new congruences for Dyson's rank*, Int. J. Number Theory **6** (2010), no. 2, 281–309. [MR2646759](#)
41. Alexander Berkovich and Frank G. Garvan, *The GBG-rank and t -cores I. Counting and 4-cores*, J. Comb. Number Theory **1** (2009), no. 3, 237–252. [MR2681308](#)
40. Kathrin Bringmann, Frank Garvan, and Karl Mahlburg, *Partition statistics and quasiharmonic Maass forms*, Int. Math. Res. Not. IMRN (2009), no. 1, Art. ID rnn124, 63–97. [MR2471296](#)
39. Alexander Berkovich and Frank G. Garvan, *K. Saito's conjecture for nonnegative eta products and analogous results for other infinite products*, J. Number Theory **128** (2008), no. 6, 1731–1748. [MR2419190](#)
38. Alexander Berkovich and Frank G. Garvan, *The BG-rank of a partition and its applications*, Adv. in Appl. Math. **40** (2008), no. 3, 377–400. [MR2402176](#)
37. Frank G. Garvan and Hamza Yesilyurt, *Shifted and shiftless partition identities. II*, Int. J. Number Theory **3** (2007), no. 1, 43–84. [MR2310493](#)
36. Alexander Berkovich and Frank G. Garvan, *On the Andrews-Stanley refinement of Ramanujan's partition congruence modulo 5 and generalizations*, Trans. Amer. Math. Soc. **358** (2006), no. 2, 703–726. [MR2177037](#)
35. Alexander Berkovich and Frank G. Garvan, *Dissecting the Stanley partition function*, J. Combin. Theory Ser. A **112** (2005), no. 2, 277–291. [MR2177487](#)
34. A. O. L. Atkin and F. G. Garvan, *Relations between the ranks and cranks of partitions*, Ramanujan J. **7** (2003), no. 1-3, 343–366, Rankin memorial issues. [MR2035811](#)
33. Alexander Berkovich and Frank G. Garvan, *Some observations on Dyson's new symmetries of partitions*, J. Combin. Theory Ser. A **100** (2002), no. 1, 61–93. [MR1932070](#)
32. F. G. Garvan, *Shifted and shiftless partition identities*, Number theory for the millennium, II (Urbana, IL, 2000), A K Peters, Natick, MA, 2002, pp. 75–92. [MR1956245](#)
31. F. G. Garvan, *More cranks and t -cores*, Bull. Austral. Math. Soc. **63** (2001), no. 3, 379–391. [MR1834941](#)
30. F. G. Garvan, *A generalization of the Hirschhorn-Farkas-Kra septagonal numbers identity*, Discrete Math. **232** (2001), no. 1-3, 113–118. [MR1823627](#)
29. Frank G. Garvan and Mourad E. H. Ismail (eds.), *Symbolic computation, number theory, special functions, physics and combinatorics*, Developments in Mathematics, vol. 4, Kluwer Academic Publishers, Dordrecht, 2001. [MR1880075](#)
28. Frank Garvan, *The Maple book.*, Boca Raton, FL: Chapman & Hall/ CRC, 2001 (English).

