



micro Flow and Interfacial  
Phenomena Conference

**FIP**



**June 20-23, 2022**  
**Irvine, California, USA**

**FINAL  
PROGRAM**

**CONFERENCE OFFICIALS**

**Yoonjin Won**

*University of California, Irvine, USA*

**Nenad Miljkovic**

*University of Illinois, Urbana-Champaign, USA*

**Patricia Weisensee**

*Washington University, St. Louis, USA*

**Jonathan Boreyko**

*Virginia Tech, Blacksburg, USA*

SPONSORED BY

**CBMS**

Chemical and Biological  
Microsystems Society



## Greetings from the Chairs


On behalf of the conference committee, we are truly delighted to welcome you to the 2<sup>nd</sup> International Conference on Micro Flow and Interfacial Phenomena ( $\mu$ FIP 2022) in Irvine, California, USA.

The scientific objective of  $\mu$ FIP is to bring together the phase change and single-phase heat transfer, single- and multi-phase flow, and bio-chemical and biomedical engineering communities. A special emphasis lies on energy applications having components exhibiting microchannel flow or microscale surface phenomena, such as found in thin films, droplets, or bubbles. In addition, the  $\mu$ FIP 2022 has expanded the range of topics to be more interdisciplinary and relevant to the most pressing challenges of our time, such as climate change and the water-energy nexus.

The  $\mu$ FIP conference format provides an active platform for the exchange of information and identification of research needs between junior and established researchers. Our program provides a unique opportunity for researchers in interdisciplinary topic areas to exchange ideas and discuss future directions. This year, we have organized an outstanding program that includes 3 plenary speakers, 6 keynote speakers, 2 award keynote speakers, 4 student keynote speakers, and 69 oral/poster presentations in 7 technical tracks. The submitted papers were peer-reviewed to ensure a high-quality program. We will continue to honor exceptional researchers with our Outstanding Early Career Award, Prominent Research Award, Leadership Award, as well as the Student Keynote Awards that encourage and stimulate high quality research by student participants.

We thank the Office of Naval Research, the National Science Foundation, The Henry Samueli School of Engineering at the University of California, Irvine, Sensific GmbH, BiRed Imaging, Photron, Telops, and others for their continued support of this conference series. We are also grateful to our conference organizers at Preferred Meeting Management, Inc. (PMMI) with special thanks to Ms. Sara Stearns and Ms. Shirley Galloway for their tireless efforts to ensure a high-quality conference.

We thank you for joining us and look forward to your participation in the conference. Please enjoy the meeting and beautiful environments in Orange County, Southern California.




Yoonjin Won  
University of California, Irvine



Patricia Weisensee  
Washington University, St. Louis



Nenad Miljkovic  
University of Illinois,  
Urbana-Champaign



Jonathan Boreyko  
Virginia Tech, Blacksburg

## SOCIAL EVENTS

*Name badges are required for all Social Events.*

### Poster Session

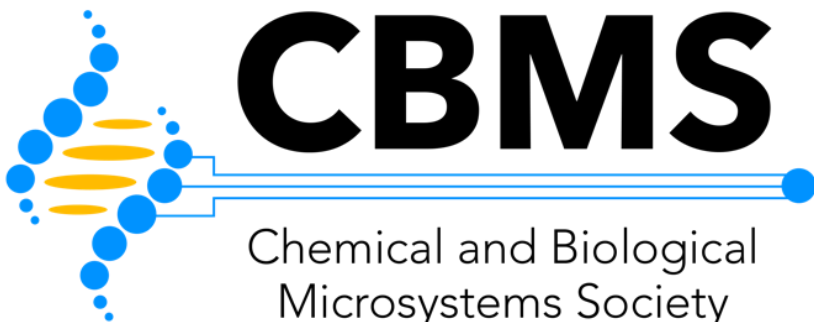
Join us Tuesday evening (17:45 – 19:00) during the poster session for an informal reception in the Atrium of the Beckman Center.

### Banquet

The Banquet will be held on Wednesday evening (18:00 – 20:00) outside on the lawn of the Beckman Center. It may be chilly, so we suggest you bring a light jacket.

## COMMERCIAL SUPPORT

Special acknowledgement to the Chemical and Biological Microsystems Society (CBMS) for their educational grant funding support of this Conference.



[www.cbmsociety.org](http://www.cbmsociety.org)

The Chemical and Biological Microsystems Society (CBMS) would also like to thank the following companies for their support, encouragement, and involvement in the Conference.

### CONFERENCE BENEFACTORS

---

**NSF - National Science Foundation**

[www.nsf.gov](http://www.nsf.gov)



**Office of Naval Research**

[www.onr.navy.mil](http://www.onr.navy.mil)



**University of California, Irvine**

**School of Engineering**

[engineering.uci.edu](http://engineering.uci.edu)



### INVITED SPEAKER BENEFACTOR

---

**Sensific GmbH**

Paukengasse 14

ULM, 89077 GERMANY

phone: +49-162-501-848-357

[info@sensific.de](mailto:info@sensific.de)

[sensific.de](http://sensific.de)



### OUTSTANDING EARLY CAREER AWARD BENEFACTOR

---

**BiRed Imaging**

44 Brandywine Lane

Rochester, NY 14618 USA

phone: 1-585-820-3487

[skandlikar@biredimaging.com](mailto:skandlikar@biredimaging.com)

