

CURRICULUM VITAE

Dr. Narsimhulu Dunna

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Research Interests

Domains: Non-linear System of Hyperbolic Partial Differential Equations (PDEs), Group Theoretic-Methods for PDEs, Magnetohydrodynamics, Nonlinear Gas Dynamics, Bio-Fluid Mechanics.

Preamble: My research interest is in applied mathematics and nonlinear partial differential equations (PDEs) in problems with applications to computational fluid dynamics (CFD). Also, it is interdisciplinary in nature, combining mathematical analysis, numerical analysis, and scientific computing. The abruptness of the change in the features of the medium characterized by shock waves and the study of unsteady flow of compressible fluid behind the strong shock propagation associated with the phenomena like an explosion, implosion, etc., is of importance in many fields of science and engineering. These flows are governed by nonlinear partial differential equations of hyperbolic type with moving boundary conditions and have no analytical solutions. Determining semi-analytical or numerical solutions for these types of flows is of great interest and forms the underlying idea of my research.

Currently, the study is also explored in the context of supersonic and hypersonic propagations. My future research work plan is to study the mathematical modeling of biological systems with the agglomeration of numerical and analytical methods.

Educational Qualifications

- **Ph.D.:** BITS Pilani, Hyderabad, Telangana, India (2011-2018)
- **M.Sc.:** Pondicherry Central University, Puducherry, India (2007-2009)
- **B.Sc.:** Andhra University, Visakhapatnam, Andhra Pradesh, India (2004-2007)

Academic Experience

- Joined at Central University of Tamil Nadu (**CUTN**) as an Assistant Professor in the Department of Statistics and Applied Mathematics, Thiruvavur, Tamil Nadu, India (**Dec 2019 - Till date**) [**Experience = 42 Months**]
- Worked as Adhoc Faculty at School of Sciences (Mathematics), National Institute of Technology (**NIT**) Andhra Pradesh, Tadepalligudem, India (**Jul 2019 - Dec 2019**) [**Experience = 6 Months**]
- Worked as Assistant Professor at School of Technology, Department of Mathematics, Gandhi Institute of Technology and Management (**GITAM**) University Hyderabad Campus, Telangana, India (**Jul 2018 - Apr 2019**) [**Experience = 10 Months**]
- Worked as a Teaching Assistant in the Department of Mathematics, Birla Institute of Technology and Science (**BITS**) Pilani Hyderabad Campus, Telangana, India (**Jan 2018 - May 2018**) [**Experience = 5 Months**]
- Worked as Lecturer at Vandana Junior and Degree College, Secunderabad, Telangana, India (**Jun 2010 - Jan 2011**) [**Experience = 8 Months**]

(Total Teaching Experience = 40+6+10+5+8 = 69 Months = **5 years and 9 months**)

Subjects Taught

- Algebra
- Advanced Topics in Differential Equations
- Business Mathematics
- Differential Equations
- Linear Algebra
- Fluid Dynamics
- MATHEMATICS-I
- MATHEMATICS-III
- Mathematical Modelling in Biology
- Numerical Analysis (Theory and lab)
- Real and Complex Analysis

Projects Guided

Guided LOP and SOP (Lab Oriented and Study Oriented Projects) for **B.E** and **M.Sc.** (Hons.) students during the **Ph.D.** program.

Computer Skills

- Microsoft Windows
- LaTeX
- Scilab, MATLAB, and Mathematica

Membership in Professional Bodies

- Life Member of Institute of Researchers (InRes), Membership No.: LM102207 (**2022**).
- Life Member of Indian Mathematical Society (**IMS**) [**2013**], Membership No.: **D13134**.

- Member of International Association of Engineers (**IAENG**) Society of Scientific Computing (**2018**), Membership No.: **223403**.
- Lifetime member of the Forum for Industrial and Applied Mathematics (**FIAM**) [**2022**], No.: **Membership/FIAM/2022/2**.
- Lifetime member of Ramanujan Mathematical Society (**RMS**) [**2022**], Membership No.: **1766**.

