

# Wednesday 19 August

All Times are British Summer Time

- 09:00 Welcome and Opening Remarks**  
Thomas Franke, *University of Glasgow, UK*  
Richard Fu, *Northumbria University, UK*

## Session 1

Session Chair: Thomas Franke, *University of Glasgow, UK*


## Keynote Speaker 1


- 09:15 ACOUSTIC LEVITATION: FASTER, HIGHER, STRONGER**  
Bruce Drinkwater  
*University of Bristol, UK*

## Contributed Talks

- 10:00 TOWARDS HIGH-THROUGHPUT MICROFLUIDIC COMPRESSIBILITY CYTOMETRY USING GRADIENT ACOUSTIC FOCUSING INTEGRATED WITH DENSITY CENTRIFUGATION**  
Mahdi Rezayati Charan, Oskar Andersson, Ola Jakobsson, and Per Augustsson  
*Lund University, SWEDEN*
- 10:10 USING OPEN-CHANNEL ACOUSTOFLUIDICS FOR FABRICATION OF SKIN EQUIVALENCE**  
Dhananjay V. Deshmukh, Jessica Polak, Christine Fux, Mirko Meboldt, Mark Tibbitt, and Jürg Dual  
*ETH Zürich, SWITZERLAND*
- 10:20 BULK ACOUSTIC WAVES-BASED SYSTEM FOR A RAPID AND HIGH THROUGHPUT CELL WASHING**  
Hugo R. Sugier<sup>1,2</sup>, Ludovic Bellebon<sup>3</sup>, Jean-Luc Aider<sup>3</sup>, Jérôme Larghero<sup>4</sup>, Juliette Peltzer<sup>5</sup>, and Christophe Martinaud<sup>6</sup>  
<sup>1</sup>*Aenitis Technologies, FRANCE*, <sup>2</sup>*Institut André Lwoff, FRANCE*, <sup>3</sup>*Sorbonne Université, FRANCE*, <sup>4</sup>*Université de Paris, FRANCE*, <sup>5</sup>*Institut de Recherche Biomédicale des Armées, FRANCE*, and <sup>6</sup>*Centre de Transfusion Sanguine des Armées, FRANCE*

## Flash Presentations

- 10:30 NOVEL ACOUSTOFLUIDIC APPROACH USING A BULK ACOUSTIC WAVE RESONATOR TO CONTROL THE TOPOLOGY AND CULTURE CONDITIONS OF BRAIN DERIVED SPHEROIDS**  
 Chloé Dupuis<sup>1,2</sup>, Xavier Mousset<sup>1,2</sup>, Guillaume Viraye<sup>2</sup>, Pierre-Ewen Lecoq<sup>1,2</sup>, Mauricio Hoyos<sup>1</sup>, Jean-Michel Peyrin<sup>2</sup>, and Jean-Luc Aider<sup>1</sup>  
<sup>1</sup>*Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE* and <sup>2</sup>*Sorbonne Université, FRANCE*

NOTE Some of the flash presentations will also present a poster on the same day as their presentation. Friday flash posters will present on Thursday. Participating posters are marked with  in the schedule.

- 10:35 ACOUSTIC WAVE ACTIVATION OF THE GROWTH OF DIELECTRIC AND METAL THIN FILMS BY PLASMA DEPOSITION TECHNIQUES**  
Manuel Oliva-Ramirez<sup>1</sup>, Helene Reichel<sup>1</sup>, Aurelio Garcia-Valenzuela<sup>1</sup>, Víctor Rico<sup>1</sup>, Juan P. Espino<sup>1</sup>, Teresa C. Rojas<sup>1</sup>, Guillermo Regodon-Harkness<sup>1</sup>, Jorge Gil-Rostra<sup>1</sup>, Armaghan Fakhfour<sup>2</sup>, Ana Gómez-Ramírez<sup>1</sup>, Rafael Alvarez<sup>1</sup>, Ana Borrás<sup>1</sup>, Alberto Palmero<sup>1</sup>, Andreas Winkler<sup>2</sup>, and Agustin R. González-Elipe<sup>1</sup>  
<sup>1</sup>Instituto de Ciencia de Materiales de Sevilla (ICMS), SPAIN and <sup>2</sup>IFW-Dresden, GERMANY

**10:40 Coffee Break**

## Session 2

Session Chair: Matthias Schneider, Technische Universität Dortmund, GERMANY

## INVITED SPEAKER 1


- 11:10 STANDING WAVE ACOUSTOPHORESIS OF LEGIONELLA SPECIES AND THE INFLUENCE OF MULTIBODY EFFECTS**  
Alen Pavlič  
ETH Zürich, SWITZERLAND

## Contributed Talks

- 11:30 CULTURE OF HEPATIC AND STEM CELL SPHEROIDS IN ACOUSTIC LEVITATION INDUCES DIFFERENT SELF-ORGANISATION DYNAMICS**  
Lucile Rabiet<sup>1,2</sup>, Lousineh Arakelian<sup>2</sup>, Duván Rojas García<sup>1</sup>, Nathan Jeger-Madiot<sup>1</sup>, Mauricio Hoyos<sup>1</sup>, Jérôme Larghero<sup>2</sup>, and Jean-Luc Aider<sup>1</sup>  
<sup>1</sup>Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE and <sup>2</sup>Inserm U976 HIPI - Hôpital Saint-Louis, FRANCE
- 11:40 MULTI LINE PATTERNING OF HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS FOR 3D MICROVASCULAR NETWORK FORMATION**  
Le Thi Huong<sup>1</sup>, Andreas Lenshof<sup>2</sup>, Huu Lam Phan<sup>1</sup>, Van Thuy Duong<sup>1</sup>, Thomas Laurell<sup>2</sup>, and Kyo-in Koo<sup>1</sup>  
<sup>1</sup>University of Ulsan, KOREA and <sup>2</sup>Lund University, SWEDEN
- 11:50 DISCOVERY OF THE MECHANISM RESPONSIBLE FOR ULTRASOUND'S EXCITATION OF ION CHANNELS IN CELLS**  
Aditya Vasan<sup>1</sup>, Jeremy Orosco<sup>1</sup>, Uri Magaram<sup>2</sup>, Marc Duque<sup>2</sup>, Connor Weiss<sup>2</sup>, Yusuf Tufail<sup>2</sup>, Sreekanth H. Chalasani<sup>2</sup>, and James Friend<sup>1</sup>  
<sup>1</sup>University of California, San Diego, USA and <sup>2</sup>Salk Institute for Biological Studies, USA

