Invitation & Preliminary Program

108TH AES CONVENTION
PALAIS DES CONGRÈS
PARIS, FRANCE
2000 FEBRUARY 19-22
CHAIRMAN’S WELCOME

Dear Attendants,

Only a few weeks to go until the 108th AES Convention opens its doors to pro-audio specialists from around the world. With an extensive Convention Program and Equipment Exhibition, the first AES event of the new millennium will present technologies and ideas, both established and visionary. This Paris Convention is the ideal location to help guide you through the latest trends and technological changes.

The turn of the millennium heralds groundbreaking innovations in the pro-audio sector. Multichannel audio, for example, seems as important a breakthrough as was the introduction of stereo. After a long period of technical fine-tuning, we are faced with the basic aesthetic and artistic questions, and once again the AES is there to help you make the right choices.

For over 50 years, the AES and its Conventions have been the link within the international audio community: a forum for exchange of new ideas. At the dawn of the new millennium and the age of globalisation, the role of the AES will be more important than ever before.

As Chairman, and on behalf of the 108th Convention Committee, I am very pleased to announce an exhaustive Convention Program: 19 paper sessions that include over 100 papers, many technical tours and 15 challenging workshops, providing a framework for professional fact-finding on the highest level.

The student activities too will be more intense than ever before, thus contributing to the AES Convention’s recognition throughout the world as a major platform for future generations of audio engineers.

Special events of both a technical and artistic nature will punctuate this Paris Convention and include a concert by Graham Blyth on the world-famous “Cavaillé-Coll” organ of the Madeleine Church.

Come to Paris to celebrate the turning of this important page in History!

Yours,

Daniel Zalay
108th AES Convention Chairman
INTRODUCTION

This Preliminary Program is designed to help you plan your trip to the 108th AES Convention. With the largest pro-audio exhibition in Europe, and more than 100 papers in 19 paper sessions, 15 workshops, a host of special events, and an interesting selection of technical tours, this year’s event looks set to surpass even the high standards of previous European AES Conventions.

Advance Registration

Signing up early will save you time and money. It is very easy, using the attached Advance Registration Form or its electronic version on the AES website: http://www.aes.org. The deadline is February 11, but we advise you not to wait until the last minute. Badges will be sent in the mail, except for applications received after February 4 which will need to be collected on-site from the Advance Registration desk.

Hotel Reservation

A selection of 18 hotels has been booked especially for AES Convention participants in and around the area of the venue (please refer to the list on the back of the Hotel Booking Form). As Paris is also expecting a large number of tourists because of the millennium celebrations, we advise you to plan your journey as soon as possible. You will find the address of the AES appointed Hotel Reservation Service on page 15.

Convention Calendar

All dates and times for the preliminary Convention Program and exhibition opening hours can be found in the Convention Calendar, page 16.

List of Exhibitors

A preliminary list of exhibitors is featured on page 14. Please check the AES website for updates to this list.

AES Website

Please also refer to the AES website on the Internet for last-minute news and program updates.

http://www.aes.org

GENERAL INFORMATION

The City of Paris

Each year, Paris has the privilege of welcoming many visitors from all over the world, eager to appreciate her splendors and curious to discover her secrets. A city of many facets, Paris offers the richness of her historic, architectural and artistic heritage as well as the diversity, charm and fascinating atmosphere of its different “quarters”.

An economic, cultural, and scientific capital that combines bustling activity with quality of life, Paris offers a full range of services. Visitors will enjoy a wide selection of restaurants and hotels, entertainment and cultural events, museums and monuments, and if the weather is mild enough, beautiful parks and gardens.

In terms of capacity, Paris has no difficulty in hosting events that attract many thousands of visitors (e.g. the Pope’s visit in 1997 and the soccer/football World Cup in 1998). But it is also a city with its own daily life and habits and you will inevitably want to know more.

Travelling to Paris

Air Travel

An international meeting point, accessible from virtually any city in the world, Paris possesses two airports: Charles de Gaulle (Roissy) to the north and Orly in the south.

Bus service from and to Charles de Gaulle

The direct Air France Shuttle links the Charles de Gaulle (Roissy) airport to the Palais des Congrès “door-to-door” in 45 minutes (shuttles every 20 minutes).

Orlyval

This automatic metro links Orly Airport to the RER (Regional Express Railway) in 10 minutes, from where it is easy to reach the Palais des Congrès by the metro.

