Department of Chemical Engineering, IIT Bombay.
List of TA, TAP and FA Ph.D Topics for Spring, 2023-2024
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Topic No	Timestamp	Email Address	Name of the faculty (email id)	Title:	Objectives (4-5 lines): You may provide a link to the additional information (Additional description, videos etc.) [Optional]	Area of the research (One key word)	Nature of the project (Experimental/Modeling/ Theoretical/):	Background required (e.g. Chemical Engg/Chemistry/Physics, Specific experimental expertise/Knowledge in
1-TAP(SMM)	TAP	sanjaym@iitb.ac.in	Sanjay Mahajani	Circular economy for foundry sand: Chemical, mechanical and thermal reclamation	The project deals with technology development for reclamation of the waste foundry sand. The method depends on the type of binders used. For bentonite binder mechanical method is employed, while for resin its thermal. For sodium silicate binders chemical method is found to useful. The student is expected to develop cost effective techniques, perform technoeconomic analysis and solutions life cycle assessment.	Process development, circular economy and sustainability	Both: Theoretical (Computational or Modelling) + Experimental	Chemical Engineering
2-TAP(SwB)	TAP	swaticb@iitb.ac.in	Swati Bhattacharya	Molecular dynamics study of Vpx, a virion-associated protein of Human Immunodeficiency Virus 2 (HIV-2)	An overarching theme in our lab is understanding the molecular mechanisms of various diseases and how the immune system responds to it. In particular, we are interested in the human protein SAMHD1 that is known to prevent HIV infection. The central goal of this project is to explore the interaction of the human protein SAMHD1 and its nemesis, the retroviral protein Vpx. Understanding this interaction at a molecular level will lay the foundation for designing small molecule drug interventions which can prevent the degradation of SAMHD1 and, in turn can prevent HIV-2 infection.	Computational Biology	Theoretical / Computational / Modelling	Chemical Engineering, Chemistry or Physics. An interest in computational modeling is required. The student is expected to learn various computational techniques during the Ph.D.
3-TAP(YS)	TAP	yshastri@iitb.ac.in	Yogendra Shastri	Optimal regional mapping of agricultural residue and end uses for decarbonization	Multiple applications of agricultural residue such as bio-power, ethanol, and biogas production are proposed in India. The economic and environmental feasibility of these options is regional. It depends on local residue availability, scale, seasonality, regional energy requirements and so on. In this project, we will develop a strategy to identify optimal regional mapping between residue and end uses. Core of the work will be development of a national scale resource optimization model. Detailed economic assessment of selected technologies will be done. Environmental impacts such as water footprint, carbon footprint, and air pollution will be calculated. This information will be used to recommend region specific (district or state level) utilization options for residue.	Energy and decarbonization	Theoretical / Computational / Modelling	Chemical engineering, Biotechnology, Industrial engineering, operations research, mechanical engineering. The work will require computer programming. Experience in computer programming is desirable but not a requirement.
4-TAP(YS)	TAP	yshastri@iitb.ac.in	Yogendra Shastri	Assessment of E-fuel production pathway using life cycle and techno-economic assessment	E-fuels are fuels produced from carbon di oxide captured using carbon capture techniques and green hydrogen. They are considered as promising replacements for conventional hydrocarbons. This project proposes to conduct early stage life cycle assessment and preliminary techno-economic assessment of selected E-fuels in collaboration with an industrial partner. We will use a combination of experimental data provided by collaborating industry and data generated using engineering calculations, process simulations, and literature. The TEA calculations will include the capital as well as operating expenses based on basic engineering designs. Recommendations will be developed for scale-up and commercialization.	Energy sustainability	Theoretical / Computational / Modelling	Chemical engineering, environmental engineering, industrial biotechnology. Background is process design and simulation will be beneficial. This is a computational project and will involve collaboration with an industrial partner.
