



SYSTEM DESIGNERS CONFERENCE

**Managing Audio: Adopting New Technologies In Auditoriums,
Theatres, Concert Halls and Stadiums**

O₂ UNIVERSUM PRAGUE NOVEMBER 7-8 2019

Dear audio professional,

We are delighted to welcome you at the 2019 System Designers Conference.

The conference-leading topic will be the management of innovations in the professional communications and entertainment industries, with a special focus on a number of innovation areas, such as professional remote communication systems and - perhaps the hottest topic this year - immersive sound.

The event will include multiple 'ears-on' workshops. A full immersive sound system will be used to demonstrate panning and acoustic enhancement in one of the conference rooms, while a second large-scale immersive system in the 4000-seat O₂ universum sports arena will be used to host workshops on arena and stadium crowd lift, as well as object-based sound and light panning in large performance spaces.

Related lectures and discussions will cover many topics such as AV facility and venue management, the relevance of standards, training/change management and the adoption of new workflows. There will also be many discussions about the future of immersive sound and its four operation modes: pre- and post-production, live panning and automated panning using stage tracking systems. They will include contributions from both educational institutes and commercial enterprises, approaching the topic from the point of view of composers and sound designers, as well as from investors and production managers.

With over 200 attendees from many countries, the conference will offer the opportunity to discuss topics in a truly international setting. The goal is to expand horizons and explore ideas of the new opportunities made possible by innovations in digital signal processing, audio networking and electro-acoustic technologies.

If you have any questions, please feel free to contact us at the conference.

We wish you a pleasant and interesting time in Prague!

 **YAMAHA**

NEXO

 **Steinberg**

T T A

O₂ universum

 **RMC CONSULTING EU**

 **AVIXA**

 **Audinate**

 **PRAHA ARCHA**

AUDILE

RAMBOLL

 **Real Concerts**

 **HAW HAMBURG**

 **THM**

 **audioconsulting ag**

 **BIG ORANGE**

 **Microsoft**

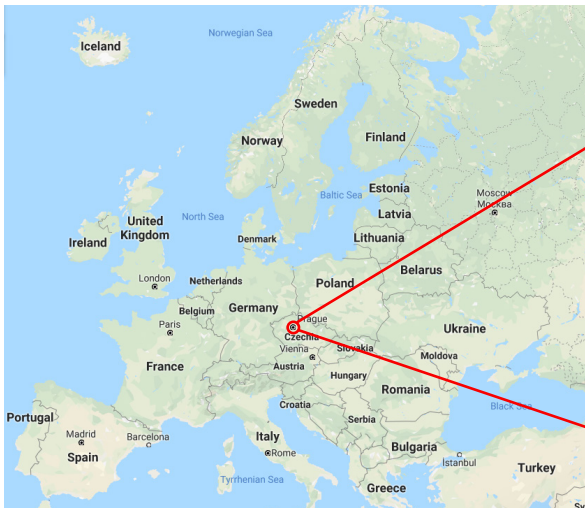
 **ONLIM**

 **SMG**

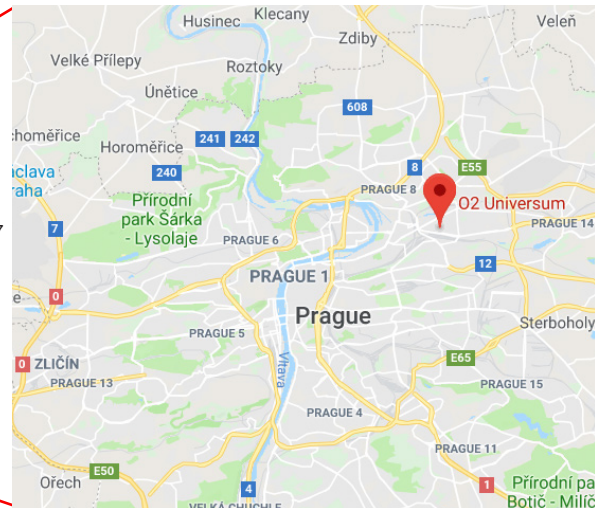
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2019 SYSTEM DESIGNERS CONFERENCE

