

Special Issue

The Application and Prospect of Multiphase Flow Technology in Oil and Gas Exploitation

Message from the Guest Editors

Oil and gas production systems represent highly complex engineering operations due to the simultaneous presence of multiple phases including oil, gas, water, and solids such as sand. The breakdown of phase equilibrium and the interaction between these phases give rise to multiphase flow phenomena. Compared to single-phase flows, modeling complex multiphase flows is a non-trivial task particularly due to the complex interfacial interactions between the phases. Multiphase flows are encountered in drilling, production, transportation, refining and processing operations. It is crucial to correctly understand the underlined phenomena to develop accurate predictive models and technologies for appropriate monitoring and the control of multiphase flows in order to optimize production, ensure safety, protect equipment, and reduce costs across upstream, midstream, and downstream sectors.

This Special Issue invites high quality contributions addressing experimental, numerical, and theoretical advancements in multiphase flow technologies with an emphasis on practical applications, novel instrumentation, machine learning integration, and approaches that mitigate environmental impact.

Guest Editors

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