TRANSFORMING TOMORROWS, TODAY

You can now treat Essential Tremor and Parkinson’s Disease patients with up to 1,024 ultrasound waves across the skull to precisely ablate a target with sub millimeter accuracy, deep in the brain.

The Future of Neurosurgery is Here.

Learn More at insightec.com
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<th>Section</th>
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</table>
Welcome to the 21st Annual International Symposium for Therapeutic Ultrasound! As the President of ISTU, it’s a true pleasure for me to officially kick off our important annual event. Indeed, this is my first kick-off as President of our Society. The 2022 meeting is particularly important as it is the first in-person ISTU event with international attendees since the start of the global pandemic. I appreciate all of you that have made the extra effort to travel and be here together in person in lovely Toronto.

We are honored to be joined by the Local Organizing Committee from the Sunnybrook Research Institute to host this year’s meeting at the University of Toronto. I especially want to recognize the meeting chairs Drs. Meaghan O’Reilly, David Goertz, and Kullervo Hynynen for their perseverance and commitment to this meeting over many years of planning and program development. I know it was difficult to accommodate the changes and closures due to the seemingly ever-changing demands of these challenging times.

As we host our second hybrid Symposium, I also want to thank this year’s virtual attendees for their engagement. This will be the first year within our new Virtual Platform, which will remain the same for the next two annual meetings. I encourage you to make the most of it – by experiencing the live streamed sessions together, and contributing to the various LIVE Q & A sessions. The Virtual Platform will be available for an extended period from June 7 to December 7, 2022 to give everyone greater access.

Please remember to visit the sponsor exhibits to interact with our sponsors. We simply can’t thank them enough for their contribution to this event, and their ongoing dedication to the success of our Society.

Since the establishment of our Society in 2001, ISTU has laid the foundation for the continuous improvement and advancement of therapeutic ultrasound technology by providing the means for the international community in ultrasound to come together once every year to collaborate and share knowledge. This year’s annual symposium will continue this tradition, and I sincerely hope this symposium will inspire new ideas and encourage innovations throughout all the different facets of this exciting field.

Our society is very inclusive, and I would like to remind that the different committees are open to everybody. Please join and contribute to the life of ISTU. After these four exciting days in Toronto, we’ll be ready to head back to Europe for our next meeting. I look forward to seeing you in April 2023 in Lyon, the French capital of gastronomy and "art de vivre".

Cyril Lafon, Ph.D.
President of ISTU
On behalf of the Local Organizing Committee, it is our great honor to host the 21st Annual International Symposium for Therapeutic Ultrasound. Toronto is Canada’s largest city and has been named the most diverse city in the world by the UN and the BBC, with over half of its population having been born outside Canada. We invite you to experience the city throughout the program!

The technical program will take place at Victoria University at the University of Toronto, one of the historic colleges located close to major attractions such as the Royal Ontario Museum and the upscale Yorkville shopping district. At the Welcome Reception, attendees will experience the Toronto Harbourfront from the patio of the Amsterdam BrewHouse. Finally, the Gala Event will take attendees to the lookout level of the iconic CN Tower. Completed in 1975, the CN tower was the tallest freestanding structure in the world until 2007, and remains the tallest in the Western hemisphere.

This year’s symposium will pilot a new type of session called virtual panels, which will bring together researchers from around the world to discuss their impressions of the material presented at the meeting. We hope these panels will stimulate discussion of the new and exciting work being presented and the potential impact for the field. These sessions will not be live streamed but will be posted to the conference platform for attendees to view.

Also new this year is the ISTU Women In Stem Coffee Break, which will feature a video with women across a range of career stages working in the field of therapeutic ultrasound. We will also offer tours to local research sites.

We will continue the long-standing traditions of the Fry and Lizzi Awards, and will introduce the new Early Career Clinical Investigator Award. Engaging students in the field remains a big focus with our Student Awards and the return of the Student Mentorship Session. The inaugural session of the Future of Therapeutic Ultrasound will provide a great opportunity for academic and industry recruiters to speak directly with current graduate students and postdoctoral researchers who are actively seeking positions.

We look forward to meeting you in-person or on the platform, and sharing new perspectives and ideas as we grow the field of Therapeutic Ultrasound together throughout the world.
# Local Organization

## Local Advisory Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Meaghan O’Reilly (Chair)</td>
<td>Sunnybrook Research Institute</td>
</tr>
<tr>
<td>David Goertz</td>
<td>Sunnybrook Research Institute</td>
</tr>
<tr>
<td>Kullervo Hynynen</td>
<td>Sunnybrook Research Institute</td>
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<tr>
<td>Isabelle Aubert</td>
<td>Sunnybrook Research Institute</td>
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<tr>
<td>Gregory Czarnota</td>
<td>Sunnybrook Research Institute</td>
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<tr>
<td>Elizabeth David</td>
<td>Sunnybrook Research Institute</td>
</tr>
<tr>
<td>Harriet Lea-Banks (Secretary)</td>
<td>Sunnybrook Research Institute</td>
</tr>
<tr>
<td>Nir Lipsman</td>
<td>Sunnybrook Health Sciences Centre</td>
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<tr>
<td>Michael Schwartz</td>
<td>Sunnybrook Health Sciences Centre</td>
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<tr>
<td>Ryan Alkins</td>
<td>Queen’s University</td>
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<tr>
<td>Olivier Villemain</td>
<td>SickKids</td>
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<tr>
<td>Adam Waspe</td>
<td>SickKids</td>
</tr>
<tr>
<td>Raffi Karshafian</td>
<td>Toronto Metropolitan University</td>
</tr>
<tr>
<td>Michael Kolios</td>
<td>Toronto Metropolitan University</td>
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<tr>
<td>Jahan Tavakkoli</td>
<td>Toronto Metropolitan University</td>
</tr>
<tr>
<td>Naomi Matsuura</td>
<td>University of Toronto</td>
</tr>
<tr>
<td>Alfred Yu</td>
<td>University of Waterloo</td>
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## Virtual Panel Organizers

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Ryan Jones</td>
<td>Sunnybrook Research Institute</td>
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<tr>
<td>Harriet Lea-Banks</td>
<td>Sunnybrook Research Institute</td>
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<tr>
<td>Dallan McMahon</td>
<td>Sunnybrook Research Institute</td>
</tr>
<tr>
<td>Carly Pellow</td>
<td>Sunnybrook Research Institute</td>
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<tr>
<td>Sheng-Kai Wu</td>
<td>Sunnybrook Research Institute</td>
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</table>
# ISTU Organization

## President

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Cyril Lafon</td>
<td>INSERM</td>
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</table>

## Secretary General

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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</thead>
<tbody>
<tr>
<td>Meaghan O'Reilly</td>
<td>Sunnybrook Research Institute</td>
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</table>

## Treasurer

<table>
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<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Allison Payne</td>
<td>University of Utah</td>
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## Fry & Lizzi Award Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Joo Ha Hwang</td>
<td>Stanford University</td>
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</table>

## Clinical Membership & Awards Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Suzanne LeBlang</td>
<td>Focused Ultrasound Foundation</td>
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</tbody>
</table>

## Student Membership & Awards Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Richard Price</td>
<td>University of Virginia</td>
</tr>
<tr>
<td>Eli Vlaisavljevich</td>
<td>Virginia Tech</td>
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## Scientific Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kim Butts Pauly</td>
<td>Stanford University</td>
</tr>
<tr>
<td>Pejman Ghanouni</td>
<td>Stanford University</td>
</tr>
<tr>
<td>David Melodelima</td>
<td>INSERM</td>
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</table>

## Executive Director

<table>
<thead>
<tr>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>Shelly Reid</td>
</tr>
</tbody>
</table>
## Invited Speakers

### Plenary Speakers

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zhen Xu</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Alessandro Napoli</td>
<td>Sapienza University of Rome</td>
</tr>
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</table>

### Education Speakers

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
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</thead>
<tbody>
<tr>
<td>Muyinatu Bell</td>
<td>Johns Hopkins University</td>
</tr>
<tr>
<td>Diane Dalecki</td>
<td>University of Rochester</td>
</tr>
<tr>
<td>Catharina Davies</td>
<td>Norwegian University of Science and Technology</td>
</tr>
<tr>
<td>Shukuan Lu</td>
<td>Xi’an Jiaotong University</td>
</tr>
<tr>
<td>Frederic Padilla</td>
<td>Focused Ultrasound Foundation &amp; University of Virginia</td>
</tr>
<tr>
<td>Lei Sun</td>
<td>The Hong Kong Polytechnic University</td>
</tr>
</tbody>
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### Invited Speakers

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Matthew Bucknor</td>
<td>UCSF</td>
</tr>
<tr>
<td>Hong Chen</td>
<td>Washington University in St. Louis</td>
</tr>
<tr>
<td>Agata Exner</td>
<td>Case Western Reserve University</td>
</tr>
<tr>
<td>Nir Lipsman</td>
<td>Sunnybrook Health Sciences Centre</td>
</tr>
<tr>
<td>Raul Martinez Fernandez</td>
<td>Hospital HM Puerta del Sur</td>
</tr>
<tr>
<td>Allison Payne</td>
<td>University of Utah</td>
</tr>
<tr>
<td>Samuel Pichardo</td>
<td>University of Calgary</td>
</tr>
<tr>
<td>Mattieu Pernot</td>
<td>Physics for Medicine, INSERM</td>
</tr>
<tr>
<td>Daniel Razansky</td>
<td>University and ETH Zurich</td>
</tr>
<tr>
<td>Eleanor Stride</td>
<td>University of Oxford</td>
</tr>
<tr>
<td>Juan Tu</td>
<td>Institute of Acoustics</td>
</tr>
<tr>
<td>Shin Yoshizawa</td>
<td>Tohoku University</td>
</tr>
<tr>
<td>Hsiang-Yu Yu</td>
<td>Taipei Veterans General Hospital</td>
</tr>
<tr>
<td>Lian Zhang</td>
<td>Chongqing Medical University</td>
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</tbody>
</table>
## Virtual Panel Speakers

