



Aditi Mahavidyalaya

Faculty Details



Titl e	Dr.	First Name	Suruchi	Last Name	Singh	Photograph
Designation	Professor					
Department	Mathematics					
Address	Aditi Mahavidyalaya, Bawana. Delhi					
Phone number						
Email	suruchi@aditi.du.ac.in					
Web-Page						
Educational Qualifications						
Degree	Institution			Year		
B.Sc.(Hons.) Mathematics	Lakshmibai College, University of Delhi			1995		
M.Sc. Mathematics	Ramjas College, University of Delhi			1997		
M.Phil.	University of Delhi			1999		
Ph.D.	University of Delhi			2012		
Career Profile						
<p>(July 18, 2018 –till date) Professor, Department of Mathematics, Aditi Mahavidyalaya, University of Delhi.</p> <p>(August 3, 2011 –July 17, 2018) Associate Professor, Department of Mathematics, Aditi Mahavidyalaya, University of Delhi.</p> <p>(August 3, 2008 – August 2, 2011) Lecturer in selection grade (Reader grade), Department of Mathematics, Aditi Mahavidyalaya, University of Delhi.</p> <p>(August 3, 2003 - August 2, 2008) Lecturer in Senior Scale (Assistant Professor), Department of Mathematics, Aditi Mahavidyalaya, University of Delhi.</p> <p>(December 14, 1999 - August 2, 2003) Lecturer (Permanent), Department of Mathematics, Aditi Mahavidyalaya, University of Delhi.</p> <p>(August 1, 1998 - December 13, 1999) Lecturer (Temporary), Department of Mathematics, Sri Ram College of Commerce, University of Delhi, Delhi, INDIA.</p>						
Administrative Assignments						

- Bursar (2003-04)
- Teacher Representative in Governing Body of the College (2001-02)
- Teacher In-charge of Mathematics Department (2002-till now)
- Convenor Admission Committee (2000-01)
- Convenor Purchase Committee (2004-05)
- Convenor Attendance Committee (2005-06)
- Co-Convenor Prize Distribution Committee (2012-13)
- Convenor Decoration Committee (2013-14)
- Convenor Fee Concession Committee (2014-15)
- Convenor Provident Fund Committee
- Appointed as NCC in-charge for one year
- Co-Convenor Environmental Committee (2015-16)
- Convenor Garden Committee (2018-19)
- Coordinator of AECC and SEC Evaluation (2020-21)
- Coordinator of short-term courses as a member of IQAC committee (2021-22)
- Convenor of IT committee (2021-22)
- Coordinator Practical exams (2021-22)
- Member of various committees such as Workload committee, Timetable committee, Library committee, BA (prog) committee, Examination committee etc.

Areas of Interest / Specialization

Numerical Analysis and Scientific Computing, Computational Methods for Differential Equations.

Subjects Taught

Undergraduate Level: Mathematica, Latex, Calculus, Differential Equations, Probability and Mathematical Statistics, Real Analysis, Coordinate Geometry, Algebra.

Post graduate Level: Numerics of partial differential equations.

Research Guidance

Supervising 2 Ph.D. students at Department of Mathematics, University of Delhi, Delhi.

Publications Profile

Books written:

- Co-authored a book “Solid State Geometry” published by Macmillan India Ltd. in January 2006.
- Co-authored a book “Concepts of Mathematics for senior secondary class Level 1”, published by Unistar Books Pvt. Ltd. in 2014.

- c. Co-authored a book “Concepts of Mathematics for senior secondary class Level 2”, published by Unistar Books Pvt. Ltd. in 2014.

List of Publications in International Journals:

- [1] R.K. MOHANTY and **SURUCHI SINGH**, “High Accuracy Numerov Type Discretization for the Solution of One Space Dimensional Non-Linear Wave Equation with Variable Coefficients”, *Journal of Advanced Research in Scientific Computing*, Vol. 03, pp. 53-66 (2011).
- [2] R.K. MOHANTY and **SURUCHI SINGH**, “A New High Order Approximation for the Solution of Two-Space Dimensional Quasi-Linear Hyperbolic Equations”, *Advances in Mathematical Physics*, Vol. 2011, Article ID 420608, 22 pages, doi:10.1155/2011/420608 (2011).
- [3] R.K. MOHANTY and **SURUCHI SINGH**, “High Order Variable Mesh Approximation for the Solution of 1D Quasi-Linear Hyperbolic Equations”, *International Journal of Nonlinear Science*, Vol. 14(No.2), pp. 220-227 (2012).
- [4] **SURUCHI SINGH**, SWARN SINGH and R.K. MOHANTY, “High Accuracy Cubic Spline Approximation on a Geometric Mesh for the Solution of 1D Non-linear Wave Equations”, *Journal of Mathematical and Computational Science*, Vol. 2, No.4, pp. 1126-1143 (2012).
- [5] R.K. MOHANTY, M.K. JAIN and **SURUCHI SINGH**, “A New Three- Level Implicit Cubic Spline Method for the Solution of 1D Quasi-Linear Hyperbolic Equations”, *Computational Mathematics and Modeling*, Vol. 24(No.3), pp. 452-470 (2013).
- [6] SWARN SINGH, **SURUCHI SINGH**, and R.K. MOHANTY, “A New High Accuracy Off-Step Discretization for the Solution of 2D Non-linear Triharmonic Equations”, *East Asian Journal on Applied Mathematics*, Vol. 3(No. 3), pp. 228-246 (2013).
- [7] R.K. MOHANTY, **SURUCHI SINGH** and SWARN SINGH, “A New High Order Space Derivative Discretization for 3D Quasi-linear Hyperbolic Partial Differential Equations”, *Applied Mathematics and Computation*, Vol. 232, pp. 529-541 (2014).
- [8] RAJNI ARORA, **SURUCHI SINGH** and SWARN SINGH, “Exponential B-spline Collocation for the Numerical Solution of One Space Dimensional Non-linear Wave Equation with Strong Stability Preserving Time Integration”, *International Journal of Advanced Research in Science and Technology*, Vol. 4, Issue 11 pp. 102-113(2015).

- [9] NEHA SHARMA, SWARN SINGH and **SURUCHI SINGH**, “Optimizing the Power Required in Hyperthermia Treatment using Magnetic Nanoparticles”, *International Journal of Control and Automation*, Vol. 9, Issue 9, pp. 181-188 (2016).
- [10] SWARN SINGH, **SURUCHI SINGH** and RAJNI ARORA, “New Highly Accurate Stable Schemes for the Solution of Telegraphic Equation with Neumann Boundary Conditions”, *Neural Parallel and Scientific Computations*, Vol. 24, pp. 1-14(2016).
- [11] SWARN SINGH, **SURUCHI SINGH** and RAJNI ARORA, “Numerical Solution of Second- order One- Dimensional Hyperbolic Equation by Exponential B-spline Collocation Method”, *Numerical Analysis and Applications*, Vol. 10, Issue 2, pp. 164-176(2017).
- [12] **SURUCHI SINGH**, SWARN SINGH and ZHILIN LI, “A High Order Compact Scheme for a Thermal Wave Model of Bio- Heat Transfer with an Interface”, *Numerical Mathematics: Theory Methods and Applications*, Vol. 11, Issue 2, pp. 321-337 (2018).
- [13] **SURUCHI SINGH**, KAZUFUMI ITO, SWARN SINGH and ZHILIN LI, “A fourth order compact scheme for transport equation with discontinuous coefficients”, *Numerical Mathematics: Theory Methods and Applications*, Vol. 11, Issue 4, pp. 782-794 (2018).
- [14] SWARN SINGH, **SURUCHI SINGH**, RAJNI ARORA and PING LIN, “Unconditionally stable modified methods for the solution of two and three dimensional telegraphic equation with Robin boundary conditions”, *Numerical Methods for Partial Differential Equations*, Vol. 35, Issue 1, pp. 246-266 (2019).
- [15] SWARN SINGH, **SURUCHI SINGH** and RAJNI ARORA, “An Unconditionally Stable Numerical Method for the Solution of two-Dimensional Second Order Hyperbolic Equation”, *East Asian Journal on Applied Mathematics*, Vol. 9, Issue 1, pp. 195-211 (2019).
- [16] **SURUCHI SINGH** and SWARN SINGH, “High order convergent modified nodal bi-cubic spline collocation method for elliptic partial differential equation”, *Numerical Methods for Partial Differential Equations*, Vol. 36, Issue 5, pp. 1028-1043(2020).
- [17] RAJNI ARORA, SWARN SINGH and **SURUCHI SINGH**, “Numerical solution of second-order two-dimensional hyperbolic equation by bi-cubic B-spline collocation method”, *Math Sci*, Vol. 14, pp. 201-213(2020).
- [18] SWARN SINGH, SANDEEP BHATT and **SURUCHI SINGH**, Cubic B-spline collocation method on non-uniform mesh for solving nonlinear parabolic partial

differential equations, Computational Methods for Differential Equation, (2020)
doi:[10.22034/CMDE.2020.39472.1726](https://doi.org/10.22034/CMDE.2020.39472.1726)

