



Acoustofluidics 2024

14-16 August 2024
Uppsala University, SWEDEN

Final Program

All Times are Central European Summer Time (CEST).

Wednesday 14 August

All Times are Central European Summer Time (CEST).

08:50 Welcome and Opening Remarks

Maria Tenje, *Uppsala University, SWEDEN* (Conference Chair)
Martin Wiklund, *KTH, SWEDEN* (Conference Co-Chair)

Session 1 – Applications of Acoustic Systems 1

Session Chair: Maria Tenje, Uppsala University, SWEDEN

Keynote Speaker 1

09:00 OPTICAL AND ACOUSTIC MANIPULATION FOR TOMOGRAPHIC IMAGING

Monika Ritsch-Marte
Medical University of Innsbruck, AUSTRIA

Contributed Talks

09:50 ACOUSTIC PIPETTE AND BIOFUNCTIONAL NEGATIVE ACOUSTIC CONTRAST MICROPARTICLE SYSTEM FOR RAPID PICOMOLAR-LEVEL BIOMOLECULE DETECTION IN WHOLE BLOOD

Cooper P. Thome¹, John P. Fowle¹, Parker McDonnell¹, Johanna Zultak¹,
Kaushik Jayaram¹, Aaron K. Neumann², Gabriel P. López³,
and C. Wyatt Shields IV¹

¹*University of Colorado Boulder, USA*, ²*University of New Mexico School of Medicine, USA*, and ³*University of New Mexico, USA*

10:05 ACOUSTOFLUIDIC BLOOD PLASMA SEPARATION FOR NEONATAL CARE

Amal Nath¹, Wei Qiu¹, Thierry Baasch¹, Andreas Lenshof¹, Marie Larsson²,
Linda Nilsson³, Magnus Gram³, David Ley³, and Thomas Laurell¹

¹*Lund University, SWEDEN*, ²*Hospitals of Halland, SWEDEN*, and
³*Skåne University Hospital, SWEDEN*

10:20 RAPID ACOUSTIC ISOLATION UNVEILS PROTEOME OF EXTRACELLULAR VESICLES FROM A MINUTE VOLUME OF HUMAN BLOOD PLASMA

Megan Havers¹, Aaron Scott¹, Niklas Ortenlöf¹, Marc Isaksson¹, Simon Ekström¹,
Charlotte Welinder¹, Thierry Baasch¹, Mikael Evander², Andreas Lenshof¹,
Magnus Gram¹, and Thomas Laurell¹

¹*Lund University, SWEDEN* and ²*AcouSort AB, SWEDEN*

10:35 Coffee Break

Session 2 – Applications of Acoustic Systems 2

Session Chair: Thomas Franke, University of Glasgow, UK

Invited Speaker 1 - Coakley Award Winner 2023

11:00 SYNERGISTIC EXPLORATION OF ACOUSTIC FIELD-MICROSWIMMER INTERACTIONS

Advaith Narayan

Washington University, St. Louis, USA

Contributed Talks

11:30 COMPRESSIBILITY-BASED POSITIVE ISOLATION OF BACTERIA FROM PLATELETS USING TILTED-ANGLE STANDING SURFACE ACOUSTIC WAVE

Song Ha Lee and Jinsoo Park

Chonnam National University, KOREA

11:45 ECHOGRID: HIGH-THROUGHPUT ACOUSTIC TRAPPING TOWARDS MICRO AND NANOPLASTIC MONITORING

Martim Costa¹, Björn Hammarström¹, Liselotte van der Geer¹, Selim Tanriverdi¹, Haakan Joensson¹, Martin Wiklund¹, and Aman Russom^{1,2}

¹*KTH Royal Institute of Technology, SWEDEN* and ²*AIMES - Karolinska Institute and KTH Royal Institute of Technology, SWEDEN*