[www.biredimaging.com](http://www.biredimaging.com)

**BIRED IMAGING INC.**

# Conference Officials

## Conference Chairs

- Chair ..... Yoonjin Won, *University of California, Irvine, USA*
- Co-Chair ..... Nenad Miljkovic, *University of Illinois, Urbana-Champaign, USA*
- Program Chair ..... Patricia Weisensee, *Washington University, St. Louis, USA*
- Program Co-Chair ..... Jonathan Boreyko, *Virginia Tech, USA*
- Communication Chair ..... Ya-Yu Chiang, *National Chung Hsing University,  
TAIWAN*
- Awards Committee Chair .. Vinod Narayanan, *University of California, Davis, USA*
- Poster Session Chair ..... Beomjin Kwon, *Arizona State University, USA*
- Speaker Chair ..... Lisa Steigerwalt Lam, *Memorial University of Newfoundland,  
CANADA*
- Student Session Chair ..... Youngjoon Suh, *University of California, Irvine, USA*

## Track Chairs

### Fundamentals

- Single-Phase Flows ..... Hyun Jin Kim, *University of Alabama, USA*
- Multi-Phase Flows ..... Damena Agonafer, *Washington University, St. Louis, USA*
- Surfaces and Interfaces ..... Xianming Dai, *University of Texas, Dallas, USA*

### Applications

- Energy Applications ..... Yangying Zhu, *University of California,  
Santa Barbara, USA*
- Bio-Chemical & Bio-Medical ..... Norbert Kockmann, *Technische Universität  
Dortmund, GERMANY*
- Bio-Chemical & Bio-Medical ..... Dirk Janasek, *ISAS, GERMANY*
- Water and Environment ..... Jeremy Cho, *University of Nevada, Las Vegas, USA*

### Emerging/Innovations

- Emerging & Innovative Tech. .... Chirag Kharangate, *Case Western  
Reserve University, USA*

## Monday, June 20

### Interdisciplinary Science & Engineering Building (ISEB)

419 Physical Sciences Quad, Irvine, CA 92697

Colloquium 1200 Room, First Floor. Map available on page 22.

#### **14:00 - Student Event**

**16:00**

##### **Student Presenters:**

Gonzalo Almanza, *Norwegian University of Science and Technology (NTNU), NORWAY*

Sang-Hyeon Chang, *University of California, Irvine, USA*

Robin Dinter, *Technical University Dortmund, GERMANY*

Dalia Ghaddar, *University of Illinois, Urbana-Champaign, USA*

Vijay Kumar, *University of California, Santa Barbara, USA*

Dale Y. Lu, *University of California, Irvine, USA*

Hyunggon Park, *Virginia Tech, USA*

Youngsup Song, *Massachusetts Institute of Technology, USA*

Emily M. Stallbaumer-Cyr, *Kansas State University, USA*

Youngjoon Suh, *University of California, Irvine, USA*

Te Faye Yap, *Rice University, USA*

#### **16:00 - Student Panel - How to Become a Successful Researcher**

**17:00**

##### **Panelists:**

Damena Agonafer, *Washington University, St. Louis, USA*

Matteo Bucci, *Massachusetts Institute of Technology, USA*

Kyoo-Chul Kenneth Park, *Northwestern University, USA*

Patricia (Patty) Weisensee, *Washington University, St. Louis, USA*

Yoonjin Won, *University of California, Irvine, USA*

# Tuesday, June 21

## Beckman Center of the National Academies of Sciences and Engineering

Auditorium Room, 100 Academy, Irvine, CA 92617

Map available on page 22.

- 08:30**      **Welcome**  
**Conference Chair** - Yoonjin Won, University of California, Irvine

### Plenary Presentation 1

Chair: Yoonjin Won, *University of California, Irvine, USA*

- 08:30**      **PHOTOMOLECULAR EVAPORATION OF WATER CLUSTERS**  
Gang Chen  
*Massachusetts Institute of Technology, USA*

- 09:30**      **Break**

### Keynote Presentation 1

Chair: Damena Agonafer, *Washington University, St. Louis, USA*

- 09:50**      **ADVANCED DESIGN OPTIMIZATION STRATEGIES FOR  
MICROFLUIDIC COOLING SOLUTIONS**  
Justin A. Weibel  
*Purdue University, USA*

### Technical Session 1 Multi-Phase Flows I

Chair: Damena Agonafer, *Washington University, St. Louis, USA*

- 10:20**      **ENHANCING THE BOILING HEAT TRANSFER COEFFICIENT  
THROUGH CONFINEMENT**  
Albraa A. Alsaati, David M. Warsinger, Justin A. Weibel,  
and Amy M. Marconnet  
*Purdue University, USA*

- 10:35**      **A NEW MODEL FOR PREDICTING CRITICAL HEAT FLUX DURING  
FLOW BOILING**  
Cho-Ning Huang and Chirag Kharangate  
*Case Western Reserve University, USA*