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Isabelle Aubert</td>
<td>Sunnybrook Research Institute</td>
</tr>
<tr>
<td>Jean-Francois Aubry</td>
<td>Physics for Medicine Paris</td>
</tr>
<tr>
<td>Scott Robert Burks</td>
<td>National Institutes of Health</td>
</tr>
<tr>
<td>Gregory Czarnota</td>
<td>Sunnybrook Health Sciences Centre</td>
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<tr>
<td>Catharina Davies</td>
<td>Norwegian University of Science and Technology</td>
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<tr>
<td>Emad Ebbini</td>
<td>University of Minnesota</td>
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<tr>
<td>Mario Fabiilli</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Jürgen Götz</td>
<td>University of Queensland</td>
</tr>
<tr>
<td>Michael Gray</td>
<td>University of Oxford</td>
</tr>
<tr>
<td>Christy Holland</td>
<td>University of Cincinnati</td>
</tr>
<tr>
<td>Sara Lauren Johnson</td>
<td>University of Utah</td>
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<tr>
<td>Hyungmin Kim</td>
<td>Korea Institute of Science and Technology</td>
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<tr>
<td>Elisa Konofagou</td>
<td>Columbia University</td>
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<tr>
<td>James Kwan</td>
<td>University of Oxford</td>
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<tr>
<td>Twan Lammers</td>
<td>RWTH Aachen University</td>
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<td>Harriet Lea-Banks</td>
<td>Sunnybrook Research Institute</td>
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<tr>
<td>Wynn Legon</td>
<td>Virginia Polytechnic Institute and State University</td>
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<tr>
<td>Mikhail Shapiro</td>
<td>California Institute of Technology</td>
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<tr>
<td>Katsuro Tachibana</td>
<td>Fukuoka University</td>
</tr>
<tr>
<td>Nick Todd</td>
<td>Brigham and Women’s Hospital</td>
</tr>
<tr>
<td>Hsiang-Yu Yu</td>
<td>Taipei Veterans General Hospital</td>
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</tbody>
</table>
Sponsors & Exhibitors

Platinum

[Image of Sponsors]

Gold

Silver

Gala Event

Women In Stem Session

Bronze

Exhibitors
General Information

Registration / Information Desk
Visit us in the Main Foyer of the Old Vic Building. We’re happy to help with anything you need. Our hours will be:

- Tuesday, June 7: Noon – 6pm
- Wednesday, June 8: 6:30am – 5pm
- Thursday – Friday, June 9 - 10: 7am - 5pm

Certificates of Attendance
Attendees will receive an email after the conference with a link to download a Certificate of Attendance if needed.

Lost & Found
Should you lose or find anything, please report to the Information Desk for assistance.

Evaluation Survey
Please take a moment to complete a very short Evaluation Survey. Your feedback is very important for the development of future ISTU programs.

![QR Code](image-url)
# Program at a Glance

## 21st International Symposium on Therapeutic Ultrasound

(7-10 June 2022)

<table>
<thead>
<tr>
<th>Time</th>
<th>Day 1 (Tuesday, June 7)</th>
<th>Day 2 (Wednesday, June 8)</th>
<th>Day 3 (Thursday, June 9)</th>
<th>Day 4 (Friday, June 10)</th>
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<tbody>
<tr>
<td>6:30 - 7:30</td>
<td>Breakfast</td>
<td>Breakfast</td>
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<tr>
<td>7:30 - 8:30</td>
<td>Education</td>
<td>Education</td>
<td>Education</td>
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<tr>
<td>8:30 - 9:30</td>
<td>Opening Remarks</td>
<td>Awards Session</td>
<td>Plenary</td>
<td>Brain: Clinical Updates and Innovations</td>
</tr>
<tr>
<td>9:30 - 10:30</td>
<td>Coffee Break / Exhibits</td>
<td>Coffee Break / Exhibits</td>
<td>Coffee Break / Exhibits</td>
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</tr>
<tr>
<td>10:30 - 11:30</td>
<td>Lunch</td>
<td>Posters / Exhibits</td>
<td>Lunch</td>
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</tr>
<tr>
<td>11:30 - 12:30</td>
<td>Student Awards Talks</td>
<td>Student Poster Award Session/ Posters / Exhibits</td>
<td></td>
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<tr>
<td>12:30 - 13:00</td>
<td>Lunch</td>
<td>Lunch</td>
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<tr>
<td>1:30 - 2:30</td>
<td>Clinical Updates and Innovations (Other than Brain)</td>
<td>Thermal Therapy</td>
<td>Cavitation Physics, Biophysics and Agents</td>
<td></td>
</tr>
<tr>
<td>2:30 - 3:30</td>
<td>Drug Delivery</td>
<td>Emerging Technology and Applications</td>
<td>Physic and Modelling/ Hardware</td>
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<tr>
<td>3:30 - 4:30</td>
<td></td>
<td>Coffee Break / Exhibits</td>
<td>General Assembly</td>
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<tr>
<td>4:30 - 5:30</td>
<td></td>
<td>Coffee Break / Exhibits</td>
<td>Student Mentorship Session</td>
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<td>5:30 - 6:30</td>
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<tr>
<td>6:30 - 7:30</td>
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<td>Gala Event at the CN Tower 7:30 - 10:00</td>
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<td>7:30 +</td>
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### Building Locations

- **Isabel Bader Theatre**
- **Northrop Frye NF003**
- **Victoria College: Old Vic & Alumni Hall (Posters) and Foyer (Exhibitors + Refreshments) and Registration/Info Desk**
- **Burwash Dining Hall**
General Tour Info

Participants had the opportunity during online registration to sign up for three different tours to research sites. **Space is limited for all tours.** If you missed the opportunity, stop by the Registration Desk to verify if a spot on a tour may be available.

**Tuesday, June 7**

**Toronto Metropolitan University (formerly Ryerson University)**

Our 20 minute tours will give attendees a glimpse into the various kinds of ultrasound and related research that are happening at iBEST. Attendees will learn about various iBEST equipment/facilities and how the shared lab facilitates collaborative research.

The iBEST lab is located on the 7th floor in the Li Ka Shing Knowledge Institute (209 Victoria Street). Attendees will enter through the Victoria Street entrance, and sign-in (conducting health screening and verifying vaccination status). **iBEST visitors will require the following for entry:**

1) One piece of government-issued photo identification ID (identification)
2) Proof of full COVID-19 vaccination (have received the full series of a COVID-19 vaccine or combination of COVID-19 vaccines approved for use in Canada AND having received the final dose of the COVID-19 vaccine at least 14 days ago). To download or print your vaccination receipt, visit Ontario.ca/proofofvaccination or call 1-833-943-3900, between 8 a.m. to 8 p.m., 7 days a week.

3) Successful completion of symptom screening at the entrance
4) Wearing a mask at all times while on site
5) No food or drink allowed in the iBEST labs

- Tour 1: 1:00pm - 1:20pm
- Tour 2: 1:20pm - 1:40pm
- Tour 3: 1:40pm – 2:00pm
- Tour 4: 2:00pm - 2:20pm
- Tour 5: 2:20pm - 2:40pm
- Tour 6: 2:40pm – 3:00pm
Profound Medical Corporation Facilities

Please join the Focused Ultrasound Foundation and Profound Medical for a “No Zoom, We Promise” reception & tour at the Profound Medical Corporation facilities. Drinks and light hors d’oeuvres will be served. Shuttles will be provided from Victoria College. (Please note: IDs required to board shuttle.) Tour times are:

- Group 1A: 4:30pm Departure / 6:45pm Return
  - 5:30 Facility Tour
  - 6:00 Reception
- Group 1B: 4:30pm Departure / 6:45pm Return
  - 5:30 Reception
  - 6:00 Facility Tour
- Group 2A: 6:00 Departure / 8:30pm Return
  - 7:00 Facility Tour
  - 7:30 Reception
- Group 2B: 6:00 Departure / 8:30pm Return
  - 7:00 Reception
  - 7:30 Facility Tour

Wednesday, June 8

Sunnybrook Research Institute

Visit Sunnybrook Health Sciences Centre to tour the Focused Ultrasound Lab, Advanced Machine Shop and Device Development Lab, and the research MRI facilities and clinical FUS systems.

A shuttle bus will be provided from Victoria College. After leaving Sunnybrook, the bus will return downtown, dropping off at the Welcome Reception at the Amsterdam Brewhouse, or returning you to Victoria College. When entering the hospital labs (Toronto Metropolitan University and Sunnybrook Research Institute), tour attendees must wear a face mask, and sign-in by confirming the health screening questions and vaccination status. Tour time:

- Bus departs Victoria College: 5:45pm
- Bus arrives at Amsterdam Brewhouse: 7:45pm
- Bus arrives at Victoria College: 8pm
Welcome Reception

Wednesday, June 8
7:30pm – 9:30pm

Amsterdam BrewHouse
245 Queens Quay W

Join us for a fun evening on the patio overlooking the Toronto Harbourfront!

Catch up with colleagues while enjoying dinner and a special selection of unique Canadian desserts, plus drinks! **We will also be featuring the participants in the Future of Therapeutic Ultrasound Poster Session.** The inaugural session of the Future of Therapeutic Ultrasound will provide a great opportunity for academic and industry leaders to network and speak directly with current graduate students and postdoctoral researchers who are actively seeking positions.

Registration for this free event occurred during online registration as space is limited. If you missed the opportunity, stop by the Registration Desk to verify if a spot may be available.

Public Transit Directions from Victoria College via Union Station (25 minutes):

- Take the TTC Southbound on Line 1 from Museum Station to Union Station
- At Union Station, transfer to the 510 Streetcar and travel three stops to Queens Quay West at Rees St
- Walk (4 minutes) from the streetcar stop to the Amsterdam BrewHouse

Public Transit Directions from Victoria College via St Andrew’s Station (25 minutes):

- Take the TTC Southbound on Line 1 from Museum Station to St. Andrew’s Station
- Walk (17 minutes) from St. Andrew's Station to the Amsterdam
Mix, mingle and catch up with friends and colleagues while enjoying a selection of local and sustainable hors d’oeuvres and beverages as jaw-dropping as the view!

We are thrilled to host this year’s Gala Event on the Main Observation Level at the iconic CN Tower, home to the city’s most awe-inspiring views. Defining the Toronto skyline at 553.33m (1,815ft5in), the CN Tower is Canada’s most recognizable and celebrated icon. Ticket Sales for the Gala Event were limited and available for purchase online during the Registration process.

Enjoy the ambiance while listening to a Jazz Quartet from the University of Toronto Music Department. We will also be highlighting all of our Annual Award Winners.

The Main Observation Level is located at 114 stories or 346 metres (1,136 feet) above the ground, overlooks the twinkling lights of the city, and offers floor-to-ceiling window walls which give guests the chance to see the full sweep of the cityscape. Access to the Main Observation Level is complimentary for guests of the event.