12:00 REVERSING THE ACOUSTIC CONTRAST FACTOR BY TUNING THE MEDIUM CAN MAKE FOCUSED BEAMS TRAP CELLS IN THREE DIMENSIONS

Shiyu Li and Zhixiong Gong

Shanghai Jiao Tong University, CHINA

12:15 Lunch

Session 3 – Acoustic Manipulation

Session Chair: Martin Wiklund, Royal Institute of Technology (KTH), SWEDEN

Keynote Speaker 2

13:30 ADVANCING THE FRONTIERS OF ACOUSTIC MICRO-ACTUATORS

Michael Baudoin

University of Lille, FRANCE

Contributed Talks

14:20 SIMULTANEOUS FLUORESCENCE AND ABSORBANCE SIGNAL SORTING OF MICROFLUIDIC DROPLETS USING TRAVELING SURFACE ACOUSTIC WAVES (TSAW)

Esther S. Richter, Andreas Link, Raymond W. Sparrow, and Thomas Franke

University of Glasgow, UK

14:35 RELAXATION TO FROZEN MODE TRANSITION OF VISCOELASTIC FLUIDS UNDER ULTRASOUND: EFFECTS ON PARTICLE TRANSPORT
T Sujith, Lokesh Malik, and Ashis K. Sen
Indian Institute of Technology, Madras, INDIA

14:50 ACOUSTOFLUIDIC PLATFORMS FOR TOMOGRAPHY OF BIOLOGICAL SAMPLES BY ROTATIONAL MANIPULATION
Mia Kvåle Løvmo¹, Shiyu Deng², Simon Moser¹, Franziska Strasser¹, Wolfgang Drexler², and Monika Ritsch-Marte¹
¹*Medical University of Innsbruck, AUSTRIA and*
²*Medical University of Vienna, AUSTRIA*

15:05 Coffee Break

Young Acoustofluidics Scientists' Network Event

15:45 Panel Discussion on Research Funding in Different Parts of the World

Sia Gosheva-Oney, Grants Office, ETH Zurich, SWITZERLAND
Bruce Drinkwater, University of Bristol, UK
NN, National Science Foundation (NSF), USA

17:00 Joint walk from the Ångström Lab to the University Main Building (~30 min)

Welcome Reception

18:00-19:00 Welcome Reception and Guided Tour in the University Main Building

Thursday, 15 August

All Times are Central European Summer Time (CEST).

08:50 Announcements

Session 4 - Physics of Acoustic Systems

Session Chair: Per Augustsson, Lund University, SWEDEN

Keynote Speaker 3

09:00 **THE PARTICLE SIZE-EFFECT IN OPTICAL AND ACOUSTIC TRAPS**

Karen P. Volke

National Autonomous University of Mexico, MEXICO

Contributed Talks

09:50 **INFLUENCE OF DIELECTROPHORESIS ON SPHERICAL AND NON-SPHERICAL PARTICLES IN A STANDING SURFACE ACOUSTIC WAVE FIELD**

Sebastian Sachs, Christian Cierpka, and Jörg König

Technische Universität Ilmenau, GERMANY

10:05 **NEAR-FIELD ACOUSTIC RESONANCE EFFECTS AND CAVITATION IN SAW AEROSOL GENERATION**

Mehrzad Roudini¹, Juan Manue. Rosselló², Ofer Manor³, Claus-Dieter Ohl², and Andreas Winkler¹

¹*Leibniz Institute for Solid State and Materials Research Dresden, GERMANY,*

²*Otto-von-Guericke University Magdeburg, GERMANY, and*

³*Technion - Israel Institute of Technology, ISRAEL*

10:20 **SUPERHYDROPHOBIC COATING ACTS AS A SHIELD AGAINST ULTRASOUND-INDUCED HEATING**

Alex Drago-González, Maxime Fauconnier, Bhuvaneshwari Karunakaran, Laura Fieber, William S. Y. Wong, Robin H. A. Ras, and Heikki J. Nieminen
Aalto University, FINLAND

