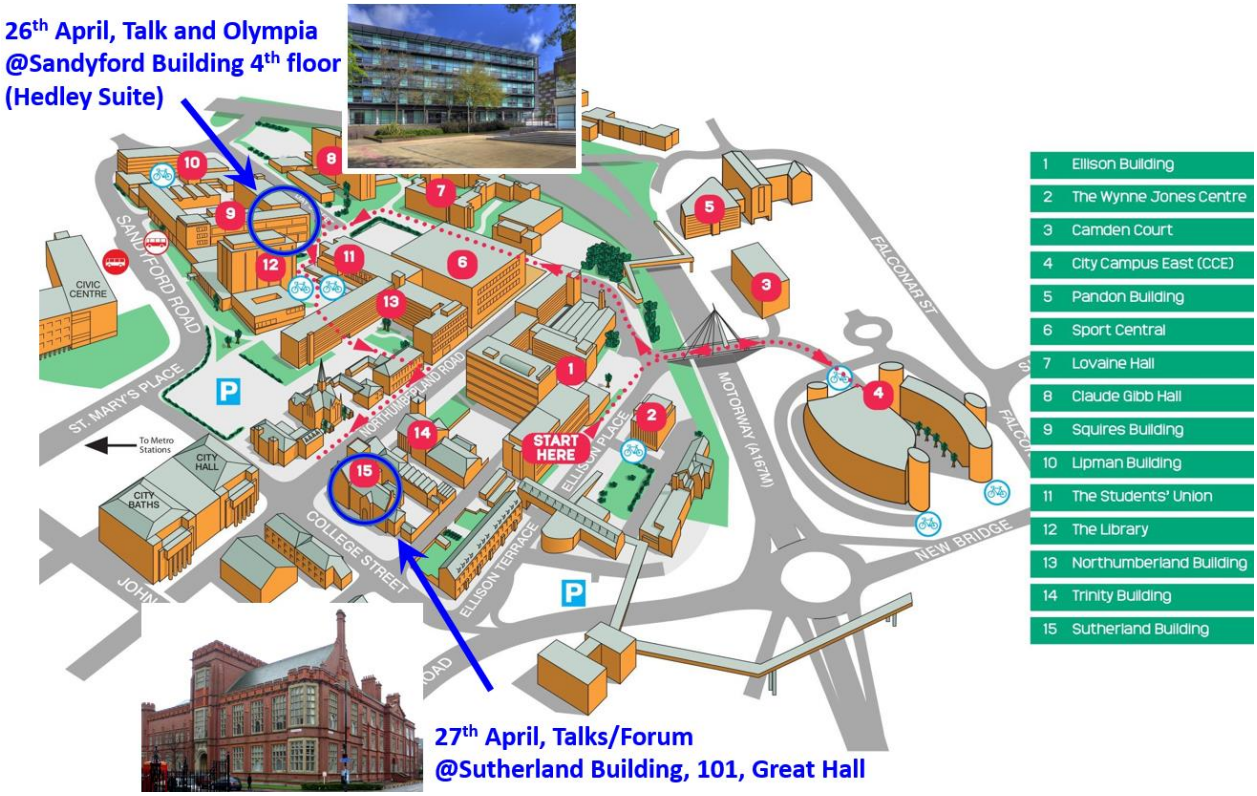
Acoustic waves trigger nano-quake impact in Northumbria University in Newcastle!

International Acoustofluidics Forum and Olympics
(3rd SIG Meeting of The Acoustofluidics in UK Fluidic Network)

This international Acoutofluidics Forum and Olympics held in Northumbria University, Newcastle on 26th and 27th April, 2018, was a showcase for exciting phenomena and applications arising from the interaction of acoustic waves with liquids. It included talks by global leaders on topics of microfluidics induced by ultrasonic, surface acoustic waves, bulk acoustic waves and flexural waves, and how they can be used of these for bio-sampling, microanalysis, and medical diagnosis.

In this event, we invited talks from speakers from Germany, Australia, France, Austria, as well as more than 15 speakers from UK universities. We also organised an Olympics demonstration event to showcase the wide range of capabilities in acoustofluidics to the public (including pupils from a local high schools) where researchers competed for the heaviest object levitated by sound or the fastest drop on a surface catapulted by sound for example. The event was turned towards knowledge transfer and companies participated and took advantage of the presence of KTP advisors to initiate funding discussions and partnerships. The community gathered in a brainstorming workshop to identify key future challenges and how the group could come together to tackle them (the results will be disseminated through the network's website https://fluids.ac.uk/sig/Acoustofluidics

Date: 26th and 27th April 2018
Venue: Northumbria University, Newcastle Upon Tyne, UK
26th April 2018: Sandyford Building, (Hedley Suite)
27th April, Great Hall, Sutherland Building



Organisation team:

Prof. Richard Fu, Northumbria University, e-mail: Richard.fu@northumbria.ac.uk
Dr. Jeremy Hawkes, The University of Manchester, email: jeremyjhawkes@gmail.com
Dr. Julien Reboud, Glasgow University, e-mail: julien.reboud@glasgow.ac.uk.
Dr. Hamdi Torun, Northumbria University, e-mail: hamdi.torun@northumbria.ac.uk
Dr. Ran Tao, Northumbria University, e-mail: r.tao@northumbria.ac.uk

The event started with a brief greeting from Prof. Richard Fu from Northumbria University.

On behalf of host of Northumbria University, Prof. Glen McHale, Pro-Vice Chancellor of Faculty of Engineering and Environment from Northumbria University, welcomed everyone for coming to this event, and introduced Northumbria University's key research and teaching achievement, and he presented an excellent overview of research work for fluidics within Smart Materials and Surfaces group, interacting with digital and continuous fluids using various techniques.

Prof. Achim Wixforth delivered a key-note talk on Acoustofluidics, covering from his pioneer work within this field, then key development within the past years, as well as his group's latest research and development in this field.

Prof. Jon Cooper from Glasgow University delivered another great keynote talk on “Shaping acoustic fields to create complex microfluidic flows”

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Invited talk from Prof. Michael Baudoin, University of Lille, France is focused on “Miniaturized single beam acoustical tweezers based on focalized acoustical vortices”. He is organising the International Conference on Acoustofluidics in Lille, France in Aug 2018.

