



Vibrations

Powering Sound Ideas

UIA 48: Toronto, Canada 15 - 17 April 2019

Jay Sheehan, Integra Life Sciences, our Symposium Chair is hard at work with the planning committee to finalize the excellent program for UIA48.

Features of this year's program include:

- Presentations from seven countries
- Interactive sessions designed to foster dialogue with presenters and participants about ideas presented during the symposium
- Participation from two universities for workshops and tours
- New companies participating in the Ultrasonics Solution Center
- Robust poster session



Tuesday Event at Mill Street Brewery -

Located in the historic Brewery District, Mill Street are beer innovators in the Canadian brewing scene with their in-house nano-brewery, which allows them to create unique, small-batch brews.

Special Points of Interest

- UIA48 Hotel Reservation Information - Page 2
- UIA48 Schedule - Page 3-4
- New ultrasonic products that will impact our daily lives - Page 5-6
- UIA48 Registration is open! Details on Page 8

Tuesday Features 3 Educational Institutions

Tuesday morning will feature workshops presented by the Sunnybrook Research Institute and Ryerson University, each focused on active research and programs in Ultrasonics / Acoustics.

The poster session will also be held on Tuesday, with presentations from students from Spain, Scotland, Canada and more.

Tuesday afternoon the group will visit the Li Ka Shing Knowledge Institute of St. Michael's, which is home to leading researchers, educators, and clinicians — dedicated professionals making new scientific discoveries, generating novel therapies, developing innovative training programs, and helping translate knowledge into practice.

Comprising the Keenan Research Centre and the Li Ka Shing International Healthcare Education Centre, the Li Ka Shing Knowledge Institute fosters an environment in which inter-professional teams collaborate to bring established best practices and research discoveries to patient bedsides faster than ever before.

See the full schedule on page 3-4.



PLAN AHEAD!

Passports Needed

Entry to Canada requires a passport. Make sure that yours won't expire before October 2019. Most countries don't require a visa - let UIA know if you need a letter of invitation and it will be sent to you promptly. See page 8.

InterContinental Toronto Centre Hotel

Sleek, yet sophisticated. Refined, yet playful. Experience the vibrant energy of downtown Toronto from our 4-diamond luxury hotel. InterContinental Toronto Centre is located steps from major attractions like the CN Tower, the Scotiabank Arena, and the Rogers Centre. Blending contemporary elegance, luxurious comfort and modern convenience, experience world-class hospitality matched with the highest echelon of service.

Soak your cares away in the newly renovated 48-foot indoor saline pool with hot tub and eucalyptus steam room before beginning your

workout in the 24-hour fitness centre. Experience well-deserved R + R at the full-service Spa InterContinental, featuring soothing massage and body treatments.

Make Your Hotel Reservations BEFORE 15 March!

To make your reservations you can call: 1-800-235-4670 or you can book [online](#). Please note that you are attending the **UIA 2019 Annual Symposium** when booking through the 1-800 number.

Hotel rooms are just \$245C/night. [Make your reservations](#) by 15 March 2019.



Planning Your Trip to Toronto!

When you check out the list of MUST SEE places in Toronto, the first two are the CN Tower and the Distillery District. UIA48 is carefully planned to provide participants easy access to both these locations.

CN Tower

Still the tallest free-standing structure in the Western Hemisphere, the CN Tower is located just steps away from our headquarters hotel. You can be one of the more than 2 million people who visit the CN Tower each year.

The floor of the observation tower is made of glass for a bird's-eye view of 113 stories below to the ground. Not to worry... the floor can withstand the weight of 35 moose. Let's hope they aren't visiting when you are!



Book an Edge-Walk! Take a walk on the edge of the tower! This should be open at the time of UIA48. To

book your Edgewalk Tour [click here](#).

Distillery District

Our Tuesday evening event will be held at the Mill Street Brewery, in the heart of the Brewery District. This is located just one mile from our hotel. Plan to stroll around the district before dinner to enjoy this historic pedestrian-only neighborhood – flanked by industrial-style Victorian buildings and paved with cobblestone once trodden on by horse-drawn carriages. It overflows with art galleries, performance spaces, cafes, restaurants and yes, a brewery. This is

the place to go for a glimpse into Toronto's past.

