

canadian acoustics

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Canadian Acoustics is published four times a year - in March, June, September and December. This quarterly journal is free to individual members of the Canadian Acoustical Association (CAA) and institutional subscribers. **Canadian Acoustics** publishes refereed articles and news items on all aspects of acoustics and vibration. It also includes information on research, reviews, news, employment, new products, activities, discussions, etc. Papers reporting new results and applications, as well as review or tutorial papers and shorter research notes are welcomed, in English or in French. The Canadian Acoustical Association selected **Paypal** as its **preferred system** for the online payment of your subscription fees. Paypal supports a wide range of payment methods (Visa, Mastercard, Amex, Bank account, etc.) and does not require you to have already an account with them. If you still want to proceed with a manual payment of your subscription fee, please Membership form and send it to the Executive Secretary of the Association (see address above). - - Dr. Roberto Racca - Canadian Acoustical Association/Association Canadienne d'Acoustique c/o JASCO Applied Sciences 2305-4464 Markham Street Victoria, BC V8Z 7X8 - - secretary@caa-aca.ca

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L'Acoustique Canadienne publie des articles arbitrés et des informations sur tous les aspects de l'acoustique et des vibrations. Les informations portent sur la recherche, les ouvrages sous forme de revues, les nouvelles, l'emploi, les nouveaux produits, les activités, etc. Des articles concernant des résultats inédits ou des applications ainsi que les articles de synthèse ou d'initiation, en français ou en anglais, sont les bienvenus.

Acoustique canadienne est publié quatre fois par an, en mars, juin, septembre et décembre. Cette revue trimestrielle est envoyée gratuitement aux membres individuels de l'Association canadienne d'acoustique (ACA) et aux abonnés institutionnels. **L'Acoustique canadienne** publie des articles arbitrés et des rubriques sur tous les aspects de l'acoustique et des vibrations. Ceci comprend la recherche, les recensions des travaux, les nouvelles, les offres d'emploi, les nouveaux produits, les activités, etc. Les articles concernant les résultats inédits ou les applications de l'acoustique ainsi que les articles de synthèse, les tutoriels et les exposés techniques, en français ou en anglais, sont les bienvenus. L'Association canadienne d'acoustique a sélectionné **Paypal** comme solution pratique pour le paiement en ligne de vos frais d'abonnement. Paypal prend en charge un large éventail de méthodes de paiement (Visa, Mastercard, Amex, compte bancaire, etc) et ne nécessite pas que vous ayez déjà un compte avec eux. Si vous désirez procéder à un paiement par chèque de votre abonnement, merci de remplir le formulaire d'inscription et de l'envoyer au secrétaire exécutif de l'association (voir adresse ci-dessus). - - Dr. Roberto Racca - Canadian Acoustical Association/Association Canadienne d'Acoustique c/o JASCO Applied Sciences 2305-4464 Markham Street Victoria, BC V8Z 7X8 - - secretary@caa-aca.ca

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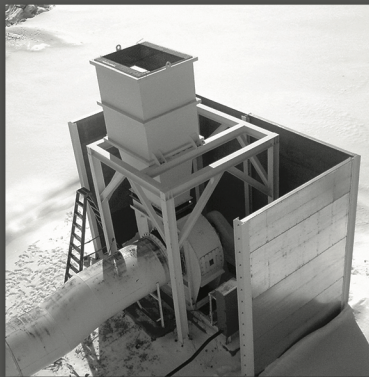
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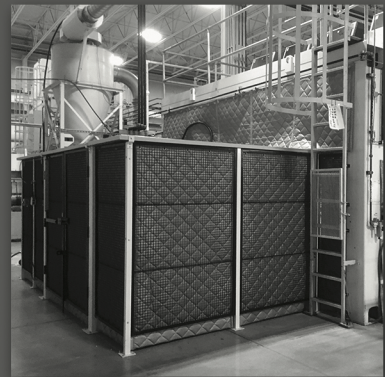
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President's note: New Role and new targets of Canadian acoustics
Le mot du président : Nouveau rôle et nouvelles cibles de l'acoustique canadienne



Canadian Acoustics for our society

Dear reader, I write this editorial, the first as the new President of CAA.

Let me start by thanking all of you for your continuous support. Having the privilege to support CAA has made, as always, an immigrant like me proud of the decision to move to Canada. I am sure I share this feeling with many of you who decided to call Canada their home. Taking up this role at a transitioning time for our association is a great honor and responsibility.

Our little association is ready to become again the center of global acoustics. In fact, as I write these few sentences, it is almost the deadline for the submission of abstracts for our next Acoustics Week in Canada which will take place early this year!

In fact, our annual event will occur from the 13th to the 17th of May, in conjunction with the 186th Meeting of the Acoustical Society of America. I wish to thank our Stan Dosso, president of ASA, for having helped make this event possible, and all our friends at ASA who decided to return to Canada. This recognition of our commitment to acoustics and the international network of acousticians on a global scale is truly wonderful, and shows how even a (numerically) small association can become vital and pro-active.

We shall also be holding a School for young acousticians before the conference (11-12 May 2024). The program of all these events is packed and we expect a thousand participants, so do not miss this great opportunity. I hope I will see you in Ottawa. Thank you!

Umberto Berardi
President of CAA

Acoustique canadienne pour notre société

Cher lecteur, j'écris cet éditorial, le premier en tant que nouveau président de la CAA.

Permettez-moi de commencer par vous remercier tous pour votre soutien continu. Avoir le privilège de soutenir CAA, comme toujours, a rendu un immigrant comme moi fier de la décision de déménager au Canada. Je suis sûr de partager ce sentiment avec beaucoup d'entre vous qui ont décidé de faire du Canada leur chez-soi. Assumer ce rôle, à une période de transition pour notre association, est un grand honneur et une grande responsabilité.

Notre petite association est prête à redevenir le centre de l'acoustique mondiale. En fait, alors que j'écris ces quelques phrases, c'est presque la date limite pour la soumission des résumés de notre prochaine Semaine de l'Acoustique au Canada qui aura lieu en milieu d'année !

En fait, notre événement annuel aura lieu du 13 au 17 mai, en union avec la 186e réunion de l'Acoustical Society of America. Je tiens à remercier Stan Dosso, président de l'ASA, d'avoir contribué à rendre cet événement possible ainsi que tous nos amis de l'ASA qui ont décidé de venir au Canada. Cette reconnaissance de notre engagement envers l'acoustique et le réseau international d'acousticiens à l'échelle mondiale est si merveilleuse et montre comment, même une petite association (numériquement,) peut être vitale et proactive.

Nous organiserons également une école pour les jeunes acousticiens avant la conférence (11-12 mai 2024). Le programme de tous ces événements est dense et nous attendons un millier de participants, alors ne manquez pas cette belle opportunité. J'espère vous voir à Ottawa. Merci!

Umberto Berardi
Président



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Notice: Canadian Acoustics journal moving to electronic format

For over 51 years, the Canadian Acoustical Association has diligently published the journal "Canadian Acoustics" in hardcopy format, four times a year. We commend the numerous editor-in-chiefs who have served before me, alongside the dedicated associate editors, section editors, copyeditors, journal manager, reviewers, and, of course, the esteemed authors. We also appreciate the invaluable efforts involved in printing and delivering these hardcopies to your offices. However, it must be acknowledged that this model is now outdated.⁷

1. The Drawbacks of Printing Hardcopies

Significant Financial Burden: These activities have been a substantial cost to the association, consuming between 50% and 66% of our annual operating budget.

Considerable Environmental Impact: The printing and delivery of paper hardcopies across Canada and to various international destinations result in a substantial carbon footprint.

Irrelevance in the Digital Age: Notably, a large majority of Canadian Acoustics readers have not provided their postal addresses upon membership. This oversight suggests that most readers prefer to access the journal's content online at <https://jcaa.caa-aca.ca>, rather than relying on the hardcopy.

2. The Advantages of an Electronic Journal Copy

Optimized Allocation of Association Funds: By ceasing print production, we can now redirect the funds previously allocated to printing toward enhancing our journal's activities. This includes support for future improvements such as updated article templates, an enhanced journal graphic layout, and the integration of modern features that often require annual subscriptions (e.g., SSL certificates, DOI registration, etc.).

Reduced Environmental Impact: Although electronic delivery does carry a carbon footprint (related to server and network equipment power consumption and the production of

Avis : Transition de la revue Acoustique canadienne au format électronique

Depuis plus de 51 ans, l'Association canadienne d'acoustique publie avec diligence la revue Acoustique canadienne au format papier, quatre fois par an. Nous saluons les nombreux rédacteurs en chef qui m'ont précédé, ainsi que les dévoués rédacteurs associés, rédacteurs de sections, correcteurs, gestionnaires du journal, relecteurs et, bien sûr, les auteurs de renom. Nous apprécions également les efforts inestimables consacrés à l'impression et à la livraison de ces exemplaires papier jusqu'à vos bureaux. Cependant, force est de constater que ce modèle est maintenant d'un autre temps.

1. Les inconvénients de l'impression de copies papier

Charge financière importante : Ces activités ont représenté un coût significatif pour l'association, absorbant entre 50 % et 66 % de notre budget annuel de fonctionnement.

Impact environnemental conséquent : L'impression et la livraison de copies papier à travers le Canada et vers diverses destinations internationales engendrent une empreinte carbone substantielle.

Obsolescence à l'ère numérique : À noter, une grande majorité des lecteurs de l'Acoustique Canadienne n'ont pas fourni leur adresse postale lors de leur adhésion. Cet oubli suggère que la plupart des lecteurs préfèrent accéder au contenu en ligne sur <https://jcaa.caa-aca.ca>, plutôt que de compter sur la version papier.

2. Les avantages d'une copie électronique de la revue

Meilleure utilisation des fonds de l'Association : En cessant la production papier, nous pouvons désormais réorienter les fonds précédemment alloués à l'impression pour améliorer nos activités éditoriales. Cela inclut le soutien à des améliorations futures telles que des modèles d'articles mis à jour, une mise en page graphique améliorée de la revue et l'intégration de fonctionnalités modernes nécessitant souvent des abonnements annuels (par exemple, des certificats SSL, l'enregistrement de DOI, etc.).

Impact environnemental réduit : Bien que la livraison électronique engendre une empreinte carbone (liée à la consommation d'énergie des serveurs et de l'équipement réseau et à la production d'appareils électroniques), cette em-

electronic devices), this footprint is orders of magnitude lower than traditional paper printouts and postal deliveries, with their associated fuel, gas, and water consumption.

Enhanced Exposure for Authors and Advertisers: The Canadian Acoustics journal enjoys recognition and inclusion in major scientific and technical bibliographic databases, such as Inspec (published by the Institution of Engineering and Technology) and Compendex (now published by Elsevier). It is also comprehensively covered by recent citation indexes, including Google Scholar, Directory of Open Access Journals (DOAJ), Scopus, and many more. As a consequence, these is the electronic version of the journal content (articles, editorial, notes, announcements, advertisements, etc.) that get the largest exposure, and on which the journal editorial will now focus its time and energy.

Optional Continued Access to Hardcopies: At its October 2023 Board of Directors' Meeting, the Canadian Acoustical Association made the decision, adopted at the Annual General Meeting of its members, not to increase annual membership fees, despite rising living costs and the expenses related to paper printing and postal services. To maintain these affordable fees, we have determined that all current members will automatically receive an "electronic journal" only. A new membership type will be introduced, with a slight price increase, for those members who still wish to receive a printed hardcopy of the journal.

Thank you for your understanding and continued support as we embark on this transition to enhance the Canadian Acoustics journal for our valued readers and contributors. Don't hesitate to contact us at jcaa@caa-aca.ca for any questions or to change your membership to include a "paper hardcopy" of the journal.

Jérémie Voix
Editor-in-Chief.

preinte est de plusieurs ordres de grandeur inférieure à celle des impressions papier traditionnelles et des livraisons postales, avec leur consommation de carburant, de gaz et d'eau associée.

Exposition améliorée pour les auteurs et annonceurs : La revue Acoustique canadienne jouit de la reconnaissance et de l'inclusion dans les principales bases de données bibliographiques scientifiques et techniques, telles que Inspec (publiée par l'Institution of Engineering and Technology) et Compendex (désormais publiée par Elsevier). Elle est également largement couverte par des indexations de citations récentes, notamment Google Scholar, le Directory of Open Access Journals (DOAJ), Scopus, et bien d'autres. En conséquence, c'est la version électronique du contenu de la revue (articles, éditoriaux, notes, annonces, publicités, etc.) qui bénéficie de la plus grande visibilité, et c'est sur cette version électronique que l'équipe de rédaction de la revue concentrera désormais son temps et son énergie.

Accès optionnel aux copies papier : Lors de sa réunion du Conseil d'administration en octobre 2023, l'Association canadienne d'acoustique a pris la décision, adoptée en Assemblée générale, de ne pas augmenter les cotisations annuelles, malgré l'augmentation actuelle du coût de la vie et les dépenses liées à l'impression sur papier et aux services postaux. Pour maintenir ces cotisations abordables, nous avons décidé que tous les membres actuels recevront désormais uniquement une "copie électronique" de la revue. Cependant, un nouveau type de cotisation sera introduit, avec une légère augmentation de prix, pour les membres qui souhaitent toujours recevoir une copie papier imprimée de la revue.

