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ightarrow Google Scholar / ORCID / ResearcherID / Scopus / Microsoft Academic / IRINS Vidwan / Research Gate / LinkdIn

BROAD RESEARCH INTERESTS

- Computational Fluid Dynamics (CFD)
 - \rightarrow <u>Macrofluidics</u>: Convective hydrodynamics and heat transfer, Bluff bodies and cavity flows
 - \rightarrow <u>Microfluidics</u>: Electrokinetic flows, Droplet generation and dynamics, MEMS
 - ightarrow Development of complex flow solvers: FVM, FEM, LBM and Meshless methods

• Experiments with Fluids

- ightarrow Flow visualization and characterization using Particle Image Velocimetry (PIV)
- ightarrow Rheology of complex fluids

PROFESSIONAL BACKGROUND

Duration	Position	Department / Institute	
2016 – Present	Associate Professor	Department of Chemical Engineering	
2009 – 2016	Assistant Professor	IIT Roorkee, India	
2007 – 2009	Post-Doctoral Research Fellow	Department of Chemical & Biomolecular Engg.	
	(Computational Fluid Dynamics)	University of Melbourne, Australia	
2007 – 2007	Senior Project Associate	Department of Mechanical Engineering	
		IIT Kanpur, India	
2002 – 2006	Teaching Assistant and	Department of Chemical Engineering	
	Doctoral Researcher	IIT Kanpur, India	
2000 – 2002	Teaching Assistant and	Department of Chemical Engineering	
	Masters Researcher	IIT Bombay, India	

ACADEMIC BACKGROUND

Year	Level	Discipline	Institute/ University/ Board		
2006	Ph. D.	Chemical Engineering	IIT Kanpur, India		
2002	M. Tech.	Chemical Engineering	IIT Bombay, India		
2000	GATE	Chemical Engineering	IIT Kharagpur, India		
2000	B. Tech.	Chemical Engineering	SLIET Longowal, India		
		(Spl. in Paper Tech.)	(Punjab Technical University Jalandhar)		
1997	Diploma	Chemical Technology	Government Polytechnic Budaun		
		(Spl. in Fertilizer Tech.)) (BTE UP, Lucknow), India		
1993	10th Std.	Science Group	Govt. Inter College Budaun		
			(UP Board, Allahabad), India		

INDUSTRIAL TRAINING

Year	Industry	
1999	Indian Formers Fertilizers Cooperative (IFFCO) Limited, Aonla, Bareilly, India	6 weeks
1998	Tata Chemicals Limited (Fertilizer Division), Babrala, Budaun, India	6 weeks
1996	Kanha Vanaspati Limited, Ujhani, Budaun, India	4 weeks

RESEARCH OUTCOME

ightarrow Refereed International Journals Publications	43	See Annexure 1(a) at Page 9
ightarrow Conferences Abstracts/Presentations/Proceedings	59	See Annexure 1(b) at Page 13
\rightarrow Books	08	See Annexure 1(c) at Page 18
ightarrow Books Chapter	01	See Annexure 1(d) at Page 19
ightarrow Academic Research & Thesis	04	See Annexure 1(e) at Page 20

RESEARCH/PROJECT GUIDANCE

ightarrow Post-Doctoral Fellow (PDF)	01	See Annexure 2(a) at Page 21
ightarrow Doctoral (Ph. D.) Thesis	09	See Annexure 2(b) at Page 21
ightarrow Masters (M. Tech.) Dissertations	26	See Annexure 2(c) at Page 22
ightarrow Undergraduate (B. Tech.) Major Projects	69	See Annexure 2(d) at Page 24
ightarrow Undergraduate (B. Tech.) Minor Projects	59	See Annexure 2(e) at Page 26
ightarrow Undergraduate (B. Tech.) Internships	03	See Annexure 2(f) at Page 28

SPONSORED PROJECTS AND INDUSTRIAL CONSULTANCIES

	Category \downarrow Status $ ightarrow$	Completed	In Progress	Submitted	Remarks
\rightarrow	Sponsored Projects	03	02	02	See Annexure 3(a) at Page 29
	(Budget in INR)	(1,74,30,000)	(54,14,332)	(1,13,33,634)	
\rightarrow	Industrial Consultancies	01	-	_	See Annexure 3(b) at Page 30
	(Budget in INR)	(85,000)	-	_	

TEACHING ENGAGEMENT

Course →		Theory	Practical	Misc	Remarks
ightarrow Teaching Engagement	@ IIT Roorkee	14	07	04	See Annexure 4(a) at Page 31
ightarrow Teaching Assistantship	@ IIT Kanpur	-	03	01	See Annexure 4(b) at Page 32
	@ IIT Bombay	01	01	01	

ADMINISTRATIVE RESPONSIBILITIES HELD

• Department Level

- \rightarrow Convener Departmental Faculty Search Committee (DFSC)
- \rightarrow Faculty Advisor B.Tech. (Chemical Engineering, 1st Year)
- \rightarrow Member Anti-Ragging Committee

- → Member Department Academic Program Committee (DAPC)
- \rightarrow Member Department Administrative Committee (DAC)
- \rightarrow Member Department Purchase Committee (DPC)
- → Member Department Research Committee (DRC)
- → Professor-in-Charge CAD Centre
- → **Professor-in-Charge** Examinations
- → **Professor-in-Charge** Website and E-mail

• Institute Level

- → Central Purchase Officer (CPO) ... Coordinating Committee of Bhawans (CCB); DoSW
- → Chief Warden..... Rajendra Bhawan; DoSW
- → Convener Dr. B.R. Ambedkar Pragteesheel Manch; DoSW
- → Coordinator Academic Reinforcement Program (ARP); DoSW
- → Faculty Advisor SC/ST Students; DoSW
- → Manager Task Force (Master Planning of Campuses); Director
- → Member Advisory Committee, Institute Computer Centre (ICC)
- → Member Anti-Ragging Committee; DoSW
- \rightarrow Member Institute AC Committee; DoInfra
- \rightarrow Member Technical Committee for E-mail system, ICC
- → Presiding Officer..... SAC Elections; DoSW
- → Returning Officer SAC Elections; DoSW
- → Warden Rajendra Bhawan; DoSW

FELLOWSHIPS/AWARDS/RECOGNITIONS

- 2013 Marquis Who's Who in the World. Listed in 30th Pearl Anniversary Edition. Marquis Who's Who, Berkeley Heights, NJ. Nov 2012, ISBN: 978-0-8379-1150-2
- 2012 IAO Certified Faculty Member. International Accreditation Organization (IAO), Houston, USA
- 2007 Post-Doctoral Fellowship (2007 2009). University of Melbourne, Australia
- 2006 Cash Award (INR 20,000) for publications by students at IIT Kanpur, India (year: 2006 2007)
- 2002 MHRD Fellowship during Ph. D. (2002 2006) at IIT Kanpur, India
- 2000 MHRD Fellowship during M. Tech. (2000 2002) at IIT Bombay, India

MEMBERSHIPS OF PROFESSIONAL/ALUMNUS BODIES

- → Life Member (# LM-49655). Indian Institute Of Chemical Engineers (IIChE), Kolkata, India.
- → Chartered Engineer (India) (# M-1551617). The Institution of Engineers (India) (IEI), Kolkata, India.
- \rightarrow <u>Member</u> (# M-1551617). The Institution of Engineers (India) (IEI), Kolkata, India.
- \rightarrow <u>Member</u> (# 105527). International Association of Engineers (IAENG).
- \rightarrow <u>Member</u> (# 105527). IAENG Society of Chemical Engineering.
- \rightarrow <u>Member</u> (# 105527). IAENG Society of Scientific Computing.
- \rightarrow <u>Member</u> (# ...). Indian Society of Rheology (ISR).
- \rightarrow <u>Member</u> (2017 ...). Executive Committee, SLIET Alumni Association (SAA) Longowal.

- \rightarrow <u>Member</u> (...). Alumni Association, SLIET Longowal, India.
- \rightarrow <u>Member</u> (...). Alumni Association, IIT Bombay, India.
- \rightarrow <u>Member</u> (...). Alumni Association, IIT Kanpur, India.