THE LOCATION

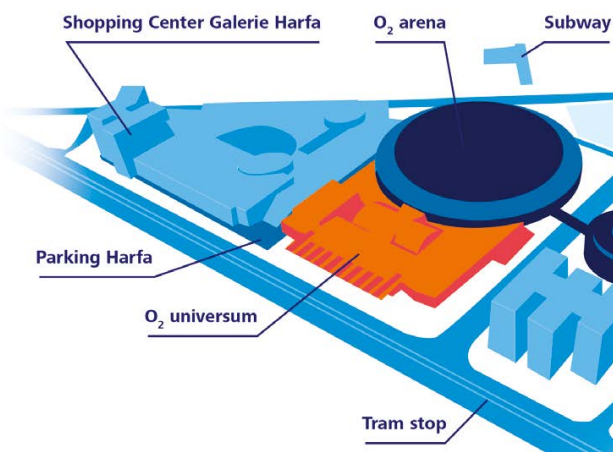


O₂ universum
 Českomoravská 2345/17
 190 00 Praha 9-Libeň
 Czechia



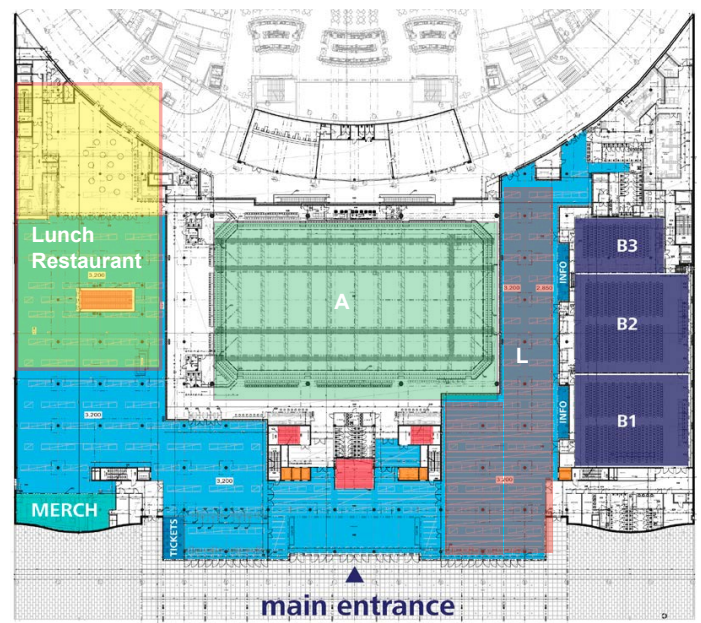
2019 SYSTEM DESIGNERS CONFERENCE

THE VENUE



The conference will be held in five rooms:

- B1 Immersive Sound Workshops
- B2 Lectures
- B3 Professional Communication Workshops
- A Large Scale Immersive Sound Workshops
- L Lobby



Accommodation

We have booked a room for all guests in the Hilton Prague hotel, which is located in the Florenc area of the city, within walking distance of the city centre.:

Hilton Prague
Pobrezni 1, Prague, 186 00,
Czech Republic



On Wednesday evening a welcome dinner will be provided at the Hilton Prague banqueting room, while on Thursday evening a conference concert dinner will take place in the historic Municipal House in the city centre:

Municipal House;
Sladkovsky hall & Pilsner Restaurant
nám. Republiky 5, 111 21 Staré Město,
Czechia

**Travel**

An airport shuttle is available for transport to the hotel on Wednesday afternoon as well as departure from the O₂ universum on Friday afternoon.

On conference days, a bus shuttle service will take you from the hotel to the O₂ universum conference location.

Wednesday 06-11-2019

15:00 Arrivals
Reception at
Hilton Prague

20:00 Welcome dinner
Hilton Prague

Thursday 07-11-2019

09:00 Welcome session
09:30 Morning programme
12:30 Lunch
13:30 Afternoon programme
17:30 Historical tram ride
18:30 Mini concert at
Municipal House
19:30 Conference dinner
Municipal House

Friday 08-11-2019

09:00 Morning programme
13:00 Lunch
14:00 Wrap-up session
14:30 O₂ universum tour
or
Leave for airport