Public Transit Directions from Victoria College via Union Station (20 minutes):

• Take the TTC Southbound on Line 1 from Museum Station to Union Station

• Walk west, following the signs for the CN Tower via the P.A.T.H./SkyWalk (10 minute walk)

Our thanks to the Gala Event Sponsor!
**Plenary Session Speakers**

*Wednesday, June 8*

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>09:05-9:30</td>
<td>Histotripsy for Liver Cancer Treatment – Latest Progress on Preclinical and Clinical Studies</td>
<td>Zhen Xu, PhD (University of Michigan)</td>
</tr>
<tr>
<td>09:30-9:55</td>
<td>MR guided Focused Ultrasound - Was the expectation for the surgery of the future eventually met?</td>
<td>Alessandro Napoli, MD, PhD (Sapienza University of Rome)</td>
</tr>
</tbody>
</table>

**Annual Award Winners**

*Thursday, June 9*

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30-8:43</td>
<td>The William and Francis Fry Honorary Fellowship for Contributions to Therapeutic Ultrasound</td>
<td>Natalia I. Vykhodtseva, PhD (Harvard Medical School, Brigham and Women's Hospital)</td>
</tr>
<tr>
<td>08:43-9:06</td>
<td>The Frederic Lizzi Early Career Award Lecture Drug Delivery Across the Blood-Brain Barrier Using Short-Pulse Ultrasound and Microbubbles</td>
<td>James J Choi, PhD (Imperial College London)</td>
</tr>
<tr>
<td>09:06-9:29</td>
<td>The Frederic Lizzi Early Career Award Lecture Fusion, Fractionation, and Frustration: An Academic Life in Acoustic Cavitation</td>
<td>Kenneth Bryan Bader, PhD (University of Chicago)</td>
</tr>
<tr>
<td>09:29-9:52</td>
<td>Early Career Clinical Investigator Award Lecture</td>
<td>Nir Lipsman, MD, PhD, FRCSC (Sunnybrook Health Sciences Centre)</td>
</tr>
</tbody>
</table>
Wednesday, June 08

7:30 AM-8:30 AM  Education Session 1  Isabel Bader Theatre
CHAIRPERSON  Harriet Lea-Banks

7:30 AM-7:35 AM  Introduction

7:35 AM-7:55 AM  Challenges in Delivery of Drugs to Tumors and Across the Blood-brain Barrier: Effects of Ultrasound
Catharina Davies (Norwegian University of Science and Technology, Trondheim, Norway)

7:55 AM-8:00 AM  Q&A

8:00 AM-8:20 AM  Ultrasound Neuromodulation and Sonogenetics
Lei Sun (The Hong Kong Polytechnic University)

8:20 AM-8:25 AM  Q&A

8:30 AM-9:00 AM  Opening Remarks
CHAIRPERSONS  David Goertz; Kullervo Hynynen; Cyril Lafon; Meaghan O'Reilly

9:00 AM-10:00 AM  Plenary Session  Isabel Bader Theatre

9:00 AM-9:05 AM  Introduction

9:05 AM-9:25 AM  Histotripsy for Liver Cancer Treatment – Latest Progress on Preclinical and Clinical Studies
Zhen Xu (University of Michigan)

9:25 AM-9:30 AM  Q&A

9:30 AM-9:50 AM  MR Guided Focused Ultrasound. Was the Expectation for the Surgery of the Future Eventually Met?
Alessandro Napoli (Sapienza University of Rome)

9:50 AM-9:55 AM  Q&A

10:00 AM-10:30 AM  Coffee Break  Victoria College Building
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</thead>
<tbody>
<tr>
<td>10:30 AM-12:30 PM</td>
<td><strong>Neuromodulation</strong> Isabel Bader Theatre</td>
</tr>
<tr>
<td>CHAIRPERSONS</td>
<td>Jean-Francois Aubry; Hyungmin Kim</td>
</tr>
<tr>
<td>10:30 AM-10:35 AM</td>
<td><strong>Introduction</strong></td>
</tr>
<tr>
<td>10:35 AM-10:50 AM</td>
<td><strong>Noninvasive and Cell-Type-Specific Neuromodulation by Integrating Ultrasound with Genetics</strong> Hong Chen (Washington University in St. Louis)</td>
</tr>
<tr>
<td>10:50 AM-11:05 AM</td>
<td><strong>High Precision Optically-Guided Transcranial Ultrasound Stimulation in the Mouse Brain</strong> Daniel Razansky (University and ETH Zurich)</td>
</tr>
<tr>
<td>11:05 AM-11:12 AM</td>
<td><strong>Low-intensity Focused Ultrasound Mediates Tissue Protection after Stroke</strong> Lauren Ruger (Virginia Polytechnic Institute and State University)</td>
</tr>
<tr>
<td>11:12 AM-11:19 AM</td>
<td><strong>Durable Ultrasonic Neuromodulation for Targeted Treatments of Deep Brain Circuits</strong> Taylor Webb (University of Utah)</td>
</tr>
<tr>
<td>11:19 AM-11:26 AM</td>
<td><strong>Low Intensity Pulsed Ultrasound Excites Synaptic Transmission in Hippocampal Neuron Networks</strong> Fenfang Li (Shenzhen Bay Laboratory)</td>
</tr>
<tr>
<td>11:26 AM-11:33 AM</td>
<td><strong>Sonogenetics for Locomotor Behavior Modulation in Freely Moving Mice</strong> Kevin Xu (Washington University in St. Louis)</td>
</tr>
<tr>
<td>11:33 AM-11:40 AM</td>
<td><strong>Motor Responses Induced by LIFU Neuromodulation and Piezoelectric Vibration in Mice</strong> Jake Hesselink (University of Calgary)</td>
</tr>
<tr>
<td>11:40 AM-11:47 AM</td>
<td><strong>Transcranial Ultrasound Stimulation Safety in Humans: Personalized Simulation Pipeline of Ultrasound Induced Thermal Rises</strong> David Attali (Physics for Medicine Paris, Inserm U1273, ESPCI Paris, PSL University, CNRS UMR 8063, Paris, France; Department of Psychiatry, Service Hospitalo-Universitaire, Centre Hospitalier Sainte-Anne, Paris Descartes University, Paris, France)</td>
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<tr>
<td>11:47 AM-11:54 AM</td>
<td><strong>Focused Ultrasound Stimulation Enhances Neural Excitability and Mobility in Awake Mice</strong></td>
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<tr>
<td>11:54 AM-12:01 PM</td>
<td><strong>Selective Deep Brain Stimulation via Nanobubbles-Mediated Low-intensity Ultrasound</strong></td>
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<tr>
<td>12:01 PM-12:08 PM</td>
<td><strong>tFUS Induced Epilepsy Control with Real-time ECoG Monitoring on the Qwake Rodent Seizure Model</strong></td>
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<tr>
<td>12:08 PM-12:15 PM</td>
<td><strong>Piezo1 Mediates Ultrasonic Neuromodulation in Mouse Brain</strong></td>
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<tr>
<td>12:15 PM-12:22 PM</td>
<td><strong>Calcium Signaling Dynamics Evoked by FUS Stimulation in a Human Neural Cell Model</strong></td>
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<tr>
<td>12:22 PM-12:29 PM</td>
<td><strong>Controlled, Effective Ultrasonic Neuromodulation Through the Skull</strong></td>
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<tr>
<td>12:30 PM-2:00 PM</td>
<td><strong>Lunch</strong></td>
</tr>
<tr>
<td>12:40 PM-1:50 PM</td>
<td><strong>Poster Session 1</strong></td>
</tr>
</tbody>
</table>

- **Topography Predicts MRgFUS-Subthalamotomy Outcome in Parkinson Disease**
  Rafael Rodriguez-Rojas (FUNDACIÓN DE INVESTIGACIÓN HM HOSPITALES. CIF:G83643841)

- **Transcranial Shock Waves: Impact of Skull Bone and Brain Tissue on the Sound Field Parameters**
  Nina Reinhardt (Chair of Medical Engineering, RWTH Aachen University)

- **Ablation of the Rodent Fornix using MR-Guided Focused Ultrasound (MRgFUS)**
  Carena Cornelssen (University of Utah)

- **Transcranial Histotripsy Induces Blood Brain Barrier Opening and Repair**
  Sarah Duclos (University of Michigan)
- **Delivery of Mesenchymal Stem Cells using MR-Guided Focused Ultrasound Exerts Therapeutic Effects on Rodent Parkinsonian Model**
  Sheng-Kai Wu (Sunnybrook Research Institute)

- **Pressure Attenuation and Focal Shift Estimation for Therapeutic Ultrasound Applications at Low Frequencies**
  Sua Bae (Columbia University)

- **Behavior of Ultrasound Neuromodulation on the Kainic-Acid-induced Epilepsy Models**
  PO-Chun Chu (National Taiwan University)

- **A Low-Intensity Focused Ultrasound (LIFU) Neuromodulation Platform for Human Studies**
  Ali Zadeh (University of Calgary)

- **Rat Brain Stimulation by Shock Wave from Laser-Generated Focused Ultrasound Transducer**
  Jooho Lee (Jeju National University)

- **Effect of Skull Plastination on Ultrasound Transmission for Neuromodulation**
  Maxime Bilodeau (GAUS)

- **Modular Design for a Hybrid Multichannel TMS-tFUS Device**
  Mohammad Daneshzand (Massachusetts General Hospital, Harvard Medical School)

- **Simulation of Transcranial Ultrasound Transmission Based on Micro-CT Skull Images**
  Milan Fritsche (Technische Hochschule Nürnberg)

- **A Computational Method to Predict Peripheral Auditory Activation during Transcranial Ultrasound Stimulation (TUS) in Mice**
  Mi Hyun Choi (Stanford University)

- **Docetaxel Perfluorocarbon Nanodroplets: a New Glioblastoma Therapeutic Agent**
  Benoit Larrat (CEA)

- **Amplification of Drug Effects at Targeted Brain Regions for Treatment of Chronic Pain**
  Nick Todd (Brigham and Women’s Hospital)
- **Striatal Blood Brain Barrier Opening in Parkinson’s Disease**  
  Jose Pineda-Pardo (HM CINAC (Centro Integral de Neurociencias Abarca Campal), Hospital Universitario HM Puerta del Sur, HM Hospitales)

- **FUS Mediated Delivery of an AAV9 Gene Therapy for Huntington's Disease**  
  Beyza Erdem (Simmons University)

- **Remote Targeted Neurostimulation with Combined Ultrasonic and Magnetic Fields**  
  Jan Kubanek (University of Utah)

- **Ultrasound and Cationic Microbubble Assisted Gene Delivery in the Brain for Fragile X Syndrome Therapy**  
  Thomas ADOR (CNRS - Centre de Biophysique Moléculaire)

- **Adapting the Hybrid Angular Spectrum Method to Improve Simulation of Transcranial Ultrasound Propagation**  
  Ningrui Li (Stanford University)

- **A Comparison of Cavitation and Displacement During Non-invasive Peripheral Focused Ultrasound Neuromodulation**  
  Erica McCune (Columbia University)

