Dr. Sachin Kumar
(Assistant Professor)
Department of Mathematics
University of Delhi (North Campus)

Title	Dr.	First Name	Sachin	Last Name	Kumar	Photograph

Designation	**Assistant Professor**
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Educational Qualifications

Degree	Institution	Year
Ph. D.	**I.I.T. Roorkee, Roorkee**	**2011**
M. Sc.	Ch. Charan Singh University, Meerut	2006
B. Sc.	Ch. Charan Singh University, Meerut	2004

Career Profile

- **Assistant Professor, Department of Mathematics, University of Delhi, (North Campus), Delhi-110007, India.**
  (12th February 2014 (FN) to Till date).
- Assistant Professor, Department of Applied Mathematics, **Babasaheb Bhimrao Ambedkar University, (A Central University),** Lucknow-226025, India.
  (14th July 2011 to 11th February 2014).
- Lecturer, Department of Mathematics, **Mangalayatan University,** Aligarh, India.
  (10th February 2011 to 13th July 2011).

Administrative Assignments

- Member, **Departmental Research Committee (DRC)**, DU, Delhi.
- Member of **Committee of Courses for Honours and Post-graduate Studies,** DU, Delhi.
- Member, **Board of Post Graduate Studies (BPGS)**, DAM, BBAU, Lucknow.
- Member of **School Board, School for Physical Science**, BBAU, Lucknow.
- Member, **Departmental Research Committee (DRC)**, BBAU, Lucknow.
- Member, **Admission Committee, Sessions**, BBAU, Lucknow.
- Member of **Sport Committee**, BBAU, Lucknow.
- Introduced **new /modified syllabus** at PG level, BBAU, Lucknow.
- Member, **Departmental M.Phil Committee,** DU, Delhi.
- Member, **Anti-ragging Committee**, DU, Delhi.
- Member, **Placement Cell**, DU, Delhi.

Areas of Interest / Specialization

- **Nonlinear Partial Differential Equations, Mathematical Modeling (Epidemiology),** Differential Equations, Lie Symmetry Analysis, Group invariant solutions, Nonlinear evolution equations and General Relativity.

Subjects Taught

- Postgraduate level: Differential Equations, Partial Differential Equations, Operations Research, Optimization Techniques & Control Theory, Fluid Dynamics, Methods of Applied Mathematics.
- Undergraduate level: Mathematics MAM-101 (B. Tech), Mathematics MAM-102 (B. Tech)

Research Guidance

- **Guidance of Ph.D Students: 08**
  1. Vishakha Jadaun **(Awarded)**

     Ph.D Thesis Title: Invariant Solutions for Nonlinear Partial Differential Equations using Lie Symmetry Analysis.
  2. Harsha Kharbanda **(Awarded)**

     Ph.D Thesis Title: Modeling and qualitative dynamics in prey-predator interactions
  3. Shikha Jain **(Pre-submission)**

     Ph.D Thesis Title: Qualitative Study and Epidemiological Modeling of Certain Complex Realities
  4. Dharmendra Kumar **(Awarded)**

     Ph.D Thesis Title: Dynamical Structure of Solitary Wave Solutions for the Nonlinear Evaluation Equations using Lie Symmetry Analysis
  5. Ihsanullah Hamid **(In process)**
  6. Amit Kumar **(In process)**
  7. Monika Niwas **(In process)**
  8. Nikita **(In process)**

- **Guidance of M.Phil Students: 05**
  1. **Yogeeta Garg (Awarded)**

     Title: Similarity Reductions and Exact Solutions of Some Nonlinear Partial Differential Equations.
  2. **Tanvi (Awarded)**

     Title: Mathematical Modelling and Stability Analysis of HIV-TB Co-infection**.**
  3. **Nikita (Awarded)**

     Title: Stability and Bifurcation Analysis of Prey-predator Models with Harvesting Rates.
  4. **Setu Rani (Awarded)**

     Title: Group invariant solutions of certain (2+1)-dimensional non-linear evolution equations using Lie symmetry analysis.
  5. **Shubham Kumar Dhimann (In process)**

Reviewer of International Journals

1. Nonlinear Dynamics
2. International Journal of Theoretical Physics.
3. Physica Scripta
4. Journal of Computational and Applied Mathematics
5. Modern Physics Letters B
6. Journal of Taibah University for Science
7. Computational and Applied Mathematics

