Curriculum Vitae

Dr. Arvind Patel

Department of Mathematics, University of Delhi

Title	**Dr.**	First Name	**Arvind**	Last Name	**Patel**	Photograph
Designation		Asst. Professor				
Department		Mathematics				
Address (Office)		Room No.14, Department of Mathematics, University of Delhi, Delhi-110 007				
(Residence)		E-4, II Floor, Teacher Residential Block (TTH), Dhaka land, Dr. Mukherjee Nagar, Delhi-110009				
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Educational Qualification

Degree	Institution	Year	Subject
Ph.D.	DDU Gorakhpur University, Gorakhpur	2009	A Study of Shock Waves in Dusty Gases
NET, JRF	CSIR, New Delhi	2002	Mathematics
M. Sc.	DDU Gorakhpur University, Gorakhpur	2000	Mathematics
B. Sc.	DDU Gorakhpur University, Gorakhpur	1998	Mathematics, Physics, Chemistry,

Career Profile

Organization / Institution	Designation	Duration	Role
University of Delhi	Asst. Professor	October 2009 - till date	PG Teaching and Research
UIET, CSJM University, Kanpur	Lecturer	March2007 - October 2009	UG & PG Teaching and Research
DDU Gorakhpur University, Gorakhpur	Guest Lecturer	July 2003 -March 2007	UG & PG Teaching and Research

Administrative Assignments

1. Convener of Workload, Tutorial, Time Table and Infrastructure committee,
2. Setup Computer Lab for the Department,
3. Member of Project appointment committee and project purchase committee,
4. Member of Purchase committee,
5. Member of Entrance Exam committee,
6. Member of Adhoc Panel

Areas of Interest / Specialization

Fluid dynamics, Shock waves, Solitons, Computational fluid dynamics, Partial Differential equations, Numerical Analysis.

Subjects / Courses Taught

2009—Present : Fluid Dynamics, Complex Analysis, Differential Equations, Hyperbolic system of Conservation Laws and Boundary Layer Theory, Method of Applied Mathematics, Functional Analysis, Advanced Fluid Mechanics. Advanced Compressible Flows, Computational Methods for ODEs.

2007--2009: Fluid Mechanics, Partial differential equation, Calculus, Linear Algebra, Real Analysis

2003--2007: Fluid Mechanics, Partial differential equation, Mechanics, Calculus, Analytical Geometry,

Research Guidance

1. **M. Phil. guidance: 15** Awarded**, 1** under progress,
2. **Ph. D. guidance: 3** Awarded, **3** under progress.
   1. Ruchi Bajargaan, Shock waves in rotating or non-rotating gases under radiation field, 2020.
   2. Manoj Singh, Structure of shock waves in gases under viscosity and heat conduction, 2020.
   3. Vinod Chauhan, Efficient numerical algorithms for higher even order non-linear two point boundary value problems on variable mesh, 2016.
   4. Vineesh kumar, under pogress
   5. Manoj Kumar, under pogress
   6. Divya, under pogress

Publications Profile

1. Divya, **Arvind Patel, 2020,** Shock wave structure in non-ideal dilute gas under variable Prandtl number, *Shock Waves*, 30 (6), 585-602, Springer**, IF 1.248,** https://doi.org/10.1007/s00193-020-00972-x
2. Sobha Bagai, Manoj Kumar, **Arvind Patel, 2020,** Mixed convection in four-sided lid-

driven sinusoidally heated porous cavity using stream function-vorticity formulation, *SN Applied Sciences,* 2, 2066, Springer. https://doi.org/10.1007/s42452-020-03815-7

