



# Dr. Venkatarao Chukka

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## Research Profiles

Scopus <https://www.scopus.com/authid/detail.uri?authorId=57191358547>  
GoogleScholar <https://scholar.google.co.in/citations?user=8Cpf-B8AAAAJ&hl=en>  
ORCID <https://orcid.org/0000-0002-9425-8242>

## Research Areas of Interest

**Fluid Dynamics, Mono and Hybrid Nanofluids, Heat and Mass Transfer, Hydrodynamic Stability, Spectral Methods.**

## Education

2014–2018 **Ph.D.**, *National Institute of Technology, Warangal, Telangana.*  
2007–2009 **M.Sc.**, *Pondicherry University, Puducherry, with 8.06 CGPA.*  
2004–2007 **B.Sc.**, *Andhra University, Visakhapatnam, Andhra Pradesh, with 69.90%.*

## Ph.D. thesis

Title *Convective Heat and Mass Transfer in a Nanofluid Flow over Frustum of a Cone.*  
Supervisor Dr. Ch. Ramreddy, Associate Professor, Department of Mathematics, National Institute of Technology-Warangal.

## Experience

2020–Present **Assistant Professor**, *Department of Mathematics, Assam University, Silchar, Assam.*  
2018–2020 **Assistant Professor**, *Department of Mathematics, MVGR (A) College of Engineering, Vizianagaram, Andhra Pradesh.*  
2016–2018 **Senior Research Fellow**, *National Institute of Technology, Warangal, Telangana.*  
2014–2016 **Junior Research Fellow**, *National Institute of Technology, Warangal, Telangana.*  
2011–2014 **Assistant Professor**, *Department of Mathematics, MVGR College of Engineering, Vizianagaram, Andhra Pradesh.*  
2009–2011 **Lecturer**, *Department of Basic Sciences & Humanities, JNTUK University College of Engineering, Vizianagaram, Andhra Pradesh.*

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## Publications

- [1] Devi SVV Sankar Chandaka Uma, Sobhanapuram Sreedhar and **Venkatarao Chukka**. Numerical study of natural convective flow of a nanofluid over rotating truncated cone with convective heating. *Journal of Nanofluids*, 13(3):808–818, 2024.
- [2] B M B Krushna and **Venkatarao Chukka**. Smallest eigenvalues for  $(n, p)$ -type fractional boundary value problems. *Nonlinear Studies*, 29:1003–1010, 2022.
- [3] M. Sambasiva Rao and **Ch. Venkata Rao**.  $\omega$ -Filters of Distributive Lattices. *Algebraic Structures and their Applications*, 9(10):145–159, 2022.
- [4] **Ch. Venkata Rao** and Ch. Ramreddy. Double-Diffusive Natural Convective Flow of a Nanofluid past an Inclined Wavy Plate in a Non-Darcy Porous Medium. *International Journal of Mathematical, Engineering and Management Sciences*, 4(6):1373—1383, 2019.
- [5] P. Murali Krishna Ch. Ramreddy and **Ch. Venkata Rao**. Effects of Double Stratification on MHD flow and Heat Transfer of Nanofluid along a Permeable Vertical Plate. *International Journal of Mathematical, Engineering and Management Sciences*, 4(6):1362–1372, 2019.
- [6] **Ch. Venkata Rao** and Ch. Ramreddy. Natural Convective Flow of a Radiative Nanofluid past an Inclined Plate in a Non-Darcy Porous Medium with Lateral Mass Flux. *Lecture Notes in Mechanical Engineering*, pages 93–102, 2019.
- [7] Ch. Ramreddy and **Ch. Venkata Rao**. Effects of Arrhenius Activation Energy and Binary Chemical Reaction on Convective Flow of a Nanofluid over Frustum of a Cone with Convective Boundary Condition. *International Journal of Chemical Reactor Engineering*, 16(3), 2018.
- [8] Ch. Ramreddy and **Ch. Venkata Rao**. Non-Similarity Analysis for Nonlinear Convective Flow of a Nanofluid over the Permeable Wavy Frustum of a Cone with Convective Boundary Condition. *Journal of Nanofluids*, 7:1258–1271, 2018.
- [9] Ch. Ramreddy and **Ch. Venkata Rao**. Numerical Study for Mixed Convective Flow of a Radiative Nanofluid Over the Vertical Frustum of a Cone with Arrhenius Activation Energy and Binary Chemical Reaction. *Advanced Science, Engineering and Medicine*, 10:952–960, 2018.
- [10] S. S. Motsa Ch. Ramreddy and **Ch. Venkata Rao**. Non-similarity solution for Soret effect on natural convection over the vertical frustum of a cone in a nanofluid using new bivariate pseudo-spectral local linearisation method. *Applied Mathematics and Computation*, 314:439–455, 2017.
- [11] Ch. Ramreddy and **Ch. Venkata Rao**. Bivariate Pseudo-Spectral Local Linearisation Method for Mixed Convective Flow Over the Vertical Frustum of a Cone in a Nanofluid with Soret and Viscous Dissipation Effects. *Journal of Mechanics*, pages 1–16, 2017.
- [12] Ch. Ramreddy and **Ch. Venkata Rao**. Bivariate Pseudo-Spectral Local Linearisation Approach for the Soret and Viscous Dissipation Effects on Natural Convective Flow

