



Prof. Swarup Kumar Mahapatra

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Education:

- Ph.D, Jadavpur University, Kolkata (2000)
- ME (Hons), University of Roorkee (Presently; IIT Roorkee), Roorkee (1992)
- BSc. Engg (Hons), UCE (Presently, VSSUT), Burla (1987)

Teaching:

• UG

Autumn (July-Dec): Hydraulics, Applied Thermo Fluid

Spring (Jan-May): Refrigeration & Air-Conditioning, Applied Thermodynamics

• PG (M.Tech/Ph.D)

Autumn (July-Dec): Advance Thermodynamics, Computational Fluid Dynamics

Spring (Jan-May): Numerical Methods in Radiative Heat Transfer

Research Interests:

- Thermal Radiation Modelling
- Conjugate Heat and Mass Transfer
- Bio-Heat Transfer
- Complex Fluid Flow
- Flow in Porous Medium

Academic Positions:

- Professor, School of Mechanical Sciences, Indian Institute of Technology Bhubaneswar (Since ..April 2013).
- Associate Professor, School of Mechanical Sciences, Indian Institute of Technology Bhubaneswar (July 2009 - April 2013).
- Professor, National Institute of Technology Rourkela (August 2006- July2009)
- Reader, University College of Engineering Burla (April 1997-August2006)
- Lecturer, University College of Engineering Burla (April 1991-April 1997)
- Trainee Engineer, Nuclear Power Corporation (1990-1991)
- Lecturer, IGIT, Sarang (1989-1990)
- Graduate Engineer, NTPC (1989)

Administrative responsibilities:

- Head, School of Mechanical Sciences, IIT Bhubaneswar
- Dean, Alumni Affairs and International Relations
- Dean of Student Affairs, IIT Bhubaneswar
- Engineer-in-charge of HVAC system for different buildings in NIT Rourkela
- Head of Cryogenics and Industrial refrigeration Center

Research Guidance:**Continuing:**

- Mr. Anil Verma
- Mr. Amman Jakhar

Awarded/submitted:

- Dr. Sofen Kumar Jena (Awarded 2014)
- Dr. Sikata Samantaray (Awarded 2014)
- Dr. R.K. Mallik (Awarded: 2012)
- Dr. B.K. Dandapata (Awarded: 2011)
- Dr. Anjan Sarkar (Awarded: 2009)
- Dr. P.K. Nanda (Awarded: 2007)

M.Tech Guidance:

Completed: 17

Continuing: 3

Conferences (International/National): 28

No Publications in the International Journal: 42

Some Publications (International Journal):