Nous vous remercions de votre compréhension et de votre soutien continu alors que nous entreprenons cette transition pour améliorer le journal Acoustique Canadienne au profit de nos précieux lecteurs et contributeurs. N'hésitez pas à nous contacter à jcaa@caa-aca.ca pour toute question ou pour activer au besoin votre cotisation pour une version incluant la "copie papier" de la revue.

Jérémie Voix
Rédacteur en chef

A NOTE ON THE RESONANCE FREQUENCY EQUATION OF MICROPERFORATED PANEL SOUND ABSORBER

Mohamed Abd-Elbasseer ^{*1}, Hatem Kh. Mohamed ^{†2}

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Résumé

Le panneau microperforé, ou MPP pour MicroPerforated Panel, peut être considéré comme un résonateur de Helmholtz multi ou N trous. C'est un absorbeur de son léger, propre et réglable, pour lequel une première modélisation a été établie par Maa en 1975. C'est un résonateur de taille submillimétrique de diamètre (0.5–1) mm, pour fournir une résistance acoustique suffisante et une faible masse acoustique qui sont nécessaires pour l'absorption acoustique à large bande. La propriété caractéristique d'un tel résonateur est sa capacité à absorber les ondes sonores d'une fréquence particulière, dite fréquence de résonance. Dans les applications pratiques et d'ingénierie, pour les MPP préfabriqués, il est important de déterminer la fréquence de résonance aussi précisément que possible, surtout si le panneau sera utilisé comme absorbant acoustique à une certaine fréquence. Il existe un écart important entre la valeur exacte de la fréquence de résonance d'un seul absorbeur MPP qui peut être obtenue à partir du pic de la courbe d'absorption calculée par l'équation de Maa et cette valeur qui peut être calculée par l'équation de fréquence de résonance de Helmholtz à N trous classique. Une proposition d'équation modifiée et simplifiée pour le calcul de la fréquence de résonance d'un MPP unique de diamètre de trou (0,5–1) mm, dérivée de l'équation d'absorption de Maa, est introduite. La nouvelle équation proposée a donné un bon accord et peu de déviation, la déviation maximale était d'environ 5 Hz sur la plage de fréquences de 50 Hz à 1000 Hz, à partir de la valeur exacte de la fréquence de résonance.

Mots clés : résonateur de Helmholtz, panneau microperforé, fréquence de résonance, réactance de masse, résistance acoustique, constante de perforation.

Abstract

Microperforated panel, MPP, can be considered as a multi or N-holes Helmholtz resonator. It is a light, clean and tunable sound absorber, for which a first modeling was established by Maa in 1975. It is a resonator in sub-millimeter size of diameter (0.5–1) mm, to provide enough acoustic resistance and low acoustic mass reactance which are necessary for wide-band sound absorber. The characteristic property of such a resonator is its ability to absorb sound waves of a particular frequency, the so-called resonant frequency. In practical and engineering applications, for prefabricated microperforated panel, it is important to determine the resonance frequency as precisely as possible, especially if the panel will be used as a sound absorber at a certain frequency. There is high deviation between the exact resonance frequency value of single MPP absorber which can be obtained from the peak of calculated absorption curve by Maa's equation and that value which can be calculated by the classical N-holes Helmholtz resonance frequency equation. A proposed modified and simplified equation for calculating the resonance frequency of single MPP sound absorber of hole diameter (0.5–1) mm, which derived from absorption equation of Maa, is introduced. The new proposed equation gave good agreement and little deviation, maximum deviation was about 5 Hz over frequency range from 50 Hz to 1000 Hz, from the exact value of resonance frequency.

Keywords: Helmholtz resonator, microperforated panel, resonance frequency, mass reactance, acoustic resistance, perforation constant.

1 Introduction

Acoustic resonator, which is known as Helmholtz resonator, is incorporated to provide relatively large sound absorption in narrow bands at the low frequencies ranging from as low as 50 Hz to as high as 1000 Hz. It can be tuned to provide a maximum of absorption in a determined frequency called resonance frequency. It has been used as a single-hole or in multi-holes as a perforated panel to absorb sound in specific environment. The perforated panel is placed in front of a rigid

wall acts as a resonator, the air volume between the panel and the wall plays the role of spring. It is like Helmholtz resonator, where it can be tuned at resonance frequency; however, the absorption of perforated panel covers wider frequency range than that obtained by Helmholtz resonator. In the ordinary perforated panels, the perforations are in millimeters or even centimeters, while the microperforated panel MPP is in sub-millimeter size of diameter (0.5–1) mm, to provide enough acoustic resistance and low acoustic mass reactance which are necessary for wide-band sound absorber, without using additional fibrous or porous materials [1]. According to Xinmin Shen and et al, the diameter of the hole d should be smaller than 2.0 mm ($2.0 \text{ mm} \geq d \geq 0.1 \text{ mm}$), the thickness t

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of the panel should be larger than 0.1 mm ($t \geq 0.1$ mm) and the distance b to the neighboring microholes should be larger than 1.0 mm ($b \geq 1.0$ mm) [2]. Perforation of the MPP sound absorber less than 1.0% [3], while X. Hua and D. W. Herrin set the perforation ratio to 5.0% [4]. MPP has found applications in a wide variety of technologically significant problems. Tang and Siriango [5] provide an excellent discussion of the use of this resonator in reducing the organized oscillations inside jet engines, rocket combustors and furnaces. It has been proved that microperforated-panel absorber can effectively reduce noise of communication products at low frequency [6]. Microperforated panels may be fabricated from any sheet material, from cardboard, plastic or plywood to sheet metal with any finishing or decoration. Thus, they may be used in ordinary indoor conditions, or be made to withstand severe conditions, like washing, wind, temperature, steam or even flame for a short time. They are suitable for any reverberation or noise control applications [7]. Maa Dah-You [1, 7-9] studied the sound absorption coefficient of microperforated panels, which are based on the impedance of the hole. The structure and frequency characteristics of the MPP absorber are depending on the acoustic resistance r , acoustic impedance m , resonance frequency f_r and the perforation constant k [1]. Helmholtz resonator or MPP absorber are simply structures where their absorption characteristics can be exactly predictable. In practical and engineering applications, for prefabricated microperforated panel, it is important to determine the resonance frequency as precisely as possible, especially if the panel will be used as a sound absorber at a certain frequency. The classical analysis of a Helmholtz resonator predicted that its resonance frequency is independent of the shape of the cavity resonator, from which the N -holes resonance frequency equation was derived

$$f_r = \frac{c}{2\pi} \sqrt{sN/Vt^*} = \frac{c}{2\pi} \sqrt{\sigma/Dt^*}, \quad (1)$$

where s is the hole area, V is the Helmholtz resonator volume and N is the number of Helmholtz resonator holes. The resonance frequency in this equation depends entirely on three parameters; the perforation ratio σ , the thickness of the panel t , which is corrected to effective thickness t^* , and the distance between the panel and the wall D . The exact (true) resonance frequency value of single MPP absorber, which can be obtained from the peak of the calculated absorption curve by Maa's equation, is different from that calculated by the classical N -holes resonance frequency equation. In equation of Maa, there is an important parameter, perforation constant k , affects the value of resonance frequency beside the other three parameters. Pantou and Miller derived modified resonance frequency equation for the cylindrical Helmholtz resonator [10]; however, their equation did not give a good approximation with the true resonance frequency when applied for single MPP absorber. In this research the author proposed a modified and simplified equation for calculating the resonance frequency, which derived from absorption equation of Maa.

2 The Helmholtz Resonator

A Helmholtz resonator, originally created and developed by Hermann von Helmholtz in the 1850's, is a cavity with a volume V filled with a gas (usually air) connected to a hole of length (thickness) t and area s as shown in Fig. 1. Foundations of the theory of Helmholtz resonator were considered by Ingard [11]. The successful practical use of Helmholtz resonator involves exact calculation of resonance frequency and absorption coefficient for a given resonator [12].

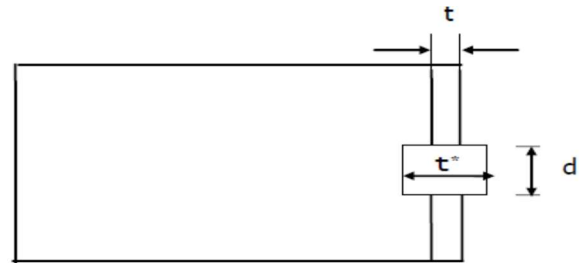


Figure 1: Single-hole Helmholtz resonator

2.1 Resonance Frequency of Single-Hole Helmholtz Resonator

The classical equation for calculation the resonant frequency of Helmholtz resonator is derived under the assumptions that all mass significant for oscillation of a resonator is concentrated in the hole of the resonator and that the spring constant is given by the volume of the resonator [13]. This result arises from an assumption that the dimension of resonator is small compared to the wavelength. When the dimensions of an acoustic system are often small in comparison with the wavelength of the sound, the motion of the medium in the system is analogous to that of mechanical system having lumped mechanical elements of mass, stiffness, and resistance. The air in the hole is considered to move as a unit and provides the mass element of the system. The pressure of the air within the cavity of the resonator changes as it is alternately compressed and expanded by the influx and efflux of air through the hole and thus provides the stiffness element. Since the air beyond the end of the actual constriction moves as a unit with the air in the constriction, it is necessary to add the end correction and use the effective length (thickness) t^* [11] which is greater than the actual length t . The resonance frequency at which absorption occurs is then determined by the value of the stiffness and the mass, and can be expressed as:

$$f_r = \frac{c}{2\pi} \sqrt{\frac{s}{Vt^*}}, \quad (2)$$

where s is the hole area, c velocity of sound = 340 m/s. and $t^* = t + 4d/3\pi$.

2.2 Resonance Frequency Of N-Holes Helmholtz Resonator

The classical resonance frequency f_r for a cylindrical resonator with N -circular holes is given by:

$$f_r = \frac{c}{2\pi} \sqrt{\frac{Ns}{Vt^*}} = \frac{c}{2\pi} \sqrt{\frac{\sigma}{Dt^*}} = \frac{c}{2\pi} \sqrt{\frac{\sigma}{D(t + \frac{4d}{3\pi})}} \quad (3)$$

3 The Microperforated Panel (MPP)

Microperforated panel sound absorbing construction consists of a thin panel perforated with large number of sub-millimeter holes together with an air space behind it, the structure and its equivalent circuit is shown in Fig. 2, The holes of MPP may be considered as a lattice of short

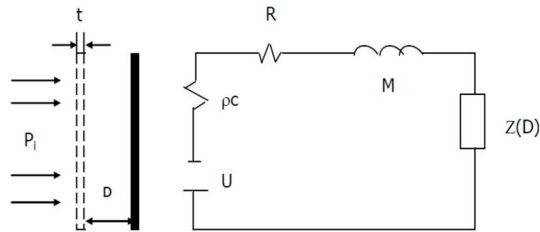


Figure 2: Microperforated panel sound absorber construction and its equivalent circuit.

narrow tubes separated by distances much larger than their diameters, but small compared to the wavelength of impinging sound wave. The propagation of sound waves in narrow tubes was treated early by Rayleigh [14] and Crandall [15]. They gave a simplified version for tubes with length very short compared with the wavelength. Assuming a sound pressure difference ΔP is applied between the ends of the tube, and the ratio of ΔP to the average value of particle velocity u over the cross-sectional area of the tube gives the specific acoustic impedance of the short tube as:

$$Z = \frac{\Delta P}{u} = j\omega\rho t \left[1 - \frac{2}{k\sqrt{-j}} \cdot \frac{J_1(k\sqrt{-j})}{J_0(k\sqrt{-j})} \right]^{-1} \quad (4)$$

where J_1 & J_0 are the Bessel functions of the first and zero order, $k = d\sqrt{(\omega\rho/4\eta)}$ is the perforation constant, $\eta = 1.789(10^{-5})$ kg/ms is the dynamic viscosity constant of air, $\rho = 1.2$ kg/m³ is the density of air and $\omega = 2\pi f$ is the angular frequency. Eq. (4) is important at intermediate value of k between 1 and 10, where it is proportional to the ratio of the diameter to viscous boundary layer thickness inside the tube. For MPP, Maa introduced an approximate formula for all values of k , which is expressed as [1]:

$$Z = \frac{32\eta t}{d^2} \sqrt{1 + k^2/32} + j\omega\rho t \left(1 + \frac{1}{\sqrt{9 + k^2/2}} \right) \quad (5)$$

The end correction of the hole thickness must be added to this equation [11].