Thursday 07-11												
13:30	14:15	14:30	15:15	15:30	16:15	16:30	17:15	17:30	18:00	18:45	19:30	22:30
<div>RF Stage Tracking: How To Bring Immersive Sound Into Amazing Live Shows</div> <div>John Skjelstad TTA Sound</div>		<div>Large Arenas Sound System Design</div> <div>Nicolas Poitrenaud NEXO</div>		<div>EN54 in Stadiums and Arenas</div> <div>Roland Hemming RH Consulting</div>		<div>Application Examples of Immersive Sound in Large Scale Venues</div> <div>Hiraku Okumura Yamaha Corporation Mikael Collin Audile Paul Malpas Ramboll</div>						
<div>Immersive Audio in Live Concerts</div> <div>Paul Jeukendrup Royal Conservatoire The Hague Erwin Roebroeks The Game of Life</div>		<div>Acoustics Measurements and Analysis</div> <div>Piotr Kozłowski Wrocław University of Science and Technology</div>		<div>Application Examples of Immersive Sound Technologies</div> <div>Joe Rimstid Yamaha Corporation of America Dai Hashimoto Yamaha Corporation</div>		<div>Aesthetic and Technical Challenges of Audio Production for Immersive Media</div> <div>Thomas Görne Hamburg University of Applied Sciences</div>						
<div>Investment Equations for Sound Systems in Large Arenas</div> <div>Francois Deffarges NEXO</div>		<div>No activity</div>		<div>Complex Production Management – the Role of Higher Level Education</div> <div>Benjamin Bernschütz, Axel Barwich, Mia Kern THM University of Applied Sciences</div>		<div>Investment Equations for Sound Systems in Large Arenas</div> <div>Francois Deffarges NEXO</div>						
<div>Network Management</div> <div>Ruben van der Goor Yamaha Music Europe Julian Carro Audinate</div>		<div>Network Management</div> <div>Ruben van der Goor Yamaha Music Europe Julian Carro Audinate</div>		<div>Remote Conferencing, Training and Education</div> <div>Marcus-Michael Mueller Yamaha Music EUrope</div>		<div>The Importance of Sound Quality in Conferencing and UC</div> <div>Andreas Schmalfeldt Yamaha Music Europe</div>						
	<div>Break Out & VR</div>		<div>Break Out & VR</div>		<div>Break Out & VR</div>		<div>Break Out & VR</div>	<div>17:30 - 18:00 Real <> ViReal Tram service to Municipal House</div>				
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Welcome Drink

Mini Concert

Conference Dinner
19:30 - 22:30

Standardization and Certification of AV Workflows



Ann Brigida
Avixa

Thursday 10:30
Friday 10:00
Room B2

While the idea that standardisation fosters innovation seems almost counterintuitive, the facts show just that: Standards not only create an environment for innovation, they boost business. This lecture, offered by the accredited association AVIXA (Audiovisual and Integrated Experience Association), will discuss the merits of using AV standards in the ever-changing landscape of designing and installing AV systems. It will demonstrate the important role certification and standards play in creating an integrated experience that puts users first.

Complex Production Management – the Role of Higher Level Education



Benjamin Bernschütz
Axel Barwich
Mia Kern
THM University of Applied
Sciences

Thursday 15:30
Friday 9:00
Room B2

Technologies and technological projects both in the field of installed AV-systems as well as in the context of live events are getting more complex day by day and customer's and recipient's expectations are rising. Both the AV and the event industry have noticed the need for highly qualified experts e.g. in the field of network technologies, computer programming or immersive audio and video technologies. In the meantime, many of those experts have specific university degrees and the romantic stories of typical self-made professionals in our business become rarer.

However, mastering the technology is just one side of the story. A growing communication gap arises between the customer and the more and more specialized technology experts. Furthermore, complex projects bring up several non-trivial management tasks, which mostly are neither in the scope of interest nor in the field competence of technology experts. Business administration, project management, marketing knowledge, human resource management or innovation management are key skills for modern technology companies to manage complex projects, to reach out into a successful future and to consolidate their presence in the market. Classical managers that run through a non-specific management course at a university cannot fill this kind of gap and are typically hardly accepted by engineers and technicians in our business. This situation calls for a new position in the market – a specific kind of manager that has both, sufficiently profound technological knowledge, as well as specific parts of the skillset and the communication abilities of a classical manager. This position is able to translate between the customer and the engineer and overviews budgets, feasibility, marketing aims and technologies all at the same time, yielding an ideal project manager for projects of growing complexity.

Finally, technology and management are both subject to rapid changes and advances. To keep pace, advanced trainings and aspects of life-long learning should be implemented for professionals in our business.

Venue AV Management



David Grundy
SMG

Thursday 9:30
Friday 11:00
Room B2

This lecture discusses the general management of publicly owned entertainment venues based on real-life examples from the US, focusing on audiovisual system related decision making and workflow issues such as return on investment, risk management, operational costs. Also, the impact of the increasing deployment of immersive audiovisual technologies is discussed.