LECTURES/INVITED TALKS DELIVERED

- \rightarrow NCL Pune (2006) \rightarrow IIT Roorkee (2009, 2010, 2015, 2016) \rightarrow IIT Delhi (2009)
- → <u>Lecture</u> on "Electrokinetics in microchannel flow" in <u>FDP course</u> on "Advance Topics in Fluid Flow & Heat Transfer" from Sep 17 – 18 (2013) at Thapar University, Patiala.
- → Lecture on "Introduction to Meso-scale Modeling: Lattice Boltzmann Method (LBM)" in <u>QIP course</u> on "Chemical Process Engineering: Flow Modelling and Applications" from Jun 20 – 24 (2016) at IIT Roorkee.
- → <u>Lecture</u> on "Introduction to Meso-scale Modeling: LBM approach" in <u>QIP course</u> on "Multiphase Flow in Miniature Systems: Flow Modeling and Applications" from Jun 4 – 8 (2018) at IIT Roorkee.
- → <u>Academic Panelist</u> for panel discussion on "Simulation Apps for Engineering Education: A New Paradigm" in <u>conference</u> on "COMSOL Conference 2019" from Nov 28 29 (2019) at Bangalore.
- → <u>Lecture</u> on "Introduction to Computational Fluid Dynamics and Mesoscale Modeling" in <u>TEQIP-III course</u> on "Mathematical Modeling of Complex Fluids" from Sep 24 28 (2020) at NIT Jalandhar.
- → <u>Keynote Lecture</u> on "Droplet Dynamics in Microfluidic Systems" in <u>National Conference</u> on "Recent Trends in Fluid Dynamics Research" from Apr 2 – 4 (2021) at NIT Rourkela.
- → Lecture on "Hydrodynamics of droplets generation in microfluidic systems" in Research Facility Training Program on "Microfluidics and Microfabrication" from Dec 15 (2021) at NIT Calicut.

RESEARCH SKILLS

• CFD Solvers:

- → <u>Commercial</u>: ANSYS FLUENT, COMSOL Multiphysics
- → Open Source: OpenFOAM, OpenLB, Palabos (Parallel Lattice Boltzmann Solver), Gmsh, Salome,
- \rightarrow <u>In-house</u>: Based on FVM, FEM, Meshless and LBM
- Numerical Methods:
 - → Structured Finite volume (FV), Finite difference (FD), Lattice Boltzmann (LB), Meshless, Deforming-Spatial-Domain/Stabilized-Space-Time (DSD/SST) method

• Hands-on and Development Experience:

- \rightarrow Rheometer and Particle Image Velocimetry (PIV) handling experience
- ightarrow Development of LBM and Meshless solvers for complex fluid flow simulations
- → Development of DSD/SST finite element method in computation of non-Newtonian fluid flow and heat transfer with moving boundaries
 - One of the highly accurate method for complex fluid flow simulations
 - Moving and deformable boundary problems can be handled at very ease
 - Incorporates forced and mixed convection flow and heat transfer in Non-Newtonian fluids

- \rightarrow FVM Solver for Newtonian flow in a lid-driven cavity (Prof. Eswaran's Research Group @ IIT Kanpur); further developed and extended as
 - Development of grid generation solver for flow across circular cylinder
 - Implementation of boundary conditions of channel confined and unconfined cylinder flow
 - Implementation of non-Newtonian power-law fluid viscosity model
- → FVM (serial and parallel) Solver for electroviscous flows of Newtonian and non-Newtonian fluids through microchannels (Prof. Davidson's Research Group @ University of Melbourne)
 - Partial implementation of non-Newtonian Carreau-fluid viscosity model
 - Partial implementation of electrokinetics in permeable wall
- → Development of FDM algorithm and FORTRAN solver for electroviscous flow of power-law fluids through microchannels of circular and non-circular cross-sections (@ University of Melbourne)
- Programming Languages:
 - \rightarrow C/C++, FORTRAN, MPI, Python, Parallel Programming, $\mathbb{M}_{E}X$, HTML, CSS, Javascript
- Operating Systems: Windows and Linux
- Miscellaneous Tools: MATLAB, Scilab, Mathematica, Maple, ASPEN, Tecplot, Origin, Paraview, etc.

PROFESSIONAL ACTIVITIES AND RECOGNITIONS

• Member, Faculty Selection Committee

- ightarrow IIT Mandi, India (Sep 2019)
- Editorial Roles
 - → <u>Associate Editor</u>, Frontiers in Chemical Engineering (Microfluidic Engineering and Process Intensification), Frontiers Media SA. Switzerland. (Since Jun 2022)
 - → <u>Review Editor</u>, Frontiers in Physics (Fluid Dynamics), Frontiers Media SA. Switzerland. (Since May 2022)
 - → <u>Editorial Board Member</u>, International Journal of Aerospace Sciences, Scientific and Academic Publishing (SAP), California, USA. (Since Aug 2012)
- Reviewer for International Journals
 - → AIChE Journal, Canadian Journal of Physics, Chemical Engineering Research and Design, Chemical Engineering Science, Industrial & Engineering Chemistry Research, Heat and Mass Transfer, ASME Journal of Fluid Engineering, ASME Journal of Heat Transfer, ASME Journal of Thermal Sciences and Engineering Applications, International Journal of Chemical Reactor Engineering, International Journal of Heat and Mass Transfer, International Journal of Mechanics and Applications, Journal of Thermal Engineering, Computational Thermal Sciences, Journal of Applied Fluid Mechanics, Physics of Fluids, Journal of Mechanical Engineering Science, Molecular Simulations, American Journal of Fluid Dynamics, Indian Journal of Chemical Technology, Polymers for Advanced Technologies, Journal of Experimental Nanoscience, International Journal of Hydraulic Engineering, Journal of Nanomaterials, Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, etc.

• Reviewer for National & International Conferences

ightarrow Chemeca 2008, EURECA 2013, FMFP, ICHMT

• External Examiner (Reviewer) for Ph.D. Thesis

- \rightarrow University of Delhi (Malti Bansal, 2010)
- \rightarrow IISc Bangalore (Eluru Gangadhar, 2018)
- \rightarrow IIT Bombay (Niteen Kumar, 2020)
- → NIT Rourkela (Deepak Kumar, 2022)

• External Examiner (Oral Board) for Ph.D. Thesis

- \rightarrow IISc Bangalore (Eluru Gangadhar, 2018)
- \rightarrow IIT Bombay (Niteen Kumar, 2020)
- → NIT Rourkela (Deepak Kumar, 2022)

• Examiner for M.Tech. Thesis and B.Tech. Projects

 \rightarrow Large number of internal and external thesis/projects examined

MISCELLANEOUS ACADEMIC/RESEARCH ACTIVITIES

• Convener

- → 12th International Conference on Complex Fluids and Soft Matter (COMPFLU 2018). IIT Roorkee, India. Dec 6 – 9, 2018.
- \rightarrow Indo-US Workshop of Soft Matter (IUWSM 2018). IIT Roorkee, India. Dec 9 11, 2018.
- Joint Organizing Secretary
 - \rightarrow International Conference of Advances in Chemical Engineering (ACE 2013). IIT Roorkee, India. Feb 22 – 24, 2013.

Session Chair

- → "Microfluidics" session in 16th International Complex Fluids Symposium (CompFlu-2022). IIT Kharagpur, India. Dec 19 - 21, 2022.
- → "Modelling and Simulation" session in International Conference on Advances in Smart Materials, Chemical and Biochemical Engineering (CHEMSMART-22), NIT Rourkela, India. Dec 16-18, 2022.
- → "Computational Fluid Dynamics" session in 9th International and 49th National Conference on Fluid mechanics and Fluid power (FMFP-2022), IIT Roorkee, India. Dec 14-16, 2022.
- → "Microfluidics" session in 9th International and 49th National Conference on Fluid mechanics and Fluid power (FMFP-2022), IIT Roorkee, India. Dec 14-16, 2022.
- → "Sustainable Energy" session in International Conference of Chemical Engineering: Enabling Transition Towards Sustainable Future (CHEMTSF). IIT Roorkee, India. Sep 8 – 10, 2022.

