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FROM THE PRESIDENT

Welcome to both the first edition of Acoustics Australia for 2021, and my first message as President. Firstly, I would like to reiterate how humbled I am to serve as President, and secondly, to recognise what an excellent job Simon did over the last 2 years in extremely challenging circumstances, whilst driving the Society forward. Although we didn’t know it at the time, fortunately the AAS had already undertaken measures that set us up to be adaptive to the challenges of 2020. In particular the ability to live-stream technical talks and meetings, and the excellent work of Webmaster Luke Zoonlens with the new and highly functional website has allowed the Society to function well through this period. At this point I must also recognise the fantastic efforts of our Secretary Julie who has had to deal with a whole new world of pain dealing with ASIC and its changing requirements for AGM’s and our Constitution. This cumulated with our AGM in late January where we achieved both a physical quorum in Brisbane in addition to our on-line attendees. Thank you all involved with that.

Whilst on the topic of recognition, some of you will also notice that after a period of transition, Danielle Moreau has taken over as Chief Editor. Thank you to Marion Burgess for always stepping up to the plate when required, and in particular for lifting Acoustics Australia to a recent Quartile 2 ranking. Welcome Danielle, and we look forward to your editorials.

So what does 2021 hold for the Society? Well there is something new and something old. As you may have also noticed, Acoustics Australia has altered its production schedule slightly which will be discussed in more detail by Danielle. The big news is however that we are looking forward to dishing MS Teams and Zoom and going back to the old days when we could all meet in person. After going without an annual AAS Conference in 2020 for the first time in basically 40 years, we are looking to Acoustics ’21 being held in the fantastic location of Wollongong on the NSW South Coast (around 1 hour from Sydney) from 8 – 10 November 2021. More details will be posted very shortly, with registrations and abstracts open from February for what will be a comprehensive technical program. The venue will be the recently renovated Novotel North Beach, right on the water and I would encourage as many of you to attend as possible as it is a great venue in a wonderful location. Naturally I am biased as I only live a few hundred metres away, but don’t take my word for it, come and see for yourself!

Jeff Parnell, President

FROM THE OUTGOING CHIEF EDITOR

This is the last issue of the journal for which I have the role as Chief Editor and I am very pleased that the Journal will be in the competent hands of Danielle Moreau. Danielle brings her experience as an author and hence good understanding of the various stages of the publication process. In the last few years as Associate Editor she has shown herself to be extremely competent. I will continue in the role of Associate Editor for the next few years.

It is perhaps timely to give a very brief history. Until 2014 the journal was fully published by the Australian Acoustical Society and it was due to the efforts of the previous chief editors, notably Howard Pollard, Neville Fletcher, Joe Wolfe and Nicole Kessissoglou that it grew from a national publication to journal status with the important citation rankings. When I was asked to take over in 2014, it was clear that it was no longer viable for the Society to try to self-publish and discussions were held with several publishers. The successful negotiations led to the current arrangement of the formal editorial and publishing management of the articles by Springer, the addition of this front (open access) section of news and notes relevant to the AAS membership plus free access for all AAS members to the published articles. Since 2015 the reputation and the number of submitted articles and has grown, and the ranking score has increased. The AAS council has agreed that the appointment as Chief Editor should not be considered as open ended but that there is a transition process through Associate Editor/Chief Editor/Associate Editor to allow for the necessary training and support. If anyone is interested in this role then watch for the call by Council applications to join the team.

This issue comprises papers on diverse topics. A review paper summarises the strategies for dealing with environmental noise in our neighbouring India. Another discusses surveillance for crocodiles in Australian waters. The other papers cover topics from underwater to noise control techniques. The next issue of the journal will be a special issue comprising papers on condition monitoring and we are grateful for the work by the guest editors Bob Randall and Pietro Borghesani from the School of Mechanical and Manufacturing Engineering at UNSW Sydney for obtaining a number of review articles.

Marion Burgess, Outgoing Chief Editor
FROM THE INCOMING CHIEF EDITOR

It is a great honour to serve as the next Chief Editor of Acoustics Australia. The journal has always been a big part of my academic life. I published my very first journal paper in Acoustics Australia as a PhD student back in 2008 so taking on this role is a career milestone for me.

I would like to acknowledge Marion for her tremendous contributions to Acoustics Australia as Chief Editor over the past 7 years. I have served as Associate Editor under Marion's guidance since 2018 and witnessed firsthand her dedication and commitment to the journal. She is a wonderful mentor and I have learned a great deal about the editorial process under her leadership.

As new Chief Editor, my goal is to maintain and strengthen the journal's international standards and its reputation. Under Marion's leadership, Acoustics Australia increased its quartile ranking to Q2 in 2019 (see Scimago Journal and Country Ranking). The ranking is an important consideration for researchers in academia when selecting which journal to submit their article to. With a view to maximising the annual journal citation count and hence the annual quartile ranking, we have changed the journal production schedule so that Issue 1 is in March 2021; Issue 2 is in June 2021; and Issue 3 is in September 2021.

Ultimately the success of the journal depends upon its authors and reviewers. I thank you all in advance for your continued support of Acoustics Australia and look forward to working with you to ensure the journal serves the Australian and international acoustics community.

Danielle Moreau, Incoming Chief Editor
ACOUSTICS AUSTRALIA 49(1), 2021 ABSTRACTS

GENERAL SUBMISSIONS

REVIEW PAPER

Normative Framework of Noise Mapping in India: Strategies, Implications and Challenges Ahead

N. Gang1,2, B. S. Chauhan1,2 & M. Singh1,2
1. CSIR-National Physical Laboratory, New Delhi, 110 012, India
2. Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, 201002, India

The paper presents a retrospective and prospective view of noise mapping strategy followed across the globe as a diagnostic tool for controlling the noise pollution in urban cities. The concept of noise mapping is primitive in India and thus developing the noise maps is really a great challenge for big metropolitan cities of India. The paper discusses the benefits associated, input parameters required, methodology, sampling and interpolation techniques used, noise control action plans and challenges ahead for the development of strategic noise maps. The pros and cons associated with noise mapping and validity of principal traffic noise models in India are presented. Also, various technical aspects pertaining to noise mapping are clarified in Indian perspectives based on the standard operating procedures used internationally. This paper recommends a national policy framework of noise mapping and control for Self-Reliant India (Aatmanirbhar Bharat) and shall serve as a guiding document to all the stake holders for noise mapping of the larger parts of the country.