## Flash Presentations

- 12:00 ACOUSTIC ACTIVATED ABSORBANCE DROPLET SORTING AT kHz DROPLET RATES**  
 Esther S. Richter<sup>1</sup>, Andreas Link<sup>1</sup>, Raymond W. Sparrow<sup>1</sup>, John S. McGrath<sup>1</sup>, Florian Höllfelder<sup>2</sup>, and Thomas Franke<sup>1</sup>  
<sup>1</sup>University of Glasgow, UK and <sup>2</sup>University of Cambridge, UK

- 12:05** **ACOUSTIC BUBBLE FOR SPHEROID TRAPPING, ROTATION, AND CULTURE: A TUMOR-ON-A-CHIP PLATFORM (ABSTRACT PLATFORM)**  
 Yuan Gao<sup>1,2</sup>, Mengren Wu<sup>1</sup>, Qiyue Luan<sup>1</sup>, Ian Papautsky<sup>1</sup>, and Jie Xu<sup>1</sup>  
<sup>1</sup>University of Illinois, Chicago, USA and <sup>2</sup>University of Memphis, USA

**12:10** **Lunch**

### Session 3

Session Chair: Bruce W. Drinkwater, University of Bristol, UK



### Keynote Speaker 2

- 13:10** **HEARING IS BELIEVING: CORRELATING OPTICAL AND ACOUSTIC IMAGING OF BUBBLE DYNAMICS IN A MICROFLUIDIC SYSTEM**  
Eleanor Stride  
University of Oxford, UK

### Contributed Talks

- 13:55** **PARTICLE TRAPPING USING AXIAL PRIMARY RADIATION FORCE**  
Lokesh Malik<sup>1</sup>, Amal Nath<sup>1</sup>, Subhas Nandy<sup>1</sup>, Thomas Laurell<sup>2</sup>, and Ashis Kumar Sen<sup>1</sup>  
<sup>1</sup>Indian Institute of Technology, Madras, INDIA and <sup>2</sup>Lund University, SWEDEN
- 14:05** **SHORT ULTRASONIC PULSES FOR ACOUSTIC TWEEZERS**  
Qing Wang<sup>1</sup>, Zhixiong Gong<sup>2</sup>, Shuhan Chen<sup>1</sup>, Jia Zhou<sup>1</sup>, Michael Baudoin<sup>2,3</sup>, and Antoine Riaud<sup>1</sup>  
<sup>1</sup>Fudan University, CHINA, <sup>2</sup>University of Lille, FRANCE, and <sup>3</sup>Institut Universitaire de France, FRANCE
- 14:15** **DYNAMIC PATTERNING OF MICROPARTICLES WITH ACOUSTIC IMPULSE CONTROL**  
Luke Cox, Anthony Croxford, and Bruce W. Drinkwater  
University of Bristol, UK

### Flash Presentations

- 14:25** **HIGH-PERFORMANCE BULK-WAVE-ACOUSTOPHORESIS DEVICES DRIVEN BY LEAD-FREE PIEZOELECTRIC MATERIALS**  
 Wei Qiu  
Lund University, SWEDEN
- 14:30** **SHEATHLESS MICROFLOW CYTOMETRY USING GIGAHERTZ ACOUSTIC STREAMING**  
 Yaping Wang, Wei Wei, Yang Yang, Wei Pang, and Xuexin Duan  
University of Tianjin, CHINA
- 14:35** **Coffee Break**

## Session 4

Session Chair: Eleanor Stride, *University of Oxford, UK*

### Invited Speaker 2

**15:05 MOMENTUM CONSERVATION AND THE 2<sup>ND</sup> LAW  
IN BIOLOGICAL COMMUNICATION**

Matthias Schneider

*Technische Universitat Dortmund, GERMANY*

### Contributed Talks

**15:25 FLUIDO-ACOUSTICS: DYNAMIC MULTI-SLIT METAMATERIAL  
TUNED USING LIQUID DROPLETS**

Shubhi Bansal, Ryuji Hirayama, and Sriram Subramanian  
*University College London, UK*

**15:35 ON-CHIP LOCALIZED MICROFLUIDIC PUMPING POWERED  
BY GUIDED FLEXURAL WAVES OVER SILICON-ON-NOTHING  
MEMBRANE WAVEGUIDES**

Philippe Vachon<sup>1,2</sup>, Srinivas Merugu<sup>1</sup>, Jaibir Sharma<sup>1</sup>, Amit Lal<sup>1,3</sup>,  
Eldwin J. Ng<sup>1</sup>, Yul Koh<sup>1</sup>, Joshua E.-Y. Lee<sup>1</sup>, and Chengkuo Lee<sup>2</sup>

<sup>1</sup>*Institute of Microelectronics, A\*STAR, SINGAPORE,*

<sup>2</sup>*National University of Singapore, SINGAPORE, and* <sup>3</sup>*Cornell University, USA*

**15:45 COMPLEX MICROSCALE PATTERNING WITH  
SUB-WAVELENGTH ACOUSTIC MICROFEATURES**

Kirill Kolesnik, Philipp Segeritz, Daniel J. Scott,  
Vijay Rajagopal, and David J. Collins  
*University of Melbourne, AUSTRALIA*

