Final Program

All Times are Central Daylight Time (CDT).

Wednesday 16 August

All Times are Central Daylight Time (CDT).

08:50 **Welcome and Opening Remarks**
J. Mark Meacham, *Washington University in St. Louis, USA*
Glauber T. Silva, *Universidade Federal de Alagoas, BRAZIL*

Session 1 - Devices 1

Session Chair: Glauber T. Silva, *Universidade Federal de Alagoas, BRAZIL*

Keynote Speaker 1

09:00 **ACOUSTIC PATTERNING AND PRINTING OF FUNCTIONAL MATERIALS**
Matt Begley
University of California, Santa Barbara, USA

Contributed Talks

09:50 **HIGH-POWER BULK WAVE ACOUSTOFLUIDICS**
Enrico Corato[1], Ola Jakobsson[1], Wei Qiu[1], Takeshi Morita[2], and Per Augustsson[1]
[1]Lund University, SWEDEN and [2]University of Tokyo, JAPAN

10:05 **ACOUSTIC MANIPULATION OF PARTICLES IN MICROFLUIDIC CHIPS WITH AN ADAPTIVE CONTROLLER THAT MODELS ACOUSTIC FIELDS**
Kyriacos Yiannacou and Veikko Sariola
Tampere University, FINLAND

10:20 **FULLY MICROFABRICATED SURFACE ACOUSTIC WAVE TWEEZER FOR (SUB-) MICRON PARTICLE FOCUSING**
Armaghan Fakhfouri[1], Melanie Colditz[1], Citsabehsan Devendran[2], Stefan Jacob[3], Kateryna Ivanova[1], Adrian Neild[2], and Andreas Winkler[1]
[1]Leibniz IFW Dresden, GERMANY, [2]Monash University, AUSTRALIA, and [3]Physikalisch-Technische Bundesanstalt, GERMANY

10:35 **Coffee Break**

Session 2 - Biological and Biomedical Applications 1

Session Chair: Yuan Gao, *University of Memphis, USA*

Invited Speaker 1

11:00 **ACOUSTOFLUIDICS – FROM RESEARCH TOWARDS HEALTHCARE**
Mikael Evander
AcouSort AB, SWEDEN

Contributed Talks

11:30 **ACOUSTIC STREAMING-DRIVEN ADVECTION ENHANCEMENT OF ELISA SPEED AND SENSITIVITY**
Lei Zhang[1], Shuai Zhang[1], Cecile Floer[2], and James Friend[1]
[1]University of California, San Diego, USA and
[2]Universite de Lorraine-CNRS, FRANCE

11:45 **INTEGRATION OF A SILICON CHAMBER IN HYBRID ACOUSTIC WAVE DEVICES FOR PRECISE CELL PATTERNING AND CILIARY WAVEFORM ANALYSIS**
Mingyang Cui[1,2], Li Shan[3], and J. Mark Meacham[1]
[1]Washington University, St. Louis, USA, [2]Massachusetts Institute of Technology, USA, and [3]University of Texas, Dallas, USA

12:00 **RAMAN-ACOUSTOFLUIDICS SPECTROSCOPY FOR RED BLOOD CELL ANALYSIS**
Ueslen Rocha and Glauber Tomaz da Silva
Federal University of Alagoas, BRAZIL

12:15 **Lunch**

Session 3 - Physics: New Phenomena

Session Chair: Alen Pavlić, *Caltech, USA*

Invited Speaker 2

13:45 **RAPID IN-FLOW MEASUREMENT OF WHOLE CHANNEL ACOUSTIC ENERGY, QUALITY FACTOR, AND CELL PROPERTIES**
Thierry Baasch
Lund University, SWEDEN

Contributed Talks

14:15 **TRANSIENT BEHAVIOR AND ACOUSTIC STREAMING EFFECTS IN ACOUSTICALLY PACKED BLOOD**
Richard Soller, Ola Jakobsson, Wei Qiu, and Per Augustsson
Lund University, SWEDEN

