

# Akshoy Ranjan Paul

**DESIGNATION:** Assistant Professor

**CONTACT ADDRESS:** Dept. of Applied Mechanics, Motilal Nehru National Institute of Technology Allahabad-211004, U.P., India.

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## ACADEMIC QUALIFICATIONS:

Degree	Subject/ Specialization	Board/University	Year of passing	Class/Div. and Distinction if any
B.E.	Mechanical Engg.	SVNIT, Surat	2000	1 <sup>st</sup> Class Distinction.
M.E.	Mechanical Engg.	Jadavpur University, Kolkata	2002	1 <sup>st</sup> Class First (Univ. Gold Medalist)
Ph.D.	Fluid Dynamics	MNNIT, Allahabad	2013	CPI = 9.25 in coursework.

**PH.D. THESIS TITLE:** Aerodynamic Studies of Turbulent Flow in Twin Air-intakes.

**AREAS OF RESEARCH:** Fluid Dynamics, Aerodynamics, Flow Control, Turbomachines, CFD, Turbulence.

**GOOGLE SCHOLAR CITATIONS:** [Google Scholar Citations \(Akshoy Ranjan Paul\)](#)

**SCOPUS PREVIEW:** [Scopus Preview \(Akshoy Ranjan Paul\)](#)

**RESEARCHGATE PROFILE :** [https://www.researchgate.net/profile/Akshoy\\_Paul?ev=hdr\\_xprf](https://www.researchgate.net/profile/Akshoy_Paul?ev=hdr_xprf)

## Detailed CV

**Name:** Akshoy Ranjan Paul.  
**E-mail:** arpaul2k@gmail.com, arpaul2k@yahoo.co.in,  
arpaul@mnnit.ac.in  
**Date of Birth:** 11<sup>th</sup> February, 1978.  
**Present Address:** C-20, MNNIT Staff Colony, Allahabd-211004. U.P. India.  
**Research Interests:** Fluid Dynamics, Aerodynamics, Flow Control, Turbomachines, CFD, Turbulence.

### Professional Experience:

No.	Name of the Institute	Post Held	Duration
1.	M. N. National Institute of Technology, Allahabad-211004. Uttar Pradesh.	Assistant Professor AGP: 7000/-	01-01-2011 to till date.
		Assistant Professor AGP: 6000/-	01-01-2010 to 31-12-2010.
		Lecturer (Scale: 8000-275-13500)	25-07-2005 to 31-12-2009.
2.	Kalyani Government Engineering College, Kalyani-741235. West Bengal.	Lecturer.	10-09-2002 to 20-07-2005.
3.	Central Mechanical Engineering Research Institute, Durgapur-713209.	Junior Research Fellow.	12-11-2001 to 09-09-2002.

### B.Tech. Teaching:

*Subjects Handled:* Fluid Mechanics, Fluid Flow Operations, Hydraulic Machines, Engineering Mechanics.

### M.Tech. Teaching:

*Subjects handled:* Aerodynamics, Turbulence, Advanced Fluid Mechanics, Boundary Layer Theory & Turbulent Flow, Experimental Methods & Design, Computational Fluid Dynamics.

### Ph.D. Guided: 03 (in progress)

- "Experimental and Computational Studies on Human Airway" by Mr. Bholu Kumar since Dec. 2014. Co-Supervisor: Prof. Anuj Jain.
- "Active Flow Control in Serpentine Air-Intakes" by Mr. Ram Sumukh Shukla since July 2014. Co-Supervisor: Prof. Anuj Jain.
- "Flow Control in Complex Ducts using Synthetic Jets" by Krishnakumar Yadav since July 2015.
- "Enhancement of Heat Transfer using Synthetic Jet Actuators" by Nikhil Sharma since July 2015.

### M.Tech. Thesis Guided: 25 (completed) + 05 (continuing).

- "Performance Enhancement Analysis of Air-Jet Pump" by Avinash Kumar in July 2015.
- "CFD Simulation of Wave Action on Submarine Pipeline" by Ayaz Khan in July 2015.

- "Design and Development of Multi-Hole Probe Data Acquisition System" by Mukesh Chawla in July 2015.
- "CFD Analysis on Optimization of Cyclone Separator" by Sarvesh Kashyap in July 2015.
- "Design Development and Analysis of Desktop Supersonic Wind Tunnel" by Sunil Kumar Gaur in July 2015.
- "Modeling & Computational Analysis of Water Jet Pump" by Lokesh Kumar in August 2014.
- "Active Flow Control in Transition Air-Intakes using Synthetic Jet Actuator" by Nithin Hegde in June 2013.
- "Modeling and Computational Analysis of Double Suction Impeller of Centrifugal Pump" by Deepak Kumar Kalyan in June 2013.
- "CFD Analysis of Airflow through Intake Manifold of Spark Ignition Engine" by Arvind Kumar Verma with co-guide as Dr. S. Saraswati in June 2013.
- "Studies on Flow Control over Hump using Acoustic and Piezoactuator" by Vinay Pathak in July 2012 with co-guide as Dr. S.J. Pawar.
- "Unsteady Flow Simulation around a Square Cylinder using Upstream Rod" by Ramakant Pandey in July 2012.
- "Analysis of Unsteady Flow through a Throttle Valve of IC Engine during Transient Operation" by Rangesh Pandey in July 2012 with co-guide as Dr. S. Saraswati.
- "Studies of Vortex Generator Jets on Flow Separation Control" by Anurag Kulshrestha, in July 2012.
- "Slotted Flow Separation Control over a NACA 2412 Airfoil" by Ashish Mittal in June 2012.
- "Active Flow Control using Vortex Generator Jets" by Kuldeep Singh in June 2011.
- "Drag Reduction of Square Cylinder using Upstream Rod" by Manish Kumar in June 2011.
- "Computational Aerodynamics of Passenger Car with a Rear Spoiler and Vortex Generators" by Pradeep Kumar Niranjana in June 2011.
- "Experimental Studies on Cyclone Separator" by Dinesh Kumar in June 2011.
- "Computational Analysis of Flow Control in S-Duct Diffusers" by Pritanshu Ranjan in June 2010.
- "Turbulent Separating Flow over Humps in a Channel" by Ajay Pratap Singh in June 2010.
- "Aerodynamic Effects of Rear Spoiler & Vortex Generators on Passenger Cars" by Dheeraj Sagar in June 2010 with co-guide as Prof. Anuj Jain.
- 'Experimental Studies on Fishtail Vortex Generators' by Vivek Kumar Patel in June 2009.
- "Experimental Studies on Flow Improvement through Rectangular S-duct Diffusers" by Mahendra Singh Yadav in July 2008.
- "Studies on Flow through Rectangular S-duct Diffusers using CFD" by Alok Jain in July 2008.
- "Internal Flow Investigation through Complex Diffusing Ducts" by Atul Singh Durgbans in July 2007.

