

# CURRICULAM VITAE

**Dr. Sunil Kumar**



*Head  
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Department of Mathematics,  
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## Personal Details

- Full Name : Sunil Kumar
- Date of Birth : 10 October, 1982
- Place of Birth : Kanpur, UP
- Nationality : Indian
- Sex : Male
- Marital Status : Married with Mrs. Smrita (Two Sons-Ujjwal and Aarsh)
- Language : Hindi and English

## Academic Qualifications

**Ph.D.** (2011), Indian Institute of Technology, Banaras Hindu University, Varanasi 221005, India

Thesis: Numerical Solution of Generalized Abel Integral equation and Some Nonlinear Partial Differential Equations by Homotopy and operational Methods

Supervisor: Late Prof. Om P. Singh

**M.Phil.** (2008)(1st Div.) in Mathematics from C.S.J.M. university Kanpur, UP, India

**M.Sc.** (2006) (1st Div.) in Mathematics from V.S.S.D. college, Nawabganj Kanpur, UP, India

**B.Sc.** (2003) (1st Div.) in Mathematics & Physics from V.S.S.D. college, Nawabganj Kanpur, UP, India

## Message

- Help to Needy Peoples
- Never Harm to Other Peoples
- Maintain Honestly in any Circumstances

## Computer Skills

MATHEMATICAL SOFTWARE

Mathematica, MATLAB

TYPESETTING SOFTWARE

L<sup>A</sup>T<sub>E</sub>X, Microsoft office

## Honors and Awards

- UGC-JRF (Rajiv Gandhi National Prime Minister Fellowship for Ph.D.): From July 2008 to June 2010.
- UGC-SRF (Rajiv Gandhi National Prime Minister Fellowship for Ph.D.): From July 2010 June 2011.
- GATE-2007 with All india rank 276th.
- International Travel support under DST (SERB).
- Listed name in two percent Indian Scientist Surveyed by Standford University in 2020.

## Course Taught

- Engineering Mathematics
- Advanced engineering Mathematics
- Higher Engineering Mathematics
- Fractional Calculus
- Special Functions, Ordinary Differential Equations, Integral Equations in M.Sc Classes

## Research Involvements

1. Fractional Calculus
2. Mathematical Modeling
3. Epidemiological Modeling
4. Disease Dynamics
5. Numerical Analysis
6. Nonlinear Dynamics and Chaos Modeling
7. Mathematical Physics
8. Numerical Methods and Analytical Methods, (Homotopy Analysis Method, Homotopy Analysis Transform Method, Homotopy Perturbation Method, Homotopy Perturbation Transform Method, Adomian Decomposition method, Laplace Decomposition Method, Galerkin Method, Fractional Order Legendre Function, Operational Matrix Method)
9. Analytical and Numerical Solutions of Nonlinear Problems Arising in Applied Sciences and Engineering.

10. Wavelet Methods for fractional differential equation
11. Chaos and Synchronization

## Research Ids

- **Web of Sciences Researcher ID:** P-7519-2015
- **ORCID ID:** <https://orcid.org/0000-0003-0620-1068>

## Teaching and Research Experiences

- **Assistant Professor** in Department of Mathematics, Dehradun Institute of Technology, Dehradun Uttarakhand, India from Aug. 1, 2011 to March 28, 2012.
- **Assistant Professor** in Department of Mathematics, National Institute of Technology, Jamshedpur, 831014, Jharkhand India from April 13, 2012 to May 15, 2018.
- **Associate Professor** in Department of Mathematics, National Institute of Technology, Jamshedpur, 831014, Jharkhand India from May 13, 2018 to till date.
- **Adjunct Research Professor on Covid-19 research project** in Department of Mathematics and Sciences, College of Humanities and Sciences, Ajman University, Ajman, UAE from June 2020 to January 2021.
- **Adjunct Research Professor on Deadly disease models based research project** in Nonlinear Dynamics Research Center (NDRC), Ajman University, Ajman, UAE from February 2021 to till date.

## Administrative Experience

- Member of Library Committee, NIT Jamshedpur since July 2013 to 2014.
- Member of Unnat Bharat Abhiyan cell, NIT Jamshedpur since 2017 to till date.
- Member of Departmental Purchase Committee since July 2013 to till date.
- Member of Selection Committee of Ph.D. students since July 18, 2013 to till date.
- Member of Departmental Doctoral Scrutiny Committee of Ph.D. since July 18, 2013 to till date.
- Performed duty in IIT Entrance Examination as Observer.
- Member of Fixed Asset Committee of NIT Jamshedpur April 17, 2018 to till date.
- Anti-ragging committee member of NIT Jamshedpur.
- Screening committee member of Department of Mathematics for appointment to the post of Assistant Professor in NIT Jamshedpur.
- ACoNFAR Committee member of non-teaching recruitment in NIT Jamshedpur.