For normal sound incidence of the sound wave on the microperforated panel, the wave motion in all the short tubes is in phase and additive, Maa [1] derived the relative (to the characteristic impedance ρc in air) acoustic impedance of MPP with end corrections:

$$z = \frac{Z}{\rho c} = r + jx = r + j\omega m, \quad (6)$$

and

$$r = \frac{32\eta t}{\sigma\rho c d^2} k_r, k_r = \sqrt{1 + k^2/32} + \frac{\sqrt{2}}{32} k \frac{d}{t} \quad (7)$$

$$\omega m = \frac{\omega t}{\sigma c} k_m, k_m = 1 + \frac{1}{\sqrt{1 + k^2/2}} + 0.85 \frac{d}{t} \quad (8)$$

Where; r is the normalized resistance, m is the normalized mass reactance, k_r is the resistance coefficient and k_m are the mass reactance coefficient. Several authors [2, 16-18] used a resistive term 4 times greater, have given little modification to formulae 5a and 5b as.

$$r = \frac{32\eta t}{\sigma\rho c d^2} k_r, k_r = \sqrt{1 + k^2/32} + \frac{\sqrt{2}}{8} k \frac{d}{t} \quad (9)$$

$$\omega m = \frac{\omega t}{\sigma c} k_m, k_m = 1 + \frac{1}{\sqrt{9 + k^2/2}} + 0.85 \frac{d}{t} \quad (10)$$

4 Resonance Frequency of Single MPP Absorber

When the microperforated panel is fitted in front of a rigid wall with an air gap in-between, will make a simple resonator sound absorber. The electric equivalent circuit is shown in Fig. 2. The sound wave impinging on the panel is equivalent to source of sound pressure on the rigid wall (analogous to the open-circuit voltage in an electric circuit) and internal resistance ρc , as that of the air. The relative acoustic resistance r and mass reactance m are given, and the relative acoustic cavity reactance is $-\cot(\omega D/c)$. For normal sound incidence, the sound absorption coefficient α is [1]:

$$\alpha = \frac{4r}{(1+r)^2 + (\omega m - \cot \frac{\omega D}{c})^2} \quad (11)$$

For long wave, $\cot(\omega D/c)$ can be replaced in first approximation by $(c/\omega D)$ and accordingly α can be given approximately from:

$$\alpha = \frac{4r}{(1+r)^2 + (\omega m - \frac{c}{\omega D})^2} \quad (12)$$

The maximum absorption of the single MPP sound absorber occurs when the mass reactance of the hole equals the relative acoustic reactance of the cavity. The frequency at which maximum absorption occurred is called resonance frequency, is given as

$$\omega_r m - \frac{c}{\omega_r D} = 0 \Rightarrow \omega_r^2 = \frac{c}{mD} \quad (13)$$

Considering Eq. (3), we find that the classical resonance frequency of N-holes Helmholtz resonator is easy to solve because it just depending on the perforation ratio (number of holes and their diameters), hole thickness and air gap. While in Eq. (13), the resonance frequency of MPP from Maa's acoustic impedance treatment, there is the mass reactance m which is important parameter in the computation of the resonance frequency, it includes mass reactance coefficient k_m beside the diameter and thickness of hole as it is seen in Eq. (10). k_m itself includes the perforation constant k "key parameter [1]" which is depending on the characteristic of air

(dynamic viscosity and density) inside the hole. All of these give some difficulty at solving the resonance frequency of MPP using Maa's treatments.

In order to reach our modified and simplified resonance frequency equation of microperforated panel Sound absorber, let us return to the Eq. (10) of mass reactance and rewrite it as follow:

$$m = \frac{t}{\rho c} \left(1 + \frac{1}{\sqrt{9 + 0.5k^2}} + 0.85 \frac{d}{t} \right). \quad (14)$$

Where $k = d\sqrt{(\omega\rho/4\eta)}$, $\rho = 0.0012 \text{ g/cm}^3$ and $\eta = 0.0001789 \text{ g/cms}$, we can get $k = d\sqrt{1.682\omega}$ then $k^2 = 1.682\omega d^2$. By replacing the value of k^2 with the second term in the bracket of Eq. (14), we get:

$$m = \frac{t}{\rho c} \left(1 + \frac{1}{\sqrt{9 + 0.841\omega d^2}} + 0.85 \frac{d}{t} \right). \quad (15)$$

The second term in bracket of Eq. (15), (i.e. $1/\sqrt{9 + 0.841\omega d^2}$), is considered as the key of this research, it is depending on each of the angular frequency ω and hole diameter d . It is inversely proportional and decreases gradually as any of ω and d increase. Consider a hole diameter of 0.05 cm, from 50 Hz to 1000 Hz, the average value of $(1/\sqrt{9 + 0.841\omega d^2}) \approx 0.256$. Then by substitute in Eq. (15), the mass reactance m , is

$$m = \frac{t}{\sigma c} \left(1 + 0.256 + 0.85 \frac{d}{t} \right) = \frac{1}{\sigma c} (1.256t + 0.85d). \quad (16)$$

Accordingly, the resonance frequency of single MPP can be given as.

For MPP of $d = 0.05 \text{ cm}$ the resonance frequency is

$$f_r = \frac{c}{2\pi} \sqrt{\frac{\sigma}{D(1.256t + 0.85d)}}. \quad (17)$$

Similarly, for MPP of $d = 0.06 \text{ cm}$ the resonance frequency is

$$f_r = \frac{c}{2\pi} \sqrt{\frac{\sigma}{D(1.237t + 0.85d)}}. \quad (18)$$

For MPP of $d = 0.07 \text{ cm}$ the resonance frequency is

$$f_r = \frac{c}{2\pi} \sqrt{\frac{\sigma}{D(1.219t + 0.85d)}}. \quad (19)$$

For MPP of $d = 0.08 \text{ cm}$ the resonance frequency is

$$f_r = \frac{c}{2\pi} \sqrt{\frac{\sigma}{D(1.204t + 0.85d)}}. \quad (20)$$

For MPP of $d = 0.09 \text{ cm}$ the resonance frequency is

$$f_r = \frac{c}{2\pi} \sqrt{\frac{\sigma}{D(1.190t + 0.85d)}}. \quad (21)$$

For MPP of $d = 0.10 \text{ cm}$ the resonance frequency is

$$f_r = \frac{c}{2\pi} \sqrt{\frac{\sigma}{D(1.177t + 0.85d)}}. \quad (22)$$

For all values of hole diameters from 0.05 to 0.10 cm, the value of 0.214 can be taken as an average of the term $(1/\sqrt{9 + 0.841\omega d^2})$, then only one equation for resonance frequency of single MPP can be introduced as:

$$f_r = \frac{c}{2\pi} \sqrt{\frac{\sigma}{D(1.214t + 0.85d)}}. \quad (23)$$

5 Numerical Examples and Discussion

Finally, for single MPP panel or Helmholtz resonator, the resonance frequency entirely is depending on the perforation ratio, distance air gap, thickness and hole diameter. In this section, numerical examples of the calculated results for the resonance frequency of N-holes Helmholtz resonator and single MPP absorber are given.

5.1 Resonance Frequency at Different Hole Diameters

First, consider a single MPP sound absorber of thickness 0.20 cm, air gap 10 cm, perforation ratio 0.5% and different hole diameters from 0.05 to 0.10 cm. By using Eq. (12), the absorption coefficient can be calculated. Fig. 3, gives the calculated absorption curves

From the calculated absorption curves, it is easy to determine the exact resonance frequency, $f_r(\text{exact})$, at which the maximum absorption occurs. The classical resonance frequency of N -holes Helmholtz resonator, $f_r(\text{HR})$, can be calculated by using the Eq. (3). The calculated resonance frequency of the same single MPP, $f_r(\text{modified})$ can be given by using the modified Eqs. (17) to (23). The obtained values of the calculated resonance frequencies $f_r(\text{exact})$, $f_r(\text{HR})$ and $f_r(\text{modified})$ are shown in Tab. 1.

From Tab. 1; the absolute deviations of $f_r(\text{HR})$ and $f_r(\text{modified})$ from the exact values can be obtained. Figure 4 shows these deviations.

It is clear from Fig. 4, there are high deviations or errors between the resonance frequency values which are calculated using the classical Eq. (3) of N -holes Helmholtz resonator and that are extracted from the calculated absorption curves which give the exact values of resonance frequency of single MPP, the lowest value is 35 Hz at the largest diameter 0.10 cm. While the largest deviation is less than 5 Hz between the exact values and that are calculated by the proposed modified Eqs. (17) to (22) for all the diameters over the frequency range from 50 Hz to 1000 Hz.

In order to understand the high and small deviations between the values of $f_r(\text{exact})$ and values of $f_r(\text{HR})$ and $f_r(\text{modified})$ respectively, we compared the classical Eq. (3) of N -holes Helmholtz resonator and the proposed modified Eqs. (17) to (22). The end correction in the proposed modified equation is due to the sound radiation at both ends ($0.85d$) while in the classical Helmholtz resonator is due to radiation of one end ($0.85d/2$). The parameter t in modified equations is multiplied by factor due to the perforation constant k , while in the

classical Helmholtz resonator there is no influence to this constant. Equation (23) which gives single resonance frequency for single MPP for all hole diameters from 0.05 to

0.10 cm can be used instead of Eqs. (17) to (22). Table 2 presents the calculated $f_r(\text{modified})$ by using Eqs. (17) to (22), and Eq. (23).

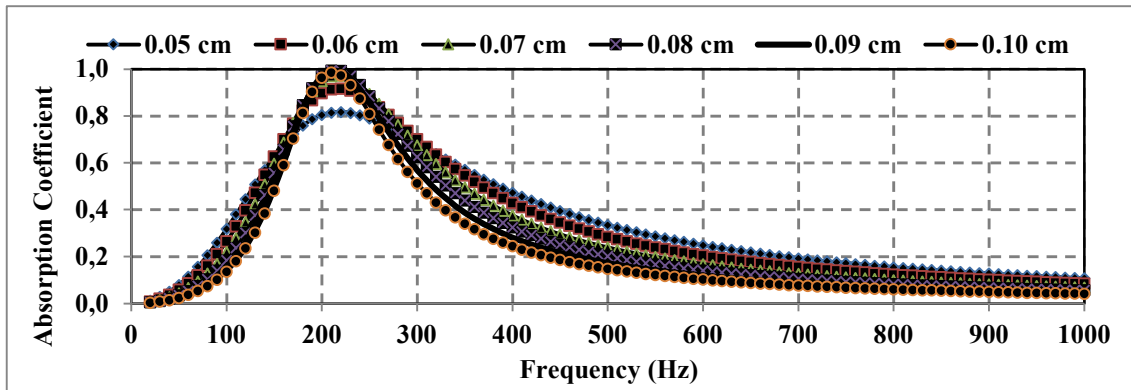


Figure 3: Calculated absorption coefficient of single MPP sound absorber ($t = 0.20$ cm, $D = 10$ cm, $\sigma = 0.5\%$ and $d = 0.05$ cm to 0.1 cm)

Table 1: Calculated $f_r(\text{exact})$, $f_r(\text{HR})$ and $f_r(\text{modified})$ of single MPP sound absorber ($t = 0.2$ cm, $D = 10$ cm, $\sigma = 0.5\%$ and $d = 0.05$ cm to 0.1 cm)

Hole diameter cm	0.05	0.06	0.07	0.08	0.09	0.10
$f_r(\text{exact})$ Hz	218.50	217.50	216.00	214.50	213.00	211.00
$f_r(\text{HR})$ Hz	257.38	254.95	252.58	250.28	248.04	245.86
$f_r(\text{modified})$ Hz	223.40	221.63	219.79	217.86	215.88	213.84

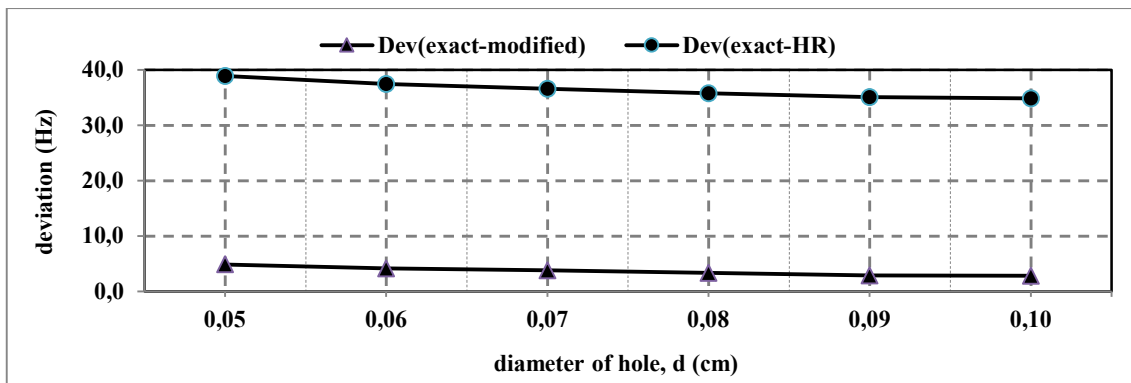


Figure 4: Absolute deviation of $f_r(\text{HR})$ and $f_r(\text{modified})$ from $f_r(\text{exact})$ of single MPP sound absorber ($t = 0.2$ cm, $D = 10$ cm, $\sigma = 0.5\%$ and $d = 0.05$ cm to 0.1 cm)

Table 2: Calculated $f_r(\text{modified})$ by using Eqs. (17) to (23) and Eq. (23) of single MPP sound absorber ($t = 0.2$ cm, $D = 10$ cm, $\sigma = 0.5\%$ and $d = 0.05$ cm to 0.10 cm)