ORIGINAL PAPERS

The Suitability of Digital Video Surveillance and Multi-beam Sonar to Monitor Saltwater Crocodiles

Matthew Brien1, Laurence Taplin2, Richard Talmage3, Simon Booth1, Colby Bignell3, Paul Beri1, Peter Freeman4 & Michael Joyce1
1. Northern Wildlife Operations, Wildlife and Threatened Species Operations, Queensland Parks and Wildlife Services and Partnerships, Department of Environment and Science, PO Box 375, Garbutt East, Townsville, QLD, 4814, Australia
2. LT CROCS Analysis Services, 65–67 Fig Tree Drive, Caravonica, QLD, 4878, Australia
3. Taltech, 15 Valley Views Drive, Lanadale, WA, 6065, Australia Hartley’s Creek Crocodile Adventures, PO Box 171, Palm Cove, QLD, 4873, Australia

Despite intensive management, the increasing conflict between humans and saltwater crocodiles in places such as Queensland, Australia, has led to the investigation of alternative techniques to improve public safety. The reliability of digital video surveillance systems (DV) placed above water and multi-beam sonar (sonar) placed under water to detect and monitor saltwater crocodiles was tested in a seminatural freshwater environment over a 2 h period (16:00–18:00 h). A total of 29 crocodiles were detected within the study area using DV, and 28 with sonar. One was obscured by a section of bank, and thus not visible on sonar. Of the 28 crocodiles detected by both methods, sonar recorded both entry and exit for all, while DV recorded both entry and exit for 15 crocodiles. The length of time that crocodiles were detected was longer on average for sonar (4 min 27 s) compared with DV (2 min 50 s). This reflected the time spent above (detected by sonar and DV) or below water (not detected by DV), as only sonar was able to detect crocodiles underwater. The use of sonar may provide a valuable management tool for detecting and monitoring saltwater crocodiles in areas frequented by people (e.g. beaches, boat ramps, upper freshwater areas) where there is a high chance of a negative interaction.

Acoustic Emission Investigation on an Electronically Controlled Two-Stroke Low-Speed Marine Diesel Engine: in Axial and Vertical Directions

Xuan Thin Dong1 & Manh Hung Nguyen1
1. Vietnam Maritime University, 484, Lach Tray St, Hai Phong, Vietnam

An experimental method in a real-working condition was conducted to collect acoustic emission (AE) signals emitted from cylinders of a large two-stroke low-speed marine diesel engine. Measurements were performed in an axial direction of the cylinder in medium-frequency (20–80 kHz) and high-frequency (100–900 kHz) ranges and in a vertical direction only in the medium-frequency range under two engine operating modes. The collected AE signals were analyzed in crank angle and crank angle–frequency domains. Kurtosis and root mean square (RMS) parameters were employed to identify engine operating modes based on the obtained AE signals as well as investigate their characteristics. A fast Fourier transform (FFT) algorithm was also utilized to discover the frequency range of the AE signals. The results showed that only the AE signals generated by combustion processes, friction and wear, and exhaust valve opening (EVO) were partially detected. However, the AE signal radiated by the friction phenomenon was not apparent in the high-frequency range. Also, the combustion process had a strong influence on the remaining AE’s sources, especially in the axial direction of the medium-frequency range. Furthermore, the measurements should be implemented for the AE signals due to friction and wear in the medium and low frequencies; meanwhile, the combustion should be investigated in the frequency range of 200–300 kHz.

Structural Modifications of Headphone Front Chamber for Better Frequency Response: Experimental and Simulation Studies

Je Ru Chen1, S. J. Pawar2 & Jin H. Huang3
1. Graduate Program of Electroacoustics, Feng Chia University, No. 100, Wenhwa Rd, Seatwen, Taichung, 40724, Taiwan, ROC
2. Department of Applied Mechanics, Motilal Nehru National Institute of Technology Allahabad, Teilyanganj, Prayagraj, 211004, UP, India

The collected AE signals were analyzed in crank angle and crank angle–frequency domains. Kurtosis and root mean square (RMS) parameters were employed to identify engine operating modes based on the obtained AE signals as well as investigate their characteristics. A fast Fourier transform (FFT) algorithm was also utilized to discover the frequency range of the AE signals. The results showed that only the AE signals generated by combustion processes, friction and wear, and exhaust valve opening (EVO) were partially detected. However, the AE signal radiated by the friction phenomenon was not apparent in the high-frequency range. Also, the combustion process had a strong influence on the remaining AE’s sources, especially in the axial direction of the medium-frequency range. Furthermore, the measurements should be implemented for the AE signals due to friction and wear in the medium and low frequencies; meanwhile, the combustion should be investigated in the frequency range of 200–300 kHz.

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The supra-aural headphone concentrates the sound in the listener’s ears, so the loudspeaker sound is confined to the cavity between the pinna and the headphone casing. It is then directed toward the tympanic membrane through the ear-canal. The high-quality sound requirement of supra-aural headphone on one side and space limitation on the other prompted this research. Similarly, inherent sound leakages from headphone on one side and a need for loud sound on the other also impelled this research. This research proposes headphone design modifications for interaction between sound from the diaphragm’s rear and front side for improved frequency response. The changes attempt to stop the sound from the diaphragm’s rear side to leak to the external surrounding, and it is routed to interact with the sound from the front side of the diaphragm in two distinct ways due to the geometrical/structural modifications of the headphone front cover. 

Prototype of three headphones (one traditional and two modified) have been modeled by computer-aided drafting software and fabricated by 3D printing. In parallel, equivalent circuits have been formed for the simulation as per the proposed headphone testing setup. The frequency response measurements of headphones have been done in an anechoic chamber using B&K HATS Type 4128. The simulated and measured responses of headphones demand modification of the equivalent circuit by adding the current-controlled voltage source. The optimum simulated performances of all three headphones include a perforated face sheet bonded to a honeycomb core. A tunable acoustic liner with a piezoelectric substrate is developed to overcome the shortcomings of current liner such as unchangeable structure and uncontrollable bandwidth. After the piezoelectric panel deformed under the driving voltage, the resonant chamber changed, and the resonant frequency shifts. The finite element method is used to calculate the acoustic system’s resonant frequency and sound pressure distribution. The transmission loss measurement was carried out in an impedance tube to demonstrate the broadband noise control effect of the liner. The experiment result indicates that the TL peak frequency keeps linear with the driving voltage, and the sensitivity is measured to be 0.1 Hz/V. A DC amplified circuit using photo resistor is designed based on constructing the function of driving voltage and noise frequency. Benefit from the adaptive algorithm, when the noise frequency offsets from 756 to 788 Hz, the driving voltage can be automatically regulated from 110 to 420 V, and the liner always keeps resonating. Meanwhile, the sound level was reduced. The adaptive noise control is realized for broadband noise reduction.