- Head of Mathematics Department in NIT Jamshedpur to May 2020 to till date.
- ACoNFAR Committee member of recruitment of Registrar in NIT Jamshedpur.

## M.Sc. Supervision

1. **Mr. Ratandeep Das:** New Fractional Derivative without Singular Kernel for Gas dynamic Equation (Awarded), 2015-2017.
2. **Mr. Ashutosh Tiwari:** The Caputo-Fabrizio Derivative for Fractional Telegraph Equation (Awarded), 2015-2017.
3. **Mr. Badal Kumar:** A Study of fractional Fokker Plank Equations with singular and non singular derivative (Awarded), 2016-2018.
4. **Miss Neha:** Wavelet method for linear fractional differential equation (Awarded), 2017-2019.
5. **Mr. Ashribad Kumar Rath:** Wavelet method for biological model (Awarded), 2019-2020.
6. **Mr. Abhishek Kumar Pal:** Non-linear dynamics and chaos (Awarded), 2019-2020.
7. **Mr. Vijay Kumar:** Fractional Calculus and its Applications (Ongoing), 2020-2021.
8. **Mr. Pallavi Sahare :** Fractional Calculus and its Applications (Ongoing), 2020-2021.
9. **Mr. Sandeep Kumar:** Fractional Calculus and its Applications (Ongoing), 2020-2021.

## Ph.D. Supervision

1. **Dr. Amit Kumar:** Numerical Solutions for Fractional Partial Differential Equation Using Analytical Methods (Awarded) (Full Supervisor) (2017).
2. **Dr. Bhuvnesh Sharma:** A Study of Non-Linear Physical Models and Non-Newtonian Flow Phenomena Using Analytical Techniques (Awarded) (Co-Supervisor) (2019).
3. **Mr. Ranbir Kumar:** Wavelet Methods for Partial Differential Equations of Arbitrary Orders (Submitted) (Full Supervisor) (2017 to 2021)
4. **Mr. Saurath Ghosh:** Spectral Methods for fractional differential equations (Submitted) (Full Supervisor) (2018 to 2021)
5. **Mr. Ajay Kumar:** Study of Chaos and synchronization of fractional differential equations (Ongoing) (Full Supervisor) (2018 to till date)
6. **Mr. R.P. Chauhan:** Application of fractional calculus in Chaos theory (Ongoing) (Full Supervisor) (2018 to till date)

7. **Mr. Pawan Kumar Shaw:** Application of fractional calculus in non-linear dynamics and Chaos theory(Ongoing) (Full Supervisor) (2018 to till date)
8. **Mr. Praveen Kumar:** Wavelet methods on biological models (Ongoing) (Full Supervisor) (2019 to till date)
9. **Mr. Anil Kumar:** Wavelet methods on disease models (Ongoing) (Full Supervisor) (2020 to till date)
10. **Miss. Tasmia Roshan:** Non-linear dynamic and chaos disease models (Ongoing) (Full Supervisor) (2020 to till date)
11. **Miss. Khusbu Agarwal:** Study on disease models (Ongoing) (Full Supervisor) (2020 to till date)

## Individual/Collaborative Ongoing Research Projects

### National Projects

1. Title of Project - **Wavelet methods for nonlinear fractional partial differential equations with Engineering applications**  
Funding Agency - National Board for Higher Mathematics, Department of Atomic Energy, Government of India  
Duration of Project - 2017-2020  
Principal Investigator - Dr. Sunil Kumar  
Total Amount of Project - 13 Lakh  
Project No. - NBHM/R.P.69/2014/Fresh
2. Title of Project - **Spectral Methods for Fractional Models of mathematical physics with new non-local and non-singular Caputo-Fabrizio derivative**  
Funding Agency - Department of Science and Technology, SERB, Government of India,  
Duration of Project - 2018-2021  
Principal Investigator - Dr. Sunil Kumar  
Total Amount of Project - Rs. 22.12/- Lakh  
Project No. - EEQ2017000385
3. Title of Project - **A Study of Incomplete Special Functions and Their Applications**  
Funding Agency - TEQIP Collaborative Research Scheme  
Co-Principal Investigator - Dr. Sunil Kumar  
Total Amount of Project - Rs. 7.35/- Lakh

### International Projects

1. Title of Project - **Mathematical modeling of the pandemic coronavirus (COVID-19) outbreak through fractional derivatives**  
Funding Agency - Department of Mathematics, School of Science, The University of Jordan, Amman 11942, Jordan  
Principal Investigator- Prof. Shaher Momani (School of Science, The University of

Jordan), Prof. Samir Bashir Hadid (UAE)  
Co-Principal Investigator - Dr. Sunil Kumar  
Total Amount of Project - 10,500/- AED