Train

Visitors from Austria, Belgium, Germany, Italy, The Netherlands, Switzerland and the UK can enjoy the journey by high-speed train. All lines offer special rates for weekend tickets or single day return tickets. (Eurostar and Thalys allow visitors to attend the Convention for one day.)

Public Transport

Paris is proud of its very good public transport network: metro (subway), RER and buses. The Parisian metro network consists of 16 lines, each identifiable by its number and final destination. The RER has 5 lines and is linked to both the metro and some SNCF train lines. The entire public transport network is accessible with a single pass for one, two or three days or with a week pass. Sets of 10 tickets (ask for a “carnet”) can be also purchased, either in the metro/RER stations, or in the tobacconist shops (Tabacs).

Taxis

There are about 15 000 taxis in service in Paris. A taxi from the Charles de Gaulle (Roissy) Airport or from Orly to the Palais des Congrès will cost approximately 300 FRF (45 EUR). From one of the 6 main stations (Gare de l’Est, du Nord, St Lazare, de Lyon, Montparnasse or Austerlitz), a taxi will charge between 100 and 150 FRF (15 and 23 EUR). Taxis are not very familiar with credit cards and cash is preferred for payment.
CONVENTION INFORMATION

Exhibition Hours
Saturday, February 19
10:00 h – 18:00 h
Sunday, February 20
10:00 h – 18:00 h
Monday, February 21
10:00 h – 18:00 h
Tuesday, February 22
10:00 h – 17:00 h

Registration
Opening hours for registration are indicated on the Convention Calendar, page 16.

For advance registration, fill out the form attached to this program and fax or mail it together with your payment to the address given on the form (deadline February 11). One form is required for each participant. Please make photocopies if necessary. You may also register at the AES website: http://www.aes.org.

AES Membership
Why not become a member of the Audio Engineering Society? The difference between the full program registration fee for non-members versus AES-members equals the AES membership fee for the year 2000: USD 80 (USD 40 for students), EUR 80 (EUR 40 for students), FRF 520 (FRF 260 for students) and includes subscription to the 10-issue per year Journal (JAES) and lower rates for AES Publications. If you wish to apply for membership, please tick the appropriate box on the Advance Registration Form.

Technical Paper Sessions and Workshops
Papers will be held as shown on the Convention Calendar, page 16. Each paper lasts 30 minutes. A complete listing of all paper sessions and workshop titles is shown in sequence, starting on page 7.

Technical Committee Meetings
The Technical Committees, co-ordinated by the AES Technical Council, track trends in the audio world in order to recommend to the Society special papers sessions, standards projects, publications and awards in their respective fields. The TC meetings are open to all Convention participants. Check the Convention Program or the AES website for the final schedule of the meetings and the room allocations.

Car travel
The Palais des Congrès is very close to the “Boulevard Périphérique” (Paris’ ring-road), which is linked to all major motorways. The Palais des Congrès car park has 1800 places, and major hotels have their own parking facilities. In France, driving is on the right-hand side of the road. Seat belts are compulsory, both in the front and the back of the vehicle. The speed limits are 50 km/h in town, 80 km/h on the Boulevard Périphérique, 90 km/h on main roads (outside cities) and 130 km/h on motorways.

Standards Committee Meetings
Audio Engineering Society Standards Committee meetings, subcommittee meetings and working groups are open to the public. The working group meetings begin two days before the opening of the Convention. A list of meetings appears in the December 1999 issue of the Journal of the Audio Engineering Society. The time and places of the meetings are updated regularly on the AESC web page: http://www.aes.org/Standards/meetings/AES108.Meting-Schedule.html.

Meetings taking place after the opening of the Convention are also listed in the final Program, but are subject to changes, shown on the website. All meetings will take place at the Palais des Congrès, unless otherwise noted. Titles and chairs of the subcommittee and working groups as well as their scopes are all listed on the AESC web page.

SPECIAL EVENTS
OPENING & AWARDS CEREMONY
Saturday, February 19, 12:30-13:30 h
The Convention will begin with the Opening Ceremony, where the AES Awards are presented to the awardees. This ceremony is the opportunity for the Society to honour those who have made significant contributions to the field of audio. Check the Convention Program or the AES website for the list of awardees as well as for last minute information about the Ceremony.

AES BANQUET
Sunday, February 20, 20:00 h
An informal Convention Banquet will take place on the evening of Sunday 20 at the Aero-Club de France. This is an excellent opportunity for attendees to meet with their friends in the warm atmosphere of the audio community. The ticket price (350 FRF /53 EUR) includes a sit-down dinner with aperitif, wine and coffee.

