Curriculum Vitae

Dr. Niranjan Sahoo
Professor
Department of Mechanical Engineering
Indian Institute of Technology Guwahati
Guwahati – 781 039, INDIA
Email: shock@iitg.ac.in
Phone: 0091-361-258 2665

Education

- Doctoral Degree (PhD): Department of Aerospace Engineering, Indian Institute of Science, Bangalore, June 2004
- Master Degree (M.E.): Thermal Engineering, Department of Mechanical Engineering, University of Roorkee (upgraded as IIT Roorkee), January 1998
- Bachelor Degree (B.E.): Mechanical Engineering, Utkal University, Bhubaneshwar, June 1996

Professional Experience

- February 2015 to till date: Professor, Department of Mechanical Engineering, Indian Institute of Technology Guwahati
- January 2010 to January 2015: Associate Professor, Department of Mechanical Engineering, Indian Institute of Technology Guwahati
- May- July 2010: Visiting Research Fellow, Shock Wave Laboratory, RWTH Aachen University, Germany
- December 2004 to December 2009: Assistant Professor, Department of Mechanical Engineering, Indian Institute of Technology Guwahati
- June 2006 to May 2007: Visiting Research Fellow, Division of Mechanical Engineering, University of Queensland, Brisbane, Australia
- March 2004 to November 2004: Research Associate, Department of Aerospace Engineering, Indian Institute of Science, Bangalore

Academic Awards/Honors

- 2010; Recipient of 2-months research fellowship under DAAD programme, Germany
- 2006-2007; Recipient of 12-months research fellowship under BOYSCAST programme, supported by Department of Science and Technology (DST), New Delhi
- 2008-2009; Recipient of Fast Track Project under Young Scientist Scheme supported by Department of Science and Technology, New Delhi

Research Highlights

- Experimental Aerodynamics (Aero-test facility design and development: Subsonic Wind Tunnel and Shock Tube)

- Measurement Diagnostics for High Speed Flows (Stress Wave Force Balances, Surface Junction Thermal Probes)
- Wind Engineering (Horizontal-axis and Vertical-axis wind turbines, Wind farm modelling, Particle Image Velocimetry – PIV)
- Renewable Energy and Hydrogen Energy
- Underwater Technology for Energy Storage Mechanism
- Internal Combustion Engines (Fuel design, Emulsification, Biofuels, Dual-fuel Engines)
- Shock Waves and Allied Research Applications
- Impact Assessment on Aerospace Materials
- Development of Lightweight Energy Absorbing Materials
- Mechanical Characterization and High Strain Rate Deformation Behavior of Materials

Courses Taught at Undergraduate (UG) and Postgraduate (PG) Level

- Engineering Drawing (UG)
- Engineering Mechanics (UG)
- Fluid Mechanics (UG, PG)
- Engineering Thermodynamics (UG)
- Applied Thermodynamics (UG)
- Advanced Thermodynamics (PG)
- Heat and Mass Transfer (UG)
- Refrigeration and Air Conditioning (UG/PG)
- Gas Dynamics (PG)
- Experimental Methods (PG)
- Combustion (PG)
- Viscous Fluid Flow (PG)
- Aircraft Propulsion (PG)

Supervision of Students

- Research Scholar (PhD): 16-completed; 18-ongoing
- Master Degree (M. Tech/MS): 56-completed; 10-ongoing
- Bachelor Degree (B. Tech): 15-completed; 06-ongoing

Research Projects

- **2022-2024**, Innovative hybrid composite metallic foam as energy absorbing materials – Design, Fabrication and Characterization, New Generation Innovation and Entrepreneurship Development Centre - New Gen IEDC, IIT Guwahati (Mentoring Investigator for PhD Scholar)