14:30 **ACOUSTOFLUIDIC SHAPE-BASED SEPARATION OF MICROPARTICLES AND CELLS BY ACOUSTIC RADIATION FORCE AND TORQUE**
Muhammad S. Khan, Mushtaq Ali, and Jinsoo Park
Chonnam National University, KOREA

14:45 **ULTRASONIC SINGLE-BEAM MANIPULATION OF PARTICLES AND ORGANOIDS THROUGH A PETRI-DISH AND A PLASTIC TUBE USING AN ACOUSTIC FIELD LIVE-VISUALISATION METHOD**
Mario Ortega Sandoval, Krishna Coimbatore Balram, Luke Cox, Martha Lavelle, James Armstrong, and Bruce Drinkwater
University of Bristol, UK

15:00 **ELECTROMECHANICAL RESONANCE IN ELECTRICAL DOUBLE LAYERS DRIVEN BY MHZ-FREQUENCY SURFACE ACOUSTIC WAVE**
Sudeepthi Aremanda and Ofer Manor
Technion-Israel Institute of Technology, ISRAEL

15:15 **Coffee Break**

PANEL FOR JUNIOR RESEARCHERS

Moderators: Alen Pavlić, *Caltech, USA* (in-person) and
Dhananjay V. Deshmukh, *ETH Zürich, SWITZERLAND* (remote)

15:40 **WHERE CAN I GO FROM HERE?**

Mikael Evander, *AcouSort AB, SWEDEN*
James Friend, *University of California, San Diego*
Thomas Laurell, *Lund University, SWEDEN*
Maria Tenje, *Uppsala University, SWEDEN*

17:00 **Transition**

Reception

17:05 - 18:30 Join us for an informal reception in the Jubel Hall Gallery.

Thursday, 17 August

All Times are Central Daylight Time (CDT).

08:50 **Announcements**

Session 4 - Biological and Biomedical Applications 2

Session Chair: Maria Tenje, *Uppsala University, SWEDEN*

Keynote Speaker 2

09:00 **ULTRASONIC ELASTICITY IMAGING WITH ACOUSTIC RADIATION FORCE**
Kathryn Nightingale
Duke University, USA

Contributed Talks

09:50 **ACOUSTOPHORESIS ENRICHES TUMOR CELL CLUSTERS IN BLOOD OF PATIENTS WITH PROSTATE CANCER**
Cecilia Magnusson[1], Per Augustsson[1], Eva Undvall Anand[1], Andreas Lenshof[1], Andreas Josefsson[2,3], Karin Welén[2], Anders Bjartell[1], Yvonne Ceder[1], Hans Lilja[1,4], and Thomas Laurell[1]
[1]Lund University, SWEDEN, [2]Gothenburg University, SWEDEN, [3]Umeå University, SWEDEN, and [4]Memorial Sloan-Kettering Cancer Center, USA

10:05 **POROS GIGA: ACOUSTOFLUIDIC PLATFORM FOR CLINICAL-SCALE CELL ENGINEERING**
Mugdha Sinha[1,2], Mohammad Albuhssin[1,2], Jahir Islam[1], J. Mark Meacham[1,2], and Michael M. Binkley[1]
[1]OpenCell Technologies, Inc., USA and
[2]Washington University, Saint Louis, USA

10:20 **IMPROVING MICROTISSUE HISTOLOGY USING ACOUSTOFLUIDICS**
Dhananjay V. Deshmukh[1], Emilie Vuille-dit-Bille[2], Nicola Gerber[1], Christine Fux[1], Annina Eichenberger[1], Sarah Heub[2], Gilles Weder[2], Jurg Dual[1], and Mark W. Tibbitt[1]
[1]ETH Zürich, SWITZERLAND, [2]CSEM SA, and SWITZERLAND

10:35 **Coffee Break**

Session 5 - Physics: Acoustic Fields and Streaming

Session Chair: Zhenhua Tian, *Virginia Polytechnic Institute and State University, USA*