5-TAP(AbC)	TAP	abhijit@che.iitb.ac.in	Abhijit Chatterjee	CO_2 electrochemical reduction over nanoporous electrocatalysts: Experiments and modeling of thermodynamics, reaction and transport, and catalyst surface evolution	Nanoporous materials are promising electrocatalysts as they possess huge surface area, large porosity, diverse catalytic sites and high defect density. The functioning of these electrocatalysts remain yet to be explained because of their complex morphology. Gaining such understanding can be useful for the numerous potential applications of such catalysts. One application is that of electrochemical reduction of CO2. Given the steadily worsening global climate issues due to greenhouse gas emissions, numerous methods for converting CO2 to hydrocarbons and valuable chemicals are being explored, e.g. biological, thermochemical, photochemical, and electrochemical. Among these techniques, the electrochemical reduction of CO2 has recently gained much attention. In general, electrochemical conversion of CO2 to hydrocarbons and alcohols at the emission source offers advantages. However, fundamental challenges related to the requirement of large overpotential, low yield of hydrocarbons and low Faradaic efficiencies remain. Electrocatalysts need to be optimized in order to achieve high selectivity in CO2 reduction products. In this direction, the project aims at exploring certain materials and material synthesis protocols. The experimental study will be augmented with a theory-based multiscale picture of the electrochemical processes. The theory will not only provide insights into the catalytic mechanism but also provide an optimal synthesis protocol. The main outcome will be a detailed understanding of (i) binding of reaction intermediates on nanoporous catalyst surface, (ii) estimation of reaction rates, (iii) interplay between thermodynamics, reaction and transport and (iv) studying the catalyst surface evolution. Thus, the overall goal is to develop catalyst materials with high activity towards CO2 electroreduction. Please contact Prof. Abhijit Chatterjee (abhijit@che.iitb.ac.in) for more details.	Catalysis and reaction engineering	Both: Theoretical (Computational or Modelling) + Experimental	Chemical engineering, Chemistry, Physics, Material Science. Experience in material synthesis will be beneficial. Experience in computer programming will be beneficial.

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6-TAP(JA)	TAP	adhikari@iitb.ac.in	Jhumpa Adhikari	Molecular simulation and experimental studies on the high value chemicals derived from biomass valorization	This project is in collaboration with IOCL via Centre of Excellence in Oil, Gas & Energy, IIT Bombay. Fossil fuel derived chemicals are considered to be negatively impacting the environment. Lignocellulosic biomass is a promising alternative to fossil fuels as a raw material for the production of fuels and chemicals. In this project, we will use molecular simulation techniques (both MD and MC via open source software packages such as LAMMPS, GROMACS MCCCS Towhee and in-house codes), which are cost effective tools to study phenomena such as phase equilibria of the individual components as well as their mixtures, and also to understand and gain insights into the molecular-level origins of the observable macroscopic properties. Experiments will be performed in conjunction with the molecular simulations, and the organic product stream and purified products will be characterized by utilizing state-of-the-art analytical techniques at IOC R & D. Research Webpage: https://sites.google.com/d/1Vtx1C3FZkwpQsBr_XjEHUZJNusWpP0vZ/p/17SS9i-8chXR6JKpPA1BVoALt283X6MLG/edit?pli=1 [1]	Biomass valorization	Both: Theoretical (Computational or Modelling) + Experimental	
7-TAP(OM)	TAP	ojus@iitb.ac.in	Ojus Mohan	Accelerating the Discovery of Bimetallic Catalysts for CO2 Conversion with DFT-assisted Machine Learning	Machine learning can be a useful tool for predicting the activity and selectivity of bimetallic catalysts for CO2 conversion reactions. By training a machine learning model on a dataset of known catalysts and their performance in CO2 conversion reactions, the model can learn patterns and relationships between catalyst composition, structure, and reaction performance. The aim of this project is to develop a machine learning model for predicting the activity and selectivity of bimetallic catalysts for CO2 conversion reactions, with the assistance of density functional theory (DFT) calculations. The project will involve the collection and preparation of a dataset of bimetallic catalysts, DFT calculations to generate features that capture the electronic and geometric properties of the catalysts, the development and optimization of a machine learning model, and the use of the model to aid in the design of new bimetallic catalysts. This project will contribute to developing efficient and accurate screening methods for potential catalysts, leading to the discovery of novel, efficient, and selective bimetallic catalysts for CO2 conversion reactions. https://www.nature.com/articles/s41929-023-00911-w https://chemistry-europe.onlinelibrary.wiley.com/doi/full/10.1002/cctc.201900595 [2]	Catalysis	Theoretical / Computational / Modelling	Knowledge in coding, AI-ML