2. Title of Project - **A modelling based study on infectious deadly diseases models by using fractional derivatives**

Funding Agency - Nonlinear Dynamics Research Center (NDRC), Ajman University, Ajman, UAE, Amman 11942, Jordan  
Principal Investigator- Prof. Shaher Momani (Ajman University, Jordan), Prof. Samir Bashir Hadid (UAE)  
Co-Principal Investigator - Dr. Sunil Kumar

## Citation Structure of My Research Papers

- Citations : 5525
- h-Index : 46
- i10-Index : 110

## Reviewer in Reputed International Journals

### Elsevier Journals

Applied Mathematical Modelling, Computer and Mathematics with Applications, Applied Mathematics Letter, Powder Technology, Physica A, Measurement, Mathematical and Computer Modelling, Ain Sham Engineering Journal, Alexandria Engineering Journal, Applied Mathematics Computation, Chaos, Solitons & Fractals, Ocean Engineering, Journal of Egyptian Mathematical Society, Journal of Applied Mathematics and Mechanics, ScientiaIranica, Nonlinear Analysis: Real World Applications, Journal of Computational and Applied Mathematics, Applied Numerical Mathematics, Egyptian Journal of Basic and Applied Sciences, Journal of King Saud University - Science, Chinese Journal of Physics,

### Springer Journals

Nonlinear Dynamics, Advances in Differences Equations, Boundary Value Problems, SpringerPlus, Proceedings of the National Academy of Sciences, India Section A: Physical Sciences, Neural Computing and Applications, Optical and Quantum Electronics, Mathematical Sciences, Journal of Optimization Theory and Applications, International Journal of Applied and Computational Mathematics, The European Physical Journal Plus, Differential Equations and Dynamical Systems, Advances in Computational Mathematics, ActaBiotheoretica, Journal of Applied and Industrial Mathematics, National Academy Science Letters, Pramana, Numerical Algorithms, Neural Computing and Applications, Modeling Earth Systems and Environment, Journal of Thermal Analysis and Calorimetry, Journal of Applied Mathematics and Computing, Indian Journal of Physics, Engineering with Computers, Journal of the Brazilian Society of Mechanical Sciences and Engineering,

**Wiley, De Gruyter, World Scientific, MDPI and Taylor & Francis Journals**  
Numerical Methods for Partial Differential Equations, Mathematical Methods in the Applied Sciences, Nonlinear Engineering-Modelling and Application, Waves, Wavelets and Fractals, Zeitschrift für Naturforschung A, Open Mathematics, Open Physics, International Journal of Nonlinear Sciences and Numerical Simulation, International Journal of Computer Mathematics, Applicable Analysis, Cogent Mathematics, International Journal for Computational Methods in Engineering Science & Mechanics, Journal of Statistical Computation and Simulation, Journal of Circuits, Systems, and Computers, American Journal of Mathematical and Management Sciences, Arab Journal of Basic and Applied Sciences, Computer Methods in Biomechanics and Biomedical Engineering, Fractals, Computation,

#### **Other SCI/SCIE/Scopus Journals**

Advances in Mechanical Engineering, Advances in Applied Mathematics and Mechanics, Journal of Economic Studies, International Journal of Numerical Methods for Heat and Fluid Flow, British Journal of Mathematics & Computer Science, Application and Applied Mathematics: An International Journal, Walailak Journal of Science and Technology, Communication Numerical Analysis, Mathematical Modelling and Analysis, Fundamental-Informaticae, International journal of Mathematical Archive, Far East Journal of Applied Mathematics, QScience Connect, International journal of Physical Sciences, International journal of Nonlinear Science, International journal of Applied Mathematics Computation, Maejo International Journal of Science and Technology, Mathematical Modelling of Natural Phenomena, Engineering Computations, Caspian Journal of Mathematical Sciences, Applied Mathematics and Nonlinear Sciences, Chaos, Frontier in Physics,

## **Editorial Experience in International Journals**

### **Guest Editor for Special Issue in International Journals**

1. Journal: Walailak Journal of Science and Technology  
Topical issue: Mathematics and Mathematical models
2. Journal: American Journal of Computational and Applied Mathematics  
Topical issue: Analytical methods for fractional modelling on physical problems
3. Journal: Open Physics (SCIE-IF-1.085)  
Topical issue: Adv. Computational Modelling of Nonlinear Physical Phenomena
4. Enzyme Research (Scopus)  
Topical issue: Advances in the computational analysis of Enzyme Reactions
5. Journal: Advances in Mechanical Engineering (SCIE-IF-0.766)  
Topical issue: Computational methods for fractional-order and Fractal-order models in Mechanical Engineering
6. Journal: Open Physics (SCIE-IF-1.005)  
Topical issue: Future Challenges of Advanced Computational Modeling on Nonlinear Physical Phenomena