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of Buongiorno Nanofluid Model Over Vertical Frustum of a Cone. *Journal of Nanofluids*, 6(3):530–540, 2017.

- [13] Ch. Ramreddy and **Ch. Venkata Rao**. Double dispersion effects on non-Darcy free convective boundary layer flow of a nanofluid over vertical frustum of a cone with convective boundary condition. *Nonlinear Engineering*, 6(4):277–292, 2017.
- [14] Ch. Ramreddy and **Ch. Venkata Rao**. Double Stratification Effects on Mixed Convection Boundary Layer Flow of a Nanofluid Over Vertical Frustum of a Cone: A Darcy-Forchheimer Model. *Journal of Nanofluids*, 6(5):971–981, 2017.
- [15] Ch. Ramreddy and **Ch. Venkata Rao**. Non-similarity Solutions for Natural Convective Flow of a Nanofluid Over Vertical Frustum of a Cone Embedded in a Doubly Stratified Non-Darcy Porous Medium. *International Journal of Applied and Computational Mathematics*, pages 1–15, 2017.
- [16] Ch. Ramreddy and **Ch. Venkata Rao**. A new numerical approach for Soret effect on mixed convective boundary layer flow of a nanofluid over vertical frustum of a cone. *International Journal of Pure and Applied Mathematics*, 113(8):73–81, 2017.
- [17] **Ch. Venkata Rao** Ch. RamReddy, O. Surender and T. Pradeepa. Adomian Decomposition Method for Hall and Ion-Slip Effects on Mixed Convection Flow of a Chemically Reacting Newtonian Fluid Between Parallel Plates with Heat Generation/Absorption. *Propulsion and Power Research*, 6(4):296–306, 2017.
- [18] O. Surender Ch. RamReddy and **Ch. Venkata Rao**. Effects of Soret, Hall and ion-slip on mixed convection in an electrically conducting Casson fluid in a vertical channel. *Nonlinear Engineering: Modeling and Application*, 5(3):167–175, 2016.
- [19] **Ch. Venkata Rao** O. Surender Ch. RamReddy, T. Pradeepa and M. Chitra. Analytical Solution of Mixed Convection Flow of a Newtonian Fluid Between Vertical Parallel Plates with Soret, Hall and Ion-Slip Effects: Adomian Decomposition Method. *International Journal of Applied and Computational Mathematics*, pages 1–14, 2015.
- [20] **Ch. Venkata Rao** Ch. RamReddy and O. Surender. Soret, Joule heating and Hall effects on free convection in a Casson fluid saturated porous medium in a vertical channel in the presence of viscous dissipation. *Procedia Engineering*, 127:1219–1226, 2015.

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## Invited Lectures

Conference **"Chebyshev Spectral Collocation Methods for Fluid Flow Problems"** in "National Conference on Recent trends in Mathematics in the fields of Science and Technology (RMST-2024)" at **Vasavi College of Engineering (Autonomous), Hyderabad (11 -12 March, 2024)**.