Publications Profile

Published Papers National / International Journals: 63
(Top-ranked SCI Journal):

2021

1. **Sachin Kumar**, Shubham Dhiman, An extended (3+1)-dimensional Jimbo-Miwa equation: Symmetry reductions, invariant solutions, and dynamics of different solitary waves, *Modern Physics Letters B* **Accepted** (2021). **(SCI/IF: 1.668)**
2. Awatif A. Hendi, Loubna Ouahid, **Sachin Kumar,** S. Owyed, M.A. Abdou, Dynamical behaviors of various optical soliton solutions for the Fokas-Lenells equation, *Modern Physics Letters B* **Accepted** (2021). **(SCI/IF: 1.668)**
3. Loubna Ouahid, M. A. Abdou, **Sachin Kumar**, Saud Owyed, S. Saha Ray, A plentiful supply of soliton solutions for DNA Peyrard–Bishop equation by means of a new auxiliary equation strategy, International Journal of *Modern Physics B* **Accepted** (2021). **(SCI/IF: 1.219)**
4. **Sachin Kumar**, Some new families of exact solitary wave solutions of the Klein–Gordon–Zakharov equations in plasma physics, *Pramana - J Phys* **Accepted** (2021). **(SCI/IF: 2.219)**
5. **Sachin Kumar**, Shubham Dhiman, Lie symmetry analysis, optimal system, exact solutions and dynamics of solitons of a (3+1)-dimensional generalized BKP-Boussinesq equation, *Pramana - J Phys* **Accepted** (2021). **(SCI/IF: 2.219)**
6. **Sachin Kumar**, Monika Niwas, Exact closed-form solutions and dynamics of solitons for a -dimensional universal hierarchy equation via Lie approach, *Pramana - J Phys* **Accepted** (2021). **(SCI/IF: 2.219)**
7. **Sachin Kumar**, Dharmendra Kumar, Generalised exponential rational function method for obtaining numerous exact soliton solutions to a (3+1)-dimensional Jimbo–Miwa equation, *Pramana - J Phys* **95,** 152 (2021). **(SCI/IF: 2.219)**
8. **Sachin Kumar**, Hassan Almusawa, Shubham Kumar Dhiman, M.S.Osman, Amit Kumar, A study of Bogoyavlenskii's (2+1)-dimensional breaking soliton equation: Lie symmetry, dynamical behaviors and closed-form solutions, *Results in Physics* **29**, 104793 (2021). **(SCI/IF: 4.476)**
9. Shikha Jain, **Sachin Kumar**, Dynamical analysis of SEIS model with nonlinear innate immunity and saturated treatment, *Eur. Phys. J. Plus* **136**, 952 (2021). **(SCI/IF: 3.911)**
10. Loubna Ouahid, M. A. Abdou, S. Owyed, **Sachin Kumar**, New optical soliton solutions via two distinctive schemes for the DNA Peyrard–Bishop equation in fractal order, *Modern Physics Letters B* **35**, no. 26, 2150444 (2021). **(SCI/IF: 1.668)**
11. **Sachin Kumar**, Amit Kumar, Abundant closed-form wave solutions and dynamical structures of soliton solutions to the (3+1)-dimensional BLMP equation in mathematical

physics, *Journal of Ocean Engineering and Science* (2021). https://doi.org/10.1016/j.joes.2021.08.001 **(SCI/IF: 3.408)**