Want to ride a Segway? Take a 30 minute tour and learn about the history of the District and enjoy this new method of transportation while you are at it.



Find more information about what you can do in Toronto here:

www.seetorontonow.com/

UIA48 Schedule: Monday, 15 April & Tuesday, 16 April (tentative)

MONDAY, 15 April 2019

8:20 Welcome, Dominick DeAngelis, UIA President

Piezoelectric Materials and Devices

8:30 - 9:00 **Optimizing the Selection of Piezoceramic Materials for Ultrasonic Transducers**, Dominick DeAngelis, Kulicke & Soffa Industries

9:00 - 9:30 **Cross Coupling and Mode Splitting in Thickness Mode Resonators**, Timo Scholehwar, *PI Ceramic*

9:30 - 10:00 **Lead-free Piezoceramic Material in an Industrial Application**, Rasmus Lou-Møller, *Meggitt A/S*

10:00 - 10:30 Networking and Refreshment Break in Sound Solutions Center

Measurement and Processing Developments in Industrial Ultrasonics

10:30 - 11:30 **Real-time Optical Observation of Power Ultrasonic Processes**, Yangyang Long, *Leibniz Universität Hannover*

11:30 - 12:00 **Measurement of Vibration Amplitude in Ultrasonic-Assisted Drilling**, Karl Graff, Amin Moghaddas, *EWI*

12:00 - 12:30 **Modeling of Ultrasonic Welding of PLA**, David Grewell, Karla Lebron, Leo Klinstein and Jeff Frantz, *North Dakota State University*

12:30 - 1:00 **Ultrasonic Spot Welding of Metallic Materials for Lightweight Automotive Applications**, Daolun Chen, *Ryerson University*

1:00 - 2:00 Luncheon

Ultrasonics Innovations for Industrial Applications

2:00 - 2:30 **Latest Innovations in Ultrasonic Transducers and Acoustic Tools from Dukane**, Robert Aldaz, *Dukane IAS, LLC*

2:30 - 3:00 **Controlled Ultrasonication of Nanomaterials**, Mark Hodnett, *NPL*

3:00 - 3:30 **The application of additive layer manufacture in SONAR and wider maritime domain**, Andrew Mathieson, *Thales UK Limited*

3:30 - 4:00 Session Debrief and Discussions

5:00 - 6:30 **Evening Reception** in Sound Solutions Center

TUESDAY, 16 April 2019: WORKSHOPS & POSTERS

8:20 - 8:30 am **Welcome**, Jay Sheehan, UIA48 Chair

8:30 - 10:00 am **Sunnybrook Research Institute: Active Research and Programs in Ultrasonics / Acoustics, including Thermal ablation, Using US through the blood brain barrier, Imaging micro bubble contrast**

10:00 - 10:30 **Poster Session/Refreshment Break** in Sound Solutions Center

10:30 - 12:00 **Ryerson University: Active Research and Programs in Ultrasonics / Acoustics**

Continued on next page

UIA48 Schedule: Tuesday, 16 April & 17 April 2019 (tentative)

- 12:00 - 1:00 **Lunch/Poster Session** in Sound Solutions Center
A numerical study on the nonlinear behavior of gas bubbles in an ultrasonic field, Christian Vanhille, *Universidad Rey Juan Carlos*
Characterisation of Piezocrystals for High Power Transducers, Nicola Fenu (*University of Glasgow*), Sandy Cochran (*University of Glasgow*), Nathan Giles-Donovan (*University of Glasgow / University of Edinburgh*), Chris Stock (*University of Edinburgh*),
Progress Towards Piezocomposite Materials for Microultrasound Medical Arrays, Arjin Boonruang (*University of Glasgow*), Tim Button (*University of Birmingham*), Sandy Cochran (*University of Glasgow*),
The Study of Acoustic Harmonic Based Real-Time Thermometry in Hyperthermia Treatment, Tyler Hornsby, *Ryerson University*
- 1:15 Travel to Li Ka Shing Knowledge Institute
- 2:00 - 4:00 Ryerson Lab Tours at iBEST
- 6:00 Meet in lobby to travel to Mill Street Brewery

