

Curriculum vitae

Dr. Ajay Kumar

B.Sc., M.Sc., & Ph.D.

Assistant Professor (Mathematics)

Department of Basic Engineering and Applied Science,
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Research Interest

Non-linear partial differential equations, Fractional differential equations, Mathematical Modeling, Computational fluid dynamic, Analytical and Numerical Method. I have sound knowledge of tools such as **Mathematica**, **MATLAB**, and other symbolic computing environments for solving applied mathematics problems and conducting simulations.

Academic Educations

S. No	Name of Degree	University/Institute	Year
1	Ph.D.	Hemvati Nandan Bahuguna Garhwal University (A Central University) Srinagar Garhwal Uttarakhand	08/10/2020
2	M.Sc.	Hemvati Nandan Bahuguna Garhwal University (A Central University) Srinagar Garhwal Uttarakhand	2014
3	B.Sc.	Mahatma Jyotiba Phule RohilkhandUniversity, Bareilly	2012
4	12 th	Board of High School and Intermediate Education Prayagraj	2009
5	10 th	Board of High School and Intermediate Education Prayagraj	2006

Teaching Experience

S. No	Name of Institute	Designation	Date of Joining
1	Department of Pharmacy, Uttarakhand Technical University	Assistant Professor (Guest faculty)	07/12/2020 To 04/02/2021
2	Department of Mathematics, Bakhtiyarpur College of Engineering-Patna	Assistant Professor (Guest faculty)	05/02/2021 To 11/07/2023
3	Department of Mathematics Patna Women's College (Autonomous) Patna University Patna-80001, India	Assistant Professor (On Contract)	12/07/2023 To 31/07/2024
4	Department of Mathematics, Mahamaya College of Agricultural Engineering and Technology, Ambedkarnagar, UP- India	Assistant Professor (Guest Faculty)	August- 2024 To 28/2/2025
5	Department of Basic Engineering and Applied Science, College of Technology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, India	Assistant Professor Regular Faculty	29/03/2025 To Till date

Experience in Research

Supervised 3 Research Projects of Undergraduate Students at College level under BSR, CPE Scheme of UGC and Star College Scheme of DBT.

Keynote speaker

- **Title:** An Efficient Technique for Nonlinear Partial Differential Equation: Solutions, Interpretation and Applications, Digital Revolution and the Future of Education in the

List of Publications

1. **Ajay Kumar**, Rahul Shukla, Dynamics behavior of solitons based on exact solutions for the mathematical model arising in telecommunications, Partial Differential Equations in Applied Mathematics, 13, 101125, 2025. **I.F. 6.2.**
2. **Ajay Kumar**, New wave interaction properties of some nonlinear models arising in fluid dynamical science, has been **accepted** for publication in Applied Mathematics-A Journal of Chinese Universities, 15 April, 2024. **I.F. 0.8**
3. **Ajay Kumar**, Dynamic behavior and semi-analytical solution of nonlinear fractional order Kuramoto-Sivashinsky equation, Pramana – Journal of Physics, 98(2), 1-13, 2024. **I.F- 2.219.**

