

ACOUSTICS WEEK IN CANADA 2023 / SEMAINE CANADIENNE DE L'ACOUSTIQUE 2023

FINAL REPORT

Olivier Doutres^{*1}, Thomas Padois^{†2} et Jérémie Voix^{‡1}

¹École de technologie supérieure (ÉTS), Montréal, QC H3C 1K3, Canada.

²Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST), Montréal, QC H3A 3C2, Canada

Résumé

L'association canadienne d'acoustique organisait la semaine de l'acoustique Canadienne (AWC) à Montréal du 3 au 6 octobre 2023. Cet événement a été un succès retentissant puisqu'il a rassemblé plus de 260 personnes pendant les 4 jours de la conférence : un record pour AWC. Plus de 160 présentations ont été données sur diverses thématiques de l'acoustique telles que la science de la parole et de l'audition, l'acoustique architecturale, la protection auditive et les matériaux pour le contrôle du bruit et des vibrations. La communauté acousticienne a pu se retrouver et partager des moments d'anthologie comme par exemple lors du « Powerpoint Karaoke » ou du jam musical organisés en marge du banquet de gala. Ce rapport présente les faits saillants de la conférence au bénéfice des participant·e·s et des futur·e·s organisateur·rice·s.

Mots clés : conférence, AWC23, rapport final

Abstract

The Canadian Acoustical Association hosted the Acoustics Week in Canada (AWC) in Montreal from October 3rd to October 6th, 2023. This event was a resounding success, bringing together over 260 participants over the 4 days of the conference, setting a record for AWC. More than 160 presentations were given on various topics in acoustics, such as speech and hearing science, architectural acoustics, hearing protection, and materials for noise and vibration control. The acoustics community was able to come together and share memorable moments, such as during the 'Powerpoint Karaoke' or the musical jam organized on the sidelines of the gala dinner. This report presents the highlights of the conference for the benefits of AWC23 participants and future conference convenors.

Keywords: conference, AWC23, final report

1 Introduction

The Canadian Acoustical Association (CAA) was pleased to invite scientists and engineers from all over Canada to attend the Acoustics Week in Canada (AWC23) held in Montréal 3-6 October 2023.

This event featured 11 technical sessions covering key theoretical and applied areas in acoustics and vibration. Three plenary lectures by internationally renowned scientists provided an overview of three exciting topics. Numerous technical and social events were offered for learning and networking, successfully achieved. The purpose of this report is to present some technical details of this conference organization for the benefit of AWC23 participants and future conference convenors.

2 The Organizing Committee and Venue

2.1 The Local Organizing Committee

The organizing committee consisted of the following individuals:

- **Olivier Doutres** (ÉTS): Conference chair
- **Thomas Padois** (IRSST): Scientific chair
- **Julien Biboud** (Mecanum): Exhibitor and sponsor chair
- **Jérémie Voix** (ÉTS): Social convener
- **Pierre Grandjean** (Université de Sherbrooke): Proceedings preparation
- **Cécile Le Cocq** (ÉTS): Proceedings preparation
- **Maël Lopez** and **Adélaïde Douchet** (ÉTS): On-site coordinators
- **Simon Prenant** (ÉTS): Website coordinator
- **Gauthier Bezançon** (ÉTS): Environmental sustain-ability coordinator
- **Victoria Duda** (Université de Montréal): CAA Student prize coordinator

2.2 The Conference Venue

As we foresaw a substantial local turnout for AWC23, particularly from Montreal and its surrounding areas, we assumed that too few rooms would be booked to honor a typical hosting of the conference within the premises of a regular hotel. We hence had to find a place that would be suitable for our event for a reasonable price. The CAA informed us that, typically, they do not aim for profit with these AWC conferences, nor can they incur a deficit. After

* olivier.doutres@etsmtl.ca

† thomas.padois@irsst.qc.ca

‡ jeremie.voix@etsmtl.ca

numerous attempts and much effort, we finally identified and secured a deal with the “Plaza Centre-Ville” venue. Situated in downtown Montreal, in the bustling business district, it offers convenient parking, access to public transport, and is close to the train station. The Plaza provides gourmet cuisine in a stylish and modern setting, and we believe that the food and beverage commitment we had to make will be a worthwhile experience for all attendees.