• Member (Organizing Committee)

- → International Conference of Chemical Engineering: Enabling Transition Towards Sustainable Future (CHEMTSF). IIT Roorkee, India. Sep 8 – 10, 2022.
- → "CHEMFERENCE-2003": the first annual series of seminars presented by the research scholars of the Department of Chemical Engineering, IIT Kanpur.

• Member (Program Committee)

- → International Conference on Data Analytics in Business and Marketing (ICDABM2022), Shivaji College, University of Delhi. Mar 1 2, 2022.
- → International conference on Advanced Technology, Sustainability and Management (IATSM2021),
 Sushant University Gurgaon. May 27 28, 2021.

 \rightarrow COMSOL Conference, Bangalore. Nov 28 – 29, 2019.

• Member (Advisory Committee)

- → International Conference on Advances in Smart Materials, Chemical and Biochemical Engineering (CHEMSMART-22), NIT Rourkela, India. Dec 16-18, 2022.
- → 9th International and 49th National Conference on Fluid mechanics and Fluid power (FMFP-2022),
 IIT Roorkee, India. Dec 14 16, 2022.
- → International Chemical Engineering Conference 2021 (ICheEC 2021), NIT Jalandhar, India. Sep 16
 19, 2021.
- → International Conference on Advances in Systems, Control and Computing (AISCC 2020), MNIT Jaipur, India. Feb 27 28, 2020.
- → Annual Conference on Civil Engineering and Engineering (ACCEE 2014), Phuket, Thailand. Mar 15 – 16, 2014.
- → International Congress on Engineering and Information (ICEAI)
 - (i) ICEAI 2016. Osaka, Japan. May 10 12, 2016.
 - (ii) ICEAI 2015. Kyoto, Japan. May 07 09, 2015.
 - (iii) ICEAI 2014. Beijing, China. May 22 24, 2014.
 - (iv) ICEAI 2013. Macau, China. Aug 28 30, 2013.
 - (v) ICEAI 2013. Bangkok, Thailand. Jan 26 28, 2013.
 - (vi) ICEAI 2012. Beijing, China. Aug 17 20, 2012.
- → Conference on Technical Advancements in Chemical and Environmental Engineering (TACEE 2012). BITS Pilani, India. Mar 23 24, 2012.

PERSONAL PROFILE

ightarrow Name:	Dr. Ram Prakash	ightarrow Gender:	Male
ightarrow Father's Name:	Late Sh. Mangli Lal	ightarrow Marital Status:	Married
ightarrow Date of Birth:	07 - April - 1979	ightarrow Nationality:	Indian

REFERENCES

- → Dr. Raj P. Chhabra, Professor (Retd.)
 <u>Ph.D. Advisor</u> at IIT Kanpur
 E-mail: chhabra@iitk.ac.in
 URL: https://bit.ly/3vOiKbg
- → Dr. V. Eswaran, Professor Ph.D. Advisor at IIT Kanpur E-mail: eswar@iith.ac.in URL: https://bit.ly/3VMYLnO
- → Dr. Malcolm R. Davidson, Adjunct Professor
 <u>Post-Doc Mentor</u>
 E-mail: m.davidson@unimelb.edu.au
 URL: https://bit.ly/3WSSeJB
- → Dr. Dalton J.E. Harvie, Associate Professor
 <u>Post-Doc Co-Mentor</u>
 E-mail: daltonh@unimelb.edu.au
 URL: https://bit.ly/3WTthOd
- → Dr. V. Shankar
 Professor
 E-mail: vshankar@iitk.ac.in
 URL: https://bit.ly/3k0vCZ5

Professor Department of Chemical Engineering Shiv Nadar University Gautam Buddha Nagar - 201314, UP, India

Department of Mechanical Engineering Indian Institute of Technology Hyderabad Yeddumailaram - 502205, A.P., India

Honorary (Principal Fellow) Department of Chemical Engineering University of Melbourne Parkville 3010, VIC, Australia

Department of Chemical Engineering University of Melbourne Parkville 3010, VIC, Australia

Department of Chemical Engineering Indian Institute of Technology Kanpur Kanpur - 208016, U.P., India

DECLARATION

I hereby declare that all the information furnished above is true to the best of my knowledge and belief.

(Ram Prakash Bharti)

ANNEXURE - 1(A)

REFEREED INTERNATIONAL JOURNALS PUBLICATIONS (*Corresponding author)

- [J.43]. A. Venkateshwarlu, and <u>R.P. Bharti</u>*. Effects of surface wettability and flow rates on the interface evolution and droplet pinch-off mechanism in the cross-flow microfluidic systems. Chemical Engineering Science, 267, 118279 (1 – 17) (2023). DOI: 10.1016/j.ces.2022.118279, arXiv preprint: 10.48550/arXiv.2201.00605
- [J.42]. J. Dhakar, and <u>R.P. Bharti</u>*. Electroviscous effects in charge-dependent slip flow of liquid electrolytes through the charged microfluidic device. Chemical Engineering and Processing - Process Intensification, 180, 109041 (1 – 18) (2022). DOI: 10.1016/j.cep.2022.109041, arXiv preprint: 10.48550/arXiv.2201.00605 (Invited article for Festschrift issue in honor of Prof. K.D.P. Nigam at his 75th Birthday)
- [J.41]. R. Pravesh*, A.K. Dhiman, and <u>R.P. Bharti</u>. Thermal Features of mixed convection from an inline periodic array of circular cylinders in non-Newtonian power-law fluids. Case Studies in Thermal Engineering, 36, 102175 (1 – 17) (2022). DOI: 10.1016/j.csite.2022.102175
- [J.40]. A. Venkateshwarlu, and <u>R.P. Bharti</u>*. Interface evolution and droplet pinch-off mechanism in two-phase liquid flow through T-junction microfluidic system. Colloids and Surfaces A: Physicochemical and Engineering Aspects, 642, 128536 (1 16) (2022). DOI: 10.1016/j.colsurfa.2022.128536, arXiv preprint: 10.48550/arXiv.2202.02130
- [J.39]. <u>R.P. Bharti</u>*, R.P. Ram, and A.K. Dhiman. Computational analysis of cross-flow of power-law fluids through a periodic square array of circular cylinders. <u>Asia-Pacific Journal of Chemical Engineering</u>, 17(2), e2748 (1 – 25) (2022). DOI: 10.1002/apj.2748
- [J.38]. A. Venkateshwarlu, and <u>R.P. Bharti</u>*. Effects of capillary number and flow rates on the hydrodynamics of droplet generation in two-phase cross-flow microfluidic systems. Journal of the Taiwan Institute of Chemical Engineers, 129, 64 – 79 (2021). DOI: 10.1016/j.jtice.2021.07.045, arXiv preprint: 10.48550/arXiv.2105.10308
- [J.37]. R. Kumar, A.K. Lal, <u>R.P. Bharti</u>*, and V. Pancholi. Experimental and computational analysis of material flow characteristics in friction stir welding. International Journal of Advanced Manufacturing Technology, 115 (9-10), 3011 – 3020 (2021). DOI: 10.1007/s00170-021-07345-3
- [J.36]. G. Vishal, J. Tomar, and <u>R.P. Bharti</u>*. Critical parameters for non-Newtonian shear-thickening power-law fluids flow across a channel confined circular cylinder. Journal of the Taiwan Institute of Chemical Engineers, 123, 34 – 46 (2021). DOI: 10.1016/j.jtice.2021.05.025, arXiv preprint: 10.48550/arXiv.1901.07362 (GV, JT, RPB: all first author(s) contributed equally)
- [J.35]. P. Kumar, and <u>R.P. Bharti</u>*. Nanocomposite polymer electrolyte membrane for high performance microbial fuel cell: synthesis, characterization and application. Journal of Electrochemical Society, 166 (15), F1190 – F1199 (2019). DOI: 10.1149/2.0671915jes