4. **Ajay Kumar**, Raj Shekhar Prasad, Haci Mehmet Baskonus, On the Implementation of Fractional Homotopy Perturbation Transform Method to the Emden-Fowler Equations, *Pramana-Journal of Physics*, 97(3), 1-11, 2023. **I.F. 2.219**
5. **Ajay Kumar**, Raj Shekhar Prasad, On dynamical behavior for approximate solutions sustained by nonlinear fractional Damped Burger and Sharma-Tasso-Olver equation, *International Journal of Modern Physics B*, DOI: 10.1142/S0217979223502284, 2023. **I.F. 2.6**
6. **Ajay Kumar**, Prachi Fartyal , Dynamical behavior for the approximate solutions and different wave profiles nonlinear fractional generalised Pochhammer-Chree equation in mathematical physics, optical and quantum electronics journal, 1-26, 2022. <https://doi.org/10.21203/rs.3.rs-1983028/v1>. **I.F. 3.3.**
7. **Ajay Kumar**, Amit Prakash, Haci Mehmet Baskonus, The epidemic COVID-19 model via Caputo–Fabrizio fractional operator, *Waves in Random and Complex Media*, 1-15, 2022, **SCI-E, IF- 4.853.**
8. Seenith Sivasundaram, **Ajay Kumar** , Ratnesh Kumar Singh, On the complex properties to the first equation of the Kadomtsev-Petviashvili hierarchy, *International Journal of Mathematics and Computer in Engineering* , 2(1), 73–86, 2023.
9. Li Yan, **Ajay Kumar**, Juan Luis García Guirao, Haci Mehmet Baskonus, Wei Gao, Deeper properties of the nonlinear Phi-four and Gross-Pitaevskii equations arising mathematical physics, *Modern Physics Letters B*, 36(04), 1-15, 2021, **SCI-E, IF- 1.219.**
10. Li Yan, Gulnur Yel, **Ajay Kumar**, Haci Mehmet Baskonus, Wei Gao, Newly Developed Analytical Scheme and Its Applications to the Some Nonlinear Partial Differential Equations with the Conformable Derivative, *Fractal and Fractional*, 5(4), 2021, **SCI-E, IF- 3.313.**
11. Arman Ciancio, Gulnur Yel, **Ajay kumar** , Haci Mehmet Baskonus, Esin Ihan, On the Complex Mixed Dark-Bright Wave Distributions to some Conformable Nonlinear Integrable Models, *Fractals*, 30(1),1-14, 2022, **SCI-E, IF- 3.154**
12. Haci Mehmet Baskonus, Juan Luis Garcia Guirao, **Ajay kumar**, Fernando S. Vidal Causanilles, and German Rodriguez Bermudez, Regarding New Traveling Wave Solutions for the Mathematical Model Arising in Telecommunications, *Advances in Mathematical Physics*, 2021, **SCI-E, IF- 1.128.**
13. Haci Mehmet Baskonus, Juan Luis Garcia Guirao, **Ajay kumar** , Fernando S. Vidal Causanilles , and German Rodriguez Bermudez, Instability modulation properties of the $(2+ 1)$ -dimensional Kundu–Mukherjee–Naskar model in travelling wave solutions, *Modern Physics Letters B*, 35(13), 2150217-2021, **SCI-E, IF-1.219.**
14. **Ajay Kumar**, Esin Ilhan, Armando Ciancio, Gulnur Yel, Haci Mehmet Baskonus, Extractions of some new travelling wave solutions to the conformable Date-Jimbo-Kashiwara-Miwa equation, *AIMS Mathematics*, 6(5), 4238-4264, 2021, **SCI-E, IF-1.427.**
15. Amit Prakash ,**Ajay Kumar**, Haci Mehmet Baskonus, Ashok Kumar, Numerical analysis of nonlinear fractional Klein-Fock-Gordon equation arising in quantum field theory via Caputo-Fabrizio fractional operator, *Mathematical Sciences*, 15(3), 269-281, 2021, **SCI-E, IF- 1.986**

16. Haci Mehmet Baskonus, **Ajay Kumar**, Ashok Kumar, Wei Gao, Deeper investigations of the (4+1)-dimensional Fokas and (2 + 1)-dimensional Breaking soliton equations, *International Journal of Modern Physics B*, 34(17),2050152, 1-16, 2020, **SCI , IF - 0.863**.
17. Juan Luis Garcia Guirao, H.M. Baskonus, **Ajay kumar**, M.S.Rawat Complex Patterns to the (3+1)-Dimensional B-type Kadomtsev –Petviashvili Boussinesq Equation, *Symmetry*, 12(17), 1-10, 2020, **SCI-E, IF- 2.645**.
18. Haci Mehmet Baskonus , Juan Luis Garcia Guirao, **Ajay kumar** , Fernado S. Vidal Causanilles , and German Rodriguez Bermudez , Complex Mixed dark bright wave patterns to the Modiffed Vakhnenko-Parkes and Modiffed alpha Equations, *Alexandria Engineering Journal*, 59(4), 2149-2160,2020, **SCI, IF-2.460**.
19. Juan Luis Garcia Guirao, H.M. Baskonus, **Ajay kumar**, Regarding new wave Patterns of the Newly Extended Nonlinear (2+1)-Dimensional Boussinesq Equation with Fourth Order, *Mathematics*, 8(3), 341, 1-9, 2020, **SCI-E, IF- 1.747**.
20. Bhim Sean Kala, Madan Singh Rawat, **Ajay Kumar**, Numerical Analysis of the Flow of a Casson Fluid in Magnetic Field over an Inclined Nonlinearly Stretching Surface with Velocity Slip in a Forchheimer Porous Media, *Asian Research Journal of Mathematics*, 16(7), 34-58, 2020.
21. Bhim Sen Kala, Madan Singh Rawat, Nimisha Rawat, **Ajay Kumar**, Numerical analysis of Non-Darcy MHD flow of a Carreau fluid over an exponentially stretching/shrinking Sheet in a porous Medium, 6(2), 295- 303, 2019.
22. Km. Renu, Ashok Kumar, **Ajay Kumar**, Jitendra Kumar, Effect Of Transverse Hydro-magnetic And Media Permeability On Mixed Convective Flow In A Channel Filled By Porous Medium. *Special Topics & Reviews in Porous Media - An International Journal*, x(x): 1–23 (2020), **SCI-E, IF-1.44**.
23. Etibar panakhov, Haci Mehmet Baskonus, **Ajay Kumar**, Hasan Bulut, Ashok Kumar, Regarding some new wave distributions to the nonlinear bogoyavlenskii equation with conformable derivative, *Control and optimization with industrial applications*, 317, 1-6 2020.