Hole diameter cm	0.05	0.06	0.07	0.08	0.09	0.10
$f_r(\text{modified})$ Hz, Eqs. (13a to 13f)	223.40	221.63	219.79	217.86	215.88	213.84
$f_r(\text{modified})$ Hz, by Eq. (14)	226.66	223.35	220.19	217.16	214.25	211.45
Absolute deviation Hz	3.26	1.72	0.41	0.70	1.63	2.39

Table 3: Calculated $f_r(\text{exact})$, $f_r(\text{HR})$ and $f_r(\text{modified})$ of single MPP sound absorber ($t = 0.2$ cm, $\sigma = 0.50\%$, $d = 0.05$ cm and $D = 5$ cm to 10 cm)

Air gap distance cm	5.0	6.0	7.0	8.0	9.0	10.0
$f_r(\text{exact})$ Hz	311.50	284.00	262.50	245.00	230.50	218.50
$f_r(\text{HR})$ Hz	364.00	332.28	307.63	287.76	271.31	257.38
$f_r(\text{modified})$ Hz	315.94	288.41	267.01	249.77	235.48	223.40

Table 4: Calculated $f_r(\text{exact})$, $f_r(\text{HR})$ and $f_r(\text{modified})$ of single MPP sound absorber ($t = 0.2$ cm, $D = 10$ cm, $d = 0.05$ cm and $\sigma = 0.5\%$ to 1.0%)

Perforation ratio	0.50%	0.60%	0.70%	0.80%	0.90%	1.0%
$f_r(\text{exact})$ Hz	218.50	240.00	260.00	278.50	296.00	312.50
$f_r(\text{HR})$ Hz	257.38	281.95	304.54	325.57	345.32	364.00
$f_r(\text{modified})$ Hz	223.40	244.72	264.33	282.58	299.72	315.94

Table 5: Calculated $f_r(\text{exact})$, $f_r(\text{HR})$ and $f_r(\text{modified})$ of single MPP sound absorber ($D = 10$ cm, $d = 0.05$ cm, $\sigma = 0.5\%$ and $t = 0.1$ cm to 0.5 cm)

Panel thickness cm	0.10	0.20	0.30	0.40	0.50
$f_r(\text{exact})$ Hz	292.00	218.50	182.00	159.00	142.50
$f_r(\text{HR})$ Hz	347.69	257.38	213.60	186.53	167.68
$f_r(\text{modified})$ Hz	295.29	223.40	186.97	164.01	147.86

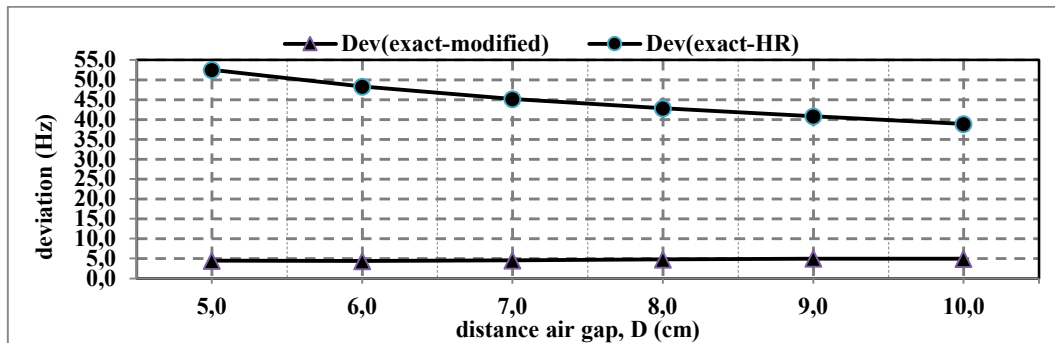


Figure 5: Absolute deviation of $f_r(\text{HR})$ and $f_r(\text{modified})$ from $f_r(\text{exact})$ of single MPP sound absorber ($t = 0.2$ cm, $\sigma = 0.5\%$, $d = 0.05$ cm and $D = 5$ cm to 10 cm)

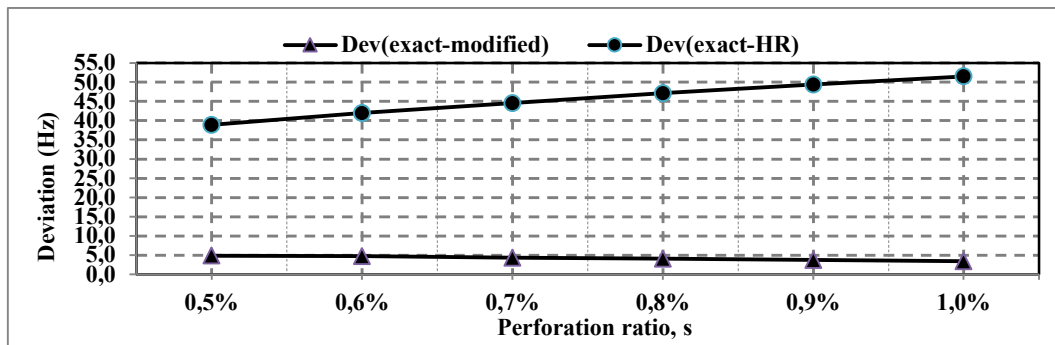


Figure 6: Absolute deviation of $f_r(\text{HR})$ and $f_r(\text{modified})$ from $f_r(\text{exact})$ of single MPP sound absorber ($t = 0.2$ cm, $D = 10$ cm, $d = 0.05$ cm and $\sigma = 0.5\%$ to 1.0%)

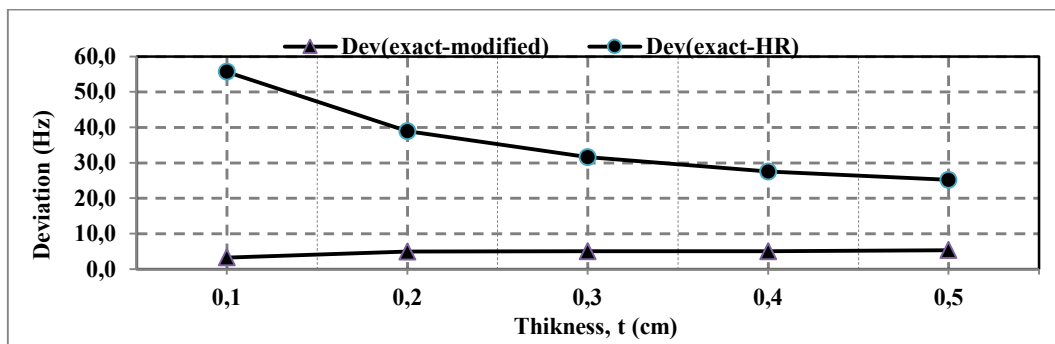


Figure 7: Absolute deviation of $f_r(\text{HR})$ and $f_r(\text{modified})$ from $f_r(\text{exact})$ of single MPP sound absorber ($D = 10$ cm, $d = 0.05$ cm, $\sigma = 0.5\%$ and $t = 0.1$ cm to 0.5 cm)

Table 2 shows little deviation of values between the calculated resonance frequencies by Eqs. (17) to (22) for each hole diameter and that calculated using Eq. (23) which is a single equation can be used for any hole diameter. So, it is acceptable to replace Eq. (23) by Eqs. (17) to (23).

5.2 Resonance Frequency at Different Air Gaps, Perforation Ratios and Thicknesses

To further confirmation the usefulness of the proposed equation, we performed some calculations on the single MPP at the other influencing parameters such as perforation ratio, air distance and thickness of the panel. Like the calculations which are carried out in Tab. 1. Tables 3, 4 and 5 give the exact resonance frequency from the absorption curves using Eq. (11), resonance frequency of N -holes Helmholtz resonator using Eq. (3) and the modified resonance frequency using Eq. (17). From Tabs. 3, 4 and 5; the absolute deviations of $f_r(\text{HR})$ and $f_r(\text{modified})$ from the exact values can be obtained. Figures 5, 6 and 7 indicate these deviations.

Like the influencing of hole diameters, Figs 5, 6 and 7 confirmed that the proposed modified equation give small deviations from the exact values extracted from the absorption curves at the other influencing parameters (σ , D and t) for the resonance frequency values, while it is still high in the case of $f_r(\text{HR})$. We can see that the deviation of $f_r(\text{HR})$ decreases with increasing D and t , but it increases as σ increases.

6 Conclusions

A proposed modified and simplified equation for calculation the resonance frequency of single MPP sound absorber was introduced. This equation gives good agreement and small deviations from the exact resonance frequency values which are extracted from the calculated absorption curves by Maa's equation of single MPP absorption coefficient. It has been shown that the importance parameter to calculating the resonance frequency of single MPP is its perforation constant k . By using the pattern in this paper, it is possible for anyone to create his own equation at the desired factors and frequencies.

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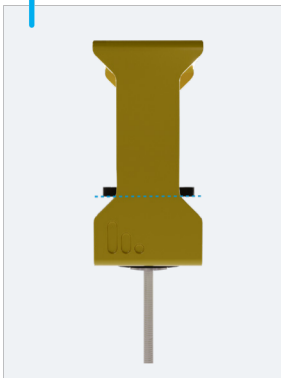
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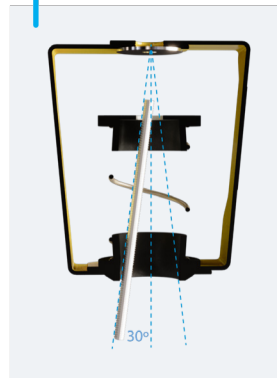
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Les normes scientifiques élevées maintenues par la revue Acoustique canadienne doivent beaucoup au dévouement constant des réviseurs de la revue, qui donnent généreusement de leur temps et de leur expertise. JCAA est heureux de rendre hommage à cette contribution en reconnaissant ceux qui ont participé au processus d'examen. Ainsi, l'équipe de rédaction de l'Acoustique Canadienne reconnaît avec une gratitude particulière les réviseurs suivants qui ont examiné des articles au cours de la période des 12 derniers mois.

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

FINAL REPORT

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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

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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.

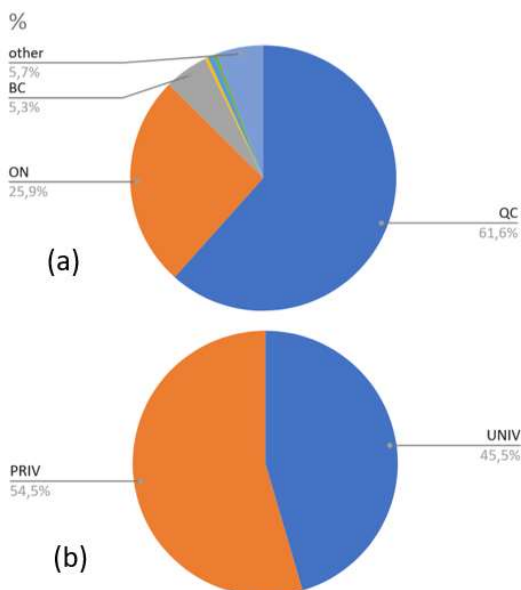


Figure 1: (a) Origin and (b) professional sector of the attendees.

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.

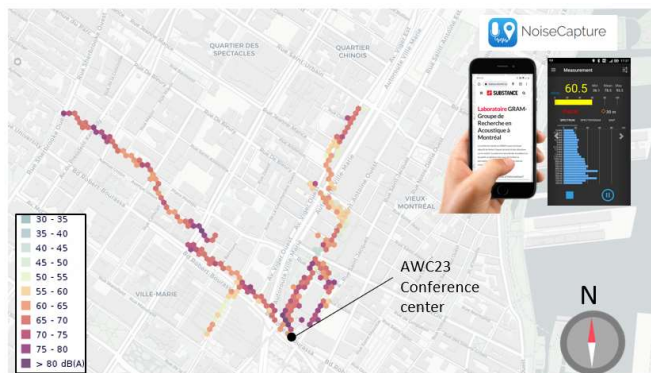


Figure 4: Noise map of Montréal collaboratively generated during AWC23.

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>



The joint 186th Meeting of the Acoustical Society of America and the 2024 Acoustics Week in Canada conference will be held from May 13-17, 2024, in downtown Ottawa, Ontario. You are invited to be part of this five days international conference featuring the latest developments in acoustics and vibration.



Shaw Convention Center

Ottawa is Canada's capital, a city that reflects the country's beauty, celebrates its diversity, embodies its spirit, and tells its stories like no other. Located at the confluence of three rivers at the foot of the rugged Canadian shield, Ottawa is home to over one million residents who are proud of their hometown and welcome people in English, French, Indigenous languages, and many more from around the world. The city's urban landscape reveals Canada around every corner, at historic and national sites, monuments, and cultural institutions. It's a city that knows how to celebrate, with annual festivals devoted to things near and dear to the hearts of Canadians, including music, arts and the diverse cultural communities that call Ottawa and Canada home. Unique

among G7 capitals, Ottawa is equal parts urban and rural, a city on the edge of nature offering boundless opportunities for adventure and recreation in the great outdoors. Put simply, if Canada were a city, Ottawa would be it.

