Start time	TUESDAY 27 2019	Session	Title	Authors	WEDNESDAY 28 2019	Session	Title	Authors	THURSDAY 29 2019	Session	Title	Authors
8:00	REGISTRATION											
8:55	OPENING REMARKS											
9:00	PAPERS - Active Noise Cancelling & Signal Processing	Keynote 1	Acoustic Transparency of Earphones and Headphones	Michael Vorländer	PAPERS - Signal Processing and Virtual Worlds	Keynote 3	Signal Processing and Machine Learning Techniques for the Spatial Augmented Reality Audio: Current Progress and Future Trends	Woon-Seng Gan	PAPERS - Electroacoustics and Drivers	Keynote 5	MEMS Technology for Portable Sound	Daniel Beer
9:45		Paper 1	The Effect of Active Noise Cancellation on the Acoustic Impedance of Headphones	Roman Schlieper, Song Li, Stephan Preihs and Juergen Peissig		Paper 9	Extracting Music and Noise from the Ear Canal using a Headset	Jussi Ramo, Vesa Valimaki, Sampo Vesa, Riitta Vaananen and Matti Hamalainen		Paper 17	Acoustic Validation of Electrostatic All-silicon MEMS Speakers	Lutz Ehrig, Bert Kaiser, Hermann A. G. Schenk, Michael Stolz, Sergiu Langa, Holger Conrad, Andreas Männchen and Tobias Brocks
10:10	COFFEE				COFFEE				COFFEE			
10:25		Paper 2	Evaluation of Predicted Listening Effort for Active Noise Cancelling Headsets	Jan Reimes		Paper 10	Ambisonics With Depth Extensions for Six Degrees of Freedom	Edward Stein and Michael Goodwin		Paper 18	Design and Electroacoustic Analysis of a Piezoelectric MEMS In-ear Headphone	Andreas Männchen, Fabian Stoppel, Tobias Brocks, Florian Niekiel, Daniel Beer and Bernhard Wagner
10:50		Paper 3	Objective Measurements of Headphone Active Noise Cancelation Performance	Christopher J. Struck		Paper 11	Reverberation Loudness Model for Mixed-Reality Audio	Remi Audfray and Jean-Marc Jot		Paper 19	The Effective Radiation Area of Midsize Headphone Drivers in the Nonlinear Working Range	Kurt Jürgen Mick
11:15	WORKSHOP - Klippel GmBH	Workshop 1	This workshop discusses practical approaches for automated measurement of three-dimensional audio directivity information in product development of modern head-worn personal audio devices. It focuses on the primary acoustic data, such as microphone response, that is crucial input data for effective DSP algorithms. In addition to measuring directivity patterns of individual microphones integrated in distributed microphone arrays, this workshop also addresses smart approaches for testing and evaluating near-field sound radiation like acoustic leakage.	Robert Werner	WORKSHOP - Waves Audio Ltd.	Workshop 3	Waves Nx™ renders a spatial audio experience without relying on standards, metadata, delivery formats, container formats, or CODECs. Originally designed as a headphone solution for audio professionals, Nx™ swaps-out noisy filters and coloration for spatialization that preserves fidelity. In addition to highly responsive head-tracking that anchors the sound source relative to head orientation, the keystone of Nx™ is room emulation. Called externalization, combining multichannel or ambisonic binaural rendering with the acoustic characteristics of real spaces achieved through venue modeling delivers a speaker-like, expanded field listening experience. Join the Waves Nx™ team at AES Headphone for a workshop featuring an overview of the Nx™ technology, interactive demos, a behind-the-scenes look at modeling a renowned studio, and insight into reproducing acoustic spaces through the Nx™ spatial renderer.	Adam Levenson	WORKSHOP - Comsol, Inc.	Workshop 5	Basic principles of headphone analysis using COMSOL Multiphysics®, including of a headphone driver as well as a full headphone, extraction of Thiele−Small parameters of the driver and their use in an equivalent electric circuit, analysis of acoustic transmission through foam-like materials with the Poroelastic Wave interface and the use of representative acoustic boundary conditions, like the eardrum impedance and equivalent perforated plate conditions, to simplify simulations. The workshop includes a live demo.	Andres Garcia