- Sofen K. Jena, Laxman K. Malla, **Swarup K. Mahapatra** and Ali J. Chamkha, Transient Buoyancy-Opposed Double Diffusive Convection of Micropolar Fluids in a Square Enclosure, *Int. J. Heat and Mass Transfer*, Vol. 81 (2015) pp. 681-694. DOI: [10.1016/j.ijheatmasstransfer.2014.10.030](https://doi.org/10.1016/j.ijheatmasstransfer.2014.10.030)
- Sofen K. Jena and **Swarup K. Mahapatra**, A numerical investigation of surface radiation interaction with magnetoconvection of an electrically conducting fluid imposed with a transverse magnetic field, *Heat Transfer Engineering*. Vol. 36 (2015) pp. 21-32. DOI: [10.1080/01457632.2014.897584](https://doi.org/10.1080/01457632.2014.897584)
- Sofen K. Jena, **Swarup K. Mahapatra** and Amitava Sarkar, Effect of Thermal Radiation Interaction with Thermosolutal Convection - A Critical Appraisal, *Heat Transfer Asian Research*, Vol. 44 (2015) pp.39-65. DOI: [10.1002/htj.21108](https://doi.org/10.1002/htj.21108)
- Sofen K. Jena, Vineel Kumar Reddy Yettella, Chinta Phani Rama Sandeep, **Swarup Kumar Mahapatra** and Ali J. Chamkha, Three-dimensional Rayleigh-Bénard convection of molten gallium in a rotating cuboid under the influence of a vertical magnetic field, *Int. J. Heat and Mass Transfer*, Vol. 78 (2014) pp. 341-353. DOI: [10.1016/j.ijheatmasstransfer.2014.06.036](https://doi.org/10.1016/j.ijheatmasstransfer.2014.06.036)
- Anjan Sarkar and **Swarup K. Mahapatra**, Role of thermal radiation on the functionality of thermoelectric cooler with heat sink, *Applied Thermal Engineering* 69 (2014) 39-45. DOI: [doi:10.1016/j.applthermaleng.2014.04.025](https://doi.org/10.1016/j.applthermaleng.2014.04.025)
- **Swarup K. Mahapatra**, Mixed Convection Inside a Differentially Heated Enclosure and its Interaction with Radiation—An Exhaustive Study, *Heat Transfer Engineering*, 35 (2014) 74-93. DOI: [10.1080/01457632.2013.730912](https://doi.org/10.1080/01457632.2013.730912)
- Sofen K. Jena and **Swarup K. Mahapatra**, Role of thermal radiation on buoyant convection of industrial dusty air, A numerical investigation, *Heat Transfer Research* (In press).
- Sofen K. Jena, **Swarup K. Mahapatra** and Amitava Sarkar, Coupled magneto-buoyant convection and radiation in an inclined enclosure: An exhaustive study, *Int. J. of Numerical Methods in Heat and Fluid Flow*, Vol. 24 (2014) pp. 237-264. DOI: [10.1108/HFF-06-2012-0127](https://doi.org/10.1108/HFF-06-2012-0127)
- Sofen K. Jena, **Swarup K. Mahapatra** and Amitava Sarkar, Double diffusive buoyancy opposed natural convection in a porous cavity having partially active vertical walls, *Int. J. of Heat and Mass Transfer*, Vol. 62 (2013) pp. 808-817. DOI: [10.1016/j.ijheatmasstransfer.2013.02.027](https://doi.org/10.1016/j.ijheatmasstransfer.2013.02.027)