- [J.34]. R. Pravesh*, A. Dhiman, and <u>R.P. Bharti</u>. Non-Newtonian power-law fluid's thermal characteristics across periodic array of circular cylinders. Journal of Brazilian Society of Mechanical Sciences and Engineering, 41(2), article no. 88 (20 pages) (2019). DOI: 10.1007/s40430-019-1584-3
- [J.33]. R. Pravesh*, A. Dhiman, and <u>R.P. Bharti</u>. Aiding buoyancy mixed convection flow and thermal features across a periodic array of heated cylinders. International Journal of Heat and Mass Transfer, 130, 1141 – 1162 (2019). DOI: 10.1016/j.ijheatmasstransfer.2018.11.035
- [J.32]. A. Bhattacharyya, F. Nasim, R. Mishra, <u>R.P. Bharti</u>, and P.P. Kundu*. Polyurethane incorporated Chitosan/alginate core-shell nanoparticles for controlled oral insulin delivery. Journal of Applied Polymer Science, 135(26), 46365 (15 pages) (2018). DOI: 10.1002/app.46365
- [J.31]. R. Kumar, V. Pancholi*, and <u>R.P. Bharti</u>. Material flow visualization and determination of strain rate during friction stir welding. Journal of Material Processing Technology, 255, 470 – 476 (2018). DOI: 10.1016/j.jmatprotec.2017.12.034
- [J.30]. K.M. Gangawane, and <u>R.P. Bharti</u>*. Computational analysis of MHD natural convection in partially-differentially heated cavity: effect of cooler size. Proceedings of IMechE, Part C: Journal of Mechanical Engineering Science, 232(3), 515 – 528 (2018). DOI: 10.1177/0954406217752745 (<u>Invited article</u> for special issue on the Lattice Boltzmann Method and its Applications in Complex Flows and Fluid-Structure Interactions)
- [J.29]. R.P. Ram, <u>R.P. Bharti</u>*, and A.K. Dhiman. Forced convection flow and heat transfer across an in-line bank of circular cylinders. Canadian Journal of Chemical Engineering, 94(7), 1381 – 1395 (2016). DOI: 10.1002/cjce.22483
- [J.28]. K.M. Gangawane, <u>R.P. Bharti</u>*, and S. Kumar. Effects of heating location and size on natural convection in partially heated open ended enclosure by using lattice Boltzmann method. Heat Transfer Engineering, 37(6), 507 – 522 (2016). DOI: 10.1080/01457632.2015.1060748
- [J.27]. K.M. Gangawane, <u>R.P. Bharti</u>*, and S. Kumar. Lattice Boltzmann analysis of effect of heating location and Rayleigh number on natural convection in partially heated open ended cavity. Korean Journal of Chemical Engineering, 32(8), 1498 – 1514 (2015). DOI: 10.1007/s11814-014-0361-3
- [J.26]. K.M. Gangawane, <u>R.P. Bharti</u>*, and S. Kumar. Lattice Boltzmann analysis of natural convection in a partially heated open ended enclosure for different fluids. Journal of Taiwan Institute of Chemical Engineers, 49, 27 – 39 (2015). DOI: 10.1016/j.jtice.2014.11.020
- [J.25]. K.M. Gangawane, <u>R.P. Bharti</u>*, and S. Kumar. Two dimensional lattice Boltzmann simulation of natural convection in differentially heated square cavity: effect of Prandtl and Rayleigh numbers. Canadian Journal of Chemical Engineering, 93(4), 766 – 780 (2015). DOI: 10.1002/cjce.22161
- [J.24]. F.-B. Tian*, <u>R.P. Bharti</u>, and Y.-Q. Xu. Deforming-Spatial-Domain/Stabilized Space-Time (DSD/SST) method in computation of non-Newtonian fluid flow and heat transfer with moving boundaries. Computational Mechanics, 53(2), 257 – 271 (2014). DOI: 10.1007/s00466-013-0905-0 (Selected and highlighted as <u>Featured article</u> in "Advances in Engineering", under the section of Mechanical Engineering, April 13, 2014)

- [J.23]. A. Kumar, A.K. Dhiman*, and <u>R.P. Bharti</u>. Power-law flow and heat transfer over an inclined square bluff body: effect of blockage ratio. Heat Transfer - Asian Research, 43(2), 167 – 196 (2014). DOI: 10.1002/htj.21071
- [J.22]. J.D. Berry, M.R. Davidson^{*}, <u>R.P. Bharti</u>, and D.J.E. Harvie. Effect of wall permittivity on electroviscous flow through a contraction. <u>Biomicrofluidics</u>, 5(4), 044102 (17 pages) (2011). DOI: 10.1063/1.3645194
- [J.21]. M.R. Davidson*, <u>R.P. Bharti</u>, and D.J.E. Harvie. Electroviscous effects in a Carreau liquid flowing through a cylindrical microfluidic contraction. <u>Chemical Engineering Science</u>, 65(23) 6259 – 6269 (2010). DOI: 10.1016/j.ces.2010.09.011
- [J.20]. V.K. Patnana, <u>R.P. Bharti</u>, and R.P. Chhabra*. Two dimensional unsteady forced convection heat transfer in power-law fluids from a heated cylinder. International Journal of Heat and Mass Transfer, 53(19-20) 4152 – 4167 (2010). DOI: 10.1016/j.ijheatmasstransfer.2010.05.038
- [J.19]. A.T. Srinivas, <u>R.P. Bharti</u>, and R.P. Chhabra*. Mixed convection heat transfer from a cylinder in power-law fluids: effect of aiding buoyancy. Industrial & Engineering Chemistry Research, 48(21) 9735 9754 (2009). DOI: 10.1021/ie801892m (Invited article for special issue in the honour of Dr. B.D. Kulkarni)
- [J.18]. V.K. Patnana, <u>R.P. Bharti</u>, and R.P. Chhabra^{*}. Two dimensional unsteady flow of power-law fluids over a cylinder. <u>Chemical Engineering Science</u>, 64(12) 2978 – 2999 (2009). DOI: 10.1016/j.ces.2009.03.029
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ANNEXURE - 1(B)

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ANNEXURE - 1(C)

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ANNEXURE - 1(D)

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- [BC.1]. P. Sivakumar, <u>R.P. Bharti</u>, and R.P. Chhabra. Steady power-law flow over a circular cylinder, In: S.K. Dwivedy and D. Maity (Eds.). Recent Advances in Computational Mechanics and Simulations, Volume II, 1st edition. pp. 1254-1260 (2007). IK International Publishing House Pvt. Ltd. New Delhi. ISBN: 9788189866167

ANNEXURE - 1(E)

ACADEMIC RESEARCH & THESIS (Prior to joining at IIT Roorkee)

ightarrow Post-Doctoral Research

Title	Electroviscous flow of Newtonian and non-Newtonian fluids	s through microchannels
Mentor(s)	ightarrow Prof. Malcolm R. Davidson	
University	University of Melbourne, Australia	
	Department of Chemical & Biomolecular Engineering	
Year	ightarrow Start date: May 15, 2007	ightarrow End date: May 14, 2009

ightarrow Senior Project Associate Research

Title	Implementation of a subroutine to calculate the non-Newtoniar	n flux in the General Purpose
	Robust CFD Solver	
Mentor(s)	ightarrow Prof. Vinayak Eswaran	
Institute	IIT Kanpur, India	
	Department of Mechanical Engineering	
Year	ightarrow Start date: Jan 01, 2007	ightarrow End date: Mar 31, 2007

ightarrow Ph. D. Research

Title	Steady flow of incompressible power-law fluids across a c	ircular cylinder: a numerical study
Supervisor(s)	ightarrow Prof. Raj P. Chhabra	
	ightarrow Prof. Vinayak Eswaran	
Institute	IIT Kanpur, India	
	Department of Chemical Engineering	
Year	ightarrow Submission date: Dec 26, 2006	ightarrow Defense date: May 07, 2007

ightarrow M. Tech. Research

Title	Monte Carlo analysis of molecular weight distribution of vinyl acetate emulsion polymers	
Supervisor(s)	ightarrow Prof. Hemant Nanavati	
	ightarrow Prof. Kannan Moudgalya	
Institute	IIT Bombay, India	
	Department of Chemical Engineering	
Year	ightarrow Submission date: Jan 2002 $ ightarrow$ Defense date: Jan 200	2