3 The Scientific Program

3.1 The Technical Sessions

The sessions at the conference covered all topics in acoustics including sessions on Architectural and building acoustics, Hearing protection, Speech and hearing, Materials for noise and vibration control, General acoustics, Environmental noise, Artificial intelligence in acoustics, Underwater acoustics, Biomedical acoustics, Aeroacoustics and Education in acoustics. The session on “Hearing protection” was organized in memory of our colleague and friend Simon Benacchio [1988-2023], who worked with fervor on the enhancement of artificial ears and hearing protectors. We are very thankful to all session chairs, the driving force behind the success of AWC23:

- Marlène Sanjosé (ÉTS): Aeroacoustics
- Joana Rocha (Carleton University): Aeroacoustics
- Mahn Jeffrey (CNRC): Architectural and building acoustics
- Joonhee Lee (Concordia): Architectural and building acoustics
- Viken Koukounian (Parklane): General acoustics
- Thomas Dupont (ÉTS): Materials for noise and vibration control
- Raymond Panneton (UdeS): Materials for noise and vibration control
- Hugues Nélisse (IRSST): Hearing protection
- Franck Sgard (IRSST): Hearing protection
- Anthony Gérard (SoftdB): Environmental noise
- Victoria Duda (U de Montréal): Hearing and speech
- Rachel Bouserhal (ÉTS): Hearing and speech
- Olivier Robin (UdeS): Education in Acoustics
- Nicolas Quaegebeur (UdeS): Biomedical acoustics
- François Grondin (UdeS): Artificial Intelligence in Acoustics
- Wilson Byrick (Pliteq): Architectural and building acoustics
- Pierre Cauchy (UQAR): Underwater acoustics
- Mathias Legrand (McGill): General acoustics.

Each of them has not only shared their expertise but has also played a crucial role in bringing together a diverse range of knowledge and experience that collectively shapes AWC23. The session chairs came from various backgrounds, representing some of the most prestigious universities in Canada, renowned research centers, and the dynamic private sector. Their collective expertise spanned the entire spectrum of acoustics, from theoretical research to practical applications.

3.2 The Plenary Lectures

Three distinguished scientists graced our event with their captivating presentations during the plenary sessions from Wednesday October 4th to Friday October 6th. Each of them passionately shared insights from decades of research:

- Prof. Christian Giguère (Université d’Ottawa) on back-up alarms on heavy vehicles and the important acoustical and psychoacoustical factors that should be comprehensively addressed in applicable standards.
- Prof. Nouredine Atalla (Université de Sherbrooke) on the modeling, characterization, and advancement of lightweight structures and their added sound packages, with a special focus on aircraft and aerospace applications.
- Prof. Fabrice Marandola (Université McGill) on the organization of musical scales in instrumental and vocal music of different cultures.

4 The Conference Outcomes

4.1 The Conference Presentations

Given the organizational constraints of 5 half-days, 4 breakout rooms, and 20-minute presentation slots, the schedule could only accommodate 162 presentations. The enthusiasm for this conference led to the easy filling of all 162 slots. Table 1 shows the number of presentations for each session. The four most popular sessions were: Speech and hearing, Architectural and building acoustics, Hearing protection and Material for noise and vibration control.

Table 1: Number of presentations per session.

Session	Number of presentations
Architectural and building acoustics	24
Hearing protection	22
Speech and hearing	30
Materials for noise and vibration control	22
General acoustics	19
Environmental noise	17
Artificial intelligence in acoustics	8
Underwater acoustics	6
Biomedical acoustics	4
Aeroacoustics	5
Education in acoustics	5
Total	162

4.2 The Conference Delegates

While we based our estimation on 250 attendees, a total of 264 attendees participated in AWC23, including delegates, exhibitors, accompanying persons, volunteers and organizing team members.

