CURRICULUM VITAE

MEENAKSHI NEROLU
SENIOR LECTURER (CAREER STATUS TRACK) • APPLIED MATHEMATICS • DATA SCIENCE
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SUMMARY

Innovative educator and researcher with expertise in Applied Mathematics, Data Science, and Mathematical Modeling. Demonstrated success in developing new curricula, integrating real-world datasets into teaching, supervising teaching fellows, and leading cross-institutional academic partnerships. Passionate about expanding access to data science education and empowering students through project-based learning.

SKILLS

- **Programming Languages**: Python, R Studio, Tableau, Open Refine, C, C++, Matlab, Mathematica, Scilab, Origin, Maxima
- **Data Science Tools:** Matplotlib/Seaborn,Tableau, OpenRefine, Data Cleaning, Data Visualization
- **Software Proficiency:** Latex, Beamer, MS-Office
- **Core Competency:** Mathematical Modeling, Teaching with Technology

EXPERIENCE

- **Howard University, Washington, DC**
  Department of Mathematics,
  College of Arts and Sciences
  Howard University, Washington DC

  Senior Lecturer (Career Status Track, Full Time), July 2025 - Present
  Master Instructor (Career Status Track, Full Time), July 2024 – July 2025
  Lecturer, January 2020 – June 2024
  - Taught courses in Data Science, Calculus I & II, and College Algebra.
  - Integrated real-world datasets and Python programming into classroom instruction.
  - Developed and coordinated the "Introduction to Data Science" and NEEL/NEON Data Analytics courses.

- 09/2018 – 01/2020
  Silbiotech, Inc. Gaithersburg, MD

  IT and Marketing Analyst
  - Promoting a new genomic test, BBDRisk Dx for Breast Atypical Hyperplasia through media campaigns and hospital visits in USA.
  - Executed successful product introductions using social media and public relations.

- 01/2016 - 01/2017
  M. S. Ramaiah University of Applied Science, Bangalore, India

  Assistant Professor
  - Taught Engineering Mathematics to undergraduate students.

- 01/2012 - 01/2016
  Bangalore University, Bangalore, Karnataka

  Research Scholar

- 01/2012 - 01/2015
  Bangalore University, Bangalore, Karnataka

  Lab Assistant
  - Taught Free Open Source Software (FOSS) viz., Scilab, Maxima, Python

- 08/2011 - 08/2012
  Dayananda Sagar College of Arts, Science and Commerce, Bangalore, Karnataka, India

  Lecturer
  - Taught Engineering Mathematics to undergraduate students.

EDUCATION AND TRAINING

2017 India	**Ph.D** in Applied Mathematics Bangalore University
2011 India	**Master of Science (M.Sc)** in Mathematics Bangalore University Received gold medal for securing highest score in Mathematical Methods and Numerical analysis in M.Sc. (Mathematics), Bangalore University, Karnataka, India.
2021 USA	**Data Science Certificate (Graduate Spring 2021)** Montgomery College, Rockville, MD

ACTIVITIES AND HONORS

- Junior Research Fellowship (2012-2016), Department of Science and Technology (DST) –under Promotion of University Research and Scientific Excellence (PURSE), New Delhi, India.
- Selected to attend Summer School on "Fluid Dynamics of Sustainability and the Environment" held at Ecole Polytechnique, Paris, France in association with Cambridge University, September 2015
- Elected as Life Member (2013) of Indian Society of Theoretical and Applied Mechanics (ISTAM), Indian Institute of Technology (IIT), Kharagpur, India.
- Young Scientist Award at the 57th Congress of the Indian Society of Theoretical and Applied Mechanics (ISTAM) during December 2012 at the Defense Institute of Advanced Technology, Pune, Maharashtra, India.
- Actively conducted workshop on Free Open Source Software (FOSS) for Faculties at Bangalore University.