27. Frank Garvan, *A q -product tutorial for a q -series MAPLE package*, Sém. Lothar. Combin. **42** (1999), Art. B42d, 27, The Andrews Festschrift (Maratea, 1998). [MR1701583](#)
26. Frank Garvan, *Modular functions, Maple and Andrews' 10th problem*, Topics in number theory (University Park, PA, 1997), Math. Appl., vol. 467, Kluwer Acad. Publ., Dordrecht, 1999, pp. 163–179. [MR1691317](#)
25. J. M. Borwein and F. G. Garvan, *Approximations to π via the Dedekind eta function*, Organic mathematics (Burnaby, BC, 1995), CMS Conf. Proc., vol. 20, Amer. Math. Soc., Providence, RI, 1997, pp. 89–115. [MR1483915](#)
24. Frank Garvan, *Maple V primer, release 4.*, Boca Raton, FL: CRC Press, 1997 (English).
23. Bruce C. Berndt, S. Bhargava, and Frank G. Garvan, *Ramanujan's theories of elliptic functions to alternative bases*, Trans. Amer. Math. Soc. **347** (1995), no. 11, 4163–4244. [MR1311903](#)
22. Frank G. Garvan, *Ramanujan's theories of elliptic functions to alternative bases—a symbolic excursion*, J. Symbolic Comput. **20** (1995), no. 5-6, 517–536, Symbolic computation in combinatorics Δ_1 (Ithaca, NY, 1993). [MR1395412](#)
21. Frank G. Garvan, *A combinatorial proof of the Farkas-Kra theta function identities and their generalizations*, J. Math. Anal. Appl. **195** (1995), no. 2, 354–375. [MR1354548](#)
20. Frank G. Garvan, *Generalizations of Dyson's rank and non-Rogers-Ramanujan partitions*, Manuscripta Math. **84** (1994), no. 3-4, 343–359. [MR1291125](#)
19. Frank Garvan, *Cubic modular identities of Ramanujan, hypergeometric functions and analogues of the arithmetic-geometric mean iteration*, The Rademacher legacy to mathematics (University Park, PA, 1992), Contemp. Math., vol. 166, Amer. Math. Soc., Providence, RI, 1994, pp. 245–264. [MR1284065](#)
18. J. M. Borwein, P. B. Borwein, and F. G. Garvan, *Some cubic modular identities of Ramanujan*, Trans. Amer. Math. Soc. **343** (1994), no. 1, 35–47. [MR1243610](#)
17. Michael Hirschhorn, Frank Garvan, and Jon Borwein, *Cubic analogues of the Jacobian theta function $\theta(z, q)$* , Canad. J. Math. **45** (1993), no. 4, 673–694. [MR1227653](#)
16. Frank G. Garvan, *Some congruences for partitions that are p -cores*, Proc. London Math. Soc. (3) **66** (1993), no. 3, 449–478. [MR1207544](#)
15. J. Borwein, P. Borwein, and F. Garvan, *Hypergeometric analogues of the arithmetic-geometric mean iteration*, Constr. Approx. **9** (1993), no. 4, 509–523. [MR1237931](#)
14. Frank G. Garvan and Gaston H. Gonnet, *A proof of the two parameter q -cases of the Macdonald-Morris constant term root system conjecture for $S(F_4)$ and $S(F_4)^\vee$ via Zeilberger's method*, J. Symbolic Comput. **14** (1992), no. 2-3, 141–177. [MR1187229](#)
13. Frank G. Garvan and Gaston Gonnet, *Macdonald's constant term conjectures for exceptional root systems*, Bull. Amer. Math. Soc. (N.S.) **24** (1991), no. 2, 343–347. [MR1078471](#)
12. Frank Garvan, Dongsu Kim, and Dennis Stanton, *Cranks and t -cores*, Invent. Math. **101** (1990), no. 1, 1–17. [MR1055707](#)
11. Frank G. Garvan, *A number-theoretic crank associated with open bosonic strings*, Number theory and cryptography (Sydney, 1989), London Math. Soc. Lecture Note Ser., vol. 154, Cambridge Univ. Press, Cambridge, 1990, pp. 221–226. [MR1055413](#)
10. Frank G. Garvan, *The crank of partitions mod 8, 9 and 10*, Trans. Amer. Math. Soc. **322** (1990), no. 1, 79–94. [MR1012520](#)

