Atul Dixit

Discipline of Mathematics
Indian Institute of Technology Gandhinagar
Palaj Gandhinagar
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India

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Education

- **Ph.D. Mathematics** *2006-2012*
  University of Illinois at Urbana-Champaign, USA
  Advisor: Bruce C. Berndt
- **M.S. Mathematics** *2004-2006*
  Texas Tech University, USA
- **B.E. Computer Engineering**, *First class* *2000-2004*
  University of Mumbai, India

Employment

- **Associate Professor** *June 2021 - present*
  Discipline of Mathematics
  Indian Institute of Technology Gandhinagar
  Palaj, Gandhinagar, Gujarat, India
- **Assistant Professor** *August 2015 – June 2021*
  Discipline of Mathematics
  Indian Institute of Technology Gandhinagar
  Palaj, Gandhinagar, Gujarat, India
- **Postdoctoral Fellow,**
  Department of Mathematics, *August 2012-July 2015*
  Tulane University,
  New Orleans, LA, USA

Research Interests

- Analytic Number Theory
- Special Functions
- Theory of Partitions, Modular Forms, q-series

Publications

1. Orthopoles and the Pappus theorem (with D. Grinberg), *Forum Geom.*, **4** (2004), 53-59.

2. Monotonicity of quotients of theta functions related to an extremal problem on harmonic measure (with A.Yu. Solynin), *J. Math. Anal. Appl*., **336**, No. 2 (2007), 1042-1053.
3. The Laplace Transform of the psi function, *Proc. Amer. Math. Soc*., **138**, No. 2 (2010), 593-603.
4. Series transformations and integrals involving the Riemann Ξ-function, *J. Math. Anal. Appl*., **368** (2010), 358-373.
5. A transformation formula involving the Gamma and Riemann zeta functions in Ramanujan's Lost Notebook (with B.C. Berndt), *The legacy of Alladi Ramakrishnan in the mathematical sciences*, K. Alladi, J. Klauder, C. R. Rao, Eds, Springer, New York, 2010, pp. 199-210.
6. Character analogues of theorems of Ramanujan, Koshliakov and Guinand (with B.C. Berndt and J. Sohn), *Adv. Appl. Math.*, **46**, (2011), 54-70. (Special issue in honor of Dennis Stanton).
7. Analogues of a transformation formula of Ramanujan, *Int. J. Number Theory*, **7**, No. 5 (2011), 1151-1172.
8. Transformation formulas associated with integrals involving the Riemann Ξ-function, *Monatsh. Math.*, **164**, No. 2 (2011), 133-156.
9. Convexity of quotients of theta functions (with A. Roy and A. Zaharescu), *J. Math. Anal. Appl.*, **386**, No. 1 (2012), 319-331.
10. Character analogues of Ramanujan type integrals involving the Riemann Ξ –function, *Pacific J. Math.*, **255**, No. 2, (2012), 317-348.
11. Analogues of the general theta transformation formula, *Proc. Royal Soc. Edinburgh, Sect. A*, **143** (2013), 371-399.
12. Rank-Crank type PDEs and generalized Lambert series identities (with S.H. Chan and F.G. Garvan), *Ramanujan J.*, **31**, Issue 1-2 (2013), 163-189 (Special issue in honor of Mourad Ismail and Dennis Stanton).
13. Generalized higher order spt-functions (with A. J. Yee), *Ramanujan J.*, **31**, Issue 1-2 (2013), 191-212 (Special issue in honor of Mourad Ismail and Dennis Stanton).
14. Ramanujan's ingenious method for generating modular-type transformation formulas, *The Legacy of Srinivasa Ramanujan*, RMS-Lecture Note Series, No. 20 (2013), pp. 163-179.
15. From sequences to polynomials and back, via operator orderings (with T. Amdeberhan, V. De Angelis, V. H. Moll and C. Vignat), *J. Math. Phys.*, **54**, 123502 (2013).
16. Monotonicity results for Dirichlet L-functions, (with A. Roy and A. Zaharescu), *J. Math. Anal. Appl.*, **410**, No. 1 (2014), 307-315.
17. The Zagier modification of Bernoulli numbers and a polynomial extension. Part I. (with V. H. Moll and C. Vignat), Ramanujan J., **33**, No. 3 (2014), 379-422.
18. The unimodality of a polynomial coming from a rational integral. Back to the original proof (with T. Amdeberhan, X. Guan, L. Jiu and V. H. Moll), *J. Math. Anal. Appl.*, **420** (2014), 1154-1166.
19. The Zagier polynomials. Part II. Arithmetic properties of coefficients (with M. Coffey, V. De Angelis, V. H. Moll, A. Straub and C. Vignat), *Ramanujan J.*, **35**, Issue 3 (2014), 361-390.
20. Self-reciprocal functions, powers of the Riemann zeta function and modular-type transformations (with V. H. Moll), *J. Number Theory* **147** (2015), 211-249.
21. Zeros of combinations of Riemann ξ-function on bounded vertical shifts (with N. Robles, A. Roy and A. Zaharescu), *J. Number Theory* **149** (2015), 404-434.
22. Ramanujan-Hardy-Littlewood-Riesz phenomena for primitive Hecke forms (with A. Roy and A. Zaharescu), *J. Math. Anal. Appl.*, **426** (2015), 594-611.
23. The finite Fourier transform of classical polynomials (with L. Jiu, V.H. Moll and C. Vignat), *J. Austral. Math. Soc.*, **98** No. 2 (2015), 145-160.
24. Partitions associated with the Ramanujan/Watson mock theta functions $\omega(q)$, $\upsilon(q)$ and $\phi(q)$ (with G. E. Andrews and A. J. Yee), *Research in Number Theory*, **1**, Issue 1 (2015), 1-25.
25. Riesz-type criteria and theta transformation analogues (with A. Roy and A. Zaharescu), *J. Number Theory* **160** (2016), 385-408.
26. Koshliakov kernel and identities involving the Riemann zeta function (with N. Robles, A. Roy and A. Zaharescu), J. Math. Anal. Appl. **435** No. 2 (2016), 1107-1128.
27. A hypergeometric inequality (with V. H. Moll and V. Pillwein), Ann. Comb. 20, No. 1 (2016), 65-72.
28. Asymptotics and exact formulas for Zagier polynomials (with M. L. Glasser, V. H. Moll and C. Vignat), *Research in Number Theory*, 2 (1) (2016), 1-26.
29. New pathways and connections in number theory and analysis motivated by two incorrect claims