10:35 Coffee Break

Session 5 - Acoustic Streaming

Session Chair: Andreas Winkler, IFW Dresden, GERMANY

Invited Speaker 2

11:00 **ACOUSTIC STREAMING**

James Friend

University of California, San Diego, USA

Contributed Talks

- 11:30 ACOUSTIC MICROSTREAMING AROUND ASYMMETRIC BUBBLES**
Claude Inserra¹, Cyril Mauger², Philippe Blanc-Benon²,
and Alexander A. Doinikov²
¹Université Lyon ¹, FRANCE and ²Ecole Centrale Lyon, FRANCE
- 11:45 VESICLE-BASED DRUG LOADING AND INTRACELLULAR DELIVERY BY GIGAHERTZ ACOUSTIC STREAMING**
Haopu Wang, Shuailong Zhang, Huikai Xie, and Yao Lu
Beijing Institute of Technology, CHINA
- 12:00 ADVANCING SIZE-SELECTIVE PARTICLE SEPARATION: ULTRASONIC MICROBUBBLE STREAMING FOR AUTOMATED DEPLETION**
Amirabas Bakhtiari and Christian J. Kähler
Bundeswehr University Munich, GERMANY
- 12:15 Lunch**

Session 6 - Physics: Two-Phase Acoustofluidics

Session Chair: Jinsoo Park, Chonnam National University, KOREA

Contributed Talks

- 13:30 NUMERICAL SIMULATION OF BULK ACOUSTIC WAVES INDUCED DROPLET GENERATION IN AN IMMISCIBLE COFLOW SYSTEM**
Sazid Z. Hoque^{1,2} and Ashis K. Sen¹
¹Indian Institute of Technology, Madras, INDIA and ²Technical University of Denmark, DENMARK
- 13:45 NUMERICAL STUDY OF ACOUSTIC STREAMING IN SPHERICAL DROPLETS SUSPENDED IN UNCONFINED MEDIA**
Pradipta Kr. Das¹, Carl D. Meinhart², and Maria Tenje¹
¹Uppsala University, SWEDEN and ²University of California, Santa Barbara, USA
- 14:00 DROPLET DYNAMICS BEYOND THE RAYLEIGH LIMIT UNDER ACOUSTIC-GRAVITY FORCES: A ROUTE TO EXTRACT SPECIFIC DROPLET SIZES FROM A BROAD RANGE**
Jeyapradhap Thirisangu and Karthick S
Indian Institute of Information Technology, Design & Manufacturing, INDIA
- 14:15 Coffee Break**

W. Terence Coakley Poster Session

14:30 - 17:30

- P01 ACOUSTIC-DRIVEN LIQUID ATOMIZATION FOR NANOSATELLITE MANEUVERING**
Amihai Horesh¹, William Connacher², and James Friend²
¹Agriculture Research Organizing, ISRAEL and ²University of California, USA
- P02 ACOUSTICALLY LEVITATED DROPLETS FOR CHEMICAL REACTIONS AND BIOASSAYS**
Ruchi Gupta¹ and Nicholas J. Goddard²
¹University of Birmingham, UK and ²Process Instruments, UK
- P03 ACOUSTOFLUIDIC SORTING OF RED BLOOD CELLS USING REAL-TIME MACHINE VISION**
Raj Kumar Rajaram Baskaran, Andreas Link, and Thomas Franke
University of Glasgow, UK
- P04 ACOUSTOFLUIDIC CHARACTERIZATION OF THE EFFECT OF STAINING ON CELL PROPERTIES**
Qing Wang, Andreas Lenshof, Alexander Edthofer, Thierry Baasch, Thomas Laurell, and Wei Qiu
Lund University, SWEDEN
- P05 ANALYTICAL SOLUTION OF SOURCE TERM FOR BULK ACOUSTIC STREAMING WITH NONLINEAR PROPAGATION**
Shiyu Li¹, Weiwei Cui², Thierry Baasch³, Bin Wang^{1,4}, and Zhixiong Gong^{1,4}
¹Shanghai Jiao Tong University, CHINA, ²Tianjin University, CHINA, ³Lund University, SWEDEN, and ⁴Key Laboratory of Marine Intelligent Equipment and System, CHINA
- P06 COMPUTATIONAL OPTIMIZATION OF ACOUSTOFLUIDIC DEVICES**
Kirill Kolesnik¹, Vijay Rajagopal^{1,2}, and David J. Collins^{1,2}
¹University of Melbourne, AUSTRALIA, and ²Graeme Clark Institute, AUSTRALIA
- P07 CONCEPT OF ACOUSTIC BUOYANCY**
Andreas Fuchsluger¹, Annalisa De Pastina², Tina Mitterramskogler¹, and Bernhard Jakoby¹
¹Johannes Kepler University Linz, AUSTRIA and ²Silicon Austria Labs, AUSTRIA
- P08 DESIGN OPTIMIZATION OF ACOUSTIC CAVITY TRAPS FOR EFFECTIVE MICROPARTICLE TRAPPING**
Pradipta Kr. Das, Gabriel Werr, and Maria Tenje
Uppsala University, SWEDEN