12:00	LUNCH				LUNCH				LUNCH			
12:45	PAPERS - HRTF Measurement, Modelling and Evaluation	Keynote 2	Audio Engines, Head-tracking and Personalization Enable New Headphone Experiences	Ramani Duraiswami	PAPERS - Binaural Perception and Externalization	Keynote 4	Creating Auditory Illusions with Binaural Technology	Karlheinz Brandenburg	PAPERS - Acoustical Fitting & Testing	Keynote 6	Hearing Damage Risk from Headphone-based Listening	Dorte Hammershoi
13:30		Paper 4	Perceptual Evaluation of Personalized BRIRs and Headphone Compensation	Graham Davis, Andre Schevciw, Isaac Munoz and Nils Peters		Paper 12	Externalization Enhancement for Headphone-reproduced Virtual Frontal and Rear Sound Images	Song Li, Roman Schlieper and Jürgen Peissig		Paper 20	A One-size-fits-all Earpiece with Multiple Microphones and Drivers for Hearing Device Research	Florian Denk, Miriam Lettau, Henning Schepker, Simon Doclo, Reinhild Roden, Matthias Blau, Jörg-Hendrik Bach, Jan Wellmann and Birger Kollmeier
13:55		Paper 5	Blockhead: A Simple Geometric Head Model	David Romblom and Helene Bahu		Paper 13	Subjective Sound Quality Evaluation of an Acoustically Transparent Hearing Device	Henning Schepker, Florian Denk, Birger Kollmeier and Simon Doclo		Paper 21	Estimating Ear Canal Volume Through Electrical Impedance Measurements from In-ear Headphones - Initial Results	Marco Comunità and Lorenzo Picinali
14:20		Paper 6	Evaluating Intermittent and Concurrent Feedback During an HRTF Measurement	Fons De Mey, Herbert Perrmans, Jonas Reijniers, Serge Demeyer and Dominique Heer		Paper 14	Binaural Spatilisation Over a Bone Condution Headset: The Perception of Elevation	Amit Barde, Robert Lindeman, Gun Lee and Mark Billinghurst		Paper 22	Joint Reproduction of Background Noise and Reverberation for Development and Testing of Binaural Devices	Magnus Schäfer, Benedikt Koppers, Jan Reimes and Hans-Wilhelm Gierlich
14:45	POSTERS - Electroacoustics and Drivers	Poster 1	The Relationship Between the Acoustic Impedance of Headphones and the Occlusion Effect	Roman Schlieper, Song Li, Stephan Preihs and Juergen Peissig	POSTERS - Spatial Audio	Poster 5	Comparison of Just Noticeable Differences in Localization of Virtual Sound Sources over Headphones and Loudspeakers	Sascha Dick and Jürgen Herre	CLOSING & AWARDS			
		Poster 2	A Comparison of Radio Power Consumption of True Wireless Earbuds	Thomas Girardier, Florian Denis and Antoine Soulier		Poster 6	Influence of Binaural Processing on Objective Perceptual Quality Assessment	Pablo Delgado, Felix Fleischmann and Jürgen Herre				
		Poster 3	Challenges of Testing Smart Headphones	Steve Temme		Poster 7	A Unity Based Unified Platform for Individualized HRTF Research and Development: From On-the-fly Fast Acquisition to Spatial Audio Renderer	Santi Peksi, Duy Hai Nguyen, Woon-Seng Gan, Rishabh Ranjan, Rishabh Gupta and Jianjun He				
		Poster 4	High-Frequency Ear Coupler	Morten Wille and Per Rasmussen		Poster 8	Non-invasive Parametric HRTF Measurement for Human Subjects Using Binaural and Ambisonic Recording of Any Sound Field	Jianjun He, Rishabh Gupta, Rishabh Ranjan and Woon Seng Gan				
	NB! ALL DEMOS RUN BOTH DAYS	Demo 1	Open Your Ears to MEMS – New Speaker Technology for In-Ear Headphone Systems	Fabian Stoppel	NB! ALL DEMOS RUN BOTH DAYS	Demo 10	Fast HRTF Measurement System for On-site Acquisition and Rendering of Near-field HRTF	Nguyen Duy Hai				
