Indian Institute of Technology Delhi

Ph.D./Post-Doc Openings 2020

Research areas: Multiphase Flows, Multiphase reactor engineering, CFD, Multi-scale simulations, Advanced measurements, Process Intensification

About the open positions:

We are looking for highly motivated PhD/Post-doc candidates with excellent academic background, interested in pursuing doctoral/post-doctoral research in the broad area of multiphase reactor engineering involving multi-scale modeling and simulations of multiphase flows/ reactors, development and application of advanced experimental techniques to characterize multiphase flows, intensification of multiphase reactors, development of micro-reactor systems, and applications of multiphase reactors in chemical processing, clean coal-based energy generation processes, and metallurgical applications. PhD/Post-doc positions in the following areas are open:

- Particle-resolved CFD simulations of packed bed reactors (sponsored by industry*)
- Modeling and simulations of liquid distribution in trickle bed reactors (International collaborative project**)
- Simulations of multiphase flows in porous media
- PIV and LIF measurements of micro-channel reactors (International collaborative project**)
- Interface-resolved bubbly flows: Measurements and CFD simulations
- Development of intensified catalytic reactors (International collaborative project**)
- Advanced flow characterization and multiphase CFD simulations of dense slurry flows (sponsored by industry*)

Eligibility criteria and other benefits for Ph.D. candidates:

- M.Tech./M.E. in Chemical/Mechanical Engineering (minimum CGPA of 7.5) OR B. Tech./B.E. in Chemical/Mechanical Engineering (minimum CGPA of 7.5 and a competent GATE Score)
- Students expecting to complete their degree in summer 2020 can also be considered
- * For industry sponsored projects: Opportunities for application to Prime Minister Research Fellowship (PMRF) (https://pmrf.in/) are available (PMRF Fellowship: 1st and 2nd year, Rs. 70,000/-; 3rd year, Rs. 75,000/-; 4th and 5th year, Rs. 85,000/-)
- ** International collaborative projects: Opportunities of 2-3 month-long research visits every year at collaborating institute/university in Germany and France
- Grants for attending conferences in India and abroad.
    - Rs. 20,000/-per year for attending conferences in India
    - Rs. 1,50,000/- once in five year through RSTA scheme of IIT Delhi.
    - Rs. 1,50,000/- once in five year through RETA scheme of IIT Delhi (for exceptional good students)

Eligibility criteria and other benefits for Post-doc candidates:

- Ph.D in aforementioned research areas with first class or equivalent grade in preceding degree
- Doctoral candidates who have submitted their thesis or about to submit it can also be considered
- Consolidated fellowship of Rs.60,000/- per month

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- Campus accommodation or HRA in lieu of on-campus housing @30% of the fellowship amount
- Professional Development Allowance of Rs.1.00 lac per financial year for attending national/ international conferences
- Rolling advertisement, see http://www.iitd.ac.in/jobs-iitd/index.html for further information.

About the Multiphase Research Group at IIT Delhi

Our research group is working on advanced measurement techniques, multi-scale modeling and simulations of multiphase flow processes and their applications to energy, oil & gas, chemical processing and metallurgical applications.

Advanced flow measurements:

- 2D/stereo/micro Particle Image Velocimetry (PIV)
- Laser Induced Fluorescence (LIF)
- Electrical Capacitance Tomography (ECT)
- Electrical Resistance Tomography (ERT)
- Miniaturized voidage probes
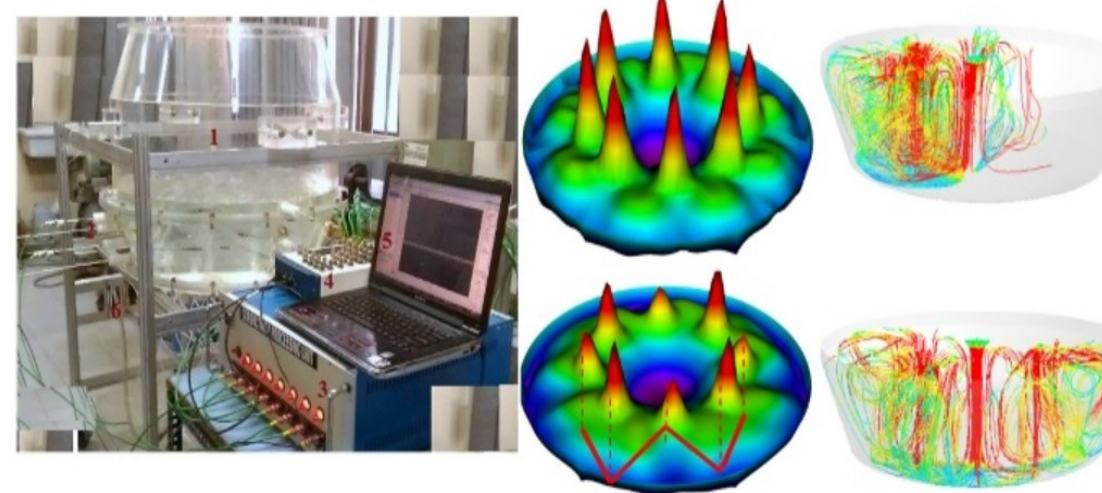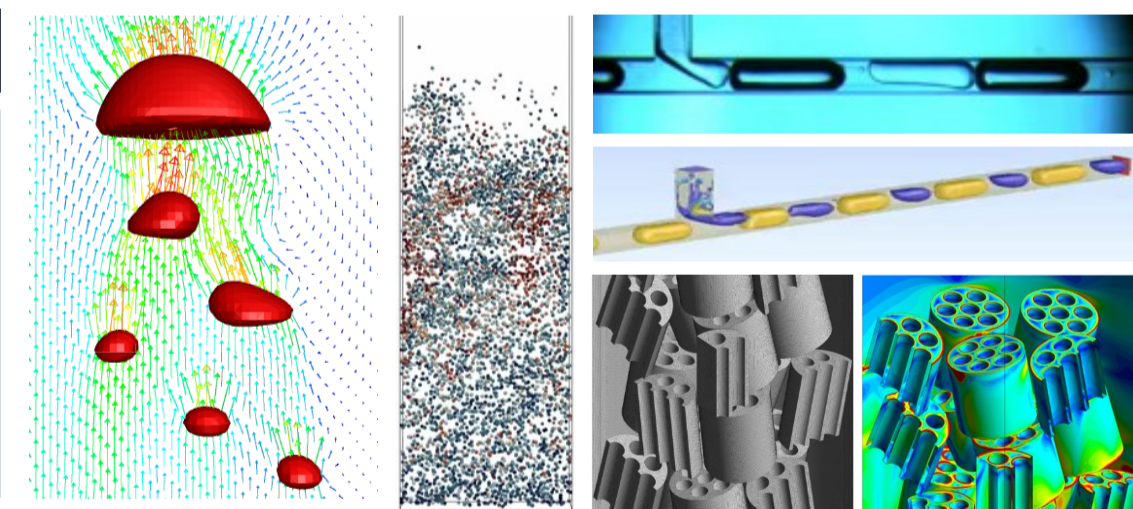- Miniaturized pressure probes
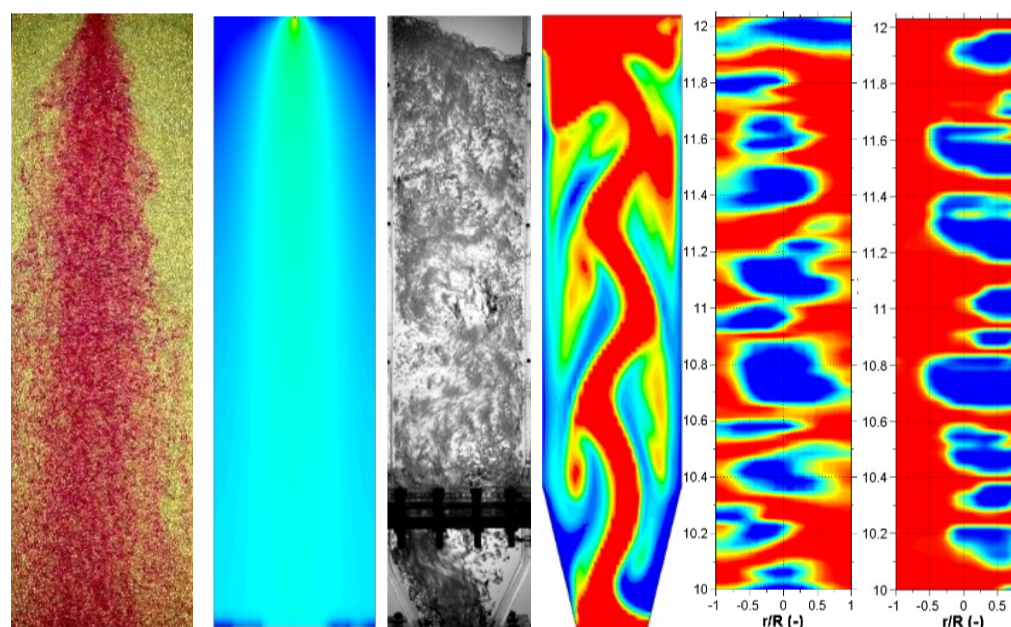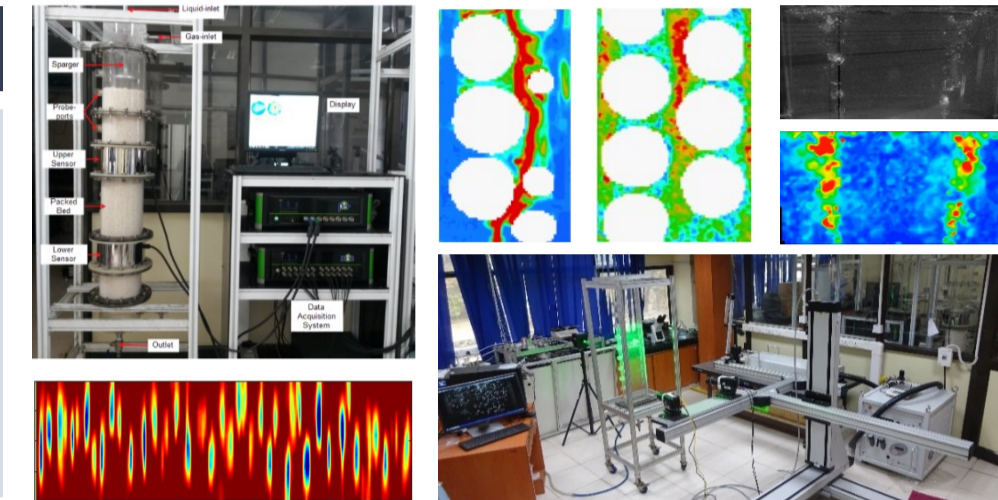
Development of CFD models for large-scale multiphase flows:

- Development of multi-fluid Eulerian models to simulate multiphase flow processes accompanied with heat & mass transfer, chemical reactions, phase change (boiling, precipitation, crystallization)
- Euler-Lagrange, DEM simulations
- OpenFOAM and commercial flow solvers

Basic research on multiphase flows:

- Bubbly flows (PIV measurements, interface-resolved simulations)
- Particle-scale flows (LBM, DEM simulations)
- Particle-resolved simulations of flow, transport processes and reactions
- Multiphase flows in micro-/milli-channels

Industrial applications:

- Design and scale-up, performance optimization, process intensification
- Upstream and downstream oil & gas processing, chemical processing, Coal-to-liquid fuels/chemicals, metallurgical applications

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