FDP **"Chebyshev Spectral Collocation Methods (with Chebfun)"** in One Week FDP on "Algebraic System and Combinatorics" at **Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science & Technology, Chennai (19 - 23 February, 2024)**.

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Online FDP **"Pseudo-Spectral Collocation Methods for Fluid Flow Problems"** in "Recent Research Developments in Mathematics, Statistics & their Applications-2021" at **GMR Institute of Technology-Rajam, Srikakulam, Andhra Pradesh.**

## Workshops/STTPs/GIANs/FDPs

- Workshop **3 Days Training for enhancing students placement**, *Organized by Career Counselling & Placement Cell, Assam University, Silchar, Assam, 12-14 December, 2022.*
- FDP **Examination Reforms**, *Organized by National Institute of Technology, Aizwal, Mizoram, 15-19 February, 2021.*
- Workshop **Numerical and Analytical Techniques in Engineering Problems**, *Organized by Department of Mathematics, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, 12-13 November, 2020.*
- Workshop **Numerical Linear Algebra**, *Organized by Department of Mathematics, Assam University, Silchar, Assam, 19-25 September, 2020.*
- Workshop **Recent Advances of Operations Research in Natural and Social Sciences**, *Jointly Organized by Department of Mathematics and IQAC, Lanka Mahavidyalaya, and Department of Mathematics, Assam University, Silchar, Assam, 18<sup>th</sup> September, 2020.*
- Workshop **Design and Applications of Single and Multi-Objective Optimization**, *Organized by Department of Mathematics, Assam University, Silchar, Assam, 7-11 September, 2020.*
- Workshop **Algebraic Number Theory**, *Organized by Department of Mathematics, Assam University, Silchar, Assam, 31<sup>st</sup> August - 5<sup>th</sup> September, 2020.*
- Workshop **An Introductory Course on Fluid Dynamics**, *Organized by Department of Mathematics, CHRIST University, Bangalore, Karnataka, 17-20 August & 24-28 August, 2020.*
- FDP **Applications of Mathematics in Science & Engineering**, *Organized by Department of Basic Sciences, Vishnu Institute of Technology, Bhimavaram, Andhra Pradesh, 7-11 July, 2020.*
- Workshop **Fluid Mechanics and its Applications in Engineering & Science**, *Organized by Department of Mathematics, PES Institute of Technology and Management, Shivamogga, Karnataka, 24-27 June, 2020.*
- Workshop **Fluid Dynamics**, *Organized by Department of Mathematics and Statistics, School of Basic Sciences, Manipal University, Jaipur, Rajasthan, 23<sup>rd</sup> June, 2020.*
- FDP **Mathematical and Statistical Modelling**, *Organized by Department of Humanities and Basic Sciences, Godavari Institute of Technology, Rajahmundry, Andhra Pradesh, 26-30 May, 2020.*
- Workshop **Scientific Computations with Python**, *Organized by E&ICT Academy, National Institute of Technology, Warangal, Telangana, 20-25 November, 2018.*
- GIAN **Separation and Instabilities in High Speed Flows**, *Organized by Department of Mathematics, National Institute of Technology, Warangal, Telangana, 6-17 August, 2018.*