Venue and Accommodation

The conference will be held at the new Shaw Convention Centre, featuring a sweeping glass façade encasing four floors of state-of-the-art meeting space. This spectacular venue is directly linked to the CF Rideau Centre Mall and a few steps away from recreational paths along the Rideau Canal and the ByWard Market shopping and restaurant district — not to mention 6,000 downtown hotel rooms, all within easy walking distance. Please refer to the conference websites for further registration details: <https://awc.caa-aca.ca> and <https://acousticalsociety.org/meeting-information/>.



Plenary, technical sessions

Plenary, technical, and workshop sessions are planned throughout the conference. Each day will begin with a keynote talk of broader interest and relevance to the acoustics community. Technical sessions are planned to cover all areas of acoustics including:



The Rideau Canal

AEROACOUSTICS / ARCHITECTURAL AND BUILDING ACOUSTICS / BIO-ACOUSTICS AND BIOMEDICAL ACOUSTICS / MUSICAL ACOUSTICS / NOISE AND NOISE CONTROL / PHYSICAL ACOUSTICS / PSYCHO- AND PHYSIO-ACOUSTICS / SHOCK AND VIBRATION / SIGNAL PROCESSING / SPEECH SCIENCES AND HEARING SCIENCES / STANDARDS AND GUIDELINES IN ACOUSTICS / ULTRASONICS / UNDERWATER ACOUSTICS

Exhibition and sponsorship

The conference offers opportunities for suppliers of products and services to engage the acoustic community through exhibition and sponsorship.

The tabletop exhibition facilitates in-person and hands-on interaction between suppliers and interested individuals. Companies and organizations that are interested in participating in the exhibition should contact the Exhibition and Sponsorship coordinator for an information package. Exhibitors are encouraged to book early for best selection.

The conference will be offering sponsorship opportunities of various conference features. In addition to the platinum, gold and silver levels, selected technical sessions, social events and coffee breaks will be available for sponsorship. Sponsors can have their logo placed on the conference web site within 10 days of their sponsorship. Additional features and benefits of sponsorship can be obtained from the Exhibition and Sponsorship coordinator or the conference web site.

Registration details

Please refer to the upcoming AWC2024 conference web site: <https://awc.caa-aca.ca/index.php/AWC/AWC2024> or to <https://acousticalsociety.org/ottawa/>.

Abstract submission

All abstracts will be submitted via the ASA submission site : <https://asa2024spring.abstractcentral.com/>

ASA and AWC Conference Proceedings

Attendees of the joint conference are invited to submit their conference proceedings to both ASA and CAA through the Proceedings of Meetings on Acoustics ([POMA](#)) and the Canadian Acoustics journal ([JCAA](#)). For the Acoustics Week in Canada conference proceeding, the manuscript is a **two-page article** that can be formatted using the available [Microsoft Word](#) or [Latex templates](#) and that can be submitted directly, **before May 1st 2024**, to the [Proceedings of the Acoustics Week in Canada](#) section. Per the agreement in place between ASA and CAA, the title of the proceeding paper must be different in both system for proper indexing and citation.

Contacts

AWC2024 General Co-Chairs:

- **Dr. Sebastian Ghinet** (Sebastian.Ghinet@nrc-cnrc.gc.ca)
- **Prof. Joana Rocha**, (JoanaRocha@cunet.carleton.ca)

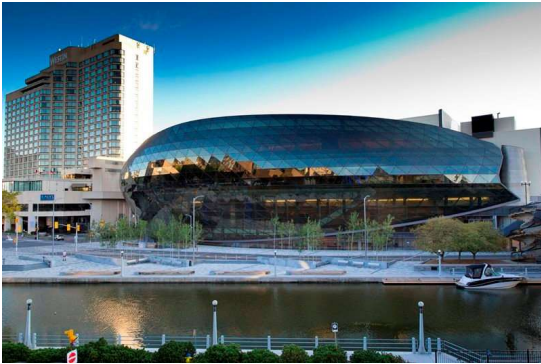
Key Dates

8 January 2024	Deadline for receipt of abstracts (https://asa2024spring.abstractcentral.com/)
Early March	Acceptance notices mailed
13 May 2024	First day of Ottawa meeting





La 186^{ème} réunion de la Société Américaine d'Acoustique (ASA), conjointement avec la Semaine Canadienne de l'acoustique 2024, aura lieu du 13 au 17 mai 2024, au centre-ville d'Ottawa, en Ontario.



Centre de congrès d'Ottawa « Centre Shaw »

Vous êtes invités à assister à cette conférence internationale de cinq jours durant laquelle les derniers développements en matière d'acoustique et de vibration seront présentés. Ottawa est la capitale du Canada, une ville qui reflète la beauté du pays, célèbre sa diversité, incarne son esprit et raconte son histoire comme aucune autre. Située à la confluence de trois rivières, au pied du bouclier canadien, Ottawa compte plus d'un million d'habitants, fiers de leur ville natale et accueillent les visiteurs en anglais, en français, en langues autochtones et bien d'autres du monde entier. Le paysage urbain de la ville révèle le Canada à chaque coin de rue, dans les sites historiques et nationaux, les monuments et les institutions culturelles. C'est une ville qui sait comment célébrer, avec des festivals annuels consacrés aux sujets chers au cœur des Canadiens, notamment la musique, les arts

et les diverses communautés culturelles qui considèrent Ottawa et le Canada leur chez-soi. Unique parmi les capitales du G7, Ottawa est à parts égales urbaine et rurale, une ville en bordure de la nature offrant d'innombrables opportunités d'aventure et de loisirs en plein air. En résumé, si le Canada était une ville, Ottawa en serait la représentation parfaite.

Lieu et hébergement

La conférence se déroulera au nouveau Centre de congrès d'Ottawa « Centre Shaw », caractérisé par une imposante façade vitrée panoramique enveloppant quatre étages d'espaces de réunion ultramodernes. Ce lieu spectaculaire est directement relié au centre commercial CF Rideau et se trouve à quelques pas des sentiers récréatifs le long du canal Rideau ainsi que du quartier des boutiques et des restaurants du marché By, sans oublier les 6 000 chambres d'hôtel du centre-ville, toutes facilement accessibles à pied. Veuillez consulter les sites web de la conférence pour de plus amples informations sur l'inscription : <https://awc.caa-aca.ca> et <https://acousticalsociety.org/meeting-information/>.



Le Canal Rideau

Sessions plénières et techniques

Des sessions plénières, techniques et des ateliers sont prévues tout au long de la conférence. Chaque jour débutera par une conférence plénière d'intérêt pour la communauté de l'acoustique. Des sessions techniques sont également prévues pour couvrir tous les domaines de l'acoustique, à savoir:

AÉROACOUSTIQUE / ACOUSTIQUE DU BÂTIMENT ET ARCHITECTURALE / BIOACOUSTIQUE / ACOUSTIQUE BIOMÉDICALE / ACOUSTIQUE MUSICALE / BRUIT ET CONTRÔLE DU BRUIT / ACOUSTIQUE PHYSIQUE / PSYCHOACOUSTIQUE / CHOCS ET VIBRATIONS / LINGUISTIQUE / AUDIOLOGIE / ULTRASON / ACOUSTIQUE SOUS-MARINE / NORMES EN ACOUSTIQUE

Exposition et parrainage

La conférence offre aux entreprises fournissant des produits et des services la possibilité de s'engager auprès de la communauté acoustique par le biais d'expositions et de parrainages.

L'exposition des produits et services facilite l'interaction entre les vendeurs et les personnes intéressées. Les entreprises et les organisations souhaitant participer à l'exposition doivent contacter le coordinateur de l'exposition et du parrainage pour obtenir de plus amples informations. Les exposants sont encouragés à réserver le plus tôt possible pour bénéficier des meilleures places.

La conférence offrira des possibilités de parrainage. En plus des niveaux platine, or et argent, certaines sessions techniques, événements sociaux et pauses café pourront être sponsorisées. Les sponsors peuvent ajouter leur logo sur le site web de la conférence dans les 10 jours suivant leur parrainage. D'autres informations et avantages du parrainage peuvent être obtenus auprès du coordinateur des expositions et du parrainage ou sur le site web de la conférence.

Inscription

Pour plus d'informations sur l'inscription, veuillez consulter le site Web de la prochaine conférence AWC2024: <https://awc.caa-aca.ca/index.php/AWC/AWC2024> ou au <https://acousticalsociety.org/ottawa/>.

Soumission du résumé

Tous les résumés seront soumis via le site de soumission de l'ASA: <https://asa2024spring.abstractcentral.com/>

Actes du congrès de la ASA et AWC

Les participants à la conférence conjointe sont invités à soumettre leurs articles de conférence à l'ASA et à la CAA par le biais des « Proceedings of Meetings on Acoustics » (POMA) et le journal de l'Acoustique Canadienne (JCAA). Pour les articles de la conférence Semaine canadienne d'acoustique, le manuscrit est **un article de deux pages** qui peut être formaté à l'aide des modèles [Microsoft Word](#) ou or [Latex](#) disponibles et qui peut être soumis directement, **avant le 1er mai 2024**, aux Actes du congrès de la [Semaine canadienne d'acoustique](#). Conformément à l'accord en vigueur entre l'ASA et la CAA, le titre de l'article doit être différent dans les deux systèmes pour une indexation et une citation appropriées.

Contacts

AWC2024 co-président.e.s de la conférence:

- **Dr. Sebastian Ghinet** (Sebastian.Ghinet@nrc-cnrc.gc.ca)
- **Prof. Joana Rocha**, (JoanaRocha@cunet.carleton.ca)

Dates clés

8 janvier 2024	Date limite de réception des résumés (https://asa2024spring.abstractcentral.com/)
Début mars	Avis d'acceptation envoyés
13 mai 2024	Première journée de réunion d'Ottawa



CANADIAN ACOUSTICAL ASSOCIATION

Minutes of the Annual General Meeting

Thursday, October 5th, 2023, 5:15-6:15 PM (EDT) at
Plaza Centre-Ville, Montreal, QC

1. Call to Order

Meeting was called to order 17:15 (EDT) by Jérémie Voix (President), who said a few words of welcome to the 25 people in attendance and introduced the meeting agenda. He moved that the agenda be adopted, seconded by Victoria Duda.

2. President's Report (Prof. Jérémie Voix)

After announcing that this would be his last report as President (more about this later), Jérémie updated the attendees on some of the project initiatives that the Association had been pursuing. He highlighted in particular:

- The now completed migration of the main CAA-ACA web site to the latest WordPress and PHP environment, ensuring its maintainability and compatibility with current standards.
- The updating of the CAA-ACA's Operations Manual and its organizing as a wiki for easy maintenance and consultation, a task led by Prof. Michael Kiefté.

Jérémie informed the members that, following the transition in July 2022 of the Open Journal System (OJS) portal to the PKP platform hosted by Simon Fraser University, the migration of all scripts and tools supporting its functionality had been completed in Spring 2023. A major improvement that is now fully implemented, Jérémie noted, is the management of advertising in the journal as a form of subscription; this not only simplifies payment for advertising but ensures that notifications are sent out when an insertion run is about to end and enables current advertisers to have full access to the journal. Jérémie also provided an update on the current local chapters of the Association, in Toronto and Montréal: both are now coordinated via Google Groups, moderated respectively by Mikk Tomme and by Romain Dumoulin and Raphael Duée.

Jérémie commented on the fact that over the 2022-2023 period numerous members reportedly had not received renewal notifications by e-mail, leading to the expiration of their active status. This had been traced to the way reminder e-mails were structured and sent, which made them liable to be blocked by spam filters; such technical issues had been corrected, and notifications were now being received reliably. He also noted that despite fluctuations in membership caused by the erratic renewal process, ultimately numbers remained solid. As for enhancements in the services and value offered to subscribers and authors, Jérémie mentioned new value-added features in the digital publication of Canadian Acoustics including easily embeddable citation links for social media and other communication platforms and indexing on the QuietLinks specialised library of noise and quiet related articles.

3. Treasurer's Report (Dalila Giusti)

Jérémie, delivering the report on behalf of Dalila in her absence, highlighted key points from the financial statements of the Association. He reminded the membership that the Association's awards are funded by the interest from investments, and that the principal cannot be touched (all investments are held in principal guaranteed GICs). He presented a comparative table of accounts balances over the previous few years, showing a solid financial position with over \$541,000 in assets between capital fund (from which awards are distributed), operating fund (for general expenses) and investments. He noted that investments have traditionally yielded a rate of return well above the guaranteed interest. He then presented a list of disbursed awards, for a total payout of \$11,100 with virtually all prizes having been awarded.

Next, Jérémie reviewed the current year budget, comparing actuals to forecast. The Association realised a higher-than-expected revenue from membership dues, thanks possibly to the interest in membership generated by the current conference. This was offset, however, by a further increase in journal production costs even above the already high 2022 level (Jérémie noted that the journal costs were driven up by an uncommonly large conference proceedings issue, likely to be an isolated phenomenon). The 2022 annual conference in St John's, Newfoundland, despite marking a very successful return to in-person meetings after the pandemic, resulted in a modest loss. Altogether, as it had been forecast, the CAA-ACA would post a deficit for 2023.