9. Frank Garvan and Dennis Stanton, *Sieved partition functions and q -binomial coefficients*, Math. Comp. **55** (1990), no. 191, 299–311. [MR1023761](#)
8. F. G. Garvan, *A proof of the Macdonald-Morris root system conjecture for F_4* , SIAM J. Math. Anal. **21** (1990), no. 3, 803–821. [MR1046804](#)
7. Frank G. Garvan, *Some Macdonald-Mehta integrals by brute force, q -series and partitions* (Minneapolis, MN, 1988), IMA Vol. Math. Appl., vol. 18, Springer, New York, 1989, pp. 77–98. [MR1019845](#)
6. George E. Andrews and F. G. Garvan, *Ramanujan’s “lost” notebook. VI. The mock theta conjectures*, Adv. in Math. **73** (1989), no. 2, 242–255. [MR987276](#)
5. F. G. Garvan, *A beta integral associated with the root system G_2* , SIAM J. Math. Anal. **19** (1988), no. 6, 1462–1474. [MR965267](#)
4. George E. Andrews and F. G. Garvan, *Dyson’s crank of a partition*, Bull. Amer. Math. Soc. (N.S.) **18** (1988), no. 2, 167–171. [MR929094](#)
3. F. G. Garvan, *New combinatorial interpretations of Ramanujan’s partition congruences mod 5, 7 and 11*, Trans. Amer. Math. Soc. **305** (1988), no. 1, 47–77. [MR920146](#)
2. F. G. Garvan, *Combinatorial interpretations of Ramanujan’s partition congruences*, Ramanujan revisited (Urbana-Champaign, Ill., 1987), Academic Press, Boston, MA, 1988, pp. 29–45. [MR938958](#)
1. F. G. Garvan, *A simple proof of Watson’s partition congruences for powers of 7*, J. Austral. Math. Soc. Ser. A **36** (1984), no. 3, 316–334. [MR733905](#)

TALKS & LECTURES

Plenary and Keynote Speaker

- | | | |
|------|-----|---|
| 2024 | Jan | Special Invited Ramanujan Zoom Seminar
Topics in Special Functions and Number Theory (snft.org)
<i>Identities for Ramanujan’s Mock Theta Functions and Dyson’s Rank Function</i> |
| 2022 | May | 100 Years of Mock Theta Functions:
New Directions in Partitions, Modular Forms, and Mock Modular Forms
<i>New symmetries for Dyson’s rank function and Zagier’s higher order mock theta functions</i> |
| 2022 | May | CBMS Regional Conference Principal Lecturer
The University of Texas Rio Grande Valley, Edinburg
<i>Ramanujan’s Partition Congruences, Mock Theta Functions and Beyond</i> |
| 2019 | Jun | The Legacy of Ramanujan in Number Theory (Bruce C. Berndt’s 80th birthday)
University of Illinois at Urbana-Champaign
<i>Mock Theta Functions: Yesterday and Today</i> |
| 2018 | Jun | Combinatory Analysis 2018 (George Andrews’s 80th birthday),
The Pennsylvania State University, University Park
<i>Higher Order Mock Theta Conjectures</i> |
| 2018 | Mar | BIRS workshop on Modular Forms and Quantum Knot Invariants Banff
<i>Higher Order Mock Theta Conjectures</i> |
| 2016 | Jul | Lambert W-Conference, University of Western Ontario, London, Canada
<i>Lambert and Ramanujan</i> |
| 2016 | Mar | AMS Spring Southeastern Sectional Meeting, University of Georgia, Athens
<i>Dyson’s Conjectures and Predictions in the Work of Ramanujan</i> (invited AMS address) |
| 2015 | May | International Conference on Orthogonal Polynomials and q -Series
(Mourad Ismail’s 70th birthday), University of Central Florida, Orlando
<i>Transformation Properties of Dyson’s Rank Function</i> |