Figure 1 depicts the origin and professional sector of the attendees. Participants came from various regions across

Canada, including Québec (QC), Ontario (ON), British Columbia (BC), Alberta (AB), New Brunswick (NB), and Nova Scotia (NS), with a notable representation from colleagues in Quebec and Ontario, underscoring the conference's local character in a country as large and diverse as Canada. Additionally, we were pleased to welcome attendees from beyond our national borders, with participants joining us from the United States, France and Germany.

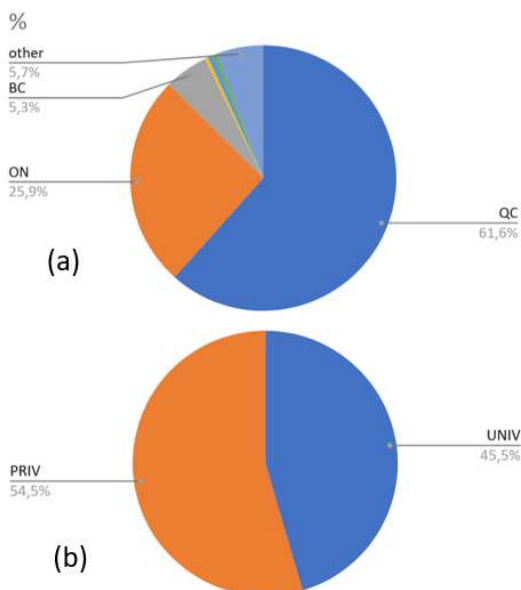


Figure 1: (a) Origin and (b) professional sector of the attendees.

It was particularly remarkable that we had achieved almost a perfect balance between attendees from both the private sector and academia. This blend of different viewpoints and backgrounds has greatly contributed to the diverse and engaging conversations we've had during these four days. It also exemplifies the collaborative spirit of AWC and underlines our commitment to fostering a holistic understanding of acoustics.

4.3 The Conference Volunteers

Thirteen volunteers, mainly comprised of graduate students from ÉTS and Polytechnique Montréal, contributed their efforts to assist in the organization of the conference: Adélaïde Douchet, Solenn Ollivier, Stanislas Teillet, Xinyi Zhang, Lucie Gallerand, Alexandre Petrosky, Elissa El Hajj, Nillfar Rastegar, Maxime Vincent, Malo Richard, Kevin Rouard, Lucas Barbier and Maël Lopez.

Their contribution facilitated every stage of the organization and ensured a smooth execution of AWC23.

4.4 The Exhibition Area

An exhibition area was proposed during two entire days, on Wednesday October 4th and Thursday October 5th. A total of 16 exhibitors (including the AWC23 sponsors, see Figure 2) presented various acoustic equipment, products, and services. AWC23 attendees could then explore the latest cutting-edge equipment and materials, as well as best

practices in the field. The placement of the exhibition area in the central zone of the Plaza conference center was appreciated by both exhibitors and all participants, and greatly facilitated the exchanges and interpersonal communication.

A draw/raffle has been organized to encourage participants to visit each of the booths. The AWC23 draw concept was simple: all participants received a card and collected stamps during their visits to the booths. If they collected stamps from all the booths, they were entered into the raffle, which took place during the Gala Banquet. Outstanding prizes were generously provided by the sponsors and exhibitors.



Figure 2: Sponsors and exhibitors of AWC23.

4.5 The Conference Budget

Table 2 lists a summary of revenues and expenses. The primary expenditure, accounting for almost 85% of the total, is the Plaza venue. As mentioned in Section 2, securing a venue for an event with less than 300 delegates in Montreal, especially during a peak period, proved to be challenging, with limited available options. Our decision to collaborate with Plaza Centre-Ville allowed us to provide AWC23 participants with a high-quality environment, without any compromises on the quality and quantity of food. In order to stay within budget, we thus had to increase the registration fees for this event compared to previous years. Hence, the primary source of revenue stems from delegate registrations, constituting almost 75 % of the total revenues, primarily attributed to the significant number of registrations received this year. The contribution of the exhibitors was significant, accounting for 14.3%, showcasing the keen interest of the private sector in participating in such a national event. We would like to acknowledge the financial support received from Pliteq Inc., our “Diamond sponsor”, as well as from IRSST, LogiSon and Sound and Vibration Solutions Canada Inc., our “Silver sponsors”. Finally, we received a very appreciated support from Tourisme Montréal when dealing with the Plaza and their subsequent financial support also helped. Finally, the net proceeds amounted to \$6,048 CAD.

