CURRICULUM VITAE – SANDIPAN GHOSH MOULIC

Designation

Professor, Department of Mechanical Engineering, I.I.T. Kharagpur

Educational Background

- Ph.D in Mechanical Engineering — December 1993
  Arizona State University — GPA 4.0/4.0
  Thesis: Nonlinear Instability Theory in Fluid Dynamics

- M.S. in Mechanical Engineering — May 1988
  Arizona State University — GPA 3.93/4.0
  Thesis: Mixed Convection Along a Wavy Surface

- B.Tech. (Hons.) in Mechanical Engineering — May 1985
  Indian Institute of Technology, Kharagpur — GPA 9.7/10.0
  Thesis: Flow in Curved Pipes

Academic / Professional Awards and Honours

- Merit Certificate in lieu of National scholarship for performance in Indian Certificate of Secondary Education (I.C.S.E.) Examination, Government of India, 1979
- Placed in one of the All-India first ten ranks in Indian School Certificate (I.S.C.) Examination, 1981
- J.C. Ghosh Scholarship for the best student of the final year class of Mechanical Engineering, I.I.T. Kharagpur, 1984-1985
- General Proficiency Prize for second rank in undergraduate class, I.I.T. Kharagpur, 1985
- General Proficiency Prize for standing first in Project, Viva-voce and Sessional Work, I.I.T. Kharagpur, 1985
- Regents Graduate Academic Scholarship, Arizona State University, 1987-1988
- Phi Kappa Phi Honor Society
- Biographical sketch published in the 16th edition of Marquis Who's Who in the World, 1999
- Mentor of the year 2000, Mechanical Engineering Association, I.I.T. Bombay, 2000
- Selected as one of the outstanding reviewers of ASME Journal of Heat Transfer, 2009
- Currently listed as the first most cited author of ASME Journal of Heat Transfer 1989, for two publications on convective heat transfer from wavy surfaces, in the database 'Exaly'

Research Interests

Theoretical and computational fluid dynamics and heat transfer

- Convective heat transfer from wavy surfaces
- Computation of two-fluid incompressible flows using level-set methods
- Numerical simulation of liquid sloshing
- Stability of steady and time-periodic flows
- Direct numerical simulation (DNS) of instability and transition
- Spectral methods in fluid dynamics
- Perturbation methods in fluid dynamics
- Numerical solution of non-similar boundary-layer flows
- Mixed Convection

Teaching Interests

Fluid Mechanics, Thermodynamics, Heat Transfer, Computational Fluid Dynamics, Mathematical Methods, Numerical Methods

Graduate level courses taken at Arizona State University

- Fluid Mechanics (MAE 571)
- Inviscid Fluid Flow (MAE 572)
- Viscous Fluid Flow (MAE 573)
- Turbulent Flow Model (MAE 577)
- Boundary layer Stability and Transition (MAE 591 S)
- Conduction Heat Transfer (MAE 585)
- Convection Heat Transfer (MAE 586)
- Radiation Heat Transfer (MAE 587)
- Advanced Convective Heat Transfer (MAE 591 S)
- Computation of Heat Transfer (MAE 591 S)
- Computational Heat Transfer and Fluid Flow (MAE 598 ST)
- Linear Algebra (ASE 582)
- Numerical Linear Algebra (MAT 591 S)
- Numerical Solution of Partial Differential Equations (MAT 591 S)
- Numerical Optimization (MAT 561)
- Dynamical Systems Chaos and Bifurcation (MAT 598 ST)
- Spectral Methods for Partial Differential Equations (MAT 598 ST)
- Numerical Methods for Bifurcation Problems (MAT 598 ST)

Professional Activities

- Reviewer for
    - Proceedings of the Royal Society of London A: Mathematical, Physical and Engineering Sciences,
    - Physics of Fluids,
    - ASME Journal of Heat Transfer,
    - International Journal of Heat and Mass Transfer,
    - International Journal of Thermal Sciences,
    - Scientific Reports,
    - Journal of Applied Mathematics,
    - Heat Transfer Engineering,
    - Heat Transfer Research,
    - Sadhana,
    - Proceedings of the National Academy of Sciences, Section A:Physical Sciences