7. Journal: Journal of Function Spaces (SCIE-IF-1.005)  
Topical issue: q-Analysis and Its Applications
8. Journal: Journal of Mathematics (SCIE-IF-0.712)  
Topical issue: Numerical Methods for the Solution of Nonlinear Differential Equations
9. Journal: Alexandria Engineering Journal (SCI-IF-2.460)  
Topical issue: Advanced Computational Fractional Dynamics: Theory, Methods and Applications
10. Journal: Computer Modeling in Engineering and Sciences (SCI-IF-0.805)  
Topical issue: Mathematical Aspects of Computational Biology and Bioinformatics
11. Journal: Computers, Materials and Continua (SCI-IF-4.89)  
Topical issue: Recent Advances in Fractional Calculus Applied to Complex Engineering Phenomena
12. Journal: Advances in Mathematical Physics (SCIE-IF-1.130)  
Topical issue: Fractional Modelling of Transport Problems in Fluid Mechanics and Heat-mass Transfer

#### **Editor Position in SCI/SCIE/Scopus/Other International Journals**

1. Topics Editor in ‘Entropy’ (SCI-2.494)
2. Editor in ”Beni-Suef University Journal of Basic and Applied Sciences (Springer)”
3. Editor in “Application and Applied Mathematics: An International Journal” (ESCI)
4. Editor in ”Italian Journal of Pure and Applied Mathematics” (SCImago)
5. Editor in ”Progress in Fractional Differentiation and Applications” (Scopus)
6. Editor in ”Walailak Journal of Science and Technology” (Scopus)
7. Editor in ”Applied Mathematics and Information Sciences Letters”
8. Editor in ”International Journal of Software and Applied Mathematics”
9. Editor in ”Numerical and Computational Methods in Sciences and Engineering”
10. Editor in ”American Journal of Applied Mathematics and Statistics”
11. Editor in ”Engineering, Technology & Applied Science Research”
12. Editor in ”Mathematics in Natural Science”
13. Editor in ”The Turkish Online Journal of Educational Technology”
14. Editor in “Communication in Numerical Analysis”
15. Editor in “Malaya Journal of Matematik”

16. Editor in “International Journal of Modern Theoretical Physics”
17. Editor in “International Journal of Modern Applied Physics”
18. Editor in “International Journal of Modern Mathematical Sciences”
19. Editor in “Journal of Applied Computational & Mathematics”
20. Editor in “Journal of Physical Mathematics”
21. Editor in “Journal of Advanced Research in Applied Mathematics and Statistics”
22. Editor in “i-manager’s Journal on Mathematics”
23. Editor in “New Trends in Mathematical Sciences”
24. Editor in “Journal of Abstract and Computational Mathematics”
25. Editor in “Research and Reviews: Journal of Statistics and Mathematical Sciences”
26. Editor in “International Journal of Mathematics and Its Applications”
27. Editor in “International Journal of Computer Systems”
28. Editor in “International J. Applied Computational Science and Mathematics”
29. Editor in “Global Journal of Mathematics”
30. Editor in “Journal of Basic and Applied Scientific Research”
31. Editor in “Fractional Calculus and Applications Group”
32. Editor in “Journal of Global Research in Mathematical Archives”
33. Editor in “IOSR Journal of Mathematics”
34. Editor in “Engineering, Technology & Applied Science Research”
35. Editor in “Journal of Engineering, Computers and Applied Sciences”
36. Editor in “International Journal of Pure and Computational Mathematics”
37. Editor in “International Journal of Mathematics and Statistics”
38. Editor in “Journal of Applied Mechanical Engineering”
39. Editor in “US Open Mathematics and Physics Journal”
40. Editor in “Journal of Scientific and Engineering Research”
41. Editor in “Global Journal of Physics”
42. Editor in “International Journal Engineering Sciences and Mathematics”
43. Editor in “International Journal of Advanced Mathematics and Physics”
44. Editor in “International Journal of Advanced Material Science”
45. Editor in “Emerging Science Journal”

46. Editor in "Turkish Journal of Inequalities"

### **Ex-Editor Position in SCI/SCIE/Scopus/Other International Journals**

1. Editor in "Open Physics" (SCIE-IF-1.085) (2016-2018)
2. Editor in "Maejo International Journal of Science and Technology" (SCIE-IF-0.456)
3. Editor in "SpringerPlus" (Springer) (SCIE)
4. Editor in "Engineering, Technology & Applied Science Research"
5. Editor in "Studies in Nonlinear Sciences"
6. Editor in "International J. of Advance in Applied Mathematics & Mechanics" (2015 to 2018)
7. Editor in "Facta Universitatis: Series Mathematics and Informatics" (2015-2018)
8. Editor in "Operation Research and Application: An International Journal"
9. Editor in "Nonlinear Science Letter A"