12. **Sachin Kumar**, Vishakha Jadaun, Wen-Xiu Ma, Application of the Lie symmetry approach to an extended Jimbo–Miwa equation in (3+1) dimensions. *Eur. Phys. J. Plus* **136,** 843 (2021). **(SCI/IF: 3.911)**
13. Monika Niwas, **Sachin Kumar**, Harsha Kharbanda, Symmetry analysis, closed-form invariant solutions and dynamical wave structures of the generalized (3+1)-dimensional breaking soliton equation using optimal system of Lie subalgebra, *Journal of Ocean Engineering and Science* (2021). https://doi.org/ 10.1016/j.joes.2021.08.002 **(SCI/IF: 3.408)**
14. **Sachin Kumar**, Kottakkaran Sooppy Nisar, Amit Kumar, A (2+1)-dimensional generalized Hirota–Satsuma–Ito equations: Lie symmetry analysis, invariant solutions and dynamics of soliton solutions, *Results in Physics* **28**, 104621 (2021). **(SCI/IF: 4.476)**
15. **Sachin Kumar**, Setu Rani, Invariance analysis, optimal system, closed-form solutions and dynamical wave structures of a (2+1)-dimensional dissipative long wave system, *Physica Scripta* **96**, no. 12, 125202 (2021). **(SCI/IF: 4.476)**
16. **Sachin Kumar,** Monika Niwas, M.S. Osman, M.A. Abdou, Abundant different types of exact-soliton solutions to the (4+1)-dimensional Fokas and (2+1)-dimensional Breaking soliton equations, *Comm. Theor. Phys.* **73**, no. 10, 105007 (2021). **(SCI/IF: 1.968)**
17. **Sachin Kumar**, Hassan Almusawa, Ihsanullah Hamid, M.A. Abdou, Abundant closed-form solutions and solitonic structures to an integrable fifth-order generalized nonlinear evolution equation in plasma physics, *Results in Physics* **26**, 104453 (2021). **(SCI/IF: 4.476)**
18. **Sachin Kumar**, Setu Rani, Lie symmetry analysis, group-invariant solutions and dynamics of solitons to the (2+1)-dimensional Bogoyavlenskii–Schieff equation, *Pramana - J Phys* **95,** 51 (2021). **(SCI/IF: 2.219)**
19. **Sachin Kumar**, Amit Kumar, Harsha Kharbanda, Abundant exact closed-form solutions and solitonic structures for the double-chain deoxyribonucleic acid (DNA) model, *Braz J Phys* **51,** 1043–1068 (2021). **(SCI/IF: 1.326)**
20. **Sachin Kumar**, Dharmendra Kumar, Abdul-Majid Wazwaz, Lie symmetries, optimal system, group-invariant solutions and dynamical behaviors of solitary wave solutions for a (3+1)-dimensional KdV-type equation, *Eur. Phys. J. Plus* **136,** 531 (2021). **(SCI/IF: 3.911)**
21. **Sachin Kumar,** Ilyas Khan, Setu Rani, Behzad Ghanbari, Lie Symmetry Analysis and Dynamics of Exact Solutions of the (2+ 1)-Dimensional Nonlinear Sharma–Tasso–Olver Equation, Mathematical Problems in Engineering, Article ID 9961764, (2021). **(SCI/IF: 1.305)**
22. Shikha Jain, **Sachin Kumar**, Chaos detection in SIR model with modified Beddington-De Angelis type incidence rate and saturated treatment, International Journal of Modeling Simulation and Scientific Computing (2021). https://doi.org/10.1142/S1793962321500495 **(ESCI)**
23. **Sachin Kumar,** Hassan Almusawa, Amit Kumar, Some more closed-form invariant solutions and dynamical behavior of multiple solitons for the (2+1)-dimensional rdDym equation using the Lie symmetry approach, *Results in Physics* **24**, 104201 (2021). **(SCI/IF: 4.476)**
24. **Sachin Kumar,** Monika Niwas, Lie symmetry reductions, abound exact solutions and localized wave structures of solitons for a (2+ 1)-dimensional Bogoyavlenskii equation, *Mod. Phys. Lett. B* **35** (15), 2150252 (2021). **(SCI/IF: 1.668)**
25. **Sachin Kumar,** Harsha Kharbanda, Sensitivity and Chaotic Dynamics of an Eco-

Epidemiological System with Vaccination and Migration in Prey, *Braz J Phys* **51,** 986–1006 (2021). **(SCI/IF: 1.326)**