One of the important key-note talks was delivered by Prof. Leslie Yeo from RMIT University, Australia. His topic is about “Acoustically-driven microscale fluid-structure interactions: Something old, something new, something unexpected”

Prof. Marc P.Y. Desmulliez from Heriot-Watt University, UK delivered an invited talk on “Acoustic streaming: unexpected applications in water sampling and printed circuit boards manufacturing”

Prof. Jack Luo from Bolton University gave an invited talk on “Thin film flexible acoustic wave sensors”

Prof. Richard Fu from Northumbria University, UK delivered a talk on “Thin film flexible and bendable acoustofluidics”

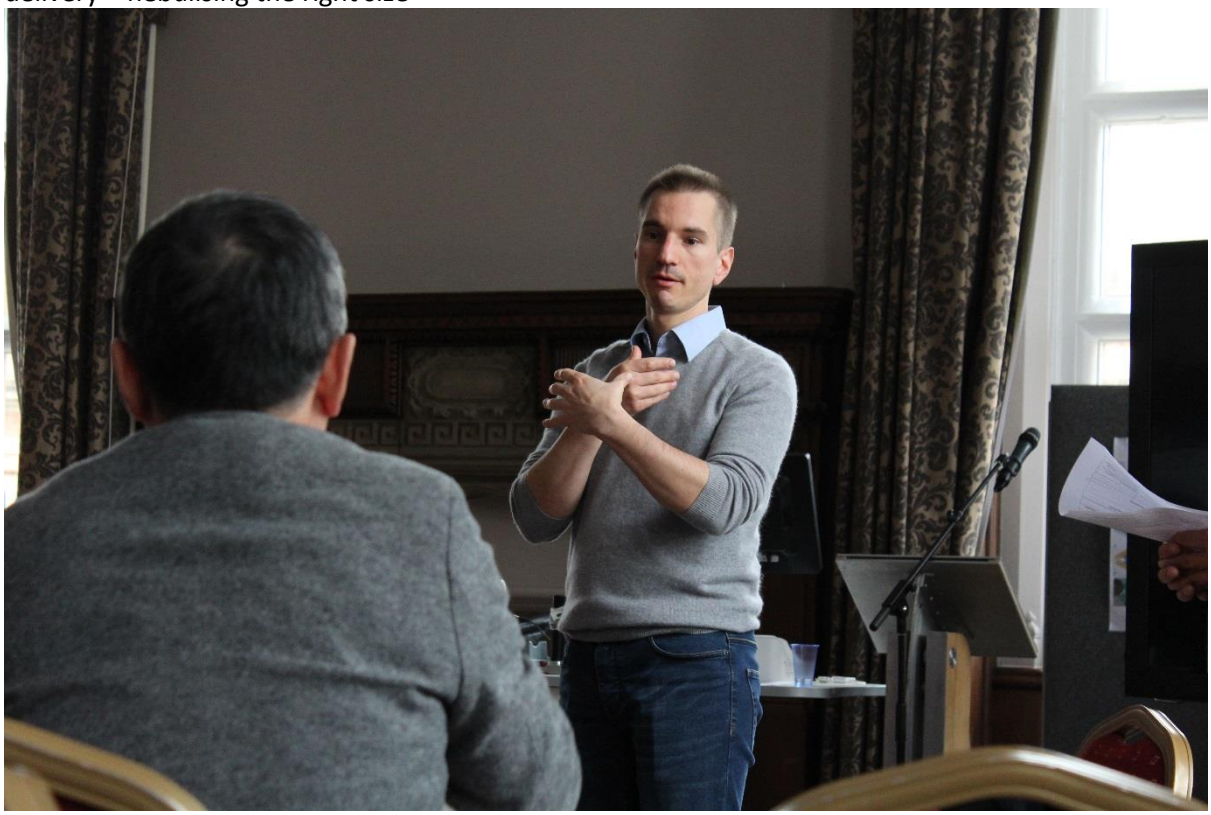
Dr. Anne Bernassau from Heriot-Watt University, UK delivered an invited talk on “Micro-acoustics in cell patterning and sorting”

Talks in second day

The first invited talk on 2nd day was given by Dr. Peter Glynne Jones from University of Southampton, UK, and he provided a keynote talk on Current challenges and future directions in acoustofluidic devices.

The second invited talk was delivered by Dr. Stefan Radel, Vienna University of technology, Austria, and his talk is about Ultrasound enhanced process analytical technology.

Dr. Julien Reboud from University of Glasgow, UK gave an invited talk on SAW-based pulmonary drug delivery – nebulising the right size



Dr. Hamdi Torun from Northumbria University, UK, delivered an invited talk on Microsystem development for single-molecular measurements

Dr. Raimund Brünig from Company of Belektronig, Germany, delivered an invited talk on SAW generator

Dr. Jeremy Hawkes summarised the acoustofludics Olympic Winners: every participants are winners and will receive a certificate later.

Dr. Mehdi Jangi from University of Birmingham, UK, gave an invited talk on High-fidelity CFD modelling of droplet dynamics subjected to the surface acoustic waves.

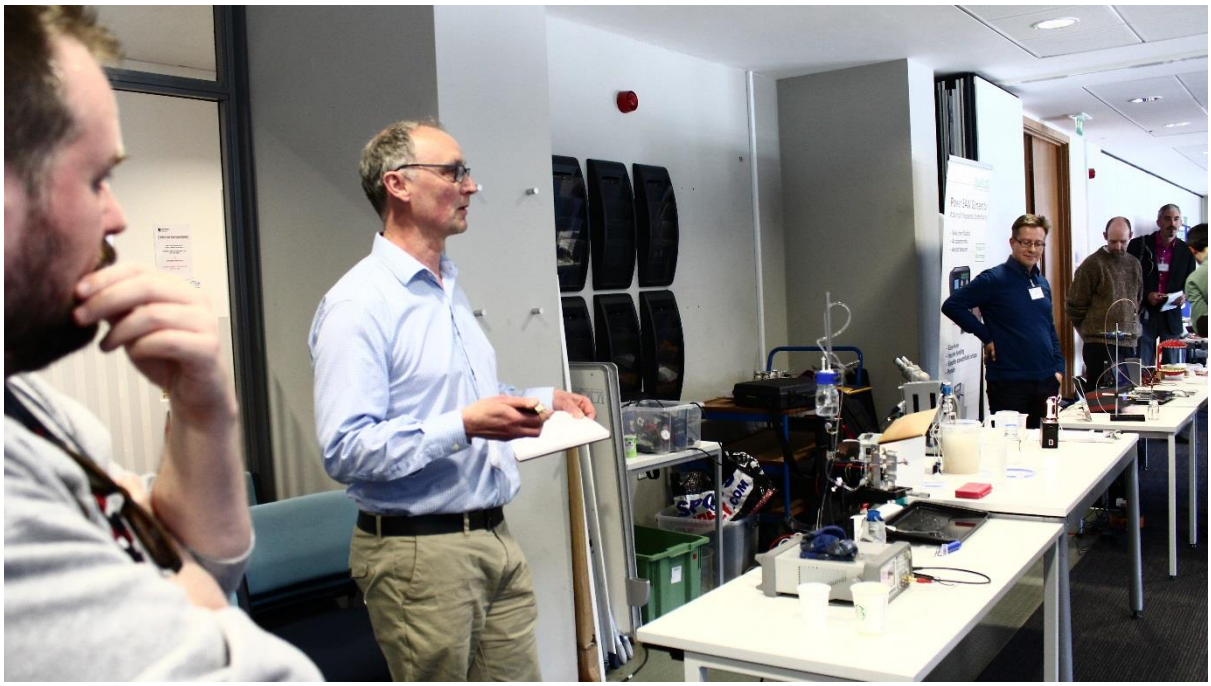
Dr. Baixin Chen from Heriot-Watt University, UK, delivered an invited talk on The hydrodynamic and thermal responses of droplet to Rayleigh SAW: Observations and simulations.