It is strongly recommended that banquet tickets are booked in advance using the Registration Form, as the number of tickets is limited by the size of the room. Group bookings may be made by entering the required number of tickets on a single Advance Registration Form. Tickets not reserved in advance may be purchased at the AES Special Event ticket shop at the Convention.

TECHNICAL COUNCIL
"OPEN HOUSE" RECEPTION AND RICHARD C. HEYSER MEMORIAL LECTURE
Monday, February 21, 12:15 h
Distinguished Lecturer, Dr. James Anderson Moorer, was educated in Electrical Engineering, Mathematics, and Computer Science at MIT and Stanford. He was a co-founder of CCRMA Stanford Centre for Computer Research in Music and Acoustics, Technical Advisor of IRCAM, Head of Digital Audio Projects at Lucasfilm, Ltd., and a co-founder and now Engineering VP of Sonic Solutions.

Dr. Moorer is a true pioneer of new directions in audio and a model of an outstanding contributor to the advancement of audio technology. He is an AES Fellow, Silver Medal Recipient, and Member of the Board of the AES Journal. In this first major address at the AES in the new millennium, Dr.
Moorer will discuss new problems and challenges that will be given to the technology that we are about to have.

* The Technical Council Open House Reception introduced a new feature, The Richard C. Heyser Memorial Lecture, which was established in May 1999 by the Audio Engineering Society Technical Council and Board of Governors to honour the memory of Richard Heyser.

Mr. Heyser was a scientist at the Jet Propulsion Laboratory of the California Institute of Technology, an inventor who was awarded nine patents in the field of audio and communication techniques, including time-delay spectrometry. He also was widely known for his patience and ability to clearly present and communicate new and complex technical ideas.

Mr. Heyser generously aided the Society not only through his technical contributions, but also through his service to its growth and organisational development as an AES Governor and the Silver Medal recipient. He died in March 1987 shortly before he was able to assume office as the President of the Society. The Heyser Series, an endowed lectureship, brings to the AES eminent individuals who have an outstanding reputation in audio engineering and related fields.

ORGAN CONCERT AT THE MADELEINE CHURCH
Monday, February 21, 20:00 h
Organist: Graham Blyth

Graham Blyth, renowned organist and technical director of Soundcraft, will present an organ recital at the world famous Parisian church “Madeleine.” This is bound to be one of the highlights for both French and international attendants. Not only is the church itself unique and beautiful but also are its acoustics. The “Cavaille-Coll” romantique-symphonic organ is renowned for its marvellous sound. The concert will feature the Grand Piece Symphonique by Cesar Franck, plus works by Bach, LouisVierne, Böllmann and Messiaen. Aristide Cavaille-Coll (1811-99) was a descendant of a family organ builders. In 1833, he established himself in Paris. Thanks to his scientific talent, his understanding of the laws of acoustics, his sense of artistic intuition and his impeccable workmanship, he became an organ builder of world-wide renown. He built or renovated the organs of St. Sulpice, N-D de Lorette, St. Roch, Ste Madeleine (La Madeleine), Ste Clotilde, St. Vincent de Paul and the Cathedral of Notre Dame.

Mr. Blyth has been active as a performing musician since he was a Junior Exhibitioner at Trinity College of Music, and Trinity College of Music. He holds diplomas in Organ Performance from the Royal College of Organists, The Royal College of Music, and Trinity College of Music. Mr. Blyth has performed at several previous AES Conventions. Admittance is free for all participants.

LUNCHTIME CONCERTS AT THE PALAIS
At lunchtime, visitors may enjoy musical breaks, performed by young international soloists, under the auspices of the Conservatoire National Supérieur de Musique de Paris which has put together a program of both classical music and jazz. Each concert will last 45 minutes. Admittance is free for all participants.

MULTICHANNEL DEMO-ROOM
Set up to run throughout the Convention, a multi-channel demonstration will allow visitors to listen to the results from the 8 different microphone arrays discussed in the W9 workshop (details in the Workshop Section of this Program).

This unique comparison set-up will be completed by technical posters providing all information on the systems. In order to listen in comfortable conditions, a ticket (free of charge), available at the AES Special Events ticket shop, will be required to enter the demo-room.