- Sofen K. Jena, **Swarup K. Mahapatra** and Amitava Sarkar, Thermosolutal Convection in a Rectangular Concentric Annulus: A Comprehensive Study, *Transport in Porous Media*, Vol. 98 (2013) pp. 103-124. DOI: [10.1007/s11242-013-0135-0](https://doi.org/10.1007/s11242-013-0135-0)
- Sikata Samantaray, **Swarup K. Mahapatra**, Sofen K. Jena and Amitava Sarkar, Transient Analysis of Mixed Convection in a Bottom Heated Square Cavity in Presence of Surface Radiation, *Computational Thermal Sciences*, Vol. 5 (2013) pp. 401-423. DOI: [10.1615/ComputThermalScien.2013007029](https://doi.org/10.1615/ComputThermalScien.2013007029)
- Sikata Samantaray, **Swarup K. Mahapatra**, Sofen K. Jena and Amitava Sarkar, Transient Mixed Convection Coupled with Surface Radiation inside a Square Cavity with Different Configurations- A Critical Study, *Int. J. Fluid Mechanics Research*, Vol. 40 (2013) pp. 545-563. DOI: [10.1615/InterJFluidMechRes.v40.i6.70](https://doi.org/10.1615/InterJFluidMechRes.v40.i6.70)
- Sofen K. Jena and **Swarup K. Mahapatra**, Numerical modeling of interaction between surface radiation and natural convection of atmospheric aerosol in presence of transverse magnetic field, *Applied Mathematical Modelling*, Vol. 37 (2013) pp. 527-539. DOI: [10.1016/j.apm.2012.02.052](https://doi.org/10.1016/j.apm.2012.02.052)
- Sofen K. Jena, **Swarup K. Mahapatra** and Amitava Sarkar, Thermosolutal convection in a fluid-porous composite medium, *Heat Transfer Asian Research*, Vol. 42 (2013) pp. 281-299. DOI: [10.1002/htj.21048](https://doi.org/10.1002/htj.21048)
- Sofen K. Jena, **Swarup K. Mahapatra** and Amitava Sarkar, Magneto convection of an electrically conducting fluid in an annulus space between two isothermal concentric squares, *Heat Transfer Research*, Vol. 44 (2013) pp. 195-214. DOI: [10.1615/HeatTransRes.2012006268](https://doi.org/10.1615/HeatTransRes.2012006268)
- S.Samantaray, **S.K.Mahapatra** & A.Sarkar, Numerical Simulation of the Interaction of Diffusively Radiating Surface with Mixed convection in a Differentially Heated Enclosure, *Heat Transfer Research*, Vol. 44 (2013), pp. 507-534. DOI: [10.1615/HeatTransRes.2012004656](https://doi.org/10.1615/HeatTransRes.2012004656)
- P. Rath & **S.K. Mahapatra**, New Formulation of Radiative Flux in Ultrashort Time Scale with its Implications, *J. Thermophysics and Heat transfer*, Vol. 26 (2012) pp. 294-299, DOI: [10.2514/1.T3793](https://doi.org/10.2514/1.T3793)
- **S.K. Mahapatra**, S.Samantaray & A.Sarkar, Role of Prandtl Number in the Interaction Phenomenon of Surface Radiation With an Opposing Mixed Convection Within a Differential Heated Cavity. *Heat transfer Asian Research*, Vol. 41 (2012) pp. 318-338. DOI: [10.1002/htj.21003](https://doi.org/10.1002/htj.21003)
- **S.K. Mahapatra**, B.K. Dandapat & A.Sarkar, Radiation transfer in participating medium interacting with variable property natural convection subjected to collimated/diffused irradiation at boundary—A critical appraisal, *Heat transfer Asian Research*, Vol. 41 (2012) pp. 164–178. DOI: [10.1002/htj.20403](https://doi.org/10.1002/htj.20403)