ANNEXURE - 2(A)

POST-DOCTORAL FELLOW (PDF)

Dr. Piyush Kumar, SERB – NPDF (National Post-Doctoral Fellow) → (Feb 2017 – Jan 2018)
 Project Title: Development of highly selective and low cost polymer electrolyte membranes (PEM) for microbial fuel cell

ANNEXURE - 2(B)

DOCTORAL (PH. D.) THESIS GUIDANCE

9.	Mansi Chopra (22908011, MHRD)	\rightarrow (Jul 18, 2022 – Pursuing –)
	Machine learning in multiphase flows.	
8.	Pratibha Dogra (20908007, PMRF)	ightarrow (Aug 17, 2020 – Pursuing –)
	Colloidal hydrodynamics of active generation and	interaction of droplets in multiple immiscible
	liquids in microfluidic systems.	
7.	Lekhraj Malviya (18908016, MHRD)	ightarrow (Dec 27, 2018 – Pursuing –)
	Non-Newtonian fluid flow and heat transfer from free	ely rotating cylinders and spheres.
6.	Jitendra Dhakar (17908011, MHRD)	ightarrow (Dec 28, 2017 – Pursuing –)
	Electroviscous effects in non-Newtonian fluid flow th	rough microchannels.
5.	Akepogu Venkateshwarlu (15908011, MHRD)	→ (Dec 28, 2015 – Apr 23, 2022 – Jul 28, 2022)
	Hydrodynamics of droplets generation in two-phase	flow through T-junction microfluidic device.
4.	Abhishek Kumar Lal (13912001, MHRD)	→ (Jul 12, 2013 – Dec 24, 2019 – <u>Feb 28, 2020</u>)
	Mixed convection in non-Newtonian fluid flow over a	rotating circular cylinder.
3.	Ram Pravesh Ram (12912011, QIP)	→ (Jul 16, 2012 – Aug 21, 2017 – Jan 31, 2018)
	Periodic flow of non-Newtonian fluids across an arra	y of cylinders.
	(<u>Co-advisor</u> : Prof. Amit Kumar Dhiman, IIT Roorkee, I	ndia)
2.	Vijay Kumar Verma (10912020, MHRD)	ightarrow (Dec 30, 2010 – Nov 30, 2017 – Apr 09, 2018)
	The development of meshless local Petrov Galerkin (N	ILPG) method for complex fluid flow simulations.
1.	Krunal Madhukar Gangawane (10912001, MHRD)	→ (Jul xx, 2010 – Dec 19, 2014 – Apr 07, 2015)
	Convective flow and heat transfer analysis by using t	hermal lattice Boltzmann method.
	(<u>Co-advisor</u> : Prof. Surendra Kumar, IIT Roorkee, India	a)

ANNEXURE - 2(C)

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MASTERS (M. TECH.) DISSERTATIONS GUIDANCE

26.	Akanksha Gupta (22561003) To be decided.	Pursuing
25.	Rohit Rajpal Dhole (21561015) Rheological studies of complex fluids.	Pursuing
24.	Pradeep Dhondi (19561005) Droplet dynamics in non-Newtonian fluid flow through microchannels.	<u>2021</u>
23.	Lalit Singh Mehra (17514006) Hydrodynamics of channel confined rotating circular cylinder submerged in non-Newtoniar	<u>2019</u> n media.
22.	S. Abu Saif (16515003) CFD analysis of opposing buoyancy mixed convection heat transfer from a confined circular in non-Newtonian power-law fluids.	<u>2018</u> r cylinder
21.	Sanjay Ram (16514010) CFD analysis of aiding buoyancy mixed convection in non-Newtonian fluids flow over a confined circular cylinder.	2018 channel
20.	S. Aman Kumar (12210026) Non-Newtonian fluid flow and heat transfer from a cylinder confined in corrugated channel.	<u>2017</u>
19.	Ashok Paliwal (12210008) Non-Newtonian fluid flow and heat transfer from a cylinder confined in irregular channel.	<u>2017</u>
18.	Venkataraman N. V. (13515024) Preliminary investigation and simulation of fibre Bragg grating (FBG) cryogenic flowmeters. (<u>Co-advisor</u> : Dr. R. Ramalingam, Institute for Technical Physics (ITEP), Karlsruhe Institute Institute for Technology (KIT), Germany)	<u>2015</u> stitute of
17.	Jyoti Tomar (13514010) Characterization of flow regimes for shear-thinning fluid flow across a channel confined cylinder.	<u>2015</u> d circular
16.	Garima Vishal (13514009) Critical Parameters for shear thickening fluid flow across a channel confined circular cylinde	<u>2015</u> er.
15.	Shikha Verma (12514023) Electroviscous effects in shear flow of power-law fluid through a microchannel. (partial sup	<u>2014</u> ervision)
14.	Vipin Kumar Sachan (11514027) Mixed convection heat transfer in confined flow of power-law fluid across a pair of tanden cylinders.	<u>2014</u> n circular

CURRICULUM VITAE

13.	Toshi Gupta (11514024) Effect of opposing buoyancy in confined flow of power-law fluids across a circular cylinder.	<u>2013</u>
12.	Sharad Tiwari (11514020) Convective flow of power-law fluids across a pair of tandem circular cylinder in confined arrange	<u>2013</u> ment.
11.	Aarti Kain (08210001) Effect of aiding buoyancy in confined flow of power-law fluid across a circular cylinder.	<u>2013</u>
10.	Vipin M. Rokade (10514020) Effect of opposing buoyancy on convective heat transfer from a cylinder to power-law fluids.	<u>2012</u>
9.	Mayank Agarwal (10514011) Mixed convection heat transfer in Poiseuille flow of power-law fluids across a cylinder.	<u>2012</u>
8.	Pratik Dilip Kakkar (071105) Mixed convection heat transfer in unconfined flow of power-law fluids across a cylinder: eff temperature and shear-dependent viscosity.	2012 ect of
7.	Manish Bhatia (———) Steady flow of non-Newtonian fluids across an array of circular cylinders.	<u>2011</u>
6.	Bhaskar Thota (———) Finite difference solution of electrokinetic flow through microchannel.	<u>2011</u>
5.	P. Ramulu Rathod (———) Finite difference solution of electrokinetic flow through microfluidic pipe.	<u>2011</u>
4.	Vijaya K. Patnana ¹ (———) Momentum and heat transfer from a cylinder to power-law fluids in the unsteady flow regime.	<u>2008</u>
3.	Avadhani T. Srinivas ¹ (———) Mixed convection from a circular cylinder to power-law liquid.	<u>2008</u>
2.	Rahul C. Patil ¹ (———) Flow over two circular cylinders in tandem configuration: drag and heat transfer.	<u>2007</u>
1.	P. Sivakumar ¹ (———) Flow past circular and elliptical cylinders: a numerical study.	2006

¹ <u>Advisor</u>: Prof. R.P. Chhabra, Department of Chemical Engineering, IIT Kanpur, India

RP Bharti (rpbharti@ch.iitr.ac.in), IIT Roorkee

ANNEXURE - 2(D)

UNDERGRADUATE (B. TECH.) MAJOR PROJECTS

(CH/CHN-400: Major Project course; *Group project coordinator; Duration: two semesters)