of Ramanujan (with B. C. Berndt, A. Roy and A. Zaharescu), *Adv. Math.* **304** (2017), 809-929.

30. Error functions, Mordell integrals and an integral analogue of a partial theta function (with A. Roy and A. Zaharescu), *Acta Arith.* **177** No. 1 (2017), 1-37.
31. Modified Nörlund polynomials (with A. Kabza, V. H. Moll and C. Vignat), *Ramanujan J.* **42** (2017), 69-96.
32. On a theorem of A. I. Popov on sums of squares (with B.C. Berndt, S. Kim and A. Zaharescu), *Proc. Amer. Math. Soc.*, **145**, No. 9 (2017), 3795-3808.
33. Overpartitions related to the mock theta function ω(q) (with G.E. Andrews, D. Schultz and A. J. Yee), *Acta Arith.* **181** No. 3 (2017), 253-286.
34. New representations for σ(q) via reciprocity theorems (with K. Banerjee), *Analytic Number Theory, Modular Forms and q-Hypergeometric Series (in honor of Krishnaswami Alladi's 60th birthday)*, Springer Proceedings in Mathematics and Statistics, 2017, pp. 39-57.
35. A generalized modified Bessel function and a higher level analogue of the theta transformation formula (with A. Kesarwani and V. H. Moll; with an Appendix by Nico M. Temme), *J. Math. Anal. Appl.* **459** (2018), 385-418.
36. Zeros of combinations of the Riemann Ξ-function and the confluent hypergeometric function on bounded vertical shifts (with Rahul Kumar, Bibekananda Maji and Alexandru Zaharescu), *J. Math. Anal. Appl.*, **466** (2018), 307-323.
37. Sums of squares and products of Bessel functions (with B. C. Berndt, S. Kim and A. Zaharescu), *Adv. Math.* 338 (2018), 305-338.
38. Modular-type transformations and integrals involving the Riemann Ξ-function, *Math. Student* **87** Nos. 3-4 (2018), 47-59.
39. On squares of odd zeta values and analogues of Eisenstein series (with Rajat Gupta), Adv. Appl. Math. **110** (2019), 86-119.
40. A simple proof of a congruence for a series involving the little q-Jacobi polynomials, Ann. Comb. **23** (2019), no. 3-4, 713-716.
41. Generalized Lambert series and arithmetic nature of odd zeta values (with Bibekananda Maji), *Proc. Royal Soc. Edinburgh, Sect. A*, **150** No. 2 (2020), 741-769.
42. Partition implications of a three parameter q-series identity (with Bibekananda Maji), *Ramanujan J.* **52** (2020), 323-358.
43. Analogue of a Fock-type integral arising from electromagnetism and its applications in number theory (with Arindam Roy), *Res. Math. Sci.* **7**, Article number: 25 (2020) (33 pages).
44. Generalized Lambert series, Raabe's cosine transform and a generalization of Ramanujan's formula for ζ(2m+1) (with Rajat Gupta, Rahul Kumar and Bibekananda Maji), *Nagoya Math. J.*, **239** (2020), 232-293.
45. Untrodden pathways in the theory of the restricted partition function p(n, N) (with Pramod Eyyunni, Bibekananda Maji and Garima Sood), *J. Combin. Theory Ser. A* **180** (2021), 105423 (49 pages).
46. On Hurwitz zeta function and Lommel functions (with Rahul Kumar), *Int. J. Number Theory* **17** no. 2 (2021), 393-404.
47. Superimposing theta structure on a generalized modular relation (with Rahul Kumar), Res. Math. Sci. **8** (2021) No. 3, Paper No. 41 (83 pages).
48. Koshliakov zeta functions I: Modular relations (with Rajat Gupta), Adv. Math., 393 (2021), Paper No. 108093, (41 pages).
49. Generalizations of the Andrews-Yee identities associated with the mock theta functions ω(q) and υ(q) (with Bruce C. Berndt and Rajat Gupta), J. Algebraic Combin. (2021), (DOI: https://doi.org/10.1007/s10801-021-01082-2).
50. Explicit transformations of certain Lambert series (with Aashita Kesarwani and Rahul Kumar), submitted for publication (51 pages).
51. Extended higher Herglotz functions I: Functional equations (with Rajat Gupta and Rahul Kumar), submitted for publication.
52. A class of identities associated with Dirichlet series satisfying Hecke's functional equation (with Bruce C. Berndt, Rajat Gupta and Alexandru Zaharescu), (provisionally accepted for publication in Proceedings of the American Mathematical Society).
53. A modular relation involving non-trivial zeros of the Dedekind zeta function, and the Generalized