- **Microbubbles for Blood-brain Barrier Opening: from In vitro to In vivo**  
  Ambre Dauba (Université Paris Saclay)

- **Phase-shift Nanoemulsions for the Targeted Treatment of Pancreatic Cancer**  
  Chloe McClenaghan (Ulster University)

- **Investigating Endothelial Sonoporation Under Fluid Flow Conditions**  
  Elahe Memari (Concordia University)

- **A Numerical Model of Ultrasound-Induced Nano-Drug Release**  
  Tyler Hornsby (Ryerson University)

- **New Sensitisers for Antimicrobial Sonodynamic/Photodynamic Therapy**  
  Heather Nesbitt (Ulster University)
- Optimization of Ultrasound-Mediated Microbubble Transfection of MicroRNA-126 to Endothelial Cells
  Stephanie He (Concordia University)

- Drug-loaded Microbubbles for Image-guided Treatment of Inflammation
  Yara Ensminger (University of Toronto)

- Effect of a Combined Immune Checkpoint Inhibitor and Mechanical Focused Ultrasound Treatment in a MC38 Preclinical Model
  Myleva Dahan (INSERM U1032)

- Ultrasound-stimulated Microbubble and Radiation Therapy Monitored by Dynamic Contrast Enhanced Magnetic Resonance Imaging
  Colleen Bailey (Sunnybrook Research Institute)

- Anatomical Guinea Pig Brain Comparative Atlas: A New Tool for Preclinical Focused Ultrasound Research
  Francesco Prada (IRCCS Istituto Carlo Besta, University of Virginia, Focused Ultrasound Foundation)

- Amygdala Neuromodulation for Reducing Agitation and Aggressive Behaviour in a Mouse Model of Alzheimer's Disease
  Flavia Venetucci Gouveia (The Hospital for Sick Children Research Institute)

- Agar/Wood-powder Breast Phantom for Focused Ultrasound Applications
  Christakis Damianou (Cyprus University of Technology)

- Spatially Targeted Sonobiopsy Releases Brain-derived Protein Biomarkers into the Blood Circulation in a Tauopathy Mouse Model
  Hong Chen (Washington University in St. Louis)

- Acoustic and Thermal Numerical Modelling of Transcranial Ultrasound Thermal Therapy
  Robert Andrew Drainville (LabTAU INSERM U1032)

- Cavitation Quantification Metric for Cross-system Comparison
  Robert Andrew Drainville (LabTAU INSERM U1032)

- A Low-cost Method of Cavitation Detection for Developing Histotripsy Transducers
  Theresa Gu (Dalhousie University)
1:55 PM-3:30 PM  **Student Awards Session**  Isabel Bader Theatre

**CHAIRPERSONS**  Richard Price; Eli Vlaisavljevich

1:55 PM-2:00 PM  **Introduction**

2:00 PM-2:09 PM  **The evolution of Ventral Intermediate Nucleus (VIM) Targeting in MRgFUS Thalamotomy for Tremor: An International Perspective**
Ayesha Jameel (Imperial College)

2:09 PM-2:18 PM  **MRI-targeted Focused Ultrasound Blood-brain Barrier Opening for Drug Delivery to Cerebral Cavernous Malformations**
Delaney Fisher (University of Virginia)

2:18 PM-2:27 PM  **Histotripsy for the Treatment of Primary Bone Tumors: In Vivo Canine Study**
Lauren Ruger (Virginia Polytechnic Institute and State University)

2:27 PM-2:36 PM  **Effective Drug Release from Safe Ultrasound-triggered Nanocarriers**
Matthew Wilson (University of Utah)

2:36 PM-2:45 PM  **Modulation of Cytoplasmic Diffusion by Low-intensity Pulsed Ultrasound and its Biological Effects**
Hyo Jun Kim (Korea Institute of Science and Technology (KIST))

2:45 PM-2:54 PM  **Temperature Sensitive State Switches For Focused Ultrasound Control of Macrophage Immunotherapy**
Abdullah Farooq (California Institute of Technology)

2:54 PM-3:03 PM  **FUS Lowers Pain Perception in Neuropathic Pain Patients**
Stephen Lee (Columbia University)

3:03 PM-3:12 PM  **Monitoring Thermal Lesions using Decorrelated Compounded Ultrasound Imaging**
Michael Nguyen (Ryerson University)

3:12 PM-3:21 PM  **Adaptive Refocusing of Broadband Wavefronts**
Collin Smith (UMN)
3:21 PM-3:30 PM  In situ Encapsulation of Free DNA with Microbubbles (MBs) and Focused Ultrasound (FUS)
Matthew Chen (University of Toronto)

3:30 PM-4:00 PM  Coffee Break  Victoria College Building

4:00 PM-5:30 PM  Clinical Updates and Innovations (Other than Brain)
Isabel Bader Theatre

CHAIRPERSONS  Alessandro Napoli; Pejman Ghanouni

4:00 PM-4:05 PM  Introduction

4:05 PM-4:20 PM  Clinical Trial Design for Musculoskeletal Applications of Focused Ultrasound
Matthew Bucknor (UCSF)

4:20 PM-4:35 PM  Applications of HIFU in Women’s Health
Lian Zhang (Chongqing Medical University)

4:35 PM-4:50 PM  Non-invasive Ultrasound Therapy of Calcific Aortic Valve Stenosis: From Basic Concept to First-in-human Study
Mathieu Pernot (Physics for Medicine, INSERM)

4:50 PM-4:57 PM  First in Man Study using HIFU to Occlude Placental Blood Vessels as a Method of Treating Twin-Twin Transfusion Syndrome - TTTS
Ian Rivens (Institute of Cancer Research)

4:57 PM-5:04 PM  Transrectal High-intensity Focused Ultrasound (TR-HIFU) for the Management of Rectal Deep Infiltrating Endometriosis: Results of Phase I Clinical Trials
Gil Dubernard (Hospices Civils de Lyon)

5:04 PM-5:11 PM  A Fully-Populated MR-Guided Focused Ultrasound Phased Array for the Treatment of Uterine Fibroids: A Feasibility Study
Ryan Jones (Sunnybrook Research Institute)

5:11 PM-5:18 PM  Comparison of Intraprostatic Calcification Measurements using CT versus MR Susceptibility Weighted Imaging in TULSA Patients
Sandeep Arora (Yale Medicine)
Paolo Cabras (Image Guided Therapy, ICube laboratory)

4:00 PM-5:30 PM  Drug Delivery  NF003
CHAIRPERSONS  Eun-Joo Park; Klazina Kooiman

4:00 PM-4:05 PM  Introduction

4:05 PM-4:20 PM  Gemcitabine-Loaded Microbubbles Reduce Toxicity of Chemoradiation
Eleanor Stride (University of Oxford)

4:20 PM-4:27 PM  Microbubble Mediated Chemo-sonodynamic Therapy for the Treatment of Prostate Cancer
Keiran Logan (Ulster University)

4:27 PM-4:34 PM  Sonoporation-mediated DNA Vaccination Against Hepatitis B
Yuanchao Shi (Shenzhen University)

4:34 PM-4:41 PM  Novel Drug Delivery Platform for Coronary and Peripheral Arteries Using Intravascular Lithotripsy
James Kwan (University of Oxford)

4:41 PM-4:48 PM  Sononeoperfusion: A New Therapeutic Effect of Enhancing Tumor Blood Perfusion Using Diagnostic Ultrasound and Microbubble
Zheng Liu (Xinqiao Hospital)

4:48 PM-4:55 PM  Focused Ultrasound Improves the Penetration of Intrathecally Administered Methotrexate to the Spinal Cord
Paige Smith (Sunnybrook Research Institute)

4:55 PM-5:02 PM  Focused Ultrasound Stimulated Docetaxel-loaded Nanobubbles for Breast Cancer Therapy
Patrick Dong Min Chang (University of Toronto)

5:02 PM-5:09 PM  A Quantitative Method to Study Ultrasound-induced Nano-drug Delivery
Tyler Hornsby (Ryerson University)
5:09 PM-5:16 PM  Comparing Drug Delivery Efficiency of Lipid-shelled Drug-loaded Nanobubbles Versus Microbubbles in Orthotopic Liver Tumors
Pinunta Nittayacharn (Case Western Reserve University)

5:16 PM-5:23 PM  Microbubble-mediated Mir-1 Delivery to Cardiomyocytes for Treatment of Hypertrophic Cardiomyopathy
Davindra Singh (Concordia University)

5:23 PM-5:30 PM  Enhancing Neoadjuvant Chemotherapy with Ultrasound Stimulated Microbubbles in an Orthotopic Murine Breast Cancer Model
Carly Pellow (Sunnybrook Research Institute)

5:45 PM-7:45 PM  Tours of Sunnybrook Research Institute
Sunnybrook HSC

7:30 PM-9:30 PM  Welcome Reception
Amsterdam BrewHouse

Thursday, June 09

7:30 AM-8:30 AM  Education Session 2
Isabel Bader Theatre

CHAIRPERSONS  Brandon Helfield, Himanshu Shekhar

7:30 AM-7:35 AM  Introduction

7:35 AM-7:55 AM  Therapeutic Ultrasound and Immunotherapy: State of the Field and Future Directions
Frederic Padilla (Focused Ultrasound Foundation & University of Virginia)

7:55 AM-8:00 AM  Q&A

8:00 AM-8:20 AM  Ultrasound Bioeffects: Acoustic Mechanisms for Therapy and Safety
Diane Dalecki (University of Rochester)

8:20 AM-8:25 AM  Q&A

8:30 AM-10:00 AM  Awards Session
Isabel Bader Theatre

8:30 AM-8:33 AM  Introduction - Fry Awardee

8:30 AM-8:33 AM  Introduction - Fry Awardee: Natalia Vykhodsteva
8:33 AM-8:43 AM  **Fry Award Lecture**  
Kullervo Hynynen (Sunnybrook Research Institute/University of Toronto)

8:43 AM-8:46 AM  **Introduction - Lizzi Awardee: Kenneth Bader**

8:46 AM-9:01 AM  **Lizzi Award Lecture**  
Kenneth Bader (University of Chicago)

9:01 AM-9:06 AM  **Q&A**

9:06 AM-9:09 AM  **Introduction - Lizzi Awardee: James Choi**

9:09 AM-9:24 AM  **Lizzi Award Lecture**  
James Choi (Imperial College London)

9:24 AM-9:29 AM  **Q&A**

9:29 AM-9:32 AM  **Introduction - Early Clinical Awardee: Nir Lipsman**

9:32 AM-9:47 AM  **Early Career Clinical Award Lecture**  
Nir Lipsman (Sunnybrook Health Sciences Centre)

