

## **LATTICE BOLTZMANN METHOD FOR FLOW AND HEAT TRANSFER**

**Zhaoli Guo**

National Laboratory of Coal Combustion, Huazhong University of Science and Technology,  
Wuhan 430074 China. zlguo@hust.edu.cn

**Guihua Tang**

School of Energy and Power Engineering, Xi'an Jiaotong University, Xi'an 710049 China.  
ghtang@mail.xjtu.edu.cn

**Key Words:** *Lattice Boltzmann method, Mesoscopic methods, Flow and Heat transfer*

### **PROPOSAL**

The lattice Boltzmann method (LBM), originated from the lattice gas automata, is a relatively new kind of numerical method for modelling and simulating fluid dynamics and associated phenomena. Unlike the conventional CFD, the LBM is a mesoscopic approach based on kinetic theory of fluids. The kinetic nature brings many distinctive features to the LBM such as the clear physics picture, the simple structure, the easy implementation of boundary conditions, and the natural parallelism. These features have made it a powerful tool for simulating flow and heat transfer problems involving complex physics. Actually, the past two decades have witnessed the amazing success of the LBM in modelling and simulating complicated transport problems such as multi-phase flows in porous media, colloidal suspension systems, polymer-solvent systems, diffusion and chemical reactions, electro-kinetics flows, magnetic fluid flows, and micro-scale flows, and currently the research in this field is still very active and expanding fast.

This mini-symposium aims to provide a platform for exchanging ideas on the latest developments in the LBM. The emphasis of this mini-symposium focuses on, but is not limited to, the following topics:

- Theories and models of the LBM;
- Algorithms and high performance computing of the LBM;
- Applications of the LBM in flow and thermal problems;
- Related mesoscopic computational methods for thermal problems, such as Gas-Kinetic Scheme, Direct Simulation Monte Carlo (DSMC), Dissipative Particle Dynamics, ...