- P09 ELECTROKINETIC INTERACTIONS BETWEEN SURFACE ACOUSTIC WAVES AND ELECTROLYTE SOLUTIONS**
Yifan Li, Sudeepthi Aremanda, Oles Dubrovski, and Ofer Manor
Technion - Israel Institute of Technology, ISRAEL
- P10 ELECTRONICS FOR ACOUSTOFLUIDIC ACTUATORS, VERSATILE VS SPECIFIC**
Raimund Bruenig¹, Melanie Colditz², and Andreas Winkler²
¹BelektroniG GmbH, GERMANY and ²IFW Dresden, GERMANY
- P11 ELUCIDATING FLUID MIXING IN AN ACOUSTIC BIOREACTOR WITH APPLICATION TO YEAST GROWTH**
Gabriel Dumy¹, Thomas Chomette², Marin Virey¹, Siriny Laumier¹, and Florian Dittmann¹
¹KOLIBRI, FRANCE and ²ESPCI Paris, FRANCE
- P12 ENRICHMENT OF PROTEIN CRYSTALS IN SERIAL CRYSTALLOGRAPHY USING FLOW CONTROL**
Varun Kumar Rajendran, Björn Hammarström, Martin Vikulnd, and Jonas Sellberg
KTH Royal Institute of Technology, SWEDEN
- P13 EQUILIBRIUM POSITION STABILIZATION OF MULTIMODAL PARTICLE MANIPULATION WITH REINFORCED LEARNING**
Alexander Edthofer, Thomas Laurell, and Thierry Baasch
Lund University, SWEDEN
- P14 EXPERIMENTAL DEMONSTRATION OF LONG-RANGE ACOUSTIC PULLING USING MODE CONVERSION IN WAVEGUIDE**
Feiyan Cai¹, Yanlong Guo², Degang Zhao², and Hairong Zheng¹
¹Shenzhen Institutes of Advanced Technology, CHINA and ²Huazhong University of Science and Technology, CHINA
- P15 FOCUSED ULTRASOUND INDUCED FLUID FLOW IN A SILICON CAPILLARY DETERMINED VIA MICRO-PIV TREATMENT**
Elisa Ghiringhelli, Carine Guivier-Curien, Philippe Lasaygues, and Cécile Baron
Aix-Marseille Université, CNRS, FRANCE
- P16 GENTLE BLOOD PLASMA SEPARATION WITH SURFACE ACOUSTIC WAVE-BASED MICROFLUIDICS**
Melanie Colditz¹, Armaghan Fakhfour¹, Romy Kronstein-Wiedemann², Kateryna Ivanova¹, Torsten Tonn², and Andreas Winkler¹
¹Leibniz-IFW Dresden, GERMANY and ²TU Dresden/ DRK-Blutspendedienst Nord-Ost GmbH, GERMANY
- P17 HIGH THROUGHPUT ACOUSTIC CELL WASHING AND CONCENTRATION FOR CAR T CELL THERAPY**
Anke Urbansky, Karl Westerlund, Raghuraman Srinivasan, Erik Karlsson, Cecilia Magnusson, Erling Nielsen, Julia Alsved, Jessica Congiu, Magnus Hivert, and Pelle Ohlsson
AcouSort AB, SWEDEN