**Low-Frequency and Large-Scale Hybrid Sound Absorption Using Active Force Control**

Yang Liu1,2, Kean Chen1,2, Yanni Zhang3, Xiuye Ma1,2 & Lei Wang1,2

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2. Key Laboratory of Ocean Acoustics and Sensing, Northwestern Polytechnical University, Ministry of Industry and Information Technology, Xi’an, 710072, Shaanxi, China
3. Institute of Launch Dynamics, Nanjing University of Science and Technology, Nanjing, 210094, Jiangsu, China

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**Design of Tunable Acoustic Liner and Adaptive Control System**

Jiquan Liu1,2, Tiexiong Su1, Zhiwei Yan2, Sigong Duan3, Fuxiang Zhang2 & Haifeng Lv1

1. College of Mechatronics Engineering, North University of China, Taiyuan, 030051, China
2. Tai Yuan Research Institute of China Coal Technology & Engineering Group, Taiyuan, 030006, China
3. China Coal Research Institute, Beijing, 100013, China

Traditional acoustic liners used in nacelles and fan ducts include a perforated face sheet bonded to a honeycomb core. A tunable acoustic liner with a piezoelectric substrate is developed to overcome the shortcomings of current liner such as unchangeable structure and uncontrollable bandwidth. After the piezoelectric panel deformed under the driving voltage, the resonant chamber changed, and the resonant frequency shifts. The finite element method is used to calculate the acoustic system’s resonant frequency and sound pressure distribution. The transmission loss measurement was carried out in an impedance tube to demonstrate the broadband noise control effect of the liner. The experiment result indicates that the TL peak frequency keeps linear with the driving voltage, and the sensitivity is measured to be 0.1 Hz/V. A DC amplified circuit using photo resistor is designed based on constructing the function of driving voltage and noise frequency. Benefit from the adaptive algorithm, when the noise frequency offsets from 756 to 788 Hz, the driving voltage can be automatically regulated from 110 to 420 V, and the liner always keeps resonating. Meanwhile, the sound level was reduced. The adaptive noise control is realized for broadband noise reduction.

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**Acoustic Calibrators**

- NATA Calibrations
  - Sound Level Meters
  - Noise Loggers
  - Octave Band Filters
  - Acoustic Calibrators

**Sound Level Meters**

- NL-42/52/62
- VM-56
- VA-12
- RIONOTE
- AS-60/70
- DA-21

**Triaxial Vibration logger**

- Vibration Analyser
- Frequency Analyser
- Software
- Data Recorder

**Noise Loggers**

- Sound Level Meters
- Octave Analysers
- Acoustic Calibrators
- Vibration Loggers
Effective low-frequency and large-scale noise reduction are crucial in industrial applications. Conventional passive methods lack the effective low-frequency performance, and existing hybrid methods are costly to realize large-scale absorption. Hence, an effective and simply actuated solution for low-frequency and large-scale absorption is urgently needed. In this study, the low-frequency (100–500 Hz) quasi-perfect absorption characteristics of a hybrid structure which adopts the active force control (AFC) strategy are confirmed by experiment and its large-scale properties are analyzed. By using a flexible plate driven by a concentrated force as the AFC component and a passive MPP absorber, the large-scale model is established to absorb the normally incident plane wave. The structural–acoustic coupling characteristics are analyzed in detail and validated both by the experiment and finite element method. It is observed that by the acoustic–structural coupling, the frequency shift of the first structural mode will be inversely proportional to the total depth of the air cavities. Key parameters relating to the control force and other specifications of the hybrid system are analyzed to improve the broadband performance of the hybrid structure. Owing to the optimized control force, the coupled structural modes could be used to realize commendable large-scale (up to ten times larger than conventional hybrid absorber) absorptions. Compared with conventional methods, the designed absorber is able to realize low-frequency broadband quasi-perfect absorptions while dramatically reducing the number of secondary sources.

**Difference Factor of Vertical Beam Pattern for Shallow-Water Source Depth Discrimination**

Guang-Ying Zheng$^{1,2}$ & Fang-Wei Zhu$^{1,2}$

1. Science and Technology on Sonar Laboratory, Hangzhou, 310023, China
2. Hangzhou Applied Acoustics Research Institute, Hangzhou, 310023, China

This study addresses the problem of source depth discrimination in the context of shallow-water acoustics. From the perspective of beam pattern correlations, a discriminating characteristic quantity, which implies the information of source depth, is presented and defined as the difference factor of the vertical beam pattern. In applying the proposed difference factor for source depth discrimination, the corresponding discrimination method and judgment criterion are presented. Numerical results, obtained by processing SwellEx-96 data recorded by a vertical line array (VLA), indicate the potential of the proposed method in source depth discrimination. This method also shows the correct discrimination of VLA signals with different frequencies by using the plus/minus sign of the difference factors of the vertical beam pattern. Effects of array aperture, array depth, signal-to-noise ratio (SNR), and environment mismatch on the performance of the current method are also analyzed to indicate the robustness of the method. Finally, the SwellEx-96 data results indicate that the proposed method is insensitive to the initial range and radial speed from the VLA to the source target.

**Head-related Transfer Function Reconstruction with Anthropometric Parameters and the Direction of the Sound Source**

Dongdong Lu$^1$, Xiangyang Zeng$^1$, Xiaochao Guo$^2$ & Haitao Wang$^1$

1. Northwest Polytechnical University, No. 127 Youyuxi Road, Beilin District, Xi'an, 710072, Shaanxi, People's Republic of China
2. Air Force Medical Center of FMMU, Beijing, 100142, People's Republic of China

An accurate head-related transfer function can improve the subjective auditory localization performance of a particular subject. This paper proposes a deep neural network model for reconstructing the head-related transfer function (HRTF) based on anthropometric parameters and the orientation of the sound source. The proposed model consists of three subnetworks, including a one-dimensional convolutional neural network (1D-CNN) to process anthropometric parameters as input features and another network that takes the sound source position as input to serve as a marker. Finally, the outputs of these two networks are merged together as the input to a third network to estimate the HRTF. An objective method and a subjective method are proposed to evaluate the performance of the proposed method. For the objective evaluation, the root mean square error (RMSE) between the estimated HRTF and the measured HRTF is calculated. The results show that the proposed method performs better than a database matching method and a deep-neural-network-based method. In addition, the results of a sound localization test performed for the subjective evaluation show that the proposed method can localize sound sources with higher accuracy than the KEMAR dummy head HRTF or the DNN-based method. The objective and subjective results all show that the personalized HRTFs obtained using the proposed method perform well in HRTF reconstruction.