26. Shikha Jain, **Sachin Kumar**, Dynamic analysis of the role of innate immunity in SEIS epidemic model, *Eur. Phys. J. Plus.* **136**: 439 (2021). **(SCI/IF: 3.911)**
27. **Sachin Kumar**, L. Kaur, Monika Niwas, Some exact invariant solutions and dynamical structures of multiple solitons for the (2+1)-dimensional Bogoyavlensky-Konopelchenko equation with variable coefficients using Lie symmetry analysis, *Chinese J. Phys.* **71**, 518-538, (2021). **(SCI/IF: 3.237)**
28. **Sachin Kumar**, Dharmendra Kumar, Harsha Kharbanda, Lie symmetry analysis, abundant exact solutions and dynamics of multisolitons to the (2+1)-dimensional KP-BBM equation, *Pramana* **95** (1), 1-19, (2021). **(SCI/IF: 2.219)**
29. B. Ghanbari, **Sachin Kumar**, Monika Niwas, D. Baleanu, The Lie symmetry analysis and exact Jacobi elliptic solutions for the Kawahara–KdV type equations, *Results in Physics* **23**, 104006 (2021). **(SCI/IF: 4.476)**
30. **Sachin Kumar,** Monika Niwas, I. Hamid, Lie symmetry analysis for obtaining exact soliton solutions of generalized Camassa–Holm–Kadomtsev–Petviashvili equation, *Int. J. Mod. Phys. B* **35** (02), 2150028 (2021). **(SCI/IF: 1.219)**

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31. **Sachin Kumar**, Setu Rani, Lie symmetry reductions and dynamics of soliton solutions of (2 ++ 1)-dimensional Pavlov equation, *Pramana - J Phys* **94,** 116 (2020). **(SCI/IF: 2.219)**
32. **Sachin Kumar,** Amit Kumar, W.X. Ma, Lie symmetries, optimal system and group-invariant solutions of the (3+1)-dimensional generalized KP equation, *Chinese J. Phys.* 69, 1-23, (2021). **(SCI/IF: 3.237)**
33. **Sachin Kumar,** Dharmendra Kumar, Amit Kumar, Lie symmetry analysis for obtaining the abundant exact solutions, optimal system and dynamics of solitons for a higher-dimensional Fokas equation, *Chaos Soliton and Fractals* **142**, 110507 (2021). **(SCI/IF: 5.944)**
34. **Sachin Kumar**, Amit Kumar, A.M. Wazwaz, New exact solitary wave solutions of the strain wave equation in microstructured solids via the generalized exponential rational function method, *Eur. Phys. J. Plus* **135,** 870 (2020). **(SCI/IF: 3.911)**
35. Harsha Kharbanda, **Sachin Kumar**, Chaos Detection and Optimal Control in a Cannibalistic Prey-Predator System with Harvesting, *International Journal of Bifurcation and Chaos in Applied Sciences and Engineering* **30**, no. 12, 2050171 (2020). **(SCI/IF: 2.836)**
36. **Sachin Kumar,** Amit Kumar, Dynamical structures of solitons and some new types of exact solutions for the (2+1)-dimensional DJKM equation using Lie symmetry analysis, *Mod. Phys. Lett. B* **34** (1), 2150015 (2020). **(SCI/IF: 1.668)**
37. **Sachin Kumar,** Dharmendra Kumar, Lie symmetry analysis and dynamical structures of soliton solutions for the (2+1)-dimensional modified CBS equation, *International Journal of Modern Physics B* **34**, no. 25, 2050221 (2020). **(SCI/IF: 1.219)**
38. **Sachin Kumar,** Dharmendra Kumar, Some more solutions of Caudrey-Dodd-Gibbon Equation using optimal system of Lie symmetries, *International Journal of Applied and Computational Mathematics* ***6****, no. 04, 125 (2020)*. **(Scopus)**
39. **Sachin Kumar,** Monika Niwas, Abdul-Majid Wazwaz , Lie symmetry analysis, exact analytical solutions and dynamics of solitons for (2+1)-dimensional NNV equations, *Physica Scripta* **95**, no. 9, 095204 (2020). **(SCI/IF: 4.476)**
40. **Sachin Kumar,** Amit Kumar, Harsha Kharbanda , Lie symmetry analysis and generalized

invariant solutions of (2+1)-dimensional dispersive long wave (DLW) equations**,** *Physica Scripta* **95**, no. 6, 065207 (2020). **(SCI/IF: 4.476)**

41. **Sachin Kumar,** Dharmendra Kumar, Solitary wave solutions of pZK equation using Lie point symmetries, *Eur. Phys. J. Plus* **135,** 162 (2020). **(SCI/IF: 3.911)**
42. **Sachin Kumar**, Mukesh Kumar, Dharmendra Kumar, Computational soliton solutions to (2+1)-dimensional Pavlov equation using Lie symmetry approach, *Pramana - J Phys* **94,** 28 (2020). **(SCI/IF: 2.219)**