#### **B.Tech. Projects Guided: 06.**

#### **Textbooks Published: 04.**

- 'Elements of Engineering Mechanics' by Sanchayan Mukherjee and Akshoy Ranjan Paul, Pages: 352, Rs. 275/-, PHI Learning Pvt. Ltd., New Delhi, 1<sup>st</sup> edition in July 2011, ISBN: 978-81-203-4379-5.
- 'Fundamental of Mechanical Sciences: Engineering Thermodynamics & Fluid Mechanics' by Sanchayan Mukherjee and Akshoy Ranjan Paul, Pages: 304, Rs. 225/-, PHI Learning Pvt. Ltd., New Delhi, 1<sup>st</sup> edition in Jan. 2009, ISBN: 978-81-203-3756-5.
- 'Mechanical Sciences: Engineering Thermodynamics & Fluid Mechanics' by Akshoy Ranjan Paul, Sanchayan Mukherjee and Pijush Roy, Pages: 604, Rs. 450/-, Prentice-Hall of India Pvt. Ltd., New Delhi, 1<sup>st</sup> edition in Jan. 2005 (2<sup>nd</sup> reprint in 2009), ISBN: 978-81-203-2727-6.

- ‘Mechanical Sciences: Engineering Mechanics & Strength of Materials’ by Akshoy Ranjan Paul, Pijush Roy and Sanchayan Mukherjee, Pages: 596, Rs. 395/-, Prentice-Hall of India Pvt. Ltd., New Delhi, 1<sup>st</sup> edition in July 2004 (3<sup>rd</sup> reprint in 2009), ISBN: 978-81-203-2611-8.

#### **Textbooks Reviewed: 01.**

- Reviewed one textbook titled ‘Strength of Materials (Sigma Series)’ authored by L.S. Negi, ISBN: 9780070634596 and published by McGraw-Hill Higher Education, New Delhi in 2007.

#### **Research Papers Published: 59.**

- **International Journals:** 16.
  - Sagar Dasgupta, Anuj Jain, **A.R. Paul**, "Sinusoidal Delta Wing: Challenges and Opportunities", Journal of Aeronautical and Automotive Engineering, vol. 2, no. 1, pp. 6-10, 2015.
  - Amit Kumar Yadav, Syed Danish Abbas, Ramsumukh Shukla, Anuj Jain, **A.R. Paul**, "Advances in Aerodynamic Aspects of Serpentine Air-Intakes: A Review", Journal of Aeronautical and Automotive Engineering, vol. 2, no. 1, pp. 16-21, 2015.
  - **Akshoy Ranjan Paul**, Shrey Joshi, Aman Jindal, Ajit Verma, Shivam P. Maurya, Anuj Jain. "Drag Reduction of a Passenger Car using Flow Control Techniques", International Journal of Automotive Technology (*Accepted in July 2014*) (SCI Expanded, ISI indexed).
  - Vivek K. Srivastav, **Akshoy Ranjan Paul**, Anuj Jain, "Effects of Cartilaginous Rings on Airflow and Particle Transport through Simplified and Realistic Human Upper Respiratory Tracts", Acta Mechanica Sinica, vol. 29, no. 6, pp. 883-892, 2013. DOI 10.1007/s10409-013-0086-2 (SCI, ISI indexed)
  - Vivek K. Srivastav, Amit Kumar, Shashank K. Shukla, **Akshoy R. Paul**, Amba D. Bhatt, Anuj Jain, "Airflow and Aerosol-Drug Delivery in a CT Scan based Human Respiratory Tract with Tumor using CFD", Journal of Applied Fluid Mechanics, Vol. 7, No. 2, pp. 345-356, April 2014. (SCI Expanded, ISI indexed)
  - **Akshoy Ranjan Paul**, Shrey Joshi, Aman Jindal, Shivam P. Maurya, Anuj Jain, "Experimental Studies of Active and Passive Flow Control Techniques Applied in a Twin Air-Intake", The Scientific World Journal, vol. 2013, Article ID 523759, 8 pages, 2013. doi:10.1155/2013/523759. An SCI Expanded, ISI indexed journal.
  - **Akshoy Ranjan Paul**, Pritanshu Ranjan, Vivek Kumar Patel, Anuj Jain, "Comparative Studies on Flow Control in Rectangular S-Duct Diffuser using Submerged-Vortex Generators", Aerospace Science and Technology (An Elsevier Journal), vol. 28, no. 1, pp. 332-343, July 2013. <http://dx.doi.org/10.1016/j.ast.2012.11.014>. (SCI, ISI indexed)
  - D. K. Kalyan and **A.R. Paul**, "Computational study of flow around a simplified 2D Ahmed body", International J. of Engg., Science and Innovative Technology, vol. 2, no. 3, pp. 148-153, 2013.
  - **Akshoy R Paul**, Shrey Joshi, Pradip K Niranjana, Aman Jindal, Ajit Verma, Shivam P Maurya, "Flow Control Analysis of a Passenger Car, International Journal of Fluid Mechanics", vol. 4, no. 2, pp. 201-219, July-Dec. 2012.
  - Vivek Kumar Srivastav, **Akshoy Ranjan Paul** and Anuj Jain, "Computational Fluid Dynamics Study of Airflow and Particle Transport in Third to Sixth Generation Human Respiratory Tract", International Journal of Emerging Multidisciplinary Fluid Sciences, vol. 3, no. 4, pp. 227-234, 2011-12.
  - **Akshoy Ranjan Paul**, Kalyan Kuppa, Mahendra S. Yadav, Ujjal Dutta, "Flow Improvement in Rectangular Air Intake by Submerged Vortex Generators", Journal of Applied Fluid Mechanics, Vol. 4, No. 2, Issue 1, pp. 77-86, July 2011. (SCI Expanded, ISI indexed)