8-TAP(SD)	TAP	sonali.das@iitb.ac.in	Sonali Das	Catalyst and process development for Plasma-catalytic conversion of Methane to C2 hydrocarbons.	The objective of this project is to develop a lab-scale Plasma-Catalytic Reactor system using Non-thermal Plasma and novel Catalysts for direct conversion of Methane to C2 hydrocarbons (ethane/ ethylene). Selective conversion of methane to higher hydrocarbons is a highly sought after goal, and non-thermal plasma is an emerging technology that can be used to convert methane in one step, at low operating temperature, by using renewable energy sources. The work will involve the development of a lab-scale plasma-catalytic reactor, synthesis and characterization of novel catalysts, testing of developed catalysts, operating parameter optimization, and process modelling/ techno-economic analysis. The work is primarily experimental, involving catalyst development and plasma-catalytic reactor systems. There will be some component on modelling and optimization of the process using software such as Aspen HYSYS. This project is funded by Centre of Excellence – Oil, Gas, and Energy, IIT Bombay. BPCL and GAIL are the industrial partners for the project. For further details, check https://sites.google.com/view/das-lab/home	Catalysis	Experimental	Chemical Engg/Chemistry/Physics
9-TAP(SD)	TAP	sonali.das@iitb.ac.in	Sonali Das	Development of novel tandem catalysts for sustainable conversion of Carbon Dioxide	The proposed research aims at developing novel catalysts for the sustainable one-step conversion of CO2 to high value fuel and chemical products such as aromatics. The development of such catalysts can lead to major technological advances towards achieving a circular carbon economy. The work will involve development of new catalytic nanomaterials (such as tandem catalysts, core-shell catalysts, zeolites and MOFs), advanced catalyst characterization, testing of developed catalysts in continuous reactors and reactor design and kinetic modelling. The project will involve collaborations with National University of Singapore and Tohoku University, Japan. For further details, visit https://sites.google.com/view/das-lab/home	Catalysis	Experimental	Chemical Engg/Chemistry

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10-TAP(RaD)	TAP	dasgupta.ratul@gmail.com	Ratul Dasgupta	Using Machine Learning for improving predictions of wave breaking - joint work with IIT Madras and Microsoft Research	Predicting the onset of wave breaking has been an unresolved challenge in the study of waves. In a recent study (Eltenik et al, Nature Communications, 2022) it has been shown that a wave breaking model (non linear Schrodinger equation) can be used alongwith a recurrent neural network (trained using experimental data of laboratory wave breaking in channels) to accurately predict wave breaking. The purpose of this project is to use the power of Direct Numerical Simulations to generate training data and obtain a predictive model for wave breaking. The work will be conducted jointly with Prof. Anubhab Roy at IIT Madras and colleagues at Microsoft Research (Bangalore & Tel-Aviv).	Machine learning and wave breaking	Theoretical / Computational / Modelling	Mechanical , Chemical , Aerospace Engineering or Physics background. Strong interest in coding and strong background in maths.
11-TAP(MT)	TAP	mahesh@che.iitb.ac.in	Mahesh Tirumkudulu	Mathematical Modelling of sustained drug release from Oral Osmotic Tablets	Controlled release drug systems are an important class of drug delivery systems that have improved patient compliance while ensuring that drug concentrations in the plasma are maintained at the therapeutic level. The current study focuses on the oral osmotic drug delivery system which consists of a tablet core coated with a semipermeable membrane containing an orifice for drug release. When the osmotic tablet is exposed to an aqueous environment, water diffuses into the tablet due to the osmotic pressure difference and hydrates the contents. As more solvent diffuses into the tablet, it increases the hydrostatic pressure until the high pressure extrudes the dispersed drug and polymer through the orifice. We are currently performing experiments to understand the influence of various components on the release profile. The goal of the proposed project is to model the release via detail simulations of the tablet interior. The modelling would account for the spatial heterogeneity and will account for the various transport processes involved in the release process. Students interested in mathematical modelling and/or transport phenomena should apply for the project.	Drug delievery	Both: Theoretical (Computational or Modelling) + Experimental	B.Tech/M.Tech in Chemical Engg/Mechanical Engg and related area
12-TAP(SBh)	TAP	bhartiya@che.iitb.ac.in	Sharad Bhartiya	Quasi-linear Parameter Varying Systems Representation and Control of Nonlinear Chemical Processes: A Machine Learning Approach	The primary objective is developing techniques to map LSTM or other RNNs to Q-LPV models as a control relevant, secondary digital twin and frozen parameter QLPV based fast MPC. The methods will be tested on single unit operation or a benchmark flowsheet level chemical process.	Model Predictive Control	Includes both, experiments and modeling	Chemical Engineering/ Systems and control/ Strong liking for coding in Matlab/Python
Only those candidates who have external fellowsip/s like CSIR/DBT JRF can opt for the following topis [12-FA(SS) to 22-FA(SBN)]								
13-FA(SS)	FA	saini@che.iitb.ac.in	Supreet Saini	Investigating the effect of epistasis in cancer genomes.	Tumor cells may harbor hundreds of mutations. How these mutations interact among themselves? How do these interactions facilitate or constrain the spread and evolvability of cancer? With increasing volumes of sequence data becoming available, it is possible to answer these questions. In this work, we will study how epistasis (interactions among mutations) dictate cancer evolutionary dynamics.	Cancer biology	Theoretical / Computational / Modelling	Strong interest in evolutionary & cancer biology. Coding and quantitative skills.