- 2013 Aug The Combinatorics of q -Series and Partitions Conference
(George Andrews' 75th Birthday), Nankai University, Tianjin, P.R. China
Dyson's rank function and Andrews' spt function
- 2012 Dec The Legacy of Srinivasa Ramanujan, New Delhi, India
The smallest parts partition function
Krishna Alladi delivered my talk since I was unable to attend for health reasons.
- 2012 Mar International Number Theory Conference in Memory of Alf van der Poorten
Newcastle, Australia
The smallest parts partition function
- 2011 Jan. Partitions, q -Series and Maass Forms Conference, Emory University, Atlanta, GA
Higher order spt-functions
- 2010 Jul Prospects in q -Series and Modular Forms Conference, University College Dublin
Biranks for partitions into 2 colors and some theta function identities
- 2010 Jul CARMA Workshop on Exploratory Experimentation and Computation
in Number Theory, University of Newcastle, Australia
Biranks for partitions into 2 colors and some theta function identities
- 2008 Apr SouthEast Regional Meeting On Numbers (SERMON)
& Palmetto Number Theory Series (PANTS) Clemson University
The Rank and Crank of Partitions – In Memory of Richard P. Lewis
- 2008 Mar Partitions, q -Series and Modular Forms Workshop, University of Florida, Gainesville
The Rank and Crank of Partitions – In Memory of Richard P. Lewis
- 2004 Dec ICNFT 2004, SASTRA University, Kumbakonam, India
Talk 1: *The Combinatorics of Ramanujan's Partition Congruences*
Talk 2: *Partitions and Infinite Products*
- 1987 Jun Ramanujan Centenary Conference, University of Illinois, Urbana
Combinatorial Interpretations of Ramanujan's Partition Congruences

Invited Speaker

- 2024 Mar International Conference on Modular Forms and q -Series
University of Cologne
*Weight 2 Hecke-Rogers Series, Holomorphic Projection and Identities
for Zagier's Higher Order Mock Theta Functions*
- 2021 Apr VIRTUAL AMS Special Session on Modular Forms and Combinatorics
Originally JMM 2022, Seattle
*Ramanujan's mock theta functions
and the mod 4 unimodal sequence conjectures*
- 2021 Apr VIRTUAL AMS Special Session on Partition Theory and Related Topics
Originally JMM 2022, Seattle
New symmetries for Dyson's rank function
- 2021 Apr VIRTUAL Georgia Southern, Mathematics Conference,
Symbolic Computations Session, Savannah, GA
*Congruences for weight $3/2$ eta-quotients and their
connection with mod 4 conjectures for the spt function
and unimodal sequences*
- 2020 Dec VIRTUAL Symposium on the Works of Ramanujan, ICSEA-2020,
Lucknow, India,
The Unimodal Sequence Conjectures
- 2020 Oct VIRTUAL AMS Special Session on q -Series and Related Areas in Combinatorics
and Number Theory, Penn State (State College, PA)
A new approach to Dyson's rank conjectures
- 2020 Jan. AMS Special Session on Experimental and Computer Assisted Mathematics,

- Denever, CO
Congruence mod powers of 5 and 7 for the rank and crank parity functions
- 2019 Mar AMS Special Session on Experimental Mathematics in Number Theory, Analysis, and Combinatorics, Auburn, Alabama
In search of mock theta function identities
- 2019 Jan. AMS Special Session on Partition Theory and Related Topics, Baltimore, MD
Hecke-Rogers series for Ramanujan's mock theta functions
- 2018 Apr AMS Special Session on Mock Modular and Quantum Modular Forms, Portland (Oregon)
Higher Order Mock Theta Conjectures
- 2018 Jan. AMS Special Session on Special Functions and Combinatorics (Dennis Stanton's 65th birthday), San Diego
New Mock Theta Function Identities
- 2017 Sept Jon Borwein Commemorative Conference Newcastle, Australia
New Mock Theta Function Identities
- 2017 Mar SERMON XXX, University of North Florida, Jacksonville
New Mock Theta Function Identities
- 2017 Jan. AMS Special Session on Partition Theory and Related Topics, Atlanta, GA
Weighted partition identities and divisor sums
- 2017 Jan. AMS Special Session on Arithmetic Properties of Sequences from Number Theory and Combinatorics, Atlanta, GA
The Andrews spt-function mod 4
- 2015 Jun The 13th International Symposium on Orthogonal Polynomials, Special Functions and Applications (OPSFA-13), Mini-symposium on the Legacy of Ramanujan National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland
Exotic Bailey-Slater Spt-Functions and Hecke-Rogers Double Series
- 2015 Jan. AMS Special Session on Partitions, q -Series, and Modular Forms, San Antonio, TX
Congruences and relations for the Fishburn numbers
- 2014 Jul Challenges in 21st Century Experimental Mathematical Computation ICERM, Brown University
Congruences and relations for the Fishburn numbers
- 2014 Apr Applications of Special Functions in Combinatorics and Analysis, AMS Spring Central Sectional Meeting, Texas Tech University, Lubbock, TX
Universal mock theta functions and two-variable Hecke-Rogers identities
- 2013 Jan. AMS Special Session on q -series in Mathematical Physics and Combinatorics, San Diego
The smallest parts partition function
 George Andrews delivered my talk since I was unable to attend for health reasons.
- 2011 May Workshop on Computational and Analytical Mathematics (Jonathan Borwein's 60th Birthday) The IRMACS Centre, Simon Fraser University, Burnaby, BC, Canada
The Andrews spt-function and higher order generalizations
- 2010 Jul Combinatorics and Mathematical Physics Conference, University of Queensland, Brisbane, Australia
Biranks for partitions into 2 colors and some theta function identities
- 2009 Oct AMS Special Session on q -Series and Related Topics in Enumerative Combinatorics and Number Theory, Pennsylvania State University, University Park, PA
Biranks for partitions into 2 colors
- 2009 Jun Ramanujan Rediscovered Conference, Bangalore India
Congruences and Relations for the Rank and Crank of Partitions
- 2008 Dec Combinatory Analysis 2008: Partitions, q -series, and Applications Conference, Pennsylvania State University, State College PA
Yet even more partition congruences
- 2008 May Mathematical Interests of Peter Borwein Conference,