69. Nishanth R. (19121019),	68. Abhinav Tyagi (19121001),	67. Hitesh Kumar (19118034),
66. Vansh Ruhela* (19112092),	65. Harshit Baranda (19112032),	
Project Title: Techno-economic feas	sibility analysis of design of tower for	absorption of CO_2 from power plant
emission source using DEA solvent	of different concentrations.	In progress
64. Sant Babu (18121020),	63. Devashish Yadav* (18112019),	62. Anuj Singh (18112012),
61. Anamika Verma (18112007),	60. Akanchha Bhadani (18112003)	,
Project Title: Techno-economic fea	asibility analysis of a plant for hyd	rogenation of CO ₂ to formate and
methanol.		2022
59. Shuvam Samadder (17112076),	,	
Project Title: Droplet dynamics in m	nicrofluidics system.	<u>2021</u>
58. Shivani Raghuwanshi* (171120	73),	57. Rishabh Singh (17112064),
56. Pratibha Deoraj (17112054),	55. Oman Kumar (17112051),	54. Avinash Jharwal (17112018),
Project Title: Techno-economic feas	sibility analysis of a plant for product	ion of 90000 MTPA terephthalic acid
using para-xylene.		<u>2021</u>
53. Saket Bhatt (16112075),		52. Ravi Ranjan (16112069),
51. Kshitij Pratap Singh Bhdauria (2	16112036),	50. Astha Verma (16112016),
49. Astha (16112015),	48. Abhishek Singh* (16112002),	47. Abhishek Kumar (16112001),
Project Title: Techno-economic feas	sibility analysis of a plant for produc	tion of 30000 MTPA pentaerythritol
& sodium formate.		<u>2020</u>
46. Vardan Bapna (15112105),	45. Manish Kumar Rasgania (1511	2049),
44. Ayush Yadav (15112026),	43. Akshay Verma* (15112008),	42. Satnam Singh (15111037),
Project Title: Techno-economic feas	sibility analysis of a plant for produc	tion of 20000 MTPA liquid fuel from
waste plastics.		<u>2019</u>
41. Saurav Kumar Goyal (14112088),	40. Nimisha Gupta* (14112065),
39. Hemant Kumar (14112038),		38. Anunay Anand (14112016),
Project Title: Techno-economic fea	asibility analysis of a plant for pro	duction of 2 MMTPA benzylamine
production via gas phase hydrogen	ation of benzonitrile.	<u>2018</u>
37. Vaibhav Pal (13112103),	36. Shivam Kumar* (13118084),	35. Shanu Singhal (13112085),
34. Sanjay Godara (13112079),	33. Ashutosh Rungta (13112019),	32. Abhishek Kumar (13112003),
Project Title: Techno-economic feas	sibility analysis of a plant for produc	tion of 55000 MTPA Ethylene Glycol
(MEG) production using coal as feed	lstock.	2017

31. Virendra Kumar Verma (12112080), **30.** Rahul (12112055), **29.** Mohit Goyal (12112047),

28. M. Satyam (12112045), 27. Ishtyaque Ahmad Ansari* (12112036), 26. Faisal Saifi (12112027),

Project Title: Techno-economic feasibility analysis of a plant for production of 100000 MTPA phenol production by toluene oxidation.

25. Surya Pratap Singh Solanki (11112050),
23. Maanik Gupta (11112022),
24. Siva Sanhit Vaddiparthi (11112047),
22. Jitendra Kumar Prabhakar (11112017),

Project Title: Techno-economic feasibility analysis of a plant for production of 1.2 million TPA total recycle hydrocracker for maximizing middle distillates from vacuum distillation unit residue in a high sulphur heavy crude petroleum refinery. (<u>Co-advisor</u>: Prof. Basheshwar Prasad) <u>2015</u>

21. Tanuj Agarwal (10112054),
20. Manav Bhati* (10112025),
19. Latil Kumar Patidar (10112023),
18. Himanshu Gupta (10112015),
17. Alok Ratre (10112004),

Project Title:Techno-economic feasibility analysis of a plant for production of sodium chlorate throughelectrolysis route using NaCl as a feedstock. (Co-advisor: Prof. Shri Chand)2014

Voggu Vikas Reddy* (9112048),
 Utsav Marwaha (9112045),
 Sandeep Kumar (9112037),
 Bhanu Kumar Paliwal (9112012),

Project Title: Techno-economic feasibility analysis of a plant for the recovery of valuable olefins from FCCU off gas streams. (Co-advisor: Prof. Shishir Sinha) 2013

11. Saumya Agarwal (8112032), **10.** Sanjay Kumar Dudawat (8112030), **9.** Sahil Sood* (8112028),

8. Rameshwari Ahriwar (8112024), 7. Harshit Wadhwa (8112009), 6. Dongla S.S. Krishna Teja (8112006),

Project Title:Techno-economic feasibility analysis of a plant for production of Propylene from LPG.(Co-advisor:Prof. V.K. Agarwal and Prof. Shashi)2012

5. Shubham Sharma (070730), **4.** Manas Gupta* (070713), **3.** Arun Singh (070707),

2. Arkapol Basu (070706), **1.** Ajay Kumar Meena (070702),

Project Title: Techno-economic feasibility analysis of a plant for production of 500 TPD Fischer Tropsh liquidfrom syngas (H2:CO = 2:1). (Co-advisor: Prof. Shri Chand)2011

ANNEXURE - 2(E)

UNDERGRADUATE (B. TECH.) MINOR PROJECTS

(CH/CHN/PEN-300: Minor Project/Case Study course; Group/individual project; Duration: one semester)

59. Piyush Yadav (20112077), **58.** Akshay Pareek (20112010), 57. Mohammed Aman (20112065), **56.** Rahul Sunwaniya (20112089), **55.** Sandal Rana (20112098), Project Title: In progress **54.** Hardik Garg (19113048), 53. Sushant Kumar Roy (19112085), 52. Nipun Aggarwal (19112051), **51.** Mogillannolla Hareeshwar Reddy (19112043), 50. Meshram Vedant Pramanand (19112042), Project Title: External Flow over cylinder. 2022 **49.** Gautam Goyal (18112023), **48.** Arjun Aryan (18112015), **47.** Arham Habib (18112014), **46.** Anurag Kumar Jaiswal (18112013), **45.** Anuj Singh (18112012), Project Title: Machine learning for fluid mechanics of bluff bodies and two-phase flow. 2021 **44.** Vinay Jain (17112088), **43.** Utkarsh Mishra (17112085), **42.** Ruchi Sharma (17111028), **41.** Ritik Gupta (17112067), **40.** Rishabh Singh (17112064), **39.** Prabhat Koutha (17121014), Project Title: Symbolic non-linear regression analysis. 2020 **38.** Tanpreet Singh Kalsi (16112095), **37.** Pawan Kumar (16112054), **36.** Naman Sinha (16112047), **35.** Kunal Satpal (16112037), **34.** Chirag Garg (16112018), **33.** Ashish Kumar (16112012), Project Title: Curve fitting and data regression analysis of multivariable function. 2019 **32.** Ritu Sharma (15112078), **31.** Parth Nagar (15112059), **30.** Ishita Singhal (15112044), **29.** Harsh Wardhan (15112041), 28. Anurag Kumar (15112013), Project Title: Bluff bodies hydrodynamics in non-Newtonian fluids: a CFD study. 2018 27. Sagar Arora (14112083), **26.** Rahul Kumar Pandey (14112070), **25.** Durga Prasad Murmu (14112033), **24.** Ayushi Agrawal (14112026), **23.** Archit Umrao (14112020), Project Title: Economic aspects of sugar industry, its qualitative and quantitative analysis. 2017 **22.** Shyam Pratap Singh (13112093), **21.** Shubham Kumar Jain (13112092), **20.** Shubham Gusain (13112091), **19.** Shobhit Gupta (13112090), **18.** Shivansh Singh (13112089), Project Title: Simulation of urea synthesis reactor: thermodynamics framework and reactor model. 2016 **17.** Shubham Jain (12112070), **16.** Saurabh Bharti (12112064), **15.** Sachin Kumar (12112060), 14. K.P. Vikas (12214010), Project Title: 2015 **13.** Anurag Anand (11112006), Project Title: Hydrodynamic characteristics of power-law fluid flow across a cylinder confined within the

square cavity.