Jérémie then presented the proposed budget for 2024, which forecasts a deficit of about \$16,000. He informed the membership that after careful consideration of the options, the Board had recommended to keep the dues unchanged for all levels of individual membership but with no print delivery of the journal; a new category of regular membership with printed

journal would be available for annual dues of \$140 (\$20 higher than the current fee). Jérémie moved that the budget and new fee structure to be approved, seconded by Prof. Frank Russo; the motion passed unanimously.

4. Secretary's Report (Dr Roberto Racca)

Roberto began his presentation showing a table of membership numbers and their trend over the previous 12 months. He noted that a remarkable recovery had taken place after a severe slump he had reported to the Board at the mid-year meeting in May. Indeed, in the two main membership categories (regular and student members) the numbers now exceeded substantially those reported at the AGM of Fall 2022, yielding a grand total of 224 between individual members and institutional subscribers. Roberto surmised that the drop observed earlier may have been due to lack of effective notifications of expiring memberships rather than waning interest, as a campaign of e-mail reminders in the lead-up to the annual conference was successful in boosting renewals. He noted as well that both advertisers and sustaining subscribers had rebounded to earlier numbers, demonstrating continued interest despite past challenges in journal publishing. It also appeared that ongoing support efforts to enable institutional subscribers to benefit from network-based free access to Canadian Acoustics content were well received.

The numerous requests of assistance with online renewals made to the Secretary in the wake of the reminder campaign, Roberto noted, highlighted again the challenges that the current portal presents to individuals trying to purchase or renew memberships or subscriptions, despite Jérémie having inserted links to "how-to" video clips in the reminder e-mails. Roberto committed to focusing his activities in the coming months on collaborating with Jérémie and other specialised resources in making the OJS portal and related administrative processes clearer and more intuitive, especially in view of eventually transitioning his secretarial duties to a successor.

5. Awards Coordinator's Report (Prof. Victoria Duda)

Victoria presented a list of the 2023 award winners and the subject, coordinator, and monetary value of each prize. Noting that there were entrants this year in most categories and nearly all prizes had been awarded, she thanked the individual coordinators and urged them to publicize the winners and their supervisors through social media and other means to attract future candidates and to heighten the profile of the Association's awards. Victoria announced that for the 2023 conference, travel grants in the amount of \$500 had been given to 7 student presenters who travelled more than 350 km to attend.

6. Editor's Report (Prof. Umberto Berardi)

Jérémie, who delivered the report on behalf of Umberto, began by introducing the September quarterly issue of Canadian Acoustics (the Acoustics Week in Canada proceedings issue) which was a massive undertaking, collating in some 260 pages two-page papers submitted for the majority of the presentations given at the event, plus abstracts for the remainder. He noted that the journal continues being published in printed form every quarter and that CAA-ACA members and institutional subscribers can access online all current content plus a vast archive of issues dating back to the origin of the publication. He acknowledged the difficulties, already mentioned in other reports, that trouble the experience of some users of the online portal attempting to purchase or renew a membership or subscription and indicated that steps would be taken to address the problems.

Through timeline graphs of online accesses to abstracts and full papers, Jérémie showed sustained activity on the journal site, peaking around publication months as subscribers viewed new content but maintaining a steady baseline in the thousands of accesses per month. He also presented some editorial statistics indicating an article acceptance rate of around 70% and average times to decision of about 70 days to accept and 130 days to reject, based on the journal years 2021-2022.

Lastly Jérémie acknowledged on behalf of Umberto the editorial executive team and the associate editors for specific disciplines in acoustics. He noted that some positions on the editorial board were vacant (subject matter experts in bioacoustics, consulting, hearing conservation, underwater acoustics) and invited any qualified candidates to consider volunteering.

7. Social Media Editor Report (Romain Dumoulin)

Jérémie gave a brief presentation on behalf of Romain, showing audience statistics for the CAA-ACA accounts on LinkedIn (1069 members, +70 since June 2022) and X / Twitter (562 followers, +40 since June 2022) and giving a summary of subjects covered in recent posts (AWC 2023, job opportunities, student awards, local chapter events). He remarked that the Association's goal on social media is not to generate a large amount of traffic, but rather to inform usefully on specific matters of interest.

8. Meetings Present and Future

AWC 2023: Montréal, QC (Prof. Olivier Doutres, Dr Thomas Padois)

Jérémie presented the current conference in numbers and facts:

- More than 260 participants.

- An almost even split in delegates between industry (55%) and academia (45%).
- Representation from across Canada, mostly Ontario and Québec plus BC, AB, NB, NS.
- Welcomed international participants from USA, France, and Germany.
- 11 sessions in 4 parallel streams; 156 presentations (maximum possible number the programme could fit).
- Preliminary budget figures: total revenues ~\$160k, total expenses ~\$153k.

ASA/AWC 2024: 13-17 May, Ottawa, ON (Joana Rocha, Sébastien Ghinet)

Joana gave a brief overview of the following year's event:

- Will occur in the Spring to match the Acoustical Society of America schedule of conferences; this will require some adjustment in the organizing of CAA-ACA meetings normally associated with AWC (the AGM and election of the Board) but will guarantee a lovely season for being in Canada's capital.
- To be held in the Shaw Convention Centre, a state-of-the-art meeting space fully capable of accommodating the about 1000 delegates expected at this joint event.
- Conference papers can be submitted, with due alterations in style and title, to one or both of the ASA's POMA (Proceedings of Meetings on Acoustics) and the CAA-ACA's Canadian Acoustics.
- ASA will be primarily responsible for coordinating the event; they would be starting the process in earnest (call for papers etc.) after their December conference in Sydney, Australia.

AWC 2025 and Points Beyond

Jérémie indicated that AWC would likely move West for its 2025 edition, with Vancouver or Banff having been proposed by Umberto Berardi and Fitsum Tariku who would coordinate the event. Further in the future, a bid to host InterNOISE 2028 in Vancouver is being brought forth by Umberto and other members of the CAA-ACA's executive in collaboration with local academic, tourism and conference hosting organisations.

9. Board of Directors Elections

- Jérémie played a brief video by Umberto who apologized for not being able to participate in person and announced his willingness to accept the Board's nomination to succeed Jérémie as President of the CAA effective immediately, swapping with him the role of Editor in Chief of Canadian Acoustics.
- Jérémie introduced to the membership the new terms for Director and executive positions agreed by the Board:
 - The 11 directors of the CAA shall be elected during the AGM from the slate submitted for reelection by the current Board of Directors and from nomination from the floor.
 - Three Directors will be appointed by the Board to hold executive positions of President, Executive Secretary and Treasurer, respectively for terms of 2+2 years, 5+1 years, and 5+1 years with their "outgoing period" (of 1 or 2 years) overlapping the active term of their successor whom they will support and mentor for that period.
 - All other directors shall hold office for a maximum of six consecutive one-year terms, unless removed, or until their respective successors are elected and qualified.
 - Directors who have served the maximum of six consecutive one-year terms are eligible for re-election after a cooling-off period of two (2) years. During this cooling-off period, they may not seek election or appointment to the Board of Directors or hold any other leadership positions within the CAA. This cooling-off period is intended to promote fresh perspectives and diverse leadership within the organization while allowing former directors the opportunity to potentially return to leadership roles after a reasonable break.
 - Terms shall begin immediately upon adjournment of the annual meeting.
- As 9 regular members of the current Board had sought re-appointment, Jérémie announced that there were 2 vacant Director positions to be filled, and he invited volunteers or nominations from the floor.
 - Board member Andy Metelka nominated Zoe Razavi,
 - Board member Bill Gastmeier nominated Anil Joshi,
 - Jérémie nominated Peter VanDelden.
- The three nominated individuals gave brief self-introductions of their backgrounds and their aspirations in joining the Board. Zoe Razavi however indicated that she would not mind deferring her joining the Board until a future time. There being now two nominees and two positions, Anil Joshi and Peter VanDelden were acclaimed to the Board.

10. Varia

None on the agenda, nor raised from the membership.

11. Motion to Adjourn

Moved by Jérémie, seconded by Peter VanDelden. Meeting adjourned at 18:12 (EST).

CANADIAN ACOUSTICAL ASSOCIATION

Minutes of the Board of Directors Meeting

Tuesday, 3 October 2023 3:00 PM – 6:30 PM (EDT)
Plaza Centre-Ville, 777 Blvd Robert-Bourassa, Montréal
and by Zoom videoconference

1. Call to Order

Present in person: Jérémie Voix (chair), Victoria Duda, Bill Gastmeier, Bryan Gick, Michael Kieffe, Andy Metelka (arrived at 17:00), Hugues Nélisse, Roberto Racca, and Joana Rocha (arrived at 17:10, previously online). Present online: Umberto Berardi, Dalila Giusti, Joana Rocha (initially), and Frank Russo.

Mehrzad Salkordeh (outgoing Director) joined briefly online to wish everyone well and was warmly greeted.

Meeting called to order by Jérémie at 15:08 (EDT).

Adoption of proposed agenda moved by Jérémie, seconded by Michael.

2. President's Report (Prof. Jérémie Voix)

Jérémie began by remarking that this would be his last report to the Board as President as he intended to transition to the role of Editor-in-Chief of Canadian Acoustics as he had announced at the Spring BoD meeting. He went on to report on the status of infrastructure projects, highlighting first off the now completed migration of the CAA-ACA website to a PHP 8.1 compliant platform that was secure and compatible with current standards. He indicated that work was actively progressing on the repository of Acoustics training programmes across Canada, with 20 entries currently in a wiki page, and the updated Operations Manual and Procedures that Michael Kieffe had been developing as a wiki as well. Projects that had not made much progress but remained as goals included the curation of a Practitioners' Corner section in Canadian Acoustics (papers would have to be invited, and the well-attended current conference might be a valuable forum to drum up interest), the improvement of terminology and content clarity in the Open Journal System portal in both English and French via the language pack (a task that Roberto had agreed to lead), the creation of a "starter kit" for new local chapters of the Association following the example of the Toronto/GTA and the Montréal groups, and the production of a bilingual video patterned after a French short named "What's an Acoustician?" but adapted to the Canadian reality of the profession (Andy had provided initial help).

Jérémie reported on the robust operational status of the scripts developed for the Open Journal System (e.g., to generate listings of BoD, sustaining subscribers, advertisers, members, etc.) that had just been finalized before the 2023 Spring meeting of the Board, and of the adverts management system structured on a subscription-like model in the OJS with ensuing benefits to advertisers such as on-line renewals and access to the digital content of the Journal. He gave further details about the Toronto/GTA and the Montréal local chapters, which were coordinated via Google Groups moderated respectively by Mikk Tomme and by Romain Dumoulin / Raphael Duée, and about the development of a complete wiki knowledge base for the Association which would include the Operations Manual and constitute a readily accessible resource for members.

Moving on to new business, Jérémie commented on the fact that over the 2022-2023 period numerous members reportedly had not received renewal notifications by e-mail, leading to the expiration of their active status. This had been traced to two technical issues: an improperly configured relaying of outgoing emails which made them liable to be considered spam, and flaws in the operation of the automated scripts that generated reminders. Both issues had been solved and reminders were now being delivered reliably to members, institutional subscribers, and advertisers at 1 month, 15 days, 1 day before and 15 days, 1 month, 6 months after the lapsing of a term. Jérémie also mentioned new features of the online journal that enhanced its value to members and subscribers, such as the introduction of easily embeddable citation links for social media and other communication platforms, and the indexing of Canadian Acoustics on the QuietLinks specialised library of noise and quiet related articles.

The final part of Jérémie's presentation addressed the all-important matter of membership engagement in the governance of the Association. He noted that 11 participants in the 2023 AWC had, through the registration form

for the conference, expressed interest in at least learning about directorship. Rather than setting up a formal meeting with just these respondents, Jérémie proposed to have two tables in the conference lunch area set aside for the first two days of AWC and identified with signage and announcements so that interested parties would have the opportunity to meet and chat informally over luncheon with current members of the Board who would volunteer to attend. He then went on to the matter of Directors' and Officers' terms of office, the discussion of which had already begun at the 2023 Spring meeting of the Board, and presented a proposal for amending them. Under the proposed new rules, Directors would serve up to six consecutive one-year terms, after which they would have a cooling-off period of two years during which they could not seek election or appointment to the Board or hold any other leadership positions within the CAA. This cooling-off period would encourage diverse leadership and fresh perspectives within the organization while allowing former Directors the opportunity to potentially return to leadership roles after a reasonable break. The proposal also envisaged for the executive position of President a term of two years in the effective role preceded by two years as "elect" and followed by two years as "immediate past". Jérémie also suggested that the position of Editor in Chief should be appointed by the BoD for a term that could be predefined or left open, and that a formal position of System Administrator should be established to capture the increasing responsibilities to maintain and advance the digital framework for the Association.