- Simon Fraser University, Burnaby, British Columbia, Canada
Congruences for the rank and crank of partitions
- 2007 May Number Theory Meeting in honor of Halberstam and Selfridge,
University of Illinois at Urbana-Champaign
Congruences for Andrews's smallest parts partition function
- 2005 Jul REU Program, Clemson University
Partition Congruences
- 2005 Apr Clifford Conference on Experimental Mathematics, Tulane University
Partitions, congruences and differential equations
- 2003 Mar AMS Special Session on q -Series in Number Theory and Combinatorics
Louisiana State University, Baton Rouge
Ekhad-Zeilberger identities and their multisum analogs
- 2000 Oct q -series with Applications to Combinatorics, Number Theory and
Physics: University of Illinois at Urbana-Champaign
*The Hirschhorn-Farkas-Kra septagonal numbers identity
and some shiftless partition identities*
- 2000 Jul Classical Combinatorics In honor of Dominique Foata's 65th birthday, Temple University
Shifted partition identities and conjectures
- 2000 Jun NATO Advanced Study Institute Special Functions 2000:
Current Perspective and Future Directions, Arizona State University
Modular relations between the rank and the crank
- 2000 May Millennial Conference in Number Theory, University of Illinois
More shifted partition identities
- 1999 Mar AMS Special Session on Elementary and Analytic Number Theory, Urbana, IL
Modular relations between the rank and the crank
- 1998 Oct AMS Special Session on Partitions and q -Series, State College, PA
Zeros of certain modular functions
- 1998 Jun AMS-IMS-SIAM Summer Research Conference on q -Series, Combinatorics
and Computer Algebra, Mt. Holyoke
Zeros of certain modular functions
- 1995 Dec Workshop on Organic Mathematics, Simon Fraser University, Vancouver
Approximations to π via the Dedekind eta function
- 1995 Dec CMS Special Session on Experimental and Constructive Mathematics,
Simon Fraser University, Vancouver
Shifted Partition Identities
- 1995 May Conference on Analytic Number Theory, Allerton Park, University of Illinois
Approximations to π via modular equations for the Dedekind η -function
- 1995 Jan. Session on Enumerative Combinatorics and Representations of the
Symmetric Group, Oberwolfach, Germany
More cranks and t -cores
- 1994 Nov AMS Special Session on Combinatorics, Richmond, Virginia
Congruences for colored partitions
- 1994 Aug AMS Special Session on q -series, Minneapolis
More cranks and t -cores
- 1994 Mar AMS Special Session on Special Functions, Manhattan, Kansas
Some generalizations of the Farkas-Kra theta function identities
- 1993 Sep ACSyAM Combinatorics and Symbolic Computation Workshop
MSI/Cornell University
Ramanujan's theories of elliptic functions to alternative bases — a symbolic excursion
- 1992 Jul Rademacher Centenary Conference, University Park, Pennsylvania
*Cubic modular identities of Ramanujan, hypergeometric functions
and analogues of the arithmetic-geometric mean iteration*