### Flash Presentations

**15:55 HIGH SENSITIVITY MEASUREMENTS OF THE ACOUSTIC CONTRAST  
FACTOR OF STIFFNESS ALTERED BIOLOGICAL CELLS**

Cooper Lars Harshbarger<sup>1,2,3</sup>, Alen Pavlic<sup>1</sup>, Davide Bernardoni<sup>2,3</sup>,  
Amelie Viol<sup>1</sup>, Jess Gerrit Snedeker<sup>2,3</sup>, and Jürg Dual<sup>1</sup>

<sup>1</sup>*ETH Zürich, SWITZERLAND,* <sup>2</sup>*University of Zurich, SWITZERLAND, and*

<sup>3</sup>*Swiss Federal Institute of Technology Zurich, SWITZERLAND*

**16:00 ACOUSTOPHORESIS-BASED CELL MANIPULATION DEVICE  
FOR ADVANCED THERAPY MEDICINAL PRODUCTS  
MANUFACTURING AUTOMATION**



Florian Jouy<sup>1</sup>, Fabien Rémy-Martin<sup>1</sup>, Franck Lardet-Vieudrin<sup>1</sup>,  
Alain Rouleau<sup>1</sup>, Pauline Bourgeois<sup>1</sup>, Rabah Zeggari<sup>1,2</sup>,  
Annie Frelet-Barrand<sup>1</sup>, and Jean-Francois Manceau<sup>1</sup>

<sup>1</sup>*Université Bourgogne Franche-Comté, FRANCE and*

<sup>2</sup>*FEMTO Engineering, FRANCE*

**16:05** **DEFORMATION/TRANSPORTATION BEHAVIORS OF  
NON-NEWTONIAN FLUID DRIVEN BY PROPAGATING  
SURFACE ACOUSTIC WAVES**



Jikai Zhang, Hossein Abdolnezhad, Luke Haworth,  
Huilong Ong, Ciro Semprebon, and Yong-Qing (Richard) Fu  
*Northumbria University, UK*

## Olympiad

**16:10 - 18:10** **Studio 2**

**A FOCUSED LINE OF CELLS FLOWING IN A CAPILLARY BRIDGE CHANNEL**

Jeremy Hawkes  
*Acoustic Machines Ltd., UK*

**BENDING AND DEFORMATION OF SAW DEVICES FOR WEARABLE  
ACOUSTOFLUIDICS APPLICATIONS**

Jikai Zhang, Luke Haworth, and Huiling Ong  
*Northumbria University, UK*

**BRISTOL ACOUSTIC MANIPULATOR**

Mario Ortega Sandoval  
*University of Bristol, UK*

**COMPACT MICRO-ACOUSTIC LIQUID ATOMIZERS**

Mehrzad Roudini and Andreas Winkler  
*Leibniz Institute for Solid State and Materials Research (IFW), GERMANY*

**DICED MICROCHANNELS AND GLASS CAPILLARIES:  
CHEAP NM-PARTICLE HANDLING**

Michael Gerlt  
*ETH Zürich, SWITZERLAND*

**HIGH SPEED ACOUSTOFLUIDIC PARTICLE FOCUSING AND HIGHER  
HARMONICS USING LATERAL MODES OF A PLATE TRANSDUCER**

Andreas Fuchsluger  
*Johannes Kepler University Linz, AUSTRIA*

**NEXT GENERATION CENTRIFUGE - PARTICLE AND CELL SEPARATION WITH FULLY  
MICROFABRICATED ACOUSTOFLUIDIC CHIPS**

Stefanie Hartmann, Melanie Colditz, and Andreas Winkler  
Leibniz Institute for Solid State and Materials Research (IFW),  
 $\mu$ AcoustiX Startup Project, GERMANY

**ON-CHIP LOCALIZED MICROFLUIDIC PUMPING AND PARTICLES TRANSPORT  
POWERED BY GUIDED FLEXURAL WAVES OVER SILICON-ON-NOTHING  
MEMBRANE WAVEGUIDES**

Philippe Vachon  
*National University of Singapore, SINGAPORE*

**TINYLEV**

Luke Cox  
*University of Bristol, UK*

## Poster Session I, Exhibit Inspection, and Drinks Reception

**16:10 - 18:10** Presentations are listed by topic category with their assigned number starting on page 13.

### Virtual Exhibit 1

**16:10 – 16:40** BelektroniG GmbH representative will be in the Zoom Room.

### Virtual Exhibit 2

**16:40 – 17:10** usePAT GmbH representative will be in the Zoom Room.

usePAT offers ultrasonic systems for enhancing in-line, real-time measurements in industrial liquids and R&D and thereby supports its customers in optimizing process management.

### Virtual Exhibit 3

**17:10 - 17:40** Royal Society of Chemistry representative will be in the Zoom Room.

**18:10** **Adjourn for the Day**

# Thursday, 20 October

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09:00 Announcements

## Session 5

Session Chair: Michael Baudoin, *IEMN, FRANCE*

## Keynote Speaker 3

09:15 **MECHANICS AND EXPERIMENTAL DYNAMICS:  
FROM ACOUSTOFLUIDICS TO GRAVITATIONAL INTERACTION**

Jürg Dual

*ETH Zürich, SWITZERLAND*

## Contributed Talks

10:00 **DYNAMIC PATTERNING OF DIELECTRIC  
PARTICLES ON A PMUT ARRAY**

Bart P. Weekers<sup>1,2</sup>, Liesbet Lagae<sup>1,2</sup>, Xavier Rottenberg<sup>2</sup>,  
and Veronique Rochus<sup>2</sup>

<sup>1</sup>*KU Leuven, BELGIUM* and <sup>2</sup>*imec, BELGIUM*

10:10 **IN-SITU INVESTIGATION OF THREE-DIMENSIONAL  
ACOUSTOPHORETIC AND ACOUSTOTHERMAL  
EFFECTS IN SAW-BASED ACOUSTIC TWEEZERS**