Extensive discussion ensued about the proposed scheme, especially regarding other executive positions (Treasurer and Executive Secretary) and whether they too should be made fixed term and with an overlap period like the President's role. Concern was expressed that such a rate of rotation would be challenging to sustain given the limited pool of candidates and potential low willingness to commit to the demands of an Executive position; it was also noted that too short a period in the active role would hardly yield adequate benefit from the experience acquired, and in the case of the treasurer it would create logistical difficulties with having to frequently update bank signatures, PayPal administrative contacts, etc. Final consensus was to have an active term of five years plus one year "outgoing" for the positions of Treasurer and Secretary; it was also agreed that an outgoing President should transition into the "immediate past" position to provide redundancy and continuity, but there was no requirement for an "elect" phase. The point was raised that if the terms of office of a member of the Executive required their position on the Board to extend beyond the six-year limit, this should be formally allowed.

Jérémie committed to summarising the agreed terms in a briefing to be presented at the AGM for information, although it was recognised that additional time and thought would be needed to formally ensconce the proposal into amended bylaws that would have to be voted on at next year's AGM. There was some additional discussion about renewal of the current Board and how to encourage a diverse and inclusive representation among new members. Bill Gastmeier suggested that a nomination and selection committee should be set up to both identify interested parties and, assuming there is a surplus of candidates, make recommendations in an EDI and merit informed manner; he volunteered to provide a guideline document to the convening of such a body and defining its mandate.

3. Treasurer's Report (Dalila Giusti)

Dalila presented a list of the Association's current investments in principal guaranteed GICs and noted that no significant interest revenue could be expected in the current calendar year since the majority would not be maturing until 2024 or later. She indicated that there had been a substantial uptick in membership revenue (whose origin would be discussed in the Secretary's report) but that was just a return to a more normal situation after a drop, and it had to be acknowledged that increased costs would start eroding the Association's savings unless new revenue streams were created, or existing ones increased.

An aspect of the budget that Dalila described as unclear was the student travel allocation for attendees to the annual conferences, which was not handled in a consistent manner. For the conference in Newfoundland the previous year, Dalila was not aware of any funds having been spent on student travel support even though the Association had allocated in the budget for that purpose \$10,000 that went unclaimed. She indicated that for the current AWC she had been in discussions with Victoria (awards coordinator) and Jérémie to define funding criteria, and student travel grants would be disbursed although the modality had not yet been finalised.

Spotlighting some additional financial facts, Dalila reported that journal costs had been considerably higher in 2023 and had already exceeded the estimate included in the proposed budget, still with one quarterly issue to go. She noted that the September issue had cost over \$12,000, more than half the budget allocation, and indicated that if that trend was expected to continue there was urgent need for a discussion of the matter to bring costs under

control. A larger number of student prizes had been awarded in 2023 (the previous year more had gone unclaimed) and the Directors' Awards for best student and member's papers in Canadian Acoustics had been judged and assigned once again in 2023 after a hiatus. Lastly, the 2022 conference had resulted in a shortfall albeit modest, about \$1,250.

Turning to the Association's assets, Dalila remarked that for the first time the cash position was slightly lower than the previous year, about \$541k against \$554k, but that was influenced by the timing of disbursements with respect to investments maturing and interest being deposited. Although paying out the awards will draw down on the capital fund, she advised against transferring any funds from the operating to the capital account until the final balance of payments and revenues became clearer. Dalila then showed a prospect of all the awards being paid out that year, totalling just over \$10,000 or about twice the amount paid the previous year; this, she noted, was a good thing as it meant that the Association had applicants for most prizes and was thus able to recognize and reward excellence.

Moving on to the operating fund, Dalila showed the comparison of estimated vs actual figures for the year in both revenues and expenses; she noted that actual membership dues at \$20,700 had far exceeded the estimate of \$15,000 that had been based on the previous year; other revenues like sustaining subscriptions were lower than forecast while advertising revenue was exactly as expected; altogether, revenues were about \$5,000 above forecast. On the expenses side, the most substantial overrun was from journal costs that rose to \$30,000 against \$21,000 forecast, especially due to an uncommonly large conference proceedings issue; still, total expenses were marginally (about \$2,500) lower than budgeted because no travel grants were paid out for AWC 2022. Based on the 2023 information Dalila projected a budget for 2024 conservatively estimating a deficit of about \$16,000.

Dalila reminded the Board that the Association had not raised its dues since 2019 despite increasing costs; she noted that she had not made a recommendation for fee increases but the matter should be reviewed. Lengthy discussion ensued on what the journal costs would be in the future and whether members would prefer a paperless option; this led to the suggestion of creating a split category for regular membership where the fee would be the current one (\$120) with no printed copy of the journal and an increased one (\$140) with paper copy delivery. Student and retired memberships would remain at their present fees but without printed journal.

Jérémie moved, seconded by Bill, for the adoption of Dalila's report amended with the proposed rates adjustment; the Board voted unanimously in favour.

4. Secretary's Report (Dr Roberto Racca)

Roberto began by presenting a table of membership and subscription numbers over the previous 12-month period comparing current values to the previous Fall BoD meeting in late September 2022 and the Spring meeting in May 2023. He noted how the precipitous drop in regular memberships that had occurred between the earlier two reporting dates had thankfully corrected itself, doubling to 142 from the 73 in May and indeed exceeding the 129 of a year earlier. Student memberships had also more than doubled to 59 from the 24 of six months before, continuing in that case a rising trend, while sustaining subscriptions had bounced back to 14 from the 9 in May and nearly recovered to the 18 of a year before. While reflecting in some part the interest in the Association created by the conference, Roberto noted, these encouraging gains were largely attributable to the campaign of e-mail reminders sent out by Jérémie in the run-up to AWC 2023 to all members whose terms had lapsed in the past year or so. This had resulted in a surge of renewals – and several apologies and expressions of goodwill for the CAA-ACA sent to the Executive Secretary in whose name the automated reminders had gone out. All said, the grand total of individual members and institutional subscribers had risen to 224.

Regarding the sustaining subscribers, Roberto indicated that he would continue following up with organisations not only to canvass their support but also to ensure that they were aware of and benefited from features such as network-based free access to the full online content of Canadian Acoustics. He pointed out that the same follow-up was being done for advertisers, who appreciated the ability to see online the most recent issues of the journal with their ad insertions thanks to the "subscriber" status lent to them by the OJS based management. On that note he remarked that ad runs had also recovered from the drop of a few months earlier, suggesting that despite the publishing schedule challenges in 2022 there had not been a loss of interest in advertising in the pages of Canadian Acoustics.

Roberto remarked that the surge in communications with members and subscribers that resulted from the reminder campaign also brought again in sharp focus the difficulties presented by the current portal to individuals trying to purchase or renew their terms. Numerous requests for instructions and clarifications had to be fielded on an individual basis by the Executive Secretary despite “how-to” video clips produced by Jérémie that are linked in renewal notification e-mails. Several people stated that navigating the subscription / membership management site was awkward and unintuitive and that the process of renewal needed to be made easier. Especially in view of the objective to transition long-held executive roles to new and freshly enthusiastic hands, Roberto committed to focusing his activities over the upcoming months, in collaboration with Jérémie and other specialised resources, to making the OJS portal and related administrative processes clearer and more intuitive.

5. Awards Report (Prof. Victoria Duda)

Victoria presented a summary table of all prizes and their awarded status for 2023 and gave the good news that most prizes had been applied for, sometime with as many as five applicants for an award, and winners had been selected. Because of this considerable turnout, and the higher cash value of the prizes after an increase decided the previous year, the total distributed amount in prizes for 2023 would be much larger than in 2022 as already mentioned in the Treasurer’s report. She highlighted some of the major awards distributed, including the Shaw post-doctoral prize in Acoustics (\$3900) which had gone unassigned the previous year for lack of a qualifying candidate. There were no applicants for two prizes, the Albert S. Bregman student prize in Psychological Acoustics and the Thomas D. Northwood student prize in Architectural and Room Acoustics, while the Hétu prize in Acoustics went unawarded because of the vacant coordinator position, formerly held by Alberto Behar, for which a replacement would be sought. Victoria expressed her gratitude to directors Bill, Brian, Dalila, Michael, and Roberto who had been judges for the Directors’ Awards for best student and best member papers in Canadian Acoustics; she noted that the Student Presentation Awards would similarly be assigned based on scoring by audience members selected by session Chairs throughout the conference. Jérémie indicated that for AWC 2023 the full complement of three prizes would be awarded to the top judged student papers across all days and sessions; this was the subject of discussion because at some previous conferences (AWC2020, AWC2022) only one such prize had been offered, but Jérémie noted that the reason had been the small number of student presenters at these events. Having verified that the CAA-ACA online documentation mentioned three prizes of \$650 each, it was confirmed that this would indeed be the case.

Lastly, Victoria reported on the AWC Student Travel grants of \$500 a person toward costs to attend the conference, which had a maximum budget of \$10,000 but no set qualifying rules for applicants. She related that the decision had been made with AWC convenors and following the 2023 Spring BoD to support students travelling to Montréal from more than 350 km away, which restricted the qualifying field to a group of 9 (from Ontario and British Columbia) based on registration records. The final list of course would depend on actual attendance by those students. Dalila confirmed that these grants, like all awarded cash prizes, would be paid out by e-transfer for which she only required the electronic mail addresses of recipients.

6. Editor’s Report (Prof. Umberto Berardi)

Umberto summarised the production status to date: issues 1 and 2 of 2023 had been printed and mailed; issue 3, the AWC 2023 proceedings, had been printed and would be mailed to members and subscribers who would not receive a copy directly at the conference. For future issues there were already 12 papers in the editorial pipeline, some of which were close to being accepted and two already accepted, so there would be no problem in publishing the fourth issue of 2023. Beyond that, he noted, he would not say too much as his editorial responsibility would end with the swap of roles with Jérémie; there were however some insights for the future that he wished to share. For the May 2024 conference jointly organised with the American Society of Acoustics, the two parties had agreed after some discussion that authors of presentations would be able to submit their papers indifferently to the ASA’s POMA (Proceedings of Meetings on Acoustics) or to Canadian Acoustics. Both doors would therefore be open, with the expectation that Canadian authors would more likely publish their paper in Canadian Acoustics while US authors would choose POMA.

Umberto also put forward, for the next Editor in Chief’s consideration, the idea of producing again a geographic special issue, as had been done in the past for the Greater Toronto Area (GTA), Montréal, and Vancouver to boost interest in the journal for potential contributors in those regions. This had not happened in the last four years, and Umberto thought the time was right to rekindle the idea. In the same vein he suggested that a topical special issue

would raise the interest in the journal for a specialty sector, as it was done for audiology a couple years back. Lastly, Umberto remarked that not much renewal had taken place over the past decade on the Advisory Board or much of the Editorial Board of Canadian Acoustics, and some vacancies remained to be filled. For the near future nonetheless, he noted in closing, the journal was in good shape editorially, with enough contributed papers to see it into the first (March) issue of 2024 whilst the June issue would feature the conference proceedings.

Jérémie thanked Umberto for his insights and said that as the upcoming Editor in Chief he would heed the suggestions regarding the publishing timeline, special issues, and the advisory bodies of the journal. He then raised a point of fact regarding the options for conference papers from the May ASA/CAA conference, stating that his understanding in exchanges with the ASA stakeholders was that the same paper could be published in both Canadian Acoustics and POMA with the proviso that the title had to be different in the two submissions to avoid indexing conflicts. Umberto confirmed that this was also his interpretation in principle, but hopefully the 800-900 ASA participants expected at the joint event would not opt to submit their papers to the Canadian Acoustics conference issue which would be overwhelmed. By comparison, following the previous joint conference held in Victoria (BC) in October 2018, a proceedings collection containing mostly 2-page articles from CAA members was published in the December issue, and as a result from the delegates' interest, a special issue of full papers from a special conference session on room acoustics dedicated to Murray Hodgson was published as a tribute in March 2019.

7. Present and Upcoming Meetings

a. AWC 2023: Montréal (Prof. Olivier Doutres, Dr. Thomas Padois – joined in person this segment only)

Olivier Doutres, conference Chair, reported that the event had attracted more than 260 registrants and that an impressive balance had been achieved between academic and industry participants, an almost exactly even split which was excellent in terms of the congress' wide appeal. He remarked on the broad geographic reach, with most participants from Québec and Ontario but many spanning Canada coast to coast, from British Columbia and Alberta to New Brunswick and Nova Scotia as well as from the USA, France, and Germany. The conference had received generous support from sponsors at the diamond level (Pliteq) and silver level (IRSST, LogiSon and SVS), who were also exhibiting at the conference along with 12 other exhibitors; to encourage attendees to visit all exhibitors' booths, a "collector" card to be stamped at each stand would entitle the bearer to be entered in a draw for prizes. Thomas Padois, the technical Chair, presented a summary of the programme structured as 11 sessions in 4 parallel streams, with a total of 156 presentations on topics ranging from Architectural & Building Acoustics, Hearing Protection, and Speech & Hearing (the three primary subjects at AWC 2023) to Environmental Noise, Artificial Intelligence, and Underwater Acoustics among others. Olivier remarked that 156 presentations were the maximum that could be accommodated, and luckily it exactly matched the number of accepted papers so that no speaker had to be turned down due to space constraints.