Investment Equations for Sound Systems in Large Arenas



François Deffarges
NEXO

Thursday 13:30, 16:30
Room B2

A comprehensive understanding of the application environment is required prior to designing a sound system for a large venue. What is a typical program? What are the income drivers? What budgets should be envisaged? This lecture will discuss several investment equations based on practical examples.

Large Scale Project Management: Fête des Vignerons



Martin Reich,
Greg Baumann
Audioconsulting AG
Andy Cooper
Yamaha R&D Centre UK

During the summer of 2019, the Swiss town of Vevey was transformed by a 'once in a generation' event which included a cast of more than 5,000 local performers. A temporary 20,000 seat stadium was constructed and fitted with five stages and five PA systems, each able to cover the whole arena. During this seminar, hear Andy Cooper from Yamaha's European R&D team discussing with Martin and Greg how they managed the audio system from concept to completion, using nine Yamaha RIVAGE PM consoles, a 10Gbps Dante network, 324 wireless mic channels, a team of 20 staff and about 50 tonnes of PA.

Thursday 11:30
Friday 12:00
Room B2

Network Management



Ruben van der Goor
Yamaha Music Europe
Julian Carro
Audinate

Networks have taken over the role of point-to-point connectivity in the AV industry, supporting system complexity and functionality beyond our wildest dreams of only a decade ago. This session discusses the effect of using networks for audio and video in professional communications and entertainment environments, and presents a view on the future, addressing also management topics such as security, user control and monitoring.

Thursday 13:30, 14:30
Room B3

SESSION ABSTRACTS

PROFESSIONAL COMMUNICATION

Remote Conferencing, Training and Education



Marcus-Michael Müller
Yamaha Music Europe

This workshop shows the workflow of remote training from a hardware and software point of view. The workshop room will be connected to a huddle room and also to other rooms around the world. It will show how remote conferencing, teaching or training can work by using the right room and system setup, so that interaction between attendees is possible. It will also show how new technologies will have an impact on the efficiency of remote training.

Thursday 9:30, 15:30
Friday 12:00
Room B3

The Importance of Sound Quality in Conferencing and UC



Andreas Schmalfeldt
Yamaha Music Europe

This workshop shows how to improve sound quality in communication solutions by using the right technologies and the right providers. It will demonstrate how important sound is for seamless conferences and communication, as well as what kind of settings in a conferencing room will have an impact on the sound quality.

Thursday 10:30, 16:30
Room B3

AI based Voice Assistance: Opportunities for Conferencing and Room Management



Alex Wahler
Onlim

Market research predicts that already in 2023 eight billion active voice assistants are available worldwide. This means that interacting via voice in natural language with machines will become part of our daily life in the same way as we are using smart phones today. In this talk an overview of the state of the art in artificial intelligence for voice and messaging systems including enterprise use cases are demonstrated. Furthermore opportunities for conference, room management and educational systems are discussed.

Thursday 11:30
Friday 11:00
Room B3

The Future of Conferencing and Presenting Using AI and Voice Processing



Dmitry Turchyn
Microsoft

Friday 9:00, 10:00
Room B3

This workshop discusses Artificial Intelligence (AI) industry trends, with the focus on natural voice processing, speech, text analysis and translation, as well as integration in professional communications or presentation applications and processes, like Microsoft Teams or Powerpoint. In this session, live captioning and translation during the presentation within Office 365 will be demonstrated: subtitles will be shown on screen, the audience can follow them on their smart phone, seeing subtitles translated into their language in real time.

SESSION ABSTRACTS

IMMERSIVE SOUND

Immersive Audio in Live Concerts



Paul Jeukendrup
Royal Conservatoire The Hague
Erwin Roebroeks
The Game of Life

Thursday 13:30
Room B2

Although immersive music is nowadays associated with immersive audio, the history of immersive music dates back to 16th century Venice. At St. Mark's Basilica, music was composed for singers and musicians placed at different locations around the church. Music especially composed for specific buildings gained popularity throughout Europe, yet it subsequently declined with the advent of concert life - which again took place in Venice - when music began to travel and was therefore no longer tailored to a specific structure. Centuries later, immersive music acquired a renewed emphasis, this time in the context of electro-acoustic music. Erwin Roebroeks will give an overview of the history of immersive music, and will argue that every successful immerse development started with an artistic idea rather than a technological approach.