- P18 IDENTIFYING TEMPERATURE GRADIENTS INSIDE ACOUSTOFLUIDIC CHANNELS**
Gabriel Werr, Pradipta Kr Das, Zahra Khaji, and Maria Tenje
Uppsala University, SWEDEN
- P19 INCREASED THROUGHPUT AND CAPACITY OF NM-PARTICLE TRAPPING USING AN ULTRASOUND ACTIVATED PACKED BED**
Michael Gerlt, Ted Bondesson, and Thomas Laurell
Lund University, SWEDEN
- P20 INVESTIGATION OF ACOUSTIC WAVE ATTENUATION IN POLYDIMETHYLSILOXANE FOR ACOUSTOFLUIDIC APPLICATIONS**
Jeongeun Park¹, Beomseok Cha¹, Furkan Ginaz Almus², Mehmet Akif Sahin², Ghulam Destgeer², and Jinsoo Park¹
¹*Chonnam National University, KOREA, and*
²*Technical University of Munich, GERMANY*
- P21 MODES THAT FORM SEVEN TYPES OF NODE**
Jeremy J. Hawkes¹, Sadaf Maramizonouz², and Richard Yongqing Fu³
¹*Acoustic Machines Ltd, UK,* ²*Newcastle University, UK, and*
³*Northumbria University, UK*
- P22 MULTI-FREQUENCY ULTRASONIC ATOMIZATION DRIVEN BY BENDING MODE USING A PARABOLIC REFLECTOR**
Weiquan Wang¹, Chikahiro Imashiro¹, Hiroshi Hasegawa², Kohsuke Hirano², and Takeshi Morita¹
¹*University of Tokyo, JAPAN and* ²*Kaijo Corporation, JAPAN*
- P23 MULTICHANNEL ACOUSTOFLUIDIC SEPARATOR FOR HIGH-THROUGHPUT MULTIPLEXED BIOMOLECULE DETECTION ON BIOFUNCTIONAL ELASTOMERIC PARTICLES**
Cooper P. Thome, Creighton T. Tisdale, and C. Wyatt Shields IV
University of Colorado Boulder, USA
- P24 ON THE EVOLUTION OF A NEUTRAL CONFIGURATION OF INHOMOGENEOUS FLUIDS UNDER ACOUSTIC FIELDS**
Sujith Jayakumar¹, Videsh Vk¹, Jeyapradhap T¹, Hemachandran E², and Karthick Subramani¹
¹*Indian Institute of Information Technology, Design and Manufacturing, INDIA, and* ²*National Institute of Advanced Manufacturing Technology, Ranchi, INDIA*
- P25 ON THE FABRICATION OF A SAW-BASED MICROFLUIDIC DEVICE WITH RAISED ACOUSTIC ENERGY DENSITY AND TAILORED ACOUSTIC PRESSURE FIELD USING DRY FILM RESIST**
Sebastian Sachs, David Schreier, Jörg König, and Christian Cierpka
Technische Universität Ilmenau, GERMANY
- P26 OPTIMIZING TRANSDUCER CONFIGURATIONS FOR 2D ACOUSTIC FOCUSING**
Tuva Eriksson Viklund, Varun Kumar Rajendran, Martin Wiklund, Jonas Sellberg, and Björn Hammarström
KTH Royal Institute of Technology, SWEDEN