14-FA(RB)	FA	rajdip@che.iitb.ac.in	Rajdip Bandyopadhyaya	Development of sensors and treatment of water contaminants by nanoparticle based reaction-adsorption reactors	Detection and removal of contaminants from water is a very important area of research. In this project, we are working on developing on-spot optical and electrochemical sensors for measuring arsenic, fluoride and other metal pollutants of concern. Simultaneously, we are developing adsorption and catalytic reaction based nanoparticle and nanocomposite systems for continuous chemical reactors to remove these pollutants from water. The work will be a combination of experiments and modeling, or only experiments.	Nanoparticles	Experimental	Engineering (Chemical, Mechanical, Environmental, Materials) or Science (Chemistry, Materials, Physics)
15-FA(RB)	FA	rajdip@che.iitb.ac.in	Rajdip Bandyopadhyaya	Anisotropic Nanoparticles: Synthesis and Applications	We have observed that, anisotropic nanoparticles, like nanorods, have higher chemical reaction rates than spherical or oval shaped (nearly spherical) nanoparticles. We hypothesize that, chemical reaction rate is a function of the shape of nanoparticles. In this project, one can do a combination of experiments and modeling/simulation or only experiments, to correlate nanoparticle shape with its reactivity. Simultaneously, one can work on its use for applications in water treatment or disinfection of microbes.	Nanorods	Experimental	Engineering (Chemical, Mechanical, Environmental, Materials) or Science (Physics, Chemistry, Materials)
16-FA(VG)	FA	venkatg@iitb.ac.in	Venkat Gundabala	Microfluidics based generation of biomaterials for 3D tumor modelling	Breast cancer is the most common cancer in women in India and accounts for 14% of all cancers in women with high prevalence and mortality rate. However, one of the major hindrances in drug discovery as well as drug screening is unavailability of suitable model system to mimic true tumor microenvironment (TME). In this project, the student will design and fabricate microfluidics based devices to generate 3D particles and core-shell microcapsules to mimic TME. The focus will be on controlling the shape, size, and stiffness through suitable manipulation of the fluids, their flow rates, and device geometry. The generated entities will be used to carry out investigations into the growth of tumor cells when co-cultured with other cells. Significant part of the project will involve designing and working with microfluidic devices and understanding the fluid mechanics behind the generation of these 3D biomaterials. Co-supervised by Prof. Abhijit Majumder.	Microfluidics	Both: Theoretical (Computational or Modelling) + Experimental	The student is expected to have good experimental skills with keen interest in the engineering and design aspects of the project. Prior experience with microfluidics is a plus, while not essential.

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17-FA(SwB)	FA	swaticb@iitb.ac.in	Swati Bhattacharya	Molecular Dynamics Study of anti-HIV protein SAMHD1	Our research group is primarily engaged in the investigation of protein dynamics and mechanisms with applications to personal genomics, intrinsic immunity, HIV therapeutics and enzymatic catalysis. The Ph.D project involves research into an anti-HIV protein SAMHD1. Given the enormous public health consequences of the HIV pandemic, the development of anti-retroviral therapeutics is of utmost importance. A human cellular enzyme, SAMHD1 has recently generated immense interest in its activity and regulation on account of its role in blocking HIV-1 infection in dendritic cells. The enzyme has the potential to provide a solution to the pandemic that has already taken an enormous human and economic toll. However, the complex regulatory mechanisms of the enzyme, which is an allosterically regulated tetrameric complex, is yet to be unravelled. The project involves using molecular dynamics simulations to get a mechanistic understanding of the allosteric regulation, phosphohydrolase activity and HIV-1 restriction activity which could pave the way for a new generation of anti-HIV drugs.	Computational Biology	Theoretical / Computational / Modelling	Chemical Engg or Chemistry or Physics. An interesting in coding is desirable.