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- GIAN **Spectral Methods for Solving Systems of ODEs & PDEs**, *Organized by Department of Mathematics, National Institute of Technology, Aizwal, Mizoram, 20-29 June, 2016.*
- STTP **Contemporary Approaches of Applied mathematics in Science & Engineering**, *Organized by Department of Mathematics, National Institute of Technology, Warangal, Telangana, 11-15 May, 2015.*
- STTP **Advanced Numerical Methods in Fluid Dynamics**, *Organized by Department of Mathematics, National Institute of Technology, Warangal, Telangana, 17-19 April, 2015.*
- STTP **Advanced Computational Methods in Engineering & Science**, *Organized by Department of Mathematics, National Institute of Technology, Warangal, Telangana, 1-3 April, 2015.*
- Workshop **New Paradigms of Mathematical Modelling and its Applications to Engineering & Technology**, *Organized by Department of Basic Science & Humanities, JNTUK University College of Engineering, Vizianagaram, Andhra Pradesh, 27<sup>th</sup> march, 2014.*
- Workshop **Mathematical Applications of Engineering Disciplines**, *Organized by Department of Mathematics, Aditya Institute of technology & management, Srikakulam, Andhra Pradesh, 4-5 Feb, 2013.*
- Workshop **Mathematical Techniques and their Application to Engineering Problems**, *Organized by Department of Mathematics, MVGR College of Engineering, Vizianagaram, Andhra Pradesh, 25-26 May, 2012.*
- Seminar **Algebra & Analysis**, *Organized by Department of Mathematics, Pondicherry University, Puducherry, 14<sup>th</sup> march, 2008.*

## Conferences Attended

- International **1<sup>st</sup> International Conference on Applied Analysis, Computation and Mathematical Modelling in Engineering**, *Organized by Department of Mathematics, National Institute of Technology, Rourkela, 24-26 February, 2021.*
- National **National Conference on Computational Modeling of Fluid Dynamics Problems (CMFDP-2019)**, *Organized by Department of Mathematics, National Institute of Technology, Warangal, 18-20 January, 2019.*
- National **National Conference on Mathematical Modelling in Science and Engineering**, *Organized by Department of Mathematics, National Institute of Technology, Warangal, 27-28 March, 2018.*
- International **International Conference on Engineering & Technology (ICET) - 2018**, *Organized by The Society for Academic Research, Melbourne, Australia, 25-26 February, 2018.*
- International **International Conference on Numerical Heat Transfer and Fluid Flow**, *Organized by Department of Mathematics, National Institute of Technology, Warangal, 19-21 January, 2018.*

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- National 9<sup>th</sup> **National Conference on Mathematical Techniques and Applications**, Organized by Department of Mathematics, SRM University, Chennai, 27-28 January, 2017.
- International 60<sup>th</sup> **Congress of Indian Society of Theoretical and Applied Mechanics**, Organized by Malaviya National Institute of Technology, Jaipur, 16-19 December, 2015.
- International **International Conference on Computational Heat and Mass Transfer-2015**, Organized by Department of Mathematics, National Institute of Technology, Warangal, 30<sup>th</sup> November - 2<sup>nd</sup> December, 2015.

## Ph.D. Supervision

- 2024-Present **Juktamoni Gautam**– Course work completed and will work on Hydrodynamic Stability. (Ongoing)
- 2022-Present **Geeti Gogoi**–Thermal and entropy generation characteristics for nanofluid flow through micro-Channels & Pipes. (Ongoing)

## M.Sc. Project Supervision

- 2024 (RP-II) **Devraj Das**–Non-Darcy Mixed Convection in a Plane-Poiseuille Flow of CuO/H<sub>2</sub>O Nanofluid.
- 2024 (RP-II) **Pranjal De**–Fully Developed Mixed Convective flow of a Nanofluid in a Vertical Channel.
- 2024 (RP-II) **Amirul Sabir Barbhuiya**–Mixed Convection Flow of a Newtonian Fluid Between Vertical Parallel Plates with Soret, Hall and Ion-Slip Effects.
- 2024 (RP-II) **Pallab Das**–Influence of Thermophoretic Particle Deposition on Fully Developed MHD Convection Flow in a Vertical Channel with Soret Effect.
- 2024 (RP-I) **Devraj Das**–Review of Some Chebyshev Spectral Collocation Methods.
- 2024 (RP-I) **Pranjal De**–Review of Homotopy Analysis Method.
- 2024 (RP-I) **Amirul Sabir Barbhuiya**–Review of Bernstein Collocation Methods.
- 2024 (RP-I) **Pallab Das**–Review of some Perturbation Methods.
- 2023 **Juktamoni Gautam**–Linear Stability Analysis of Darcy-Bénard Problem.
- 2023 **Rajashree Roy**–REVIEW OF ADOMIAN DECOMPOSITION METHODS.
- 2023 **Sayefullah**–Some Non-Perturbation Methods for Ordinary Differential Equations.
- 2023 **Muktar Hussain**–Review of Some Perturbation Methods for Ordinary Differential Equations.
- 2022 **Bikash Jyoti Deka**–Numerical Implementation of Some Adomian Decomposition Methods.
- 2022 **NG Premjit Singha**–Numerical Methods for Solving Singularly Perturbed Differential Difference Equations.
- 2022 **Sameeksha**–Spectral Collocation Methods for Non-Linear Ordinary Differential Equations.