- **Akshoy Ranjan Paul**, Ravi Ranjan Upadhyay, Anuj Jain, “A Novel Calibration Algorithm for Five-hole Pressure Probe”, International Journal of Engineering, Science and Technology (IJEST), Vol. 3, No. 2, pp. 89-95, July 2011.
  - Dheeraj Sagar, **Akshoy Ranjan Paul**, Anuj Jain, “Computational Fluid Dynamics Investigation of Turbulent Separated Flows in Axisymmetric Diffusers”, International Journal of Engineering, Science and Technology (IJEST), Vol. 3, No. 2, pp. 104-109, July 2011.
  - Pritanshu Ranjan, **Akshoy Ranjan Paul**, Ajay Pratap Singh, “Computational Analysis of Frictional Drag over Transverse Grooved Flat Plates”, International Journal of Engineering, Science and Technology (IJEST), Vol. 3, No. 2, pp. 110-116, July 2011.
  - Ajay Pratap Singh, **Akshoy Ranjan Paul**, Pritanshu Ranjan, “Investigation of Reattachment Length for a Turbulent Flow over a Backward Facing Step for Different Step Angle”, International Journal of Engineering, Science and Technology (IJEST), Vol. 3, No. 2, pp. 84-88, July 2011.
  - **Akshoy Ranjan Paul**, Pritanshu Ranjan, Vivek Kumar Patel, Anuj Jain, “Flow Control in Rectangular S-Duct Diffuser using Submerged Vortex Generators”, Int. Review of Aerospace Engineering, Vol. 4, No. 2, pp. 76-86, April 2011.
- **International Conferences: 22.**
    - Atiq Ur Rehman, Subhash Shinde, **Akshoy Ranjan Paul**, Anuj Jain, "Effects of Discharge on the Performance of an Industrial Centrifugal Pump", Proceedings of 2015 International Conference on Computing Techniques and Mechanical Engineering (ICCTME-2015), Oct. 1-3, 2015, Phuket (Thailand), paper ID: U1015114, pp. 23-30 , ISBN: 9789384422400.
    - Shilpee Roy, Anurag Kulshrestha, Anuj Jain, **Akshoy Ranjan Paul**, "Computational Analysis of Drag Reduction for a Hatchback Car", Proceedings of the International Conference on Advanced Computational Technologies and Creative Media (ICACTCM-2014), August 14-15, 2014, Pattaya (Thailand), Paper ID: E0814507, pp. 94-98, ISBN: 9788192965345.
    - **Akshoy Ranjan Paul**, Shrey Joshi, Aman Jindal, Shivam P. Maurya, Ajit Verma, "Large Eddy Simulation of Vortex Shedding with Triangular Cylinder ahead of a Square Cylinder", Proceedings of the 8th Asia-Pacific Conference on Wind Engineering (APCWE-VIII), Dec. 10-14, 2013, Chennai, Paper ID: 241, pp. 299-302, ISBN No. 9789810780128.
    - Atique Ur Rehman, Subhash Shinde, Vikash K. Singh, **Akshoy R. Paul**, Anuj Jain, Rakesh Mishra, "CFD based condition monitoring of centrifugal pumps", Proceedings of COMADEM 2013, 11-13 June 2013, Helsinki, Finland, ISBN 9789526798103.
    - **Akshoy Ranjan Paul**, Shrey Joshi, Aman Jindal, Shivam P Maurya, Prakhar K. Tiwari, Anuj Jain, “Effects of Upstream Rod’s Shape on Drag of a Square Cylinder”, Proceedings of the 3<sup>rd</sup> International Conference on Mechanical, Automotive and Materials Engineering (ICMAME’2013), 26-17 January 2013, Hong Kong (China), Paper ID: 113811, pp. 35-40, ISBN No. 9789382242239.
    - **Akshoy Ranjan Paul**, Shrey Joshi, Aman Jindal, Ajit Verma, Shivam P. Maurya, Anuj Jain, “Active Flow Control in Twin Air-Intake using Vortex Generators Jets”, Proceedings of the 9<sup>th</sup> International Conference on Mechanical Engineering (ICME-2011), 18-20 December 2011, Dhaka, Bangladesh, Paper Code: ICME11-FL-024.
    - Vivek Kumar Srivastav, Anuj Jain, **Akshoy Ranjan Paul**, Shrey Joshi, “CFD Modelling of Airflow in Human Respiratory System”, Proceedings of the 9<sup>th</sup> International Conference on Mechanical Engineering (ICME-2011), 18-20 December 2011, Dhaka, Bangladesh, Paper Code: ICME11-FL-09.
    - Vivek Kumar Patel, **Akshoy Ranjan Paul**, “Experimental studies on ‘Fishtail’ vortex generators”, Proceedings of The 11th Asian International Conference on Fluid Machinery & The 3rd Fluid Power Technology Exhibition, 21 - 23 November 2011, IIT Madras, Chennai, India, Paper code: AICFM\_FM\_012, ISBN No. 9788191057133.
    - **Akshoy Ranjan Paul**, Pritanshu Ranjan, Ravi Ranjan Upadhyay, Anuj Jain, “Passive Flow Control in Twin Air-Intakes”, Proceedings of WASET International Conference on

Mathematical and Computational Methods in Science and Engineering (ICMCMSE 2011), Paris, France, June 24-26, 2011, Yr. 7, Issue 77, Article No. 56, pp. 297-304, Print ISSN: 2010-376X.