3. Vineesh Kumar, **Arvind Patel**, **2020**, Construction of the soliton solutions and modulation instability analysis for the Mel'nikov system, *Chaos, Solitons and Fractals*, 140, 110159(1-15), Elsevier. **IF 3.764,** https://doi.org/10.1016/j.chaos.2020.110159
4. Sobha Bagai, Manoj Kumar**, Arvind Patel, 2020,** The four sided lid driven square cavity using stream function-vorticity formulation, *Journal of Applied Mathematics and Computational Mechanics*, 19(2), 17-30. https://doi.org/10.17512/jamcm.2020.2.02
5. Manoj Singh, **Arvind Patel, 2019,** Shock wave structure in a non-ideal gas under temperature and density-dependent viscosity and heat conduction, *Theoretical and Computational Fluid Dynamics,* 33, 537–559, Springer. **IF 1.675,** https://doi.org/10.1007/s00162-019-00505-y
6. **Arvind Patel** and Vineesh Kumar, **2019**, Soliton solutions and modulation instability analysis of the coupled Zakharov-Kuznetsov equation, *Europian Physical Journal Plus*, 134 (4), 170(1-16), Springer. **IF 3.228,** https://doi.org/ 10.1140/epjp/i2019-12521-6
7. **Arvind Patel** and Manoj Singh, **2019,** Exact solution of shock-wave structure in a non-ideal gas under constant and variable coefficient of viscosity and heat-conductivity, *Shock Wave,* 29, 427-729, Springer.**IF 1.248,** https://doi.org/10.1007/s00193-018-0855-8
8. Manoj Singh, **Arvind Patel**, Ruchi Bajargaan, **2019**, Travelling wave solution of a Riemann problem and shock structure in an unsteady flow of a perfect gas under viscosity *International Journal of Heat and Technology*, 37 (3), 909-917. https://doi.org/1018280/ijht.370329
9. **Arvind Patel** and Vineesh Kumar, **2018**, Dark and kink soliton solution of generalized ZKBBM equation by iterative scheme, *Chinese Journal of Physics*, 56, 819-829, Elsevier. **IF 2.638,** https://doi.org/10.1016/j.cjph.2018.03.012
10. Ruchi Bagargaan and **Arvind Patel**, **2018,** Self similar flow behind an exponential shock wave in a self-gravitating, rotating_axisymmetric dusty gas with heat conduction and radiation heat flux, *Indian Journal of Physics*, 92(4), 1119-1135, Springer. **IF** https://doi.org/1.40710.1007/s12648-018-1199-z
11. **Arvind Patel** and Vineesh Kumar, **2018**, Study of generalized ZK-BBM equation to construct solitary patterns solutions via variational iteration method, *Far East Journal of Mathematical Sciences ,* 103(11), 1721-1739. http://dx.doi.org/10.17654/MS103111721
12. Manoj Singh and **Arvind Patel, 2018,** Travelling wave solution of shock structure in unsteady flow of viscous non-ideal gas flow, Ganita, 68(1), 165-179.
13. Ruchi Bajargaan, **Arvind Patel**, Manoj Singh, **2017**, Homotopy analysis method for one dimensional unsteady adiabatic gas flow, *International Journal of Pure and Applied Mathematics (IJPAM)***,** 115(4), 673-692. https://doi.org/10.12732/ijpam.v115i4.3
14. **Arvind Patel** and Ruchi Bajargaan, **2017**, Similarity Solution for a cylindrical shock wave in a self-gravitating, rotating axisymmetric dusty gas with heat conduction and radiation heat flux, *Journal of applied Fluid Mechanics*, 10(1), 329-34. **IF 0.914,** https://doi.org/10.18869/acadpub.jafm.73.238.25679

15. Manoj Singh, **Arvind Patel**, Ruchi Bajargaan, **2016**, Study of a one -dimensional unsteady gas dynamic problem by Adomian decomposition method, *International Journal of Applied Mathematics,* 29(6), 775-794. http://dx.doi.org/10.12732/ijam.v29i6.8
16. **Arvind Patel**, **2014**, A self-similar flow headed by a cylindrical shock wave in a rotating dusty gas, *J. Nat. Acad. Math*. 28, 1-14.
17. **Arvind Patel**, **2013**, A Self-similar Flow behind a Shock Wave in a Dusty Gas under a Gravitational Field, *J. Nat. Acad. Math*. 27, 83-98.
18. Vishnu Saran and **Arvind Patel**, **2008**, Self-similar solution of Magnetogasdynamic spherical shock propagation in a rotating medium with radiation heat flux, *South East Asian Journal of Mathematics and Mathematical sciences*, 5(2), 33-48.
19. J.P. Vishwakarma, Vinay Chaube, **Arvind Patel**, **2007**, Self-similar solution of shock propagation in non-ideal gas, *International Journal of Applied Mechanics and Engineering*, 12(3) 813-829.