- **2022-2024,** Design and in-house fabrication of an underwater compressed air storage system, IIT Guwahati Technology Innovation and Development Foundation, (Principal Investigator – PI)
- **2021-2023,** Online diagnosis of shock induced damage in future reusable launch vehicle (RLV), India Space Research Organization (ISRO-VSSC-RESPOND), Bangalore (Co-Investigator)
- **2020-2022,** Stress Wave Force Balance (SWFB) Technique: An alternative method of accurate force measurement, India Space Research Organization (ISRO-VSSC-RESPOND), Bangalore (Principal Investigator – PI)
- **2019-2022,** Experimental studies on fineness of a wing, sponsored by Defense Research and Development Board (AR&DB–Aerodynamic panel), New Delhi (Co-Investigator)
- **2015-2018,** Calibration methods of high frequency thermal sensors for localized temperature and heat flux measurements in gas turbine and internal combustion engine application, sponsored by Defense Research and Development Board (AR&DB–GTMAP Panel), New Delhi (Principal Investigator - PI)
- **2016-2019,** Development and performance analysis of nanofluid based dielectric fluid as an insulant and coolant in power transformers, Science and Engineering Research Board (SERB), New Delhi (Co-Investigator)
- **2016-2017,** Compressible flow solver with immersed boundary approach, sponsored by India Space Research Organization (ISRO-VSSC-RESPOND), Bangalore (Co-Investigator)
- **2014-2016,** Development and performance evaluation of a 3kW biogas based power generation system utilizing lignocellular biomass, Ministry of New and Renewable Energy (MNRE), New Delhi (Co-Investigator)
- **2014-2016,** Laser based calibration methodology for thermal sensors in combustion measurements, sponsored by Defense Research and Development Board (ER&IPR), New Delhi (Principal Investigator - PI)
- **2012-2014,** Development of a conjugate heat transfer solver for hypersonic applications, sponsored by Aeronautics Research and Development Board, New Delhi (Co-Investigator)
- **2011-2012,** Utilization of Biowaste for Generating Power in Diesel Engines, sponsored by Defense Research and Development Laboratory, Tezpur (Co-Investigator)
- **2010-2012**, Shock tube development and verification of capabilities of existing correlation for stagnation point heat transfer rate, sponsored by Aeronautics Research and Development Board, New Delhi (Principal Investigator - PI)
- **2010-2012**, Development and Analysis of Twisted Two-bladed, Two-stage Savonius Rotor for Power Generation, sponsored by ADnEnergy, London (Co-Investigator)
- **2009-2012,** Design, Development and Performance Evaluation of Stress Wave Force Balances for Aerospace Applications" sponsored by Department of Science and Technology, Govt. of India, New Delhi (Principal Investigator - PI)

Online Teaching Course Materials (In association with other faculty members)

- **2022**: Blast and Shock Resistant Bio-Inspired Functional Materials Design Methodologies, GIAN Course offered through IIT Kharagpur
- **2022**: Advanced Thermodynamics (Mechanical Engineering/Energy Systems/Propulsion), MOOCs Course (30 hours & 12 Weeks, PG) offered under NPTEL platform
  Course URL: https://archive.nptel.ac.in/courses/112/103/112103313/
- **2021**: Applied Thermodynamics (Mechanical Engineering/Energy Systems/Propulsion), MOOCs Course (30 hours & 12 Weeks, UG) offered under NPTEL platform
  Course URL: https://onlinecourses.nptel.ac.in/noc21_me119/preview
- **2021**: Fundamentals of Compressible Flow (Mechanical/Aerospace Engineering), MOOCs Course (30 hours & 12 Weeks, PG) offered under NPTEL platform
  Course URL: https://onlinecourses.nptel.ac.in/noc21_me123/preview
- **2020**: Fundamentals of Compressible Flow (Mechanical/Aerospace Engineering), MOOCs Course (20 hours & 8 Weeks, PG) offered under NPTEL platform
  Course URL: https://swayam.gov.in/nd1_noc20_me59/preview
- **2010-2014,** "Virtual Laboratory Experiences in Fluid and Thermal Sciences" MHRD, New Delhi
- **2009-2012,** "Principles of Fluid Dynamics and Hypersonic Aerodynamics", Web Course Developer (Aerospace Engineering) under NPTEL II/III
- **2011**, QIP Sponsored Short Term Course on "Recent Trends in Fuels and Combustion", Department of Mechanical Engineering, Indian Institute of Technology Guwahati, 29th August to 02nd September 2012
- **2008**, QIP Sponsored Short Term Course on "Aerospace Propulsion for Beginners", Department of Mechanical Engineering, Indian Institute of Technology Guwahati, December 8-12
- **2005-2007**, "Fluid Mechanics" Web Course Developer (Civil Engineering) under NPTEL
- **2005-2007**, Preparation of Self-Instructional Course Material on "Refrigeration and Air-conditioning/Utilization" under Construction Education and Training Project (CETP) by Construction Industry Development Council (CIDC) for Indira Gandhi National Open University (IGNOU)

Research Publications

(Details of Journal/Conference publications can be found from Google Scholar Citations)