Contributed Talks

11:00 **DROPLET UPON A SUPERHYDROPHOBIC SURFACE FOR STUDYING FLUID INTERACTIONS WITH ACOUSTIC WAVES**
Kha Nguyen[1], Jeremy Orosco[1], Shuai Zhang[1], Antoine Pallois[2], Stefan Llewellyn Smith[1], and James Friend[1]
[1]University of California, San Diego, USA and [2]Ecole Polytechnique, FRANCE

11:15 **MICROSTREAMING INDUCED BY THE COMPLEX MOTION OF A MICRO-PILLAR**
Jules Ghesquiere, Michaël Baudoin, Olivier Bou Matar, and Sarah Cleve
Université de Lille, FRANCE

11:30 **ABOUT ALTERING EQUILIBRIUM POSITIONS OF PARTICLES TRAPPED IN AN ACOUSTIC TWEEZER BASED ON A 2DSSAW**
Jörg König[1], Zhichao Deng[1], Sebastian Sachs[1], Hagen Schmidt[2], and Christian Cierpka[1,3]
[1]TU Ilmenau, GERMANY, [2]IFW Dresden, GERMANY, and [3]Lund University, SWEDEN

11:45 **ACOUSTIC STREAMING IN THE FLUID OF THE INNER EAR**
Charles Thompson, Kavitha Chandra, and Adian Keefe
University of Massachusetts, USA

12:00 **UNIVERSAL INTERDIGITAL TRANSDUCER (IDT) FOR STABLE MULTI-PATTERNS AGGREGATION OF MICROPARTICLES IN A DROPLET**
Etien Martinez Roman, Bjørn M. Qvenild-Svennungsen, and Diego Sanchez Saldaña
Norwegian University of Science and Technology (NTNU), NORWAY

12:15 **Lunch**

Session 6 - Physics: Theory and Simulation

Session Chair: Nitesh Nama, *University of Nebraska, Lincoln, USA*

Keynote Speaker 3

13:30 **SIMULATING BUBBLES AND THEIR ROLE IN SHOCKWAVE AND ULTRASOUND THERAPIES**
Tim Colonius
California Institute of Technology, USA

Contributed Talks

14:20 **THEORY AND NUMERICAL STUDIES OF SHALLOW TRAVELLING-WAVE MICROPUMPS**
Søren A.S. Kuhberg and Henrik Bruus
Technical University of Denmark, DENMARK

14:35 **IMPACT OF ACOUSTIC SCATTERER ELASTICITY AND FREQUENCY ON ACOUSTOPHORESIS IN A STANDING WAVE FIELD**
Khemraj Gautam Kshetri, and Nitesh Nama
University of Nebraska, Lincoln, USA

14:50 **ACOUSTOKES: FRAMEWORK FOR MULTIBODY ACOUSTOPHORESIS SIMULATIONS INCLUDING ACOUSTICS, HYDRODYNAMICS AND CONTACTS**
Alen Pavlić[1,2], Wei Qiu[3], Jürg Dual[1], and Thierry Baasch[3]
[1]ETH Zürich, SWITZERLAND, [2]Caltech, USA, and [3]Lund University, SWEDEN

15:05 **Coffee Break**

Session 7 - Devices 2
Session Chair: Mingyang Cui, *Massachusetts Institute of Technology, USA*

Contributed Talks

15:30 **DESIGN OF BIMORPH TRANSDUCER FOR HIGH-THROUGHPUT GENE EDITING**
Mohammad M. Albuhssin[1,2], Mugdha Sinha[1,2], Jahir Islam[2], J. Mark Meacham[1], and Michael M. Binkley[1]
[1]OpenCell Technologies, Inc., USA and
[2]Washington University, Saint Louis, USA

15:45 **MICROSCALE CHARACTERIZATION OF A VERSATILE ULTRASONIC DROPLET GENERATOR**
Hongyu Bai[1], Li Shan[1,2], and J. Mark Meacham[1]
[1]Washington University, St. Louis, USA and [2]University of Texas, Dallas, USA