- Acted as Vice-President, National Society for Fluid Mechanics and Fluid Power, 2011

- Offered a short-term course on ‘Nonlinear Dynamics and Chaos’ at I.I.T. Bombay, sponsored by Quality Improvement Program, AICTE, in May 1997

- Offered short-term course on ‘Numerical Solution of Differential Equations’ to scientists of Nuclear Power Corporation, in November 2000

- Principal Investigator of project sponsored by Indian Space Research Organization, on ‘Numerical Solution of Axisymmetric Sloshing Motion in Rotating Cylindrical Containers Under Low Gravity Conditions’, at I.I.T. Bombay, from 1996-2000

- Taught Fluid Mechanics in a one-week Coordinators’ Workshop on Fluid Mechanics, organized under National Mission on Education through ICT (NMEICT), MHRD, Government of India, in March 2014

- Taught Fluid Mechanics in a two-week ISTE Main Workshop on Fluid Mechanics, organized under National Mission on Education through ICT (NMEICT T10KT EIT Project) to over 8000 teachers, in May 2014

Research Supervision

A) Ph.D : 5

- Title of thesis: Numerical Simulation of Two-Fluid Flows with Sharp Interfaces Using Level Set Method
  Name of scholar: Dr. Abdusamad Alias Salih

- Title of thesis: On Some Aspects of Room Airflow Simulations
  Name of scholar: Dr. Brajesh Tripathi
  Name of co-supervisor: Late Prof. R.C. Arora

- Title of thesis: Hydrodynamic Stability of Buoyancy Driven Flows Using Chebyshev Spectral Method on Non-staggered Grid
  Name of scholar: Dr. Himangsu Sekhar Panda

- Title of thesis: Linear Stability of Steady and Time-periodic Flows
  Name of scholar: Dr. Uttam Kumar Sarkar

- Title of thesis: Numerical and Experimental Investigation of Buoyancy-Induced Convection in High Porosity Media
  Name of scholar: Dr. Tupakula Ramakrishna
  Name of co-supervisor: Prof. A. Bhattacharya

B) M.Tech.: 50

C) B.Tech.: 53

Courses Taught

A) Undergraduate courses taught at I.I.T. Bombay (1994-2000)

- Fluid Mechanics I (ME203)
- Fluid Mechanics II (ME204)
- Computational Methods in Engineering (ME342)
- Advanced Computer-Aided Solutions (ME473)
- Computational Fluid Dynamics and Heat Transfer (ME415)
- Fluid Mechanics Laboratory (ME214)
- Fluid Mechanics and Hydraulic Machines Laboratory (ME217)
- Experimental Engineering I (ME329)
- Experimental Engineering III (ME417)

B) Postgraduate courses taught at I.I.T. Bombay (1994-2000)

- Fluid Dynamics (ME651)
- Computational Methods in Thermal and Fluids Engineering (ME704)
- Numerical methods and computational techniques for fluid flow problems (ME660)
- Thermal and Fluids Engineering Laboratory (ME657)
- Energy Systems Laboratory (EN609)

C) Undergraduate courses taught at I.I.T. Kharagpur

- Fluid Mechanics (262005, ME22001, ME21101)
- Basic Thermodynamics (ME22002)
- Advanced Fluid Mechanics (ME60201, ME61003)
- Convective Heat and Mass Transfer (ME60002, ME61004, ME60014)
- Compressible Flow (ME60088)
- Computational Fluid Dynamics (ME60212, ME60204)
- Applied ThermoFluids II (ME40701)
- Thermal Engineering Laboratory (263901)
- Applied Thermofluids Laboratory I (ME39606)
- Applied Thermofluids Laboratory II (ME34004, ME44001, ME49003, ME49601)

D) Postgraduate courses taught at I.I.T. Kharagpur

- Fluid Mechanics (ME60011)
- Conduction and Radiation Heat Transfer (ME60017)
- Convective Heat and Mass Transfer (ME60014)
- Compressible Flow (ME60088)
- Computational Fluid Dynamics (26538, ME60012)
- Mathematical Methods in Thermal Engineering (ME60309)