9:47 AM-9:52 AM  **Q&A**

9:52 AM-9:57 AM  **Women in STEM**

10:00 AM-10:30 AM  **Coffee Break**  
Victoria College Building

10:30 AM-12:30 PM  **Immunotherapy and Oncology**  
Isabel Bader Theatre

**CHAIRPERSONS**  
Natasha Sheybani; Ivan Suarez-Castellanos

10:30 AM-10:35 AM  **Introduction**

10:35 AM-10:50 AM  **The Impact of Microbubble Cavitation on the Viability, Migration and Cell Cycle Distribution of Melanoma Cells**  
Juan Tu (Institute of Acoustics)

10:50 AM-10:57 AM  **Ultrasound-Mediated Drug Free Theranostics for Treatment of Prostate Cancer**  
Reshani Perera (Case Western Reserve University)
10:57 AM-11:04 AM  Novel MRI-Guided Focused Ultrasound-Stimulated Microbubble Radiation Enhancement Treatment for Breast Cancer
Gregory Czarnota (Sunnybrook Research Institute)

11:04 AM-11:11 AM  Partial Thermal Ablation of Melanoma Augments Intratumoral IL-1b Expression, Implicating Pyroptosis as Pro-Tumorigenic
Richard Price (University of Virginia)

11:11 AM-11:18 AM  Focused Ultrasound Immunomodulation on the Myeloid Compartment of the Brain in Treating GBM and Alzheimer's Disease
Tao Sun (Brigham and Women's Hospital, Harvard Medical School)

11:18 AM-11:25 AM  FUS-aided ImmunoPET for Quantitative Imaging of PD-L1 Expression in Glioblastoma.
Céline Chevaleyre (Paris-Saclay University, CEA, CNRS, Inserm)

11:25 AM-11:32 AM  Influence of Boiling Histotripsy on Melanoma Growth Control and Acquisition of Tumor Antigen in Tumor-draining Lymphnodes
Richard Price (University of Virginia)

11:32 AM-11:39 AM  Effects of Fluorescein-mediated Sonodynamic Treatment on the Glioma Microenvironment and Immune Landscape
Nicoletta Corradino (IRCCS Istituto C. Besta, University of Milan)

11:39 AM-11:46 AM  Transcriptomic Effects of Nonablative Focused Ultrasound Treatment on Murine Breast and Melanoma Tumors
Scott Burks (National Institutes of Health Clinical Center)

11:46 AM-11:53 AM  FUS Thermal Ablation and Anti-PD-1 Checkpoint Inhibitor Combination Therapy in Murine MMTV-PyMT Breast Cancer
Sara Johnson (University of Utah)

11:53 AM-12:00 PM  Assessing Microbubble Mediated Microvascular Disruption Therapy with Two-photon Microscopy and Cavitation Monitoring
Xiaoxiao Zhao (University of Toronto)
12:00 PM-12:07 PM  Endobronchial Ultrasound for Lung Cancer Anti-vascular Therapy  
Yu-Jack Shen (University of Toronto)

12:07 PM-12:14 PM  Enhancement of 5-ALA Mediated Sonodynamic Therapeutic Effect by MEK Inhibition  
Kuochen Wei (Chang Gung Memorial Hospital)

12:14 PM-12:21 PM  Low Frequency Nanobubbles-Enhanced Ultrasound Mechanotherapy  
Mike Bismuth (Tel Aviv university)

12:21 PM-12:28 PM  Novel Metal–Organic Framework (MOF)-Based Ultrasound-Responsive Sonosensitizer for Bladder Cancer Therapy  
Zheng Zhu (Harvard Medical School)

12:30 PM-2:00 PM  Lunch  
Burwash Dining Hall

12:40 PM-1:55 PM  Student Awards Poster Session  
Victoria College

CHAIRPERSON  Mikhail Shapiro

-   Neuronavigation-Guided Transcranial Histotripsy on Human Cadavers: A Feasibility Study  
Sang Won Choi (University of Michigan)

-   High-Speed Microscopy of Microbubble-Vessel Interactions in an In-Vivo Chorioallantoic Membrane Model  
Rojin Anbarafshan (Sunnybrook Research Institute, University of Toronto)

-   MR-Thermometry Pre-Treatment Targeting for MR-Guided Histotripsy  
Dinank Gupta (University of Michigan)

-   Simulation of Transvertebral Passive Acoustic Mapping for Bubble Based Therapy in the Spinal Cord  
Andrew Frizado (Sunnybrook Research Institute/University of Toronto)

-   Decorrelation Time Mapping for Analysis of Nanobubble Dynamics in Tumours  
Dana Wegierak (Case Western Reserve University)
- **Comparing Focused Ultrasound and Dry Needling Therapies on Healing of Rat Tendinopathy**  
Molly Smallcomb (The Pennsylvania State University)

- **Array Based Focusing to the Human Vertebral Canal Using Non-Invasive Phase Correction**  
David Martin (University of Toronto)

- **Motor Responses Induced by LIFU Neuromodulation and Piezoelectric Vibration in Mice**  
Jake Hesselink (University of Calgary)

- **Simulation-Guided Navigation System for Transcranial Focused Ultrasound**  
TaeYoung Park (Bio-Medical Science and Technology, KIST School, Korea Institute of Science and Technology)

- **Sonoporation-Mediated DNA Vaccination Against Hepatitis B**  
Yuanchao Shi (Shenzhen University)

- **Cavitation Bubble Cloud Behavior and Tissue Ablation from a 6.3 MHz High Frequency Endoscopic Histotripsy System**  
Jessica Gannon (Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences)

- **Small Focal Volume Blood Brain Barrier Opening in the Non-Human Primate through Intact Skull**  
Thomas Manuel (Vanderbilt University)

- **A 32-Element PZT-PVDF Stacked Transducer Array for Transcranial Focusing and Reception Using Short Ultrasound Pulses**  
Zheng Jiang (Imperial College London)

- **Sonogenetics for Locomotor Behavior Modulation in Freely Moving Mice**  
Kevin Xu (Washington University in St. Louis)

- **Partial Thermal Ablation of Melanoma Augments Intratumoral IL-1b Expression, Implicating Pyroptosis as Pro-tumorigenic**  
Mark Schwartz (University of Virginia)

- **Characterisation of Cavitation Threshold Properties of Selected Hydrogels as Tissue Mimics for Therapeutic Ultrasound**  
Lisa Braunstein (The Institute of Cancer Research)
- Transcranial Ultrasound Stimulation Safety in Humans: Personalized Simulation Pipeline of Ultrasound Induced Thermal Rises
  David Attali (Physics for Medicine Paris, Inserm U1273, ESPCI Paris, PSL University, CNRS UMR 8063, Paris, France ; Department of Psychiatry, Service Hospitalo-Universitaire, Centre Hospitalier Sainte-Anne, Paris Descartes University, Paris, France)

- A Neuronavigation-guided Sonobiopsy Device for the Noninvasive Diagnosis of Brain Diseases
  Lu Xu (Washington University in St.Louis)

- Engineering Viral Vectors for Acoustically Targeted Gene Delivery
  Hongyi Li (California Institute of Technology)

- Non Invasive Liver Treatment With a Toroidal HIFU Transducer In Vivo Study
  Sophie Cambronero (LabTAU, INSERM, Centre Léon Bérard, Université Lyon)

12:45 PM-1:55 PM  Poster Session 2  Victoria College Building

- Microbubble Dynamics in Brain Microvessels at 330 kHz and 1 MHz Ultrasound Frequencies
  James Bezer (Imperial College London)

- Ultrasound-Triggered Microbubble Destruction Enhances the Radiosensitivity of Glioblastoma by Inhibiting Autophagy
  Ying He (Xinqiao Hospital, Army Medical University)

- Influence of a Dual-Frequency Excitation on the Inertial Cavitation Threshold in Various Viscoelastic Mediums
  Tatiana Filonets (National Taiwan University)

- Towards a Mechanistic Understanding of Therapeutic Ultrasound as a Treatment Modality for Alzheimer Disease
  Jürgen Götz (University of Queensland)

- Reflectors for Therapeutic Vortex Beam Generation
  Noe Jimenez (Universitat Politècnica de València)

- Quantitative Assessment of Tissue Susceptibility to Boiling Histotripsy
  Alisa Krokhmal (Lomonosov Moscow State University, Moscow, Russian Federation)

- Feasibility of The Noninvasive Gene Delivery To Large
Brain Areas
Shirin Nouraein (Rice university)

- Control of the Extent of Lesion Formation in Pressure-Modulated Shockwave Histotripsy (PSH) Approach: An In Vitro Study
  Jun Hong Park (Korea Institute of Science and Technology (KIST))

- Recovery of Markers through Insonation: An Alternative to Monitoring Gene Expression in Deep Tissues
  Joon Pyung Seo (Rice University)

- Estimation of the Acoustic Attenuation Along the Propagation Path of Focused Ultrasound using Reflected Echoes: Ex Vivo Study
  Tianfeng Zhang (ChongQing Medical University)

- Bubble Dynamics on the Potential Therapeutic Ultrasound Contrast Agents with Heterodyne Driving Pulses
  Xue Song (Shanghai Jiao Tong University)

- USgHIFU for Unresectable Pancreatic Cancer: Survival after Successful Ablation (NPVR 50%)
  Kun ZHOU (The Second Affiliated Hospital of Chongqing Medical University)

- Inertial Cavitation with Low Energy Caused by Focused Ultrasound Thalamotomy for Tremor-dominant Parkinson’s Disease
  Toshio Yamaguchi (Shin-yurigaoka General Hospital)

- Single Acoustic Hologram for Reconstructing Acoustic Fields of HIFU Arrays
  Azamat Kaloev (Physics Faculty, Lomonosov Moscow State University, Moscow, Russian Federation; Institut Polytechnique, Paris, France)

- Schlieren-Optical Characterization of Ultrasound Waves – Towards an MRI-compatible Setup
  Johannes Lindemeyer (University of Cologne, Faculty of Medicine and University Hospital Cologne)

- Anti-Cancer Provascular Therapy using Ultrasound Microbubble Cavitation and Nitrites to Increase Radiotherapy Efficacy
  Francois Yu (Université de Montréal)
- Ultrasound and Microbubbles Mediated Oncolytic Virotherapy to Treat Cancer
  Kishan Italiya (CRCHUM: “Centre Hospitalier de l’Université de Montréal” Research Centre, Montreal, QC, Canada)

- Stable Cavitation Behaviour of Size-Isolated Protein-Shelled Microbubbles and SonoVue
  Anuj Kaushik (IIT Gandhinagar)

