

Research Division of Multiscale Interfacial Thermofluid Dynamics



Period: April 2017 ~ March 2020

Member

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Y. Sumino	Dept. Applied Physics, Faculty of Science Division I
T. Tsukahara	Dept. Mechanical Engineering, Faculty of Science & Technology
K. Yamamoto	Dept. Mechanical Engineering, Faculty of Engineering

+6 visiting member (All belongs to overseas universities or institutes)

OBJECTIVES

Our research group focuses on thermofluid dynamics which involves interfacial transport phenomena in multiscale and on development of interdisciplinary and interactive activities as a successive group of “International Research Division of Interfacial Thermo-Fluid Dynamics (2012-2016)”.



RESEARCH TOPICS

1. Elucidation of “dynamics wetting” with three-phase contact line interacting with small objects
2. Advanced handling technologies of droplets and particles with the use of fluid flow induced by physicochemical properties distribution or gradient
3. Dynamics of association and dissociation of cell and protein with flow

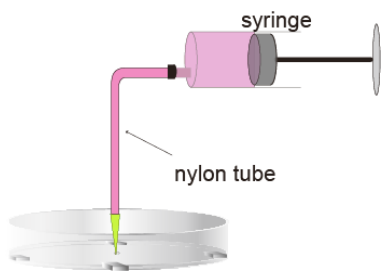
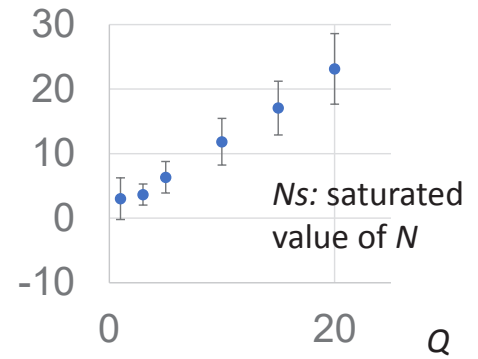
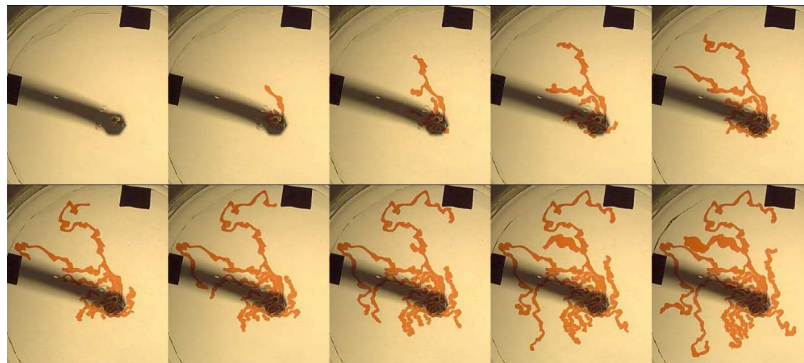
ACTIVITIES: PAST, PRESENT AND FUTURE

- 4 TUS members and 3 International members were added.
- 2 symposium (1 kick-off and 1 international), 1 workshop and 3 seminars were hosted.
- International collaboration with mutual human exchange: From abroad, 3 researchers and 2 students / To abroad, 1 researcher and 2 students
- Future plan: Promotion of more active collaboration within the research division / Cooperation with other research divisions in RIST or Japanese societies

Research Highlight 1



Pattern of injected fluid in a confined geometry induced by solidification of front

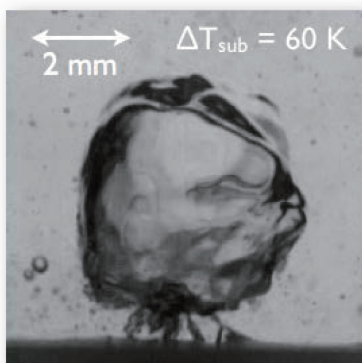


Essential features of filament meandering and splitting can be reproduced

Research Highlight 2



Condensation of vapor bubble in subcooled pool



Effect of entrainment of ambient liquid on condensation
 → Source of disturbance + roll as condensation nuclei