**TECHNICAL NOTES**

**Analysis of Acoustic Emission Signal for Crack Detection and Distance Measurement on Steel Structure**

Arpita Mukherjee$^1$ & Aishwarya Banerjee$^1$

1. CSIR-Central Mechanical Engineering Research Institute, Durgapur, West Bengal, 713209, India

Acoustic emission (AE) technique has been merged to a promising method for structural health monitoring in non-destructive technique. So an analysis of the AE signal is becoming a very important research component. In this paper, an algorithm is developed for detection of the crack signal among different noise signals since the AE signal is also generated by several means like any impact or rubbing action on the structure which may give erroneous results. An AE monitoring system is developed with three experimental setups to generate three types of AE signals from three dissimilar sources. Thus, an algorithm is developed to identify the crack signal by comparing the parameters of different signals acquired from different sources using some signal processing techniques such as parameter based analysis, waveform based analysis e.g. fast Fourier transform, continuous wavelet transform, cross-correlation coefficient, magnitude coherence coefficient, and energy distribution. After identification of the crack signal, the distance of the crack source has been calculated by analysing the signal in time–frequency domain also an algorithm has been designed to calculate the velocity of the acoustic wave more accurately and consequently the distance of the crack.
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- Noise monitoring on Channel 4 with class1 Microphone User programmable Curves in FFT & 1/3 Octaves
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Richard Devereaux – Appointment to Fellow

Richard Devereaux has been appointed to the Grade of Fellow in recognition of the contributions he has made both personally and via his company Acran over the long-term to the Queensland Division of the Australian Acoustical Society and to the body of knowledge around acoustics in general.

AAS News

From the General Secretary

As we move into 2021 the Society continues to move forward. The office has been abuzz with activity since returning to operations in early January. An average day in the AAS office is quite busy and involves attending to a wide variety of matters. On a daily basis enquiries from members, prospective members, the general public and (occasionally) the media are received and attended to. Operational tasks such as the processing of new memberships and upgrades are increasing and in turn growing the member base with AAS membership numbers at the time of writing this totalling 727.

Organisational duties such as database and website management, scheduling and attending meetings, with the follow up of tasks allocated as a result of these meetings, being always ongoing. Liaising with external bodies such as Standards Australia, national and international government agencies, educational facilities, ASIC and other regulatory authorities provide an interesting addition to the working week. Receiving and distributing information from international affiliates and communication with internal bodies such as State Division committees, AAS representatives and Acoustics Australia are also regularly undertaken. The pace is steady, sometimes a little hectic, but always interesting!

The AAS is very fortunate to be overseen by multiple highly qualified individuals in the form of Federal Council. With the combined education, experience and business acumen of these 10 individuals, the AAS is well placed to handle the myriad of situations and circumstances that the Society encounters in its operations.

As the AAS moves into a new presidency I would like to take this opportunity to thank the outgoing President, Simon Moore, for his time, patience and support whilst I settled into my role as General Secretary. Simon has given much of himself to the Society in his time as President and accomplished a lot for the AAS despite very challenging times. I would also like to welcome Jeff Parnell as incoming President and assure him of his support and the assistance he requires in his role as President.

As the AAS enters its 50th year of incorporation it has clearly achieved a great deal and has provided an essential knowledge base for acousticians not only in Australia but globally. The AAS remains dedicated to furthering the science of acoustics and looks forward to continuing this well into the future.

Julie Sobolewski

Richard Devereaux – Appointment to Fellow

Richard joined the Acoustical Society in 2001, becoming a member of the Queensland Divisional Committee in 2002. He is the long-term Divisional Secretary, having held that position for over 16 years. During his time on the Queensland Divisional Committee, Richard has been part of the organising committee for the ACOUSTICS 2004, ACOUSTICS 2011 and ACOUSTICS 2016 conferences.

For all of those conferences, Richard has used his business acumen, persistent gentle manner, and wonderful sense of humour to aid the Division when negotiating with venues, vendors, and exhibitors.

As the owner and Managing Director of Acran Noise Control & Air Movement Engineers, Richard has generously made the facilities and resources at Acran available to the Society at no cost over a period of nearly two decades. Some of the ways in which Richard has gone the extra length to help the Society include safely storing both the Queensland and Federal Archives, providing a venue for Divisional Committee meetings, allowing Acran to be used as the delivery, storage and packing venue for items in the lead up to conferences, providing commercial vehicles to transport items and equipment to conference venues and providing Acran staff to help complete organisational tasks associated with the planning of technical meetings and conferences.

While Richard’s support of the Society via his company Acran has been enough to win the respect and acknowledgement of his peers, his personal quest to improve the body of knowledge of the practical side of noise control is where he has made his biggest contribution to acoustics. Whether it has been by mentoring acoustic consultants or assisting university researchers, Richard has helped acousticians to develop solutions to noise control problems that are not covered in textbooks. In doing so, he has greatly assisted research being conducted by final year students and master’s thesis students at The University of Queensland. His research contributions are ongoing and include small chamber reverberation absorption measurements, testing and optimisation of acoustic test laboratories, acoustic louvre design and optimisation and the influences of internal finishes and fittings on reverberation times in enclosed spaces.

Richard Devereux has been appointed to the Grade of Fellow in recognition of the contributions he has made both personally and via his company Acran over the long-term to the Queensland Division of the Australian Acoustical Society and to acoustics in general.

Awards and Grants

The AAS Education Grant has been renamed the “Richard Booker Education Grant” in honourable memory of the late General Secretary, Richard Booker (Hon.) MAAS.

Congratulations to the successful applicants of the 2020 submissions for Research and Education Grants who were announced at the AAS AGM in January.