- Passive Cavitation Detection using a Fiber Bragg Grating Sensor
  Kuldeep Jajoria (Indian Institute Of Technology-Gandhinagar (IIT-Gandhinagar))

- Sonodynamic Response of a Water-Soluble Porphyrin Derivative to Ultrasound Exposure at 1 MHz
  Manita Das (Indian Institute of Technology (IIT) Gandhinagar)

- Histotripsy Bubble Cloud Contrast using Chirp-Coded Excitation and Volterra Filtering
  Vishwas Trivedi (Indian Institute of Technology Gandhinagar, India)

- Sonogenetics for Neuronal Inhibition and Alleviation of Kainic Acid Induced Seizure In Vivo
  Ting ZHU (The Hong Kong Polytechnic University)

- Evaluation of 8 mm Diameter Miniature Histotripsy Transducers of Various Operating Frequencies (4, 5 and 6 MHz
  Justin Greige (Dalhousie University)

- Feasibility Assessment of Aerosolized Contrast to enhance Airway Imaging
  Phillip Durham (Eshelman School of Pharmacy, University of North Carolina at Chapel Hill)

- A Spinal “Back-Door” Approach for Gene Delivery into the Brain: An Alternative to Ultrasound BBB Opening Method
  Hiroshi Kida (Fukuoka University)

- Influence of Nanobubble Size Distribution on Ultrasound-Mediated Plasmid DNA and Messenger RNA Gene Delivery
  Hiroshi Kida (Fukuoka University)

- Ultrasound Modulation of Glymphatic System
  Ming-Yen Hsiao (National Taiwan University Hospital)

- Effectiveness of 3 MHz Ultrasound in Ex-vivo Scleral Delivery of Macromolecules of Different Sizes
  Hanaa Almogbil (George Washington University)
- Claudin-5 Binder Enhances Focused Ultrasound-Mediated Opening in vitro
  Liyu Chen (Queensland Brain Institute)

- Acoustic Coupling Pads for the Control of Ultrasound Neuromodulation Exposure
  Samantha Schafer (Drexel University)

- Imaging Mechanisms of Therapeutic Ultrasound in Human Islets in vitro
  Andrew Chen (The George Washington University)

- The Cost-Effectiveness of Unilateral MRgFUS Thalamotomy for Medically Refractory Essential Tremor in England, UK.
  Ayesha Jameel (Imperial College)

- Relation between in-vitro Microbubbles Cavitation Threshold and in-vivo Blood-Brain Barrier Opening (BBBO)
  Alexis Vivien (Bracco Suisse SA)

- The Role of Boosting based Machine Learning Algorithms in Predicting the Outcome of HIFU Ablation of Uterine Fibroids
  Emine Akpinar (Yildiz Technical University)

- Numerical Approach for Treatment Planning and Aberration Correction for Renal HIFU Ablation based on Computed Tomography Data
  George Schade (University of Washington)

- Volumetric Analysis of Thermal Dose and Vascular Perfusion in MR-HIFU Ablation of Pediatric Osteoid Osteoma
  Reshma Modi (Children’s National Medical Center)

2:00 PM-3:30 PM  
**Thermal Therapy**  
Isabel Bader Theatre

CHAIRPERSONS  
Holger Gruell; W. Apoutou N’DJIN

2:00 PM-2:04 PM  
**Introduction**

2:04 PM-2:19 PM  
Developing Imaging Biomarkers for MR Guided FUS Breast Cancer Treatments
  Allison Payne (University of Utah)

2:19 PM-2:34 PM  
Observation of Cavitation Bubbles Generated in Sliced Tissue Phantom for Cavitation-enhanced Heating using High Speed Camera
  Shin Yoshizawa (Tohoku University)
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:34 PM-2:41 PM</td>
<td><strong>High Intensity Focused Ultrasound (HIFU) Ablation of Fetal Rabbit Umbilicus</strong></td>
<td>Ava Danialy (University of Toronto)</td>
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<tr>
<td>2:41 PM-2:48 PM</td>
<td><strong>Thermal Treatment Planning Module for Clinical Ultrasound Ablation of Prostate Cancer</strong></td>
<td>Pragya Gupta (University of California San Francisco)</td>
</tr>
<tr>
<td>2:48 PM-2:55 PM</td>
<td><strong>Multichannel Matrix-array based System for Small Animal Hyperthermia and Ablation</strong></td>
<td>Marc Fournelle (Fraunhofer IBMT)</td>
</tr>
<tr>
<td>2:55 PM-3:02 PM</td>
<td><strong>Comparison of HIFU Lesion Monitoring Techniques based on B-mode Images</strong></td>
<td>Thomas Payen (LabTau)</td>
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<tr>
<td>3:02 PM-3:09 PM</td>
<td><strong>Real-time Lesion Monitoring during HIFU Treatment using Harmonic Motion Imaging Guided FUS (HMIgFUS) ex vivo &amp; Human in vivo</strong></td>
<td>Xiaoyue Li (Columbia University)</td>
</tr>
<tr>
<td>3:09 PM-3:16 PM</td>
<td><strong>Feasibility of Volumetric Hyperthermia using the InSightec ExAblate Body System</strong></td>
<td>Kisoo Kim (University of California, San Francisco)</td>
</tr>
<tr>
<td>3:16 PM-3:23 PM</td>
<td><strong>Patient Specific Adjuvant Hyperthermia in Prostate, using a Novel Phased-array Applicator of Transperineal Ultrasound</strong></td>
<td>Pauline Guillemin (Geneva University)</td>
</tr>
<tr>
<td>3:23 PM-3:30 PM</td>
<td><strong>Intraoperative HIFU Treatment at the Hepatic Confluence Preclinical Study</strong></td>
<td>Sophie Cambronero (LabTAU, INSERM, Centre Léon Bérard, Université Lyon)</td>
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<tr>
<td>2:00 PM-3:30 PM</td>
<td><strong>Cavitation Physics, Biophysics and Agents</strong></td>
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<tr>
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<td>CHAIRPERSONS: Naomi Matsuura; Christy Holland</td>
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</tr>
<tr>
<td>2:00 PM-2:05 PM</td>
<td><strong>Introduction</strong></td>
<td></td>
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<tr>
<td>2:05 PM-2:20 PM</td>
<td><strong>Therapeutic Applications of Nanobubbles in Cancer</strong></td>
<td>Agata Exner (Case Western Reserve University)</td>
</tr>
</tbody>
</table>
2:20 PM-2:27 PM  Cavitation Bubble Cloud Behavior and Tissue Ablation from a 6.3 MHz High Frequency Endoscopic Histotripsy System  
Jessica Gannon (Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences)

2:27 PM-2:34 PM  High-speed Microscopy of Microbubble-vessel Interactions in an in-vivo Chorioallantoic Membrane Model  
Rojin Anbarafshan (Sunnybrook Research Institute, University of Toronto)

2:34 PM-2:41 PM  Conditions for the Propagation of Focused Ultrasound through Dense Bubble Clouds with Minimum Loss: A Numerical Study  
Amin Jafarisojahrood (Sunnybrook Health Science Center)

2:41 PM-2:48 PM  Integrin Ligation Mediates Ca2+ Response Elicited by Cavitation Microbubble  
Fenfang Li (Shenzhen Bay Laboratory)

2:48 PM-2:55 PM  Characterisation of Cavitation Threshold Properties of Selected Hydrogels as Tissue Mimics for Therapeutic Ultrasound  
Lisa Braunstein (The Institute of Cancer Research)

2:55 PM-3:02 PM  Design of Radiosensitizing Pluronic Nanobubbles for Cancer Treatment  
Claire Counil (Case Western Reserve University)

3:02 PM-3:09 PM  High-speed Imaging of Nanoparticle-loaded Microbubbles for Drug Delivery  
Sofie Snipstad (Department of Physics, Norwegian University of Science and Technology; Department of Biotechnology and Nanomedicine, SINTEF Industry; Cancer Clinic, St. Olav’s Hospital, Trondheim, Norway)

Cameron Smith (California Institute of Technology)
3:16 PM-3:23 PM  Bubble nucleation in polyacrylamide hydrogels with varying stiffness and impurities  
Ferdousi Sabera Rawnaque  
(Pennsylvania State University)

3:23 PM-3:30 PM  Assessing Tumoral Vascular Permeability and Nanoparticle Extravasation with Nanobubble Contrast-enhanced Ultrasound Imaging  
Michaela Cooley (Case Western Reserve University)

3:30 PM-4:00 PM  Coffee Break  
Victoria College Building

4:00 PM-5:30 PM  Emerging Technology and Applications  
Isabel Bader Theatre

CHAIRPERSONS  
Julianna Simon; Laura Curiel

4:00 PM-4:05 PM  Introduction

4:05 PM-4:12 PM  Investigating Blood-labyrinth Barrier Opening using MRI-guided Focused Ultrasound combined with Microbubbles  
Neha Chauhan (Sunnybrook Research Institute)

4:12 PM-4:19 PM  Preclinical Evaluation of a Dual-Mode CMUT Probe For Ultrasound-guided HIFU Treatment  
Ivan Suarez-Castellanos (LabTAU - INSERM - Université de Lyon)

4:19 PM-4:26 PM  Sonobiopsy enables sensitive detection of glioblastoma-derived circulating tumor DNA  
Hong Chen (Washington University in St. Louis)

4:26 PM-4:33 PM  Effects of FUS Vasomodulation and Oral Administration of Ginkgo Biloba Extract on Diabetic Peripheral Neuropathy  
Gin-Shin Chen (National Health Research Institutes)

4:33 PM-4:40 PM  Bioprinting for Super-resolution Acoustic Droplet Vaporization in Hydrogels  
Mitra Aliabouzar (University of Michigan)

4:40 PM-4:47 PM  A Low-intensity Ultrasound Delivery System using Acoustic Holograms  
Diana Andres (Universitat Politècnica de València)
4:47 PM-4:54 PM  Regional Enhancement of Glymphatic Transport by Pulsed Transcranial FUS  
Seung-Schik Yoo (The Brigham and Women’s Hospital, Harvard Medical School)

4:54 PM-5:01 PM  Machine Learning-based Classification of Focused Ultrasound-stimulated Microbubble Activity in 3D Passive Cavitation Imaging  
Dallan McMahon (Sunnybrook Research Institute)

5:01 PM-5:08 PM  Array based focusing to the Human Vertebral Canal using Non-invasive Phase Correction  
David Martin (University of Toronto)

5:08 PM-5:15 PM  Control of Fibroblast Differentiation using Acoustic Droplet Vaporization  
Mario Fabiilli (University of Michigan)