WEDNESDAY, 17 April 2019

- 8:50 - 9:00 **Welcome**, Jay Sheehan, UIA48 Chair
- 9:00 - 9:30 **Modified Osteogenic LIPUS Signal Improves Bone Strength in the Soft-Callus Phase**, Jason Winder; Robert Muratore, *Acoustic Sciences Associates*
- 9:30 - 10:00 **A collaborative approach to determining the neuromodulation effects of ultrasound and other modalities**, Robert Muratore, *Quantum Now LLC*
- 10:00 - 10:30 Refreshment Break in Sound Solutions Center
- 10:30 - 11:00 **Intellectual property in medical ultrasound - A brief history of time**, Kevin Houser, *Johnson & Johnson*
- 11:00 - 12:00 **Questions in Ultrasonics**
- 12:00 - 1:00 Luncheon in Sound Solutions Center
- 1:00 - 2:00 **Application of pulsed high intensity focused ultrasound toward studying traumatic brain injury (TBI) and its treatment**, Jahan Tavakkoli, *Ryerson University*
- 2:00 - 2:30 **Micro-Ultrasound Technologies**, Dr. Christine Demore, *Sunnybrook Research Institute*
- 2:30 - 3:00 **Ceramic Aging**, Myra Flitcroft, *Moog*
- 3:00 - 3:30 **Bending Ultrasound Around Multiple Corners in Thin Flexible Waveguides**, Jeff Vaitekunas, *Penn State University*
- 3:30 - 4:00 **Ultrasonic Petrous Apex Surgery (UPAS)**, Rebecca Cleary, *University of Glasgow*
- 4:00 **Closing remarks**

Ultrasound Applications in the News

Sonic Soak: The Ultimate Ultrasonic Cleaning Tool

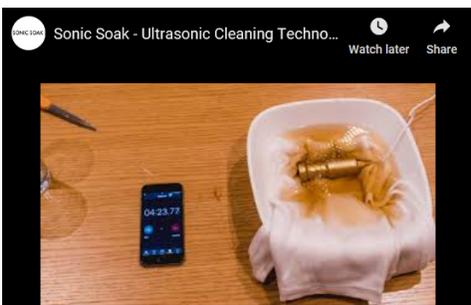
Ultrasound has hit Indiegogo.com This new product, Sonic Soak, raised \$2.9M with their campaign, almost 100 times their goal. Here's some information about this product that garnered 16,376 backers.

Dirt, mud, pollen? Don't worry about it, we've got you covered. Sonic Soak is the newest evolution in washing technology that utilizes ultrasonic technology to result in a deeper clean, saved time, water and energy, all in a compact package that can be taken anywhere. Who says you can't have it all?

Sonic Soak is a device that aims to revolutionize cleanliness and hygiene in our daily lives by using ultrasonic cleaning technology. Sonic Soak's modulated ultrasonic waves travel through water to clean at a microscopic level. Using ultrasonic technology to clean at the microscopic level, Sonic Soak revolutionizes washing technology and allows you to clean like never before.

The Sonic Soak is the answer to achieving a truly clean wash by cleaning at the source. Clean what the washing machine can't with ultrasonic technology and see results that would shock even the neatest of freaks.

Click on the video below to learn more - or visit their page at Indiegogo.com



What it Cleans



Laundry



Lingerie, Lace



Fruits, Vegetables



Hand-wash Only Fabrics



Razors



Personal Hygiene Tools



Toys



Watches



Jewelry



Silverware



Glasses



Baby Items

Greener

Uses 10% of energy consumption and less than 2% of the water consumption of a conventional washing machine.

Cleaner

Experience a deeper clean than washing machines or cleaning sprays can achieve!