TECHNICAL TOURS
The Technical Tour Program is currently being prepared. It will include visits to famous French recording studios (Plus XXX, GuillaumeTell), broadcast, post-production and television facilities (Auditorium de Boulogne, Canal Plus, Dubbing Brothers), large sound installations (Stade de France, Palais des Congres), and venues with interesting acoustics (IRCAM, Opéra Bastille, Conservatoire National Supérieur de Musique).

Please check the AES website for detailed program. In general, all tours have a limited capacity, and tickets are allocated on a first-come first-served basis. There is a small fee to cover the transportation costs. All tickets for the Technical Tours will be on sale at the AES Special Event Ticket shop, located near the registration area.

CULTURAL PROGRAM
Each day of the Convention, the Cultural Program Chairman will welcome attendants wishing to take advantage of cultural visits. The meeting point will be in the lobby of the Mandarin Hotel in the open area of the Polo Bar from 09:00 to 10:00 h. Coffee and croissants will be served. According to the number of participants and the weather conditions, the program will be decided for the day (visit to the Louvre and Orsay Museums, Cruise on the River Seine, Lunch at the Maison de la Vigne et du Vin).

STUDENT PROGRAM
An Education Fair and Forum and other student activities are scheduled for the benefit of those participants who want to get information on schools, colleges and institutes providing courses in the field of audio. See the detailed program below.

Student Delegate Assembly 1
Saturday, February 19, 14:30 h - 15:30 h
This is the opening meeting for the student activities of the Convention. The Student Chair Ulrike Schwarz and Vice-Chair Kresimir Crnkovic will report on their activities of the past year. Emily Morin and Blaise Chabanis, Chairs for the 108th Convention Students and Education events, will report on their activities for this Convention and give an overview of the organised activities for the four days in Paris.

Posters and recordings should be handed in by the end of this meeting. During this meeting, the Vice-President for each of the four Regions of this Convention (Northern Europe, Central Europe, Southern Europe, and International Regions) will nominate candidates for the SDA Officers. Each candidate will be introduced and will present their qualifications. Rules for these elections will be available on the AES website in December. Alternatively, write to the address on page 15 to receive a copy.
Student Section Report
Saturday, February 19, 15:30 h – 16:30 h
The number of Student Sections in the AES is growing rapidly. Creating a Student Section is an exciting project which can greatly benefit students. It is, however, not an easy task when you've no idea where to start. The aim of this meeting is to explain what Student Sections are, and how they can benefit you and your fellow students. We will then talk about the different practical issues in creating a Section: Where do you get information from? How do you find out about doing it in your country? How do budgets work? What activities might you want to organise within a Section? In a student version of the Regions and Sections meeting, each existing Section will report on its main activities for the year, and raise any problems it has had, so that solutions can be worked out. Students wanting to create a section or simply find out about them are very welcome. Established Sections will also find a lot of interesting subjects are discussed in this meeting. Please come with lots of questions!

Education Fair
Sunday, February 20, 10:00 h – 13:00 h
The Education Fair is now well established in the student activities of the AES Conventions. It is free and open to the public. Every audio school or university that makes the request will have a table to present literature to prospective students and to provide academic counselling. Contact the address on page 15.

Poster Session
Sunday, February 20, 10:30 h – 11:30 h
This session is the chance for students to present their research work on all subjects covered by the AES, whether it be sound recording, psychoacoustics, underwater acoustics, electroacoustics, etc. Awards will be given to those students who have shown good and interesting work. Candidates should first of all send a preliminary document (8 pages maximum) detailing their work (experiment protocol, results) before the 31st of January (postmark taken as proof), to the address on page 15.

Candidates having registered for the Convention will then be able to present a poster summarising their work. The posters will be displayed throughout the Convention in the area where the Education Fair will be held. Posters should be handed in at the end of SDA 1 at the latest. Rules for this session will be available on the AES website in December. Alternatively, write to the address on page 15 to receive a copy.

Job Forum
Sunday, February 20, 14:00 h – 16:00 h
A panel of active professionals address the issues of market, education and expectations in a variety of careers in audio. What jobs do students think they will want to have in ten years time? What do they want to become with these jobs? What do students expect from audio jobs? These are questions that will be debated in this Forum. The invited professionals will try and give an overview of the jobs that exist in the pro-audio world. They will describe their jobs and talk about the technical knowledge they need for their jobs. This session is for Student Members of the AES, and each recording must be represented by the candidate. Refer to the AES website for rules and conditions. Alternatively, write to the address on page 15 to receive a copy.