Table 2: AWC23 budget.

Expenses	Amount \$CAD	Contribution -%
Venue + Food & Beverages	130,349	84.4
A/V Rental	14,725	9.5
PayPal & bank fees	4,297	2.8
Social events	4,539	2.9
Misc.	610	0.4
Total	154,521 \$	

Revenues	Amount \$CAD	Contribution -%
Registrations	119,807	74.6
Exhibitors	22,961	14.3
Sponsors	15,001	9.3
Tourisme MTL	2,800	1.7
Total	160,569 \$	

4.6 Scientific Visits and Technical Events

At the end of the conference, on Friday October 6th, three exciting scientific tours have been proposed (see Figure 3). Furthermore, a noise map of Montreal was collaboratively generated by AWC23 attendees over the three days of the conference.

Visit 1: Exclusive Tour of CIRMMT

The Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT pronounced “kermit”) is housed at the Schulich School of Music at McGill University, just a couple blocks north of the AWC23 venue. CIRMMT is a multidisciplinary research group that seeks to develop innovative approaches to the scientific study of music media and technology, to promote the application of newer technologies in science and the creative arts, and to provide an advanced research training environment. CIRMMT occupies a unique position on the international stage having developed intense research partnerships with other academic and research institutions, as well as diverse industry partners throughout the world. Several volunteers of the AWC23 local organising committee are regular members of CIRMMT and a special tour had been arranged, thanks to Prof. Rachel Bouserhal (ÉTS) and CIRMMT director Prof. Fabrice Marandola (McGill University) to let AWC23 delegates discover this unique center and visit its new Music Multimedia Room. 27 delegates participated and enjoyed this unique visit.

Visit 2: Exclusive Tour of ICAR

The ICAR laboratory (Infrastructure commune en acoustique pour la recherche ÉTS-IRSST) is housed at ÉTS (École de Technologie Supérieure), just a couple blocks away from the AWC23 venue. ICAR is a training and research laboratory for industrial Acoustics. Its creation results from the successful collaboration between ÉTS university and IRSST occupational health research institute. ICAR allows to test,

improve and develop new products or processes that are more acoustically efficient. The ultimate goal of ICAR activities is to increase the comfort, health and safety of workers (and the general public) through the operation of state-of-the-art acoustic testing facilities that meet the needs of both industry and academic researchers. The visit led by Prof. Thomas Dupont and Prof. Olivier Doutres encompassed a presentation of the new 6-degrees-of-freedom vibration platform, designed to investigate issues such as musculoskeletal problems caused by truck seats. Additionally, the 20 delegates were introduced to the acoustic facilities within the laboratory, along with ongoing research projects on hearing protection devices, acoustic metamaterials, acoustic camera for source localization, nail guns and structure borne noise conducted by the research teams.



Figure 3 : Exclusive tours of (a) CIRMMT, (b) ICAR lab. and (c) Maison symphonique.

Visit 3: Exclusive Tour of Maison symphonique

Inaugurated in 2011, the Maison symphonique is internationally recognized for the excellence of its acoustics. What criteria were used to achieve this excellence? Located in the heart of downtown near the metro and numerous construction sites, how was it ensured that no noise would interfere with the music played inside? How was the hall designed so that

each of the 2100 spectators would benefit from the same sound quality? During a panel discussion attended by over 30 AWC23 delegates, Romain Dumoulin, Senior Consultant at Soft dB led the conversation alongside Todd Brook, Associate at Arup, and an integral figure in the acoustical design of the hall. Joining them were Jean-Willy Kunz, Organist-in-Residence of the Orchestre symphonique de Montréal, and Sébastien Almon, Director of Artistic Operations at Orchestre symphonique de Montréal. The discussion delved into the intricacies of the Maison symphonique's acoustical design. Following the engaging dialogue, Jean-Willy Kunz presented a detailed overview of the organ acoustics, accompanied by a musical demonstration. The session concluded with listening tests conducted at various locations within the audience, featuring musical excerpts played by a cellist.

