# Ranganatha D., Ph.D.

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## Employment History

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|---|---|
| March 5, 2018 – · · · · | **Assistant Professor**, Department of Mathematics, Central University of Karnataka, Kadaganchi, Kalaburagi, Karnataka-585367, India. |
| July 22, 2017 – March 3, 2018 | **Assistant Professor**, Department of Mathematics, Siddaganga Institute of Technology, Tumakuru, Karnataka-572103. |
| August 16, 2012–May 31, 2014 | **Assistant Professor**, Department of Mathematics, P.E.S. Arts, Science and Commerce, Mandya, Karnataka-571401. |

## Education

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| 2014 – 2018 | **Ph.D., University of Mysore**<br>Thesis title: *On Study of Partition Identities and Modular Relations.*<br>Advisor: Prof. Chandrashekar Adiga. |
| 2010 – 2012 | **M.Sc.** in Mathematics.<br>University of Mysore, India. |
| 2007 – 2010 | **B.Sc.** in Mathematics, Chemistry & Physics.<br>Tumakur University, India |

## Research Interest

- Theory of Partitions, $q$-series, Analytic Number Theory, Special Functions, Ramanujan's Mathematics.

## Supervision

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| Current Ph.D. Students | 1. G. K. Kavya (currently in her Fourth year)<br>2. S. Ananya (currently in her first year) |
| Past Ph.D. Students | 1. Channabasavayya (Current job: Assistant Professor, Dept. of Mathematics, Govt. First Grade College, Shiralakoppa - 577 427, Shimoga Dist.) |

## Research Publications

### Journal Articles

1. S. Ananya, K. G. Kavya, and D. Ranganatha, "Partition $k$-tuples with 5-cores modulo powers of 5," *Bol. Soc. Mat. Mex., accepted*, 2026. DOI: https://doi.org/10.1007/s40590-026-00901-5
2. S. Ananya and D. Ranganatha, "On sixth order mock theta function and 3-regular partitions in three colors," *Communicated*, 2026.

3. N. A. S. Bulkhali, Channabasavyya, D. Ranganatha, and M. S. Surekha, "Some continued fractions of Ramanujan of order twelve," *Proceedings of the Jangjeon Mathematical Society*, vol. 29 (1), pp. 105–124, 2026. DOI: http://dx.doi.org/10.17777/pjms2026.29.1.008

4. K. G. Kavya, S. Ananya, and D. Ranganatha, "Congruences modulo powers of 2 and 3 for overpartition $k$-tuples," *Boletín de la Sociedad Matemática Mexicana*, vol. 32, Article number 28, 2026. DOI: https://doi.org/10.1007/s40590-026-00861-w

5. K. G. Kavya, N. A. S. Bulkhali, and D. Ranganatha, "Infinite families of identities for $p_{[c^\ell d^m]}(n)$, the generalized partition function," *Communicated*, 2026.

6. S. Ananya, Channabasavayya, D. Ranganatha, and R. G. Veeresha, "Vanishing coefficient results in three infinite $q$-products," *Hardy Ramanujan Journal*, vol. 48, Part-B, pp. 43–57, 2025.

7. N. D. Baruah, D. Ranganatha, and K. G. Kavya, "Vanishing coefficients of some new infinite $q$-products," *International Journal of Number Theory, https://doi.org/10.1142/S1793042126500042*, 2025.

8. N. A. S. Bulkhali, G. K. Keerthana, and R. Dasappa, "On a product of three theta functions and the number of representations of integers as mixed ternary sums involving squares, triangular, pentagonal and octagonal numbers," *Journal of Mathematical Analysis and Applications*, vol. 551, no. 2, Part 1, p. 129 676, 2025. DOI: https://doi.org/10.1016/j.jmaa.2025.129676

9. Channabasavayya, G. K. Kavya, and D. Ranganatha, "On further modular relations for the Rogers–Ramanujan functions," *Indian Journal of Pure and Applied Mathematics*, vol. 56, pp. 113–124, 2025. DOI: https://doi.org/10.1007/s13226-023-00458-3

10. Channabasavayya, G. K. Kavya, and D. Ranganatha, "On a generalization of 5–dissections of some infinite $q$–products," *Ramanujan Journal*, vol. 64, pp. 1335–1355, 2024. DOI: https://doi.org/10.1007/s11139-024-00872-z

11. Channabasavayya and D. Ranganatha, "On a generalization of vanishing coefficients in two $q$–series expansions," *Journal of Ramanujan Mathematical Society*, vol. 39, no. 2, pp. 187–192, 2024.

