

## Experimental and Numerical Study of Multiphase Flow Phenomena and Models in Oil & Gas Industry



Multiphase flows, including gas-liquid, gas-solid, liquid-liquid, liquid-solid, and solid-liquid-liquid flows, exist in many fields such as petroleum, power, chemical, food, biomedical, metallurgical, nuclear, and hydraulic engineering. In the Oil & Gas industry, they play a key role due to its presence in many phases of oil and gas' production and transportation and, especially as fields become more economically marginal, there is growing demand to model and predict the detailed thermo-fluid dynamic behavior of those flows and the phenomena that they manifest. Studies on phase distribution and heat or mass transfer are fundamental to give insight into the complicated principle and the application prospect.

Multiphase fluid dynamics have generated a great deal of recent interest, leading to many notable advances in experimental, analytical and numerical studies in this area. Close interaction between numerical modellers and other researchers is indispensable to resolve many outstanding issues in multiphase flow. Theory and experiments are essential for validation and verification of numerical methods, with the latter providing new insights into the interpretation of experimental results and suggesting new directions of theoretical research.

This special issue accounts of the experimental, theoretical, and numerical research work emphasizing on the contributions to the investigation of multiphase flow and heat transfer process and the application to the engineering problems, providing new perspectives to established mechanism, highlighting unsolved theoretical issues.

Topics for this SI include:

- Studies on the hydrodynamic and thermodynamic behavior of

- multiphase flow
- Heat and mass transfer in multiphase flow
- Development of new measurement technologies in multiphase flow field
- Prediction of flow patterns of multiphase flow by models
- Research on the theoretical and experimental investigation of the stability of dispersions
- Studies on the effect of additives such as surfactants on multiphase pipeline flow characteristics
- Numerical approaches and experimental observation of the interaction between bubbles or droplets dispersed in bulk phase
- Multiphase flow simulation
- Bubble and drop dynamics
- Interface behaviour
- Experimental measurements
- Compressible multiphase flows
- Turbulent multiphase flow

We wish you enjoy reading this special issue on “Experimental and Numerical Study of Multiphase Flow Phenomena and Models in Oil & Gas Industry” and look forward to learning about your research results in the area of Multiphase Flow in the coming issues of PETROLEUM.

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