2019 -2010

43. **Sachin Kumar** and Amit Kumar, Lie symmetry reductions and group Invariant Solutions of (2+1)-dimensional modified Veronese web equation, Published in the Nonlinear Dynamics (ISSN:PRINT-0924-090X, ONLINE-1573-269X), Vol. 98, No. 03, 1891-1903 (2019), (SCI/IF: 4.604).
44. **Sachin Kumar** and Dharmendra Kumar, Solitary wave solutions of (3+1)-dimensional extended Zakharov–Kuznetsov equation by Lie symmetry approach**,** Published in the Computers & Mathematics with Applications (ISSN:PRINT-0898-1221), Vol. 77, No. 08, 2096-2113 (2019), **(SCI/IF: 2.811).**
45. Dharmendra Kumar and **Sachin Kumar** , Some new periodic solitary wave solutions of (3+1)-dimensional generalized shallow water wave equation by Lie symmetry approach, Computers & Mathematics with Applications (ISSN:PRINT-0898-1221), Vol. 78, No. 03, 857-877 (2019), **(SCI/IF: 2.811).**
46. **Sachin Kumar,** Dharmendra Kumar and Abdul-Majid Wazwaz , Group invariant solutions of (3+1)-dimensional generalized B-type Kadomstsev Petviashvili equation using optimal system of Lie subalgebra, Published in the Physica Scripta (ISSN:PRINT-1402-4896, ONLINE:1402-4896), Vol. 94, No. 06, 065204 (2019) **(SCI/IF: 2.151).**
47. **Sachin Kumar,** Dharmendra Kumar, Abdul-Majid Wazwaz and Amit Kumar, Group invariant solutions of (2+1)-dimensional rdDym equation using optimal system of Lie subalgebra, Published in the Physica Scripta (ISSN:PRINT-1402-4896, ONLINE:1402-4896), Vol. 94, No. 11, 115202 (2019) **(SCI/IF:: 2.151).**
48. **Sachin Kumar and** Shikha Jain, Assessing the effects of treatment in HIV-TB Co-infection model, Published in The European Physical Journal Plus (ISSN:ONLINE-2190-5444), Vol. 133, No. 02, 294 (2018) **(SCI/IF: 2.612).**
49. **Sachin Kumar** and Harsha Kharbanda, Chaotic behavior of predator-prey model with group defense and non-linear harvesting in prey, Published in the Chaos, Solitons & Fractals (ISSN:PRINT-0960-0779), Vol. 119, 19-28, (2019) **(SCI/IF: 3.064).**
50. Vishakha Jadaun and **Sachin Kumar**, Lie Symmetry Analysis and Invariant Solutions of (3+1)-dimensional Calogeros-Bargoyavlenskii-Schiff equation, Published in the Nonlinear Dynamics (ISSN:PRINT-0924-090X, ONLINE-1573-269X), Vol. 93, No. 02, 349-360 (2018) **(SCI/IF: 4.604).**
51. **Sachin Kumar and** Vishakha Jadaun, Symmetry Analysis and Some new exact solutions of Born-Infeld equation Published in the International Journal of Geometric Methods in Modern Physics (ISSN:PRINT-0219-8878, ONLINE-1793-6977), Vol. 15, No. 11, 1850183 (2018) **(SCI/IF: 1.022).**
52. Vishakha Jadaun and **Sachin Kumar**, Symmetry Analysis and Invariant Solutions of (3+1)-dimensional Kadomtsev-Petviashvili equation, Published in the International Journal of Geometric Methods in Modern Physics (ISSN:PRINT-0219-8878, ONLINE-1793-6977), Vol. 15, No. 08, 1850125 (2018), **(SCI/IF: 1.022).**
53. **Sachin Kumar and** Dharmendra Kumar, Lie symmetry analysis, complex and singular solutions of (2+1)-dimensional combined MCBS-nMCBS equation Published in the International Journal of Dynamics and Control (ISSN:PRINT-2195-268X, ONLINE-2195-