- 1992 Apr Illinois Number Theory Conference, Urbana
Cranks, t -cores and congruences for partitions
- 1988 Mar AMS Special Session on Algebraic Combinatorics, East Lansing, Michigan
Combinatorial interpretations of congruences for certain plane partitions
- 1987 Summer Meeting of the AMS on Theta Functions, Bowdoin, Maine
Ranks, Cranks and Congruences for Partitions

Contributed Talk

- 2011 Jan. AMS Session on Number Theory, New Orleans
Higher order spt -functions
- 1995 Jun Workshop on Special Functions, q -series and Related Topics,
Fields Institute, University College, University of Toronto
Approximations to π via modular equations for the Dedekind eta-function
- 1993 Aug Joint AMS-CMS-MAA Conference, Vancouver
Generalizations of Dyson's rank and non-Rogers-Ramanujan partitions
- 1989 Jul Annual conference of the Austral. Math. Soc., Macquarie University
Recent developments in the combinatorics of partition congruences

Colloquia

- 2016 Dec Mathematics Colloquium, University of Newcastle, Australia
Transformation Properties for Dyson's Rank Function
- 2008 Jul Mathematics Colloquium, University of Newcastle, Australia
- 2005 Jul Mathematics Colloquium, University of Melbourne, Australia
- 2001 Jul Mathematics Colloquium and Number Theory Seminar,
Macquarie University, Sydney, Australia
- 2000 Jul Mathematics Colloquium and Number Theory,
University of Sussex, Brighton, England
- 1999 Jul Mathematics Colloquium and Number Theory Seminar,
Macquarie University, Sydney, Australia
- 1997 Mar Mathematics Colloquium, University of Illinois, Urbana
- 1996 Jul Mathematics Colloquium, Macquarie University, Sydney
- 1995 Mar Mathematics Colloquium, Florida State University, Tallahassee

Seminars

- 2024 Mar Seminar on Combinatorics and Number Theory
University of Vienna
Modular Transformations and Hecke Operators for Ramanujan's Mock Theta Functions
- 2023 Sep VIRTUAL Seminar in Partition Theory, q -Series and Related Topics
Michigan Technological University
Cultivating Maple and Sage in Ramanujan's Garden
- 2023 Mar Number Theory Seminar
Vanderbilt University
Cultivating Maple and Sage in Ramanujan's Garden
- 2021 Jun. VIRTUAL Oberseminar Zahlentheorie
Universität Köln
The unimodal sequence conjectures
- 2021 Mar VIRTUAL Algebra and Number Theory Seminar
UCD (Dublin), Ireland
The spt and unimodal sequence conjectures

2020 Oct	VIRTUAL Penn State Algebra and Number Theory Seminar <i>The unimodal sequence conjectures</i>
2020 Oct	VIRTUAL Number Theory Seminar, St. Petersburg State University and the Euler International Mathematical Institute <i>A new approach to Dyson's rank conjectures</i>
2017 Mar	Graduate Number Theory Seminar, University of Illinois, Urbana <i>Playing with partitions and q-series</i>
2017 Mar	Number Theory Seminar, University of Illinois, Urbana <i>New mock theta function identities</i>
2013 Aug	CARMA OANT Seminar, University of Newcastle, Australia <i>Dyson's rank function and Andrews's SPT function</i>
2013 Apr	Rutgers Experimental Mathematics Seminar, Rutgers University <i>The Dyson rank of partitions</i>
2003 Apr	Number Theory Seminar, University of Illinois, Urbana
1997 Mar	Number Theory Seminar, University of Illinois, Urbana
1996 Aug	Number Theory Seminar, University of New South Wales, Sydney