Riemann Hypothesis (with Shivajee Gupta and Akshaa Vatwani), submitted for publication.

54. Ramanujan and Koshliakov meet Abel and Plana (with Bruce C. Berndt, Rajat Gupta and Alexandru Zaharescu), submitted for publication.

Expository Papers

1. The integrals in Gradshteyn and Ryzhik. Part 28. The confluent hypergeometric function and Whittaker functions (with V. H. Moll), *Scientia, Series A*, 26 (2015), 49-61.
2. The integrals in Gradshteyn and Ryzhik. Part 30. Trigonometric functions (with T. Amdeberhan, X. Guan, L. Jiu, A. Kuznetsov, V. H. Moll and C. Vignat), *Scientia, Series A*, 27 (2016), 47-74.
3. Ramanujan's paper on Riemann's functions $\xi(s)$ and $\Xi(t)$ and a transformation from the Lost Notebook (with A. Zaharescu), to appear in the *Encyclopedia of Srinivasa Ramanujan and His Mathematics*.
4. Ramanujan's published papers on definite integrals (with B. C. Berndt and V. H. Moll), to appear in the *Encyclopedia of Srinivasa Ramanujan and His Mathematics*.
5. Elliptic and related integrals (with B. C. Berndt and V. H. Moll), to appear in the *Encyclopedia of Srinivasa Ramanujan and His Mathematics*.
6. Beautiful integrals (with B. C. Berndt and V. H. Moll), to appear in the *Encyclopedia of Srinivasa Ramanujan and His Mathematics*.
7. Ramanujan's beautiful integrals (with B. C. Berndt), *Hardy-Ramanujan Journal* (Special volume dedicated to 100th death anniversary of Srinivasa Ramanujan).

Books (Editor)

1. V. R. Thiruvenkatachar and K. Venkatachaliengar, Ramanujan at Elementary Levels: Glimpses, Bruce C. Berndt, Atul Dixit, Victoria J. Reuter, Ping Xu, and Boonrod Yuttanan, eds. Ramanujan Mathematical Society, Lecture Note Series, No. 24, 2016.

Honors and Awards

• SwarnaJayanti Fellowship	(2022-2027)
• Gábor Szegö prize, SIAM, USA	2021
• Member of the *Indian National Young Academy of Sciences*	(2021-2025)
• SERB Core Research Grant for 3 years for the project '*Number Theoretic Analysis of certain transformations and an extension of the Ramanujan Master Theorem'.*	*Jan. 12, 2021 – Jan. 2023 (Rs. 26,26,096)*
• Excellence in Teaching Award, IIT Gandhinagar	*January 26, 2020*
• SPARC grant, MHRD, Government of India for 2 years for the project titled '*Problems in Analytic and Combinatorial Number Theory'* (Joint with Prof. Akshaa Vatwani, IIT Gandhinagar; Prof. Bruce C. Berndt, Univ. of Illinois at Urbana-Champaign, USA; Prof. Ram Murty, Queen's University, Canada)	*Apr. 16, 2019 – Apr. 15, 2021*
• SERB MATRICS grant of Rs. 6,00,000 for three years	*Mar. 19, 2019-Mar. 18, 2022*

• *28th Hansraj Gupta Memorial Award Lecture*, *December 13, 2017*
83rd Annual Conference of the Indian Mathematical Society, Sri Venkateswara University, Tirupati, December 12-15, 2017

• SERB-DST Early Career Research Award *Sept.2016 – Sept. 2019*
for the project '*At the Interface of Analytic Number Theory and Special Functions*' *(Rs. 14,86,980)*

• Excellence in Research Fellowship, *Aug. 2015- Aug. 2018*
Indian Institute of Technology Gandhinagar

• Bateman Prize in Number Theory
University of Illinois at Urbana-Champaign *2011*