2014

12. Anuj Kumar (11112005),

Project Title: Effect of temperature	dependent viscosity on the hydrod	ynamic characteristics of a cy	linder
confined within the square cavity.			<u>2014</u>
11. Ronak Jain (10112039),	10. Raunak Kumar (10112038),	9. Rakesh Bhardwaj (101120	37),
Project Title:			<u>2013</u>
8. Shubham Khare (9112041),	7. Ravi Kumar Chaudhary (911203	5), 6. Rajat G. Garia (9112033),	
Project Title:			<u>2012</u>
5. Himanshu Goyal (8112011),	4. Himanshu Agarwal (8112010),		
Project Title: Lattice Boltzmann sim	nulation of non-Newtonian fluid flov	v in a pipe.	<u>2011</u>
3. Tarun Singh Bhatia (070733),	2. T. Sivaram Reddy (070732),	1. Suhen Singhal (070731),	
Project Title: Poiseuille flow of pow	er-law fluid across a rotating cylind	er.	<u>2010</u>

ANNEXURE - 2(F)

UNDERGRADUATE (B. TECH.) SUMMER INTERNSHIPS

3. Pratyush Kumar Mohanty

Program/Institute: 3rd year, B. Tech. (Chemical Engineering), NIT Rourkela, India Project Title: Viscoelastic fluid flow across a channel confined cylinder using RheoTool - OpenFOAM.

2. Rushi Girish Yerawar

SPARK fellowship, IIT Roorkee, India. (SPARK ID: SPA216259) Program/Institute: 2nd year, B. Tech. (Chemical Engineering), IIT Kharagpur, India Project Title: Hydrodynamics of multilayer asymmetric ionic liquids flow through the rectangular microchannel.

1. Archi Agrawal

 \rightarrow (May 15, 2020 – Jul 25, 2020)

 \rightarrow (Dec 06, 2022 – Dec 26, 2022)

 \rightarrow (Jun 01, 2021 – Jul 26, 2021)

SPARK fellowship, IIT Roorkee, India. (SPARK ID: SP202376) <u>Program/Institute</u>: 2nd year, B. Tech. (Metallurgical and Materials Engineering), IIT Roorkee, India

Project Title: Electroviscous effects in low Reynolds number fluid flow through a slit-like microfluidic device.

ANNEXURE - 3(A)

SPONSORED PROJECTS

			Status $ ightarrow$	Completed	In Progress	Submitted
			No. of Projects $ ightarrow$	03	02	02
			Budget (in INR) $ ightarrow$	1,74,30,000	54,14,332	1,13,33,634
5.	Synergistic design a	nd thermal pe	erformance analysis	of a liquid-c	ooled microfl	uidic thermal
	management system	for a lithium-ior	n battery pack for ele	ctric vehicles	\rightarrow In Progre	ess (2023 – 26)
	ightarrow Investigator(s):	<u>R.P. Bharti</u>				
	ightarrow Funding Outlay:	INR 47,54,332	-	\rightarrow Ref. No.: EE	Q/2022/001053	3
	\rightarrow Funding Scheme:	Empowerment	t and Equity Opportu	nities for Exce	lence in Sciend	ce (EMEQ)
	ightarrow Funding Source:	Science and Er	ngineering Research	Board (SERB),	New Delhi, Ind	ia
4.	Numerical analysis of	electroviscous	effects in multilayer	complex fluid	s flow through	a microfluidic
	device				ightarrow In Progre	ess (2020 – 23)
	ightarrow Investigator(s):	<u>R.P. Bharti</u>				
	ightarrow Funding Outlay:	INR 6,60,000	-	\rightarrow Ref. No.: MT	R/2019/001598	8
	ightarrow Funding Scheme:	Mathematical	Research Impact Cen	tric Support (N	ATRICS)	
	ightarrow Funding Source:	Science and Er	ngineering Research	Board (SERB),	New Delhi, Ind	ia
3.	Development of highl	y selective and l	ow cost polymer elec	trolyte membi	ranes (PEM) for	microbial fuel
	cell				ightarrow Complet	ed (2017 – 19)
	ightarrow Investigator(s):	Piyush Kumar	(PI), and <u>R.P. Bharti</u> (Mentor PI)		
	ightarrow Funding Outlay:	INR 19,20,000	-	ightarrow Ref. No.: PD	F/2016/001581	
	ightarrow Funding Scheme:	National Post-	Doctoral Fellow (NPD	PF)		
	ightarrow Funding Source:	Science and Er	ngineering Research	Board (SERB),	New Delhi, Ind	ia
2.	Advanced Rheometer	with Microscor	oy, High temperature	, Extensional F	Rheology, Magr	neto Rheology
	Attachments				ightarrow Complet	ed (2017 – 18)
	ightarrow Investigator(s):	Vimal Kumar, (Gaurav Sharma, Sum	ana Ghosh, Pra	ateek Kumar Jł	na, P.P. Kundu,
		<u>R.P. Bharti,</u> Am	it Kumar Dhiman, V.O	C. Nathan, Ans	hu Anand,	
		Sanjoy Ghosh,	P. Bera, Vivek Pancho	oli		
	ightarrow Funding Outlay:	INR 1,52,30,00	0 -	ightarrow Ref. No.: SM	ILE/2017/42	
	\rightarrow Funding Scheme:	Support for Ma	ajor Interdisciplinary	Laboratory Eq	uipment (SMIL	E)
	ightarrow Funding Source:	Sponsored Res	search & Industrial Co	onsultancy (SR	IC), IIT Roorkee	e, India
1.	Bluff body hydrodyna	mics of non-Ne	wtonian fluids		ightarrow Complet	ed (2010 – 13)
	ightarrow Investigator(s):	<u>R.P. Bharti</u>				
	ightarrow Funding Outlay:	INR 2,80,000	-	\rightarrow Ref. No.: IIT	R/SRIC/886/F.I.	.G.(Scheme-A)
	ightarrow Funding Scheme:	Faculty Initiati	on Grant (FIG), Scher	ne A		
	ightarrow Funding Source:	Sponsored Res	search & Industrial Co	onsultancy (SR	IC), IIT Roorkee	e, India

2.	Reusable microcapsu	les for carbon dioxide (CO_2) captur	e	ightarrow Submitted (Dec 2020)
	ightarrow Investigator(s):	<u>R.P. Bharti</u> , B.J. Deka,		
		S. Mettu (Univ. of Melbourne, Aust	ralia)	
	ightarrow Funding Outlay:	INR 72,31,920	ightarrow Ref. No.: throu	gh email
	\rightarrow Funding Scheme:	IOCL Projects - Industry Academia	Interaction	
		(Domain: cost efficient carbon cap	ture & utilization (CCU) technologies)
	ightarrow Funding Source:	Principal Scientific Advisor (PSA) t	o GoI, New Delhi	
1.	Development of lattic	e Boltzmann method based numer	ical solver for elect	ro-thermo-hydrodynamic
	phenomenon			\rightarrow Submitted (Oct 2019)
	ightarrow Investigator(s):	K.M. Ganagwane (NIT Rourkela), <u>F</u>	.P. Bharti,	
		Abdulmajeed Mohamad (Univ. of	Calgary, Canada),	
		Gholamreza Kefayati (Univ. of Tas	mania, Australia	
	ightarrow Funding Outlay:	INR 41,01,714	\rightarrow Ref. No.: 1583	
	\rightarrow Funding Scheme:	Scheme for Promotion of Academ	ic and Research Co	ollaboration (SPARC)
	ightarrow Funding Source:	Ministry of Human Resource Deve	lopment (MHRD), N	lew Delhi

ANNEXURE - 3(B)

INDUSTRIAL CONSULTANCIES

1.	Opinions on phosphorus pentachloride (PCl $_5$) manufacturing process		\rightarrow Completed (Mar 2010)
	ightarrow Investigator(s):	<u>R.P. Bharti</u>	

→ Funding Outlay: INR 85,000 → Ref. No.: CHD-1001/10-11
→ Industry: Pharma Chemicals Industries (PCI),