16:00 **INTEGRATED TRANSPARENT SURFACE ACOUSTIC WAVE TECHNOLOGY FOR ACTIVE DE-FOGGING AND ICING PROTECTION ON GLASS**
Hui Ling Ong, Luke Haworth, Jikai Zhang, Prashant Agrawal, Hamdi Torun, Qiang Wu, and Yong-Qing Fu
Northumbria University, UK

16:15 **DYNAMIC DROPLET IMPACT UNDER ACOUSTIC WAVES: SURFACE INCLINATION, HYDROPHOBIC COATINGS AND NON-NEWTONIAN LIQUIDS**
Luke Haworth[1], Mehdi Biroun[2], Prashant Agrawal[1], Hamdi Torun[1], Glen McHale[3], and Richard Fu[1]
[1]Northumbria University, UK, [2]University College London, UK, and
[3]University of Edinburgh, UK

16:30 Transition

W. Terence Coakley Poster Session
Holmes Lounge
17:00 – 18:30

P01 STRUCTURAL REORGANIZATION OF ACTIN FILAMENTS IN A CIRCULAR FLOW USING SURFACE ACOUSTIC WAVES
Donyoung Kang, Minseo Kim, and Hyungsuk Lee
Yonsei University, KOREA

P02 MICROSCALE CHARACTERIZATION OF A VERSATILE ULTRASONIC DROPLET GENERATOR
Hongyu Bai[1], Li Shan[1,2], and J. Mark Meacham[1]
[1]Washington University, St. Louis, USA and [2]University of Texas, Dallas, USA
(Presented in Session 7 - Devices 2)

P03 HIGH-POWER BULK WAVE ACOUSTOFLUIDICS
Enrico Corato[1], Ola Jakobsson[1], Wei Qiu[1], Takeshi Morita[2], and Per Augustsson[1]
[1]Lund University, SWEDEN and [2]University of Tokyo, JAPAN
(Presented in Session 1 - Devices 1)

P04 ACOUSTIC STREAMING-DRIVEN ADVECTION ENHANCEMENT OF ELISA SPEED AND SENSITIVITY
Lei Zhang[1], Shuai Zhang[1], Cecile Floer[2], and James Friend[1]
[1]University of California, San Diego, USA and
[2]Universite de Lorraine-CNRS, FRANCE
(Presented in Session 2 - Biological and Biomedical Applications 1)

P05 INTEGRATION OF A SILICON CHAMBER IN HYBRID ACOUSTIC WAVE DEVICES FOR PRECISE CELL PATTERNING AND CILIARY WAVEFORM ANALYSIS
Mingyang Cui[1,2], Li Shan[3], and J. Mark Meacham[1]
[1]Washington University, St. Louis, USA, [2]Massachusetts Institute of Technology, USA, and [3]University of Texas, Dallas, USA
(Presented in Session 2 - Biological and Biomedical Applications 1)

P06 TRANSIENT BEHAVIOR AND ACOUSTIC STREAMING EFFECTS IN ACOUSTICALLY PACKED BLOOD
Richard Soller, Ola Jakobsson, Wei Qiu, and Per Augustsson
Lund University, SWEDEN
(Presented in Session 3 - Physics: New Phenomena)

P07 ULTRASONIC SINGLE-BEAM MANIPULATION OF PARTICLES AND ORGANOIDS THROUGH A PETRI-DISH AND A PLASTIC TUBE USING AN ACOUSTIC FIELD LIVE-VISUALISATION METHOD
Mario Ortega Sandoval, Krishna Coimbatore Balram, Luke Cox, Martha Lavelle, James Armstrong, and Bruce Drinkwater
University of Bristol, UK
(Presented in Session 3 - Physics: New Phenomena)

P08 **POROS GIGA: ACOUSTOFLUIDIC PLATFORM FOR CLINICAL - SCALE CELL ENGINEERING**

Mugdha Sinha[1,2], Mohammad Albuhssin[1,2], Jahir Islam[1], J. Mark Meacham[1,2], and Michael M. Binkley[1]
[1]OpenCell Technologies, Inc., USA and
[2]Washington University, Saint Louis, USA
(Presented in Session 4 - Biological and Biomedical Applications 2)