PUBLICATIONS

- N. Meenakshi, 2026, Integrating AI and Data Visualization to Support Quantitative Reasoning in Undergraduate Mathematics Education, ***International Journal of Mathematical Education in Science and Technology*** **(submitted).**
- N. Meenakshi and P. G. Siddheshwar, 2022, "Controlling Rayleigh-Benard magnetoconvection in Newtonian nanoliquids by rotational, gravitational and temperature modulations: a comparative study", ***Arabian Journal for Science and Engineering (Springer)***.
- P. G. Siddheshwar and N. Meenakshi, 2019, "Comparison of the effects of three types of time-periodic body force on linear and non-linear stability of convection in nanoliquids", ***European Journal of Mechanics-B/Fluids***, 77, pp. 221-229.
- P. G. Siddheshwar, N. Meenakshi and **Igor Pa$\breve{z}$anin**, 2017, "Flow and heat transfer in a Newtonian nanoliquid due to a curved stretching sheet", ***Zeitschrift für Naturforschung A (ZNA),*** 72 (9) pp. 833-842**.**
- P. G. Siddheshwar and N. Meenakshi, 2017, "A theoretical study of enhanced heat transfer in nanoliquids with volumetric heat source", ***Journal of Applied Mathematics and Computing,*** *doi 10.1007/s12190-017-1129-9,* pp. 1-26**.**
- P. G. Siddheshwar and N. Meenakshi, 2016, "Effects of suction and free stream velocity on hydromagnetic flow and heat transfer in a Newtonian fluid due to a stretching sheet", ***ASME Journal of Heat Transfer****,* 138 (9), pp. 1-4, doi: 10.1115/1.4033460.
- P. G. Siddheshwar and N. Meenakshi, 2015, "Amplitude equation and heat transport for Rayleigh-Benard convection in Newtonian liquids with nanoparticles", ***International Journal of Applied and Computational Mathematics (Springer)***, Vol. 2, pp. 1-22, doi:10.1007/s40819-015-0106-y.
- P. G. Siddheshwar, N. Meenakshi, **Y. Kakimoto** and **A. Nakayama**, 2016, "Study of heat transport in Newtonian water-based nanoliquids using single-phase model and Ginzburg-Landau approach", Bangalore, Vignana Bharathi, ISSN No.:0971-6882, 1 (2), pp. 76-92.
- P. G. Siddheshwar and N. Meenakshi, 2014, "Hydromagnetic forced flow of a Newtonian, Electrically conducting fluid due to a curved stretching surface", *Proceedings of International Conference on Emerging Trends in Computational and Applied Mathematics (ICCAM-2014),* ISBN:978-93-81212-7-9, pp. 343-347.

INVITED TALKS

- ***Nano appearance but microinfluence – an example from hydrodynamics,*** International Science Fiction Conference (Online), ISFC 2020, Bangalore University, India, December 2020.
- ***Enhanced Heat Transfer in Liquids – Nano Solution,*** FDP Lecture Series "Recent Trends in Fluid Dynamics", Sapthagiri College of Engineering, Bengaluru, India, November 2020.
- ***Regulatory mechanisms for Rayleigh-Benard convection in nanoliquids: A survey***, International conference on "Fluid Dynamics and Its Applications" held at B. N. M. Institute of Technology, Bengaluru, India, July **2017.**
- ***Two days workshop on Scilab and Maxima (FOSS),*** M.E.S. Degree College of Arts, Commerce and Science, Malleshwaram, Bengaluru, India, July 2015.
- ***Two days workshop on Mathematics Practicals (using FOSS tools),*** Bangalore University Mathematics Teachers Form, January 2015.

- ***Towards a New Curriculum in Engineering Mathematics with Scilab & Maxima,*** Jyothy Institute of Technology, Bangalore, India, December 2014.
- ***National workshop on Scilab and Maxima software,*** Oxford College of Science, Bangalore, India, November 2012.

SEMINARS/WORKSHOPS ATTENDED

- ***Hands-On Workshop: Unlock the Power of Data and Gain Access to a Unique Dataset for Your Research*****,** Howard University, February 2025.
- ***OPEN Math Workshop - Who's Afraid of Generative AI: Promises and Challenges of AI for the Mathematics Classroom,*** **May 2024**
- ***Moderator of AMS Sectional Meeting AMS Special Session*****,** April 2024.
- ***9th Maryland Collegiate STM Conference*** hosted by Montgomery Community College, April 2024.
- ***A Five-Day International Online Workshop on Advanced Numerical Techniques for Differential Equations*** **(ANTDE-2022),** Department of Mathematics**,** Malaviya National Institute of Technology, Jaipur, June 2022.
- ***Workshop on Dynamical Systems and Related Topics***, University of Maryland, College Park, USA, April **2018**.
- Two-week International workshop on ***Computational Fluid Dynamics*** organized by Department of Mathematics, BMS College of Engineering, Bangalore, India, June **2014**.
- Two-day Science Academies' Lecture Workshop on ***Mathematical Modelling using Differential Equations*** held at Department of Mathematics, Maharani's Science College for women, India, in association with Central College Mathematical Society Bangalore University, March **2014**.
- ***Conference on Differential Geometry*** held at the Department of Mathematics, Bangalore University, Central College Campus, Bangalore, India, July **2013**.
- ***National workshop on Scilab and Maxima software***, The Oxford College of Science, Bangalore, India, November **2012**.
- Four-day National workshop on ***Recent Trends in Bio-Mathematics and Statistics*** at Apaji Institute of Mathematics and Applied Computer Technology, Centre for Mathematical Sciences (CMS), Banasthali University, Jaipur, India, November **2012**.