Book Chapter

1. **Ajay Kumar**, Haci Mehmet Baskonus and Amit Prakesh, Approximate numerical solution of nonlinear fractional Klein-Gordon equation with Caputo-Fabrizio fractional operator , has been accepted for publication in springer, 2022.
2. Haci Mehmet Baskonus, **Ajay Kumar**, MS Rawat, Bilgin Senel, Gulnur Yel, Mine Senel, Studying on the Complex and Mixed Dark-Bright Travelling Wave Solutions of the Generalized KP-BBM Equation, *Advanced Numerical Methods for Differential Equations*, CRC Press, 17-38, 2021.
3. Haci Mehmet Baskonus, Mine Senel, **Ajay Kumar**, Gulnur Yel, Bilgin Senel, Wei Gao, On the Wave Properties of the Conformable Generalized Bogoyavlensky–Konopelchenko Equation, *Handbook of Fractional Calculus for Engineering and Science*, Chapman and Hall/CRC, 103-121, 2022.

National and International Conference (Paper Presentation)

- International Congress On Finance, Economy And Sustainable Policies (ICOFESP) (ICOFESP), **19-21 September 2024 in Tirana, Albania** with the paper entitled The Fractional Investigation of Some Nonlinear Partial Differential Equations by Using a Caputo–Fabrizio fractional derivative
- International Congress on Finance, Economy and Sustainable Policies (ICOFESP) will be held in Bursa Technical University from **24 – 27 April 2024 in Bursa, Türkiye**.
- 13th International Conference on Mathematical Problems in Engineering, Aerospace and Sciences Tuesday, **June 27– Friday to June 30, 2023**, Prague, Czech Republic
- 7th International Conference on Computational Mathematics and Engineering Science,(CMES-2023), 20-21 May 2023, **Van- Elazig Turkey**
- 6th International Conference on Computational Mathematics and Engineering Science,(CMES-2022), 20-22 May 2022, **Van- Turkey**
- 5th International Conference on Computational Mathematics and Engineering Science,(CMES-2021), 08-10 June 2021, **Van- Turkey**
- Three day's International Conference on Differential equation and control Problems: Modeling, Analysis and Computations (ICDECP19), organized by **Indian Institute of Technology Mandi, Mandi, Himachal pradesh, India**.
- The 2nd International Conference on Mathematical Modelling, Applied analysis and Computation-2019(ICMMAAC-19). During August 8-10,2019 organized by Department of Mathematics, Faculty of science, **JECRC University, Jaipur(Raj.), India**.
- Two day's National Conference on Recent Advancements in Natural Products Chemistry and Nanotechnology, During October 09-10, 2019 organized by Department of Chemistry, H.N.B.Garhwal University, **Birla Campus Srinagar (Garhwal) Pauri Garhwal (Uttarakhand), India**.
- Two day's National Conference on promoting the Advancement of applied Science. During October 22-23,2019 organized by Department of Mathematics, H.N.B.Garhwal University, **S.R.T. Campus Badshahi Thaul, Their Garhwal(Uttarakhand), India**.
- Two day's International e- Conference on the theme Prospective of Interdisciplinary Research in Science and Technology in the Present Scenario, During May 15-16, 2020, organized by Department of Physics **Chaudhary Charan Singh University Meerut, Uttar Pradesh, India**.
- Two day's International e- Conference on Recent Trends in Advancement of Mathematical and Physical Sciences, During May 22-23, 2020, organized by Deva **Nagri College, Meerut**, Chaudhary Charan Singh University Meerut, Uttar Pradesh, India.
- The 3rd International Conference on Mathematical Modelling, Applied analysis and Computation-2020 (ICMMAAC-20). (An Online Conference) During August 7- 9,2020 organized by Department of Mathematics, Faculty of science, **JECRC University, Jaipur(Raj.), India**.
- International Conference on Mathematical Analysis & Applications (MAA-20) (An Online Conference) During November 02-04,2020 organized by Department of Mathematics, **NIT Jamshedpur**.