5:15 PM-5:22 PM  Decorrelation Time Mapping for Analysis of Nanobubble Dynamics in Tumours  
Dana Wegierak (Case Western Reserve University)

5:22 PM-5:29 PM  A Neuronavigation-guided Sonobiopsy Device for the Noninvasive Diagnosis of Brain Diseases  
Lu Xu (Washington University in St.Louis)

4:00 PM-5:30 PM  Cavitation Monitoring and Control NF003

CHAIRPERSONS  Kevin Haworth; Antonios Pouliopoulos

4:00 PM-4:05 PM  Introduction

4:05 PM-4:12 PM  Real-time Transcranial Cavitation Monitoring for Blood-brain-barrier Opening in Non-human Primates  
Sua Bae (Columbia University)

4:12 PM-4:19 PM  3D Ultraharmonic Imaging for Exposure Calibration and Damage Prediction during Microbubble-mediated Ultrasound Brain Therapy  
Ryan Jones (Sunnybrook Research Institute)

4:19 PM-4:26 PM  Ultrafast Intrapulse Feedback Control of FUS-induced BBB Disruption  
Corentin Cornu (CEA Saclay)
4:26 PM-4:33 PM  Evaluating Cavitation Mapping During Histotripsy with Electronic Focal Steering
Greyson Stocker (University of Michigan)

4:33 PM-4:40 PM  Simulation of Transvertebral Passive Acoustic Mapping for Bubble Based Therapy in the Spinal Cord
Andrew Frizado (Sunnybrook Research Institute/University of Toronto)

4:40 PM-4:47 PM  The Fast and The Spurious: Characterization and Mitigation of Passive Acoustic Mapping and B-Mode Co-registration Errors
Michael Gray (University of Oxford)

4:47 PM-4:54 PM  Micro-elastography on Spheroids and the Impact of Ultrasonic Cavitation
Gabrielle Laloy Borgna (University of Lyon)

4:54 PM-5:01 PM  Immune Checkpoint Targeted Therapy in Glioma with Closed Loop Microbubble Enhanced Focused Ultrasound
Hohyun Lee (Georgia Institute of Technology)

5:01 PM-5:08 PM  Individualized Closed-loop Feedback Control of Focused Ultrasound for Blood-brain barrier Opening
Chih-Yen Chien (Washington University in St. Louis)

5:08 PM-5:15 PM  3D PAM of a Cavitating Source with Adaptive Beamformers
Audrey Sivadon (Inserm)

5:15 PM-5:22 PM  A Preclinical Sparse Hemispherical Array for Acoustic Monitoring and Control of Microbubble-mediated Ultrasound Brain Therapy
Yi Lin (University of Toronto)

5:22 PM-5:29 PM  Acoustic Emission Feedback based Blood–Brain Barrier Energy Control
Hsiang-Ching Lin (NaviFUS Corporation/National Taiwan University)

5:30 PM-6:00 PM  General Assembly  Isabel Bader Theatre

7:30 PM-10:00PM  Gala Event  CN Tower
Friday, June 10

7:30 AM-8:30 AM  Education Session 3  Isabel Bader Theatre
CHAIRPERSONS  Gregory Clement, Tao Sun

7:30 AM-7:35 AM  Introduction

7:35 AM-7:55 AM  AI in Ultrasound: Image Formation in the Deep Learning Age
Muyinatu Bell (Johns Hopkins University)

7:55 AM-8:00 AM  Q&A

8:00 AM-8:20 AM  Acoustic Mapping of Cavitation
Shukuan Lu (Xi’an Jiaotong University)

8:20 AM-8:25 AM  Q&A

8:30 AM-10:00 AM  Brain: Clinical Updates and Innovations  Isabel Bader Theatre
CHAIRPERSONS  Toshio Yamaguchi; Ying Meng

8:30 AM-8:33 AM  Introduction

8:33 AM-8:48 AM  Focused Ultrasound for Parkinson’s Disease: from Evidence to Experience
Raul Martinez Fernandez (Hospital HM Puerta del Sur)

8:48 AM-9:03 AM  Neuromodulation for Drug-resistant Epilepsy by Focused Ultrasound
Hsiang-Yu Yu (Taipei Veterans General Hospital)

9:03 AM-9:18 AM  Focused Ultrasound in Brain Cancer: Early Human Experience and Emerging Applications
Nir Lipsman (Sunnybrook Health Sciences Centre)

9:18 AM-9:25 AM  Pilot Study of Blood-brain barrier Disruption in Alzheimer’s Disease
Michael Canney (Carthera)

9:25 AM-9:32 AM  Combination of Neuronavigation-guided Focused Ultrasound and Bevacizumab for Patients with Recurrent Glioblastoma
Ko-Ting Chen (Chang Gung Memorial Hospital)
9:32 AM-9:39 AM  Combining Accelerometer and Handwriting Biomarkers towards the Evaluation of the Tremor with MRgFUS Thalamotomy  
Hongchae Baek (Cleveland Clinic Foundation)

9:39 AM-9:46 AM  Early Outcomes from First-in-human Use of Low Intensity Focused Ultrasound in Depressed Patients  
Amanda Arulpragasam  
(Brown University/VA Providence)

9:46 AM-9:53 AM  Ultrasonic Deep Brain Neuromodulation in Disorders of Consciousness  
Joshua Cain (UCLA)

9:53 AM-10:00 AM  Ultrasound-based BBB Opening leads to Drug Penetration in the Human Brain  
Adam Sonabend (Northwestern Medicine Malnati Brain Tumor Institute of the Lurie Comprehensive Cancer Center, Feinberg School of Medicine, Northwestern University)

10:30 AM-12:30 PM  Brain  
Isabel Bader Theatre

CHAIRPERSONS  Hao-Li Liu; Muna Aryal

10:30 AM-10:35 AM  Introduction

10:35 AM-10:42 AM  Engineering Viral Vectors for Acoustically Targeted Gene Delivery  
Hongyi Li (California Institute of Technology)

10:42 AM-10:49 AM  Evaluation of Subharmonic Emissions during Ultrasound-mediated Blood-brain Barrier Disruption in Glioblastoma Patients  
Nathan McDannold (Brigham and Women's Hospital, Harvard Medical School)

10:49 AM-10:56 AM  Focused Ultrasound Mediated Intranasal Delivery by Enhancing the Glymphatic Transportation  
Dezhuang Ye (Washington University in St Louis)

10:56 AM-11:03 AM  Small Focal Volume Blood Brain Barrier opening in the Non-human Primate through Intact Skull  
Thomas Manuel (Vanderbilt University)
11:03 AM-11:10 AM  
**In vivo Delivery of a Cobalt-based Drug using Rapid Short Pulses reduces the Amyloid Beta burden in Alzheimer’s Disease Mice**  
Sophie Morse (Imperial College London)

11:10 AM-11:17 AM  
**Repeated 5-Aminolevulinic Acid-mediated Sonodynamic Therapy Using MR-guided Focused Ultrasound in 9L Brain Tumour Model**  
Sheng-Kai Wu (Sunnybrook Research Institute)

11:17 AM-11:24 AM  
**Acoustic Holograms for Bilateral Blood-brain Barrier Opening in Mice**  
Sergio Jimenez Gambin (Columbia University)

11:24 AM-11:31 AM  
**Investigating the Feasibility of MRgFUS to Target Mesial Temporal Lobe Structures to Treat Q Temporal Lobe Epilepsy**  
Sijia Guo (University of Maryland)

11:31 AM-11:38 AM  
**Ultrasound-Stimulated Microbubbles Potentiated Enhancement of Radiation Response of Brain Tumors**  
Deepa Sharma (Sunnybrook Health Sciences Centre)

11:38 AM-11:45 AM  
**Effects of Single and Repeated FUS-mediated BBB Disruption Treatments on Neuroinflammation and Neurovascular Coupling**  
Nick Todd (Brigham and Women's Hospital)

11:45 AM-11:52 AM  
**Quantitative Determination of FUS-induced BBB Permeability using PET Imaging**  
Anthony Novell (BioMaps, Université Paris Saclay, CEA, CNRS, Inserm)

11:52 AM-11:59 AM  
**Theranostic Ultrasound-mediated Blood-brain Barrier Opening and Viral Delivery with a Novel Pulse Sequence**  
Alec Batts (Columbia University)

11:59 AM-12:06 PM  
**Real-time Intravital Imaging of the Vascular Effects Induced by Acoustic Cluster Therapy (ACT®) in a Murine Brain**  
Melina Mühlenpfordt (NTNU)

12:06 PM-12:13 PM  
**Effects of Aducanumab and Scanning Ultrasound on Amyloid Plaques and Behavior in the APP23 Mouse Model of Alzheimer Disease**  
Gerhard Leinenga (The University of Queensland)
12:13 PM-12:20 PM  Oxygen-loaded Nanodroplets enhance Cerebral Ablation in Sonodynamic Therapy
Harriet Lea-Banks (Sunnybrook Research Institute)

12:20 PM-12:27 PM  Gene Delivery using Ultrasound-mediated Blood-brain Barrier Opening
Benoit Larrat (CEA)

12:30 PM-2:00 PM  Lunch
Burwash Dining Hall

12:40 PM-1:55 PM  Poster Session 3
Victoria College Building

- The Effect of Inter-bubble Spacing of the Resonance Response of Phospholipid Encapsulated Ultrasound Contrast Agents
Hossein Yusefi (Concordia University)

- Increase of the Ablated Volume in Liver Tissue using a Cross-shpaed Toroidal Transducer
Sophie Cambronero (LabTAU, INSERM, Centre Léon Bérard, Université Lyon)

- An Exposure System for In-vitro 3D Tumour HIFU Studies
Ian Rivens (Institute of Cancer Research)

- Tumor Response Monitoring of Ultrasound-Stimulated Microbubbles and Hyperthermia In Vivo
Deepa Sharma (Sunnybrook Health Sciences Centre)

- Effect of Tumor Microvessels on HIFU Thermal Field
Farshad Moradi Kashkooli (Ryerson University)

- Cavitation Dynamics and Shockwave Evolutions during Histotripsy Treatment
Scott Haskell (University of Michigan)

- The Strain and the Flurry: Thrombolysis via Histotripsy and Thrombolytics
Kenneth Bader (University of Chicago)

- Feasibility Study for Histotripsy of Soft Tissue Sarcoma Treatment
Ryan Hubbard (University of Michigan)

- Effects of High Frequency Histotripsy Pulse Settings on Brain Ablation Outcomes
Thomas Landry (Dalhousie University)
- Histotripsy Bubble Dynamics in Tendons and Anisotropic Hydrogels
  Julianna Simon (The Pennsylvania State University)