- **Akshoy Ranjan Paul**, Pritanshu Ranjan, Ravi Ranjan Upadhyay, Anuj Jain, “Flow Control in Twin Air-Intakes using Vortex Generators”, Recent Researches in Applied and Computational Mathematics, pp. 107-116, WSEAS Press, ISBN: 9781618040022, Proceedings of International Conference on Applied and Computational Mathematics (ICACM '11), Lanzarote, Canary Islands, Spain, May 27-29, 2011.
- Anuj Jain, **Akshoy Ranjan Paul**, S.K. Aggarwal, B. Mohanty, B.P. Mani, “A New Correlation for Holdup in Gas-Solids Cyclone”, Recent Researches in Applied and Computational Mathematics, pp. 117-126, WSEAS Press, ISBN: 9781618040022, Proceedings of International Conference on Applied and Computational Mathematics (ICACM '11), Lanzarote, Canary Islands, Spain, May 27-29, 2011.
- **Akshoy Ranjan Paul**, Pritanshu Ranjan, Ravi Ranjan Upadhyay, Anuj Jain, “Passive Flow Control through Y-shaped Air Intake using Submerged Vortex Generators”, Proceedings of 5<sup>th</sup> International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM-2010), IIT Kharagpur, India, Dec 27-29, 2010, Paper No. 148, pp. 373-375, ISBN: 9789380813035.
- Pritanshu Ranjan, **Akshoy Ranjan Paul**, “Effects of Inflow Conditions and Turning Angles on the Performance of S-Duct Diffusers-A Computational Approach”, Proceedings of 5<sup>th</sup> International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM-2010), IIT Kharagpur, India, Dec 27-29, 2010, Paper No. 149, pp. 376-378, ISBN: 9789380813035.
- Ajay Pratap Singh, **Akshoy Ranjan Paul**, Ravi Ranjan Upadhyay, Anuj Jain, “Control of Turbulent Flow Separation over Humps in a Channel”, Proceedings of 5<sup>th</sup> International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM-2010), IIT Kharagpur, India, Dec 27-29, 2010, Paper No. 301, pp. 740-742, ISBN: 9789380813035.
- Dheeraj Sagar, **Akshoy Ranjan Paul**, Ravi Ranjan Upadhyay, Anuj Jain, “Aerodynamic Effects of Rear Spoiler and Vortex Generators on Passenger Cars”, , Proceedings of 5<sup>th</sup> International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM-2010), IIT Kharagpur, India, Dec 27-29, 2010, Paper No. 311, pp. 760-762, ISBN: 9789380813035.
- **Akshoy Ranjan Paul**, Ravi Ranjan Upadhyay, Anuj Jain, “Influence of Overlap in Second Bends and Turning Angle on the Flow Characteristics of Y-shaped Air Intakes” Proceedings of 13<sup>th</sup> Asian Congress of Fluid Mechanics (ACFM-2010), Dhaka, Bangladesh, Dec. 17-21, 2010, Paper No. 154, vol. I, pp. 150-153, ISBN: 9789843322142.
- **Akshoy Ranjan Paul**, Pritanshu Ranjan, Ravi Ranjan Upadhyay, Anuj Jain, “Fluid control in Y-shaped air intake using vortex generator”, Proceedings of 4<sup>th</sup> International Conference on Fluid Mechanics and Fluid Power, I.I.T. Madras, India, Dec. 16-18, 2010, Paper No. FMFP-10-FP-5, ISBN: 9788191051719.
- **Akshoy Ranjan Paul**, Mahendra Singh Yadav, Kalyan Kuppa, Ujjal Datta, “Experimental studies on flow improvement through rectangular S-duct diffuser”, 27<sup>th</sup> AIAA Applied Aerodynamics Conference, San Antonio, Texas, June 22-25, 2009, Paper No. AIAA-2009-3511, eISBN: 9781624101304.
- **Akshoy Ranjan Paul**, Kalyan Kuppa, Navanshu Tripathi, Tanmay Rajpathak, “Experimental and computational study of flow improvement through sigmoid air intake ducts using flow deflector”, 26<sup>th</sup> AIAA Applied Aerodynamics Conference, Honolulu, Hawaii, August 18-21, 2008, Paper No. AIAA-2008-7513, eISBN: 978160086-9877.
- **Akshoy Ranjan Paul**, K. Kalyan, Navanshu Tripathi, B. Majumdar, “Effects on twin-bladed deflector on flow through S-duct diffuser”, Proc. of 4<sup>th</sup> International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM 2007), IIT Kharagpur, India, Dec. 27-29, 2007, Paper No. 218.