Immersive audio has been successfully implemented in contemporary electro-acoustic music performances since the invention of the loudspeaker, with pioneers like Pierre Schaeffer, John Cage and Karlheinz Stockhausen being a source of inspiration for numerous other composers. However, in the live entertainment industry, despite some highly adventurous experiments, until now immersive audio has been a rare phenomenon. In this presentation by Paul Jeukendrup, we ask ourselves what the added value of immersive audio can be for (commercial) concert productions and what limitations will we meet when applying this technology? How can we realize a musically meaningful implementation and what can we learn from a pioneer like Karlheinz Stockhausen?

Aesthetic and Technical Challenges of Audio Production for Immersive Media



Prof. Thomas Görne
HAW University of Applied Sciences, Hamburg

Thursday 16:30
Room B2

With immersive media like 360° video, extended realities and cinematic '3D' sound, the 'auditory spatial turn' we are currently experiencing raises not only practical but also aesthetic questions: How do we produce spatial content? What are the aesthetic guidelines one can follow? What is the added value for the audience or the consumer? We know quite well how to produce music in stereo, we have elaborate technical tools and the audience knows very well the value of the format. But when it comes to spatial audio, it seems like all of these things are still missing. Kinetics in Sound and Space is a joint research project of HAW Hamburg's Immersive Audio Lab with Hamburg University of Music and Drama, focusing on the aesthetics and applications of spatial sound. The talk introduces the scope of aesthetic research in spatial audio and gives a brief outline of the creative and technical challenges emerging in music production and sound design for immersive media.

Immersive Pre- and Post Production



Vincent Koning
Big Orange

Friday 10:00
Room B1

Immersive audio techniques have become, and will become, more significant in audiovisual storytelling - including film, video, commercials, museum tour guides, just to name a few. This development led to the deployment of several immersive technologies with compelling names such as binaural, head-tracked, head-locked, object-based, ambisonics. These technologies can all serve a function, but are only successful when used in dedication for the story: the storytelling determines which audio elements are used, what they should achieve and which tools have to be used to accomplish it. This session presents pre- and post- production approaches to several immersive audio driven experiences on the basis of several real-life cases.

Immersive Pre- and Post Production



Aldo Lamanna
Steinberg

Thursday 10:30
Room B1

After an introduction to object-based audio pre- and post-production technologies, three audio content creation workflow examples are demonstrated and discussed using Nuendo 10 and Dolby Atmos: Pre-production at a small studio with music and sound effects, bed and object 3D panning with automation using VST MultiPanner, and the transition to large scale object based setups. An outlook on upcoming object based technologies is also presented, focusing on concepts to be expected soon such as non-proprietary object based file formats (ADM) and plug-in based, non-proprietary renderers (VST).

Application Examples of Immersive Sound Technologies



Joe Rimstidt
Yamaha Corporation of America
Dai Hashimoto
Yamaha Corporation

Thursday 9:30, 15:30
Friday 9:00, 11:00
Room B1

For this workshop, several acoustic environments will be created in the conference centre's session room B1 using an AFC4 acoustic enhancement system - including a recreation of the acoustics of the Prague Municipal House's Sladkovsky hall. The Prague Music String Quartet will play a mini concert in both acoustic environments, allowing both performers and listeners to experience the reality and the enhanced system. Furthermore, using 'silent' instruments and a Stagetracker II system, object-based panning will be demonstrated.

Live Object Based Panning GUI Concepts



Matt Hardy
DeusO

Thursday 11:30
Room B1

Migrating from stereo panning to object based panning in every day entertainment productions, such as pop concerts and musicals, as well as in professional communications like forum discussions and large stage presentations implies that automated panning should become a standard function in audio systems, requiring a live panning GUI that is as easy to use as the pan controls on a mixing console. This session discusses the topic from the manufacturers point of view.

Acoustics Measurements and Analysis



Dr. Piotr Kozłowski
*Wrocław University of
Science and Technology*

Thursday 14:30
Friday 12:00
Room B1

The design of any kind of sound reinforcement system requires the study and analysis of the acoustic environment. For this, acoustic measurements have to be done before and after a sound reinforcement system is installed. Proper decisions are based on measurement results and have significant impact on the final sound system's immersive quality. Reliable measurement comes with a lot of combinations of source and receiver placements in a performance space, a very time-consuming process. The time you need to spend on every single measurement, as well as the time to analyse and report the aggregated result, is critical to get a sensible quality/cost factor. This session will discuss the acoustic measurement and analysis process. It will take place in conference room B1, equipped with an AFC4 acoustic enhancement system. Several acoustic environments are used to demonstrate acoustic measurement and analysis workflows.