Awards/Scholarships/Honors

- **VIVEKANANDA PRIZE**, Institute of Researchers, Kerala, India (**2022**).
- **INSPIRE Award**: Innovation in Science Pursuit for Inspired Research. This fellowship is given by the Department of Science and Technology, New Delhi, India for pursuing a science carrier with an outstanding scholastic record. INSPIRE Regist. No.: **IF110071 (10th Jan 2011)**
- **REGIS Gold Medal** in Postgraduate Level, Pondicherry University, Puducherry, India (**2nd Apr 2010**)
- **Best Award** in SSC Level, Lions Club of Palasa - Kasibugga District: 324 - CI (INDIA) (**15th Aug 2002**)

Academic Achievements

- Secured **6th** rank, Pondicherry Central University M.Sc. Mathematics Entrance Exam 2007.
- Secured **6th** rank, Andhra University MA-Education (Mathematics) Entrance Exam 2007.
- Secured **25th** rank, Acharya Nagarjuna University M.Sc. Mathematics Entrance Exam 2007.
- Secured **113th** rank, Andhra University M.Sc. Mathematics Entrance Exam 2007.
- University **Gold Medalist** for the year of **2009** in Mathematics (**PG Level**).

Publications Accepted/Appeared in Referred Journals

1. Ravilisetty Revathi, Addepalli Ramu and **Dunna Narsimhulu**, “Solutions for Converging Cylindrical and Spherical Shock Waves in Condensed Matter Equation of State”, Nonlinear Studies, Cambridge Scientific Publishers (CSP), Vol. 27(3), pp. 673-692, **2020**, <http://www.nonlinearstudies.com/index.php/nonlinear/article/view/2175>
2. **Narsimhulu Dunna**, Addepalli Ramu, and Dipak Kumar Satpathi, “Self-Similar Motion of Strong Converging Cylindrical and Spherical Shock Waves in Non-Ideal Stellar Medium”, Journal of Applied Fluid Mechanics (**Open access**), **Regional Information Center for Science and Technology**, Iran, Vol. **11(6)**, pp. 1717-1726, **2018**. DOI: [10.29252/JAFM.11.06.28566](https://doi.org/10.29252/JAFM.11.06.28566), ISSN No.: 1735-3572, E-ISSN No.: 17353645, https://www.jafmonline.net/article_718.html [The **Q2** journal is indexed in UGC CARE, Scopus, Web of Science (SCIE), DOAJ; The (SJR) SCImago Journal Rank is **0.469**; Overall rank of JAFM is **14046**; The ISSN of JAFM journal is 17353645, 17353572; The impact score (IS) 2021 of JAFM is **1.12**, Impact Factor (IF) 2023 of JAFM is **1.152**, and h-index is **34**]
3. **Narsimhulu Dunna**, Addepalli Ramu and Dipak Kumar Satpathi, “Similarity Solution of Spherical Shock Waves: Effect of Viscosity”, Proyecciones Journal of Mathematics (**Open access**), <https://www.revistaproyecciones.cl/article/view/1232>, **Departamento de Matematicas, Universidad Catolica Del Norte.**, Chile, Vol. **35(1)**, pp. 11-31, **2016**. ISSN No.: 0716-0917, E-ISSN No.: 7176279. <https://doi.org/10.4067/S0716-09172016000100002> [The **Q3** journal is indexed in UGC CARE, Scopus, DOAJ; The (SJR) SCImago Journal Rank is **0.285**; Overall rank of Proyecciones is **15275**; The ISSN of Proyecciones journal is 07176279, 07160917; The impact score (IS) 2021 of Proyecciones is **0.71**, and h-index is **14**]
4. Addepalli Ramu, **Narsimhulu Dunna**, and Dipak Kumar Satpathi, “Numerical Study of Shock Waves in Non-Ideal Magnetogas dynamics (MHD)”, Journal of the Egyptian Mathematical Society (**Open access**) (<https://www.sciencedirect.com/science/article/pii/S1110256X14001230?via%3Dihub>), **Elsevier**, Egypt, Vol. **24(1)**, pp. 116-124, **2016**. ISSN No.: 2090-9128, DOI: <https://doi.org/10.1016/j.joems.2014.10.002>

5. **Narsimhulu Dunna**, Addepalli Ramu, Dipak Kumar Satpathi and G Sudha, “Phase-Plane Analysis Application to Guderley’s Problem”, Journal of Emerging Trends in Engineering and Applied Sciences, ISSN No.: 2141-7016, **Scholarlink Resource Centre Limited**, United Kingdom, Vol. 4(3), pp. 406-411, **2013**.