- 10:50 POOL BOILING OF COPPER HEAT SPREADERS FOR HIGH EFFICIENCY COOLING OF ELECTRONICS**  
 Arielle R. Gamboa<sup>1</sup>, Tarek Gebrael<sup>1</sup>, Nirvan Sinha<sup>1</sup>,  
 Robert Pilawa-Podgurski<sup>2</sup>, and Nenad Miljkovic<sup>1</sup>  
<sup>1</sup>*University of Illinois, Urbana-Champaign, USA and*  
<sup>2</sup>*University of California, Berkeley, USA*
- 11:05 BALANCING SURFACTANT MASS TRANSFER TO OPTIMIZE BOILING HEAT TRANSFER**  
 Mario R. Mata Arenales, Brandon Ortiz, Dhruv Luhar, Vesper Evereux,  
 and H. J. Cho  
*University of Nevada, Las Vegas, USA*
- 11:20 NUMERICAL SIMULATIONS OF BUBBLE COALESCENCE AND DEPARTURE DYNAMICS DURING BOILING**  
 Flavio Dal Forno Chuahy<sup>1</sup>, Thomas P. Foulkes<sup>2</sup>, Hyunggon Park<sup>3</sup>,  
 Charles P. Collier<sup>1</sup>, and Jonathan B. Boreyko<sup>3</sup>  
<sup>1</sup>*Oak Ridge National Laboratory, USA, <sup>2</sup>Pacergy LLC, USA, and*  
<sup>3</sup>*Virginia Tech, USA*
- 11:35 ENHANCED FLOW BOILING HEAT TRANSFER IN MICROSTRUCTURED TUBES WITH A LOW-GWP REFRIGERANT**  
 Nithin Vinod Upot<sup>1</sup>, Kazi Fazle Rabbi<sup>1</sup>, Alireza Bakhshi<sup>1</sup>,  
 Anthony Jacobi<sup>1</sup>, and Nenad Miljkovic<sup>1,2</sup>  
<sup>1</sup>*University of Illinois, Urbana-Champaign, USA and*  
<sup>2</sup>*Kyushu University, JAPAN*

**11:50 Lunch**

## Keynote Presentation 2

Chair: Kyoo-Chul "Kenneth" Park, *Northwestern University, USA*

- 13:00 VAPOR-LIQUID SEPARATION FOR EXCEPTIONAL PHASE CHANGE HEAT TRANSFER**  
 Xianming (Simon) Dai  
*University of Texas, Dallas, USA*



## Student Keynote Presentation 1

Chair: Kyoo-Chul "Kenneth" Park, *Northwestern University, USA*

### 13:30 HEAT FLUX PARTITIONING ON MICRO-PILLAR SURFACE IN POOL BOILING

Chi Wang<sup>1</sup>, Md Mahamudur Rahman<sup>2</sup>, and Matteo Bucci<sup>1</sup>

<sup>1</sup>*Massachusetts Institute of Technology, USA and*

<sup>2</sup>*University of Texas, El Paso, USA*

## Technical Session 2 Surfaces and Interfaces I

Chair: Kyoo-Chul "Kenneth" Park, *Northwestern University, USA*

### 13:50 LIQUID-LIQUID INTERPHASE TRACKING DURING COALESCENCE FOR PROCESS SCALE UP

Laura M. Neuendorf<sup>1</sup>, Christian Bergeest<sup>1</sup>, Christiane Schlander<sup>2</sup>,  
Arjan Meijer<sup>2</sup>, and Norbert Kockmann<sup>1</sup>

<sup>1</sup>*Technical University Dortmund, GERMANY and*

<sup>2</sup>*Merck KGaA, GERMANY*

### 14:05 MICRO-COMPUTED TOMOGRAPHY FOR 3D-IMAGING OF LIQUID-LIQUID INTERFACES IN CAPILLARY FLOW

Bastian Oldach, Carmen Helwing, Kim Fabienne Buchhorn,  
and Norbert Kockmann

*TU Dortmund University, GERMANY*

### 14:20 CAPILLARY PEELING OF SELF-ASSEMBLED MICROSPHERE ARRAYS FOR VERSATILE FABRICATION OF OPAL STRUCTURES

Carlos D. Diaz-Marin<sup>1</sup>, Diane Li<sup>1</sup>, Cameron Kilpatrick<sup>2</sup>, Youngsup Song<sup>1</sup>,  
Geoffrey Vaartstra<sup>1</sup>, and Evelyn N. Wang<sup>1</sup>

<sup>1</sup>*Massachusetts Institute of Technology, USA and*

<sup>2</sup>*Stanford University, USA*

### 14:35 DISCRETE DROPLET NANOFLUIDICS

James Friend

*University of California, San Diego, USA*

### 14:50 ANOMALOUS SURFACE ADHESION OF BACTERIA-LADEN DROPLETS

Sirshendu Misra, Kiran Raj M, and Sushanta Mitra

*University of Waterloo, CANADA*

- 15:05 A PLATFORM FOR PORTABLE ANALYSIS OF CAPILLARY FILLING DYNAMICS ENABLES RHEOLOGICAL ANALYSIS OF COMPLEX FLUIDS AT THE POINT-OF-NEED**  
Jose C. Contreras-Naranjo and Victor M. Ugaz  
*Texas A&M University, USA*

**15:20 Break**

### **Keynote Presentation 3**

Chair: Chirag Kharangate, *Case Western Reserve University, USA*

- 15:40 DEEP LEARNING SURROGATES: TRANSFERABILITY FOR SCALABLE MODELING OF FLUIDS**  
Aparna Chandramowliswaran  
*University of California, Irvine, USA*