- Professor Nicole Kessissoglou for her successful application for the Research Grant ($50K) for her study titled ‘Prediction and assessment of road traffic noise impact arising from heavy vehicles’
- Mr Matthew Ottley for his successful application for the Richard Booker Education Grant ($5K) for his ‘Talking Acoustics Podcast’
At the recent 2020 Annual General Meeting of the Australian Acoustical Society a ‘Special Resolution’ was tabled to replace the Memorandum, Articles of Association and By Laws of the AAS with a modernised Constitution, By Laws and Code of Ethics.

Members from across the Society voted in the majority to pass the resolution and adopt the modernised Constitution, By Laws and Code of Ethics.

The new AAS Constitution, By Laws and Code of Ethics can be accessed by members by logging into www.acoustics.org.au and clicking on the ‘Members Area’ menu—>Forms and Documents, or by clicking here.

QLD Division

QLD division activities continue to be restricted due to the ongoing pandemic. We are hoping to resume meetings in the next few months.

Richard Devereux

NSW Division

COVID-19 restrictions forced the cancellation of our well attended annual Xmas Breakfast Tech Talk in 2020 meaning that during the backend of the year we only had one Technical Meeting which was combined with the NSW Divisional AGM. The topic of NSW Building Reforms was presented by legal firm Wotton+Kearney and was a joint presentation with the Society of Fire Safety (New South Wales). It was well attended by both NSW and interstate members and was the first time we had a joint presentation by the other organisation.

After the AGM most positions on the NSW Divisional Committee have remained the same with a few notable changes being John Wassermann taking over the role of chair from Angus Leslie after his tenure of 2 years. Chris Marsh joining the committee, and Rodney Stevens and Mattia Tabacchi finishing up their time with the committee. Rodney having been a very valued member of the committee for 20 years, including extended periods as technical meeting coordinator, and then as treasurer. Mattia having driven the technical meeting program during his 6 years on the committee, including taking the talks online. Thank you, Angus, Mattia and Rodney for all your work over the years and for transitioning David Suwandi to Treasurer over the past 18 months.

The Division would also like to remind members that the EPA has placed its draft Construction Noise Guideline on public exhibition and is seeking comment until 15 March 2021. The guidelines can be found at: https://yoursay.epa.nsw.gov.au/construction-noise. A presentation on the guidelines will be the first technical meeting of the year.

The big news for NSW is that we have now confirmed that there will be a physical AAS Conference this year with Acoustics 2021 being held at the Novotel North Beach, Wollongong from 8-10 November 2021. We look forward to seeing you all there.

John Wassermann

WA Division

There has been no division activity since the Christmas season. We are not currently in a position to plan any future Division activities due to the recent lockdown in Perth and surrounds.

Benjamin Farrell

VIC Division

The Division held its last technical meeting for 2020 on 8 December, with a presentation by Pablo Reboredo Gasalla from ACOR Consultants (Vic) Pty Ltd on structural dynamics, noise and vibration for buildings adjacent to train lines.

After three years as Division Chairman, Andrew Mitchell is stepping down. Marc Buret was elected by the division committee as the new Chairman, and Rohan Barnes will be the new Divisional Secretary. We would like to thank Andrew for his direction and leadership during his time as Chairman and in particular his efforts in the preparation and organisation of the national conference held in Cape Schanck late 2019. We are pleased that Andrew remains a member of the division committee.

Following our submission to the consultation by the Victorian Government on the implementation of the Professional Engineers Registration Act 2019 (the Act), two division committee members met recently with representatives of the Victorian Department of Justice and Community Safety.

The meeting was an opportunity to get some clarifications in response to our concerns regarding registration for the area of ‘acoustic engineering’ (an area sitting within mechanical engineering in the scheme).

Details on the professional engineer registration scheme are available on the website of Consumer Affairs Victoria, which includes a Professional Engineers page under the ‘Licensing and registration’ menu. Information is also available on the EngageVictoria website, including a set of Questions and answers.

The areas of registration that are covered by the Act, and those that are not, are set out in the ‘Guidelines on areas of engineering’ available on the Professional Engineers page of Consumer Affairs Victoria. Guidelines on the meaning of professional engineering services are also provided.

It is important to note that the Act prohibits a person from providing ‘professional engineering services’ in any of the five prescribed areas of engineering unless they are registered, or they are working under the direct supervision of a registered practising professional engineer or only in accordance with a prescriptive standard. Besides, the Act explicitly protects the
title ‘professional engineer’. It will also be an offence for a person who is unregistered to represent that they can provide ‘professional engineering services’, that they are an endorsed building engineer or that they are a non-practising professional engineer.

Registration will be subject to assessment under a scheme administered by an assessment entity (for example an industry organisation) that has been approved by the Victorian Business Licence Authority.

We understand that different pathways for the assessment of qualifications and competencies are considered:

- degree (under-graduate Bachelor of Engineering or post-graduate Master of Engineering) in the relevant area of engineering in which registration is sought accredited by a signatory of the Washington Accord, combined with minimum experience requirements
- non-Washington Accord academic qualifications that have been assessed as substantially equivalent to an accredited Washington Accord degree, combined with minimum experience requirements
- alternative pathway for people demonstrating substantial equivalence with the competencies and outcomes of the other pathways.

For details on the pathways for assessment of qualifications and competencies, refer to Section 9 of the ‘Guidelines on applying for approval of assessment schemes’ available on the Consumer Affairs Victoria website.

The Act is due to commence on 1 July 2021. However, registration for the five prescribed areas of engineering – structural, civil, electrical, mechanical and fire safety – will be phased-in over the following two-and-a-half-year period. Registrations will need to be renewed every three years.

The process to approve assessment schemes is in progress, and a register of approved assessment schemes and assessment entities will be published on the website in the course of 2021.

To keep updated about the implementation of the registration scheme, please refer to the Professional Engineers page of Consumer Affairs Victoria. We strongly recommend you also subscribe to their newsletter.

Marc Buret
Acoustics News

INTERNATIONAL YEAR OF SOUND

Due to the impact of COVID-19 around the world the ICA decided that IYS will be extended to the end of 2021. Several events – Intermoise 2020, FORUM ACUSTICUM 2020 and the ASA Fall meeting in Chicago were successfully held in the form of e-conferences. Many other events originally planned for 2020 have been rescheduled for 2021.