(https://www.researchgate.net/publication/301695836_Phase-Plane_Analysis_Application_to_Guderley's_Problem)

Publications in Conference Proceedings

1. Revathi Ravilisetty, **Narsimhulu Dunna**, and Ramu Addepalli, Effect of Viscosity on the Spherical Shock Wave Propagation in a Dusty Gas with Radiation Heat Flux and Exponentially Varying Density, the 4th International Conference on Frontiers in Industrial and Applied Mathematics, Springer Proceedings in Mathematics and Statistics: Frontiers in Industrial and Applied Mathematics (book chapter), Vol. 410, pp. 369-381, 2023, DOI: https://doi.org/10.1007/978-981-19-7272-0_26
2. Revathi Ravilisetty, Addepalli Ramu, **Narsimhulu Dunna**, “Solution of One-Dimensional Strong Converging Cylindrical and Spherical Shock Waves in Non-Ideal Gas”, The 64th Congress of the **Indian Society of Theoretical and Applied Mechanics** (An International Conference), Section Code: FM 6, held at School of Mechanical Sciences and School of Basic Sciences (Mathematics), Proceedings of 64th International Congress of ISTAM (http://203.110.246.133/#!/pages/proceedings_earlier), Indian Institute of Technology Bhubaneswar, India, December 9 - 12, **2019**
(http://203.110.246.133/resources/2019/proceedings/Papers_Abstract/126abstract.pdf)
(https://scholar.google.com/citations?view_op=view_citation&hl=en&user=HQmD3r8AAAAJ&citation_for_view=HQmD3r8AAAAJ:qjMakFHDy7sC)
3. **Narsimhulu Dunna**, Addepalli Ramu and Dipak Kumar Satpathi, “Numerical Solution to Strong Cylindrical Shock Wave in the Presence of Magnetic Field”, Lecture Notes in Engineering and Computer Science: Proceedings of the World Congress on Engineering, (<http://www.iaeng.org/publication/WCE2018/#:~:text=WCE%202018%20has%20attracted%20more.at%20the%20congress%20is%2050.95%25.>), International Conference on Applied and Engineering Mathematics (**ICAEM 2018**), Imperial College of London, London, United Kingdom, ISSN No.: 2078-0966, **Newswood Limited**, Vol. **I**, pp. 33-38, July 4-6, **2018**.
(http://www.iaeng.org/publication/WCE2018/WCE2018_pp33-38.pdf)
4. **Narsimhulu Dunna**, Addepalli Ramu and Dipak Kumar Satpathi, “Similarity Solutions to Shock Waves in Non-ideal Magnetogasdynamics”, AIP Conference Proceedings: 11th International Conference of Numerical Analysis and Applied Mathematics (**ICNAAM 2013**), With the cooperation of European Society of Computational Methods in Sciences, Engineering and Technology (ESCMCET), Rodos Palace Hotel, Rhodes, DOI: <https://doi.org/10.1063/1.4825632>, ISSN No.: 0094243X, E-ISSN No.: 15517616, **American Institute of Physics**, Vol. **1558**(1), pp. 860-864, September 21-27, **2013**.
(<https://aip.scitation.org/doi/abs/10.1063/1.4825632>)

Papers Presented in Conferences/Seminars/Symposiums

- **Narsimhulu Dunna**, “Effect of Modes of Heat Transfer on Converging Shock Waves in Non-ideal Magnetogasdynamics” in the International Conference on Mathematical Modelling and Emerging Trends in Computing (ICMMETC-2023) [In Collaboration with APTSMS) held during June 23-25, 2023 at Woxsen University, Hyderabad, Telangana, India.
- **Narsimhulu Dunna** and Revathi Ravilisetty, “Similarity Solutions of One-dimensional MHD Shock Wave in a Non-Ideal Gas with the Effect of Viscosity”, presented (as a contributory paper) in the **86th Annual Conference of Indian Mathematical Society** (An International Meet) organized by the

Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, during December 17 - 20, 2020.