Portable

Lighter and smaller than an iPhone, pack it in your bag and take it anywhere!

SONIC SOAK

Flexibility

The perfect general purpose cleaner - clean things you never could before!

Convenient

Save time and money - no more dry cleaning or hand washing!



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Ultrasound Applications in the News, continued

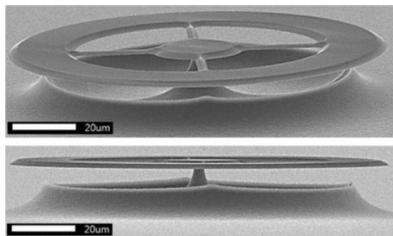
Ultra ultrasound to transform new tech

A new and extremely sensitive method of measuring ultrasound could revolutionise everything from medical devices to unmanned vehicles

Researchers at The University of Queensland have combined modern nanofabrication and nanophotonics techniques to build the ultraprecise ultrasound sensors on a silicon chip.

Professor Warwick Bowen, from UQ's Precision Sensing Initiative and the Australian Centre for Engineered Quantum Systems, said the development could usher in a host of exciting new technologies.

"This is a major step forward, since accurate ultrasound measurement is



A scanning electron micrograph of a microdisk similar to the one researchers used to create their new ultrasound sensor.
Credit: The University of Queensland

critical for a range of applications," he said.

"Improving these applications requires smaller, higher precision sensors and, with this new technique, that's exactly what we've been able to develop."

The technology is so sensitive that it can hear, for the first time, the miniscule random forces from surrounding air molecules.

"We've developed a near perfect ultrasound detector, hitting the limits of

what the technology is capable of achieving," Professor Bowen said.

"We're now able to measure ultrasound waves that apply tiny forces -- comparable to the gravitational force on a virus -- and we can do this with sensors smaller than a millimetre across."

Research leader Dr Sahar Basiri-Esfahani, now at Swansea University, said the accuracy of the technology could change how scientists understand biology. "We'll soon have the ability to listen to the sound emitted by living bacteria and cells," she said.

"This could fundamentally improve our understanding of how these small biological systems function. A deeper understanding of these biological systems may lead to new treatments, so we're looking forward to seeing what future applications emerge."

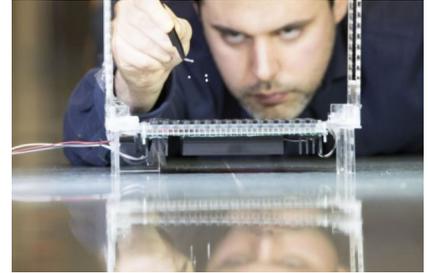
Source:

www.sciencedaily.com/releases/2019/01/190116110955.htm

Sound waves levitate multiple objects

Surgeons won't be shrunk and sent into the body like in the 1960s Sci-Fi, *Fantastic Voyage*, but could program a specialised array of mini-speakers to create an intricate sound field that 'traps' and manipulates selected objects in 'acoustic tweezers' for manipulation within tissue.

Advancements in acoustic tweezers from Professor Bruce Drinkwater in the Department of Mechanical Engineering, University of Bristol, and his colleague



Researcher Asier Marzo checks the strength of the acoustic traps generated by the Holographic Acoustic Tweezers.

Credit: Sergio Larripa, Asier Marzo and Bruce Drinkwater

Dr Asier Marzo, from Universidad Pública De Navarra in Spain, are driving the technology towards this futuristic-sounding reality. The team's recent developments, published Dec. 17 in the *Proceedings of the National Academy of Sciences* (PNAS), demonstrate for the first time the acoustic levitation and manipulation of multiple objects simultaneously.

Professor Drinkwater envisions an iteration of this system eventually being used to acoustically stitch up internal injuries or deliver drugs to target organs. He said: "Now we have more versatility -- multiple pairs of hands to move things and perform complex procedures, it opens up possibilities that just weren't there before."