- P28** **PARTICLE RADIATION AND ACOUSTIC MIXING IN A CNC MILLED ALUMINUM-BASED DEVICE**
Amaury de Hemptinne, Pierre Gelin, Vyacheslav R. Misko, and Wim De Malsche
Vrije Universiteit Brussel, BELGIUM
- P29** **PRESSURE CONTROLLED VARIABLE VOLUME ULTRASONIC BIOREACTOR FOR BIOPRODUCTION APPLICATIONS**
Gabriel Dumy, Marin Virey, Siriny Laumier, Florian Dittmann, Noémie Cavanna, and Mathilde Maëstrali
KOLIBRI, FRANCE
- P31** **SMART MICROACOUSTIC SETUP FOR AUTOMATED ICE SENSING AND DEICING USING SURFACE ACOUSTIC WAVES**
Kiana Khodakarami¹, Stefan Jacob², Atefeh Karmizadeh¹, Uhland Weissker¹, Shilpi Pandey¹, Jaime Del Moral³, Jorge Gil-Rostra³, Ana Borrás³, Agustin R. González-Elipé³, and Andreas Winkler¹
¹*Leibniz Institute for Solid State and Materials Research, GERMANY,*
²*Physikalisch-Technische Bundesanstalt, GERMANY, and*
³*Consejo Superior de Investigaciones Científicas, SPAIN*
- P33** **STUDY OF SAW FIELD NONUNIFORMITY FOR OPTIMIZATION OF SAW BASED ACOUSTIC STREAMING MICROPUMP**
Chen Wu^{1,2}, Grim Keulemans², Benjamin Jones², Veronique Rochus², Xavier Rottenberg², and Paul Heremans^{1,2}
¹*KU Leuven, BELGIUM and* ²*Imec, BELGIUM*
- P34** **THE EFFECT OF SPEED OF SOUND MISMATCH ON ACOUSTOPHORETIC FOCUSING QUALITY WITHIN DROPLETS**
Qian Shi¹, Thierry Baasch², Zhenhua Liu¹, Anna Fornell¹, Gabriel Werr¹, Laurent Barbe¹, and Maria Tenje¹
¹*Uppsala University, SWEDEN and* ²*Lund University, SWEDEN*
- P35** **THE IN-FLOW MOBILITY RATIO METHOD ENABLES OPTIMIZING ACOUSTOPHORESIS SEPARATION QUALITY**
Thierry Baasch, Alexander Edthofer, Linda Péroux, Olivia Rengbrandt, Lovisa Silversand, Andreas Lenshof, and Thomas Laurell
Lund University, SWEDEN
- P36** **TOWARDS LOVE WAVE-BASED IN-SITU MEASUREMENT OF ICE LAYER THICKNESS ON WIND TURBINE ROTOR BLADES**
Philipp Schulmeyer and Hagen Schmidt
Leibniz Institute for Solid State and Materials Research Dresden, GERMANY
- P37** **TRANSIENT BUILDUP AND DECAY OF THERMOACOUSTIC STREAMING**
Franziska Martens, Wei Qiu, Ola Jakobsson, and Per Augustsson
Lund University, SWEDEN
- P38** **TRANSIENT MODEL OF THE OPTO-ACOUSTOPHORETIC EFFECT USING SEPERATION OF TIMESCALES**
Jonas H. Jørgensen
Comsol A/S, DENMARK

- P39 TWO-STEP ACOUSTOFLUIDIC CANCER CELL ENRICHMENT**
Cecilia Magnusson, Mahdi Rezyati Charan, and Per Augustsson
Lund University, SWEDEN
- P40 ULTRASONIC ATOMIZATION IN A SUPERHYDROPHOBIC MICROCHANNEL'S PLASTRON.**
Maxime Fauconnier, Bhuvaneshwari Karunakaran, Alex Drago-González, Laura Fieber, William S.Y. Wong, Robin H.A. Ras, and Heikki J. Nieminen
Aalto University, FINLAND
- P41 VOLUMETRIC TEMPERATURE MEASUREMENT IN A MICRO CHANNEL SUBJECTED BY A STANDING SURFACE ACOUSTIC WAVE**
Jörg König and Christian Cierpka
Technische Universität Ilmenau, GERMANY
- P42 ARRAY OF PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS (PMUTS) FOR THE ACOUSTOFLUIDIC MANIPULATION OF PARTICLES AND SPHEROIDS**
Emilie Vuille-dit-Bille^{1,2}, Sarah Heub¹, Dara Z. Bayat¹, Marc-Alexandre Dubois¹, Thomas Overstolz¹, Gilles Weder¹, Michel Despont¹, and Selman Sakar²
¹CSEM SA, SWITZERLAND, and ²EPFL, SWITZERLAND
(Presented in Session 8 – Devices)
- P43 BLOOD CELL FOCUSING IN SIMULATION OPTIMIZED MOLDED POLYMER ACOUSTOPHORESIS CHIP**
Mathias Ohlin¹, Fabian Lickert², Sazid Zamal Hoque², Anke Urbansky¹, Mikael Evander¹, Agnes Michanek¹, Magnus Hivert¹, Henrik Bruus², and Pelle Ohlsson¹
¹AcouSort AB, SWEDEN and
²Technical University of Denmark (DTU), DENMARK
(Presented in Session 8 – Devices)
- P45 ECHOGRID: HIGH-THROUGHPUT ACOUSTIC TRAPPING TOWARDS MICRO AND NANOPLASTIC MONITORING**
Martim Costa¹, Björn Hammarström¹, Liselotte van der Geer¹, Selim Tanriverdi¹, Haakan Joensson¹, Martin Wiklund¹, and Aman Russom^{1,2}
¹KTH Royal Institute of Technology, SWEDEN and ²AIMES - Karolinska Institute and KTH Royal Institute of Technology, SWEDEN
(Presented in Session 2 - Applications of Acoustic Systems 2)
- P46 LOCALIZED BULK ACOUSTIC TRAPS USING MILLED ALUMINUM DEVICES**
Saumitra Joshi, Dhananjay V. Deshmukh, and Mark W. Tibbitt
ETH Zurich, SWITZERLAND
(Presented in Session 8 – Devices)