Thomas gave a brief overview of the three keynote speakers (Christian Giguère, Nouredine Atalla, and Fabrice Marandola), then Olivier described the social and technical events associated with the conference. These included an all-time "NoiseCapture Party" whereby participants would use their Android phone and NoiseCapture app (duly calibrated) to assemble a map of sound levels wherever they went around Montréal during the three days of the conference. On the Wednesday afternoon there would be two parallel social events, a "Beer and Pizza" gathering for students at a local microbrewery, and a combination of cocktails, technical visits to EERS and CRITIAS laboratories, and a ghost tour of Griffintown for all conference participants registered to that event. On the Thursday afternoon after the end of sessions there would be the CAA-ACA Annual General Meeting, followed by a cocktail reception & PowerPoint Karaoke, the conference gala banquet, and a musical jam session. Finally on the Friday afternoon after the end of the conference programme three parallel technical visits were planned, to CIRMMT, or ICAR (ÉTS), or the Maison symphonique.

Regarding food and beverage offerings for the delegates (in addition to the gala dinner), Olivier mentioned that there would be that evening a Welcome cocktail reception (open bar and appetizers), then on every day of the conference a continental breakfast, 2 coffee breaks, and a buffet seated lunch, all complimentary. A point of great importance to the conference organisers, Olivier noted, was the environmentally sensible running of the event; he listed the sustainable actions adopted which included low-impact waste management, responsible consumption, and sustainable choices in food and beverage, following the guidelines proposed by Tourisme Montréal and the Sustainable Events Council of Québec. All sustainability measures adopted were openly communicated to

participants via e-mails and the web site – including the 40% quota of vegetarian dishes offered at the gala banquet, which Olivier felt might turn out to be the least popular.

Lastly Olivier showed a preliminary breakdown and estimate of the conference budget. On the revenue side, the event was forecast to bring in \$160,121 of which the largest component (72%) came from registration fees. On the expenses side, the total estimate was \$152,817 of which the vast majority (84%) were the venue costs. The event was therefore expected to realise a modest revenue, or at any extent not to run into a deficit. Olivier mentioned the challenge and cost of securing a suitable venue, which caused the organisers considerable anguish until the registration numbers began to rise and they could be confident that the event would be well subscribed. Board members expressed their appreciation for the efforts of Olivier and his colleagues, and Jérémie complimented them on having by his records surpassed the attendance of any previous AWC.

b. ASA/AWC 2024: Ottawa (Joana Rocha, Sébastien Ghinet)

Joana reported that all arrangements for the collaboration between ASA and CAA in running the event had been finalised, and the conference would be held from 13 to 17 May 2024 in the Shaw Centre in Ottawa. By ASA's estimates, upward of 1000 participants would be expected. Joana noted that the ASA team was very organised in the running of conference events, and they had provided considerable support. The modality for submission of papers had not yet been decided in terms of whether it would be mixed or kept distinct for the two organisations, but the ASA would be managing the process. The choice of season would be uncommon for AWC, but Joana indicated that there would not have been any option for rescheduling a joint event since the ASA had long before committed to the venue. The positive side of the Spring scheduling is that it will be tulip season in Ottawa and the city will be very pleasant to visit. Thanks to Sébastien Ghinet of NRC being co-chair, one or more technical visits to NRC laboratories were being planned; Joana and her local team were also advising ASA on possible social and leisure activities to include in the programme. At the moment, she noted, her committee was in standby mode waiting for ASA to accept input regarding CAA specific activities to fit in the schedule; because of the far greater complexity of the ASA conference structure, much of the logistical organising had to be left in ASA's hands.

Roberto asked whether Joana or any other members of her committee were directly involved with the technical structuring of the conference from ASA's standpoint (he noted that for the 2018 joint conference in Victoria he had been the ASA technical chair and coordinated the entire programme); Joana indicated that the arrangement in this case was altogether different and the ASA technical chair was someone with considerable involvement in that organisation and experience in structuring their events. Jérémie noted that in some instances it had been possible for the CAA to carve out in the main programme one or two sessions to be chaired and arranged independently of the larger structure; in the present case, however, the ASA had run matters from the outset, and we had joined their conference largely on ASA's terms – but could still make the most of the opportunity.

c. AWC 2025: Vancouver/Banff (Umberto Berardi / Fitsum Tariku)

Umberto having already left the remote connection, Jérémie only informed the Board that the option of AWC moving West for 2025 remained a possibility that Umberto and his colleague Fitsum Tariku at BCIT in Vancouver would consider. The decision to commit to the event might be affected, however, if developments were to occur on a potential bid to have Vancouver host InterNOISE 2028 which could divert the available time and attention of would-be local AWC organisers toward that prestigious but highly demanding target. Jérémie noted that there is still ample time to identify a potential alternative for 2025.

8. Social Media Editor Report (Romain Dumoulin – joined in person this segment only)

Romain presented some statistics of members / followers for the CAA-ACA accounts on LinkedIn (1069 members, +70 since June 2022) and X / Twitter (562 followers, +40 since June 2022) and gave a summary of subjects covered in recent posts which included AWC 2023, job opportunities, student awards, and local chapter events among others. He indicated that he planned to report on awards and other events associated with the conference, and urged anyone with photos and videos of the event to post them on social media with event hashtags he would make known among attendees, and he would repost and/or share them. He also reiterated a previously expressed intent to work with the journal editor to identify and post references to archival articles of particular interest or curiosity, as “Gems from the past.” In response to a Board member's question about presence on Facebook, he stated that there were no plans

to add that platform to the CAA-ACA portfolio as in general LinkedIn provided a more professional appearance for complex posts and gave better capabilities to manage content.

Jérémie reminded the directors that Romain had been appointed to the role in 2019 by the Board for a period of four years, and his mandate would need renewing if it was felt that his work merited it. He moved to keep Romain in the role of social media editor, seconded by Joana; the motion was carried unanimously. Jérémie also remarked that two members of the international media had requested to cover the conference and they had been given free passes to the event (though no other benefits such as meals as that could be seen as an inducement), and Romain proposed to act as liaison with them and also try contacting local media to see if any interest could be generated in covering the event. He remarked that for future conferences there should be an established process to reach out to the media with press releases and announcements to raise the profile of the events with the public.

9. Varia

Jérémie coordinated with Board members on site the logistics of attending, over the next two days' lunches, at the information tables for people potentially interested in serving on the Board. He also alerted members of the executive, present and online, that he would assemble a slide pack for the AGM to which they would have to contribute brief summaries of their presentations.

10. Motion to Adjourn

Moved by Jérémie, seconded by Roberto, at 18:20 (EDT).

CANADIAN ACOUSTICS ANNOUNCEMENTS - ANNONCES TÉLÉGRAPHIQUES DE L'ACOUSTIQUE CANADIENNE

Looking for a job in Acoustics?

There are many job offers listed on the website of the Canadian Acoustical Association!

You can see them online, under <http://www.caa-aca.ca/jobs/>

August 5th 2015

Acoustics 2023 (Sydney, Australia)

Early Bird Registration Deadline 5 September, 2023! Make sure you don't miss the lower rate early bird deadline by completing your registration now! There will be no extension to this deadline so do not delay.

On behalf of the Australian Acoustical Society and The Acoustical Society of America, the Organising Committee looks forward to welcoming you to the Acoustics 2023 Conference to be held Monday 4 December to Friday 8 December 2023 at the International Convention Centre Sydney (ICC Sydney), Australia. Early Bird Registration Deadline 5 September, 2023! Make sure you don't miss the lower rate early bird deadline by completing your registration now! There will be no extension to this deadline so do not delay. More information can be found online at <https://acoustics23sydney.org/>

August 23rd 2023

Inter-Noise 2024 - CALL FOR ABSTRACTS

The French Acoustical Society (SFA) on behalf of International Institute of Noise Control Engineering (I-INCE) is delighted to announce that the call for abstracts for the 53rd International Congress and Exposition on Noise Control Engineering (Inter-Noise 2024) is open. You can now submit your abstracts via the official website: <https://internoise2024.org/authors/> • We look forward to receiving your contribution by February 9, 2024. • Abstract notification acceptance is scheduled for March 1, 2024. • Registrations will be open from December 1, 2023, up to April 12, 2024, for authors.

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ble by offering the lowest possible registration fees while ensuring French-style conviviality! A platform for booking accommodation for Inter-Noise 2024 participants at accessible and negotiated prices will also be launched very soon. Registrations will be open on December 2023. The congress will take place in the city of Nantes, France, on August 25–29, 2024. Nantes is a fast-growing city on the French Atlantic coast. With its booming economy and thriving cultural scene, Nantes is one of the new up-and-coming European destinations. Known for its eclectic sights and architecture, as well as its quality of life recognized by the European Green Capital label, Nantes regularly ranks first among the most welcoming cities. Inter-Noise 2024 is organized by The French Acoustical Society (SFA) on behalf of the International Institute of Noise Control Engineering (I-INCE), with the support of many academic and institutional partners, as well as by many sponsors.

November 19th 2023

Joint 186th Meeting of the Acoustical Society of America and 2024 Acoustics Week in Canada (AWC2024) in Ottawa (ON), 13–17 May 2024

Joint Meeting 186th Meeting of the Acoustical Society of America & 2024 Acoustics Week in Canada (AWC2024) The Ottawa meeting is jointly sponsored by the Acoustical Society of America and the Canadian Acoustical Association will be held at the Shaw Centre in Ottawa (Ontario, Canada) on 13–17 May 2024. No sessions will be offered in hybrid format. Deadline for submission of abstracts is 8 January 2024
<https://acousticalsociety.org/ottawa/>

Submit abstract for Ottawa Meeting Visit the Ottawa Meeting webpage and calls for papers for information about the Technical Program and Special Sessions and other meeting events and features

November 20th 2023

Joint 186th Meeting of the Acoustical Society of America and 2024 Acoustics Week in Canada (AWC2024) in Ottawa (ON), 13–17 May 2024

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November 20th 2023

ASA School 2024: 11-12 May 2024 Ottawa, Ontario, Canada

Living in the Acoustic Environment - 11-12 May 2024 - Ottawa, Ontario, Canada ASA School 2024 is an Acoustical Society of America event for graduate students and early career acousticians in all areas of acoustics to learn about and discuss a wide variety of topics related to the interdisciplinary theme Living in the Acoustic Environment. ASA School 2024 follows on the success of five previous ASA Schools starting in 2012, and will provide opportunities for meeting instructors and fellow attendees, mentoring, discussing research topics, and developing collaborations and professional relationships within acoustics. Application and Deadlines The application form and preliminary program will be available online in December

2023, at www.AcousticalSociety.org.

Program and Costs ASA School 2024 will take place at the Westin Ottawa Hotel, which is the ASA meeting hotel. Lectures and demonstrations followed by discussions will be given by distinguished acousticians in a two-day program covering topics in acoustical oceanography, animal bioacoustics, computational acoustics, musical acoustics, physical acoustics, signal processing in acoustics, structural acoustics and vibration, and underwater acoustics. Although ASA School 2024 will focus primarily on these 8 technical areas, graduate students and early career professionals in all areas of acoustics are encouraged to attend to achieve a broader understanding of the diverse field of acoustics. The registration fee is \$50. Hotel rooms at the Westin Ottawa Hotel for two nights (double occupancy) and meals will be provided by ASA. Participants are responsible for their own travel costs and arrangements including transportation to the Westin Ottawa Hotel. **Participants and Requirements** ASA School 2024 is targeted to graduate students and early career acousticians (within 3 years of terminal degree) in all areas of acoustics. Attendance is limited to 60 participants who are expected to attend all School events and the ASA meeting immediately following on 13-17 May 2024. ASA School attendees are required to be an author or co-author on an abstract for presentation at the ASA Ottawa meeting. **Application and Deadlines** The application form and preliminary program will be available online in December 2023, at www.AcousticalSociety.org.

December 20th 2023

À la recherche d'un emploi en acoustique ?

De nombreuses offres d'emploi sont affichées sur le site de l'Association canadienne d'acoustique !

Vous pouvez les consulter en ligne à l'adresse <http://www.caa-aca.ca/jobs/>

August 5th 2015

Congrès conjoint pour la 186e conférence de l'Acoustical Society of America et la Semaine acoustique du Canada 2024 (AWC2024)

Congrès conjoint pour la 186e conférence de l'Acoustical Society of America et la Semaine acoustique du Canada 2024 (AWC2024) Le congrès d'Ottawa est organisé conjointement par l'Acoustical Society of America et l'Association canadienne d'acoustique et se tiendra au Centre Shaw à Ottawa (Ontario, Canada) du 13 au 17 mai 2024. Aucune session ne sera proposée en format hybride. La date limite de soumission des résumés est fixée au 8 janvier 2024 <https://acousticalsociety.org/ottawa/>

"Soumettez un résumé pour la réunion d'Ottawa Visitez la page web de la réunion d'Ottawa et consultez les appels à contributions pour obtenir des informations sur le Programme technique et les sessions spéciales et les autres événements et fonctionnalités de la réunion"

November 20th 2023

The Canadian Acoustical Association - L'Association canadienne d'acoustique

MEMBERSHIP DIRECTORY 2023 - ANNUAIRE DES MEMBRES 2023

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