Publications in Journals

R.C. Arora and S. Ghosh Moulic 1989 Laminar free convection from a vertical flat plate with a protuberance. *Reg. J. Energy Heat Mass Transfer* **11**, 37-46

S. Ghosh Moulic and L.S. Yao 1989 Mixed convection along a wavy surface. *ASME J. Heat Transfer* **111**, 974-979

S. Ghosh Moulic and L.S. Yao 1989 Natural convection along a wavy surface with uniform heat flux. *ASME J. Heat Transfer* **111**, 1106-1108

S. Ghosh Moulic and L.S. Yao 1991 Heat transfer near a small heated protrusion on a plate. *Int. J. Heat Mass Transfer* **34**, 1481-1489

S. Ghosh Moulic and L.S. Yao 1992 Natural convection near a small protrusion on a plate. *Int. J. Heat Mass Transfer* **35**, 2931-2940

B. B. Rogers, S. Ghosh Moulic and L.S. Yao 1993 Finite amplitude instability of mixed convection. *J. Fluid Mech.* **254**, 229-250

L.S. Yao and S. Ghosh Moulic 1994 Uncertainty of convection. *Int. J. Heat Mass Transfer* **37**, 1713-1721

L.S. Yao and S. Ghosh Moulic 1995 Nonlinear instability of traveling waves with a continuous spectrum. *Int. J. Heat Mass Transfer* **38**, 1751-1772

L.S. Yao and S. Ghosh Moulic 1996 Taylor-Couette instability with a continuous spectrum. *ASME J. Appl. Mech.* **62**, 915-923

L.S. Yao and S. Ghosh Moulic 1996 Dynamic effect of centrifugal forces on turbulence. *ASME J. Appl. Mech.* **63**, 84-94

S. Ghosh Moulic and L.S. Yao 1996 Taylor-Couette instability of traveling waves with a continuous spectrum. *J. Fluid Mech.* **324**, 181-198

A. Salih and S. Ghosh Moulic 2006 A level set formulation for the numerical simulation of impact of surge fronts. *Sadhana* **31**, 697-707

B. Tripathi and S. G. Moulic 2007 Investigation of the buoyancy affected airflow patterns in an enclosure subjected at different wall temperatures. *Energy and Buildings* **39**, 906-912

B. Tripathi and S. G. Moulic 2007 Investigation of the airflow patterns inside a room through the low Re k-ε model. *Int. J. Heat and Technology* **25**, 25-31

B. Tripathi, S.G. Moulic and Late R.C. Arora 2007 A CFD analysis of effect of buoyancy on room air flow. *Thermal Science* **11**, 79-94

S. Ghosh Moulic and L.S. Yao 2009 Mixed convection along a semi-infinite vertical flat plate with uniform surface heat flux. *ASME J. Heat Transfer* **131**, 022502(1-8)

S. Ghosh Moulic and L.S. Yao 2009 Non-Newtonian Natural Convection along a vertical flat plate with uniform surface temperature. *ASME J. Heat Transfer* **131**, 062501(1-8)

A. Salih and S. Ghosh Moulic 2009 Some numerical studies of interface advection properties of level set methods. *Sadhana* **34**, 271-298

A. Salih and S. Ghosh Moulic 2010 Numerical simulation of buoyancy driven bubble motion using level set method. *Int. J. Computational Methods in Engineering Science and Mechanics* **11**, 211-229

H.S. Panda and S. Ghosh Moulic 2010 Analytical solution of natural convective gas microflow in a tall vertical enclosure. *Proc. IMechE, Part C: J. Mechanical Engineering Science* **225**, 145-154

B. Tripathi and S. Ghosh Moulic 2011 Numerical evaluation of inclined ceiling diffuser on buoyancy and airflow patterns in an enclosed space. *CFD Letters* **3**, 48-64

B. Tripathi and S. Ghosh Moulic 2012 Investigation of air drafting pattern obtained from the variation in outlet positions inside a closed area, *Journal of Applied Fluid Mechanics*, **5 (4)**, 1-12

A. Salih and S. Ghosh Moulic 2013 A Mass Conservation Scheme for Level Set Method Applied to Multiphase Flows. *Int. J. Computational Methods in Engineering Science and Mechanics* **14 (4)**, 271-289