### **Student Keynote Presentation 2**

Chair: Chirag Kharangate, *Case Western Reserve University, USA*

- 16:10 PROBING LOW SURFACE TENSION MICRODROPLET CONDENSATION USING REFLECTED LASER INTERFEROMETRY**  
Sirshendu Misra<sup>1</sup>, Hideaki Teshima<sup>2</sup>, Koji Takahashi<sup>2</sup>,  
and Sushanta Mitra<sup>1</sup>  
*<sup>1</sup>University of Waterloo, CANADA and <sup>2</sup>Kyushu University, JAPAN*

### **Technical Session 3**

#### **Emerging and Innovative Technologies**

Chair: Chirag Kharangate, *Case Western Reserve University, USA*

- 16:30 VISIONit: A VISION-BASED FRAMEWORK FOR NUCLEATION PHASE CHANGE SCIENCE**  
Youngjoon Suh, Peter Simadiris, Sang Hyeon Chang, and Yoonjin Won  
*University of California, Irvine, USA*
- 16:45 A THREE DIMENSIONAL HYDRODYNAMIC FOCUSING MIXING DEVICE FOR X-RAY SPECTROSCOPY**  
Thomas Kroll<sup>1</sup>, Diego A. Huyke<sup>1</sup>, Augustin Braun<sup>1</sup>,  
Ashwin Ramachandran<sup>1</sup>, Dimosthenis Sokaras<sup>1</sup>, Britt Hedman<sup>1</sup>,  
Uwe Bergmann<sup>1</sup>, Edward I. Solomon<sup>1</sup>, Mario U. Delgado-Jaime<sup>2</sup>,  
Daniel P. DePonte<sup>1</sup>, and Juan G. Santiago<sup>1</sup>•  
*<sup>1</sup>Stanford University, USA and <sup>2</sup>University of Guadalajara, MEXICO*

- 17:00 ADDITIVELY MANUFACTURED INERTIAL COALESCENCE FILTERS**  
Rawand M. Rasheed<sup>1</sup>, Logan J. Torres<sup>2</sup>, Anoop Rajappan<sup>1</sup>,  
Mark M. Weislogel<sup>2</sup>, and Daniel J. Preston<sup>1</sup>  
*<sup>1</sup>Rice University, USA and <sup>2</sup>IRPI LLC, USA*
- 17:15 NEUROMORPHIC DEEP LEARNING FRAMEWORK FOR REAL-TIME CRITICAL HEAT FLUX PREDICTION**  
Dale Y. Lu, Youngjoon Suh, and Yoonjin Won  
*University of California, Irvine, USA*
- 17:30 ROUGHNESS CHARACTERIZATION AND THERMAL-HYDRAULIC FLOW PERFORMANCE ENHANCEMENT OF ADDITIVELY MANUFACTURED MICROCHANNELS**  
Kevin Uvodich and Nenad Miljkovic  
*University of Illinois, Urbana-Champaign, USA*

**Poster Presentations**  
**17:45 - 19:00**

**Applications - Bio-Chemical and Bio-Medical Applications**

- P-01 EFFECT OF THERMAL MASS ON VIRUS INACTIVATION TIMESCALE**  
Te Faye Yap and Daniel J. Preston  
*Rice University, USA*
- P-02 FABRICATION OF HIGH ASPECT RATIO MICRO-CHANNELS WITH PEGDA FOR CELL DEFORMATION**  
Ratul Paul, Yuwen Zhao, and Yaling Liu  
*Lehigh University, USA*
- P-03 MICROFLUIDICS WITHIN A WELL**  
Youngtaek Kim and Noo Li Jeon  
*Seoul National University, KOREA (ROK)*
- P-04 REACTION KINETIC INVESTIGATION WITH OPEN-SOURCE MICROFLUIDIC CONDUCTIVITY SENSOR**  
Robin Dinter, Lennart Helwes, Marcel Pillath, and Norbert Kockmann  
*TU Dortmund University, GERMANY*

## Applications - Energy Applications

**P-05 FUNCTIONAL THERMAL ENERGY STORAGE MATERIALS FOR BUILDINGS**

Shuang Cui<sup>1, 2</sup>, Sumanjeet Kaur<sup>3</sup>, and Judith Vidal<sup>2</sup>

<sup>1</sup>University of Texas, Dallas, USA, <sup>2</sup>National Renewable Energy Laboratory, USA, and <sup>3</sup>Lawrence Berkeley National Laboratory, USA

## Emerging and Innovative Technologies

**P-06 A DEEP LEARNING MODEL FOR MIXED CONVECTION HEAT TRANSFER**

Munku Kang and Beomjin Kwon  
*Arizona State University, USA*

**P-07 FLOW VISUALIZATION OF LAMINAR MIXED CONVECTION IN TRANSPARENT 3D-PRINTED CHANNELS**

Nadine A. Tim, Munku Kang, and Beomjin Kwon  
*Arizona State University, USA*

## Fundamentals - Multi-Phase Flows

**P-08 COALESCENCE-INDUCED JUMPING BUBBLES DURING POOL BOILING**

Hyunggon Park<sup>1</sup>, Thomas P. Foulkes<sup>2</sup>, and Jonathan B. Boreyko<sup>1</sup>  
<sup>1</sup>Virginia Tech, USA and <sup>2</sup>Pacergy LLC, USA