P09 **ABOUT ALTERING EQUILIBRIUM POSITIONS OF PARTICLES TRAPPED IN AN ACOUSTIC TWEEZER BASED ON A 2DSSAW**

Jörg König[1], Zhichao Deng[1], Sebastian Sachs[1], Hagen Schmidt[2], and Christian Cierpka[1,3]
[1]TU Ilmenau, GERMANY, [2]IFW Dresden, GERMANY, and
[3]Lund University, SWEDEN
(Presented in Session 5 - Physics: Acoustic Fields and Streaming)

P10 **ACOUSTOFLUIDIC TRAPPING AND ANALYSIS OF MICROSWIMMERS**

Advaith Narayan[1], Mingyang Cui[2], and J. Mark Meacham[1]
[1]Washington University, St. Louis, USA and
[2]Massachusetts Institute of Technology, USA
(Presented in Session 8 - Manipulation and Control)

Banquet

18:30 - 20:30 **Holmes Lounge**

Friday, 18 August

All Times are Central Daylight Time (CDT).

08:50 **Announcements**

Session 8 - Manipulation and Control

Session Chair: Per Augustsson, *Lund University, SWEDEN*

Contributed Talks

09:00 **PIEZOELECTRIC PHONONIC CRYSTAL-BASED ACOUSTIC TWEEZERS**
Feiyan Cai[1], Jun Wang[1,2], Yongchuan Li[1], Ke Deng[2], Hairong Zheng[1]
[1]Shenzhen Institutes of Advanced Technology, CHINA and
[2]Jishou University, CHINA

09:15 **ACOUSTOFLUIDIC TRAPPING AND ANALYSIS OF MICROSWIMMERS**
Advaith Narayan[1], Mingyang Cui[2], and J. Mark Meacham[1]
[1]Washington University, St. Louis, USA and
[2]Massachusetts Institute of Technology, USA

09:30 **SELF-ASSEMBLY AND SELF-ORGANISATION IN ACOUSTIC LEVITATION**
Mauricio A. Hoyos, Jean-Luc Aider, and Jean-Michel Peyrin
National Center for Scientific Research (CNRS), FRANCE

09:45 **MAPPING THE ACOUSTIC PROPERTIES OF TWO-PHASE SYSTEMS FOR USE IN DROPLET ACOUSTOFLUIDICS**
Qian Shi, Zhenhua Liu, Anna Fornell, Gabriel Werr, Laurent Barbe, and Maria Tenje
Uppsala University, SWEDEN

10:00 **ACOUSTOFLUIDIC DROPLET SEPARATION USING TRAVELING SURFACE ACOUSTIC WAVE-INDUCED ACOUSTIC RADIATION FORCE**
Mushtaq Ali and Jinsoo Park
Chonnam National University, KOREA

10:15 **Coffee Break**

Session 9 - Biological and Biomedical Applications 3

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

Invited Speaker 3

10:40 **ULTRASOUND WITH MICROBUBBLE-MEDIATED AGENT TRANSPORT IN AND OUT OF THE BRAIN**
Hong Chen
Washington University, St. Louis, USA

Contributed Talks

11:10 **MEASUREMENT OF ACOUSTIC CONTRAST OF HEMATOPOIETIC STEM CELLS BY TRAJECTORY ANALYSIS**
Ryan Dubay[1], Jennifer L. Walker[1], Jayanth Dabbi[1], John Manis[2], and Jason Fiering[1]
[1]Draper, USA and [2]Harvard Medical School and Boston Children's Hospital, USA

11:25 **CAPILLARITY-VISCOSITY-DRIVEN TRAVELLING WAVES IN SUPERHYDROPHOBICITY-SUPPORTED SHALLOW GAS**
Maxime Fauconnier, Bhuvaneshwari Karunakaran, Alex Drago Gonzalez, William Wong, Robin Ras, and Heikki Nieminen
Aalto University, FINLAND

11:40 **Award Announcements**

12:05 **Announcement of Acoustofluidics 2024**

12:10 **Conference Adjourns**