- P47 RAPID ACOUSTIC ISOLATION UNVEILS PROTEOME OF EXTRACELLULAR VESICLES FROM A MINUTE VOLUME OF HUMAN BLOOD PLASMA**
Megan Havers¹, Aaron Scott¹, Niklas Ortenlöf¹, Marc Isaksson¹, Simon Ekström¹, Charlotte Welinder¹, Thierry Baasch¹, Mikael Evander², Andreas Lenshof¹, Magnus Gram¹, and Thomas Laurell¹
¹Lund University, SWEDEN and ²AcouSort AB, SWEDEN
(Presented in Session 1 - Applications of Acoustic Systems 1)
- P48 VESICLE-BASED DRUG LOADING AND INTRACELLULAR DELIVERY BY GIGAHERTZ ACOUSTIC STREAMING**
Haopu Wang, Shuailong Zhang, Huikai Xie, and Yao Lu
Beijing Institute of Technology, CHINA
(Presented in Session 5 - Acoustic Streaming)
- P49 ACOUSTOFLUIDIC BLOOD PLASMA SEPARATION FOR NEONATAL CARE**
Amal Nath¹, Wei Qiu¹, Thierry Baasch¹, Andreas Lenshof¹, Marie Larsson², Linda Nilsson³, Magnus Gram³, David Ley³, and Thomas Laurell¹
¹Lund University, SWEDEN, ²Hospitals of Halland, SWEDEN, and ³Skåne University Hospital, SWEDEN
- P50 NUMERICAL STUDY OF ACOUSTIC STREAMING IN SPHERICAL DROPLETS SUSPENDED IN UNCONFINED MEDIA**
Pradipta Kr. Das¹, Carl D. Meinhart², and Maria Tenje¹
¹Uppsala University, SWEDEN and ²University of California, Santa Barbara, USA

Acoustofluidics Olympics

House 10, First Floor, Room 101136

14:30 - 17:30

THE ECHOGRID – THE WORLD’S FASTEST MICROPLASTIC ENRICHMENT DEVICE!

Martim Costa

KTH, SWEDEN

We will demonstrate the EchoGrid, which is an acoustofluidic chip used for upconcentrating microplastics from dilute liquid samples. The chip is based on a surface displacement transducer combined with a PDMS flow chamber, and utilizes silica seed particles for trapping and enriching microplastics at relatively high flow rates. The device has recently been described in this publication: M. Costa et al., *Anal. Chem.* 2024, 96, 23, 9493–9502 (<https://doi.org/10.1021/acs.analchem.4c00933>).

A FRUGAL, SELF-SUSTAINING ACOUSTOFLUIDICS BIOREACTOR DEMONSTRATOR

Gabriel Dumy

KOLIBRI, FRANCE

This is a much simplified version of our bioreactor that was made for education purposes, but that exhibit how the acoustofluidics methods that are exploited in a conference such as ours can be efficiently implemented with quite few material and devices. For less than 400€, this small bioreactor system generates a complete culture column, that can shift its position in space, in accordance to the temperature and constrains imposed to the system. Real time control is achieved on said position, and the fluid cavity (about 30mL) is projected on a large screen.

NM-PARTICLE TRAPPING IN A PACKED BED

Michael Gerlt

Lund University, SWEDEN

We demonstrate trapping of 270 nm fluorescent particles in a capillary filled with 100 µm polystyrene particles. The setup consists of syringe pumps, the trapping device and a dynolite camera for fluorescence analysis.