• Bateman Fellowship in Number Theory
University of Illinois at Urbana-Champaign *2011*

• Trjitzinsky Fellowship
University of Illinois at Urbana-Champaign *2010*

• Research Experience for Graduate Students (REGS)
University of Illinois at Urbana-Champaign *2007*

Talks at conferences/Invited Talks

- Monotonicity of Quotients of Theta Functions, *Midwest Number Theory Conference for Graduate Students IV*, University of Illinois at Urbana- Champaign, October 28-29, 2006.
- Generalizing Theorems of Ramanujan, Koshliakov and Guinand for even, periodic and completely multiplicative sequences, *Illinois Number Theory Fest*, Conference in the honor of 80th Birthday celebration of Heini Halberstam and John Selfridge, University of Illinois at Urbana-Champaign, May 16-20, 2007.
- Character Analogues of formulas of Ramanujan, Koshliakov and Guinand, *Midwest Number Theory Conference for Graduate Students V*, University of Wisconsin at Madison, November 3-4, 2007.
- A transformation formula involving the Gamma and Riemann zeta functions in Ramanujan's Lost Notebook, *Combinatory Analysis 2008*, Conference in the honor of George E. Andrews' 70th birthday, Penn State University, December 5-7, 2008.
- Analogues of a transformation formula of Ramanujan, *Quadratic Forms, Sums of Squares, Theta Functions and Integral Lattices conference*, University of Florida at Gainesville, March 11-15, 2009.
- Transformation formulas associated with integrals involving the Riemann Ξ function, 2009 AMS Fall Central Sectional Meeting, *Special Session on contemporary Complex and Special Function Theory*, Baylor University, October 16-18, 2009.
- Transformation formulas associated with integrals involving the Riemann Ξ function, *Midwest Number Theory Conference for Graduate Students VI*, University of Wisconsin at Madison, November 7-8, 2009.
- Transformation formulas associated with integrals involving the Riemann Ξ function, *Focused week on Quadratic Forms and Theta functions*, University of Florida at Gainesville, March 22-26, 2010.

- Character analogues of Ramanujan type integrals involving the Riemann Ξ function, Joint Mathematics Meeting, *Special session on Asymptotic Methods in Analysis with Applications II*, New Orleans, January 6-9, 2011.
- A hypergeometric proof of a Rank-Crank type PDE, q-series 2011 , *q-series, partitions and special functions conference in the honor of Mourad Ismail and Dennis Stanton*, Georgia Southern University , March 14-16, 2011.
- Rank-Crank type PDEs through the identities of Jackson and Chan, *Midwest Number Theory conference for Graduate Students 2011*, University of Wisconsin at Madison, November 18-20, 2011.
- Transformation formulas associated with integrals involving the Riemann Ξ function, *Young Researchers Meet (Mathematics and Computer Science)*, Stanford University, May 26-27, 2012.
- Analogues of the general theta transformation formula, 2012 AMS Fall Central Sectional Meeting, *Special Session on Special Functions, Combinatorics and Analysis*, University of Arizona, October 27-28, 2012.
- Generalized higher order spt-functions, *Ramanujan 125 conference to commemorate Ramanujan's 125th birth anniversary*, University of Florida, Gainesville, November 5-7, 2012.
- Rank-Crank-type PDEs and generalized Lambert series identities, *Legacy of Srinivasa Ramanujan Conference*, Srinivasa Ramanujan center, SASTRA University, Kumbakonam, India, December 14-15, 2012.
- Generalized higher order spt-functions, The Legacy of Srinivasa Ramanujan Conference, *An international conference to commemorate Ramanujan's 125th birth anniversary*, University of Delhi, India, December 17-22, 2012.
- Two problems in the theory of partitions, *Colloquium talk*, Tata Institute of Fundamental Research, Mumbai, January 3, 2013.
- Rank-Crank-type PDEs and generalized Lambert series identities, Joint Mathematics Meeting, *AMS special session on the Influence of Ramanujan on his 125th Birthday*, San Diego, January 9-12, 2013.
- Ramanujan-Hardy-Littlewood-Riesz phenomena and monotonicity results for Dirichlet L-functions, Indian Institute of Science Education and Research, Pune, May 30, 2013.
- Ramanujan-Hardy-Littlewood-Riesz phenomena and monotonicity results for Dirichlet L-functions, IIT Bombay, June 7, 2013.
- A series identity, possibly connected with a divisor problem, in Ramanujan's Lost Notebook, *Number Theory Seminar, University of Illinois at Urbana-Champaign*, Urbana, November 7, 2013.
- A series identity, possibly connected with a divisor problem, in Ramanujan's Lost Notebook, *Seminar, Indian Institute of Science*, Bangalore, March 5, 2014 (given through skype).
- Some identities of Ramanujan in connection with the circle and divisor problems, *Algebra and Number Theory seminar, Louisiana State University*, Baton Rouge, April 8, 2014.
- A series identity, possibly connected with a divisor problem, in Ramanujan's Lost Notebook, *AMS Spring Central Sectional Meeting, Texas Tech University*, Lubbock, April 12, 2014.
- Error functions, Mordell integrals and integral analogue of partial theta function, Midwest Number Theory Conference for Graduate Students, X, University of Illinois at Urbana-Champaign, June 3-4, 2014.
- Zagier polynomials and modified Nörlund polynomials, Number Theory Seminar, University of Illinois at Urbana-Champaign, October 21, 2014.
- Koshliakov transforms and modular-type transformations, Graduate Student Number Theory Seminar, University of Illinois at Urbana-Champaign, October 23, 2014.