Ben Ash from University of Exeter, UK, gave an invited talk on “Annular hole phononic crystal for surface acoustic waves”

Amanda Franklin, from University of Bristol, UK, gave an invited talk on “Exploring acoustic lenses and signatures for three-dimensional particle trapping”

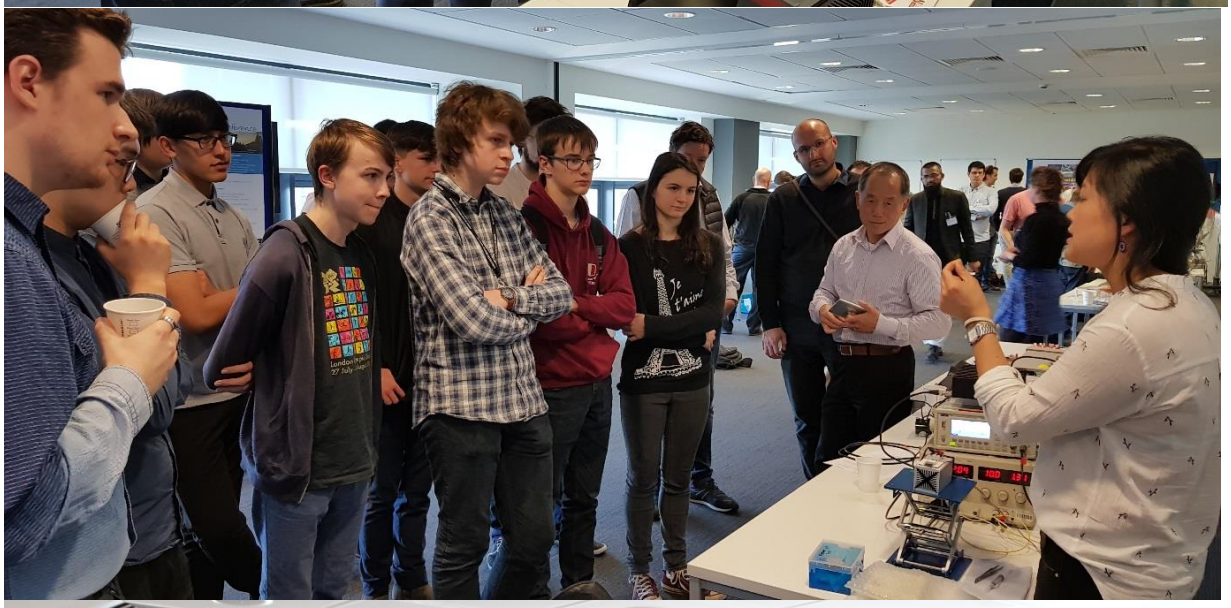
A great event:

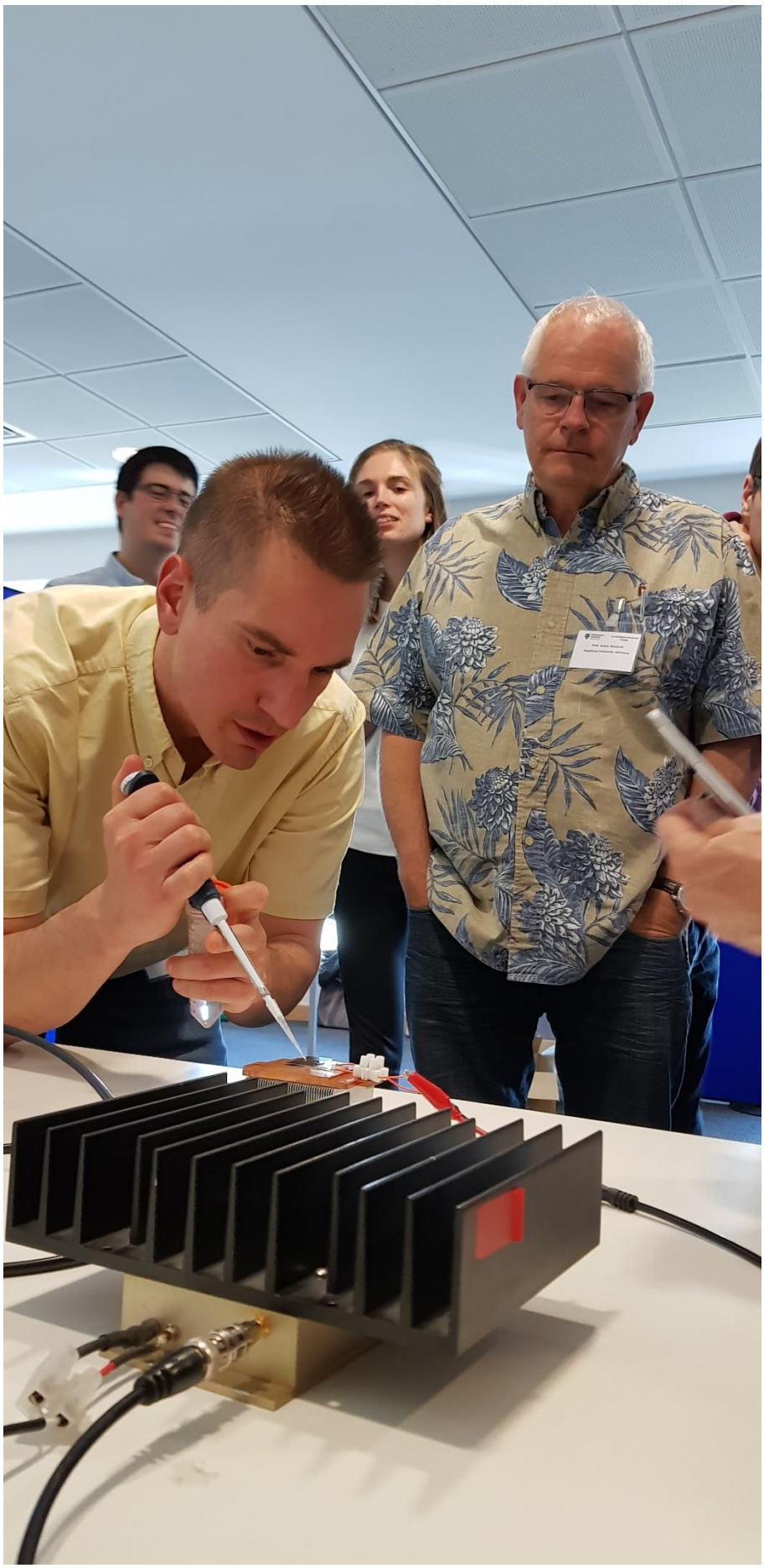
Acoustofluidic Olympic Demonstrations and public engagement (with local school students and industry)