- **Akshoy Ranjan Paul**, Dr. B. Majumdar, “Studies on flow deflector installation at inlet of sigmoid ducts”, Proc. of 2<sup>nd</sup> Int. Conf. on Fluid Mechanics & Fluid Power, Indian Institute of Technology Roorkee, India, Dec. 13-15, 2002, vol. I, pp. 209-216.
  - **Akshoy Ranjan Paul**, Dr. B. Majumdar, “Some studies on flow regimes and wall pressure recovery of air-intake ducts”, Proc. of Int. Conf. on Mechanical Engineering (ICME-2001), Department of Mechanical Engineering, Bangladesh University of Engineering & Technology, Dhaka, Bangladesh, Dec. 26-28, 2001, vol. 4, pp. 5-10.
- *National Conferences: 21.*
    - Bholu Kumar, Sumit Malik, Vivek Kumar Srivastav, **Akshoy Ranjan Paul**, Anuj Jain, "Numerical Studies of Toxic-Particle Deposition in the Sixth Generation Human Respiratory Tract", Proc. in the National Conference on Emerging Trends in Physics of Fluids & Solids (NCETPFS-2015) at Jadavpur University during Feb. 24-25, 2015.
    - Shrey Joshi, Aman Jindal, Vikrant S. Yadav, Prakhar K. Tiwari, **Akshoy R. Paul**, Anuj Jain, "Calibration Methodology of Wall Shear Stress Sensor", Proceedings of 40th National Conference on Fluid Mechanics & Fluid Power (FMFP-2013), 12-14 December 2013, NIT Hamirpur, Himachal Pradesh, Paper code: 290, ISBN: 9789382880905.
    - Shashank Kumar Shukla, Vivek Kumar Srivastav, **Akshoy Ranjan Paul**, Anuj Jain, "Computational Study of Aerosol Drug Deposition on Tumorous Human Airway Model", Proceedings of 40th National Conference on Fluid Mechanics & Fluid Power (FMFP-2013), 12-14 December 2013, NIT Hamirpur, Himachal Pradesh, Paper code: 148, , ISBN: 9789382880905.
    - Deepak Kumar Kalyan, Atiq Ur Rehman, **Akshoy Ranjan Paul**, Anuj Jain, "Computational Flow Analysis through a Double-Suction Impeller of a Centrifugal Pump", Proceedings of 40th National Conference on Fluid Mechanics & Fluid Power (FMFP-2013), 12-14 December 2013, NIT Hamirpur, Himachal Pradesh, Paper code: 141, , ISBN: 9789382880905.
    - Nithin Hegde, Prakhar Kant Tiwari, **Akshoy Ranjan Paul** and Anuj Jain, Investigation of Flow Control in Transition Air-Intake using Synthetic Jet Actuators, Proc. of Indian Conference on Applied Mechanics (INCAM-2013) at IIT Madras, July 4-6, 2013, paper code: FM\_13, ISBN: 978935137.
    - Vivek K. Srivastav, Arvind K. Verma, Vikrant S. Yadav, **Akshoy R. Paul**, Anuj Jain, "Studies of Laminar Flow through a Bifurcated Human Respiratory Tract", Proc. of Indian Conference on Applied Mechanics (INCAM-2013) at IIT Madras, July 4-6, 2013, paper code: FM\_1, ISBN: 978935137.
    - Subhash Shinde, **Akshoy Ranjan Paul**, Anuj Jain, "CFD Analysis of Viscous Flow over Delta-Rectangular Wing", Proc. of 2nd Students' Conference on Engineering and Systems (SCES 2013), MNNIT Allahabad, 12-14 April 2013, ISBN: 978-1-4673-5629-9.
    - Vivek Kumar Srivastav, **Akshoy Ranjan Paul**, Anuj Jain, “CFD Simulation of Airflow and Particle Deposition in Third to Sixth Generation Human Respiratory Tract”, Proceedings of 39<sup>th</sup> National Conference on Fluid Mechanics & Fluid Power (FMFP-2012), 13-15 December 2012, SVNIT Surat, Gujarat, Paper code: 245, ISBN: 9788192549408.
    - **Akshoy Ranjan Paul**, Ashish Mittal, Anuj Jain, “Slotted flow separation control over a NACA2412 airfoil”, Proceedings of 39<sup>th</sup> National Conference on Fluid Mechanics & Fluid Power (FMFP-2012), 13-15 December 2012, SVNIT Surat, Gujarat, Paper code: 039, ISBN: 9788192549408.
    - **Akshoy Ranjan Paul**, Ramakant Pandey, Aman Jindal, Prakhar Kant Tiwari, Anuj Jain, “Studies of Drag on Square Cylinder with Upstream Rod in Staggered Arrangement”, Proceedings of 6th National Conference on Wind Engineering (NCWE-2012), 14-15 December 2012, New Delhi, Paper ID: 1207, pp. 169-179, ISBN: 9788192554808.
    - **Akshoy R. Paul**, Pradip K. Niranjana, Shrey Joshi, Ajit Verma, Anuj Jain, “Computational Analysis of a Rear Spoiler on a Sedan Car”, Proceedings of the 38<sup>th</sup> National Conference

on Fluid Mechanics and Fluid Power, M.A.N.I.T. Bhopal, India, Dec. 13-15, 2011, Paper code: CFD-13.