18-FA(MukT)	FA	tripathy@iitb.ac.in	Mukta Tripathy	Miscibility of nanorods in star polymer melt	Mixing nanorods in polymer melt significantly improves its physical properties, such as mechanical, rheological, and conductivity properties. In this project we will study the role of nanorod length and diameter as well as polymer branching on the miscibility of the nanocomposite system.	Polymer nanocomposites	Theoretical / Computational / Modelling	Chemical Engg/Chemistry/Physics
19-FA(GAV)	FA	ganeshav@iitb.ac.in	Ganesh Viswanathan	Re-wiring cellular state to engineer cancer cell-death	Cell-death process, which occurs ubiquitously under normal and healthy conditions, is disturbed in diseased tissues such as that of cancer. Network of biochemical reactions activated by a stimulus orchestrates both pro-survival and cell-death processes. The goal of the project is to unravel effective network re-wiring strategies that enable modulation of the underlying cellular state favouring cell-death in a cancer tissue. The project will involve simulating a stochastic model of the cancer cell network activated by cytokine tumor necrosis factor alpha. Simulations and analysis will be conducted using Matlab and/or Python coding with a scope to employ machine learning toolboxes. Model simulations will be contrasted with experimental data, available in-house, to identify the effective strategies. Recent manuscripts: https://www.che.iitb.ac.in/web/faculty/ganesh/pdfs/2022/modulation.pdf https://www.che.iitb.ac.in/web/faculty/ganesh/pdfs/2023/Modulation.pdf	Systems biology	Theoretical / Computational / Modelling	B.Tech/M.Tech in Chemical Engg/Mechanical Engg/Biotechnology/Biochemical Engg/Systems biology or M.Sc in Physics/Mathematics. No prior background in biology needed. Interest to learn and collaborate with experimentalists is desired.
20-FA(HN)	FA	hnanavati@che.iitb.ac.in	Hemant Nanavati	Accurate Molecular Models for Real Polymers and Biopolymers	Accurate Molecular Models for Real Polymers and Biopolymers	Polymer Physics, Mathematical Modeling, Statistical Thermodynamics	Theoretical / Computational / Modelling	
21-FA(SBN)	FA	noronha@iitb.ac.in	Santosh Noronha	Production of chiral pharma intermediates	Production of chiral pharma intermediates	Biotechnology	Experimental	
22-FA(SBN)	FA	noronha@iitb.ac.in	Santosh Noronha	Catalytic bioreactors	Catalytic bioreactors	Biotechnology	Both: Theoretical (Computational or Modelling) + Experimental	

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List of TA topics that will be available for PhD students selected under TA cetegory in December 2023 admission round.
All candidates who have applied under TA/RA/FA category are eligible to opt for TA choice.