### **Published Research Papers in International Journals**

1. **Sunil Kumar** (with Om P. Singh), Numerical Inversion of the Abel Integral Equation using Homotopy Perturbation Method, Zeitschrift fur Naturforschung, 65a, 677-682 (2009) (Germany) (**SCI**).
2. **Sunil Kumar** (with Om P. Singh and S. Dixit), An analytic algorithm for solving system of Fractional Differential equations, Journal of Modern Methods in Numerical Methods, 1(1), 12-26 (2010) (Egypt) .
3. **Sunil Kumar** (with Om P. Singh and S. Das), Solutions of Nonlinear Second Order Multi-point Boundary Value Problems by Homotopy Perturbation Method, Applications and Applied Mathematics: An International Journal, 5, 1592-1600 (2010) (USA)(**ESCI**).
4. **Sunil Kumar** (with Om P. Singh and Sandeep Dixit), An analytic algorithm for Generalized Abel Integral Equation, Applied Mathematical Sciences, (5), 5, 223-232 (2011) (Bulgaria).
5. **Sunil Kumar** (with Om P. Singh and Sandeep Dixit), Generalized Abel Inversion Using Homotopy Perturbation Method, Applied Mathematics, 2, 254-257 (2011) (USA).

6. **Sunil Kumar** (with S. Dixit, Rajesh K. Pandey and Om P. Singh), Solution of Generalized Abel Integral equation by using Almost Bernstein Operational Matrix, *American Journal of Computational Methods*, 1, 226-234 (2011) (USA).
7. **Sunil Kumar** (with M. Khan, M.A. Gondal), Novel Homotopy Transform Method Algorithm for Linear and nonlinear System of Partial Differential Equations, *World Applied Sciences Journal*, 12(12), 2352-2357(2011) (Dubai).
8. **Sunil Kumar** (with Om P. Singh and Sandeep Dixit), Homotopy Perturbation Method for Solving System of Generalized Abel's Integral Equations, *Applications and Applied Mathematics: An International Journal*, 5(10), 2009-2024 (2011) (**ESCI**).
9. **Sunil Kumar** (with M. Khan and M. A. Gondal), A new analytical approach to solve exponential stretching sheet problem in fluid mechanics by variational iterative Pade method, *The Journal of Mathematics and Computer Sciences*, 3(2) 135-144 (2011) (Poland)(**SCI**).
10. **Sunil Kumar** (with K. Vishal and S. Das), Application of Homotopy Analysis method for fractional Swift Hohenberg equation- Revisited, *Applied Mathematical Modelling*, 36 (8), 3630-3637(2012) (Elsevier) (USA) (USA) (**SCI**).
11. **Sunil Kumar** (with Yasir Khan, Ahmet Yildirim), A Mathematical Modelling arising in the Chemical system and its approximate Numerical solution, *Asia Pacific Journal of Chemical Engineering*, 7 (6), 835-840, (2012) (Taiwan) (Wiley) (**SCI**).
12. **Sunil Kumar** (with Y. Khan, Naeem Faraz, Ahmet Yildirim), A coupling Method of homotopy method and Laplace transform for fractional models, *U.P.B. Sci. Bull., Series A Appl. Math. Phys.*, 74 (1), 57-68 (2012) (Romania) (**SCIE**).
13. **Sunil Kumar** (with Jianping Zhao, Bo Tang and Yan Ren Hou), The extended fractional sub-equation method for nonlinear fractional differential equations, *Mathematical Problems in Engineering*, (2012) Volume 2012, Article ID 924956, 11 pages, doi:10.1155/2012/924956 (IF: 1.305) (**SCIE**).
14. **Sunil Kumar** (with M. Khan and M. A. Gondal), A new analytical solution procedure for nonlinear integral equations, *Mathematical and Computer Modelling*, 55(7), 1892-1897 (2012) (Elsevier) (USA) (IF: 1.420) (**SCI**).
15. **Sunil Kumar** (with Wenbin Zhang and Jiangbo Zhou), Symmetry Reduction, Exact Solutions, and Conservation Laws of the ZK-BBM Equation, *ISRN Mathematical Physics*, 2012(2012), Article ID 837241, 9 pages doi:10.5402/2012/ 837241 (**SCIE**).
16. **Sunil Kumar** (with Sandeep Dixit and Om P. Singh), A stable numerical inversion of Generalized Abel Integral Equation, *Applied Numerical Mathematics*, 62(5), 567-579 (2012) (Elsevier) (USA) (**SCI**).
17. **Sunil Kumar** (with H. Jafari, K. Sayevand, L. Wei), A Analytical Solution of Black-Scholes Option Pricing Equation by using Laplace transform, *Journal of fractional calculus and Applications*, 2(8), 1-9 (2012) (Egypt).