Conference Organization/ Presentations

1. **Arvind Patel**, **2018**, Structure of shock wave by continuum versus kinetic model National conference on Recent trends in Mathematical Sciences, Organized by Department of Mathematics and Statistics, DDU Gorakhpur University Gorakhpur, Nov.24-25, 2018, India
2. Arvind Patel, **Organizing Secretary**, **2018,** The 33rd Annual Conference of Ramanujan Mathematical Society, held at Department of Mathematics, University of Delhi, during June, 1-3**.**
3. Arvind Patel and Manoj Singh, **2017,** Shock wave structure in a viscous non ideal gas under heat conduction and radiation heat flux, International Conference on Recent Advanced in Pure and Applied Mathematics and 28th Annual Conference of Rajasthan Ganita Parishad, 13-14 Feb., organized by Dept. of Mathematics and Statistics, MLSU, Udaipur (Rajasthan), India.
4. Arvind Patel and Manoj Singh, **2017,** Exact solution of shock wave structure in a non ideal gas under constant and variable coefficient of viscosity and heat-conductivity, International conference on Mathematics and Applications, Ramjas College, University of Delhi, Delhi, April 26-28.
5. Arvind Patel and Manoj Singh, **2016,** Solution of system of gas dynamic equation for the unsteady adiabatic flow by Adomian decomposition method, National Workshop on Analysis, Differential Equation and Application, Department of Mathematics and Statistics, MLS University Udaipur, Feb.25-27, 2016.
6. Arvind Patel and Amit Sharma, **2016**, An application of homotopy perturbation method for modified boundary boundary layer equations over a flat plate, in National Conference on Recent Trends in Mathematical Sciences (NCRTMS) organized by Department of

Applied Science of MMM University of Technology, Gorakhpur during April 12-13, 2016.

7. Arvind Patel and Vineesh Kumar, **2016**, Solitary patterns solutions of gZK-BBM non-linear evolution equation via variational iteration method, in National Conference on Recent Trends in Mathematical Sciences (NCRTMS) organized by Department of Mathematics and Statistics, DDU Gorakhpur University, at Gorakhpur, July 23-24, 2016.
8. Arvind Patel & Ruchi Bagraggan, **2015**, 'Homotopy analysis method for the solution of the system of unsteady gas flow' 60th congress of ISTAM 2015 an international conference organised by MNIT Jaipur, India 16-19 Dec. 2015.
9. Arvind Patel & Ruchi Bagraggan, **2014**, 'Similarity Solution for a cylindrical Shock Wave in a Self-gravitating, Rotating and axisymmetric dusty gas with heat conduction and radiation heat flux by, 11th National Conference on Role of Mathematical Sciences in Science and Technology by ISMAMS and Department of Mathematics and Statistics, DDU Gorakhpur University, at Gorakhpur, Feb. 21-22, India.
10. Arvind Patel, **2012**, A Self-similar flow of a mixture of non-ideal gas and small solid particles behind an exponential shock at Conference on Recent Trends in Mathematics and Statistics, DDU Gorakhpur University, Gorakhpur, March 12-13, India.