MENTORING ACTIVITIES

Post docs mentored

2011	Goksel Biligici: Congruences for partition functions Now at Kastamonu University, Turkey
2011	Ali Bulent Ekin: Congruences for partition functions Now at Ankara University, Turkey
2004 – 2006	Hamza Yesilyurt: Shifted partition identities and Ramanujan's Circular summation Now Associate Professor at Bilkent University, Ankara, Turkey

Ph.D. students advised

2021 – present	Zhumagli Shomanov
2021 – present	Avi Mukhopadhyay
2020 – present	Rishabh Sarma
2020 – 2024	Connor Morrow (graduating, August 2024) Thesis: <i>Congruences for Andrews's Even Parts below Odd Parts Partition Function</i>
2020 – 2023	Jonathan Bradley-Thrush (graduated, August 2023) Thesis: <i>Symmetries in the Theory of Basic Hypergeometric Series</i> Present position: Postdoc, University of Lisbon
2019 – 2022	John Streese (graduated May, 2022) Thesis: <i>Rank and Crank Identities and Relationships to Quasi-Modular Forms</i> Present position: Lecturer, Math Dept, University of Florida
2012 – 2015	Chris Jennings-Shaffer (graduated May, 2015) Thesis: <i>Analytic and Arithmetic Properties of Smallest Parts Partition Functions and Generalizations</i> Present position: Research Specialist at Howard Hughes Medical Institute, Seattle

Visiting Ph.D. students mentored

- 2019 – 2020 Dandan Chen: Congruences for mock theta functions
Now Assistant professor in Shanghai
- 2019 – 2020 Rong Chen: Congruences for mock theta functions
Now Post doc in Shanghai

Masters students mentored

- 2006 – 2007 Amitava Ghosh (graduated August 2007)
Thesis: *Approximations to π , Dedekind's eta function, and modular equations*

DEPARTMENTAL SERVICE

2023 – 2024 Faculty Committees

- Computer and Technology Committee
- Graduate Committee
- Steering Committee

Past Committees

Math dept webmaster 2001 – July, 2009. Other past committees: Post-Doc Search Committee, Group Proposals Committee, Steering Committee (2000 – 2002, 2007–2009, 2018–2020), Resource Room Committee, Computer Committee (chair), Graduate Committee, Undergraduate Committee Upper Division, Mentor (with Krishna Alladi, 2020) of Jesse Thorner, Faculty Open Search Committee (2022–2023)

Gainesville Number Theory Conferences Organized

- Nov 2019 AMS Special Session on Partitions and Related Topics
Co-organizers: Dennis Eichhorn (UC, Irvine) and
Brandt Kronholm (University Of Texas Rio Grande Valley)
- Mar 2016 ALLADI60
(Conference in Honor of Krishna Alladi)
- Nov 2012 Ramanujan 125
(Conference celebrating Ramanujan's 125th birthday)
- May 2009 Higher Degree Forms
- May 2009 Quadratic Forms, Sums of Squares, Theta Functions and Integral Lattices
- Mar 2008 Partitions, q -Series and Modular Forms
- Nov 2004 Additive Number Theory
- Mar 2003 Number Theory and Combinatorics in Physics
- Nov 1999 Symbolic Computation, Number Theory, Special Functions, Physics and Combinatorics

UNIVERSITY SERVICE

Member of College Mathematical Sciences Committee 2004 – 2007.