- Error functions, Mordell integrals and an integral analogue of partial theta function,*14th Red Raider Mini Symposium (Honoring the Retirement of Roger W. Barnard)*, Texas Tech University, Lubbock, November 7-9, 2014.
- Zagier polynomials and modified Nörlund polynomials, Colloquium talk, Texas Tech University, Lubbock, November 11, 2014.
- Zagier polynomials and modified Nörlund polynomials, Algebra and Number Theory Seminar, Pennsylvania State University, State College, November 20, 2014.
- Partitions associated with three third order mock theta functions, Number Theory Seminar, University of Illinois at Urbana-Champaign, March 19, 2015.
- A modular-type transformation involving series of Hurwitz zeta function, Graduate Student Number Theory Seminar, University of Illinois at Urbana-Champaign, March 19, 2015.
- Zagier polynomials, their asymptotics and exact formulas, International Conference on Orthogonal Polynomials and q-series (in the honor of Professor Mourad Ismail), University of Central Florida, May 10-12, 2015.
- Ramanujan, the Voronoi summation formula, circle and divisor problems and modular transformations, *Legacy of Ramanujan Minisymposium, 13th International Symposium on Orthogonal Polynomials, Special Functions and their Applications*, National Institute of Standards and Technology, Gaithersburg, Maryland, June 1-5, 2015.
- Ramanujan, the Voronoi summation formula, circle and divisor problems and modular transformations, *International Conference Special Functions and their Applications*, Amity University, Noida, September 10-12, 2015.
- Ramanujan, the Voronoi summation formula, circle and divisor problems and modular transformations, *National Workshop on Number Theory and Works of Srinivasa Ramanujan*, University of Mysore, February 26, 2016.
- Partitions associated with Ramanujan/Watson mock theta function $\omega(q)$ and their overpartition analogues, *National Workshop on Number Theory and Works of Srinivasa Ramanujan*, University of Mysore, February 27, 2016.
- Overpartitions associated with the Ramanujan/Watson mock theta function $\omega(q)$, International Number Theory Conference (in the honor of Krishnaswami Alladi's 60th birthday), University of Florida, Gainesville, USA, March 17-21, 2016.
- Overpartitions associated with the Ramanujan/Watson mock theta function $\omega(q)$, Algebraic geometry and number theory seminar, Rice University, Houston, USA, March 22, 2016.
- Zagier polynomials: their asymptotics and exact formulas, Graduate Student Number Theory Seminar, University of Illinois at Urbana-Champaign, March 29, 2016.
- Overpartitions associated with the Ramanujan/Watson mock theta function $\omega(q)$, Illinois Number Theory seminar, University of Illinois at Urbana-Champaign, USA, March 31, 2016.
- New representations for $\sigma(q)$ via reciprocity theorems, 29th International Conference of Jangjeon Mathematical Society on Number Theory and Special Functions and its Applications, Pondicherry University, Pondicherry, India, August 8-10, 2016.
- Ramanujan, the Voronoi summation formula, circle and divisor problems and modular transformations, Lecture at Tata Institute of Fundamental Research, Mumbai, October 3, 2016.
- The beauty of Ramanujan's mathematics, *Mathegon 2017*: National Mathematics Day Celebration, IIT Gandhinagar, January 2, 2017.
- New representations for $\sigma(q)$ via reciprocity theorems, AMS Special Session on Partition Theory and Related Topics, Joint Mathematics Meeting, Atlanta, USA, January 4-7, 2017.
- Transformations involving $r_k(n)$ and Bessel functions, Number Theory Seminar, University of Florida, Gainesville, January 10, 2017.
- Transformations involving $r_k(n)$ and Bessel functions, Algebra and Number Theory Seminar, Penn State University, State College, January 12, 2017.
- Transformations involving $r_k(n)$ and Bessel functions, Mathematics Discipline Seminar, IIT Gandhinagar, January 24, 2017.
- A generalized modified Bessel function and a higher level analogue of the general theta transformation formula, Seminar Talk, Harish-Chandra Research Institute, Allahabad, July 3, 2017.