CONFERENCE PRESENTATION

- *Nanofluids in Science and Engineering: Fundamentals, Applications, and Future Trends,* Joint Mathematics Meeting (JMM), Washington, DC, January 2026.
- *Nanofluids in Modern Engineering: Fundamentals, Applications, and Challenges,* Howard University's Research Symposium 2022, Howard University, USA, April 2025.
- *External Mechanisms of Controlling Rayleigh-Benard Convection in Newtonian Nanoliquids,* Howard University's Research Symposium 2022, Howard University, USA, April 2022.
- *Three mechanisms of externally controlling Rayleigh-Benard convection in Newtonian Nanoliquids,* 6th Coastal Bend Mathematics & Statistics Conference (CBMSC) (online virtual conference), Texas A&M University-Corpus Christi, USA, April 2022.
- *Effect of time-periodic vertical oscillations of the Rayleigh-Benard system on onset of convection in Newtonian Nanoliquids*, 60th Congress of Indian Society of Theoretical and Applied Mechanics (ISTAM 2015), Jaipur, India, December 2015.
- *Steady finite amplitude Rayleigh-Benard convection in Newtonian nanoliquids with volumetric heat source*, 23rd International Conference of Forum for Interdisciplinary Mathematics (FIM) on *"Interdisciplinary Mathematical, Statistical and Computational Techniques (IMSCT)-2014*, Surathkal, Karnataka, India, December 2014.
- *Hydromagnetic forced flow of a Newtonian electrically conducting fluid due to a curved stretching surface*, International Conference on Emerging Trends in Computational and Applied, ITM University, Gurgaon, India, June 2014.
- *Uni-variate differential transform method of solving family of Falkner-Skan equations*, National Conference on Mathematics, University of Lucknow, India, November 2013.
- *Uni-variate differential transform method of solving nonlinear differential equation*", National Conference MMEA-2013, Bangalore, India, October 2013.
- *Uni-variate differential transform method of solving generalized Falkner-Skan-type equation*, 26th International Conference of Jangjeon Mathematical Society, South Korea at Acharya Institute of Graduate Studies , Bangalore, India, August 2013.
- *Effects of Free Stream Velocity, Suction and Magnetic Field on the flow of a Newtonian fluid due to a linearly or an exponentially stretching sheet*, Award Session of the 57th Congress of Indian Society of Theoretical and Applied Mechanics (ISTAM) held at Defense Institute of Advanced Technology, Pune, India, December 2012.
- *Generalized Crane Problem with Free Stream Flow, Suction and Magnetic Field*, International Conference on "Emerging Trends in Fluid Mechanics and Graph Theory" at Christ University, Bangalore, India, August 2012.

POSTERS

- *Rayleigh-Benard convection in nanoliquids, NSF-CBMS Regional Conference on Mathematical Biology: Modeling and Analysis, Howard University, Washington, DC, May 2018.*
- *Circulation in the presence of suspended particles-Lorenz model,* Summer School on "Fluid Dynamics of Sustainability and the Environment" held at *Ecole Polytechnique, Paris, France in association with Cambridge University*, September 2015.

RESEARCH INTEREST

My research area concerns linear and nonlinear stability analyses of Rayleigh-Bénard convection in Newtonian nanoliquids using Lorenz and Ginzburg-Landau models. I come across system of non-linear ordinary and partial differential equations (IBVPs) in my works.

Enhancement of heat transfer is an important goal in many thermal engineering systems involving liquids as a working media, e.g., heat exchanger systems. Heat transfer enhancement has been attempted in such problems by placement of fins, ventilators and other mechanisms. An innovative way of heat transfer enhancement in liquids is to add nanoparticles in them. The enhancement here will then be due to the high thermal conductivity of nanoparticles.

The aim of the future project is to come up with new possibilities to enhance heat transfer performance compared to pure liquids and nanoliquids. Matrix Differential Operator Method and the weighted residual technique are proposed to be used to solve the governing system of PDEs either analytically or numerically.

SERVICE

- Coordinator, **Calculus I.**
- Coordinator, **Introduction to Data Science**.
- Coordinator, **NEEL/NEON Introduction to Data Analytics (Grow with Google collaboration)**
- Member, **Montgomery College Data Science Advisory Board.**