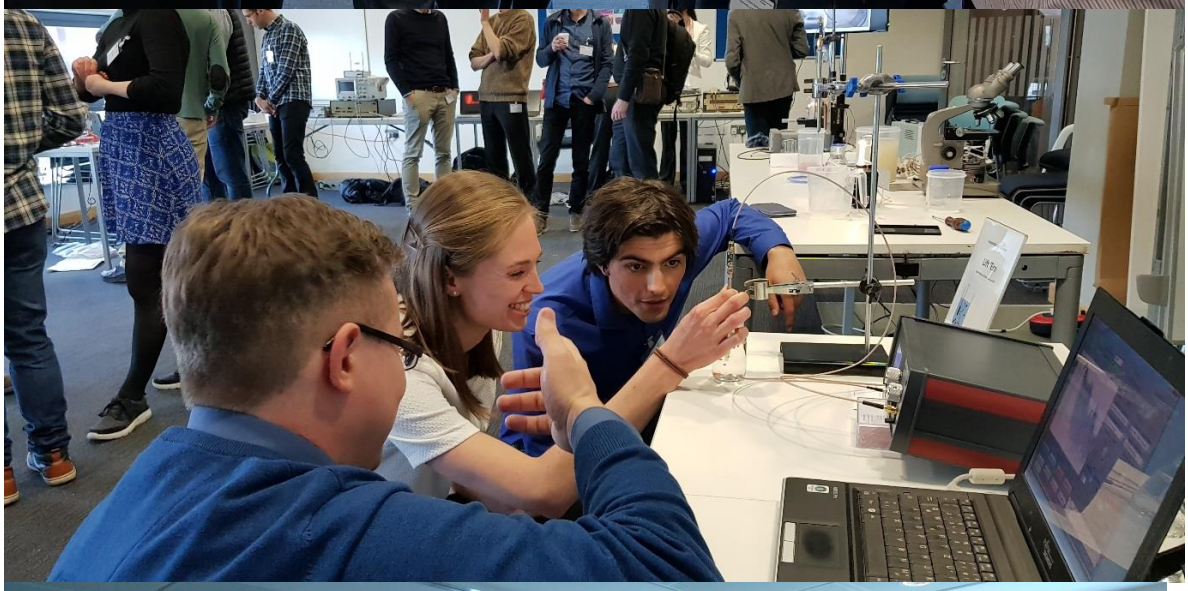


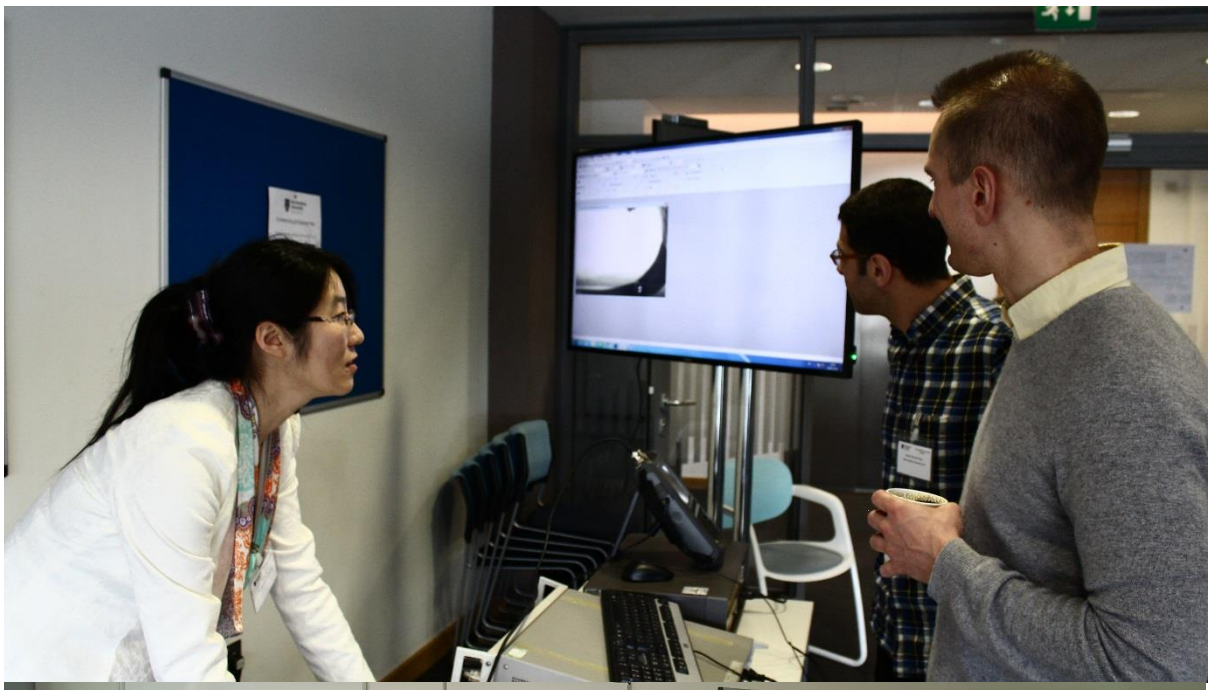

Power SAW Generator


Power SAW Generator



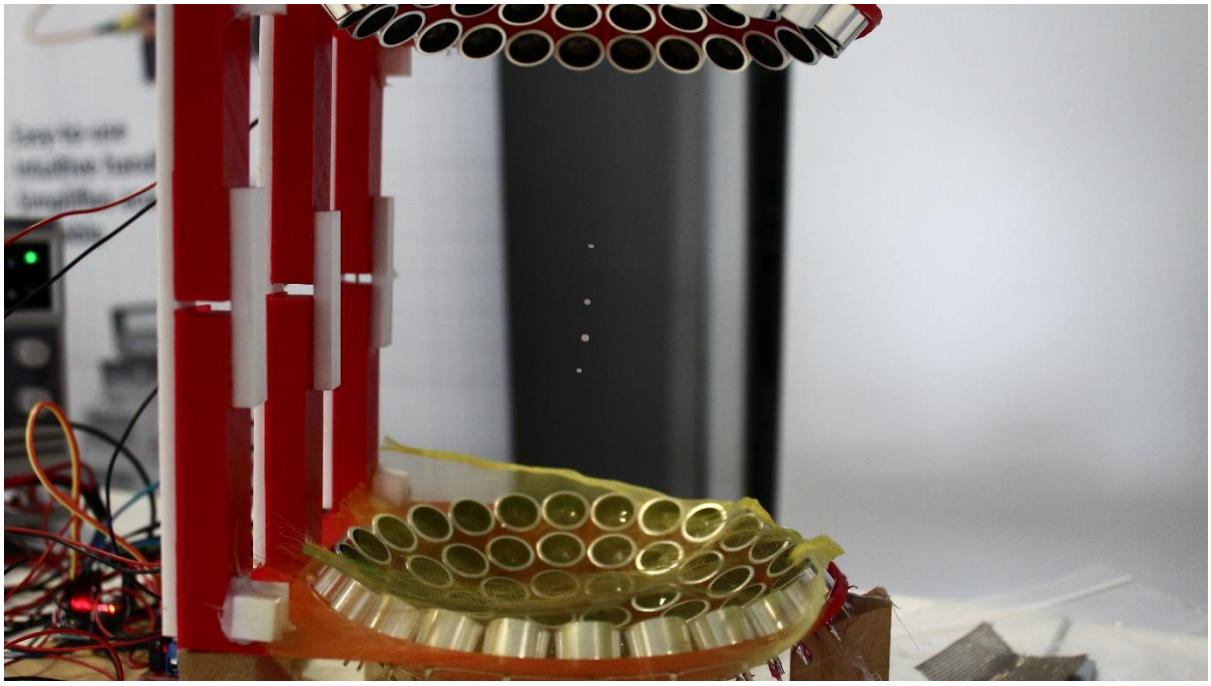


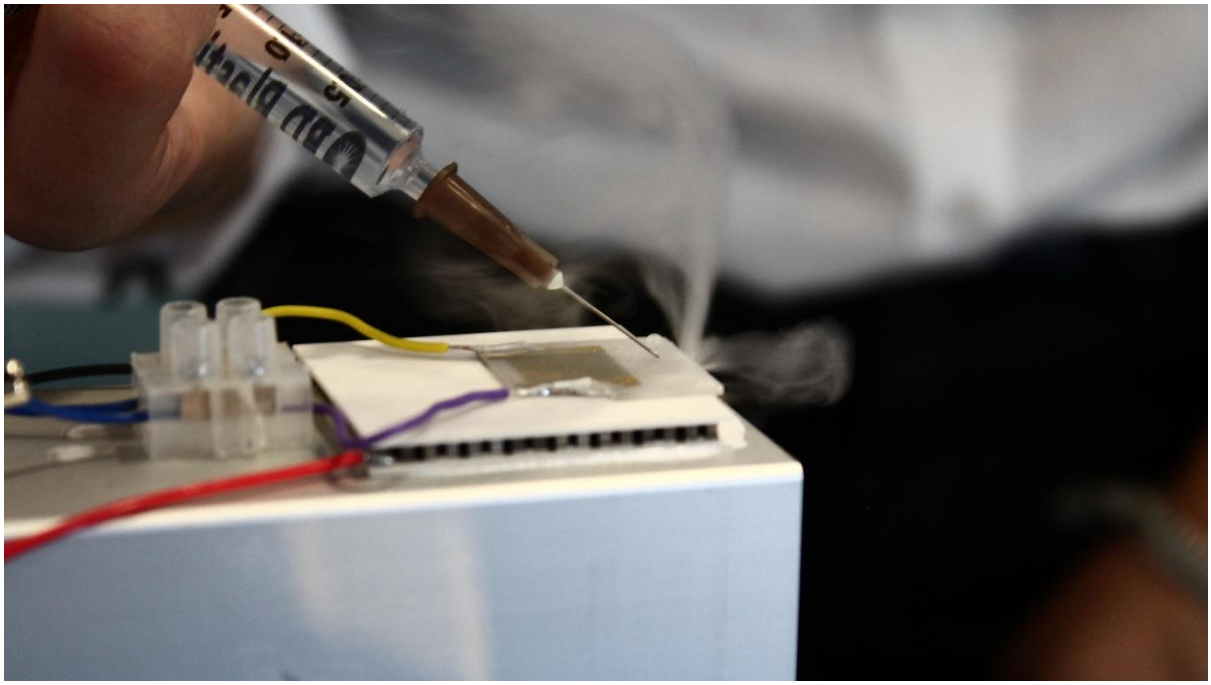




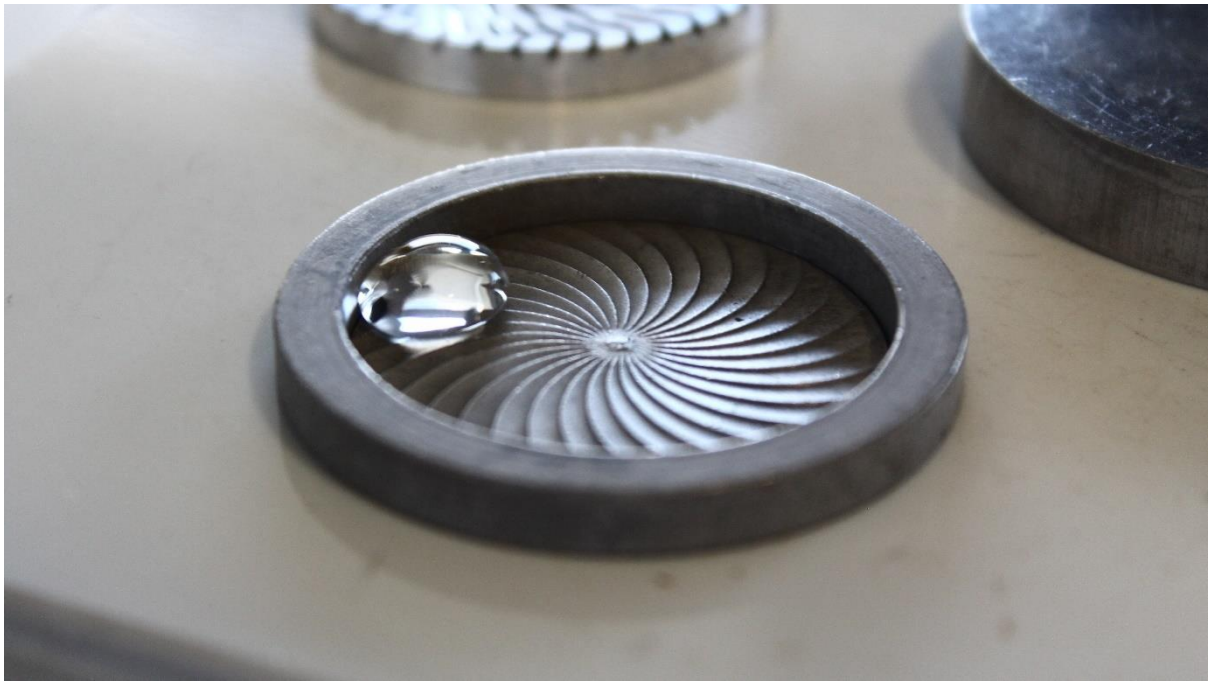
Acoustofluidics Olympia		
Dr. Peter Glynne Jones	University of Southampton, UK	An air based acoustic levitator
Asier Marzo	University of Bristol, UK	Acoustic Levitation
Luke Cox + Asier Marzo	University of Bristol, UK	Huge Levitation
Dr. Stefan Radel	Vienna University of Technology, Austria	Sonicatch