The website https://sound2020.org is the primary reference location for the events/activities/resources related to the IYS. It contains a wide and growing selection of resources – educational, novel, recreational – all inspired by the theme of the year to increase the awareness of the importance of sound in our world.

In view of the challenges for students and education around the world the IYS INTERNATIONAL STUDENT COMPETITION has had its deadline extended to the end of April 2021. Details of this competition are available from https://sound2020.org. There is a primary level section where the young children provide a drawing that is inspired by the song My world of sounds (music on the website). High school aged students are asked to compose some words to go with the theme My world of Sounds. Class or individual entries are welcomed.

Australian Building Codes Board

The Australian Building Codes Board (ABCB) has committed to a long-term strategy to deliver a National Construction Code (NCC) that is user friendly and modern. As a result, important changes are being implemented for the 2022 edition of the code. For more information about the changes and for documents being developed to guide users through changes, access the link: A new look for NCC 2022

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This is what lockdown sounds like

An article by Pete Stollery discusses how his work explores how people interact with sound and how it impacts upon their daily lives through listening – that’s active listening with attention, rather than passive hearing. He talks about how the recent lockdowns have given us the opportunity to refocus on the sounds in our lives and he also talks about how the restrictions have changed the soundscape of our lives significantly. His passion for this prompted him to develop “A COVID-19 Sound Map”. He put a call out on social media and the result has been the development of a crowd sourced sound map, built in the Google Earth Web environment that includes more than 230 sounds from more than 24 countries around the world.

For more information find the full article below, including a link to the COVID-19 Sound Map.

https://theconversation.com/this-is-what-lockdown-sounds-like-153590

Noise pollution is penetrating further into our oceans, endangering marine animals

Human generated noise pollution in our oceans is having an increasingly negative impact on several marine populations including, mammals, invertebrates, fish and marine birds and reptiles.

A team of researchers recently undertook a large-scale review of scientific literature and their findings have been published in Science. See link below.

Researchers are now calling for noise pollution to be included in environmental assessments of human impacts on Marine Ecosystems.

https://science.sciencemag.org/content/371/6529/eaba4658

Study reveals the relaxing music to help you sleep

UNSW PhD student, Thomas Dixon is a music psychology researcher who says that listening to music can hold the answer to a better night’s sleep.

In his latest study, conducted with Professor Emery Schubert, titled “Musical Features that Aid Sleep” he goes further by identifying the specific characteristics of music that are successful in aiding sleep.

For further information:-

https://newsroom.unsw.edu.au/news/social-affairs/study-reveals-relaxing-music-help-you-sleep

New futuristic audio technology from Noveto Systems has recently been released in the form of its SoundBeamer 1.0, a desktop device that beams sound directly to a listener without the use of headphones. Find more information in the article below:-

New device puts music in your head — no headphones required

Vibration isolation products from REGUPOL were recently tested and proven to remain effective for more than 50 years. This testing, conducted by the independent lab at the Karlsruhe Institute of Technology, included the entire range of REGUPOL products with varying load capacities.

The results show that REGUPOL and REGUFOAM vibration isolation products routinely outperform the minimum sound isolation requirements of most projects. REGUPOL is the first manufacturer worldwide to achieve this level of testing and resilience.

The Karlsruhe Institute tested a total of 10 REGUPOL and 12 REGUFOAM products and found they withstand wear and tear in diverse climate zones for 50 years or more.
Anita Barbara Greenslade was born in Hertfordshire, UK in 1930 and attended Roedean girl’s boarding school where she developed an abiding interest in cricket, being a leading player for the school team. She arrived in Australia with her parents late in 1946 and it was during this journey that she fell in love with sea travel and boats. Subsequently she met and fell in love with Gerald Robert Lawrence (Gerry) and they were married in 1957.

Anita achieved many notable ‘firsts’. Not only was she the first female graduate from the Architecture Department at the University of New South Wales (UNSW) but she was the first woman to receive a University Medal from UNSW when in 1955 she was granted a Bachelor of Architecture with First Class Honours. After undertaking some projects at the CSIRO she joined the UNSW academic staff and completed a 32-year teaching and research career specialising in acoustics, ultimately achieving an Associate Professor position.

In the early 1970s she initiated the first post graduate course in acoustics in Australia at UNSW - the Graduate Diploma in Architectural Acoustics, which was subsequently upgraded to MSc (Acoustics). Many Australian practitioners obtained their broad understanding of acoustics by undertaking part or all of that course. This program continued for almost two decades until the University considered that, because of the small annual cohort, it was no longer financially viable.

Anita was chair of the Standards Australia Committee.
which produced the first Australian Standard on environmental noise. This AS 1055 detailed not only measurement procedures but also provided guidance on typical noise levels based on land-use planning and time-of-day which were used as the basis for most environmental noise regulations at that time. She also played a pivotal role in developing numerous other Australian acoustics standards.

In 1964 a number of visionaries initiated formation of the Australian Acoustical Society (AAS) - incorporated as a public company in 1971 - and one of them, Anita, became the first female on its committee. She maintained a strong involvement with the AAS, holding many positions on both the Divisional Committee and on Federal Council, including being President for a term from 1981. Furthermore, she took every opportunity to raise the profile of Australian achievements in acoustics by encouraging participation in international meetings on acoustics. In the mid-1970s she and Jack Rose pursued a vision that the AAS, on the other side of the world from where much of the action was, could host an International Conference on Acoustics (ICA). The ICA was held every third year so several AAS members travelled to the 1977 ICA in Madrid, and there won the bid to host the next ICA in Sydney. Just imagine the logistics involved, as this was before the days of fax or email, and phone discussions were so expensive that most communication was by mail. Every author had to be sent special manuscript paper to have their paper typed upon and this had to be mailed back to Australia and ultimately compiled into the proceedings (the three volumes can be viewed at https://www.icacommission.org/proceedings.html). Despite concerns about international participation because of the “tyranny of distance”, the 1980 ICA was an outstanding success with over 800 registrants.

Anita was also the chair of the successful bid to host the first Internoise conference in Australia in 1991. By then, logistics for managing a conference and proceedings was easier with email and fax, and that UNSW-hosted Internoise conference was very successful. Subsequently she was the first female board member of the I-INCE (International Institute of Noise Control Engineering), serving on their board from 1992 through to 1998.