Vijay V. Kondalkar<sup>1</sup>, Zhichao Deng<sup>2</sup>, Alexandre N. Darinskii<sup>3</sup>, Robert Weser<sup>1</sup>,  
Christian Cierpka<sup>2</sup>, Jörg König<sup>2</sup>, and Hagen Schmidt<sup>1</sup>

<sup>1</sup>*Leibniz Institute for Solid State and Materials Research Dresden, GERMANY,*

<sup>2</sup>*Technische Universität Ilmenau, GERMANY, and*

<sup>3</sup>*Institute of Crystallography FSRC, RUSSIA*

10:20 **ACOUSTIC MICROPARTICLE PATTERNING OF  
ARBITRARY-DEFINED SHAPES BY 3D WAVEGUIDES**

William S. Harley, Kirill Kolesnik, Daniel E. Heath, and David J. Collins

*University of Melbourne, AUSTRALIA*

## Flash Presentations

10:30 **ON-CHIP PARTICLE CENTRIFUGE USING SPIRAL SURFACE  
ACOUSTIC WAVES ON ZnO/GLASS SUBSTRATE**

Zhihao Zhu and Xiasheng Guo

*Nanjing University, CHINA*

10:35 **CHARACTERIZATION AND CONTROL OF A BROADBAND ACOUSTIC  
CAVITY: APPLICATION TO CELLS SPHEROIDS MANIPULATION**



Nathan Jeger-Madiot<sup>1</sup>, Xavier Mousset<sup>1,2</sup>, Chloé Dupuis<sup>1,2</sup>, Lucile Rabiet<sup>1,3</sup>,  
Mauricio Hoyos<sup>1</sup>, Jean-Michel Peyrin<sup>2</sup>, and Jean-Luc Aider<sup>1</sup>

<sup>1</sup>*Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE,*

<sup>2</sup>*Sorbonne Universités, FRANCE, and* <sup>3</sup>*APHP Hôpital Saint-Louis, FRANCE*

10:40 **Coffee Break**

## Session 6

Session Chair: Mark Meacham, *Washington University, St. Louis, USA*

### Invited Speaker 3

**11:10 LEVERAGING TIME AND FREQUENCY MULTIPLEXING FOR DYNAMIC ACOUSTIC TWEEZERS**

Zhenhua Tian  
*Virginia Tech, USA*

### Contributed Talks

**11:30 TRANSVERSE MODE OF BULK ACOUSTIC WAVE FOR SUB-100 NM NANOPARTICLES MANIPULATIONS**

Wei Wei, Zhaoxun Wang, and Xuexin Duan  
*University of Tianjin, CHINA*

**11:40 3D CELL ROTATION BASED ON A VIBRATION-INDUCED FLOW**

Hiroyasu Kobayashi, Yuha Koike, and Takeshi Hayakawa  
*Chuo University, JAPAN*

**11:50 HIGH PERFORMANCE ACOUSTOFLUIDIC PARTICLE FOCUSING IN SILICON-BASED AND POLYMER-BASED DEVICES USING LATERAL MODES OF PLATE TRANSDUCERS**

Andreas Fuchsluger<sup>1</sup>, Annalisa De Pastina<sup>2</sup>, Norbert Cselyuszka<sup>2</sup>, Nikolai Andrianov<sup>2</sup>, Ali Roshanghias<sup>2</sup>, Rafael Ecker<sup>1</sup>, Tina Mitterramskogler<sup>1</sup>, Thomas Voglhuber-Brunnmaier<sup>1</sup>, Mohssen Moridi<sup>2</sup>, and Bernhard Jakoby<sup>1</sup>  
<sup>1</sup>*Johannes Kepler University Linz, AUSTRIA* and <sup>2</sup>*Silicon Austria Labs, AUSTRIA*

### Flash Presentations

**12:00 IN-FLOW MEASUREMENT OF ACOUSTIC MOBILITY**



Thierry Baasch, Linda Péroux, Andreas Lenshof, and Thomas Laurell  
*Lund University, SWEDEN*

**12:05 CONSTANT VOLTAGE VERSUS CONSTANT POWER IN ACOUSTOFLUIDIC APPLICATIONS**

Fabian Lickert, Henrik Bruus, and Massimiliano Rossi  
*Technical University of Denmark, DENMARK*

**12:10 Lunch**



## Session 7

Session Chair: Jürg Dual, ETH Zürich, SWITZERLAND

### Invited Speaker 4

**13:10 EXPLOITING ACOUSTIC FIELD-MICROSWIMMER INTERACTIONS TO ACCELERATE ACOUSTOFLUIDIC DEVICE DEVELOPMENT**

Mark Meacham

*Washington University, St. Louis, USA*

### Contributed Talks

**13:30 ACOUSTIC MICROSTREAMING INDUCED BY A SUBSTRATE-ATTACHED ACOUSTIC MICROBUBBLE**

Claude Inserra<sup>1</sup>, Maxime Fauconnier<sup>1</sup>, Jean-Christophe Béra<sup>1</sup>, Cyril Mauger<sup>2</sup>, Alexander Doinikov<sup>2</sup>, and Philippe Blanc-Benon<sup>2</sup>

*<sup>1</sup>Université Claude Bernard Lyon, FRANCE and <sup>2</sup>Ecole Centrale de Lyon, FRANCE*

**13:40 LOOKING FOR THE MISSING MASS: INSIGHTS ON SURFACE-ACOUSTIC-WAVE-DRIVEN DROPLET CENTRIFUGING**

Shuren Song, Jia Zhou, and Antoine Riaud

*Fudan University, CHINA*

**13:50 ULTRAFAST ACOUSTOFLUIDIC HANDLING OF HUMAN BLOOD**

Md Ehtashamul Haque<sup>1</sup>, Alvaro Conde<sup>2</sup>, Harikumar Kuzhikkattu Chandrasekharan<sup>1</sup>, William N. MacPherson<sup>1</sup>, Stephen Knight<sup>3</sup>, Richard Carter<sup>1</sup>, and Maiwenn Kersaudy-Kerhoas<sup>1</sup>