3 NODE TYPES IN DIFFERENT CHANNELS ON ONE MICROSCOPE SLIDE

Jeremy Hawkes

Acoustic Machines, UK

Liquids in capillary bridge channels run in parallel on a microscope slide. The channel depths range from 0.15 mm to 1 mm and particles simultaneously move to the nodes in each liquid bridge. Different node patterns form at each channel depth. The nodes are produced by resonances in: 1) the top film, 2) the liquid and 3) the glass. The nodes from each resonant source appear independently and separated by the channel depth because at each depth a resonance from only one origin dominates.

Board Meeting of the Acoustofluidics Society (open to all)

House 10, First Floor, Room 101132

16:00 - 17:00

Banquet

18:30 - Norrlands Nation

Late

Norrland's Nation, Västra Ågatan 14, 753 09 Uppsala

No conference is complete without a banquet. Join us on Thursday evening at Norrland's Nation for a delicious meal and a chance to network with colleagues. Norrland's Nation is centrally located by the riverbanks of Fyrisån, a 30-minute walk or a 15-minute bus ride from the Ångström Laboratory.



Friday, 16 August

All Times are Central European Summer Time (CEST).

08:50 Announcements

Session 7 – Applications of Acoustic Systems 3

Session Chair: Thomas Laurell, Lund University, SWEDEN

Keynote Speaker 4

09:00 THE EMERGING CONFLUENCE OF ACOUSTIC MICROMANIPULATION, ACOUSTIC HOLOGRAPHY AND 3D PRINTING

David Collins

University of Melbourne, AUSTRALIA

Contributed Talks

09:50 MICRO-MANIPULATION OF MISCIBLE FLUIDS WITH ACOUSTIC TWEEZERS

Samir Almohamad¹, Gustav K. Modler², Ravinder Chutani¹, Udit Gosh¹, Sarah Cleve¹, Henrik Bruus², and Michael Baudoin¹

¹Université de Lille, FRANCE and ²Technical University of Denmark, DENMARK

10:05 APPLICATIONS OF HIGH-POWER BULK WAVE ACOUSTOFLUIDICS

Enrico Corato, Wei Qiu, and Per Augustsson

Lund University, SWEDEN

10:20 HIGH-POWER BULK-WAVE-ACOUSTOPHORESIS DEVICES UTILIZING AN ELLIPTICAL REFLECTOR FOCUSING TRANSDUCER

Zhirui Chen¹, Chikahiro Imashiro¹, Wei Qiu², and Takeshi Morita¹

¹University of Tokyo, JAPAN and ²Lund University, SWEDEN

10:35 Coffee Break

Session 8 – Devices

Session Chair: Martyn Hill, University of Southampton, UK

Contributed Talks

11:00 BLOOD CELL FOCUSING IN SIMULATION OPTIMIZED MOLDED POLYMER ACOUSTOPHORESIS CHIP

Mathias Ohlin¹, Fabian Lickert², Sazid Zamal Hoque², Anke Urbansky¹, Mikael Evander¹, Agnes Michanek¹, Magnus Hivert¹, Henrik Bruus², and Pelle Ohlsson¹

¹AcouSort AB, SWEDEN and

²Technical University of Denmark (DTU), DENMARK

- 11:15 LOCALIZED BULK ACOUSTIC TRAPS USING MILLED ALUMINUM DEVICES**
Saumitra Joshi, Dhananjay V. Deshmukh, and Mark W. Tibbitt
ETH Zurich, SWITZERLAND
- 11:30 ARRAY OF PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS (PMUTS) FOR THE ACOUSTOFLUIDIC MANIPULATION OF PARTICLES AND SPHEROIDS**
Emilie Vuille-dit-Bille^{1,2}, Sarah Heub¹, Dara Z. Bayat¹, Marc-Alexandre Dubois¹, Thomas Overstolz¹, Gilles Weder¹, Michel Despont¹, and Selman Sakar²
¹CSEM SA, SWITZERLAND, and ²EPFL, SWITZERLAND
- 11:45 Award Announcements**
- 12:00 Announcement of Acoustofluidics 2025**
- 12:15 Conference Adjourns**