- Histotripsy Ablation to Treat Soft Tissue Sarcoma: In Vivo Study in Dogs
  Lauren Ruger (Virginia Polytechnic Institute and State University)

- Effects of Dose and Parameter Selection in Treating Human Benign Prostatic Hyperplasia with Different Histotripsy Modalities
  Adam Maxwell (University of Washington)

- Experimental Passive Directivity Detection with Biaxial Transducers
  Nathan Meulenbroek (University of Calgary)

- Broadband Multiple-focus Synthesis using Orthogonal Frequency Division Multiplexing
  Collin Smith (UMN)

- High-throughput Acoustic Rheometry System Tracks Clotting Blood in Real Time
  Christina Hendren (University of Michigan)

- Preliminary Study: PSMA Nanobubbles for TUS Treatment/Prevention of Tumor Growth in a Rabbit Orthotopic Prostate Tumor Model
  Eric Abenojar (Case Western Reserve University)

- Algorithm for Path Planning in MRgFUS Therapy
  Christakis Damianou (Cyprus University of Technology)

- Multiaxial Driving Method Applied for Concave Phased Arrays
  Samuel Pichardo (University of Calgary)

- Monitoring Focused Ultrasound Therapy of Tendon using Cavitation Detection
  Imogen den Otter-Moore (Hospital for Sick Children)

- A Low-Cost Driving Circuit for Microbubble-Based Therapeutic Ultrasound Systems
  Betul Ilbilgi Yildiz (Imperial College London)

- Numerical Simulations and Experimental Verification of the extent of HIFU-induced Necrotic Lesions
  Lukasz Fura (Institute of Fundamental Technological Research Polish Academy)
- Gadgetron-based Open Source Thermometry Pipeline for Siemens MRI Platforms
  Craig Macsemchuk (University of Toronto)

- Quantitative Acoustic Output Measurement Device for Low Intensity Focused Ultrasound Systems
  Mark Schafer (Drexel University)

- First Report on the Persist Time of the Free Radical Produced by Shock Wave Pulses Employed in Clinical ESWL
  Eun-Joo Park (Seoul National University Hospital)

- An Experimental Demonstration of the Ultrasonic Rewarming of Frozen Biological Tissue
  Rui Xu (University College London)

- Evaluation of CMUT for Passive Monitoring of Microbubble-assisted Ultrasound Therapies
  Ambre Dauba (Université Paris Saclay)

- Modification of Heavily Calcified Lesions with Ultrasound-induced Microbubble Cavitation in PTA
  Yung Han Lee (National Tsing Hua University)

- Robotic Device for Preclinical and Veterinary Trials of Focused Ultrasound
  Christakis Damianou (Cyprus University of Technology)

- Changes of Mechanical and Ultrastructural Characteristics of In vitro Human Hematomas Over Time
  Kseniia Tumanova (Physics Faculty, Lomonosov Moscow State University, Moscow, Russian Federation; Department of Medical Biophysics, Temerty Faculty of Medicine, University of Toronto)

- In vitro Evaluation of Single Pulsed vs. Burst Shock Waves
  Nina Reinhardt (Chair of Medical Engineering, RWTH Aachen University)

- Influence of the Medium Salinity and Charges on the Dynamics of Size Isolated Lipid-coat MBs
  Amin Jafarisojahrood (Sunnybrook Health Science Center)

- Spatial Filtering for Improved Passive Cavitation Imaging
  Kevin Haworth (University of Cincinnati)

- Shear Wave Passive Elastography for Crystalline Lens Elasticity Measurement in the Context of Presbyopia Treatment
  Alice Ganeau (INSERM)
- **Synthetic Focalization using the Correlation Framework**
  Tamara Krpic (Universite de Sherbrooke)

- **Development of 3T Head Coil to Improve MRgFUS Planning and Therapy**
  Giulia Frazzetta (Insightec)

- **Motion Compensation During MRgHIFU May Improve Thermosensitive Drug Release**
  Suzanne Wong (University of Toronto)

- **Sonowell®: A Versatile Ultrasound Platform for Reproducible In Vitro Experiments on Prokaryotic and Eukaryotic cells**
  Gaetano Barbato, Ph.D., CEO (Inno-Sol SRL)

12:40 PM-1:55 PM  **Future of ISTU Poster Session**  Victoria College
Robert Andrew Drainville (LabTAU INSERM U1032)
Connor Edsall (Virginia Tech)
Delaney Fisher (University of Virginia)
Catherine Gorick (University of Virginia)
Ning Lu (University of Michigan)
David Martin (University of Toronto)
Thomas Manuel (Vanderbilt University)
Chitra Meduri, M.S., Virginia Tech
Greyson Stocker (University of Michigan)
Tejaswi Worlikar (University of Michigan)

2:00 PM-3:30 PM  **Histotripsy**  Isabel Bader Theatre

CHAIRPERSONS  Adam Maxwell; Ki Joo Pahk

2:00 PM-2:05 PM  **Introduction**

2:05 PM-2:12 PM  **Neuronavigation-guided Transcranial Histotripsy on Human Cadavers: A Feasibility Study**
Sang Won Choi (University of Michigan)
2:12 PM-2:19 PM  Transrectal Histotripsy Ablation of the Prostate: Initial Preclinical In Vivo Assessment  
George Schade (University of Washington)

Hrishikesh Raghuram (University of Toronto)

2:26 PM-2:33 PM  Rapid and Precise Fractionation of Embolus using Boiling Histotripsy with Acoustic Trapping: A Proof-of-concept Study  
Jeongmin Heo (Korea Institute of Science and Technology)

2:33 PM-2:40 PM  Histotripsy for the Treatment of Pancreatic Tumors: Feasibility Study in an In vivo Porcine Model  
Jessica Gannon (Virginia Tech - Wake Forest School of Biomedical Engineering and Sciences)

2:40 PM-2:47 PM  Two-step Aberration Correction for Transcranial Histotripsy  
Ning Lu (University of Michigan)

2:47 PM-2:54 PM  Comparing Focused Ultrasound and Dry Needling Therapies on Healing of Rat Tendinopathy  
Molly Smallcomb (The Pennsylvania State University)

2:54 PM-3:01 PM  Changes in Tumor Viability and Vasculature Following Histotripsy Exposure  
Kenneth Bader (University of Chicago)

3:01 PM-3:08 PM  Nanodroplet-mediated Ultrasound Mechanotherapy for Low Energy Histotripsy  
Bar Glickstein (Tel Aviv University)

3:08 PM-3:15 PM  MR-Thermometry Pre-treatment Targeting for MR-guided Histotripsy  
Dinank Gupta (University of Michigan)

3:15 PM-3:22 PM  Performance Characterization of a High-Frequency Image-Guided Histotripsy Platform  
Jeremy Brown (Dalhousie University)
3:22 PM-3:29 PM  Safety of Histotripsy in an Anticoagulated Porcine Model
Timothy Ziemlewicz (University of Wisconsin)

2:00 PM-3:30 PM  Physics and Modelling/Hardware  NF003
CHAIRPERSONS  Yun Jing; Ryan Jones
2:00 PM-2:05 PM  Introduction

2:05 PM-2:20 PM  Multi-axial Technology for the Generation and Detection of Ultrasound
Samuel Pichardo (University of Calgary)

2:20 PM-2:27 PM  A 32-element PZT-PVDF Stacked Transducer Array for Transcranial Focusing and Reception using Short Ultrasound Pulses
Zheng Jiang (Imperial College London)

2:27 PM-2:34 PM  An Affordable and Easy-to-use Focused Ultrasound Device for High Precision Drug Delivery to the Mouse Brain
Zhongtao Hu (Washington University in St. Louis)

2:34 PM-2:41 PM  Simulation-guided Navigation System for Transcranial Focused Ultrasound
TaeYoung Park (Bio-Medical Science and Technology, KIST School, Korea Institute of Science and Technology)

2:41 PM-2:48 PM  Simulation and Visualization Tool for Subject-specific Transcranial Focused Ultrasound Neuronavigation
Mohammad Daneshzand (Massachusetts General Hospital, Harvard Medical School)

2:48 PM-2:55 PM  Acoustic Evaluation of Synthetic Skulls from Conditional Adversarial Networks
Michelle Sigona (Vanderbilt University)

2:55 PM-3:02 PM  An Ultrasound-guided Hemispherical Phased Array for Microbubble-mediated Ultrasound Therapy
Lulu Deng (Sunnybrook Research Institute)
3:02 PM-3:09 PM  Clinical Transmit-receive High-power Transducer Array System for the Treatment of Deep Vein Thrombosis
Maryam Dadgar (University of Toronto)

Jingjing Liu (Sunnybrook research institute)

3:16 PM-3:23 PM  Focalization Improvements in Single-element Ultrasound Ring Transducers by the Application of Biaxial Excitation
Sagid Delgado (University of Calgary)

3:23 PM-3:30 PM  Computational Simulation based Investigation of Phase Aberration for Transabdominal Histotripsy
Ellen Yeats (University of Michigan)

3:30 PM-4:00 PM  Coffee Break
Victoria College Building

4:00 PM-4:10 PM  Student Award Announcement
Isabel Bader Theatre

CHAIRPERSONS  Richard Price, Eli Vlaisavljevich

4:10 PM-5:00 PM  Debate

Debate Statement: Focused ultrasound and microbubble-mediated opening of the blood-brain barrier will achieve widespread clinical adoption.

Arguments - For: Alexandre Carpentier

Arguments - Against: Joseph Alan Frank

5:00 PM-5:30 PM  Closing Remarks

CHAIRPERSONS  David Goertz; Kullervo Hynynen; Cyril Lafon; Meaghan O’Reilly
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The International Society for Therapeutic Ultrasound (ISTU) is a non-profit organization founded in 2001 to increase and diffuse knowledge of therapeutic ultrasound within the scientific and medical communities, and to facilitate the translation of therapeutic ultrasound techniques into the clinical area for the benefit of patients worldwide. We are committed to bringing knowledge of therapeutic ultrasound to our members through the Annual Symposium and the virtual ISTU On-Air Webinar Series.

Save the Dates!
Next Webinar:
Kevin J. Haworth, PhD, FAIUM
University of Cincinnati
July 28, 2022: Making Gas to Remove Gas: Acoustic Droplet Vaporization for Reperfusion Injury

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The Gala Event will take place at l’Embarcadère on Wednesday, April 19th. Located between the greenery of the Sainte-Foy garden and the Rambaud pier, L’Embarcadère sits by the beautiful Saône river.

Registration and Abstract Submissions Open October 2022
Early Registration Deadline: February 1, 2023
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