- Monotonicity and convexity of quotients of theta functions, Akshaya Patra Foundation, Bhadaj, Gujarat, July 5, 2017.
- Transformations involving $r_k(n)$ and Bessel functions, International conference on class groups of number fields & related topics', Harish-Chandra Research Institute, Allahabad, September 4-7, 2017.
- Ramanujan's formula for $\zeta(2m+1)$ and subsequent developments, International conference on *'Exploring the History of Indian Mathematics'*, IIT Gandhinagar, Gandhinagar, December 4-6, 2017.
- Modular-type transformations and integrals involving the Riemann Ξ-function, *28th Hansraj Gupta Memorial Award Lecture*, 83rd Annual Conference of the Indian Mathematical Society, Sri Venkateswara University, Tirupati, December 12-15, 2017.
- On a new generalization of Ramanujan's formula for $\zeta(2m+1)$ and its implications, *Number Theory: Arithmetic, Diophantine and Transcendence*, Celebrating 130th birth anniversary of Srinivasa Ramanujan, IIT Ropar, December 22-25, 2017.
- Ramanujan's formula for odd zeta values and subsequent developments, Remembering Ramanujan: The Indian Mathematical Genius, Tezpur University, April 26, 2018.
- Partitions and overpartitions associated with some third order mock theta functions, Remembering Ramanujan: The Indian Mathematical Genius, Tezpur University, April 26, 2018.
- Partitions implications of a three-parameter q-series identity, Combinatory Analysis 2018, A conference in honor of George E. Andrews' 80th birthday, Penn State University (June 21-24, 2018), June 22, 2018.
- Ramanujan's formula for odd zeta values and subsequent developments, Number Theory Seminar, Queen's University, Canada, June 27, 2018.
- Ramanujan's formula for odd zeta values and subsequent developments, Algebra, Geometry and Number Theory Seminar, University of Saskatchewan, Canada, June 28, 2018.
- The beauty of Ramanujan's Mathematics, Prachin Bharat ke Vaigyanik aur unke avadaan, Gorakhpur University, January 23, 2019.
- On values of the Riemann zeta function at odd positive integers, Mathematics Seminar, IIT Kanpur, January 25, 2019.
- On values of the Riemann zeta function at odd positive integers, Mathematics Seminar, Ramkrishna Mission Vivekananda Educational and Research Institute, Kolkata, March 6, 2019.
- On odd zeta values and analogues of Eisenstein series, International Conference on Number Theory (ICNT) 2019, IISER Thiruvananthapuram, March 11, 2019.
- On values of the Riemann zeta function at odd positive integers, *Analytic and Combinatorial Number Theory: The Legacy of Ramanujan*, University of Illinois at Urbana-Champaign, June 6-9, 2019.
- Recent developments in the theory of the restricted partition function p(n, N), *International Conference on Number Theory and Graph Theory* in honor of Chandrasekhar Adiga's 62nd birthday, University of Mysore, June 27-29, 2019.
- Recent developments in the theory of the restricted partition function p(n, N), Algebra & Combinatorics Seminar, IISc Bangalore, October 9, 2019.
- Superimposing theta structure on a generalized modular relation, Eigenfunctions Seminar, IISc Bangalore, October 11, 2019.
- Recent developments in the theory of the restricted partition function p(n, N), International Conference on Number Theory, Special Functions and Combinatorics, Thapar Institute of Engineering and Technology, October 12, 2019.
- Superimposing theta structure on a generalized modular relation, International Conference on Special Functions and its Applications, Bikaner Technical University, October 22, 2019.
- Analogue of a Fock-type integral arising from electromagnetism and its applications in number theory, Symposium on 'Ramanujan and Mathematical Analysis', 85th conference of the Indian Mathematical Society, IIT Kharagpur, November 22-25, 2019.
- Superimposing theta structure on a generalized modular relation, Number Theory Seminar, University of Illinois at Urbana-Champaign, January 14, 2020.

- Superimposing theta structure on a generalized modular relation, Mathematics seminar, SRM University AP, March 11, 2020.
- Superimposing theta structure on a generalized modular relation (online), Special Functions and Number Theory Seminar, June 4, 2020
- Superimposing theta structure on a generalized modular relation (online), Zoom Colloquium, Tata Institute of Fundamental Research, July 2, 2020.
- Superimposing theta structure on a generalized modular relation (online), Recent Developments in Number Theory – 2020, KIIT University, Bhubaneswar, August 17, 2020.
- Partitions of integers and their applications in statistical mechanics and mathematical physics, Popular Mathematics Lecture Series (online), Babu Banarasi Das University, October 6, 2020.
- On generalizations of the third order mock theta functions ω(q) and ν(q) (online), International Conference on Number Theory (ICNT 2020) (in honor of Mahadaeva Naika's superannuation), Bengaluru City University, October 26, 2020.
- An introduction to the theory of partitions (online), Jhunjhunwala College, Mumbai, October 31, 2020.
- On generalizations of the third order mock theta functions ω(q) and ν(q) (online), Combinatorics/Partitions seminar, Penn State, December 8, 2020.
- The beauty of Ramanujan's mathematics (online), Think India Gujarat, December 22, 2020
- On generalizations of the third order mock theta functions ω(q) and ν(q) (online), International Conference on Special Functions and their Applications (ICSFA 2020), December 22, 2020.
- An introduction to the theory of partitions (online), The Life and Legacy of Srinivasa Ramanujan, Veer Narmad South Gujarat University, Surat, December 22, 2020.
- On generalizations of the third order mock theta functions ω(q) and ν(q) (online), Special Lecture Series on Mathematics (On the eve of National Mathematics Day), Central University of Karnataka, December 23, 2020.
- A generalized modified Bessel function and explicit transformations of certain Lambert series (online), International Conference on Number Theory and Algebra, IIT BHU, December 23, 2020.
- A generalized modified Bessel function and explicit transformations of certain Lambert series (online), Hardy-Ramanujan Lecture Series, IIT Indore, December 24, 2020.
- On generalizations of the third order mock theta functions ω(q) and ν(q) (online), Mathematics Colloquium, Ashoka University, January 19, 2021.
- A generalized modified Bessel function and explicit transformations of certain Lambert series, International Webinar on Mathematical Analysis and Its Applications, Feb. 22-26, 2021
- A generalized modified Bessel function and explicit transformations of certain Lambert series, Webinar on Recurrent Sequences and Special Functions, Sambalpur University, Feb. 24, 2021.
- Superimposing theta structure on a generalized modular relation (online), Bucharest Number Theory Days, International conference in honor Alexandru Zaharescu's 60^{th} birthday, June 3, 2021.