18. **Sunil Kumar** (with H. Kocak, A. Yildirim), A fractional model of gas dynamics equation by using Laplace transform, *Zeitschrift fur Naturforschung*, 67a, 389-396 (2012) (Germany) (**SCI**).
19. **Sunil Kumar** (with A. Yildirim, Y. Khan, W. Leilei), A fractional model of diffusion equation by using Laplace transform, *Science Irantica*, 19 (4), 1117-1123 (2012) (Elsevier) (Iran) (**SCIE**).
20. **Sunil Kumar** (with L. Wei, X. Zhang), Numerical study based on an implicit fully discrete local discontinuous Galerkin method for time fractional coupled Schrodinger system, *Computer and Mathematics with application*, 64 (8), 2603-2615 (2012) (USA) (Elsevier) (**SCI-IF 3.476**).
21. **Sunil Kumar** (with L. Wei and Yinnian He), Numerical study based on an implicit fully discrete local discontinuous Galerkin method for time fractional KdV- Burgers-Kuramoto equation, *JAMM Journal of Applied Mathematics and Mechanics*, 93 (1), 14-28 (2013) (Wiley) (**SCI**).
22. **Sunil Kumar** (with M. P. Tripathi and Om P. Singh), A fractional model of Harry Dym equation and its approximate solution, *Ain Shams Engineering Journal*, 4,111-115 (2013) (Elsevier) (Egypt) (**SCI-IF 3.18**).
23. **Sunil Kumar** (with S. Kazem and S. Abbasbandy), Fractional-order Legendre functions for solving fractional-order differential equations, *Applied Mathematical Modelling*, 37 (7), 5498-5510 (2013) (Elsevier) (USA) (**SCI-IF 5.129**).
24. **Sunil Kumar** (with Jiangbo Zhou, Lixin Tian, Wenbin Zhang), Peakon–antipeakon interaction in the Dullin-Gottwald-Holm equation, *Physics Letters A*, 377, 1233-1238 (2013) (Elsevier) (**SCI-IF 2.654**).
25. **Sunil Kumar** (with Jagdev Singh and Devendra Kumar), New treatment of fractional Fornberg-Whitham equation via Laplace transform, *Ain Sham Engineering Journal*, 4, 557-562 (2013) (Elsevier) (Egypt) (**SCI-IF 3.18**).
26. **Sunil Kumar** (with Jagdev Singh, Devendra Kumar), A new reliable algorithm for solving discontinuity problem in nanotechnology, *Science Irantica*, 20(3) pp. 1059-1062 (2013) (Elsevier) (**SCIE**).
27. **Sunil Kumar** (with Wenbin Zhang, Jiangbo Zhou), On the support of solutions to a two-dimensional nonlinear wave equation, *Journal of Mathematics*, Volume 2013 (2013), Article ID 578094, 4 pages.
28. **Sunil Kumar**, A Numerical Study for Solution of Time Fractional Nonlinear Shallow-Water Equation in Oceans, *Zeitschrift fur Naturforschung A*, 68 a, 1-7, (2013) (Germany) (**SCI**).