Workshop/ Short Term Course / Gian Course Faculty Development Programme

- National central for mathematics, Online Teacher's Enrichment Workshop on Differential Equation and its Applications hosted by **Deshbandhu College, University of Delhi, during March 15-28, 2021**
- Application of fractional Calculus in engineering & Technology organised by **Rajasthan Technical University Kota, during 1/03/2021 to 05/03/2021.**
- National centre for Mathematics Workshop on Schubert Varieties Held at **The Institute Mathematical Science Chennai, During October 23-November 04, 2017.**
- GIAN Course in Stability of Vortices and non-Isothermal Parallel Flow Conducted during December 4 to 9, 2017 at **Department of Mathematics, IIT Roorkee.**
- National Workshop on Development of Soft Skills (Matlab, Latex & Mathematica) during March 25 – 29, 2019 organized by Department of Applied Science and Humanities, **Rajkiya Engineering College, Ambedkar Nagar (U.P) India,** and sponsored by TEQIP-III.
- National Workshop on Advance Numerical Techniques and Its Applications. During May 06 - 11, 2019. Organized by Department of Mathematics. **Graphic Era Hill University, Dehradun, Uttarakhand , India.**
- North Regional Training Workshop on Vedic Mathematics organized by Himachal Pradesh Council for Science, Technology & Environment (HIMCOSTE) w.e.f.19th to 22nd June 2019 at **IIT Kamand, Mandi (H.P).**
- Short term course on Finite Element Method for engineers and Researchers held at **Indian institute of Technology Mandi , Mandi,Himachal Pradesh** during 24 - 28 june 2019.
- Short term course on MATLAB and LabVIEW: Applications in Engineering and Sciences during January 20-24, 2020 organized by **Department of Electrical Engineering, NIT Uttarakhand** and sponsored by TEQIP - III.
- Short term course on Advanced Computational techniques in Engineering Sciences & Mechanics during February, 24-28 organized by **Department of Mathematics, NIT Uttarakhand** and sponsored by TEQIP - III.
- Faculty Development Programme on Machine Learning and Data Analytics Using Python , conducted by **Electronics and ICT Academy , IIT Roorkee** from 06 May – 14 May, 2020.
- One- week Faculty Development Programme on MATLAB & Its applications in AI & ML, organized by **Department of ECE, NIT Patna and AEC, Kumbakonam, Tamilnadu under Electronics and ICT Academy, NIT Patna,** held from 19th – 26th May, 2020 in online mode.
- International Science and Technology Online Lecture Series held on 3rd June to 6th June, 2020, conducted by **Anand International College of Engineering Jaipur, India.**
- A five day national Level Online Faculty Development Programme on Skill Development for Effective Research and Teaching- Learning Process, organized by Department of **Electronics and Communication Engineering, Anil Neerukonda Institute of Technology and Science (ANITS), Visakhapatnam,** during 8th – 12th June 2020.
- The TEQIP–III sponsored one week online Short term course entitled “Optimization & Statistical Models and Tools” organized by Department of Mathematics, NIT Jalandhar, held at **Dr B R Ambedkar National Institute of Technology, Jalandhar,** from 26th - 30th August, 2020.
- AICTE Training and Learning (ATAL) Academy Online FDP on “ Coastal & Offshore Engineering” by Department of Mathematics IIT Guwahati , during 14-18 September 2020.

Areas of Interest:

In Mathematics and Computing

- Differential Equation with Matlab, Mathematical Methods, Numerical Analysis with Matlab, Calculus of Variation.
- Real analysis, Complex Analysis and differential Calculus.
- Nonlinear partial differential equation with Mathematica .
- Fractional differential equation with Mathematica .

Computer Skills:


- Programming skills in **Matlab, Mathematica, Maple**
- Text processing using Latex, **MS-Word, LibreOffice and Latex.**
- Operating systems Windows, **Linux.**

References

1. Dr. M. S. Rawat (Ph.D. Supervisor)
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Declaration

I hereby solemnly declare that all statement made above are true and correct to the best of my knowledge and belief



Signature