**P-09 COMBINED EFFECTS OF CONTACT LINE LENGTH AND CAPILLARY-WICKING ON POOL BOILING HEAT TRANSFER**

Youngsup Song, Lenan Zhang, Carlos D. Díaz-Marín, Samuel S. Cruz, and Evelyn N. Wang  
*Massachusetts Institute of Technology, USA*

**P-10 MICRO RAMAN THERMOMETRY FOR SPATIALLY RESOLVED CHARACTERIZATION OF THIN FILM EVAPORATION**

Vijay Kumar, Harrison Szeto, Xichen Liang, and Yangying Zhu  
*University of California, Santa Barbara, USA*

## Fundamentals - Single-Phase Flows

**P-11 THE EFFECTS OF SURFACTIN ON DROPLETS IN A FAN NOZZLE**

Emily M. Stallbaumer-Cyr and Melanie M. Derby  
*Kansas State University, USA*

- P-12 EFFECT OF ALUMINUM HEAT EXCHANGER SURFACE WETTABILITY ON CONDENSATION HEAT TRANSFER AND WATER HARVESTING PERFORMANCE**  
Dalia Ghaddar, Kalyan Boyina, Sophie Wang, and Nenad Miljkovic  
*University of Illinois, Urbana-Champaign, USA*
- P-13 ENHANCED VOLTAGE GENERATION THROUGH ELECTROLYTE FLOW OVER LIQUID-FILLED SURFACES**  
Bei Fan<sup>1</sup> and Prabhakar Bandaru<sup>2</sup>  
<sup>1</sup>*Michigan State University, USA and*  
<sup>2</sup>*University of California, San Diego, USA*
- P-15 MANAGED SALT PRECIPITATION FOR AMBIENT PRESSURE DISTILLATION ON POLYMERIC SURFACES**  
Walter Parker and Akanksha K. Menon  
*Georgia Institute of Technology, USA*
- P-16 MASS-MANUFACTURABLE FOG HARPS**  
Kevin R. Murphy, Jimmy K. Kaindu, and Jonathan B. Boreyko  
*Virginia Tech, USA*
- P-17 ULTRASONICALLY-DRIVEN MICROSCALE CAPILLARY WAVE TURBULENCE IN A SHALLOW BASIN**  
Jeremy Orosco and James Friend  
*University of California, San Diego, USA*
- P-18 WETTABILITY IN HYDROPHILIC SURFACES WITH MICROCAVITIES**  
Gonzalo Almanza, Carlos A. Dorao, and Maria Fernandino  
*Norwegian University of Science and Technology (NTNU), NORWAY*
- 19:00 Adjourn for the Day**

## Wednesday, June 22

### Plenary Presentation 2

Chair: Nenad Miljkovic, *University of Illinois, Urbana-Champaign, USA*

**08:30 CRISPR-BASED DIAGNOSTICS: FUNDAMENTAL KINETICS AND MICROFLUIDIC ASSAYS**

Juan Santiago  
*Stanford University, USA*

**09:30 Break**

### Keynote Presentation 4

Chair: Hyun Jin Kim, *University of Alabama, USA*

**09:50 ADDITIVELY MANUFACTURED HEAT EXCHANGERS**

William P. King  
*University of Illinois, Urbana-Champaign, USA*

### Technical Session 4 Single-Phase Flows & Surfaces and Interfaces II

Chair: Hyun Jin Kim, *University of Alabama, USA*

**10:20 A COMPACT MICROPOROUS FOAM RESISTOR FOR SOFT PNEUMATIC LOGIC CIRCUITS**

Anoop Rajappan and Daniel J. Preston  
*Rice University, USA*

**10:35 REAL-TIME MANIPULATION OF LIQUID DROPLETS ON SLIPS USING PHOTO-RESPONSIVE SURFACTANTS**

Xichen Liang, Lei Zhao, Serena Seshadri, Sophia Bailey, Michael Haggmark, Matthew E. Helgeson, Michael Gordon, Paolo Luzzatto-Fegiz, Javier Read de Alaniz, and Yangying Zhu  
*University of California, Santa Barbara, USA*

**10:50 FREEING OF FEW NANOMETER WATER DROPLETS**

Alireza Hakimian and Hadi Ghasemi  
*University of Houston, USA*

**11:05 HYDRODYNAMIC SLIP LENGTH FOR WATER FLOW IN CARBON NANOCHANNELS**

Luis E. Paniagua-Guerra and Bladimir Ramos-Alvarado  
*Pennsylvania State University, USA*

**11:20 REDUCED-ORDER MODELING OF SILICON CARBIDE EMBEDDED COOLING TECHNOLOGY**

Jarred Wilhite<sup>1,2</sup> and Chirag Kharangate<sup>2</sup>  
<sup>1</sup>*NASA Glenn Research Center, USA and*  
<sup>2</sup>*Case Western Reserve University, USA*