Noise Mapping Event

Thanks to the initiative of Prof. Olivier Robin (U. Sherbrooke) and Prof. Olivier Doutres (ÉTS), a noise map of Montreal was collaboratively generated by AWC23 delegates over the three days through the use of their cellphones and the NoiseCapture application. The noise map is presented in Figure 4. The somewhat modest participation in this activity still allowed for the collection of interesting data that confirms the issue of noise pollution in the city of Montreal.

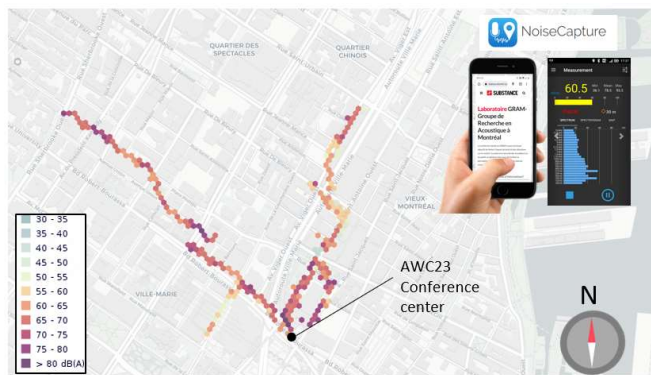


Figure 4: Noise map of Montréal collaboratively generated during AWC23.

4.7 Social Events

Several social events took place throughout the conference and contributed to the success of AWC23.

Welcome Reception

The AWC23 Welcome Reception took place on the evening of Tuesday, October 3rd. All participants were cordially invited to attend while it was also mentioned that a cap of 90 delegates had been imposed by the conference center (based on our estimation) as free drinks would be served during the whole event. A total of 89 delegates eventually showed up and this event was the ideal opportunity to make contacts in a friendly atmosphere with other scientists, engineers and conference delegates early in the week.

Students and Volunteers Event

As a token of appreciation for all the amazing work of all the awesome volunteers (see sec. 4.3), as well as an « ice-breaking » event for the student delegates of AWC23, a « Beer and Pizza » event was held at “L’Amère à boire” microbrewery on Wednesday, October 4th. This event, organized with the help of Thomas Padois, was attended by 44 delegates.



Figure 5: (a) Volunteers and student members event “Beer and Pizza”, (b) Participants of the “Powerpoint Karaoke”, (c) Music jam session.

Cocktails, Labs & Ghosts

EERS Global Technologies Inc. conveyed all AWC2023 delegates interested to attend a free cocktail at its creative facilities on Wednesday October 4th. EERS is Montreal-based company that sponsors the "ÉTS-EERS Industrial Research Chair in In-Ear Technologies (CRITIAS)" led by Prof. Jérémie Voix and specializes in enhancing hearables with advanced hearing protection, biometric and in noise communication solutions. Technical tours of the EERS and CRITIAS laboratories were offered to over 40 delegates who attended this event. Later during the evening, a dozen of them went for the famous Ghost Tour of Griffintown facilitated by EERS.

PowerPoint Karaoke

As the Social Convener for Acoustics Week in Canada 2023, Jérémie Voix was challenged by his colleague and friend Cécile Le Cocq to organize a PowerPoint Karaoke event, a dream he had secretly harbored for many years. PowerPoint Karaoke (also called PowerPoint Roulette or Battledecks) is an improv game where volunteers give a presentation from a slide deck they've never seen, taken randomly from various slide decks presented during a given conference. This dream became a reality at AWC23 and turned out to be an absolute blast for all the attendees. Figure 5 (b) shows, from left to right, the seven participants (Pierre Cauchy, Michael Schutz,

Jahurul Islam, Frank Russo, Olivier Valentin, Arian Shamei, Olivier Robin) who improvised brilliantly on stage, along with Malo Richard, who meticulously curated the 7 decks of slides randomly selected from various AWC23 PowerPoint presentations. It was a very good moment that took place during the cocktail right before the Gala Banquet on Thursday October 5th in front of several dozens of cheerful delegates.