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TA-A	TA	bharat.k.suthar@iitb.ac.in	Bharatkumar Suthar	Modeling and simulation of Na-ion battery	Batteries	Both: Theoretical (Computational or Modelling) + Experimental
TA-B	TA	bharat.k.suthar@iitb.ac.in	Bharatkumar Suthar	Modeling and simulation of Fuel Cells	FuelCells	Theoretical / Computational / Modelling
TA-C	TA	bharat.k.suthar@iitb.ac.in	Bharatkumar Suthar	Development of battery management system for electric vehicle	E-mobility [1]	Both: Theoretical (Computational or Modelling) + Experimental
TA-D	TA	saini@che.iitb.ac.in	Supreet Saini	How does epistasis impact fitness of tumor cells?	Cancer evolution	Theoretical / Computational / Modelling
TA-E	TA	jogwar@iitb.ac.in	Sujit Jogwar	Distributed control of integrated networks	Process Systems Engineering	Both: Theoretical (Computational or Modelling) + Experimental
TA-F	TA	picardo@iitb.ac.in	Jason Picardo and Amol Subhedar	Thermofluid dynamics of melt-water in and under glaciers	Glacial fluid mechanics	Theoretical / Computational / Modelling
TA-G	TA	picardo@iitb.ac.in	Jason Picardo and Partha Goswami	Multiscale simulations to explain how tiny polymers calm and excite turbulence	Viscoelastic turbulence	Theoretical / Computational / Modelling
TA-H	TA	picardo@iitb.ac.in	Jason Picardo	Pattern formation amid turbulence: how large-scale order survives small-scale chaos	Pattern formation and nonlinear dynamics	Theoretical / Computational / Modelling
TA-I	TA	swaticb@iitb.ac.in	Swati Bhattacharya	Molecular dynamics study of Vpx, a protein of Human Immunodeficiency Virus 2 (HIV-2)	Biomolecular Simulations [2]	Theoretical / Computational / Modelling
TA-K	TA	swaticb@iitb.ac.in	Swati Bhattacharya	Molecular Dynamics Simulation of SAMHD1, a human protein that prevents HIV-1 infection	Biomolecular Simulations	Theoretical / Computational / Modelling
TA-L	TA	swaticb@iitb.ac.in	Swati Bhattacharya	Development of a novel framework to explore long-timescale dynamics of protein systems	Biomolecular Simulations (Method Development)	Theoretical / Computational / Modelling
TA-M	TA	guruswamy@iitb.ac.in	Guruswamy Kumaraswamy	Formation of microplastics and nanoplastics	Polymers	Experimental
TA-N	TA	sonali.das@iitb.ac.in	Sonali Das	Development of novel tandem catalysts for sustainable conversion of Carbon Dioxide	Catalysis, Nanomaterials, Sustainability	Experimental
TA-P	TA	sonali.das@iitb.ac.in	Sonali Das	Catalyst and Process development for Plasma-catalytic Methane Valorization	Catalysis, Nanomaterials, Sustainability	Both: Theoretical (Computational or Modelling) + Experimental
TA-Q	TA	sonali.das@iitb.ac.in	Sonali Das	Catalyst development for applications in storage of green hydrogen in the form of liquid hydrogen carriers.	Catalysis, Green Hydrogen, Sustainability	Experimental
TA-R	TA	sonali.das@iitb.ac.in	Sonali Das	Development of photothermal catalysts for sustainable carbon dioxide conversion using solar energy.	Catalysis, nanomaterials, sustainability.	Experimental
TA-S	TA	noronha@iitb.ac.in	Santosh Noronha	Production of chiral pharma intermediates	Biotechnology	Experimental
TA-T	TA	noronha@iitb.ac.in	Santosh Noronha	Catalytic bioreactors	Biotechnology	Both: Theoretical (Computational or Modelling) + Experimental
TA-U	TA	adhikari@iitb.ac.in	Jhumpa Adhikari	Molecular simulation based design of efficient & highly functional 2 D materials, 3 D nanomembranes & their hybrid heterostructures	Molecular Simulations	Theoretical / Computational / Modelling
TA-V	TA	adhikari@iitb.ac.in	Jhumpa Adhikari	Molecular Simulation Study of Liquid-Liquid Equilibria for Rational Design of Green, Task-Specific Solvents	Molecular Simulations	Theoretical / Computational / Modelling
TA-W	TA	amol.subhedar@iitb.ac.in	Amol Subhedar	Diffuse interface modeling of moving solid inside two-phase flow	Computational fluid dynamics	Theoretical / Computational / Modelling
TA-X	TA	psg@iitb.ac.in	Partha Sarathi Goswami	Investigation on clustering of micro particles/droplets in wall bounded turbulent flows using CFD and experiments	CFD and EFD (PIV)	Both: Theoretical (Computational or Modelling) + Experimental