Christian Witte/Elijah Nazarzadeh	University of Glasgow, UK	High speed drop race
Xi King/Elijah	University of Glasgow, UK	Misting for drug delivery to the lungs
Dr. Julien Reboud/Rab Wilson	University of Glasgow, UK	Acoustic heating
Dr. Julien Reboud/Rab Wilson	University of Glasgow, UK	Jetting : most directional / highest jet !
Dr. Ran Tao	Northumbria University, UK	Flexible SAW microfludic devices.
Dr. Hamdi Torun	Northumbria University, UK	Listening with electromagnetic ears
Dr. Prashant Agrawal	Northumbria University, UK	Lendenfrost effects
Dr. Qiang Wu	Northumbria University, UK	Optical fibre for acoustic microphone
Dr. Jeremy Hawkes, UK		A filter for biological cells based on enhancing sedimentation with ultrasound
Dr. Jeremy Hawkes, UK		Combining acoustofluidics and dielectrophoresis to select uniform droplets "an experiment you can try at home"
Dr. Raimund Brünig	Belektronig, Germany	SAW-chip to stir small liquids

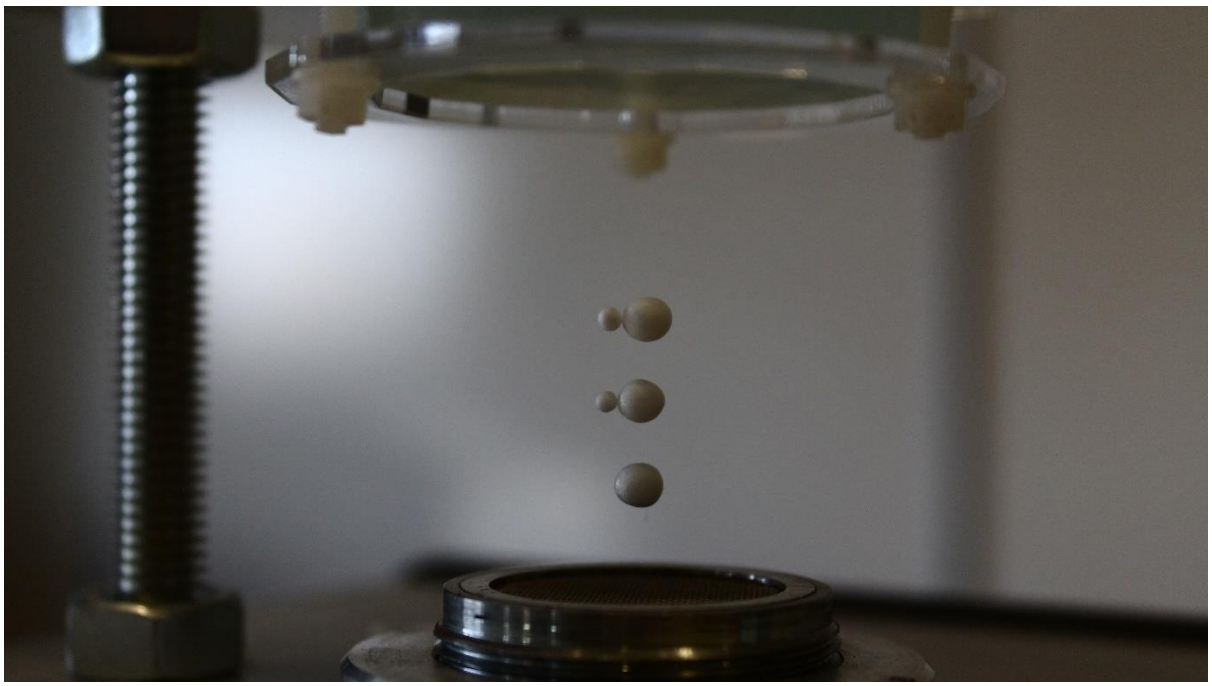
Some captured images from Olympic Demonstrations:
Here are some exciting acoustofludics moments!