Teaching

Indian Institute of Technology Gandhinagar

• Single-variable calculus and Linear Algebra (Undergraduate course)	(Spring 2021)
• Topics in Real Analysis (Graduate course)	(Fall 2020)
• Complex Analysis (Graduate course)	(Spring 2020)
• Theory of Partitions (Graduate course)	*(Fall 2019)*
• Basic Algebra (Group Theory) (Graduate), Number Theory (Graduate)	*(Spring 2019)*
• Special Functions (Graduate course), Complex Analysis (Undergraduate course)	*(Fall 2018)*
• Number Theory (Graduate course)	*(Spring 2017)*
• Special Functions (Graduate course), Complex Analysis (Undergraduate course)	*(Fall 2017)*
• Number Theory (Graduate course)	*(Spring 2017)*

• Topics in Real Analysis (Graduate course) *(Fall 2016)*
• Number Theory (Graduate course), Numerical Methods (Undergraduate course) *(Spring 2016)*
• Topics in Real Analysis (Graduate course), Calculus (tutorial) *(Fall 2015)*

Tulane University

• Combinatorics (*Spring 2014*)
• Modular Forms (Graduate course) (*Fall 2013*)
• Elementary Number Theory (*Spring 2013*)
• Calculus III (*Fall 2012*)

University of Illinois at Urbana-Champaign

As a Full Instructor

• Calculus for Business I *Spring 2012*
• Calculus I with *Mathematica* *Fall 2011*
• Calculus III with *Mathematica* *Fall 2009, Fall 2010* †
• Calculus II *Summer 2010* †
• A Mathematical World *Fall 2008, Summer 2009*
• Precalculus *Summer 2008*

† Named in the 'List of Teachers Ranked as Excellent by their students'.

As a Teaching Assistant

• Calculus 2 *Spring 2008, Spring 2009*
• Calculus 1 *Fall 2007*

Texas Tech University

Full Instructor

• Precalculus *Fall 2005, Spring2006*

Advising

- ## PhD students (past)
  1. *Aashita Kesarwani* (joint with Victor H. Moll), Tulane University (Graduated – December 31, 2017). Current job: Scientific computing specialist, Harvey-Mudd College, USA.
  2. *Rahul Kumar*, IIT Gandhinagar (Graduated October 26, 2020).

- ## PhD students (current)
  3. *Rajat Gupta*, IIT Gandhinagar (currently in his fifth year)
  4. *Shivajee*, IIT Gandhinagar (joint with Akshaa Vatwani) (currently in his third year).

- ## Postdocs
  1. *Bibekananda Maji* (PhD - Harish-Chandra Research Institute (2017))
     (Current job: Assistant Professor of Mathematics at IIT Indore)
  2. *Garima Sood* (PhD – Panjab University, Chandigarh (2016))
     (Current job: Postdoc, University of Vienna)
  3. Soumyarup Banerjee (PhD – Harish-Chandra Research Institute (2018)) – Aug. 19, 2020 – present
  4. *Rahul Kumar*, (PhD - IIT Gandhinagar).