*<sup>1</sup>Heriot-Watt University, UK, <sup>2</sup>Micronit B.V., NETHERLANDS, and <sup>3</sup>University of Edinburgh, UK*

**14:00 DICED MICROCHANNELS AND AUTOMATED DESIGN OPTIMIZATION: A PROMISING COMBINATION FOR AFFORDABLE NM-PARTICLE TRAPPING**

Michael Gerlt, Nicola Hagger, and Jürg Dual

*ETH Zürich, SWITZERLAND*

### Flash Presentations

**14:10 ACOUSTIC MOBILITY OF FLUORESCENT POLYSTYRENE PARTICLES**



Thierry Baasch, Alexander Edthofer, Andreas Lenshof, and Thomas Laurell  
*Lund University, SWEDEN*

**14:15 ACOUSTOFLUIDIC TWEEZER INSIDE CIRCULAR GLASS CAPILLARY USING TRAVELING SURFACE ACOUSTIC WAVES**



Qiaoyun Wang<sup>1,2</sup>, Jikai Zhang<sup>2</sup>, Hui Ling Ong<sup>2</sup>, and Yong-Qing (Richard) Fu<sup>2</sup>  
*<sup>1</sup>Northeastern University, CHINA and <sup>2</sup>Northumbria University, UK*

**14:20 Coffee Break**

## Session 8

Session Chair: Zhenhua Tian, Virginia Tech, USA

### Contributed Talks

- 14:50 SINGLE FOCUSED-BEAM ACOUSTICAL TWEEZERS**  
Zhixiong Gong<sup>1</sup> and Michael Baudoin<sup>1,2</sup>  
<sup>1</sup>*IEMN, FRANCE* and <sup>2</sup>*Institut Universitaire de France, FRANCE*
- 15:00 AMPLIFICATION OF SECONDARY BJERKNES FORCES USING MICROBUBBLE ARRAYS FOR PRECISE ACOUSTOFLUIDIC MANIPULATION**  
Rahul Goyal<sup>1</sup>, Athanasios G. Athanassiadis<sup>1,2</sup>, Zhichao Ma<sup>3</sup>, and Peer Fischer<sup>1,2</sup>  
<sup>1</sup>*Max Planck Institute for Medical Research, GERMANY*,  
<sup>2</sup>*Heidelberg University, GERMANY*, and <sup>3</sup>*Shanghai Jiao Tong University, CHINA*
- 15:10 OSAFT: A PYTHON LIBRARY FOR ACOUSTOFLUIDICS**  
Jonas Fankhauser, Christoph Goering, Merrill Gutzwiller, and Jürg Dual  
*ETH Zürich, SWITZERLAND*

### Keynote Speaker 4

- 15:20 ACOUSTIC CONTROL OF SORTING AND FLUID INJECTION IN MICROFLUIDIC DEVICES**  
David Weitz  
*Harvard University, USA*

### OSAFT (Open-Source Acoustofluidic Theory) Demo

- 16:05 Studio 2**  
Christoph Goering and Jonas Fankhauser  
*ETH Zürich, SWITZERLAND*

### Poster Session II, Exhibit Inspection, and Drinks Reception

- 16:05** Presentations are listed by topic category with their assigned number starting on page 13.
- 18:05** Adjourn for the Day

### Conference Banquet

- 19:30 – 21:30** Glasgow Union Dining Hall

# Friday, 21 October

All Times are British Summer Time

09:00 Announcements


## Session 9

Session Chair: Alen Pavlic, *ETH Zürich, SWITZERLAND*

### Contributed Talks

- 09:15 **ELECTRICAL IMPEDANCE SPECTROSCOPY FOR ACOUSTOFLUIDIC APPLICATIONS**  
William N. Bodé<sup>1</sup>, Fabian Lickert<sup>1</sup>, Per Augustsson<sup>2</sup>, and Henrik Bruus<sup>1</sup>  
<sup>1</sup>*Technical University of Denmark, DENMARK* and <sup>2</sup>*Lund University, SWEDEN*
- 09:25 **THERMOVISCOUS CORRECTIONS TO THE ACOUSTIC RADIATION FORCE ON A SPHERICAL PARTICLE INCLUDING SCATTERING AND MICROSTREAMING**  
Bjørn G. Winckelmann and Henrik Bruus  
*Technical University of Denmark, DENMARK*
- 09:35 **INTERFACIAL EVOLUTIONS AND PHASE CHANGES OF RIME ICE ACTIVATED BY THIN-FILM SURFACE ACOUSTIC WAVES**  
Deyu Yang<sup>1</sup>, Luke Haworth<sup>2</sup>, Xianghui Hou<sup>1</sup>, and Yong-Qing (Richard) Fu<sup>2</sup>  
<sup>1</sup>*University of Nottingham, UK* and <sup>2</sup>*Northumbria University, UK*
- 09:45 **ANALYSIS OF ACOUSTIC RELOCATION OF IMMISCIBLE FLUIDS IN A MICROCHANNEL**  
Varun Kumar Rajendran, Aravind Ram S P, and Karthick Subramani  
*Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram, INDIA*

### Flash Presentations

- 09:55 **MEASUREMENT OF THE ACOUSTICALLY INDUCED FLUID FLOW IN A 2DsSAW TWEezer AND ITS INFLUENCE ON SINGLE CELL PATTERNING**  
 Zhichao Deng<sup>1</sup>, Hagen Schmidt<sup>2</sup>, Christian Cierpka<sup>1</sup>, and Jörg König<sup>1</sup>  
<sup>1</sup>*Technische Universität Ilmenau, GERMANY* and <sup>2</sup>*SAWLab Saxony, GERMANY*
- 10:00 **FORMATION OF MICRON SIZED DROPS FROM LOW VISCOSITY LIQUID FILMS UNDER THE ACTION OF SURFACE ACOUSTIC WAVES**  
Niladri Sekhar Satpathi and Ashis Kumar Sen  
*Indian Institute of Technology, Madras, INDIA*
- 10:05 **Coffee Break**