12. Channabasavyya and D. Ranganatha, "Vanishing coefficients in arithmetic progressions of some infinite products with modulo 13, 17, 19, and 29," *Journal of Analysis*, vol. 32, pp. 3101–3114, 2024. DOI: https://doi.org/10.1007/s41478-024-00784-7

13. D. Ranganatha, Channabasavayya, and G. K. Kavya, "On some new arithmetic properties of certain restricted color partition functions," *Arabian Journal of Mathematics*, vol. 13, pp. 275–289, 2024. DOI: https://doi.org/10.1007/s40065-024-00458-z

14. D. Ranganatha and G. K. Kavya, "A further look at the overpartition function modulo $2^4$ and $2^5$," *Ramanujan Journal*, vol. 65, pp. 1159–1179, 2024. DOI: https://doi.org/10.1007/s11139-024-00933-3

15. P. Sonik, D. Ranganatha, and M. Goyal, "On a generalized basic series and Rogers–Ramanujan type identities," *Contributions to Discrete Mathematics*, vol. 18, no. 1, pp. 15–28, 2023. DOI: https://doi.org/10.55016/ojs/cdm.v18i1.73025

16. N. A. S. Bulkhali and D. Ranganatha, "Modular relations for the Rogers–Ramanujan functions with applications to partitions," *The Ramanujan Journal*, vol. 56, no. 1, pp. 121–139, 2021. DOI: https://doi.org/10.1007/s11139-020-00336-0

17. D. Ranganatha, "Some properties of $k$–tuple $t$–core partitions," *The Ramanujan Journal*, vol. 56, pp. 369 - –385, 2021. DOI: https://doi.org/10.1007/s11139-020-00351-1

18. B. Hemanthkumarm, D. Ranganatha, and H. S. Bharadwaj, "On eight colour partitions," *Indian Journal of Pure and Applied Mathematics*, vol. 51, pp. 1843–1856, 2020. DOI: https://doi.org/10.1007/s13226-020-0500-y

19. B. R. Srivatsa Kumar, Shruthi, and D. Ranganatha, "Some new congruences modulo 5 for the general partition function," *Russian Mathematics*, vol. 64, no. 7, pp. 73–78, 2020. DOI: https://doi.org/10.3103/S1066369X20070099

20. C. Adiga, A. Bayad, and D. Ranganatha, "Some new congruences for $(s, t)$–regular bipartition functions," *Publications de l'Institut Mathématique*, vol. 106 (120), pp. 53–67, 2019. DOI: https://doi.org/10.2298/PIM1920053A

21. C. Adiga and D. Ranganatha, "On 3–regular tripartitions," *Acta Mathematica Sinica, English Series*, vol. 35, pp. 355–368, 2019. DOI: https://doi.org/10.1007/s10114-018-7111-0

22. C. Adiga, M. M. Naika, D. Ranganatha, and C. Shivashankar, "Congruences modulo 8 for $(2, k)$–regular overpartitions for odd $k > 1$," *Arabian Journal of Mathematics*, vol. 7, pp. 61–75, 2018. DOI: https://doi.org/10.1007/s40065-017-0195-z

23. C. Adiga and D. Ranganatha, "Congruences for 7 and 49–regular partitions modulo powers of 7," *The Ramanujan Journal*, vol. 46, pp. 821–833, 2018. DOI: https://doi.org/10.1007/s11139-017-9936-z

24. C. Adiga and D. Ranganatha, "On overpartition pairs into odd parts modulo powers of 2," *Discrete Mathematics*, vol. 341, no. 11, pp. 3141–3147, 2018. DOI: https://doi.org/10.1016/j.disc.2018.08.002

25. D. Ranganatha, "On some new congruences for $\ell$–regular overpartitions," *Palest. J. Math.*, vol. 7, no. 1, pp. 345–362, 2018.

26. C. Adiga and D. Ranganatha, "Congruences modulo powers of 2 for $\ell$–regular overpartitions," *J. Ramanujan Math. Soc*, vol. 32, no. 2, pp. 147–163, 2017.

27. C. Adiga and D. Ranganatha, "A simple proof of a conjecture of dou on (3, 7)–regular bipartitions modulo 3," *Integers*, vol. 17, A14, 2017. DOI: 10.5281/zenodo.10636099

28. D. Ranganatha, "Ramanujan–type congruences modulo powers of 5 and 7," *Indian Journal of Pure and Applied Mathematics*, vol. 48, pp. 449–465, 2017. DOI: https://doi.org/10.1007/s13226-017-0237-4

29. C. Adiga, A. Agarwal, and D. Ranganatha, "On generalizations of some combinatorial identities," *Journal of Ramanujan Society of Mathematics and Mathematical Sciences*, vol. 5, no. 01, pp. 47–56, 2016. DOI: https://www.rsmams.org/download/articles/1_5_1_636867170_Paper%205%20C%20Adiga.pdf

30. C. Adiga, N. Bulkhali, D. Ranganatha, and H. Srivastava, "Some new modular relations for the Rogers–Ramanujan type functions of order eleven with applications to partitions," *Journal of number theory*, vol. 158, pp. 281–297, 2016. DOI: https://doi.org/10.1016/j.jnt.2015.06.019

31. C. Adiga and D. Ranganatha, "Arithmetic properties of partition four tuples with 3–cores," *Advanced Studies in Contemporary Mathematics*, vol. 26, no. 3, pp. 417–434, 2016.