Projects (Major Grants / Collaborations)

1. Research & Development Grant of University of Delhi, Delhi 2015-16, RC/2015/9677 dated Oct. 15, 2015 Amount. Rs. 1.3 lakh.
2. Research & Development Grant of University of Delhi, Delhi 2014-15, RC/2014/6820 dated Oct. 15, 2014, Amount. Rs. 1.1 lakh.
3. Research & Development Grant of University of Delhi, Delhi, DRCH/R&D/2013-14/4155 dated Oct.21, 2013, Amount. Rs. 1.5 lakh.
4. Research & Development Grant of University of Delhi, Delhi, Dean(R)/2012/ R&D/917 dated July 03, 2012, Amount. Rs. 0.85 lakh.
5. Research & Development Grant of University of Delhi, Delhi, DRCH/R&D/2011/423 dated June16, 2011 Amount. Rs. 1.0 lakh.

Awards and Distinctions

1. Senior Research Fellowship (CSIR) in 2005
2. Junior Research Fellowship (CSIR) in 2003
3. Achieved second position in PG (M.Sc., Mathematics) in DDU Gorakhpur University, Gorakhpur
4. National scholarship in 1993-1995, 1995-1998

Association With Professional Bodies

Life Member of Indian Society of Mathematics and Mathematical Science

Life Member of ISTAM
Life Member of Bharata Ganita Parishad

Other Activities

Conference, Workshop, School, Invited Talk, Resource person

1. Participated in the International **conference** on 'The Legacy of Ramanujan' held at University of Delhi during 17- 22 Dec, **2012**.
2. **Resource person**, ' Integral Equation: Theory and Applications I & II' in Refresher Course on Mathematical Sciences by CPDHE, University of Delhi on Jan. 14-15, **2013**.
3. **Resource person**, 'Dimensional Analysis : Theory and Applications' in Refresher Course on Mathematical Sciences by CPDHE, University of Delhi on Jan. 16, **2013**.
4. Participated in a **Refresher Course** on Mathematical Sciences organized by the CPDHE, University of Delhi, at Delhi, Dec.14. **2013** to Jan. 4, 2014.
5. Given an **invited talk** on 'The Dimensional Analysis and its Application' in a national conference on 'Mathematical Sciences for the advancement of Science and Technology' held during 23-24 Feb**.2013** at Gorakhpur.
6. Given an **invited talk**, 'Adomian Decomposition Method: a new approach to Partial Differential Equations', 11th National Conference on Role of Mathematical Sciences in Science and Technology by ISMAMS and Department of Mathematics and Statistics, DDU Gorakhpur University, at Gorakhpur , Feb. 21-22, **2014**
7. Participated in '**Instructional School for Lecturer (ISL),** on Numerical Analysis, 2014' held at Department of Mathematics, Punjab University, Chandigarh, from June 9, 2014 to June 28, **2014**.
8. **Invited talk,** 'Algebra' DST Inspire Science Camp-2014, at K.S. Jain Institute of Engineering and Technology, Modinagar, Ghazaibad UP, Sept. 25, 2014
9. Participated in 'ATM **Workshop** on conservation laws with applications to continuum mechanics (2014)', held at Department of Mathematics, Punjab University, Chandigarh, from Dec. 2, to Dec. 7, **2014**.
10. Worked as a **jury member** in DST sponsored INSPIRE award in 2014
11. Participated in a **Orientation Course** organized by the CPDHE, University of Delhi, Delhi, June 8 to July 4, **2015**
12. Participated in a **Refresher Course** in Mathematical sciences organized by HRDC, CPDHE, University of Delhi, Delhi, Nov. 26 to Dec. 16**, 2015**
13. Delivered an **Invited talk**, ' Various Aspects of Conservation Laws', at Department of Physical Sciences, SGT University Gurgoan, March 19, **2016**
14. Delivered an **Invited talk**, 'Homotopy Perturbation Method: Theory and Application' at National Conference on Recent Trends in Mathematical Sciences (NCRTMS) organized by Department of Applied Science of MMM University of Technology, Gorakhpur during April 12-13, **2016.**
15. Delivered an **Invited talk**, 'Non-linear Wave Equations and Solitons' at National

Conference on Recent Trends in Mathematical Sciences (NCRTMS) organized by Department of Mathematics and Statistics, DDU Gorakhpur University, at Gorakhpur, July 23-24, **2016**.

Dr. Arvind Patel **December 1, 2020**