**11:35 OPTIMIZATION OF QUASI-RANDOM POROUS STRUCTURE FOR THERMOFLUIDIC APPLICATIONS**

Chuanning Zhao, Jonathan T. Eweis-Labolle, Ramin Bostanabad, and Yoonjin Won  
*University of California, Irvine, USA*

**11:50 Lunch**

**Keynote Presentation 5**

Chair: Xianming Dai, *University of Texas, Dallas, USA*

**13:00 PASSIVE HEAT SWITCH BASED ON CAPILLARY FORCING**

Patricia (Patty) Weisensee  
*Washington University in St. Louis, USA*

**Student Keynote Presentation 3**

Chair: Xianming Dai, *University of Texas, Dallas, USA*

**13:30 ELECTROSTATIC DE-ICING**

Venkata Yashasvi Lolla<sup>1</sup>, Ranit Mukherjee<sup>2</sup>, and Jonathan B. Boreyko<sup>1</sup>  
<sup>1</sup>*Virginia Tech, USA and* <sup>2</sup>*University of Minnesota, USA*

**Technical Session 5  
Surfaces and Interfaces III**

Chair: Xianming Dai, *University of Texas, Dallas, USA*

**13:50 SUSTAINABLE ANTI-ICING ON QUASI-LIQUID SURFACES**

Jyotirmoy Sarma, Lei Zhang, Zongqi Guo, and Xianming Dai  
*University of Texas, Dallas, USA*

- 14:05 SUSTAINABLE HIGH-PERFORMANCE STEAM CONDENSATION ON QUASI-LIQUID SURFACE**  
Deepak Monga, Zongqi Guo, Li Shan, Seyed Adib Taba, Jyotirmoy Sarma, and Xianming Dai  
*University of Texas, Dallas, USA*
- 14:20 CONDENSATION AND WETTING DYNAMICS ON AMPHIPHILIC MINICHANNEL TUBES**  
Rebecca Winter and Matthew McCarthy  
*Drexel University, USA*
- 14:35 FROST PATTERN ON MACROTEXTURED SURFACES**  
Christian Machado and Kyoo-Chul Ken Park  
*Northwestern University, USA*
- 14:50 ICE QUENCHING**  
Mojtaba Edalatpour and Jonathan B. Boreyko  
*Virginia Tech, USA*
- 15:05 NON-ISOTHERMAL DROPLET IMPACT AND LEIDENFROST EFFECT ON A SINGLE POST**  
Junhui Li and Patricia Weisensee  
*Washington University, St. Louis, USA*

**15:20 Break**

### **Keynote Presentation 6**

Chair: Beomjin Kwon, *Arizona State University, USA*

- 15:40 INACTIVATION OF VIRUSES WITH DRY HEAT**  
Daniel J. Preston  
*Rice University, USA*

### **Student Keynote Presentation 4**

Chair: Beomjin Kwon, *Arizona State University, USA*

- 16:10 REVERSAL OF MENISCUS-CLIMBING MICRODROPLETS ON LIQUID-INFUSED SURFACES**  
Jianxing Sun and Patricia Weisensee  
*Washington University, St. Louis, USA*



**Technical Session 6**  
**Multi-Phase Flows II & Bio-Chemical and Bio-Medical**

*Chair: Beomjin Kwon, Arizona State University, USA*

- 16:30 SIZE AND FREQUENCY ANALYSIS OF THE JETTING REGIME IN A GASLIQUID CO-FLOWING DEVICE**  
Zihao Meng and Carlos H. Hidrovo  
*Northeastern University, USA*
- 16:45 OPTIMIZING ANN MODEL PARAMETERS TO DEVELOP AN ACCURATE MODEL FOR FLOW BOILING HEAT TRANSFER COEFFICIENT PREDICTIONS**  
Yue Qiu<sup>1</sup>, Tinh Vo<sup>1</sup>, Deepak Garg<sup>2</sup>, and Chirag Kharangate<sup>1</sup>  
<sup>1</sup>*Case Western Reserve University, USA and*  
<sup>2</sup>*University of California, Los Angeles, USA*
- 17:00 HIGH VISCOSITY TWO PHASE FLOW SEPARATION**  
Yu-Chieh Chen and Ya-Yu Chiang  
*National Chung Hsing University, TAIWAN*
- 17:15 CORE-ANNULAR LIQUID-LIQUID SEPARATOR FOR LOW SURFACE TENSION TWO-PHASE IMMISCIBLE LIQUID**  
Can-Hong Ni, Xi-Lun Wang, and Ya-Yu Chiang  
*National Chung Hsing University, TAIWAN*
- 17:30 LIGHT DEPENDENT RESISTOR FOR ONLINE DISPERSION POINT IN TIME DETECTION IN EMULSIFICATION PROCESSES VIA MINICHANNEL BYPASS**  
Inga Burke, Sebastian Derkum, and Norbert Kockmann  
*TU Dortmund University, GERMANY*
- 17:45 LIQUID METAL FOAMS AND EMULSIONS FOR THERMAL AND BIOMEDICAL APPLICATIONS**  
Konrad Rykaczewski, Najam U.H. Shah, Shreyas Kanetkar, Nathan Casey, and Robert Y. Wang  
*Arizona State University, USA*