Gala Banquet

We made the decision to make the gala banquet free for all participants (excluding those attending individual days on Tuesday, Wednesday, and Friday) due to contractual commitments with the Plaza concerning food and beverage arrangements. The gala commenced with an elegant cocktail hour accompanied by live music from a jazz trio from the Schulich School of Music of McGill (see Figure 6). The banquet unfolded with a series of notable speeches, beginning with heartfelt addresses from Prof. Olivier Doutres, the General Chair, and Thomas Padois, the Scientific Chair. Following this, Julien Biboud, the Exhibitors and Sponsors Chair, expressed gratitude to each sponsor and exhibitor individually, announcing the lucky winners of the raffle (refer to Section 4.4).



Figure 6: Lunch, Cocktail and Gala banquet.

The evening culminated with Prof. Jérémie Voix, the outgoing president of the Canadian Acoustical Association, stepping forward to announce his departure with a sense of pride and accomplishment after seven years of dedicated service. He emphasized the current unprecedented vitality of the 61-year-old association, characterized by a steadfast and consistently renewed membership, a flourishing journal, and an annual conference that garners high praise. Recognition was given to the unwavering support of the Board of Directors, including Dalila Giusti, Bill Gastmeier, Andy Metelka, Hugues Nélisse, Joana Rocha, Michael Kieft, Roberto Racca, Umberto Berardi, and Victoria Duda, extending gratitude for their trust and support since his election in 2006. In closing, Prof. Jérémie Voix expressed warm appreciation to the AWC23 convenors and highlighted

the remarkable contributions of Olivier Doutres, Thomas Padois, and Julien Biboud.

Music Jam Session

A few days into the AWC23 conference, as the vibrant and friendly atmosphere enveloped us, it quickly became evident that a "Music Jam Session" was a must. Gratefully, with last-minute support from "Musique ÉTS," the student music club from ÉTS, and unwavering assistance from Maël Lopez, we were able to assemble a stage complete with a full drum set, an electronic keyboard, various guitars, and vocal microphones (see Figure 5 (c)). The rest of the evening has become a memorable chapter in our history, with more than a hundred delegates coming together to share in that magical moment.

4.8 Conference Sustainability initiatives

In addition to being a national conference, which inherently limits air travel and its associated environmental impact (see section 4.2), here are the actions taken to minimize the ecological footprint of this event 0:

- A vegetarian option was available for all lunches and the gala dinner. During the gala dinner, 40% of the main course options was vegetarian.
- The "Plaza centre-ville" conference center donated all surplus food to local food banks.
- The coffee station was "zero waste". Single-use plastic or glass water bottles was not distributed. Food was served in washable dishes.
- Name tags and lanyards, kindly provided by ÉTS university, were collected and returned to ÉTS for reuse in future events.
- QR codes displayed at the conference venue gave access to the most up-to-date program, conference proceedings and WIFI information.
- No conference bags were distributed.
- Prize draw rather than systematically distribution of gifts or promotional items.
- For energy conservation, organizers asked that indoor temperature be kept at 21 degrees Celsius and not cooler despite the external warmth.

Acknowledgments

The authors would like to acknowledge the support received from IRSST, the Quebec Occupational Health and Safety Institute, in particular through the clearance of time for Thomas Padois to allocate to AWC23 as its Scientific Chair. The authors express gratitude to "Tourisme Montréal" for their financial support and assistance in securing the conference center, as well as to ISO TC43 national organizing committee for the donation of the surplus from the 2023 plenary held in Montreal in May 2023 under the hospices of the Canadian acoustical association.

References

- [1] <https://dam.mtl.org/m/186501cc2e6424a7/original/Ecoresponsable-Guide-2022.pdf>