## Session 10

Session Chair: Richard Fu, *Northumbria University, UK*

### Contributed Talks

- 10:35 SELF-INDUCED RADIATION FORCE ON A MOVING MONOPOLAR SOURCE**  
Michael Baudoin, Aymeric Roux, and Jean-Paul Martishang  
*University of Lille, FRANCE*
- 10:45 EFFECTS OF WETTABILITY IN RELOCATION OF COFLOWING IMMISCIBLE LIQUIDS EXPOSED TO BULK ACOUSTIC WAVE**  
Sazid Z. Hoque and Ashis K. Sen  
*Indian Institute of Technology, Madras, INDIA*
- 10:55 LIQUID LAYER EVOLUTION CHARACTERIZATION USING GHz ULTRASONIC PULSES: LINEAR AND NONLINEAR EFFECTS**  
Rohan Sanghvi, Justin Kuo, and Amit Lal  
*Cornell University, USA*
- 11:05 THERMOACOUSTIC STREAMING INDUCED BY ASYMMETRIC LASER HEATING**  
Franziska Martens, Wei Qiu, and Per Augustsson  
*Lund University, SWEDEN*
- 11:15 ACOUSTIC NEAR-RESONANCE MODES IN A CYLINDRICAL HALF-WAVELENGTH MICROCAVITY**  
Glauber T. Silva  
*Federal University of Alagoas, BRAZIL*
- 11:25 STABLE, OBSTRUCTION-FREE, AUDIBLE-FREQUENCY ACOUSTIC MICROSTREAMING BY A PINNED OSCILLATING MEMBRANE**  
Anthony Mercader and Sung Kwon Cho  
*University of Pittsburgh, USA*
- 11:35 Award Announcements**
- 11:55 Announcement of Acoustofluidics 2023**
- 12:00 Conference Adjourns**

# Poster Presentations

W – Wednesday, 19 October (16:10 - 18:10)

Th – Thursday, 20 October (16:05 - 18:05)

All Times are British Summer Time

## Applications - Biology

### WP-01 BIOMARKER PROTEIN CAPTURE AND ACOUSTO-MICROFLUIDIC SEPARATION USING FUNCTIONAL MICROPARTICLES

Song Ha Lee and Jinsoo Park  
*Chonnam National University, KOREA*

### WP-02 USING ACOUSTOFLUIDICS FOR CONTINUOUS PATTERNING OF CELLS WITHIN A HYDROGEL

Dhananjay V. Deshmukh, Peter Reichert, Joel Zvick, Céline Labouesse, Valentin Künzli, Oksana Dudaryeva, Ori Bar-Nur, Mark W. Tibbitt, and Jürg Dual  
*ETH Zürich, SWITZERLAND*

## Devices - Lab-on-a-Chip

### WP-03 MASS-PRODUCIBLE SAW CHIPS FOR BLOOD CELL SORTING

Melanie Colditz<sup>1</sup>, Armaghan Fakhfour<sup>1</sup>, Kateryna Ivanova<sup>1</sup>, Uhland Weißker<sup>1</sup>, Romy Kronstein-Wiedemann<sup>2</sup>, Stefanie Hartmann<sup>1</sup>, Raimund Brünig<sup>3</sup>, Torsten Tonn<sup>2</sup>, and Andreas Winkler<sup>1</sup>  
<sup>1</sup>*Leibniz Institute for Solid State and Materials Research Dresden, GERMANY*,  
<sup>2</sup>*DRK-Blutspendedienst Nord-Ost GmbH, GERMANY*, and  
<sup>3</sup>*Belektronik GmbH, GERMANY*

## Devices - Transducer Fabrication

### WP-04 A HOLISTIC SOLUTION TO ICING BY ACOUSTIC WAVES ON PIEZOELECTRIC PLATES

Jaime del Moral<sup>1</sup>, Laura Montes<sup>1</sup>, Victor J. Rico<sup>1</sup>, Carmen López-Santos<sup>1,2</sup>, Stefan Jacob<sup>3</sup>, Manuel Oliva<sup>1,2</sup>, Jorge Gil-Rostra<sup>1</sup>, Armaghan Fakhfour<sup>3</sup>, Shilpi Pandey<sup>3</sup>, Miguel Gonzalez del Val<sup>4</sup>, Julio Mora<sup>4</sup>, Paloma Garcia-Gallego<sup>4</sup>, Pablo F. Ibáñez-Ibáñez<sup>5</sup>, Miguel A. Rodríguez-Valverde<sup>5</sup>, Andreas Winkler<sup>3</sup>, Ana Borrás<sup>1</sup>, and Agustín R. González-Elipe<sup>1</sup>  
<sup>1</sup>*Materials Science Institute of Seville (CSIC-US), SPAIN*,  
<sup>2</sup>*Universidad de Sevilla, SPAIN*, <sup>3</sup>*Leibniz IFW Dresden, GERMANY*,  
<sup>4</sup>*INTA, SPAIN*, and <sup>5</sup>*Universidad de Granada, SPAIN*

### WP-05 FACILELY FABRICATED, FLEXIBLE ULTRASOUND SENSOR AS A NON-INVASIVE APPROACH FOR PULSE AND BLOOD PRESSURE MONITORING