- **Akshoy R. Paul**, Shrey Joshi Aman Jindal, Shivam P. Maurya, Anuj Jain, “Comparison of Active and Passive Flow Controls: A Case Study in Bifurcated Air-Intake”, Proceedings of the 38<sup>th</sup> National Conference on Fluid Mechanics and Fluid Power, M.A.N.I.T. Bhopal, India, Dec. 13-15, 2011, Paper code: FP-04.
- Vivek Kumar Srivastav, Amit Kumar, Anuj Jain, **Akshoy Ranjan Paul**, , “CFD Modelling of Bifurcated Human Airways”, Proceedings of the 38<sup>th</sup> National Conference on Fluid Mechanics and Fluid Power, M.A.N.I.T. Bhopal, India, Dec. 13-15, 2011, Paper code: CFD-07.
- Ravishankar L N , Anuj Jain, **Akshoy Ranjan Paul**, “CFD Analysis of Separation Efficiency in a Typical Cyclone Separator”, Proc. of Modeling and Simulation in Heat Transfer and Fluid Flow (MSHTFF), National Institute of Technology, Jamshedpur, July 9-10, 2010, Paper No. MSHTFF-14.
- Manish Mangal, Pritanshu Ranjan, **Akshoy Ranjan Paul**, “Computational Analysis of Drag Reduction of a Cylinder using an Upstream Circular Rod”, Proc. of Modelling and Simulation in Heat Transfer and Fluid Flow (MSHTFF), National Institute of Technology, Jamshedpur, July 9-10, 2010, Paper No. MSHTFF-06.
- **Akshoy Ranjan Paul**, Ravi Ranjan Upadhyay, Anuj Jain, “Studies on calibration algorithms of five-hole pressure probe”, Proc. of 5<sup>th</sup> National Conference on Applicable Mathematics in Wave Mechanics and Vibrations (5th WMVC-2010), Kakatiya University, Warangal, March 13-15, 2010, vol. I.
- Pritanshu Ranjan, **Akshoy Ranjan Paul**, Ajay Pratap Singh, “Computational investigation of boundary layer flow over transverse grooved flat plates”, Proc. of 5<sup>th</sup> National Conference on Applicable Mathematics in Wave Mechanics and Vibrations (5th WMVC-2010), Kakatiya University, Warangal, March 13-15, 2010, vol. I.
- Dheeraj Sagar, **Akshoy Ranjan Paul**, Pritanshu Ranjan, Anuj Jain, “Validation of turbulent separated flows in axisymmetric diffusers using CFD”, Proc. of 5<sup>th</sup> National Conference on Applicable Mathematics in Wave Mechanics and Vibrations (5th WMVC-2010), Kakatiya University, Warangal, March 13-15, 2010, vol. I.
- Ajay Pratap Singh, Pritanshu Ranjan, **Akshoy Ranjan Paul**, “Investigation of flow characteristics over backward facing step for different inclination angle”, Proc. of 5<sup>th</sup> National Conference on Applicable Mathematics in Wave Mechanics and Vibrations (5th WMVC-2010), Kakatiya University, Warangal, March 13-15, 2010, vol. I.
- Sanchayan Mukherjee, **Akshoy Ranjan Paul**, *et al.*, “A graphical case based solution for determination of optimum values of the guiding parameters in cooling towers”, Proc. National Seminar on Recent Advances in Mechanical Engineering, K.K. Wagh College of Engineering, Nasik, January 16-17, 2004.
- **Akshoy Ranjan Paul**, Dr. Bireswar Majumdar, “Performance estimation for Francis turbine- A case study”, Proc. of 28<sup>th</sup> National Conf. on Fluid Mechanics & Fluid Power, Punjab Engineering College, Chandigarh, Dec. 13-15, 2001, vol. I, pp. 331-336.

#### **Panel Reviewer in Journals: 05.**

- Selected as a panel Reviewer of 'Water Science and Engineering' – an international journal since Oct. 2015.
- Selected as a panel Reviewer of 'Thermal Science' – an ISI indexed and SCI expanded international journal since March 2014.
- Selected as a Panel Reviewer of 'International Research Journal of Engineering Science, Technology and Innovation (IRJESTI)' since January 2012.
- Selected as a Panel Reviewer of 'International Journal of Engineering, Science and Technology (IJEST)' since May 2011.



- Selected as a Panel Reviewer of ‘Journal of Applied Fluid Mechanics (JAFM)’ – an ISI indexed and SCI expanded international journal since January 2010.

### **Current Externally Funded Research Project: 03**

- Received a research project entitled “**Flow Control in Complex Ducts using Synthetic Jets**” funded by DST-SERB Fast Track Research Scheme for Young Scientists in April 2013. Funding amount: Indian Rupees 2.393 Million. Project duration: 3 years (Dec. 2013 – Nov. 2016). Status: ongoing. Role in the Project: Principal Investigator. JRF working in the Project: Yadav Krishnakumar Rajnath.
- Received a research project entitled “**Experimental and Computational Studies on Human Airways**” funded by SERB under FSER Scheme in June 2014. Funding amount: Indian Rupees 3.85 Million. Project duration: 3 years (June 2014 – May 2017). Status: Ongoing. P.I.: Prof. Anuj Jain. Role in the Project: Co- Principal Investigator. JRF working in the Project: Er. Bholu Kumar.
- Received a research project entitled “**Respirable Suspended Particulate Matter (RSPM) on Chronic Obstructive Pulmonary Diseases (COPD) using Computational Fluid Dynamics (CFD)**” funded by Council of Science and Technology, Govt. of Uttar Pradesh under Technology Innovation scheme in May 2015. Funding amount: Indian Rupees 1.148 Million. Project duration: 3 years. Status: Ongoing. P.I.: Prof. Anuj Jain. Role in the Project: Co-Principal Investigator. Vacancy Open: Senior Research Assistant (SRA)- 01.

### **Other Research Projects:**

- Received an institute research grant (from MNNIT Allahabad) for in-house project on “Studies on Wall Shear Stresses in Turbulent Flow Regime through Bifurcated Ducts” amounting Rs. 85,000/- in January 2009. Duration: 18 months. Status: Completed in July 2010. Role in the Project: Principal Investigator.
- Contributed considerably in the DST-FIST grant awarded to Department of Applied Mechanics, MNNIT, Allahabad. Project duration: 2006-2013. Amount: Rs. 130 Lakh. Status: Completed. Self contribution: Setting up of Turbulent flow measurement facility, CFD laboratory.

### **Testing & Consultancy Activities:**

- Involved in testing activities related to Pipe flow measurement and Materials testing as principal investigator.

### **Research Initiatives Taken:**

- **Under Progress:**
  - Development of a ‘Fluids Engineering Research Laboratory’ in the Applied Mechanics Department, MNNIT.
  - Development of various active flow control devices, like vortex generator jets, synthetic jets, acoustic flow control techniques etc.
  - Development of a ‘state-of-the-art’ suction-type subsonic wind tunnel facility having 2 ft. × 2 ft. test section with data acquisition and control.
  - Development of Smoke tunnel facility for flow visualization purpose.
  - CFD modeling and analysis thermo-fluid flows (eg. flow in Cyclones, Fluidization, intake manifolds of IC engines), bio-medical flows (eg. Modeling of pulmonary flows, blood flow through arteries), 3D flows (eg. flow through centrifugal pumps, axial fans), multiphase flows (eg. flow in Cyclone separators).

