



## Education

- **Institute of Process Engineering, Chinese Academy of Sciences, Beijing, CN** (2016)

*Ph.D. Degree, EMMS group, State Key Laboratory of Multiphase Complex Systems*

Thesis: “Multiscale Modeling of Complex Flows in Bubble Column Reactors Based on Lattice Boltzmann Method”

- **Huazhong University of Science and Technology, Wuhan, CN** (2010)

*B.Sc. Degree, School of Chemistry and Chemical Engineering*

Thesis: “CFD Simulation of Single Phase Flow in a Stirred Tank”

## Research Interests

- Computational Multiphase Fluid Dynamics
- Multi-scale modelling of multiphase flow
- Chemical Reaction Engineering
- Bubble Column Reactor (High Temperature High Pressure)
- Scale-up and Optimization
- Lattice Boltzmann Method
- Discrete Element Method
- Immersed Boundary Method
- Compartment Model
- Meso-Scale modelling
- High Performance Computing
- GPU acceleration

## Work Experience

- **Process Engineering Advanced Research Lab (PERAL), Postdoc** 2016.09-  
Polytechnique Montreal, Montreal, QC, Canada

## Expertise

- Computational Fluid Dynamics
- Direct Numerical Simulation of Immiscible Fluids
- C/C++
- CUDA/MPI programming and optimization
- Gas-liquid two-phase flow
- Lattice Boltzmann Method
- ANSYS Fluent
- ACUSIM

## Research Background

- Direct Numerical Simulation Of Bubble Dynamics
- GPU accelerated Lattice Boltzmann Simulation of Stirred Tanks
- GPU accelerated Lattice Boltzmann Simulation of Bubble Column Reactor
- Large Scale Simulation of Crude Oil Mixing In An Industrial-scale Oil Storage Tank (Collaboration with BP)
- Population Balance Modelling of Aerated Equipment in Ice-cream Manufacturing (Collaboration with Unilever)
- Process Intensification in Emulsification With the Aid of CFD (Collaboration with BASF)
- Granular Flow and Segregation in Pharmaceuticals Industry
- Compartment Modelling of High Pressure and High Temperature Bubble Column Reactor (Collaboration with TOTAL)
- Experiments on High Pressure and High Temperature Bubble Column Reactor (Collaboration with TOTAL)

## Journal Publications

- Shu, S., Yang, N. LBM simulation of gas-liquid flow in a rectangular bubble column. In progress.
- Shu, S., Yang, N. (2017). GPU Accelerated Lattice Boltzmann simulation of mixing process in stirred tank with Immersed Boundary method. Submitted to AIChE Journal.
- Shu, S., Yang, N. (2017). Numerical study and acceleration of LBM-RANS Simulation of Turbulent Flow. Chinese Journal of Chemical Engineering Accepted.
- Wu H, Shu S., Yang N, et al. (2014). Chemical Engineering Science, 117: 173-182.
- Wu H, Shu S., Yang N, Liu M. (2014). Computers and Applied Chemistry. 31(8):897-901.
- Shu, S., Yang, N. (2013). Industrial & Engineering Chemistry Research, 52(33), 11391-11403.

## Conference Publications

- Shu, S., Yang N. Multiscale simulation of bubble column based on Lattice Boltzmann Method. Poster, 1st International workshop on Computational Particle Technology and Multiphase Processes Engineering, Suzhou, March 9-12, 2016.
- Shu, S., Yang N. Direct Numerical Simulation of Bubble Dynamics Using Phase-Field Model and Lattice Boltzmann Method. Poster, 4th International Conference on Multiscale Structures and Systems in Process Engineering, Beijing, Sep 26-28, 2012.

### **Patents and Software Copyrights**

- Shu, S., Yang N. FastCFD for industrial mixing process. Software Copyright.
- Shu, S., Yang N. A method for quasi-real-time CFD simulation. CN Patent: 201510272453.4