COURSE DEVELOPMENT

- Summer 2009 Developed an online component of my Graduate Special Topics Course
Partitions and q -Series, so I could offer it as a Reading Course.
See the website

Summer 2005	qseries.org/fgarvan/qs/summer2009/ Developed Graduate Special Topics Course <i>Partitions and q-Series</i> , which ran as a section of MAT6932
1997 – 1999	Developed a new Undergraduate course <i>Introduction to Maple</i> , which ran as a section of MAT4930

TEACHING EXPERIENCE

- MAA 4102 Introduction to Advanced Calculus 1 for Engineers and Physical Scientists, Fall 2013
- MAA 4103 Introduction to Advanced Calculus 3 for Engineers and Physical Scientists, Spring 2014
- MAA 4211 - Advanced Calculus 1, Fall 1995
 - MAA 4212 - Advanced Calculus 2, Spring 1996
 - MAA 4402/5404 - Functions of a Complex Variable, Fall 2007, Summer 1996, Summer 1997, Fall 2013, Fall 2015, Spring 2016, Fall 2016, Spring 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2021, Fall 2022, Spring 2023, Fall 2023, Spring 2024
 - MAC 2233 - Survey of Calculus 1, Fall 1998
 - MAC 2312 - Analytic Geometry and Calculus 2, Spring 1995, Fall 1996, Spring 1996, Spring 1998, Spring 2000, Spring 2010
 - MAC 2313 - Analytic Geometry and Calculus 3, Fall 1992, Fall 1998, Spring 1999, Fall 2001, Fall 2003,
 - MAC 3473 - Honors Calculus 2, Fall 1995, Fall 2000, Spring 2000, Fall 2007, Spring 2009
 - MAC 3474 - Honors Calculus 3, Spring 2007
 - MAD 3107 - Discrete Mathematics, Spring 2007
 - MAP 2302 - Elementary Differential Equations, Spring 1993, Fall 1999, Spring 2000, Spring 2001, Fall 2002, Fall 2004, Spring 2008, Fall 2009, Spring 2011, Fall 2011, Spring 2012, Spring 2014
 - MAP 4305/5304 - Differential Equations for Engineers and Physical Scientists, Summer 2003, Summer 2006, Summer 2012
 - MAP 4403 - Mathematical Methods for Engineers, Fall 2000, Fall 2001
 - MAS 3113 - Matrices and Vector Spaces, Fall 1993, Spring 1994
 - MAS 3114 - Computational Linear Algebra, Fall 1994, Fall 1997, Summer 2004, Fall 2005, Summer 2013, Summer 2017
 - MAS 3300 - Numbers and Polynomials, Fall 1992, Fall 1994, Fall 1997, Spring 1997, Summer 2001, Fall 2006, Fall 2008 Fall 2011
 - MAS 4105 - Linear Algebra 1, Fall 1993, Spring 1993, Spring 1994, Fall 2002, Fall 2009, Spring 2011, Spring 2013, Fall 2014, Fall 2016, Spring 2020, Fall 2020
 - MAS 4203 - Introduction to Number Theory, Spring 1995, Summer 1995, Spring 1997, Spring 2002, Spring 2005, Summer 2002, Spring 2009, Spring 2010, Summer 2011, Summer 2014, Summer 2015, Spring 2016, Spring 2017
 - MAS 4301 - Abstract Algebra 1, Spring 2012, Fall 2012, Spring 2015, Fall 2015, Spring 2018, Fall 2018, Fall 2019, Fall 2020, Spring 2021, Fall 2021, Spring 2022, Fall 2022, Fall 2023, Spring 2024

- MAS 7215 - Theory of Numbers I, Fall 1999, Fall 2003, Fall 2005
- MAS 7216 - Theory of Numbers II, Spring 2001, Spring 2004, Spring 2006, Spring 2019
- MAT 4911 - UG Research Math, Fall 2022
- MAT 4930 - Introduction to Maple (Special Topics in Mathematics), Fall 1998, Spring 1998, Spring 1999, Spring 1999, Spring 2000
- MAT 6905 - Individual Work, Summer 2021 (Connor Morrow, Rishabh Sarma); Spring 2021 (Zhumagli Shomanov); Fall 2020 (Rishabh Sarma) Summer 2020 (Connor Morrow, Rishabh Sarma, Jonathan Bradley-Thrush)
- MAT 6932 - Partitions and q -Series (Special Topics in Mathematics), Summer 2005
- MAT 6932 - Modular Forms and Mock Theta Functions (Special Topics in Mathematics), Fall 2014, Spring 2015, Spring 2022

Updated April 14, 2024