**Award Ceremony /  $\mu$ FIP 2023 Announcement  
and Banquet  
18:00 - 20:00**

**20:00 Adjourn for the Day**

**Thursday, June 23**

**Plenary Presentation 3**

Chair: Patty Weisensee, *Washington University, St. Louis, USA*

**08:30 BEYOND PHOTOELECTROCHEMICAL WATER SPLITTING**

Xiaolin Zheng

*Stanford University, USA*

**09:30 Break**

**Keynote Presentation 7**

Chair: Yangying Zhu, *University of California, Santa Barbara, USA*

**09:50 EXPLOITING ACOUSTIC FIELD-MICROSWIMMER INTERACTIONS  
IN ACOUSTOFLUIDIC DEVICE DEVELOPMENT**

J. Mark Meacham

*Washington University in St. Louis, USA*

**Technical Session 7**

**Energy Applications & Bio-Chemical and  
Bio-Medical & Water and Environments II**

Chair: Yangying Zhu, *University of California, Santa Barbara, USA*

**10:20 MICROINJECTION MOLDING OF POLYCARBONATE  
MICROSTRUCTURES USING LOW-COST  
POLYDIMETHYLSILOXANE (PDMS) INSERTS**

Shapour Jafargholinejad and Pouya Rezai

*York University, CANADA*

**10:35 HEAT AND MASS TRANSFER IN HYGROSCOPIC HYDROGELS**

Carlos D. Diaz-Marin, Lenan Zhang, Bachir El Fil, Zhengmao Lu,  
Mohammed Alshrah, Jeffrey C. Grossman, and Evelyn N. Wang

*Massachusetts Institute of Technology, USA*

**10:50 UNDERSTANDING EFFECT OF POROUS TRANSPORT LAYER MORPHOLOGIES AND CATALYST LAYER STRUCTURE ON OXYGEN TRANSPORT IN POLYMER ELECTROLYTE MEMBRANE WATER ELECTROLYZERS**

Devashish Kulkarni<sup>1</sup>, Alex Huynh<sup>1</sup>, Pongsarun Satjaritanun<sup>1</sup>, Maeve O'Brien<sup>1</sup>, Dilworth Parkinson<sup>2</sup>, Pavel Shevchenko<sup>3</sup>, Francesco DeCarlo<sup>3</sup>, Nemanja Danilovic<sup>2</sup>, Kathrine E. Ayers<sup>4</sup>, Christopher Capuano<sup>4</sup>, and Iryna Zenyuk<sup>1</sup>

<sup>1</sup>University of California, Irvine, USA, <sup>2</sup>Lawrence Berkeley National Laboratory, USA, <sup>3</sup>Argonne National Laboratory, USA, and <sup>4</sup>Nel Hydrogen, USA

**11:05 FABRICATION AND BONDING OF INDEX-MATCHED CELL TRAP ARRAYS FOR MULTIPARAMETRIC DRUG SCREENING ASSAYS**

Edward R. Polanco and Thomas A. Zangle

University of Utah, USA

**11:20 LIQUID TRANSPORT PROPERTIES THROUGH HYDROGELS**

Yiwei Gao, Mario R. Mata Arenales, Bianca Navarro, Stone Wachs, and H. J. Cho

University of Nevada, Las Vegas, USA

**11:35 DYNAMIC PHASE CHANGE MATERIALS USING PRESSURE-ENHANCED CLOSE CONTACT MELTING**

Wuchen Fu, Xiao Yan, Yashraj Gurumukhi, Vivek S. Garimella, William P. King, and Nenad Miljkovic

University of Illinois, Urbana-Champaign, USA

**11:50 Lunch**

**Keynote Presentation 8**

Chair: Jeremy Cho, University of Nevada, Las Vegas, USA

**13:00 WATER DRAG REDUCED ON MICRO GAS POCKETS**

Chang-Jin "CJ" Kim

University of California, Los Angeles, USA

**Technical Session 8**  
**Surfaces and Interfaces IV &**  
**Bio-Chemical and Bio-Medical III**

Chair: Jeremy Cho, *University of Nevada, Las Vegas, USA*

- 13:30 SURFACE CONTAMINATION UNDER ULTRA-HIGH VACUUM**  
Zhen Liu<sup>1</sup>, Youngsup Song<sup>2</sup>, Anoop Rajappan<sup>1</sup>, Evelyn N. Wang<sup>2</sup>,  
and Daniel J. Preston<sup>1</sup>  
*<sup>1</sup>Rice University, USA and <sup>2</sup>Massachusetts Institute of Technology, USA*
- 13:45 EXPERIMENTAL OBSERVATIONS OF THE PHOTOMOLECULAR EFFECT**  
Yaodong Tu and Gang Chen  
*Massachusetts Institute of Technology, USA*
- 14:00 CONTINUOUS BIODIESEL PRODUCTION USING SERIOUS MICROREACTORS**  
Po-Ying Chen, Cheng-Yu Wang, Yi-Chun Chen, Yi-Han Liao,  
and Ya-Yu Chiang  
*National Chung Hsing University, TAIWAN*
- 14:15 DEAN FLOW OF SHEAR-THICKENING NANOFLUIDS IN CURVED MICROCHANNELS**  
Arsalan Nikdoost and Pouya Rezai  
*York University, CANADA*
- 14:30 MICROFLUIDIC-BASED TIMELAPSE CHARACTERIZATION OF WATER UPTAKE IN SUPERABSORBENT POLYMER (SAP) PARTICLES**  
Ehsan Tabesh, Sunny Leung, and Pouya Rezai  
*York University, CANADA*
- 14:45 THE SURFACE ENERGY OF PHYSICALLY AND CHEMICALLY FUNCTIONALIZED GRAPHENE**  
James Carpenter, Hyunchul Kim, Jules Suarez, Arend van der Zande,  
and Nenad Miljkovic  
*University of Illinois, Urbana-Champaign, USA*
- 15:00 Break**

