From the Guest editor

THERMO-HYDRODYNAMICS MEETS ADVANCED TECHNOLOGY

Thermo-hydrodynamic models have been caught much attention in textile engineering, environmental science, micromechanics, and other fields. This issue solicits some thermo-hydrodynamic models for vapor–liquid two-phase flows, precipitation forecast, nozzle optimization, supercritical CO_2, microfluid, Brownian coagulation, skin thermal property, aerodynamic thermal environment, solar seasonal storage, lotus effect, unsteady cavitation flow, air permeability of nanofiber membrane and others. This issue also publishes some fractional models, lattice models, and spatio-temporal dynamic models for discontinuous problems. All these models are solved either numerically or analytically and verified experimentally. Numerical methods include the genetic algorithm, the Monte-Carlo method and others, the analytical methods are the homotopy perturbation method, the fractional power series and others.

This issue elucidates that a thermo-hydrodynamic model is a simple but effective tool for the frontier research in modern technology, especially in nanotechnology. A simple mass conservation can predict the main flow properties of a spinning process for fabrication of nanofibers, and a laminar flow can be used to control macromolecule's motion in a long and narrow tube, making it possible to mimic spider-spinning for fabrication of functional nanofibers, this might spark a light in a possible new discipline called Angstrom technology, which studies phenomena on molecule scales.

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