29. **Sunil Kumar** (with M. M. Khader and S. Abbasbandy), New homotopy analysis transform method for solving the discontinued problems arising in nanotechnology, Chinese Physics B 22(11), 1-5, (2013). (**SCI**).
30. **Sunil Kumar**, Numerical Computation of Time-Fractional Fokker-Planck Equation Arising in Solid State Physics and Circuit theory, Zeitschrift fur Naturforschung, 68a, 1-8 (2013) (Germany) (**SCI**).
31. **Sunil Kumar**, A new fractional modelling arising in Engineering Sciences and its analytical approximate solution, Alexandria Engineering Journal, 52(4), 813-819 (2013) (Elsevier) (**SCI**).
32. **Sunil Kumar** (with M. M. Khader), An accurate numerical method for solving the linear fractional Klein-Gordon equation, Mathematical Method in Applied Sciences, 37 (18), 2972-2979 (2014) (**SCI-IF 2.321**).
33. **Sunil Kumar** (with Rajnesh Kumar), A new fractional modelling on Susceptible-Infected-Recovered equations with constant vaccination rate, Nonlinear Engineering- Modelling and Application, 3(1), 11-19 (2014) (**SCIImago**).
34. **Sunil Kumar**, An analytical algorithm for nonlinear fractional Fornberg-Whitham equation arising in wave breaking based on a new iterative method, Alexandria Engineering Journal, Elsevier, 53(1), 225-231 (2014) (**SCI-IF 3.732**).
35. **Sunil Kumar** (with Jagdev Singh and Devendra Kumar), A fractional model of nonlinear shock wave equation arising gases, Nonlinear Engineering- Modelling and Application, 3(1), 43-50 (2014) (**SCIImago**).
36. **Sunil Kumar** (with Jagdev Singh and Devendra Kumar), Analytic and approximate solutions of space and time fractional telegraph equation via Laplace transform, Walailak Journal of Sciences and Technology, 11(8), 711-728, (2014) (IF: 0.1086) (**Scopus**).
37. **Sunil Kumar** (with Naeem Faraz, Khosro Sayevand), A fractional model of Bloch equation in Nuclear magnetic Resonance and its approximate solution, Walailak Journal of Sciences and Technology, 11(4), 273-285, (2014) (Thailand) (IF: 0.1086) (**Scopus**).
38. **Sunil Kumar** (with Devendra Kumar, Jagdev Singh and Saurabh Singh), New Homotopy Analysis Transform Algorithm to Solve Volterra Integral Equation, Ain Sham Engineering Journal, (2014) 5(1), 243-246 (2014) (Elsevier) (**SCI-IF 3.18**).
39. **Sunil Kumar** (with R. Pourgholi and A. Esfahani), A numerical algorithm for solving an inverse semilinear wave problem, International Journal of Computing Science and Mathematics, 5 (1), (2014).
40. **Sunil Kumar**, A New Efficient Algorithm to Solve Non-Linear Fractional Ito Coupled System and Its Approximate Solution, Walailak Journal of Sciences and Technology, 11(12), 1057-1067 (2014) (Thailand) (**Scopus**).

41. **Sunil Kumar**, A new mathematical modelling for nonlinear wave in hyperelastic rod and its approximate solution, *Walailak Journal of Sciences and Technology*, 11(11), 965-973, (2014) (Thailand) (**Scopus-IF-0.138**).
42. **Sunil Kumar** (with Devendra Kumar and Jagdev Singh), Numerical Computation of Non-linear Fractional Zakharov- Kuznetsov Equation arising in Ion-Acoustic Wave, *Journal of the Egyptian Mathematical Society*, 22(3)373-378, 2014 (Elsevier).
43. **Sunil Kumar** (with M. M. Rashidi and L. Shamekhi), Parametric Analysis of Entropy Generation in Off-Centered Stagnation Flow towards a Rotating Disc with the Keller-Box Method solution, *Nonlinear Engineering- Modelling and Application*, 3(1), 27-41, (2014) (**SCImago-IF-0.444**).
44. **Sunil Kumar** (with Deepak Kumar, S. Abbasbandy, M. M. Rashidi), Analytical Solution of fractional Navier-Stokes equation by using Modified Laplace Decomposition Method, *Ain Sham Engineering Journal*, , 5(2), 569-574 (2014) (Elsevier) (IF-0.44) (**SCI-IF-3.18**).
45. **Sunil Kumar**, A new analytical modelling for telegraph equation via Laplace transform, *Applied Mathematical Modelling*, 38(13), 3154-3163 (2014) (Elsevier) (**SCI-IF-5.129**).
46. **Sunil Kumar**, A new fractional analytical approach for treatment of system of physical models by using Laplace Transform, *Science Iranica*, 21(5), 1693-1699, (2014) (**SCIE**).
47. **Sunil Kumar** (with Devendra Kumar and U. S. Mahabaleswar), A new adjustment of Laplace transform for fractional Bloch equation in NMR flow, *Application and Applied Mathematics: An International Journal (AAM)*, 9(1) 201-216 (2014) (**ESCI**).
48. **Sunil Kumar** (with Nagma Irfan and S. Kapoor), Bernstein Operational Matrix Approach for Integro-Differential Equation Arising in Control theory and Astronomy, *Nonlinear Engineering- Modelling and Application*, 3(2), 117-123 (2014) (**SCImago-IF-0.313**).
49. **Sunil Kumar** (with M.M. Rashidi, A. Hosseini, I. Pop and N. Freidoonimehr), Comparative Numerical Study of Single and Two Phase Models of Nano fluid Heat Transfer in a Wavy Channel, *Applied Mathematics and Mechanics (English Edition)* (2014), 35, (7), 831-848 (**SCI-IF-2.866**).
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## Published Book Chapters

1. **Sunil Kumar** (with Amit Kumar, J. J. Nieto, B. Sharma), *Atangana–Baleanu Derivative with Fractional Order Applied to the Gas Dynamics Equations*, Springer Nature Switzerland AG (2019).
2. **Sunil Kumar** (with Amit Kumar, Ranbir Kumar), *A hybrid formulation of fractional model of Todda lattice equations*, CPC Press.
3. **Sunil Kumar** (with Bhuvnesh Sharma, Carlo Cattani), *Laminar Convection of Power-Law Fluids in Differentially Heated Closed Region: CFD Analysis*, Springer Nature Switzerland (2021).