- **Completed:**
  - A state-of-the-art “Internal Flow Generation Facility” at the Compressible Flow Laboratory at the Department of Applied Mechanics, MNNIT.
  - Turbulence measuring facility with CTA anemometry.
  - Various microprocessors based Probe Traversing Mechanisms.
  - New designs of twin air-intakes, vane-type vortex generators and vortex generator jets.
  - CFD modeling and analysis of flow through twin air-intakes.

#### **Courses Developed:**

- Framed Revised Draft curriculum for M.Tech. (Fluids Engineering) programme in Applied Mechanics Department in 2013 and 2015.
- Introduced an elective course “Aerodynamics” in M.Tech. (Fluids Engineering) programme in 2013.
- Framed Revised Draft curriculum (comprising of 16 subjects) for M.Tech. (Fluids Engineering) programme in Applied Mechanics Department in 2010.
- Introduced an elective course “Computational Fluid Dynamics” in M.Tech. (Applied Mechanics) programme in 2007.
- Introduced a new compulsory course “Advanced Fluid Mechanics” in M.Tech. (Applied Mechanics) programme in 2007.
- Framed the whole new Draft Curriculum (comprising of 16 subjects) for M.Tech. (Fluids Engineering) programme in Applied Mechanics Department in 2006.

#### **Laboratory Developed/Modernized:**

- Developed a state-of-the-art **Fluids Engineering Laboratory** for M.Tech. & Research.

#### **Workshops & Summer Schools Organized: 11.**

- As the Convener, self-financed International Workshop on “Advances in the Applications of Computational Fluid Dynamics (ACFD-2015)” was organized during August 12-16, 2015 at Department of Applied Mechanics, MNNIT, Allahabad.
- As the Convener, a self-financed Short-term Training Programme (STTP) on “Computational Fluid Dynamics (CFD-2015)” was organized during June 22-26, 2014 at Department of Applied Mechanics, MNNIT, Allahabad.
- As the Convener, TEQIP-II sponsored National Workshop on “Advanced Computational Fluid Dynamics (ACFD-2014)” was organized during June 28-July 02, 2014 at Department of Applied Mechanics, MNNIT, Allahabad.
- As the Coordinator, a self-financed Short-term Training Programme (STTP) on “Basics of Computational Fluid Dynamics (BCFD-2014)” was organized during June 23-27, 2014 at Department of Applied Mechanics, MNNIT, Allahabad.
- As a Workshop Coordinator, NMEICT-IIT Kharagpur Sponsored "Main Workshop on Fluid Mechanics" was organized during May 20-13, 2014 at MNNIT, Allahabad.
- As the Convener, TEQIP-II sponsored "National level Industry-Institute Symposium on Turbomachines" (NIST-2014) was organized during April 5-6, 2014 at Department of Applied Mechanics, MNNIT, Allahabad.
- As one of the Conveners, a National Symposium on “Future Role of Applied Mechanics in Engineering (FRAME-2014)” was organized on March 30, 2014 at Department of Applied Mechanics, MNNIT, Allahabad.
- As a Coordinator, National Workshop on "Research Methodology in Fluid Mechanics" (RMFM-2013) was organized in collaboration with national Society of Fluid Mechanics &

Fluid Power (NSFMFP), IIT Bombay during September 27-28, 2013 at Department of Applied Mechanics, MNNIT, Allahabad.

- As the Programme Coordinator, a self-financed Short-term Training Programme (STTP) on “Computational Fluid Dynamics (CFD)” was organized during July 2-6, 2013 at Department of Applied Mechanics, MNNIT, Allahabad.
- As the Co-coordinator, an AICTE/MHRD sponsored Faculty Development Programme on “Experimental & Computational Methods in Fluid Dynamics” was organized during July 7-19, 2008 at Department of Applied Mechanics, MNNIT, Allahabad.
- As the Coordinator, a “One-Day Sensitization Programme for Engineering & Technical Students for Disabilities & Rehabilitation” was organized under the aegis of Community Development Cell on March 31<sup>st</sup>, 2008 at Department of Applied Mechanics, MNNIT, Allahabad.
- As the Coordinator, a three-day Training Programme on “FLUENT- A CFD software” was organized on January 7-9, 2008 at Department, of Applied Mechanics MNNIT, Allahabad.
- As the Coordinator, a one-day “Curriculum Development Workshop for M.Tech. (Fluids Engineering) Programme” was organized on May 31, 2006 at Department, of Applied Mechanics, MNNIT, Allahabad.