**Leadership Panel - Tenure and Beyond**  
**15:10 - 16:10**

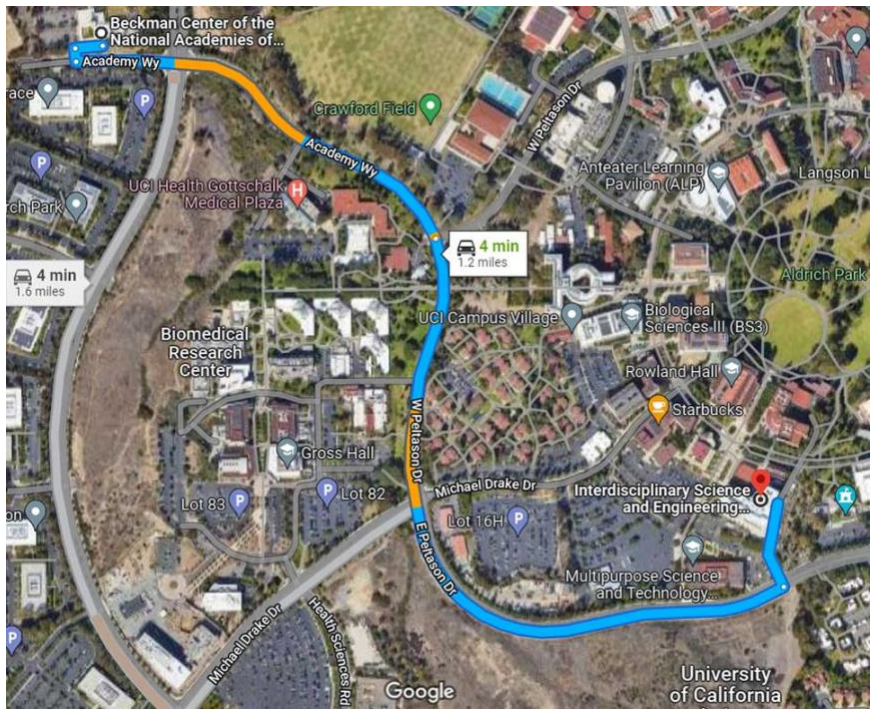
Nenad Miljkovic, *University of Illinois, Urbana-Champaign, USA* (moderator)  
Gang Chen, *Massachusetts Institute of Technology, USA*  
Srinivas Garimella, *Georgia Tech, USA*  
Samuel Graham, *University of Maryland, USA*

**Government Panel – What is Next?**  
**16:10 - 17:10**

William P. King, *University of Illinois, Urbana-Champaign, USA* (moderator)  
Mark S. Spector, *Office of Naval Research, USA*  
Philseok Kim, *ARPA-E, USA*  
Ying Sun, *Drexel University, USA*

**17:10**      **Closing Remarks / Conference Adjourns**

Map from [Beckman Center to Interdisciplinary Science & Engineering Building \(ISEB\)](#).



**19 – 21 October 2022**  
**UNIVERSITY OF GLASGOW, UK**



University  
of Glasgow



**call for  
papers**

Abstract Deadline  
**1 July 2022**

**Acoustofluidics  
2022**



**CHAIRS**

Thomas Franke  
*University of Glasgow, UK*

Richard Yongqing Fu  
*Northumbria University, UK*

**[www.acoustofluidics.net](http://www.acoustofluidics.net)**

# μTAS 2022



Hangzhou · China

23-27 · October

In-Person

Hybrid

Virtual

The 26th International Conference on Miniaturized Systems  
for Chemistry and Life Sciences

## 23-27 OCTOBER

Conference Location:  
Hangzhou International Expo Center

# PLENARY SPEAKERS



**Lyderic Bocquet**  
Ecole Normale Supérieure, FRANCE



**Amy Herr**  
University of California, Berkeley, USA



**Hiroyuki Noji**  
University of Tokyo, JAPAN



**Joyce Poon**  
University of Toronto, CANADA  
Max Planck Institute of Microstructure  
Physics, GERMANY



**David A. Weitz**  
Harvard University, USA



**Xiaoliang Sunney Xie**  
Peking University, CHINA

### HONORARY CHAIR

Professor Hong-Yuan Chen  
Nanjing University, CHINA

### CHAIR

Professor Qun Fang  
Zhejiang University, CHINA

### CO-CHAIRS

Professor Xing-Hua Xia  
Nanjing University, CHINA

Professor Yan-Yi Huang  
Peking University, CHINA

Professor Jian-Hua Qin  
Dalian Institute of Chemical Physics,  
Chinese Academy of Sciences (CAS), CHINA

Professor Zhi-Hong Li  
Peking University, CHINA

[www.microtas2022.org](http://www.microtas2022.org)