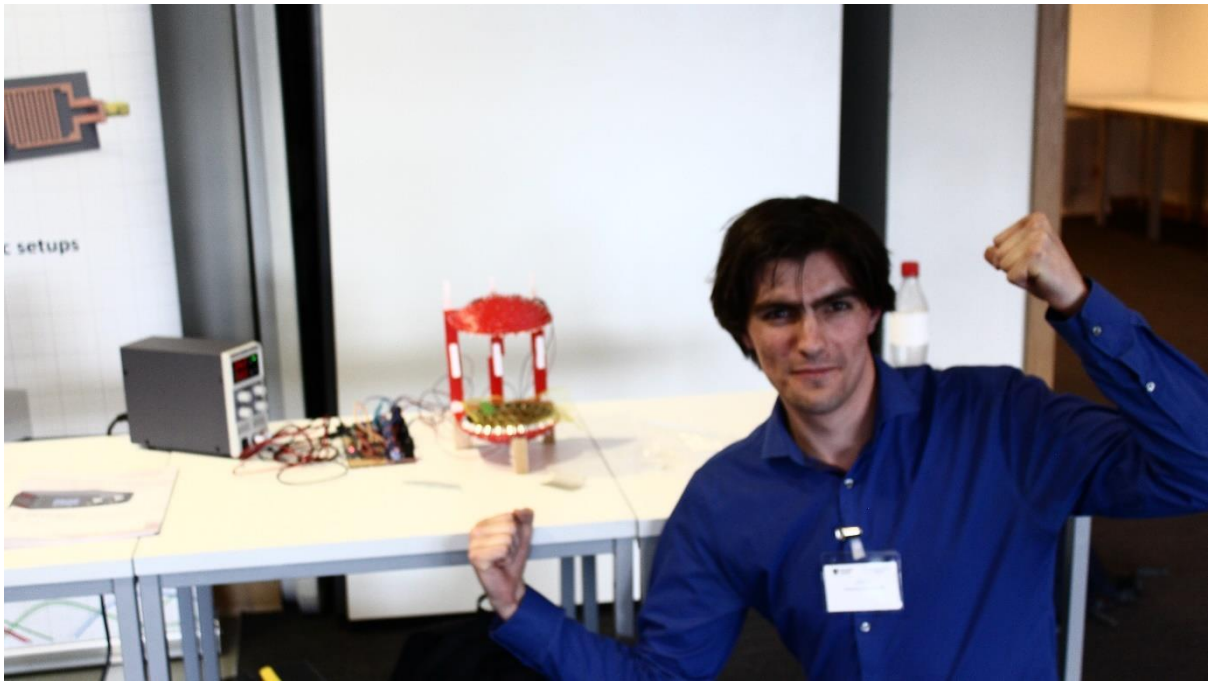





Advanced Frequency Controller for
- SAW driven fluidics
- Acoustophoresis
- Acoustic tweezer
Made in Germany
- Easy-to-use
- Intuitive handling
- Simplifies acoustofluidic setups
- Portable



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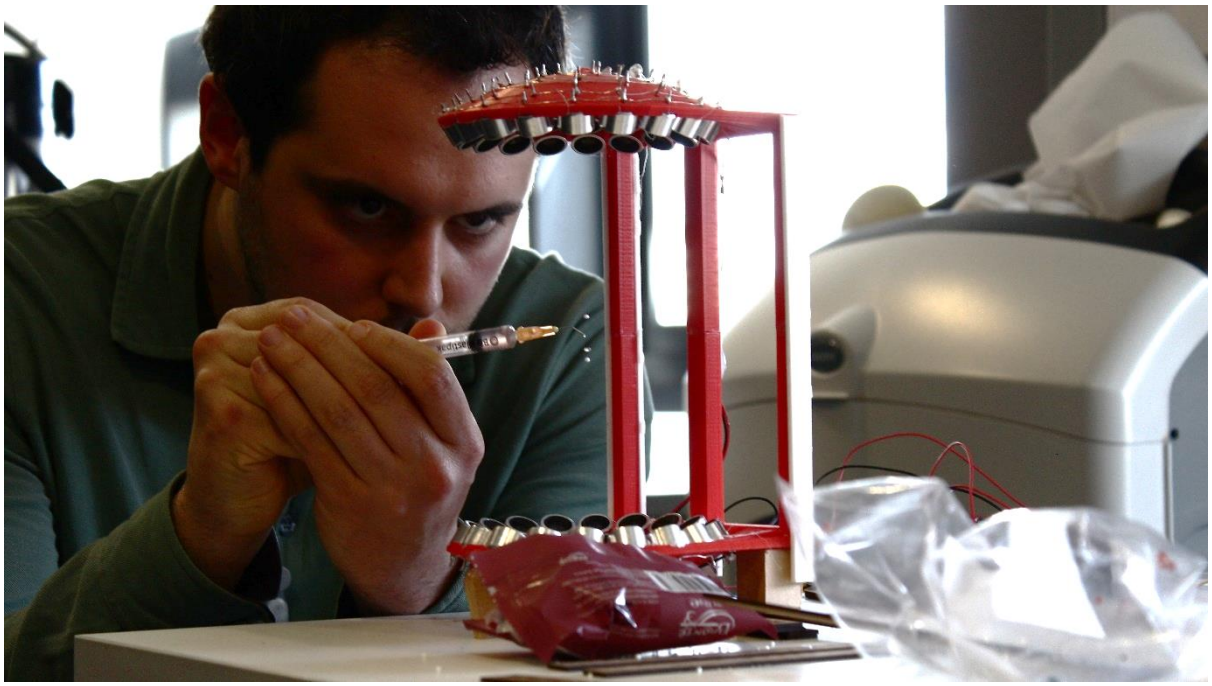