Yuyang Li and Jia Zhang  
*Harbin Institute of Technology, CHINA*

## Manipulation, Transport and Control - Acoustic Manipulation

- WP-06 APPLICATION OF LIVING PROBES TO ASSESS SAW-BASED ACOUSTOFLUIDIC DEVICE PERFORMANCE**  
Advaith Narayan<sup>1</sup>, Mingyang Cui<sup>1,2</sup>, and J. Mark Meacham<sup>1</sup>  
<sup>1</sup>Washington University, Saint Louis, USA and  
<sup>2</sup>Massachusetts Institute of Technology, USA
- WP-07 DEFORMATION OF THALASSAEMIA MINOR AND MAJOR RED BLOOD CELLS INDUCED BY SURFACE ACOUSTIC WAVES**  
Mustafa Zaimagaoglu, Andreas Link, and Thomas Franke  
University of Glasgow, UK
- WP-08 GENERATION OF VARIOUS CELL PATTERNS WITH MILLIMETER SCALE WITH STANDING WAVES ON A LIQUID SURFACE**  
Kohei Morita and Takeshi Hayakawa  
Chuo University, JAPAN
- WP-09 SIZE-SELECTIVE SEPARATION AND ENRICHMENT OF NANO/MICROPARTICLES USING GHz ACOUSTIC STREAMING**  
Shen Sihong, Shen Xiaotian, and Duan Xuexin  
Tianjin University, CHINA

## Manipulation, Transport and Control - Droplets

- WP-10 ACOUSTIC STREAMING FLOW INDUCED IN-DROPLET CHEMICAL CONCENTRATION CONTROL OF PICOLITER SCALE DROPLET**  
Woohyuk Kim and Jinsoo Park  
Chonnam National University, KOREA
- WP-11 RAPID DROPLET MIXING USING STEREO ACOUSTOFLUIDIC VORTICES**  
Xiaotian Shen, Tiechuan Li, and Xuexin Duan  
Tianjin University, CHINA

## Manipulation, Transport and Control - Theory and/or Simulation

- WP-12 THE ANALYTICAL STUDY OF CELL COUNTING DEVICE BASED OF FOCUSED SURFACE ACOUSTIC WAVE**  
Yingqi Jiang and Weipeng Xuan  
Hangzhou Dianzi University, CHINA

## Physics - Acoustic Thermal Effects and Energy

- WP-13 STUDY OF THE ACOUSTOTHERMAL HEATING INSIDE A LIQUID DROPLET USING IR THERMOGRAPHY**  
Etien Martinez Roman, Diego Sánchez Saldaña, Maria Fernandino, and Carlos A. Dorao  
Norwegian University of Science and Technology (NTNU), NORWAY

## Physics - Theory and/or Simulation

### WP-14 NONLINEAR LARGE DEFORMATION OF A SPHERICAL RED BLOOD CELL INDUCED BY ULTRASONIC STANDING WAVE

Fengxian Xin and Yifan Liu  
*Xi'an Jiaotong University, CHINA*

## Applications - Biology

### ThP-15 MICROMIXER BASED ON GHz BULK ACOUSTIC WAVE FOR CONTROLLABLE LIPOSOME SYNTHESIS

Huihui Xu, Chen Wu, Zhaoxun Wang, and Xuexin Duan  
*Tianjin University, CHINA*

## Devices - Integrated System

### ThP-16 A MANIPULATION SYSTEM FOR PHASE-CONTROLLABLE ACOUSTOFLUIDIC MANIPULATIONS OF MICROPARTICLES

Hayato Yamaki, Natsumi Hirata, and Takeshi Hayakawa  
*Chuo University, JAPAN*

## Devices - Theory and/or Simulation

### ThP-17 PIEZOELECTRIC MICROMACHINED ULTRASOUND TRANSDUCERS (PMUTs) FOR ACOUSTIC POSITIONING OF SUSPENDED MICROTISSUES

Emilie Vuille-dit-Bille<sup>1,2</sup>, Dara Zaman Bayat<sup>1</sup>, Marc-Alexandre Dubois<sup>1</sup>, Thomas Overstolz<sup>1</sup>, Sarah Heub<sup>1</sup>, Michel Despont<sup>1</sup>, Mahmut Selman Sakar<sup>2</sup>, and Gilles Weder<sup>1</sup>  
<sup>1</sup>CSEM SA, SWITZERLAND and  
<sup>2</sup>École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

## Devices - Transducer Fabrication

### ThP-18 ADDED MASS CONTROLS: THE SEPARATION, ALIGNMENT AND INTENSITY OF NODES IN ACOUSTOFLUIDIC CAPILLARY BRIDGES

Jeremy J. Hawkes<sup>1</sup>, Sadaf Maramizonou<sup>2,3</sup>, Mohammad Rahmati<sup>2</sup>, Yong-Qing Fu<sup>2</sup>, and Stephen J. Wilkinson<sup>4</sup>  
<sup>1</sup>Acoustic machines Ltd., UK, <sup>2</sup>Northumbria University, UK,  
<sup>3</sup>Newcastle University, UK, and <sup>4</sup>University of Chester, UK

## Manipulation, Transport and Control - Acoustic Manipulation

### ThP-19 AN ACOUSTOFLUIDIC MICROMANIPULATION SYSTEM WITH AN OPEN MICROFLUIDIC CHIP

Natsumi Hirata and Takeshi Hayakawa  
*Chuo University, JAPAN*

### ThP-20 COUPLING ACOUSTOPHORESIS AND THERMOPHORESIS FOR ENRICHING NANOPARTICLES

Jing Dong<sup>1</sup>, Dongfang Liang<sup>1</sup>, and Xin Yang<sup>2</sup>  
<sup>1</sup>University of Cambridge, UK and <sup>2</sup>Cardiff University, UK

**ThP-21 DROPLET ACOUSTOFLUIDICS AND PICO-INJECTION FOR LONG-TERM CELL CULTURE**

Sagar Narhari Agnihotri<sup>1</sup>, Zhenhua Liu<sup>1</sup>, Laurent Barbe<sup>1</sup>,  
Anna Fornell<sup>2</sup>, and Maria Tenje<sup>1</sup>

<sup>1</sup>*Uppsala University, SWEDEN* and <sup>2</sup>*Lund University, SWEDEN*

**ThP-22 MANIPULATION OF MICRO-SIZE PARTICLE INDUCED BY FOCUSED HELICAL PROGRESSIVE WAVES**

Diego Sánchez Saldaña, Etien Martinez Roman, Maria Fernandino,  
and Carlos A. Dorao

