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# Hasegawa Lab.

## [Modeling & Simulation of Interfacial Transport Phenomena]

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**Interfacial Transport Engineering**

Department of Mechanical Engineering

## Prediction and Control of Interfacial Transport

Toward accurate prediction of environment and efficient energy utilization, we conduct researches on prediction and control of flow and associated transport phenomena. Through thorough analyses of thermal and velocity fields obtained from large-scale computations, we develop and assess models for interfacial transport phenomena. In addition, by applying optimal control theory, we aim to establish a tool to optimize various energy devices without replying researchers' subjective insights.

- Control of Wall Turbulence for Skin Friction Drag Reduction
- Simultaneous Achievement of Heat Transfer Enhancement and Drag Reduction
- Modeling of High Schmidt Number Mass Transfer at Air-Water Turbulent Interface
- Heat Transfer in Micro Two-Phase Flow for High Heat Flux Cooling Applications

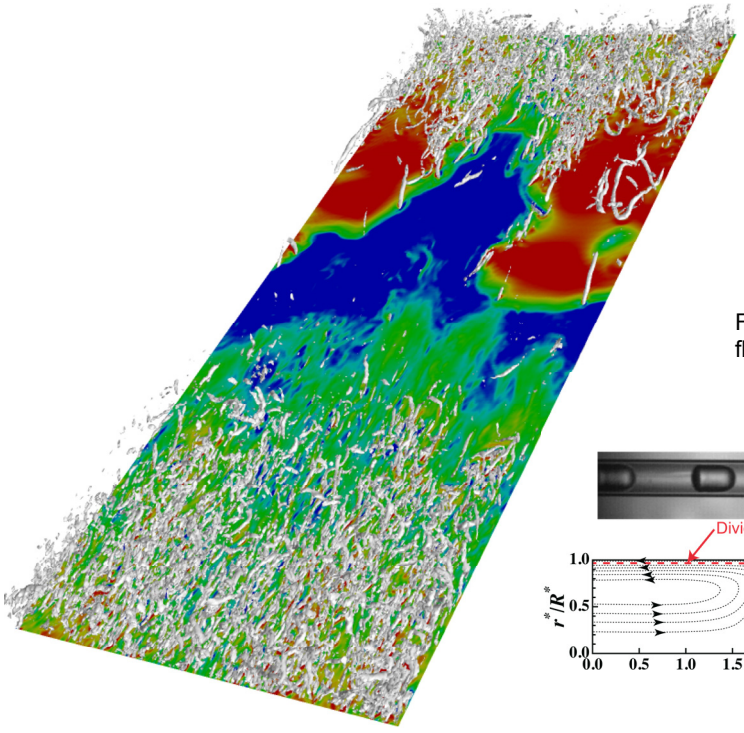

Fig. 1 Instantaneous wall turbulence under optimal control for simultaneous achievement of drag reduction and heat transfer enhancement

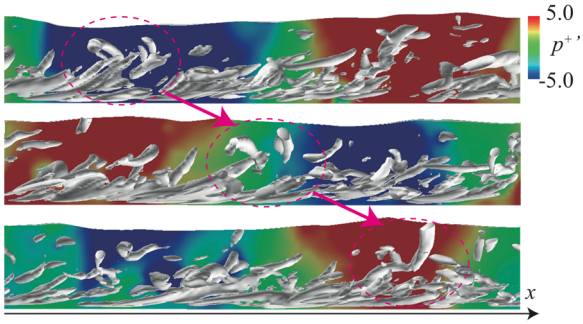


Fig. 2 Time development of coherent structures and pressure fluctuations near an air-water turbulent interface

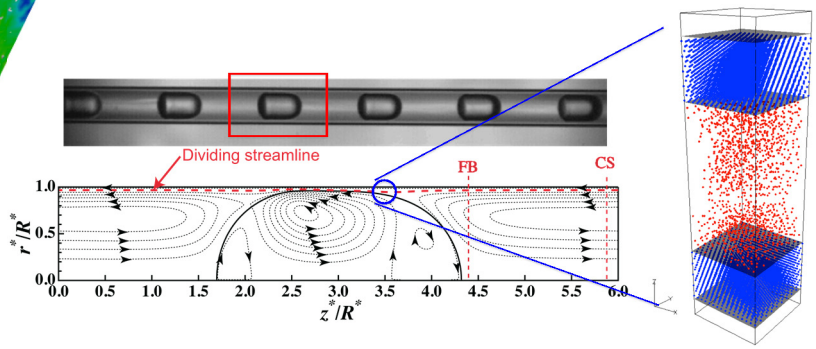


Fig. 3 Multi-scale modeling and simulation of gas-liquid micro two-phase flow