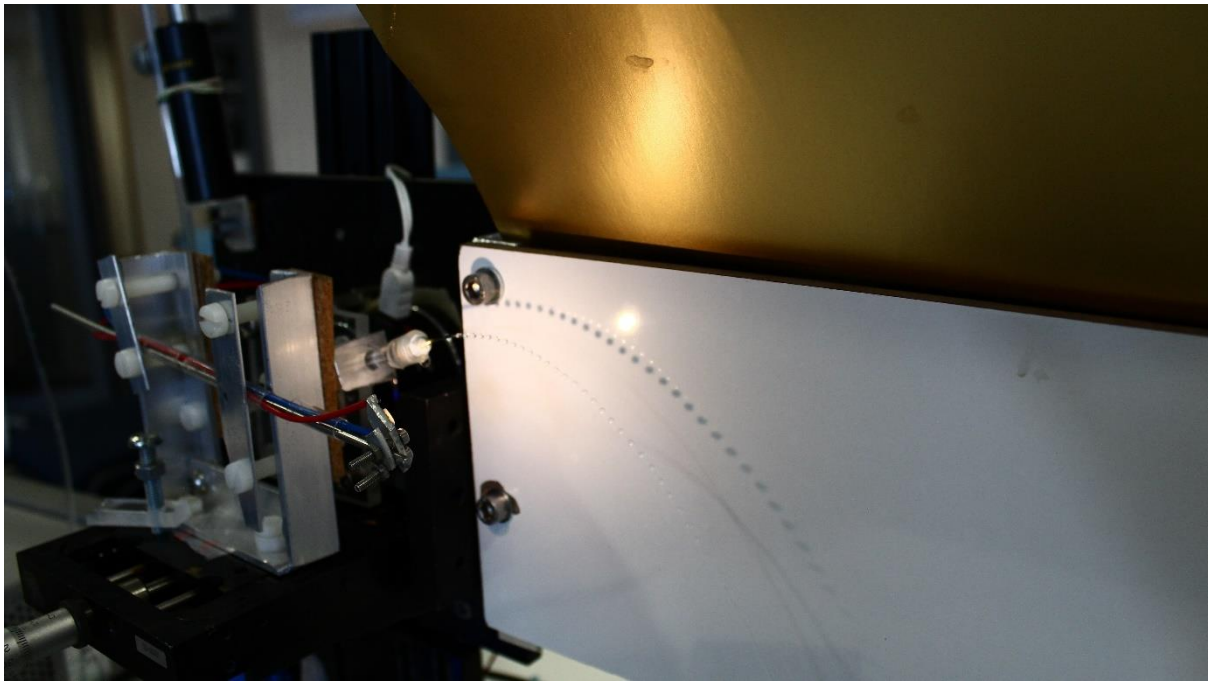

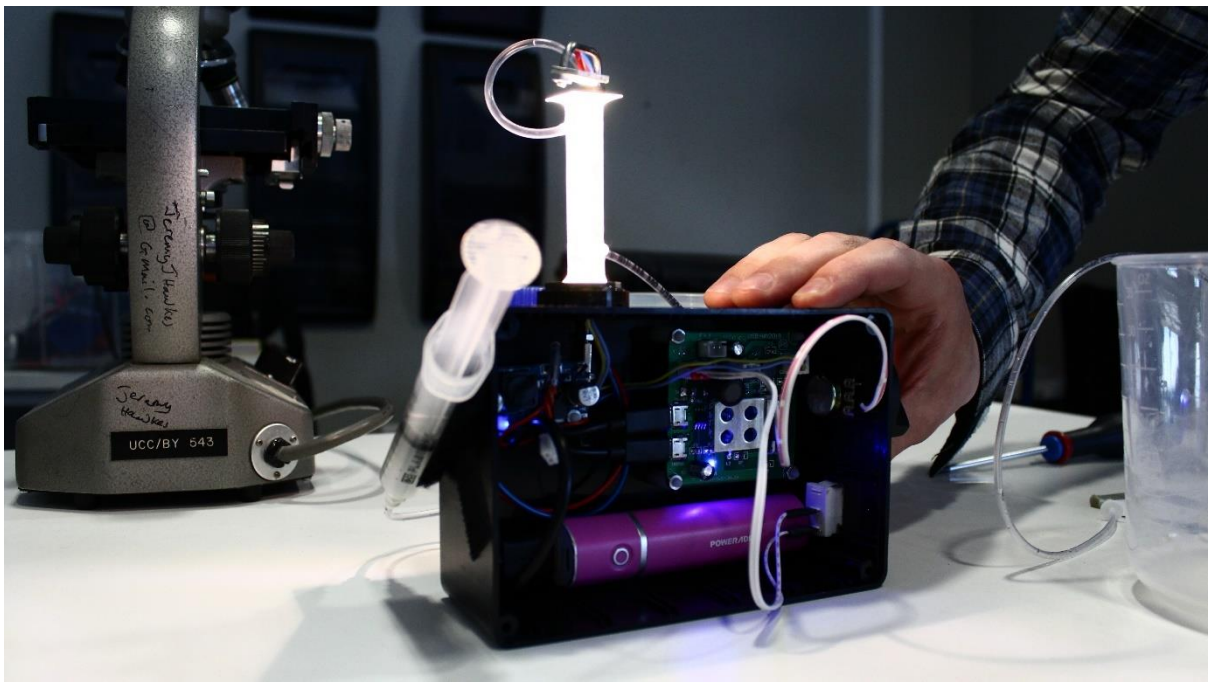

Acoustofluidic Forum

We have this platform to invite everyone actively in participating the activities including in identifying key future challenges; brainstorming for key research work, implementation and planning for tackling the challenges.


Aknowledgements
EPSRC
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Key Future Challenges in acoustofluidics
• Choose 2-3 challenges for 2nd phase
3 min
• Prepare quick feedback t
5 min
• Feedbac m
2-3 min/table


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Key Future Challeng
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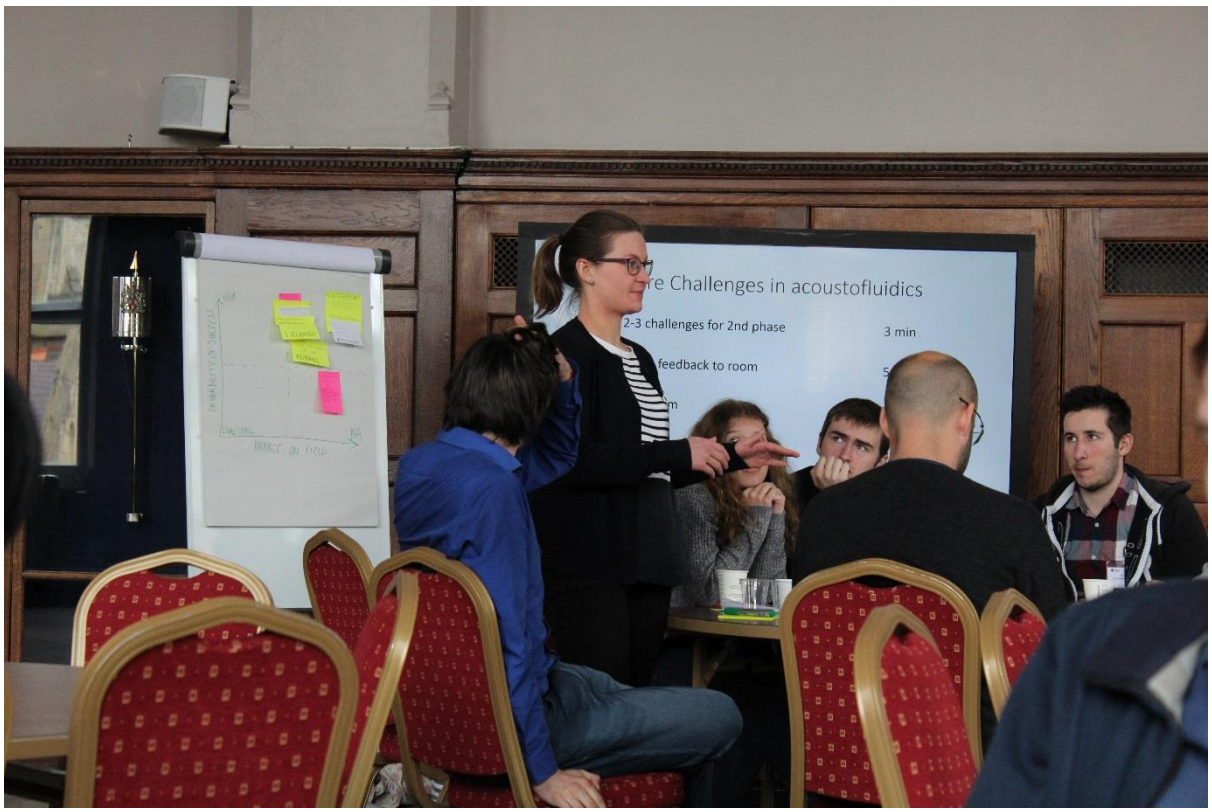
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3 min
feedback to room


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