32. N. Bulkhali and D. Ranganatha, "New modular relations for the Rogers–Ramanujan type functions of order thirteen with applications to partitions," *Sohag J. Math.*, vol. 3, no. 2, pp. 67–75, 2016. DOI: doi:10.18576/sjm/030204

33. D. Ranganatha, "On a Ramanujan–type congruence for bipartitions with 5–cores.," *J. Integer Seq.*, vol. 19, no. 8, Article 16.8.1, 2016. DOI: https://cs.uwaterloo.ca/journals/JIS/VOL19/Dasappa/dasappa5.pdf


## Research Projects

- Congruence properties of restricted partition functions in the spirit of Ramanujan's congruences, CUK Seed Money Research Grant (CUK/ACAD-II/R&D/F-3625/19-20/22, dated August 01, 2019).
- A study on congruences for certain restricted partition functions and modular relations, UGC -Start-Up Research Grant (No.F.30-489/2019 (BSR), dated September 17, 2019).

## Conferences/Workshops/ Faculty Development Programmes

### Talks /Paper presentation at the conferences

- Contributed talk, New Modular Relations for the Rogers-Ramanujan Type Functions of Order Thirteen with Applications to Partitions, National Conference on Mathematics and its Applications, AIT, Chikkamagaluru, India, December 22-23, 2015.
- Contributed talk, Arithmetic Properties of Partition Four Tuple with Three Cores, $31^{st}$ Conference of Ramanujan Mathematical Society, National College, Trichy, Tamil Nadu, June 18-21, 2016.
- Contributed talk, New Congruences for $\ell$-regular overpartitions for $\ell \in \{5, 3^r\}$, where $r \geq 2$, The 29th International Conference of Jangjeon Mathematical Society on Number Theory, Special Functions and its Applications, Pondicherry University, India, August 8-10, 2016.
- Contributed talk, Ramanujan-type congruences modulo powers of 5 and 7, $83^{rd}$ Annual conference of IMS-an International meet, S.V. University, Tirupati, Andra Pradesh, December 12-15, 2017.
- Contributed talk, On overpartition pairs into odd parts modulo powers of 2, The international conference on special functions and applications, Amal Jyothi College of Engineering, Kottayam, Kerala, November 22-24, 2018.
- Contributed talk, Ramanujan-type congruences for partitions in eight colors modulo powers of 2", The International Conference on Number Theory and Graph Theory, University of Mysore, Mysuru, 27-29 June 2019.
- Contributed talk, Arithmetic properties for $k$-tuples $t$-core partitions, The $85^{th}$ Annual Conference of Indian Mathematical Society, IIT Kharagpur, November 22-25, 2019.
- Contributed talk, Some properties of $k$-tuple $t$-core partitions, The $86^{th}$ Annual Conference of the Indian Mathematical Society-An International Meet, VIT Vellore, December 17-20, 2020.
- Contributed talk, Modular relations for the Rogers-Ramanujan functions with Application to partitions, The international conference on special functions and applications, Babu Banarasi Dasi University, Uttar Pradesh, 22-23 December 2020.
- Contributed talk, On Some New Arithmetic Properties of Certain Restricted Color Partition Functions, The International Conference on Special Functions & Applications (ICSFA-2022), University of Mysore, India, November 26-28, 2022.
- Invited talk, Open Problems in Number Theory, Sharn Basva University, Karnataka, July 16, 2023.
- Invited talk, Srinivasa Ramanujan and his Contributions to Mathematics, Central University of Karnataka, India, December 22, 2023 (On the eve of National Mathematics Day).
- Invited talk, Srinivasa Ramanujan and his Contributions to Mathematics, Doddappa Appa Pre-University Science College, Karnataka, December 22, 2023 (On the eve of National Mathematics Day).
- Invited Talk, A Talk on the Mathematical Wonders of Ramanujan, National Seminar On Recent Trends in Mathematics, VIT-AP University, December 22, 2023 (Online Mode).
- Contributed talk, On a generalization of 5–dissections of some infinite $q$–products, CONTACT–III, March 16-17, 2024 (Online)
- Contributed talk, On a product of three theta functions and the number of representations of integers as mixed ternary sums involving squares, triangular, pentagonal and octagonal number, Conference on Number Theory in the Spirit of Ramanujan and Berndt, Yonsei University, Seoul, South Korea, June 23-25, 2025
- Invited talk, Mathematical Reasoning and Aptitude for for UGC NET/JRF, Central University of Karnataka, February 23, 2026
- Invited talk, Understanding the Nature and Process of Mathematical Research, Six days national level FDP on Research methodlogy for Experimental and Theoretical Sciences, SSCASCW, Tumakuru, March 9-14, 2026
- Invited talk, Vanishing coefficients of some new infinite $q$-products, Mathematics Research Symposium on Recent Advances in Mathematics, MIT, Manipal, Karnataka, India, April 10-11, 2026