						Demo 11	Flat Baffled 3D Mic Arrays	Svein Berge				
		Demo 3	High Definition Music Card Surround Playback on Headphones	Alexander Golberg Jero		Demo 12	Real-time Hear Through for Augmented Reality Headphones	Rishabh Gupta				
		Demo 4	Interactive Augmented Audio Experience designed by Sennheiser AMBEO for Magic Leap	Remi Audfray		Demo 13	3Pass Lab/flex, It's All About UX – A Multidimensional Sound Field	Luis Arango and Jacob Soendergaard				
		Demo 5	Head-tracked Control of Spatial Sound Polyrhythmic Metronome in an Augmented Reality Scene Using Bose Frames	James Pinkl and Michael Cohen		Demo 14	Demonstrate Vesper's ZeroPower Listening TM Technology for Wireless Stereo Headsets	Udaynag Pisipati				
		Demo 6	Demonstrate Headphone Test and Measurement	Chris Gill and Tony Spica		Demo 15	HRTF Measurement Methodology	Fons De Mey				
		Demo 7	Web-based and Mobile Binaural Audio and Sonic Narratives	Marco Comunità and Lorenzo Picinali		Demo 16	Challenges of Testing Smart Headphones	Steve Temme				
		Demo 8	Demonstration of End-of-line Tester	Mike Klasco		Demo 17	Eastman - A World Leader in Polymer Technology	John Quigley				
		Demo 9	Electroacoustic Simulation of Headphones and Earphones with Open Source Software	Mark Kahrs								
16:15	PAPERS - HRTF Measurement, Modelling and Evaluation	Paper 7	Computation of Head-related Transfer Functions Using Graphics Processing Units and a Perceptual Validation of the Computed HRTFs against Measured HRTFs	Ziqi Fan, Terek Arce, Chenshen Lu, T.W. Wu and Kyla McMullen	PAPERS - Binaural Perception and Externalization	Paper 15	The Influence of the Sound Source on Perceived Differences between Binaurally Rendered Sound Spaces	François Salmon, Etienne Hendrickx, Nicolas Epain, Quentin George and Mathieu Paquier				
16:40		Paper 8	VAS – A Cross Platform C-library for Efficient Dynamic Binaural Synthesis on Mobile Devices	Thomas Resch, Christoph Böhm and Stefan Weinzierl		Paper 16	Study on Differences between Individualized and Non-individualized Hear Through Equalization for Natural Augmented Listening	Rishabh Gupta, Rishabh Ranjan, Jianjun He and Woon-Seng Gan				
17:05	WORKSHOP - Dolby Laboritories, Inc.	Workshop 2	This workshop will explore the challenges and methodology of producing a realistic binaural ATMOS experience of Henry Brant's spatially composed, Pulitzer Prize winning "Ice Field" - a full orchestra work with organ solo that involved the simultaneous capture of multiple, diversely located section ensembles situated throughout the 2,743 seat Davies Symphony Hall. Unlike many acoustic surround recordings that attempt to provide the listener an enhanced realization of the actual performance/capture venue, this project required treating the hall acoustic as an equal compositional component as the composer intended. Through the use of the newest ATMOS post-production tools, this live recording is now available as a binaural download via multiple on-line distributors.	John Loose, Dolby Laboratories, Inc.; Jack Vad, San Francisco Symphony	WORKSHOP - Menlo Scientific	Workshop 4	One presentation will be on practical aspects of headphone construction; requirements of the materials, implications of various choices, ergonomics, and other factors not commonly found in the technical literature of headphone engineering. I will have a couple of panel members. The other presentation will be on stable mass production challenges for calibration and quality control of active noise canceling headphones.	Moderator: Michael Klasco, Menlo Scientific, Ltd. Panelists: John Patrick Quigley, Eastman Chemical Company; Chris Struck, CJS-Labs; Mark Donaldson, SoundChip				
18:00	BUS TRANSFER				WALKING TRANSFER							
18:45	DOLBY RECEPTION				DISNEY MUSEUM							