2698), Vol. 7, No. 02, 496-509 (2019) **(Scopus).**

54. Harsha Kharbanda and **Sachin Kumar**, Asymptotic stability of one prey and two predators model with two functional responses Published in the Ricerche di Matematica (A Journal of Pure and Applied Mathematics) (ISSN:PRINT-0035-5038, ONLINE-1827-3491), Vol. 68, No. 02, 435-452 (2019) **(SCIE).**
55. Y.K. Gupta**, Sachin Kumar** and Pratibha, A New Class of Relativistic Perfect fluid Cylinders with expansion proportional to Shear Scalar, Published in the International Journal of Astronomy, Astrophysics and Space Science (ISSN:PRINT-0004-640X, ONLINE-1572-946X), Vol. 332, No. 01, 49-56 (2011) **(SCI/IF: 2.064).**
56. **Sachin Kumar** and Y.K. Gupt**a,** Generalized Invariant Solutions for Spherical Symmetric Non-Conformally Flat Fluid Distributions of Embedding Class One, Published in the International Journal of Theoretical Physics (ISSN:PRINT-0020-7748, ONLINE-1572-9575), Vol. 53, No. 06, 2041-2050 (2014) **(SCI/IF: 1.086).**
57. Y.K. Gupta**, Sachin Kumar** and Pratibha, Charged Analogues of Henning Knutsen Type Solutions in General Relativity, Published in the International Journal of Theoretical Physics (ISSN:PRINT-0020-7748, ONLINE-1572-9575), Vol. 50, No. 11, 3337-3347 (2011), **(SCI/IF: 1.086).**
58. Y.K. Gupta, Pratibha and **Sachin Kumar,** Some Non-Conformal Accelerating Perfect Fluid Plates of Embedding Class 1 Using Similarity Transformations, Published in the International Journal of Modern Physics A (ISSN:PRINT-0217-751X, ONLINE-1793-656X), Vol. 25, No. 09, 1863-1879 (2010), **(SCI/IF: 1.699).**
59. **Sachin Kumar,** Y.K. Gupta and Pratibha, Invariant Solutions of Einstein Field Equation for Non-Conformally Flat Fluid Spheres of Embedding Class One, Published in the International Journal of Modern Physics A (ISSN:PRINT-0217-751X, ONLINE-1793-656X), Vol. 25, No. 20, 3993-4000 (2014), **(SCI/IF: 1.699).**
60. **Sachin Kumar**, Y.K. Gupta and J.R. Sharma, Study of Perfect Fluid Cylinders Subjected to Kinematical Properties in General Relativity, Published in the International Journal of Applied Mathematics and Mechanics (ISSN:PRINT-0973-0184), Vol. 6, No. 8. p. 46–74, 2010.
61. **Sachin Kumar,** Y.K. Gupta and J.R. Sharma, Some Fluid Spheres of Embedding Class One with Non-Vanishing Weyl-Tensor in 5-Flat Form, Published in the International Journal of Stability and Fluid Mechanics (ISSN:PRINT-0975-8399) Vol. 1, No. 2. p. 163–176, 2010.
62. **Sachin Kumar,** Y.K. Gupta and J.R. Sharma, Some New Non-Conformally Flat Fluid Spheres of Class One In General Relativity , Published in the International Journal of Stability and Fluid Mechanics (ISSN:PRINT-0975-8399) Vol. 1, No. 1. p. 71–81, 2010.
63. **Sachin Kumar,** Y.K. Gupta and J.R. Sharma, Some Static and Non-Static Cylindrical Symmetric Perfect Fluid Distributions in General Relativity, Published in the International Transactions in Applied Sciences, Vol. 1, No. 4. p. 527 – 543, 2009. 24. Sachin Kumar, New Static Spherically Symmetric Isotropic Solutions For Perfect Fluid Distributions, Published in the Mathematical Sciences International Research Journal, Vol. 4, No. 2. p. 360-367, 2015.

Research papers on arXiv in 2017: 5

1. **Sachin Kumar** and Dharmendra Kumar, New solitary wave and Multiple soliton solutions of (3 + 1)-dimensional KdV type equation by using Lie symmetry approach, arXiv:1808.08364.
2. **Sachin Kumar** and Dharmendra Kumar, Lie symmetry analysis and new solitary wave solutions of (3+1)-dimensional generalized shallow water wave equation, arXiv: 1808.07005.
3. Vishakha Jadaun, **Sachin Kumar** and Yogeeta Garg, Symmetry analysis and soliton solution of (2+1)- dimensional Zoomeron equation, arXiv:1701.05499.
4. **Sachin Kumar** and Harsha Kharbanda, Stability Analysis of Prey-Predator Model with

Infection, Migration and Vaccination in Prey, arXiv:1709.10319.