- B. Padhi, P.Rath, **S.K. Mahapatra** & A.K. Satapathy, Short pulse collimated radiation with diffusely reflecting boundaries, Heat Transfer Research, Vol. 42 (2011) pp. 301-315. DOI: [10.1615/HeatTransRes.2011002797](https://doi.org/10.1615/HeatTransRes.2011002797)
- R.K. Mallik, **S.K. Mahapatra** & A. Sarkar, Development of a Novel Improved Differential Approximation (NIDA) for Analysis of Combined Conduction-Radiation Heat Transfer (CCR) in a Two-Dimensional Enclosure with Participating Medium: An Experimental Validation, Numerical Heat Transfer, Part B, Vol.56 (2009) pp. 231-258. DOI: [10.1080/10407790903266553](https://doi.org/10.1080/10407790903266553)
- R.K. Mallik, **S.K. Mahapatra** & A. Sarkar, Neural Finite difference method in development of Improved differential approximation and its application for coupled conduction and radiation heat transfer in a square enclosure: an experimental validation, Int. J. Heat and Mass Transfer, Vol. 52 (2009) pp. 504-515. DOI: [10.1016/j.ijheatmasstransfer.2008.04.073](https://doi.org/10.1016/j.ijheatmasstransfer.2008.04.073)
- Anjan Sarkar, **S.K. Mahapatra**, & A. Sarkar, Opposing Mixed Convection and its Interaction with Radiation inside Eccentric Horizontal Cylindrical Annulus, Int. J. Num. Meth in Fluids, Vol.: 61 (2009) pp. 291-310. DOI: [10.1002/flid.1958](https://doi.org/10.1002/flid.1958)
- **S.K. Mahapatra**, Anjan sarkar & A. Sarkar, Numerical Simulation of Opposing mixed Convection in differentially heated square enclosure with partition, Int. J. Thermal Sciences, Vol. 46 (2007) pp. 970-979. DOI: [10.1016/j.ijthermalsci.2006.11.017](https://doi.org/10.1016/j.ijthermalsci.2006.11.017)
- **S.K. Mahapatra**, Interaction of radiation with opposing mixed convection within differentially heated square enclosure, J. Mech. Eng. Sci., IMechE-PartC, Vol. 223 (2009) pp. 451-462. DOI: [10.1243/09544062JMES1100](https://doi.org/10.1243/09544062JMES1100)
- **S.K. Mahapatra**, Numerical Simulation for optimal configuration of heater and cooler location with natural convection inside a square enclosure and the effect of radiation on the same in presence of radiatively active medium, J. Mech. Eng. Sci., IMechE-PartC, Vol. 222 (2008) pp. 1505-1514. DOI: [10.1243/09544062JMES831](https://doi.org/10.1243/09544062JMES831)
- **S.K. Mahapatra**, B.K. Dandapatat & A. Sarkar, Analysis of combined conduction and radiation heat transfer in presence of participating medium by the development of hybrid method, J. Quantitative Spectroscopy and Radiative Transfer, Vol. 102 (2006) pp.277-292. DOI: [10.1016/j.jqsrt.2006.02.015](https://doi.org/10.1016/j.jqsrt.2006.02.015)
- **S.K. Mahapatra**, P. Nanda & A. Sarkar, Interaction of Mixed convection in twosided lid-driven differentially heated square enclosure with radiation in presence of participating medium, Heat and Mass Transfer, Vol. 42 (2006) pp. 739-757. DOI: [10.1007/s00231-005-0034-1](https://doi.org/10.1007/s00231-005-0034-1)
- **S.K. Mahapatra**, P. Nanda & A. sarkar, Analysis of coupled conduction and radiation heat transfer - using a hybrid method, Heat and Mass Transfer, Vol. 41 (2005) pp. 890-898. DOI:[10.1007/s00231-004-0587-4](https://doi.org/10.1007/s00231-004-0587-4)

- **S.K. Mahapatra** & S.B. Mahapatra, Numerical Modelling of Combined Conductive and Radiative Heat Transfer within Square Enclosure using DOM, Heat and Mass Transfer, Vol.40 (2004) pp. 533-538. DOI:10.1007/s00231-003-0500-6
- **S.K. Mahapatra**, S. Sen & A. Sarkar, Interaction of Surface Radiation and Variable Property Natural convection in a Differentially Heated Square Cavity- A Finite Element Analysis, Int. J. Num. Meth. for Heat & Fluid Flow, Vol.4 (1999) pp.423- 443. DOI: 10.1108/09615539910266594

Sponsored Projects (as Principal Investigator):

- Title :CFD modelling of 76 mm Naval gun projectile motion in aid of range enhancement
Funding agency: DRDO, Govt. Of India
Status: Ongoing since Nov. 2012
Budget: 50 lakh
- Title :Simulation of conjugate heat transfer phenomenon in ultra short laser tissue
Funding agency: Dept. Science and Technology, GOI.
Status/Duration: Completed, 2008-2012
Budget: 10.55 lakh
- Title: Study on the influence of radiation on natural convection within enclosure
Funding agency: Dept. Science and Technology, GOI.
Status/Duration: Completed, 2003-2006
Budget: 6.48 lakh
- Title: Radiation induced buoyancy driven flow within enclosure,
Funding Agency: AICTE,
Status/Duration: Completed, 2002-2005

Reviewer:

- Int. J. Heat and Mass Transfer
- Int. J. Thermal Sc.
- J. Q. Spectroscopy and Radiative Transfer
- Heat Transfer Engineering
- J. Mech. Eng. Sc. (I.Mech.E)
- ASME J. Heat Transfer
- Numerical Heat Transfer
- Int. J. Numerical Methods in Heat and Fluid Flow
- Heat and Mass Transfer