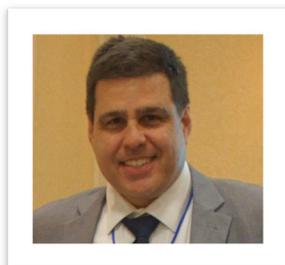
Dr Marzo explained: "The flexibility of ultrasonic sound waves will allow us to operate at micrometre scales to position cells within 3D printed assemblies or living tissue. Or on a larger scale, to levitate tangible pixels that form a physical hologram in mid-air."

Source:

<https://www.sciencedaily.com/releases/2018/12/181219115603.htm>

From the President

Our dynamic symposium chair Jay Sheehan has really put together an extraordinary conference for our assembly in Toronto this year. If you have never been to a UIA symposium before, this is the one that will definitely exceed your expectations! Not only is Toronto an amazing place to visit, but our event is being held at the magnificent InterContinental hotel, which is literally at the “centre” of all the action in Toronto.



Dominick DeAngelis
UIA President

This year our industrial session will focus on many cutting-edge topics in power ultrasonics that will pique your interest, such as clever ultra-sonic measuring techniques, spot welding for automotive applications, optimizing piezo materials for your transducer designs, and designing thickness mode resonators just to name a few.

Our Tuesday session will offer a window into the exciting ultrasonic research activities that are being done at Toronto’s Ryerson University and Sunnybrook Research Institute, topped off with a walking tour at the nearby Li Ka Shing Knowledge Institute. We also have many interesting papers in Tuesday’s poster session such as methods for characterizing piezoceramics for high power transducers, and piezo-composite materials for micro-ultrasound medical arrays.

And finally, on Tuesday night, you will not want to miss our dinner event at the fabulous Mill Street Brewery for some amazing craft pours and great conversation.

Our Wednesday session will offer something for everyone interested in medical ultrasonics, or even for those industrial minded researchers looking for ideas outside their realm of study. This includes talks on focused ultrasound for studying traumatic brain injuries from our Key-note Speaker Jahan Tavakkoli of Ryerson University, as well as understanding neuromodulation effects of ultrasound, ultrasonic petrous apex surgery, intellectual property in medical ultrasound, and bending ultrasound around corners in flexible waveguides, as a brief summary.

If I haven’t convinced you yet that the UIA symposium is a worthwhile endeavor, please go to our website to see all the amazing research that has been presented in previous years, but I really hope to see you in Toronto!

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UIA48: Registration, Sponsorship, & Visas

Register Now

UIA48 Registration

You know you are coming to the only event that focuses on the latest advances in ultrasound.—so don't wait until the last minute! Registration closes on Wednesday, 10 April.

UIA Sponsorship

Sign up for the sponsorship level of your choice (see page 7 - 8 for all the details) by clicking on the button above and selecting the **Sponsorship Package Registration Form**.

Planning for your exhibit in Toronto

UIA48 is registered with Canada Customs to make it easier for you to bring your exhibit material into Canada.

We are working with Consult Expo as our customs broker, and have the documentation you will need to complete for

your shipment of material to Toronto. **Please plan ahead!** You will need to complete a forms package and ship your material to Canada **no later than 1 April no foolin'!**

You can include your marketing materials and a pop-up banner stand in your baggage without a problem.

Need a Visa?

Most of our UIA48 participants will not require a visa to enter Canada. All you will need to bring is your passport.



However, if you are coming from a country that does require a visa, please email us at uia@ultrasonics.org and we will send you the formal letter of invitation you will need to secure your visa.



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VISIT US AT
ULTRASONICS.ORG

How can ultrasonics enhance the value of your business?

UIA is the international business forum for users, manufacturers, and researchers of ultrasonics. Our members use acoustic vibrations to improve materials, industrial processes, and medical technology. We call this *powering sound ideas*.

Let's work together to power your sound ideas. Contact a member consultant or company through our online Referral Network, learn about ultrasonics with our online primer, or meet industry leaders at our next symposium.



Important Dates

15 March 2019: Last day to make your reservations at the InterContinental Hotel Toronto Centre [**UIA48 Hotel Reservations**](#)

15 - 17 April 2019: UIA48 in Toronto, ON, Canada