5. **Sachin Kumar** and Shikha Jain, A Mathematical Model for HIV-TB Co-infection: The Effect of Treatment, arXiv:1709.10353.

Published Papers in Proceedings of National / International Conferences: 7

1. Dharmendra Kumar and **Sachin Kumar, Ultimate Numerical Bound Estimation of Chaotic Dynamical Finance Model,** Published in the Modern Mathematical Methods and High Performance in Mathematics & Statistics 171, DOI 10.1007/978-981-10-1454-3_6; Springer Science+Business Media Singapore 2016.
2. **Sachin Kumar**, Y.K. Gupta and J.R. Sharma, **Some Static Isotropic Perfect Fluid Spheres in General Relativity,** Proceedings in the International Conference on Mathematics, Statistics and Scientific Computing, Penang, Malaysia, February 24 -26, 2010**.** (ISSN: 2070). Vol. 62. p. 592 – 596. **(This Paper is published in the proceedings of Malaysia Conference).**
3. **Sachin Kumar,** Y.K. Gupta and Pratibha, **Some Similarity Solutions For Plane Symmetric Perfect Fluid Distributions in General Relativity,** Proceedings in International Transactions in Mathematical Sciences & Computer (ISSN:PRINT-0974-5068, ONLINE-0975-3753) Vol. 2, No. 2. p. 223 – 240. (National Conference on Recent Trends in the Advancements of Astronomy and Applied Mathematics), Dehradun, November 14 – 15, 2009.
4. **Sachin Kumar**, Y.K. Gupta and J.R. Sharma, **A Study of Similarity Solutions For Non-Conformal and Non-Static Accelerating Perfect Fluid Plates in 5-D Flat Space,** Proceedings in the 54th Congress of the Indian Society of Theoretical and Applied Mechanics, (International Meet), New Delhi, January 18 – 21, 2009. p. 186 – 193.
5. **Sachin Kumar**, Y.K. Gupta and J.R. Sharma, **On Some Non-Conformally Flat Non-Static Accelerating Perfect Fluid Spheres of Embedding Class one,** Proceedings in the 13th Annual Conference of Vijnana Parishad of India and National Symposium on Recent Developments in Applicable Mathematics, JIET, Guna , December 4 – 6, 2009. Vol. 40. p. 1 – 12.
6. Y.K. Gupta, Jitendra Kumar, J.R. Sharma and **Sachin Kumar**, **Some Static Fluid Spheres of Embedding Class One with Vanishing Radial Stress,** Proceedings in the International Conference on Challenges and Apllications of Mathematics in Science and Technology, Rourkela, Orissa, January 11 – 13, 2010. (ISBN: 023-032-875-X). p.890 – 896.
7. **Sachin Kumar**, Y.K. Gupta and J.R. Sharma, **On Some Inhomogeneous Non – Conformally Fluid Plates of Embedding Class One,** Proceedings in the International Conference on Challenges and Apllications of Mathematics in Science and Technology, Rourkela, Orissa, January 11 – 13, 2010. (ISBN: 023-032-875-X). p. 923 – 931.

Conference Organization/ Presentations (in the last three years)

Paper Presentations/ Invited Talks in Conferences: 11

1. Invited Talk in the National Conference on **Complex systems in Interdisciplinary Sciences**, organized by Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, New Delhi India during March 11-12, 2019.
2. Invited Talk in the **Faculty Development Programme Application of MATLAB for Scientific & EngineeringComputation** on **Complex systems in Interdisciplinary Sciences**, organized by Department of Mathematics, Faculty of Science and Humaities, Delhi-NCR, Sonepat, India during November 18-23, 2019.
3. Presented a paper in the International Conference on **Lie-Symmetry Analysis and Similarity Reductions for the Non-Linear Partial Differential Equations**, organized by Vardhaman College, Bijnor, India during February 24-25, 2018.