## Conferences/Workshops/ Faculty Development Programmes (continued)

### Training Courses/ Faculty Development Programme attended

- In-house Faculty Development Programme Work Series-XLII, SIT, Tumakuru, India, July 23-28, 2017.
- One-day orientation program, Central University of Karnataka, India, December 9, 2019.
- $3^{rd}$ Faculty Induction Programme, Pondicherry University, Pondicherry, January 27, 2021 – February 25, 2021 (Online).
- Inter/ Multi-Disciplinary Refresher Course in Mathematics, Statistics, and Computer Science, Kannur University, Kerala, December 8, 2021 – December 21, 2021 (Online).
- Refresher Course on AI in Basic Sciences, University of Madras, December 2, 2025 –December 15, 2025 (Online).

## ACADEMIC RESPONSIBILITY

- Organized International e-conference on Number theory and Differential Equations, December 20-24, 2021 (On the eve of National Mathematics Day).
- BOS member, Dept. of Mathematics, CUK (2020-2023).
- School Board Member (School of Physical Sciences, CUK (2020-2023).
- IQAC, Co-Coordinator, representing the Dept. of Mathematics, CUK (December 2022-June 2025.
- Nodal Person for NBHM Library grant, Dept. of Mathematics, CUK(Responsible for liaising between the National Board of Higher Mathematics (NBHM) and the CUK Administration).
- Exam. coordinator (2020-2023), Dept. of Mathematics, CUK.
- Warden (From Oct. 30, 2024), Krishna Boys Hostel, CUK

## Teaching Experience

- P.E.S. Arts, Science and Commerce, Mandya, Karnataka, August 2012 – May 2014; Courses Taught: Real Analysis, ODE & PDE, Topology.
- Siddaganga Institute of Technology, Tumakuru, July 2017 – March 2018; Courses Taught: Engineering Mathematics I, II, III & IV.
- Central University of Karnataka, Kalaburagi, India From March 5, 2018; Courses Teaching: Algebra, Topology, Measure and Integration, Theory of Numbers, Theory of Partitions, Complex Analysis, Advance Calculus, Real Analysis, Linear Algebra, Cryptography, Ramanujan's Theta functions and their application to Number Theory

## Honors and Awards

- CSIR-NET (2015), KSET (2013)
- University Grants Commission, New Delhi has awarded a Research Fellowship in Science for Meritorious Students (RFSMS) under UGC-Basic Scientific Research Scheme Order No. MG/MATHS/168/UGC-BSR/2014-15, Dated: 14-07-2014.
- Third Rank in B.Sc., Tumkur University, Tumakuru, Karnataka (2010).
- First Rank in M.Sc., University of Mysore, Mysuru, Karnataka (2012).
- Professor N. Rudraiah Felicitation Committee Endowment Gold Medal, Professor K.S. Iyengar Gold Medal, The Sridhar Kumar Gold Medal, Han's (South Korea) Cash Prize, The M.T. Narayan Iyengar Memorial Prize, Professor K. Venkatachala Iyengar Endowment Cash Prize for highest marks in M.Sc. Awarded by the University of Mysore, Mysuru in 2012.

## Honors and Awards (continued)

- Best Paper Presentation Award-The $29^{th}$ International Conference of Jangjeon Mathematical Society on Number Theory, Special Functions, and its Applications, Pondicherry University, Pondicherry, India, August 8-10, 2016.
- Indian Mathematical Society (IMS) Prize for the year 2020 for presenting the best research paper in the area of Number Theory.
- Received ANRF-International Travel Grant for attending the conference Number Theory in the Spirit of Ramanujan and Berndt at Yonsei University, Seoul, South Korea, June 23-25, 2025.

## References

**Prof. K. R. Vasuki**
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