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- 2022 **Shantanu Das**—Some Perturbation Methods to Solve Ordinary Differential Equations.
- 2021 **Prabal Das**—Homotopy Methods for Solving Non-Linear Differential Equations.
- 2021 **Manisha Bhattacharjee**—Perturbation Methods for Solving Ordinary Differential Equations.
- 2021 **S Sapana Devi**—Non-Perturbation Methods for Non-Linear Differential Equations.
- 2021 **Biswarup Bhattacharjee**—Adomian Decomposition Methods and its applications.

## Subjects Taught

- Assam University Ordinary Differential Equations, Partial Differential Equations, Numerical Analysis, Linear Algebra, Basic Abstract Algebra, Algebra-II, Numerical Analysis Lab, Basic Mathematical Softwares Lab.
- MVGR CoE Engineering Mathematics-I, Engineering Mathematics-II, Engineering Mathematics-III, Complex Variables and Statistical Methods, Probability & Statistics for B.Tech Students under JNTU-Kakinada.
- JNTUK CoE Engineering Mathematics-I, Engineering Mathematics-II, Engineering Mathematics-III, and Mathematical Methods for B.Tech Students under JNTU-Kakinada.

## Responsibilities

- Deputy Co-ordinator Departmental IQAC Committee of the Department of Mathematics, Assam University, Silchar, Assam.
- Deputy Co-ordinator Departmental Placement committee of the Department of Mathematics, Assam University, Silchar, Assam.
- Deputy Co-ordinator Departmental Remedial Coaching Centre committee of the Department of Mathematics, Assam University, Silchar, Assam.
- Deputy Co-ordinator Fort Night Seminar committee of the Department of Mathematics, Assam University, Silchar, Assam.
- Member Research Sub-Committee of the Department of Mathematics, Assam University, Silchar, Assam.
- Lab-In charge UGC Laboratory, Department of Mathematics, Assam University, Silchar, Assam.

## Awards and Fellowships

- Best Paper Received a **Best Paper Award** for one of my articles “Natural Convective Flow of a Radiative Nanofluid past an Inclined Plate in a Non-Darcy Porous Medium with Lateral Mass Flux”, in **International Conference on Numerical Heat Transfer and Fluid Flow** at **NIT-Warangal**, during 19-21 January, 2018.
- SRF Senior Research Fellowship (2016-2018), MHRD, India.
- JRF Junior Research Fellowship (2014-16), MHRD, India.

## Achievements

- GATE Qualified GATE-2014, conducted by IIT-Kharagpur, with All India Rank-254.

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SET Qualified State Eligibility Test-2012, conducted by Osmania University, Andhra Pradesh.

## Languages and Skills

LaTeX	Advanced	2014 – Present
MATLAB	Intermediate	2014 – Present
Mathematica	Intermediate	2014 – Present
Scilab	Intermediate	2022 – Present

## References

- 1 Dr. Ch. Ramreddy,  
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Department of Mathematics,  
National Institute of Technology-Warangal.  
Email: [chittetiram@gmail.com](mailto:chittetiram@gmail.com)
- 2 Prof. D. Srinivasacharya,  
Professor,  
Department of Mathematics,  
National Institute of Technology-Warangal.  
Email: [dsc@nitw.ac.in](mailto:dsc@nitw.ac.in)
- 3 Prof. P V S N Murthy,  
Professor,  
Department of Mathematics,  
Indian Institute of Technology-Kharagpur.  
Email: [pvsnm@maths.iitkgp.ernet.in](mailto:pvsnm@maths.iitkgp.ernet.in)
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Professor,  
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