- **Narsimhulu Dunna**, “Numerical Solution of One-dimensional Magnetohydrodynamic Shock Waves in a Viscous Ideal Gas”, presented in the **Three-day International Webinar on The Role of Applied Mathematics in Present Global Crises** organized by the Department of Applied Mathematics with Oceanology and Computer Programming, Vidya Sagar University, Midnapore, West Bengal, India, during August 5 - 7, 2020.
- Revathi Ravilisetty, Addepalli Ramu, **Narsimhulu Dunna**, “Solution of One-Dimensional Strong Converging Cylindrical and Spherical Shock Waves in Non-Ideal Gas”, presented in 64th Congress of the **Indian Society of Theoretical and Applied Mechanics** (An International Conference), Section Code: FM 6, held at School of Mechanical Sciences and School of Basic Sciences (Mathematics), Indian Institute of Technology Bhubaneswar, India, December 9 - 12, 2019.
- **Narsimhulu Dunna** and Addepalli Ramu, “An Explicit Forward Scheme to One-Dimensional Strong Converging Cylindrical and Spherical Shock Waves in Non-Ideal Gas”, presented in **International Conference on Applicable Mathematics (ICAM 2016)**, held at the Department of Mathematics, Stella Maris College, Chennai, India, during November 30 - Dec 1, 2016.
- **Narsimhulu Dunna** and Addepalli Ramu, “Self-Similar Motion of Strong Converging Cylindrical and Spherical Shock Waves in Non-ideal Medium”, presented in **International Conference on Current Trends in PDEs: Theory and Computations (ICCT-PDEs: TC 2015)**, held at Department of Mathematics, South Asian University, New Delhi, India, during December 28 - 30, 2015.
- **Narsimhulu Dunna** and Addepalli Ramu, “Similarity Solutions of Shock Waves in Non-Ideal Magnetogasdynamics: Part-a”, presented in **International Conference on Mathematical Sciences (ICMS 2012)**, held at Department of Mathematics, S. S. E. S. Amravati’s Science College, Nagpur, India, during December 28 - 31, 2012.

Conferences/Seminars/Workshops/Faculty Development Programs Participation

- Attended and participated in DST-SERB Sponsored the International Conference on Mathematical Modelling and Emerging Trends in Computing (**ICMMETC-2023**) [In Collaboration with APTSMS] organized by School of Technology, Woxsen University, Hyderabad, Telangana, India, during June 23-25, 2023.
- Participated in the One Week Online Faculty Development Programme on “**Mathematics and It’s Applications in Technology and Science**”, organized by the Department of mathematics, Madanapalle Institute of Technology and Science, Madanapalle-517325, Andhra Pradesh, India, during from 05-06-2023 to 09-06-2023.
- Participated in the **International Webinar on “Information Technology (IT) Journey from Data to Truth”**, organized by the Department of Statistics and Applied Mathematics, School of Mathematics and Computer Sciences, Central University of Tamil Nadu, Thiruvarur, Tamil Nadu, India, on 28th April 2023.
- Attended and participated in **Online Faculty Induction Programme (FIP)** organized by UGC-HRDC Osmania University, Hyderabad, Telangana from 02-12-2022 to 31-12-2022.
- Attended and participated in the Five Days National Level Faculty Development Program on Recent Advances in Mathematics organized by the Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore-632014, Tamil Nadu, India, during August 8-12th, 2022.
- Participated in the **International Webinar on “Applications of Machine Learning Techniques”**, organized by the Department of Statistics and Applied Mathematics, School of Mathematics and Computer Sciences, Central University of Tamil Nadu, Thiruvarur, Tamil Nadu, India, during 25 and 26th April 2022.
- Attended and participated in the International Workshop on Statistical Techniques and Data Analysis using STATA, Scheme for Promotion of Academic and Research Collaboration (SPARC) Government of India (GoI) and Indian Association for Social Sciences and Health (IASSH), jointly organized by the

School of Humanities and Social Sciences (SHSS), Indian Institute of Technology Mandi, March 22-26, **2022.**