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

**ThP-23 TRAP STABILITY UNDER ACOUSTIC LEVITATION - A NUMERICAL AND MACHINE LEARNING APPROACH**

Shirsendu Mitra and Ruchi Gupta

*University of Birmingham, UK*

**Manipulation, Transport and Control - Droplets**

**ThP-24 AN ACOUSTICALLY-ACTIVATED SUB-NANOLITER DROPLET GENERATION DEVICE AS INTERFACE PROTOTYPE TO MASS SPECTROMETER FOR PROTEIN DETECTION**

Giovanni Marinaro<sup>1,2</sup>, Axel Tojo<sup>1</sup>, Martin Bengtsson<sup>1</sup>,  
Takehiko Kitamori<sup>2</sup>, Thomas Laurell<sup>1</sup>, and Johan Nilsson<sup>1</sup>

<sup>1</sup>*Lund University, SWEDEN* and <sup>2</sup>*University of Tokyo, JAPAN*

**Manipulation, Transport and Control - Theory and/or Simulation**

**ThP-25 INFLUENCES OF ASPECT RATIO OF MICROCHANNEL ON SSAW-BASED ACOUSTOPHORESIS**

Yiming Li and Dongfang Liang

*University of Cambridge, UK*

**Physics - Acoustic Fields and Streaming**

**ThP-26 CHARACTERISING LOW FREQUENCY BULK-DRIVEN ACOUSTIC STREAMING IN AIR**

Christopher Stone, Bruce W. Drinkwater, Anthony Croxford,  
and Mahdi Azarpeyvand

*University of Bristol, UK*

**Physics - Acoustic Thermal Effects and Energy**

**ThP-27 THERMOACOUSTIC STREAMING IN A LINEAR TEMPERATURE GRADIENT FOR PERPENDICULAR AND PARALLEL ULTRASOUND FIELDS**

Enrico Corato<sup>1</sup>, Jonas Helboe Joergensen<sup>2</sup>, Ola Jakobsson<sup>1</sup>,  
Wei Qiu<sup>1</sup>, Henrik Bruus<sup>2</sup>, and Per Augustsson<sup>1</sup>

<sup>1</sup>*Lund University, SWEDEN* and <sup>2</sup>*Technical University of Denmark, DENMARK*



## Physics - Theory and/or Simulation

### ThP-28 SIMULATION OF SAW-BIOLOGICAL CELL INTERACTION FOR EXTRACT SHEAR STRESS ON OSTEOBLASTIC SaOs-2 BONE CELLS

D. Spencer, Bidouba Sanvany, Francic Kosior, Denis Beyssen, Aude Gigodot, Elisabeth Gaudion, and Frederic Sarry  
*Université de Lorraine, France*

## Open Poster

### ThP-29 ULTRASOUND-ENHANCED 3D CELL CULTURES IN A MULTI-CHAMBERED MICROWELL CHIP FOR ANTICANCER CYTOTOXICITY STUDIES

Martin Wiklund<sup>1</sup>, Niklas Sandström<sup>1</sup>, Valentina Carannante<sup>2</sup>, Karl Olofsson<sup>1</sup>, Patrick A. Sandoz<sup>1</sup>, Hanna Van Ooijen<sup>1</sup>, Quentin Verron<sup>1</sup>, Thomas Frisk<sup>1</sup>, and Björn Önfelt<sup>1,2</sup>  
<sup>1</sup>*KTH Royal Institute of Technology, SWEDEN* and  
<sup>2</sup>*Karolinska Institutet, SWEDEN*

## Abstract Only Presentations

### A FLEXIBLE PRINTED CIRCUIT BOARD BASED SAW DEVICE FOR EFFECTIVE CONCENTRATION OF MICRO-PARTICLES

Povilas Dumčius<sup>1</sup>, Roman Mikhaylov<sup>1</sup>, Xiaoyan Zhang<sup>1</sup>, Mercedes Stringer Martin<sup>1</sup>, Aled Clayton<sup>1</sup>, Chao Sun<sup>2</sup>, and Xin Yang<sup>1</sup>  
<sup>1</sup>*Cardiff University, UK* and <sup>2</sup>*Northwestern Polytechnical University, CHINA*

### ACOUSTOFLUIDIC-ASSISTED COLORIMETRIC ANALYSIS FOR POINT-OF-CARE TESTING

Liyang Zhang, Panpan Chen, and Shuhu Du  
*Nanjing Medical University, CHINA*

### DYNAMIC ULTRASOUND MANIPULATIONS IN AIR WITH A PERFORATED REFLECTOR

Xiaolong Lu<sup>1,2</sup>, Jens Twiefel<sup>3</sup>, Zhichao Ma<sup>2</sup>, and Peer Fischer<sup>2</sup>  
<sup>1</sup>*Nanjing University of Aeronautics and Astronautics, CHINA*, <sup>2</sup>*Max Planck Institute for Intelligent Systems, GERMANY*, and <sup>3</sup>*Leibniz Universität Hannover, GERMANY*

### EFFICIENT ACOUSTOFLUIDICS AND ACTIVE SURFACE CLEANING USING ZnO/GLASS THIN FILM ACOUSTIC WAVES

Hui Ling Ong, Jikai Zhang, Prashant Agrawal, Hamdi Torun, Kunyapat Thummavichai, Qiang Wu, and Yong-Qing (Richard) Fu  
*Northumbria University, UK*

### LOCALISED MECHANICAL CHARACTERISATION OF SMALL ORGANISMS ENABLED THROUGH MICROBUBBLE-BASED MANIPULATION

Nino F. Läubli<sup>1,2</sup>, Jan T. Burri<sup>1</sup>, Gabriele S. Kaminski Schierle<sup>2</sup>, Daniel Ahmed<sup>1</sup>, and Bradley J. Nelson<sup>1</sup>  
<sup>1</sup>*ETH Zürich, SWITZERLAND* and <sup>2</sup>*University of Cambridge, UK*