- [19] SWARN SINGH, **SURUCHI SINGH** and SANDEEP BHATT, Optimal cubic spline method for convection diffusion equation, Journal of Mathematics and Computer Science, 11 (2021), No. 4, 4351-4368, <https://doi.org/10.28919/jmcs/5659>
- [20] **SINGH, S.**, SINGH, S. & AGGARWAL, A. Fourth-order cubic B-spline collocation method for hyperbolic telegraph equation, Mathematical Sciences (2021), <https://doi.org/10.1007/s40096-021-00428-y>
- [21] SWARN SINGH, **SURUCHI SINGH** and SANDEEP BHATT, High order compact cubic B-spline collocation method for the solution of Fisher's Equation, International Journal of Applied and Computational Mathematics, 7, 217(2021).
- [22] SWARN SINGH, **SURUCHI SINGH** and ZHILIN LI, "A new patch up technique for elliptic partial differential equation with irregularities", Journal of Computational and Applied Mathematics, <http://dx.doi.org/10.1016/j.cam.2021.113975> (2021).

Conference Organization/ Presentations

- (a) Delivered a talk on "Exponential B-Spline Collocation Method for Hyperbolic Partial Differential Equations" at Department of Mathematics, North Carolina University, Greensboro, USA on February 22, 2017.
- (b) Invited as a resource person for the online Refresher Course in Mathematics held by Ramanujan College, University of Delhi, Delhi held from 16-03-2021 to 30-03-2021. Delivered a lecture on Mathematica: An Introduction Part -1.
- (c) Resource person for the online Refresher Course in Mathematics held by Ramanujan College, University of Delhi, Delhi held from 16-03-2021 to 30-03-2021. Delivered a lecture on Mathematica: An Introduction Part -2.
- (d) Resource person for the online Refresher Course in Mathematics held by Ramanujan College, University of Delhi, Delhi held from 16-03-2021 to 30-03-2021. Delivered a lecture on Mathematica: An Introduction Part -3.
- (e) A resource person for the two-week Refresher Course in Applicable Mathematics held by Ramanujan College in collaboration with Deshbandhu College under the aegis of Pandit Madan Mohan Malaviya National mission on teachers and teaching, University of Delhi, Delhi held from 15-12-2021 to 29-12-2021.
- (f) Attended the Fall Meeting of the MD-DC-VA section of the MAA (Mathematical Association of America, Maryland-District of Columbia- Virginia Section) held at Johns Hopkins University, Baltimore, USA from November 4-5, 2016.

- (g) Attended the Fall Southeastern Sectional Meeting of AMC (American Mathematical Society) held at North Carolina State University, Raleigh, USA from November 12-13, 2016.
- (h) Attended the JOINT MATHEMATICS MEETING organized by American Mathematical Society and Mathematics Association of America at Atlanta, GA, USA during January 4-7, 2017.
- (i) Attended DEMARC-NSF (Differential Equations Model and Resource Creators funded by National Science Foundation, USA) workshop from July15, 2018 to July 21, 2018 at Manhattan College, Riverdale, New York, USA. Also produced teaching material.
SURUCHI SINGH, "Skin Burn Model Numerical Methods" (2018), 9-001-Text-S-Skin Burn Model Numerical Methods," <https://simiode.org/resources/5019>.

Research Projects (Major Grants/Research Collaboration)

- Carried out advanced Research in ‘Computational Methods for Differential Equations’, in collaboration Prof Zhilin Li and Prof. Kazufumi Ito, North Carolina State University, Raleigh, NC, USA under the Raman Fellowship.

Awards and Distinctions

- **Shrimati Sivakamma Radhakrishnan Medal** for being the best women candidate in M.A. Examinations in University of Delhi.
- **Professor Ram Bihari Medal** for being the best candidate in M.A./M.Sc. (Mathematics) Examinations in University of Delhi.
- **J.N. Mitra Memorial Medal** for being the best candidate in M.A./M.Sc. Examinations in Mathematics, Statistics, Physics (taken together) in University of Delhi.
- **Shri Ram Chandra Memorial Medal** for being the best candidate in M.A./M.Sc. (All Subjects) Examinations in University of Delhi.
- **Junior Research Fellowship** from U.G.C./C.S.I.R during M.Phil.
- Awarded **RAMAN FELLOWSHIP** to carry out advanced Research in ‘Computational Methods for Differential Equations’, by UGC. Visited North Carolina State University, Raleigh, NC, USA under this fellowship.

Association With Professional Bodies

Member of the following:

- American Mathematical Society
- Ramanujan Mathematical Society
- Indian Mathematical Society

Other Activities

- Judged the undergraduate student poster presentations of the Mathematical Association of America (MAA) on January 6, 2017 at the Joint Mathematics Meetings, Atlanta, GA, USA.
- I was one of the judges for SCUDEM VI competition November, 2021 organized by SIMIODE (Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations) U.S.A. From all over the world, 82 teams participated.
- I mentored a team from South Asian University for the competition Simiode Challenge Using Differential Equations Modelling –VI, U.S.A, 2021