## Attend National Conferences/Workshop

1. National Conference on Mathematical Modelling and Computer Simulation, Institute of Technology, Banaras Hindu University, Varanasi, 2011.
2. Workshop on Advanced Computational Mathematics, National Institute of Technology, Jamshedpur, Jharkhand, From: 23 June 2014 to 27 June 2014.
3. National Conference on “Mathematical Analysis and Computation” MNIT Jaipur, From 20-21 Feb, 2015.

## Invited Talk/Lectures

- I have given a lecturer on “Numerical and Analytical Methods for Scientists and Engineers” on Feb. 19, 2015, JECRC University, Jaipur.

- **Keynote Speaker**, Fractional Calculus and Its Applications to Biology, The First Online Conference on Modern Fractional Calculus and Its Applications, Biruni University, Istanbul, Turkey, December 4-6, 2020.

## International Conferences Papers

1. R. Bansal, S. Kapoor, S. Rawat, B. K Singh and **Sunil Kumar**, Role of diffusivity ratio in the linear stability analysis of double diffusive free convective flow in anisotropic porous media, Science and Engineering and National Conference (SETNC), UniKL Malaysian France Institute , Kuala Lumpur (Malaysia), 3-4 July (2013).
2. Zheng Hong Guo, Omer Acan, **Sunil Kumar**, Sumudu Transform Series Expansion Method for Solving the Local fractional Laplace equation in Fractal Thermal Problems.

## Committee Member in National/International Conferences

1. **Scientific Committee Member** in International Conference “Applied Mathematics in Heat and Fluid Flow” Shangjiang, Shanghai, China, during April 27-29, 2016  
<http://www.amhfaf.com/p%28scientific%20committee%29.htm>
2. **Scientific Committee Member**, National Organizing Committee member in 24th International on Finite or Infinite Dimensional Complex Analysis & Applications, 22-26 August 2016, Anand International College of Engineering, Jaipur, India  
<http://nandice.ac.in/24icfidcaa-2016/organizeing-commeettee/>
3. **Associate Editor** in International Conference in Advances in Applied Mathematics, 19-20 November 2016, Ponjestly College of Engineering Nagercoil Kanyakumari, India  
<http://www.djicaam.org/editorialboard.html>
4. **Scientific Advisory Committee Member** in National workshop on Differential Equations and Dynamical Systems, 27-28 February 2017, Shivaji University, Kolhapur  
<http://www.unishivaji.ac.in:8080/pages/National-Seminar-on-Differential-Equations-and-Dynamical-Systems-2017>
5. **Scientific Advisory Committee member** in International Conference on Mathematical Modeling, Applied Modelling, Applied Analysis and Computation (ICMMAAC-18)  
<http://sws.jecrcuniversity.edu.in:81/ICMMAAC-18/NATIONAL-ADVISORY>
6. **Scientific Advisory Committee Member** in 2nd International Conference on Mathematical Modelling, Applied Analysis and Computation is a specialized conference on mathematical modelling and its applications -2019 (ICMMAAC-19), JECRC University, Jaipur, India .  
<https://www.cmescongress.org/scientific-committee/>

7. **International Scientific Committee Member** in 5th International Conference on Computational Mathematics and Engineering Science will be held in Van Yüzüncü Yıl University from June 19 to 21, 2020 in Van.  
<https://www.cmescongress.org/scientific-committee/>
8. **Scientific Advisory Committee Member** in International Conference on Applied Mathematics in Engineering (ICAME'20) will be held from June 24 to June 26, 2020 in Burhaniye/Balikesir, Turkey.  
<http://icame.balikesir.edu.tr/committees.html>
9. **Organizing Committee Member** in 9th International Conference on Mathematics and Information Sciences will be held from 6-8 Feb. 2020, Aswan, Egypt.  
<http://confs.naturalspublishing.com/icmis2020/page.asp?pgid=470>

## My Some National Collaboraters

1. Prof. Om P. Singh (Supervisor), Department of Applied Mathematics, Indian Institute of Technology, Banaras Hindu University, Varanasi, India.
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## My Some International Collaboraters

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11. Prof. Zaid M. Odibat, Department of Applied Science, Prince Abdullah Bin Ghazi Faculty of Science & IT, Al-Balqa' Applied University, Al-Salt – Jordan.
12. Prof. Ali H. Bhrawy, Beni-Suef University, King Abdulaziz University, Jeddah, 21589, Saudi Arabia.

## References

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## **Declaration**

I, hereby declare that all the statements made in this application are true and complete to the best of my knowledge and brief.

Place: Jamshedpur

**(Sunil Kumar)**