- ## Masters and undergraduate honors students

- *Yizhen Han* (Tulane Univ.) for her senior year project 'Ramanujan's Partition Congruences'.
- *Leigh Cosolito* (Tulane Univ.) for her senior year project 'Look-and-say Biochemistry'.
- *Adam Kabza* (Tulane Univ.) for his senior year project 'Modified Nörlund polynomials'.
- *Pamina Buechner* (Tulane Univ.) for her honors thesis on 'A generalized modular relation in Ramanujan's Lost Notebook'.
- *William Byron* (Tulane Univ.) for his senior year project 'Combinatorial proofs of generating function identities for F-partitions'.
- *Aarti Bansal* (IIT Gandhinagar) for her MSc. Thesis 'On partition function and smallest parts function'.
- *Abhishek Kumar* (IIT Gandhinagar) for his MSc. Thesis 'Partitions and q-series'.
- *Balu Ram* (IIT Gandhinagar) for his MSc. Thesis 'Functional equation of $\zeta(s)$ using Lipschitz summation formula and Hurwitz relation'.
- *Priyanka Rana* (IIT Gandhinagar) for her MSc. Thesis 'Special Functions'.
- *Deepika Parmar* (IIT Gandhinagar) for her MSc. Thesis 'Combinatorial Proofs of Legendre Theorems for Subclasses of Overpartitions'.
- *Aritra Kumar Bhaduri* (IIT Gandhinagar) for his MSc. Thesis 'Combinatorial Analysis of Some Partition Identities'
- *Meghali Garg* (IIT Gandhinagar) for her MSc. Thesis 'Riesz-type Criteria for Riemann Hypothesis and Asymptotic Formulas for Two Continued Fractions in Ramanujan's Lost Notebook'.
- *Mohammad Aqib* (IIT Gandhinagar) – Voronoi Summation, Modular-type Transformations and Analogues of Koshliakov's Formula.
- *Kashif Jamal (IIT Gandhinagar)* for his MSc. Thesis 'Hurwitz's formula in the theory of the Hurwitz zeta function'.
- *Lokesh Sharma (IIT Gandhinagar)* for his MSc. Thesis 'On the Hurwitz-zeta function and Koshliakov kernel and identities involving the Riemann zeta function'.
- *Surendra Chaudhry (IIT Gandhinagar)* for his MSc. Thesis 'Riemann zeta function'.
- *Ankit Sharma (IIT Gandhinagar)* for his MSc. Thesis 'Riemann zeta function and Gauss sums'
- *Bhunesh Nagar (IIT Gandhinagar)* for his MSc. Thesis 'Some results on Epstein's zeta function and error functions'
- *Shiva (IIT Gandhinagar)* for his MSc. Thesis 'L-functions and the fourth moment of the Riemann zeta function'

Professional involvement and services

• Member of Indian National Young Academy of Sciences (INYAS) for five years 2021-25.

• Co-organizer of the online Special Functions and Number Theory Seminar along with Gaurav Bhatnagar (Ashoka Univ.) and Krishnan Rajkumar (JNU)

• Guest Editor for Volumes 43 and 44 of the Hardy-Ramanujan Journal dedicated to the memory of Srinivasa Ramanujan

• One of the three organizers of 'Symposium in Number Theory' at IIT Gandhinagar, December 22-23, 2019. (http://events.iitgn.ac.in/2019/ntsymposium/)

• On the Editorial Boards of the Journal of the Ramanujan Mathematical Society (since March 2017) and *The Mathematics Student* (since January 2015).

• Member of the American Mathematical Society since 2005.

• One of the main organizers of the upcoming conference titled '*The Legacy of Ramanujan in Number Theory: An International Conference in honor of Professor Bruce C. Berndt's 80th birthday*' to be held at

University of Illinois at Urbana-Champaign from June 6-9, 2019.

• One of the organizers of the Special Session on '*Applications of Special Functions in Combinatorics and Analysis*' in the Spring Central Sectional Meeting of the American Mathematical Society, *Texas Tech University*, April 11-13, 2014.

• One of the organizers of the Special Session on '*Partitions, q-series and modular forms*' at the Joint Mathematics Meeting of the American Mathematical Society, Henry B. Gonzalez convention center, San Antonio, January 10-13, 2015.

• One of the organizers of Mathegon 2017 (on account of National Mathematics Day Celebration), IIT Gandhinagar, January 2, 2017.

• Refereed articles for

- Advances in Mathematics
- Journal of Number Theory
- Journal of Mathematical Analysis and Applications
- The Ramanujan Journal
- Proceedings of the London Mathematical Society
- Proceedings of the American Mathematical Society
- Journal of the Indian Mathematical Society
- Rocky Mountain Journal of Mathematics
- International Journal of Number Theory
- Publicationes Mathematicae (Debrecen)
- Hardy-Ramanujan Journal
- Journal of the Ramanujan Mathematical Society
- Functiones et Approximatio Commentarii Mathematici
- Proceedings of the Indian Academy of Sciences
- Czechoslovak Mathematical Journal
- Scientia Series A
- Mathscinet (Math reviews)
- Acta Arithmetica

• Coach for teaching geometry to the Indian students appearing at the regional, national (Indian) and International Mathematics Olympiad camps in Oct. 2001, Dec. 2002 and June 2004 respectively.

• Member of *Hyacinthos* group on Yahoo groups devoted to research in triangle geometry (where I have done some research in finding new triangle centers, for example the center X(3590) in http://faculty.evansville.edu/ck6/encyclopedia/ETCPart3.html).

References

Available upon request.