

# Research Division of Multiscale Interfacial Thermofluid Dynamics



Period : April 2017 ~ March 2020

Member

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K. Yamamoto	Dept. Mechanical Engineering, Faculty of Engineering
T. Hori	Dept. Mechanical Engineering, Faculty of Science & Technology

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

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## 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

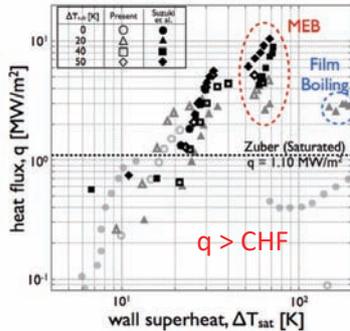
## ACTIVITIES: PAST, PRESENT AND FUTURE

- 1 TUS member were added.
- 2 symposium (international, co-organize) and 4 seminars were held.
- International collaboration with mutual human exchange: From abroad, 5 researchers and 2 students / To abroad, 3 researcher and 3 students
- Our activity was appealed via co-organization of the int’l symposium.
- Future plan: Promotion of more active collaboration within the research division / Cooperation with other research centers/divisions in RIST

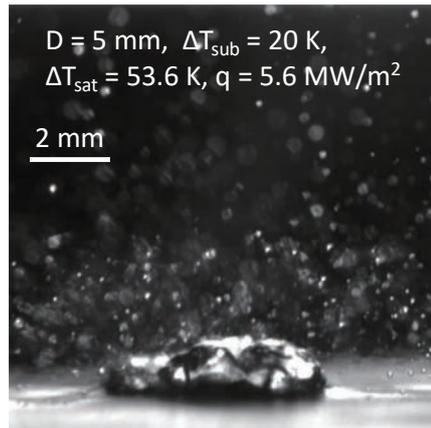
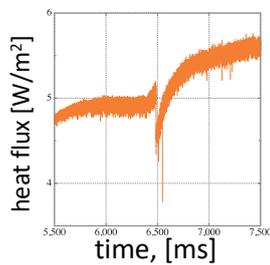
## 研究ハイライト1



### Microbubble emission boiling with ultrahigh heat flux



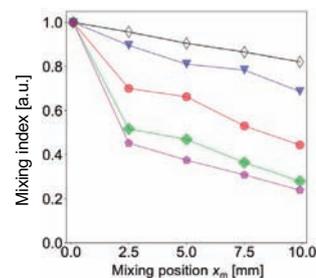
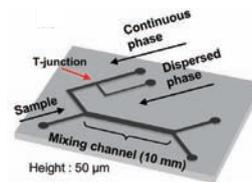
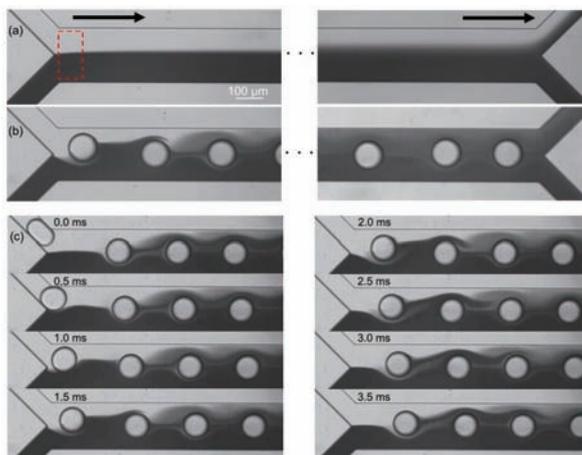
- Growth, condensation and collapse of vapor bubbles
- A number of fine bubbles are emitted
- Collapse event drives liquid toward heated surface



## 研究ハイライト2



### Concentration-adjustable micromixer by a train of bubbles/droplets



Mixing performance is adjustable by frequency of droplet injection