**Invited Talks Delivered: 10.**

- Presented a *two* part lecture series on "Calibration and Flow Measurement using Multi-Hole Pressure Probes at the Centre for Efficiency and Performance Engineering at the Department of Engineering and Technology within the School of Computing and Engineering at the University of Huddersfield, U.K. on 6th June and 10th June 2014.
- Presented one invited lecture on "Turbulence and Its Modeling" at the Short Term Course on “Basic and Advanced Fluid Mechanics" (BAFD-2014) organized by Sam Higginbottom Institute of Agriculture, Technology and Sciences (SHIATS), Allahabad on Jan. 28, 2014.
- Presented one invited lecture on "Modeling & Simulation of Centrifugal Pumps: Challenges & Opportunities" at the self-financed One-week Short Term Course on “Computer Aided Engineering" (CAE-2013) organized by Department of Mechanical Engineering, MNNIT Allahabad on July 14, 2013.
- Presented one invited lecture on “Aerodynamic Studies of Turbulent Flow through Air-Intakes” at the Department of Mechanical Engineering, Nitte Meenakshi Institute of Technology, Yelhanka, Bangalore on February 16, 2010.
- Presented a talk on “An Introduction to Fluid Dynamics” at the AICTE/MHRD sponsored Faculty Development Programme on “Experimental & Computational Methods in Fluid Dynamics” was organized during July 7-19, 2008 at Applied Mechanics Department, MNNIT, Allahabad.
- Presented *two* invited lectures on “Understanding Fluid Dynamics through Natural Phenomena” at the AICTE/MHRD sponsored Faculty Development Programme on “Experimental & Computational Methods in Fluid Dynamics” organized during July 7-19, 2008 at Applied Mechanics Department, MNNIT, Allahabad.
- Presented *two* invited talks on “Fluid Flow Phenomena in Materials Processing: A Basic Idea” and “Fluid Flow Phenomena in Materials Processing: Applications” at the AICTE sponsored Staff Development Programme on “Advanced Manufacturing Processes” held in March 12-23, 2007 by Mechanical Engineering Department, MNNIT, Allahabad.

**Details of Technical Schools/Workshop/Summer Trainings/Summit Attended: 07.**

- Attended 'One week Coordinator's Workshop on Fluid Mechanics' organized by National Mission on Education through ICT (MHRD, Govt. of India) at IIT Kharagpur during March 11-15, 2014.
- Attended NBA Sponsored '2nd World Summit on Accreditation' organized by National Board of Accreditation (NBA) at Hotel The Asoka in New Delhi during March 8-10, 2014.

- Attended a Workshop on "Intellectual Property Rights (IPR)" at MNNIT Allahabad during Feb. 6-7, 2014.
- Attended an International Workshop on "OpenFOAM- A Free Computational Fluid Dynamics Software: Applications and Development" at Rajashi Sahu College of Engineering, Pune during Dec. 26-28, 2013.
- Attended summer training on "Computational Techniques of Turbulent Flow" under Dr. Sekhar Majumdar, Scientist-G & Head, CTFD Division, National Aerospace Laboratories, Bangalore during May 14-June 15, 2007.
- Attended AICTE sponsored summer school on "Present Trends & Future Prospects of Non-Conventional Energy in Jharkhand-Problems & Challenges" held at Birla Institute of Technology, Mesra, Ranchi during June 09-21, 2003.
- Attended AICTE sponsored winter school on "Mechanical Engineering Design: A Concurrent Engineering Approach" held at North Eastern Regional Institute of Science & Technology (NERIST), Itanagar, Arunachal Pradesh during Dec. 02-13, 2002.

#### **Medals & Awards Received:**

- Recipient of University Gold Medal for securing First Class First position in M.E Examination 2002, Jadavpur University, Kolkata.
- Recipient of Best Paper Award for the paper "Computational Analysis of Drag Reduction for a Hatchback Car", presented at the International Conference on Advanced Computational Technologies and Creative Media (ICACTCM-2014), August 14-15, 2014, Pattaya (Thailand).

#### **Scholarships Received:**

- Recipient of MHRD monthly scholarship during M.E. programme (2000-2002).

#### **Membership of Professional Bodies:**

- Life Member, National Society of Fluid Mechanics & Fluid Power (NSFMFP), since 2012.
- Life Member, Indian Society of Technical Education (ISTE), New Delhi since 2002.

#### **Foreign Academic Visits/Training:**

- Asian Institute of Technology, Bangkok, Thailand (August 2014, Sept. 2015)
- University of Huddersfield, U.K. as *Visiting Scholar* (June 2014)
- Islamic University of Technology, Gazipur, Dhaka, Bangladesh (Dec. 2010).
- University of Leeds, U.K. (March 2009).
- Technical University of Denmark, Lyngby, Denmark (March 2009).
- Bangladesh University of Engineering & Technology, Dhaka, Bangladesh (Dec. 2001).

#### **Administrative Activities Performed:**

- **Present Departmental Responsibility:**
  - Convener, Departmental Doctoral Programme Committee (DDPC) (since July 2015).
  - Officer in-charge, Fluid Mechanics & Hydraulics Lab. (since Jan. 2012)
  - Officer in-charge, Compressible Flow Lab. (since Jan. 2012).
  - Officer in-charge, Fluids Engineering Lab. (since Sept. 2013).
- **Past Departmental Responsibility:**
  - O.C., Fluid Mech. & Hydraulics Lab. (June 2006 to Mar. 2011 & since Jan. 2013 to date).
  - O.C., Compressible Flow Lab. (June 2006 to March 2011 & since Jan. 2013 to date).
  - O.C., Departmental Workshop (Dec. 2007 to March 2011 and Jan. 2013 to 2014).

- Member, Departmental Masters Programme Committee (DMPC), Applied Mechanics Department (July 2015 onwards).
- Member, Departmental Under Graduate Committee (DUGC), Applied Mechanics Department (Nov. 2005 to Oct. 2008 & July 2011 to June 2013).
- O.C., Departmental Library (Sept. 2008 to Aug. 2011).
- Departmental Coordinator, Examination (since Nov. 2011 to July 2015) .
- Officer In-charge, Departmental Time Table (since Aug. 2011 to July 2015).

- **Past Institute Level Responsibility:**

- Member, Examination Cell (since Sept. 2012 to till date).
- Member, Centre for Energy Studies, MNNIT (2006-March 2011).
- Member, Research & Consultancy Committee, MNNIT (2006-Sept. 2009).
- Member, Library Learning & Research Committee (LLRC), MNNIT (since 2009 to June 2013).

**Other Responsibility:**

- Nominated as member in the Board of Studies, Department of Mechanical Engineering, Invertis University, Bareilly, U.P., India from Jan. 2013 - Dec. 2015.

Date: 16th November 2015.

(Akshoy Ranjan Paul)