4. Presented a paper in the International Conference on **Lie Symmetry Analysis and Invariant solutions of Born-Infeld equation**, organized by Inderprastha Engineering College, Ghaziabad, India during January 04-06, 2018.
5. Presented a paper in the International Conference on **Symmetry Reducations and Invariant Solutions of (2+1)-Dimensional Zoomeron Equation**, organized by KIET Group of Institutions, Ghaziabad, India during December 22-23, 2017.
6. Short Talk in the International Conference on **Invariant Solutions of Zabolotskaya-Khokhlov Equation using Similarity Transformation Method**, organized by Department of Mathematics, Shaheed Bhagat Singh College, University of Delhi, Delhi during February 08-11, 2017.
7. Invited Talk in the National Conference on **Applications of Similarity Transformations Method**, organized by Department of Applied Mathematics, BBAU, Lucknow, India during March 30-31, 2016.
8. Presented a paper in the International Conference on **New Static Spherically Symmetric Isotropic Solutions for Perfect Fluid Distributions**, organized by Department of Mathematics, University of Kerala, Thiruvanathapuram, Kerala, India during November 26-28, 2015.
9. Presented a paper in the International Conference on **Similarity Solutions of Einstein's Field equations for Type D Fluid Spheres in 5-Flat Space**, organized by Rajkumar Goel Institute of Technology Ghaziabad, Uttar Pradesh, India during December 27-29, 2015.
10. Presented a paper in the National Conference on **To Study the Perfect Fluid Distributions of Embedding Class One**, organized by Department of Mathematics, CDLU, Sirsa, India during March 17-18, 2015.
11. Invited Talk in the National Conference on **Generalized Similarity Solutions of Einstein's Field Equations for Non-conformally Flat Fluid Spheres in 5-Flat Space**, organized by Department of Applied Mathematics, BBAU, Lucknow, India during October 30-31, 2014.

Research Projects (Major Grants/Research Collaboration)

Total Number of Research Projects: 5

- Title of Project: **Lie Symmetry Analysis and Dynamics of Physical Phenomena for Nonlinear Evolution Equations,** MTR/2020/000531, **(MATRICS)** SERB-DST, India (Estimated Cost: Six Lakh)
- Title of Project: **Study of the dynamics of exact solutions for the nonlinear evolution equations using Lie symmetry analysis,** EEQ/2020/000238 **(Empowerment and Equity Opportunities for Excellence in Science)** SERB-DST, India, (Estimated Cost: Twenty Lakh)
- Title of Project: **Study for Solve the Nonlinear Partial Differential Equations by Similarity Transformations Method**, Funding Agency/Ministry: UGC-BSR Start-Up Grant, Duration of the project: 02 years, Estimates cost of Project: 6 Lakh.
- Title of Project: **Exact Solutions of Some Non-linear Partial Differential Equations**, Funding Agency/Ministry: Research & Development Grant, Delhi University, duration of the project: 01 years, Estimates cost of Project: 1.5 Lakh.
- Title of Project: **To Solve the Non-linear Partial Differential Equations by One parameter Lie Group of Transformations**, Funding Agency/Ministry: Research & Development Grant, Delhi University, duration of the project: 01 years, Estimates cost of Project: 1.5 Lakh.

Awards and Distinctions

- **UGC-BSR Research Start-Up Grant** from October, 2012 to Till Date for project work in Babasaheb Bhimrao Ambedkar University, (A Central University), Lucknow, India.
- **Ministry of Human Resource Development (MHRD) Fellowship** from January 2007 to March 2008 for Ph.D. in Indian Institute of Technology Roorkee, India.
- **National Doctoral fellowship (NDF)** of All India Council for Technical Education (AICTE) from March 2008 to January 2011 for Ph.D. in Indian Institute of Technology Roorkee, India.
- **DST-SERC Travel grant** to attend the "ICMSSC 2010: International Conference on Mathematics, Statistics and Scientific Computing", Penang, Malaysia, February 24-26, 2010.
- **M.Sc. Class Topper** in D.N. Degree College Meerut, (U.P).

Other Activities

No. of conferences organized by the Department during last five years: 4

- Organizing Secretary of **"International Conference on Mathematical Modeling and Numerical Simulation"** during July 01-03, 2013.
- Organizing committee member of **"International Conference on Radiation Environment-Assessment, measurement &Its Impact (RADENVIRON-2012)"** during April 12-14, 2012.
- Organizing Secretary of "**National Conference on Applied Statistics and its Applications 2013"** during March 16-17, 2013.
- Organizing Secretary of **"National Conference on Mathematical and Statistical Techniques and their Applications to Science and Engineering"** during November 26-27, 2011.

Signature of Faculty Member