Anita was tireless in her quest to develop a wide understanding in architecture and the building industry of the importance of good acoustic design. She was a believer that all built environment professionals should understand and value the practice of acoustics, saying “a person’s experience of a building can be drastically altered by bad acoustics – it’s imperative that architects, builders and landscape architects understand the importance of achieving optimal sound in a room or building.” In 1970, Elsevier published her book Architectural Acoustics - a slender book that provides a comprehensive explanation of all aspects of acoustics related to buildings; not only did she write the text but she also produced all illustrations in the book.

During her career at UNSW, she was awarded a number of research grants, predominantly in relation to environmental noise and especially road traffic noise. The picture below shows her outside the test room facility near a busy road in an industrial area. These field measurements of various window systems provided the important comparison with laboratory measured values.

In 2015 she made a generous bequest to UNSW’s Faculty of Built Environment to establish and fund the Anita Lawrence Chair in High Performance Architecture. Then, in her will following her death on 6 April 2019, she bequeathed a further $2.3M to be specifically allocated to enhance teaching and research in acoustics and the built environment. This generous grant will be used to support PhD students with on average one scholarship being offered annually and commencing in 2021.

Anita and her husband Gerry were regular attendees at AAS and International conferences and both shared a love of boats, the water and cricket. For example, they regularly attended test cricket matches in Sydney and for many years owned a boat and greatly enjoyed cruising the Hawkesbury River on weekends.

Anita was an inspiration to so many and leaves an outstanding legacy to the national and international acoustics community.

Anita Lawrence measuring the noise outside the test facility in Alexandria, 1982

Marion Burgess
The NSW Division of the Australian Acoustical Society warmly invites all members of the acoustics community to attend Acoustics 2021 - Making Waves, Wollongong in the spectacular Illawarra Region. To be held from 8 – 10 November, the technical program promises to be of great interest to all-comers, covering a full range of topics from active noise control through to musical and bio-acoustics as well as the regular areas such as transportation and environmental noise.

Acoustics 2021 - Making Waves will mark a welcome return to the hosting of physical conferences and will not feature an online option. Several internationally recognised keynote speakers, along with local leaders in their field will be in attendance, combined with a trade exhibition of all the latest and greatest equipment, products and services making this a high quality event.

The venue is the recently renovated Novotel North Beach, located right on North Wollongong beach and featuring high quality conference facilities as well as bars, pools, coffee shops, restaurants, and rooms with views of either the amazing escarpment, or all the way along the coast to Sydney.

So, take the opportunity to come along to the beautiful NSW South Coast and enjoy ‘Acoustics by the Beach’.

Jeff Parnell, Conference Chair

**Topics include**

- Active Noise and Vibration Control
- Aeroacoustics
- Architectural and Building Acoustics
- Computational Acoustics
- Environmental Noise
- Fundamental Acoustics
- Industrial Noise
- The Generation and Mitigation of Noise on Mine Sites
- Instrumentation
- Legislation and Standards
- Low Frequency Noise
- Marine Environmental and Bio Acoustics
- Musical Acoustics
- Physiological and Psychological Acoustics
- Sonar Signal Processing
- Transportation Noise
- Underwater Acoustics and Noise
- Vibration
- Wind Turbine Noise
- Workplaces, OH&S Noise Exposure and Hearing Protection
- Other
It is with deep sadness that we report the passing of Nicholas Tselios MAAS.

Nick passed away at the age of 50, at 8pm Friday 15th January 2021 after a battle with cancer.

Nick’s 23-year career in acoustics started and ended at Renzo Tonin & Associates. He finished his Bachelor of Engineering (Mechanical) at UNSW in 1997 and started as a wide-eyed and very-green Graduate Engineer with Renzo Tonin that same year. He was a long-time member of the AAS and Engineers Australia and was Renzo Tonin’s company’s representative at the AAAC for many years. In 2007 he became a Director of Renzo Tonin and was instrumental in growing the business ever since, including the company’s expansion to Victoria, Queensland and beyond. His specialty was in building acoustics and he worked on many of the largest residential, commercial and institutional building projects in NSW, VIC and QLD. His accomplishments throughout his career are prodigious and exemplary, but it would be his commitment, dedication and loyalty to Renzo Tonin, to his colleagues, clients and to his acoustics profession that will be his enduring legacy. He had passion and zeal for acoustics and was a great mentor to many younger engineers, always willing to give his time and to pass on his knowledge and wisdom. Anyone who ever met Nick would immediately warm up to his personality and humour. He will be very sorely missed.

He is survived by his wife Natalie and their two sons, Alexander and Christian, 16 and 14 years old, and a strong legacy with Renzo Tonin, his clients, colleagues, friends and the Australian acoustics profession.

Peter Karantonis
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FUTURE CONFERENCES

Editorial Note: Under the extraordinary world we are living in at the time this goes to press there is great uncertainty regarding future meetings nationally and internationally. Some meeting organisers have bravely advised postponed dates, others have converted to e-conferences and others are yet to confirm if the meeting will go ahead. Acoustics Australia take no responsibility for the accuracy of the listings below and recommends that you seek the latest details from the news flashes on the respective web pages for the conference website. Additional meetings may be listed on the ICA calendar at: http://www.icacommission.org/calendar.html

WTN2021 - Ninth Int conf on Wind Turbine Noise e-conference
These biennial conferences were instigated by Geoff Leventhall for INCE Europe in 2005. For our ninth conference we be presently remotely from Europe in May 2021.
The conferences have become the main international forum for the technical discussion of wind turbine noise from how it is generated to its effect on neighbours. They aim to bring together the latest information on noise and vibration from wind turbines and attract delegates from a wide range of disciplines – aeroacoustic research students, researchers into the effects of noise on people, acoustic consultants and representatives of central and local government. They provide a venue for researchers on wind turbine noise and its effects on people to meet together and also to meet with those who design wind turbine installations, both in industry and in the planning process.
Wind Turbine Noise 2021 will be different from previous conferences because it is an e-conference. As such we shall be emphasising discussions, conversations and other formats that get people together.
https://www.windturbinenoise.eu/

ICBV27 e-conference
The 27th International Congress on Sound and Vibration (ICSV-27) will be held on July 11-15, 2021.
This congress is a leading event in the area of acoustics and vibration and provides an important opportunity for scientists and engineers to share their latest research results and exchange ideas on theories, technologies and applications in these fields.
This congress will only be held on-line and check the website for the updated information.
https://www.icsv27.org/

INTER-NOISE 2021 – Washington DC e-conference
INTER-NOISE 2021 will now be a virtual (online) congress and an extra day has been added to the program.
The 50th International Congress and Exposition on Noise Control Engineering will be held in the virtual (online) mode only.
The Congress theme is Next 50 Years of Noise Control. The Congress is organized by the Institute of Noise Control Engineering of the USA (INCE-USA) and Pro Acustica (Brazil), on behalf of the International Institute of Noise Control Engineering (I-INCE).
Cooperative societies that support the 50th Congress include the Acoustical Society of America, SAE International, Spanish Acoustic Society and the Korean Society for Noise and Vibration Engineering.
https://internoise2021.org/
EURONOISE 2021

The EuroNoise 2021 Congress is now planned for 25 to 27 October, 2021. EuroNoise 2021 will be organized by the Portuguese Acoustical Society (SPA), on behalf of the European Acoustical Association (EAA).

