



CALL FOR RESEARCH ASSOCIATE (RA) FOR DST SPONSORED PROJECT

Applications are invited from suitable candidates for Research Associate to work on DST-SERB sponsored project at Department of Chemical Engineering, BITS Pilani-Hyderabad campus.

Project: Lattice Boltzmann Method (LBM) for multiphase flow and transport in porous media.

Lattice Boltzmann Method (LBM), a mesoscale method, rose as one of the best tools to model the multiphase flows in porous media. LBM is having its roots in the fundamentals of statistical mechanics and is able to recover Navier Stokes equation at the macroscale and imitate the interparticle forces at the microscale. Its automatic interface tracking ability and advantages of not solving the tedious Poisson equation makes it an attractive for the multiphase flows in porous media. Due to its versatility, the development of LBM for multiphase flow and transport in porous media applications[1–3] is very demanding. In this work, we aim to develop a robust hybridized coupled-multiphase LBM tool for the applications of drying, enhanced oil recovery, CO₂ sequestration, salt precipitation, pathogen transport and phase change materials.

No. of Positions: 1

Fellowship: Rs 47,000/- per month + HRA (as applicable)

Eligibility: PhD or Masters (with 2-3 years of experience) in Chemical/Mechanical/Civil Engineering

- Preference:**
1. He/She will be keen in working in computational Modeling and Simulation.
 2. Prior experience in multiphase flow in porous media is preferable
 3. Must be willing to understand and work in Lattice Boltzmann Method.
 4. Must possess good programming skills in C++ and MPI/OpenMP
 5. Must possess very good documentation skills (MS Office and LaTeX).

There is an opportunity (Masters qualified) to register for PhD in BITS Pilani Hyderabad Campus. Interested candidates with the essential qualifications can send the application by email giving detailed information about the education qualifications, research experience and publications by August. 2, 2023 via email to surasani@hyderabad.bits-pilani.ac.in . Please note that only qualified and suitable candidates will be called for interview by August 3, 2023 to be held at BITS Pilani, Hyderabad campus.

References:

- [1] D. Panda, B. Supriya, A. Kharaghani, E. Tsotsas, and V. K. Surasani, "Lattice Boltzmann simulations for micro-macro interactions during isothermal drying of bundle of capillaries," *Chemical Engineering Science*, vol. 220, p. 115634, 2020. DOI: <https://doi.org/https://doi.org/10.1016/j.ces.2020.115634>.
- [2] D. Panda, S. Paliwal, D. P. Sourya, et al., "Influence of thermal gradients on the invasion patterns during drying of porous media: A lattice Boltzmann method," *Physics of Fluids*, vol. 32, no. 12, p. 122116, 2020. DOI: <https://doi.org/10.1063/5.0031349>.
- [3] S. Paliwal, D. Panda, S. Bhaskaran, et al., "Lattice Boltzmann method to study the water-oxygen distributions in porous transport layer (PTL) of polymer electrolyte membrane (PEM) electrolyser," *International Journal of Hydrogen Energy*, vol. 46, no. 44, pp. 22747–22762, 2021. DOI: <https://doi.org/https://doi.org/10.1016/j.ijhydene.2021.04.112>.

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