- Participated in the Faculty Development Program organized by the Central University of Tamil Nadu, Thiruvavur, India on 30-03-**2021.**
- Attended and participated in the **86th Annual Conference of Indian Mathematical Society (An International Meet)** organized by the Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, during December 17 - 20, 2020.
- Participated in the **National Webinar on Mathematics in Industry, Challenges, and Frontiers (NWMICF-2020)** organized by the Department of Statistics and Applied Mathematics, School of Mathematics and Computer Sciences, Central University of Tamil Nadu, Thiruvavur, Tamil Nadu, India on 3rd October 2020.
- Attended and participated in **TEQIP-III Sponsored - Week Online Short Time Course (e-STC) on Numerical Solutions of Differential Equations**, which was held at Department of Mathematics, Dr. B. R. Ambedkar National Institute of Technology, Jalandhar, Punjab, India, September 16 - 20, 2020.
- Participated in the **Webinar on Graphisoft** (A training program on skill development) organized by the Department of Mathematics, Central University of Tamil Nadu, Thiruvavur, Tamil Nadu, India on 22nd September 2020.
- Participated in the **National Level Webinar on Changing facets of Human Development** organized by the Department of Economics, Central University of Tamil Nadu, Thiruvavur, Tamil Nadu, India on 12th August 2020.
- Participated in the **Three-day International Webinar on The Role of Applied Mathematics in Present Global Crises**, which was held at the Department of Applied Mathematics with Oceanology and Computer Programming, Vidya Sagar University, Midnapore, West Bengal, India, during August 5 - 7, 2020.
- Participated in the **“Webinar on Fascinating World of Mathematics and its Applications”**, which was held at the Department of Mathematics, School of Applied Sciences, Reva University, Karnataka, India on 24th July 2020.
- Participated in **One Week Online Faculty Development Program on “Scilab”** organized at Sinhgad College of Engineering, Vadgaon (Bk), Pune, India in association with Spoken Tutorial Project, IIT Bombay from 29th April 2020 to 4th May 2020.
- Attended and participated in **‘Short Term Training Program on Advanced Computational Methods in Engineering and Science’**, organized by the Department of Mathematics, National Institute of Technology (NIT), Warangal, during April 1 - 3, **2015.**
- Attended and participated in **‘Introductory Research Methodology Workshop’**, conducted by the Department of Humanities and Languages, Birla Institute of Technology and Science (BITS) Pilani Hyderabad Campus, 14th September **2013.**
- Attended and participated in **‘DAAD Network International Workshop on Modeling, Computing and Optimization’**, organized by the Department of Mathematics, Indian Institute of Technology (IIT), Madras, during September 3 - 12, **2012.**
- Attended and participated in **‘Recent Trends in Partial Differential Equations and Applications**, organized by the Department of Mathematics and Statistics, University of Hyderabad, during March 18 - 19, **2012.**
- Attended and participated in **‘LECTURE -WORKSHOP IN MATHEMATICS’** (Initiatives in M.Sc. Integrated Program), organized by the Ramanujan School of Mathematics and Computer Science, Pondicherry Central University, during April 3 - 5, **2008.**
- Attended and participated in **‘Mathematics Training and Talent Search Programme’** (MTTS) funded by NBHM, R. I. E. Mysore, May 19 – June 14, **2008.**

Invited/Plenary/Key Note Speaker

- Presented a paper entitled “Mathematical Modelling of Blood Glucose and Insulin Regulatory System (BGIRS)” (as a **Plenary** talk) in the International Conference on Mathematical Modelling and Emerging Trends in Computing (ICMMETC-2023) [In Collaboration with APTSMS) held during June 23-25, 2023 at Woxsen University, Hyderabad, Telangana, India.
- Acted as the Session Chair of the International Conference on Mathematical Modelling and Emerging in Computing held during June 23-25, at Woxsen University, Hyderabad, Telangana, India.

Administrative Experience

- Acting as a Department mentor for the remedial coaching classes, Remedial Coaching Cell, Central University of Tamil Nadu, Thiruvarur, India.
- Nominated as a subcommittee member for the NAAC Criterion-III.
- Acting as a Department Alumni coordinator.

Personal Information

Name: Narsimhulu Dunna
Father's Name: Late. Dunna Madhavayya
Date of Birth: 12th June 1987
Nationality: Indian
Gender: Male
Marital Status: Married
Language Proficiency: English, Hindi, Telugu.
Permanent Address: H. No.: 1-33, Chinna Veedhi Street, Pallivooru Village,
Reyya Padu Post, Vajrapukotturu Mandal, Srikakulam District,
Visakhapatnam City, Andhra Pradesh State, Pin Code - 532218.

Declaration

I hereby declare that the above statements made by me are true to the best of my knowledge and belief.

Date: 03-07-2023,

Place: Thiruvarur.

(Narsimhulu Dunna)