The technical program of this Congress will cover the main topics of acoustics, including the classical themes and the most recently developed areas. A technical exhibition will be held during the Congress days, in a place with easy access and visibility for the attendees and other interested people who would like to make short visits to exhibitor’s booths.

http://www.spacustica.pt/euronoise2021/

NOVEM 2021 – Auckland

Date Change – 13-15 December 2021

NOVEM 2021 is the 7th in the series of NOVEM conferences. NOVEM 2021 has been postponed due to COVID-19 and will now be held 13-15 December 2021 in the beautiful city of Auckland, New Zealand at the Owen G Building, The University of Auckland. The conference will be a major gathering of researchers, from research establishments and from industry, working in the areas of noise and vibration.

The emphasis of the conference is on new and emerging methods, techniques and technologies in acoustics and vibration.

As with previous NOVEMs, each day will contain a Keynote Forum, which will bring together key specialists within a common theme, followed by extensive discussion. These themes represent major scientific challenges related to noise and vibration.

https://www.novem2021.ac.nz/

Acoustics 2022 – Wellington

Joint ASNZ/AAS meeting

Date Change – 31 October-2 November 2022

The Acoustical Society of New Zealand (ASNZ) and Australian Acoustical Society (AAS) Joint Conference will be held at Te Papa Tongarewa Museum in Wellington New Zealand, from 31 October-2 November 2022.

Acoustics 2022 will provide a unique opportunity for manufacturers and suppliers to showcase the latest developments in acoustic instrumentation, software and noise and vibration control products. Surrounded by nature and fuelled by creative energy, Wellington is a compact city with a powerful mix of culture, history, nature and cuisine. Fuel your visit with strong coffee and world-class craft beer – Wellingtonians are masters of casual dining, with plenty of great restaurants, night markets and food trucks.

On the waterfront itself you’ll find Te Papa Tongarewa Museum, New Zealand’s national museum. Te Papa, as it’s colloquially known, means ‘our place’ and is one of the best interactive museums in the world.

It is an iconic New Zealand building, right in the heart of the capital city. It is easily accessible by international and domestic flights into Wellington airport, which is only a short 15 min drive from the venue.

On behalf of the Acoustics 2022 Organising Committee, we look forward to welcoming you to Wellington in November and hope that the conference gives you an opportunity to strengthen your existing networks and that you leave with great memories, fresh ideas, and new friendships.

We encourage you to save the dates in your calendar and register your expression of interest today to be kept up to date with the latest information and program news.

https://www.acoustics2022.com/

Acoustics 2021 – Wollongong

The NSW Division of the Australian Acoustical Society warmly invites all members of the acoustics community to attend Acoustics 2021 - Making Waves, Wollongong in the spectacular Illawarra Region. To be held from 8 – 10 November, the technical program promises to be of great interest to all-comers, covering a full range of topics from active noise control through to musical and bio-acoustics as well as the regular areas such as transportation and environmental noise.

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For latest information check the link from

www.acoustics.org.au
The following are Sustaining Members of the Australian Acoustical Society. Full contact details are available from www.acoustics.org.au or click on company logo.

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Acoustic Research Labs Pty Ltd

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Aerison Pty Ltd

Armstrong Ceiling Solutions (Australia) Pty Ltd

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Broadcrest Consulting

Dynamic Composite Technologies

Association of Australasian Acoustical Consultants

EMS Bruel & Kjaer

Hottinger Bruel & Kjaer Australia Pty Ltd

Embelton

Lee Brothers Fencing Group

NSW Environment Protection Authority

IAC Acoustics

EMS Brüel & Kjaer

NSW Environment Protection Authority

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Regupol Australia

Soundblock Solutions Pty Ltd

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Regupol (Australia) Pty Ltd

Vibration Solutions

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Vipac Engineers & Scientists Ltd
DIARY

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2021

18-21 May 2021, Dublin, Ireland
WTN2021 - Ninth Int conf on Wind Turbine Noise
e-conference
https://www.windturbinenoise.eu/

8-10 June, Seattle, Washington
180th Meeting of the Acoustical Society of America
e-conference
https://acousticalsociety.org/asa-meetings/

14-17 June, Stockholm, Sweden
13th ICBEN Congress on Noise as a Public Health Problem
e-conference
http://icben2021.se/

11-16 July, Prague
27th International Congress on Sound and Vibration
e-conference
(ICSV27) www.icsv27.org/

1-5 August, Washington, USA
INTER-NOISE 2021
e-conference
https://internoise2021.org/

25-27 October
EURONOISE 2021
e-conference
www.spacustica.pt/euronoise2021/

2022

8-10 November, Sydney (Wollongong), Australia
Acoustics2021 – Australian Acoustical Society Conference
www.acoustics.org.au

13-15 December, Auckland, New Zealand
NOVEM 2021 Noise and Vibration Emerging Methods
https://www.novem2021.ac.nz

2023

4-8 December, Sydney, Australia
Acoustics 2023 Sydney
Joint meeting ASA, AAS, WESPAC, PRUAC
acoustics2023sydney@arinex.com.au

24-28 October, Gyeongju, Korea
ICA 2022 http://ica2022korea.org/

31 October-2 November, Wellington, New Zealand
Acoustics 2022
https://www.acoustics2022.com/

NATacoustic
National Acoustic Calibration Laboratory
www.natacoustic.com.au

B & K
Norsonics
Bion
NTI
ARL
KTA Technology
Svantek
Larson Davis
Cevsa
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01dB
Pulsar
Sinus

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