RF Stage Tracking: How To Bring Immersive Sound Into Amazing Live Shows

TTA

John T. Skjelstad
TTA

Thursday 13:30
Friday 9:00
hall A

Immersive sound is quite familiar to us in playback settings, for example in cinemas and living rooms, or in gaming. With the ongoing innovation in DSP technologies, it is now increasingly being deployed in live shows, providing an immersive experience for the audience. To support live artists with sound and light localization in real time, knowing the artist's movements at all times is crucial. By fitting a small transmitter on each performer and sensors above the stage, three-dimensional stage tracking can be realized, making fast and accurate localization possible. Knowing the positions of your artists, and controlling sound and light localization systems based on the real time data, can turn live shows into amazing immersive experiences. This workshop discusses the RF technology, communication protocol standards and workflow for real time, automated immersive sound systems.

Application Examples of Immersive Sound in Large Scale Venues

AUDILE RAMBOLL YAMAHA

Mikael Collin
Audile
Paul Malpas
Ramboll
Hiraku Okumura
Yamaha Corporation

Thursday 10:30, 16:30
Friday 10:00, 12:00
Hall A

As we speak, immersive sound systems are increasingly being implemented in high level entertainment applications, such as opera and musicals. 'Immersive' is also a hot topic for other applications. This workshop discusses the possible use of object-based light and sound localization in large scale events, using a temporary immersive sound system in the 4000-seat O₂ universum sports arena. The system uses RF performer tracking to automate panning. As part of this workshop, the 'crowd enhancement' application is also discussed, supporting sports arenas and stadiums built with inferior acoustics to support higher intelligibility for pop concerts and voice evacuation. In those cases, the 'dry' acoustics are in conflict with sports events, where spectators prefer a 'live' environment. An active acoustic enhancement system can also be applied to create variable acoustics on a very large scale, supporting both activities.

EN54 in Stadiums and Arenas

RHCONSULTING.EU

Roland Hemming
RH Consulting

Thursday 11:30, 15:30
Hall A

Sports arenas and stadiums are multipurpose venues with a complex set of requirements: intelligibility for voice evacuation, high power and flexibility for pop concerts and other events. Sound reinforcement and crowd enhancement systems can be used, supporting amplified entertainment, voice evacuation messages and, of course, sports events. These systems have to comply with several, sometimes conflicting, standards for emergency voice evacuation. This lecture discusses the use of voice alarm standards, including EN54, in Europe and beyond. It explains how to apply them in such complex environments and its impact on the design of audio systems for sports arenas and stadiums.

Large Arena Sound System Design

NEXO

Nicolas Poitrenaud
NEXO

Thursday 14:30
Friday 11:00
Hall A

Large venues such as stadiums and arenas host a wide variety of events, from sporting fixtures - lately e-sports - to meetings and classical music/pop/rock/EDM concerts. The cultural environment, constraints and requirements for each are so different that a single system cannot adequately cover them all - although there is some crossover between applications. This lecture will cover current and future technical trends on design, implementation and operation for each of these applications, illustrated with the O₂ universum as an example.

Break Out Session and Historical Tram RideO₂ universe Lobby

Live immersive sound involves multi-speaker playback systems. However, for pre-produced immersive content - entertainment as well as games - it is most commonly experienced through headphones and a video display, or, increasingly, through wearable systems such as the Oculus range of headsets. To experience binaural perception of audio and 3D video, conference goers are invited to take the tram to the Sladkovsky concert hall on Thursday afternoon for the mini concert and the conference dinner, experiencing a tram ride in Prague in real life. The same tram ride has been recorded and edited as 3D production, which can be experienced using Oculus Go headsets set up in the lobby. This offers the unique opportunity to undergo the tram ride experience both virtually and in real life.

O₂ universum and O₂ Arena tourO₂ universum

Chmatal Marek
O₂ Universum

Guided Tour through the O₂ universum and O₂ Arena venue on Friday afternoon.
Appr. 30 minutes.

Friday 14:30

Please sign up at the event reception.

IMPORTANT GATHERING TIMES

event	day	time	where
Welcome Dinner	Wednesday 06-11-2019	20:00	Hilton Grand Ballroom
Departure to O2 Universum	Thursday 07-11-2019	08:30	Hilton Entrance Bus Area
Departure to Municipal House	Thursday 07-11-2019	17:30	O ₂ universum entrance Tram Stop
Departure to O2 Universum	Friday 08-11-2019	08:30	Hilton Entrance Bus Area
Bus Shuttle to Airport	Friday 08-11-2019	14:30	O ₂ universum entrance Bus Area