M.M. Molla, S. Ghosh Moulic and L.S. Yao 2016 Prediction of Heat Transfer to Fully Developed Pipe Flows with a Modified Power Law Viscosity Model. *SCIREA Journal of Mechanics* **1**, 1-47

T. Ramakrishna, S. Ghosh Moulic and A. Bhattacharya 2021 Experimental Investigation of Buoyancy-Induced Convection in High-Porosity Open-Cell Aluminium Metal Foams Under Different Orentations, *ASME Journal of Thermal Science and Engineering Applications* **13,** 061003(1-10)

Publications in International Conferences

S. Ghosh Moulic and L.S. Yao 1991 Influence of body forces on homogeneous turbulence. *Bull. Amer. Phys. Soc*. **36** (10), 2680 (presented at the Forty-Fourth Annual Meeting of the Division of Fluid Dynamics of the American Physical Society)

L.S. Yao and S. Ghosh Moulic 1994 Nonlinear instabilities of traveling waves with a continuous spectrum. *Bull. Amer. Phys. Soc.* **39** (9), 1920 (presented at the Forty-Seventh Annual Meeting of the Division of Fluid Dynamics of the American Physical Society)

H.R. Mistry, S. Ghosh Moulic and R.C. Arora 2002 Liquid sloshing in rectangular containers, Proceedings of the 29th National and 2nd International Conference on Fluid Mechanics and Fluid Power, I.I.T. Roorkee, December 12-14, 2002, 445-452

A. Salih and S. Ghosh Moulic 2002 Oscillations of a liquid drop in a zero gravity environment- A benchmark problem for two-phase flow computations, Proceedings of the 29th National and 2nd International Conference on Fluid Mechanics and Flow Power, I.I.T. Roorkee, December 12-14, 2002, 940-947

B. Tripathi, R.C. Arora and S. Ghosh Moulic 2004 Effect of Grashof number on laminar room air flow, Proceedings of the 17th National and 6th ISHMT-ASME Heat and Mass Transfer Conference, IGCAR, Kalpakkam, January 5-7, 2004, HMT2004 C025, 145-150

B. Tripathi, R.C. Arora and S. Ghosh Moulic 2004 Effect of buoyancy on room air flow, Proceedings of 2004 ASME Heat Transfer/Fluids Engineering Summer Conference, July11-15, 2004, Western Charlotte, North Carolina, USA, (HTFED2004-56878-83) 1333-1338

A. Salih and S. Ghosh Moulic 2005 A level set method for simulation of coalescence of droplets, Proceedings of IMECE2005, ASME International Mechanical Engineering Congress and Exposition, Orlando, Florida, USA, December 5-11, 2005 (IMECE2005-79507) ASME Publications, **261**, 723-732 (2005) doi:10.1115/IMECE2005-79507

A. Salih and S. Ghosh Moulic 2006 Simulation of Rayleigh-Taylor instability using level set method, 33rd National and 3rd International Conference on Fluid Mechanics and Fluid Power, I.I.T. Bombay, December 7-9, 2006, Paper No. 1303

U.K. Sarkar and S. Ghosh Moulic 2013 Stability of plane Couette-Poiseuille flow under stable thermal stratification. 22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, I.I.T. Kharagpur, December 28-31, 2013, Paper No. HMTC1300443

T. Ramakrishna, S. Ghosh Moulic and A. Bhattacharya 2017 Experimental Study on Buoyancy-Induced Convection in Open Cell Aluminium Metal Foams, ASME 2017 International Mechanical Engineering Congress and Exposition Vol. 8: Heat Transfer and Thermal Engineering, Tampa, Florida, November 3-9, 2017, Paper No. IMECE2017-71592, pp V008T10A023, 6 pages, ISBN 978-0-7918-5843-1, doi: 10.1115/IMECE2017-71592

U.K. Sarkar and S. Ghosh Moulic 2018 An efficient algorithm for stability analysis of time-periodic flows. 5th International Conference on Computational Methods for Thermal problems, 519-522, THERMACOMP2018, I.I.Sc Bangalore, July ,9-11 2018.