TA-Y	TA	psg@iitb.ac.in	Partha Sarathi Goswami	Direct Numerical Simulations (DNS) to investigate the effect of inertial particles on structures and regeneration cycle of fluid turbulence [in collaboration with Prof V. Kumaran, IISc]	CFD	Theoretical / Computational / Modelling

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TA-Z	TA	psg@iitb.ac.in	Partha Sarathi Goswami	Dynamics of cohesive spherical and non spherical particles in spouted and spout-fluid bed		Both: Theoretical (Computational or Modelling) + Experimental
TA-AA	TA	madhu@che.iitb.ac.in	Madhu Vinjamur	Mechanisms for loading and release of drugs on silica from supercritical carbon dioxide	Drug delivery	Both: Theoretical (Computational or Modelling) + Experimental
TA-AB	TA	p.sunthar@iitb.ac.in	P Sunthar	Colloidal Fingering in Miscible Liquids	Colloids	Both: Theoretical (Computational or Modelling) + Experimental
TA-AC	TA	p.sunthar@iitb.ac.in	P Sunthar	Natural Length Scales of Pre-biotic Vesicles	Soft-matter	Theoretical / Computational / Modelling
TA-AD	TA	ganeshav@iitb.ac.in	Ganesh Viswanathan	Modeling cancer cell death	Systems biology	Theoretical / Computational / Modelling
TA-AE	TA	ganeshav@iitb.ac.in	Ganesh Viswanathan	Data-driven approach for pattern formation in reactors	Reaction engineering	Theoretical / Computational / Modelling
TA-AF	TA	ganeshav@iitb.ac.in	Ganesh Viswanathan	Dynamics of necroptosis response	Reaction engineering & Systems biology	Theoretical / Computational / Modelling
TA-AG	TA	ganeshav@iitb.ac.in	Ganesh Viswanathan	Regimes of enzymatic reactions	Reaction engineering	Theoretical / Computational / Modelling
TA-AH	TA	hnanavati@che.iitb.ac.in	Hemant Nanavati	Accurate Molecular Models for Real Polymers and Biopolymers(TA/FA)	Polymer Physics, Mathematical Modeling, Statistical Thermodynamics	Theoretical / Computational / Modelling
TA-AI	TA	srjadhav@iitb.ac.in	Sameer Jadhav	Flow analysis and control in microfluidic networks	microfluidics	Theoretical / Computational / Modelling
TA-AJ	TA	amalani@iitb.ac.in	Ateeque Malani	Understanding clound condensing nucleai formation	Environmental Chemistry, Atmospheric Sciences	Theoretical / Computational / Modelling
TA-AK	TA	amalani@iitb.ac.in	Ateeque Malani	Analysis of porous materials for water harvesting in dry-arid regions	Atmospheric Sciences, Water,	Theoretical / Computational / Modelling
TA-AL	TA	amalani@iitb.ac.in	Ateeque Malani	Simulation studies of enhanced oil recovery	Energy science, Oil recovery	Theoretical / Computational / Modelling
TA-AM	TA	amalani@iitb.ac.in	Ateeque Malani	Porous materials for adsorbed natural gas	Energy, gas adsorption	Theoretical / Computational / Modelling
TA-AN	TA	dasgupta.ratul@iitb.	Ratul Dasgupta	Estimating evaporation rates of airborne droplets in the ocean	Fluid Mechanics & thermodynamics	Theoretical / Computational / Modelling
TA-AO	TA	jyoti@che.iitb.ac.in	Jyoti Seth	Making suspensions flow	Network rheology	Both: Theoretical (Computational or Modelling) + Experimental
TA-AP	TA	jyoti@che.iitb.ac.in	Jyoti Seth	Dynamics of freezing drops	Rheology and coalescence	Both: Theoretical (Computational or Modelling) + Experimental
TA-AQ	TA	jyoti@che.iitb.ac.in	Jyoti Seth	Charging jammed suspensions to flow	Electrorheology	Both: Theoretical (Computational or Modelling) + Experimental
TA-AR	TA	jyoti@che.iitb.ac.in	Jyoti Seth	Building with polyelectrolytes	Self assembly	Theoretical / Computational / Modelling
TA-AS	TA	sarika@che.iitb.ac.in	Sarika Mehra	Upstream Process development for recombinant therapeutics including MABs and vaccine subunits	Biochemical Engineering	Both: Theoretical (Computational or Modelling) + Experimental
TA-AT	TA	sarika@che.iitb.ac.in	Sarika Mehra	Genome scale metabolic model for process optimisation of CHO cell culture	systems biology	Theoretical / Computational / Modelling
TA-AU	TA	sarika@che.iitb.ac.in	Sarika Mehra	Mathematical models for development of resistance in host		Theoretical / Computational / Modelling
TA-AV	TA	sharad_bhartiya@iitb.	Sharad Bhartiya	Simulated moving bed chromatography for isolation and purification of nutraceuticals	Chromatographic separation	Both: Theoretical (Computational or Modelling) + Experimental