Plot 2811, GIDC, Sarigam - 396155, Valsad, Gujrat, India

ANNEXURE - 4(A)

TEACHING ENGAGEMENT

 \rightarrow @ IIT Roorkee, India (2009 – Present)

ightarrow Theory Courses 1

14.	CH–205: Fluid	Dynamics			. (3–2–2)	DCC – UG – 2
	ightarrow AS:	2010–11;	2011–12;	2012–13;	2013–14;	
13.	CH–308: Indus	trial Instrumer	tation		(2–0–0)	DCC – UG – 3
	ightarrow SS:	2010-11;				
12.	CH-423: Proce	ss Integration			. (3–0–0)	DEC – UG – 4
	ightarrow SS:	2011–12;	2012–13;			
11.	CH-426: Advar	nced Numerica	l Methods		. (3–0–0)	DEC – UG – 4
	ightarrow SS:	2012–13;	2013–14;			
10.	CH–560: Proce	ss Intensificati	on in Hydrocarb	oon Industries	. (3–1–0)	DEC – UG – 4
	ightarrow SS:	2010-11;				
9.	CHN-103: Comp	uter Programr	ning and Nume	rical Analysis	. (3–2–2)	DCC – UG – 1
	ightarrow AS:	2013–14;	2014–15;	2015–16;		
8.	CHN-104: Fluid	Dynamics			. (3–2–2)	DCC – UG – 1
	ightarrow SS:	2014–15;	2015–16;	2016–17;		
7.	CHN-322: Optim	nization of Che	mical Engineeri	ng Processes	. (3–1–0)	DEC – UG – 3
	ightarrow SS:	2018–19;	2019–20;	2020–21;	2021–22;	2022–23;
6.	CHN-324: Comp	utational Fluic	Dynamics		. (3–1–0)	DEC – UG – 3
	ightarrow SS:	2016–17;	2017–18;			
5.	CH-561: Comp	utational Fluid	Dynamics ²		(3–1–0)	DEC – PG – 1
	\rightarrow SS:	2014 15.	2015 10.		x <i>y</i>	
		2014-15,	2015-16;			
4.	CHE-501: Mathe	ematical Metho	2015–16; ods in Chemical	Engineering ²	(3–1–0)	DCC – PG – 1
4.	CHE-501: Mather \rightarrow AS:	2014–13, ematical Metho 2018–19;	2015–16; ods in Chemical 2019–20;	Engineering ²	(3–1–0) 2021–22;	DCC – PG – 1 2022–23;
4. 3.	CHE-501: Mathe → AS: CHE-503: Advar	2014–13, ematical Metho 2018–19; nced Transport	2015–16; ods in Chemical 2019–20; Phenomena ²	Engineering ² 2020–21;	(3–1–0) 2021–22; (3–1–0)	DCC – PG – 1 2022–23; DCC – PG – 1
4. 3.	CHE-501: Mather \rightarrow AS: CHE-503: Advar \rightarrow AS:	2014–13, ematical Metho 2018–19; nced Transport 2016–17;	2015–16; ods in Chemical 2019–20; Phenomena ² 2017–18;	Engineering ² 2020–21;	(3–1–0) 2021–22; (3–1–0)	DCC – PG – 1 2022–23; DCC – PG – 1
4. 3.	CHE-501: Mather \rightarrow AS: CHE-503: Advar \rightarrow AS: ICH-01: Comp	2014–13, ematical Metho 2018–19; nced Transport 2016–17; putational Fluic	2015–16; ods in Chemical 2019–20; Phenomena ² 2017–18;	Engineering ² 2020–21;	(3–1–0) 2021–22; (3–1–0)	DCC – PG – 1 2022–23; DCC – PG – 1
4. 3. 2.	CHE-501: Mather \rightarrow AS: CHE-503: Advar \rightarrow AS: ICH-01: Comp \rightarrow SS:	2014–13, ematical Metho 2018–19; nced Transport 2016–17; putational Fluic 2011–12:	2015–16; ods in Chemical 2019–20; Phenomena ² 2017–18; I Dynamics 2012–13:	Engineering ² 2020–21; 	(3–1–0) 2021–22; (3–1–0)	DCC – PG – 1 2022–23; DCC – PG – 1 IEC – UG – 3/4
4. 3. 2.	CHE-501: Mathe \rightarrow AS: CHE-503: Advar \rightarrow AS: ICH-01: Comp \rightarrow SS: MI-101: Therm	2014–13, ematical Metho 2018–19; need Transport 2016–17; putational Fluic 2011–12; nodynamics	2015–16; ods in Chemical 2019–20; Phenomena ² 2017–18; I Dynamics 2012–13;	Engineering ² 2020–21; 	(3-1-0) 2021-22; (3-1-0) . (3-1-0)	DCC – PG – 1 2022–23; DCC – PG – 1 IEC – UG – 3/4

- ightarrow **AS**: Autumn Semester (Jul Dec); \rightarrow **SS**: Spring Semester (Jan - May); ightarrow **DCC**: Department Core Course;
- \rightarrow **IEC**: Institute Elective Course;

¹ Course Code: Title (L–T–P) Type–Level– Year \rightarrow Semester: Session [Students]

² (PG Core + UG Elective + Pre-Ph.D.) Course

\rightarrow Laboratory Courses¹

7.	CH–310: Chemical Engineering	g Lab - II		. (0–0–3)	. DCC – UG – 3
	ightarrow SS: 2010–11;	2011–12;			
6.	CHN-103: Computer Programm	ing and Num	erical Analysis	. (0–0–2)	. DCC – UG – 1
	ightarrow AS: 2016–17;	2017–18;	2018–19;	2019–20;	
5.	CHN-104: Fluid Dynamics			. (0–0–2)	. DCC – UG – 1
	ightarrow SS: 2014–15;	2015–16;	2016–17;		
4.	CHN–201: Heat Transfer			. (0–0–2)	. DCC – UG – 2
	ightarrow AS: 2018–19;	2019–20;			
3.	CHN-301: Mass Transfer - II			. (0–0–2)	. DCC – UG – 3
	ightarrow AS: 2022–23;				
2.	CH–504: Process Simulators			. (0–0–4)	. DCC – PG – 1
	ightarrow SS: 2011–12;	2012–13;	2013–14;		
1.	CH–507: Computer Programm	ing and Softw	vare Tools	. (0–0–4)	. DCC – PG – 1
	ightarrow AS: 2011–12;	2012–13;	2013–14;		
ightarrow Mis	cellaneous Courses ¹				
4.	CH–312: Communication Skill	s		. (0–4–0)	. DCC – UG – 3
	ightarrow SS: 2010–11;	2012–13;			
3.	CH–407: In-Plant Training - Se	minar		. (0–2–0)	. DCC – UG – 4
	ightarrow AS: 2009–10;	2012–13;			
2.	CHN-391: Technical Communic	ation		. (0–4–0)	. DCC – UG – 3

1. CHE/N-700: Seminar² DCC – PG – 1

ightarrow SS: 2015–16;

 \rightarrow SS: 2021–22; 2022–23;

2016-17;

ANNEXURE - 4(B)

TEACHING ASSISTANTSHIP

 \rightarrow At IIT Kanpur, India (2002-2006)

 \rightarrow At IIT Bombay, India (2000-2002)

No.	Code	Name of subject/Task	Coordinator	Institute
7.	ChE 391	Heat and Mass Transfer Lab	Prof. J. P. Gupta	IIT Kanpur
6.	ChE 491	Reaction Engineering Lab	Prof. D. P. Rao	IIT Kanpur
5.	ChE 492	Process Control Lab	Prof. A. Khanna	IIT Kanpur
4.	-	Departmental Web & Computers	Prof. V. Shankar	IIT Kanpur
3.	-	Thermodynamics	Prof. H. Nanavati	IIT Bombay
2.	-	Heat Transfer Lab	Prof. H. Nanavati	IIT Bombay
1.	_	Departmental Library	Prof. V. A. Juvekar	IIT Bombay