- Referred Journals*: 115
- Conferences: 153
- Book Chapters: 11

* List of Peer-Reviewed Impact Factor Journals

- AIAA Journal
- AIAA Journal of Thermophysics and Heat Transfer
- AIAA Journal of Spacecraft and Rockets
- Aerospace Science and Technology, Elsevier
- Applied Thermal Engineering, Elsevier

- ASCE Journal of Energy Engineering
- ASME Journal of Fluids Engineering
- ASME Journal of Energy Resources Technology
- ASME Journal of Engineering for Gas Turbines and Power
- ASME Journal of Engineering Materials and Technology
- ASME Journal of Heat Transfer
- ASME Journal of Solar Energy Engineering
- ASME Journal of Thermal Science and Engineering Applications
- Biomass Conversion and Biorefinery, Springer
- Biofuels, Taylor & Francis
- Cleaner Engineering and Technology, Elsevier
- Energy, Elsevier
- Energy Conversion and Management, Elsevier
- Energy and Environment, Sage
- Energy and Fuels, ACS
- Experimental Thermal and Fluid Science, Elsevier
- Experiments in Fluids, Springer
- European Journal of Fluid Mechanics, Elsevier
- Flow Measurement and Instrumentation, Elsevier
- Heat and Mass Transfer, Springer
- International Journal of Advanced Manufacturing Technology, Springer
- International Journal of Aerodynamics, Inderscience
- International Journal of Exergy, Inderscience
- International Journal of Green Energy, Taylor & Francis
- International Journal of Heat and Mass Transfer, Elsevier
- International Journal of Numerical Methods in Fluids, John Wiley
- International Journal of Heat and Mass Transfer, Elsevier
- International Journal of Structural Stability and Dynamics, World Scientific
- IEEE Transaction of Dielectric and Electrical Insulation
- IET Science, Measurement & Technology
- Journal of Power Technologies, Institute of Heat Engineering
- Journal of the Institution of Engineers (India): Series C, Springer
- Journal of Manufacturing Processes, Elsevier
- Journal of Materials Engineering and Performance, Springer
- Journal of Wind Engineering & Industrial Aerodynamics, Elsevier
- Journal of Renewable and Sustainable Energy, AIP
- Measurement, Elsevier
- Measurement Science and Technology, IOP
- Physical Review E, APS
- Physics of Fluids, AIP
- Proc. IMechE, Part A: Journal of Power and Energy, Sage
- Proc. IMechE, Part G: Journal of Aerospace Engineering, Sage
- Renewable Energy, Elsevier
- Renewable and Sustainable Energy Reviews, Elsevier
- Sadhana – Academy Proceedings in Engineering Science, India
- Smart Materials and Structures, IOP
- Waste Biomass Valor, Springer
- Wind Engineering, Sage

Outreach Activities

- Invited delegate and resource speakers for academic institutions and R&D organizations
- Session chair for various reputed conferences
- Organizers for TEQIP III short term courses and GIAN courses

- Reviewer of peer reviewed Journals, PhD thesis of various institutes and universities
- Expert committee members for R&D organizations
- Mentors for Post-doc research scholars
- Research collaboration with foreign universities
- Member of professional organizations

Administrative Responsibilities for specific durations

- Academic Coordinator, Joint PhD programme with GIFU University, Japan
- Faculty In charge, Peer Review Comittee
- Member, Faculty Advisory Committee
- Member, Library Advisory Comittee
- Secretary, Department Post Graduate Committee
- Committee Chair, Institute In fracture Planning Establishment
- B.Tech Project Coordinator
- Vice-Chair Person GATE/JAM

Graduating PhD Scholars

1. Dr. Anil Kumar Rout (2022)
2. Dr. Saibal Kanchan Barik (2022)
3. Dr. Wittison Kamei (2021)
4. Dr. Sangjukta Devi (2020)
5. Dr. Samiayyan Pandian (2020)
6. Dr. Shuvayan Brahmachary (2019)
7. Dr. Menelik Walle Mekonen (2019)
8. Dr. Mrutyunjay Maharana (2019)
9. Dr. Soumya Ranjan Nanda (2018)
10. Dr. Sumit Agarwal (2018)
11. Dr. Ashish Jagannath Chaudhari (2018)
12. Dr. Shrutidhara Sarma (2017)
13. Dr. Ravi Kumar Peetala (2014)
14. Dr. Rakesh Kumar (2014)
15. Dr. Biplab Kumar Debnath (2013)
16. Dr. Bibhuti Bhusan Sahoo (2011)