Student Delegate Assembly 2
Tuesday, February 22, 15:00 – 16:00 h
This Student Delegate Assembly meeting marks the end of the Convention and the start of the new year. Election of the new SDA officers will take place during this meeting. A discussion of the services and projects of the SDA will be encouraged. The meeting will end with the Recordings and Posters awards.

Student Center
An assembly area will be provided where all students can meet, and discuss student matters. A display area will be used for the posters, and a room will be provided where students can listen to their recordings. Student activities of the AES Conventions. It is free and open to the public. Every audio school or university that makes the request will have a table to present literature to prospective students and to provide academic counselling. Contact the address on page 15.

The 108th Convention Committee

Chairman
Daniel M. A. Zalay
108th_chair@aes.org

Papers
Eugène M’Paya Kitantou,
108th_papers@aes.org

Workshops
François Ragued
108th_workshops@aes.org

Technical Tours
Klaus Blasquiz
108th_techtours@aes.org

Facilities
Christian Mardrin
108th_facilities@aes.org

Cultural Program
Steve Clark
108th_cultural@aes.org

Students
Emily Morin
108th_students@aes.org
Blaise Chabanis
108th_students@aes.org

Recording Awards
Monday, February 21, 14:00 h – 17:00 h
The category for this year's recording session will be OPEN. Each entry will be judged for technical and artistic merit regardless of musical style or ensemble. Finalists will be selected by an elite panel of judges. Each finalist will give a brief description of their work, and play up to five minutes of their recording. Judges will comment on these, and awards will be given to students who will have shown professionalism in their area of audio engineering. Candidates must present a stereo recording on the medium of their choice (DAT or CD) at the opening meeting of the SDA.

This recording session is for Student Members of the AES, and each recording must be represented by the candidate. Refer to the AES website for rules and conditions. Alternatively, write to the address on page 15 to receive a copy.

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**Session A**
Saturday, 19 February, 09:30 h – 12:00 h  
**MICROPHONE TECHNOLOGY AND USAGE**  
Session Chair: David Josephson, USA

A1 09:30 h  
**A Selective Sound Receiving Microphone System Using Blind Source Separation**  
M. asakazu Iwaki, Setsu Komiyama, Akira Morita, Eiichi Miyasaka, N H K Science and Technical Research Laboratory, Tokyo, Japan and M. kio Tohyma, Kagakuni University, Tokyo, Japan

A2 10:00 h  
**Reducing Relative Inherent Noise of Commercial Condenser Microphones for Adaptation to Specific Applications**  
Bernard Debbal, AETA-CNET/DIH/DIPS, Lannion, France

A3 10:30 h  
**Distance Perception based on the Spectrum of the Spoken Voice**  
Eddy Brixien, DELTA Acoustic, Lyngby, Denmark

A4 11:00 h  
**Proximity Effect Frequency Characteristics of Directional Microphones**  
Emil Nikolov Milanov, Proximity Effect Acoustics, Sofia, Bulgaria

A5 11:30 h  
**On Developing a Condenser Vocalist Microphone**  
Martin Schneider, Georg Neumann GmbH, Berlin, Germany

**Session B**
Saturday, 19 February, 09:30 h – 12:00 h  
**AUDIO CODING Part I**  
Session Chair: Jayant Datta, USA

B1 09:30 h  
**Experimenting MPEG-2 AAC Inter and Intraframe Spectral Prediction Tools**  
Antonio S. Pena and Salvador Souto, E.T.S.E. Telecommunication, Universidad de Vigo, Vigo, Spain

B2 10:00 h  
**Synthetic Audio Tools in MPEG-4 Standard**  
Riitta Vaananen, Research Scientist, Helsinki, Finland

B3 10:30 h  
**Real-Time Implementation of the MPEG-4 Low Delay Advanced Audio Coding Algorithm (LD-AAC) on Motorola DSP56300**  

B4 11:00 h  
**Evaluating Adaptive Transform Acoustic Coding for Minidisc**  
David Speter, London Guildhall University, London, UK

B5 11:30 h  
**A Bit-Allocation Scheme for an Embedded and Signal-Adaptive Audio Coder**  
Markus Erne and George M. ozguytz, Institute for Signal- and Information Processing, ETH-Zurich, Switzerland

**Session C**
Saturday, 19 February, 14:00 h – 17:00 h  
**PSYCHOAUDIOLOGICALS Part I**  
Session Chair: Durand Begault, USA

C1 14:00 h  
**Quantification of Subwoofer Requirements, Part I: Generation of Stimuli and Listening System Equalization**  
Jan Abildgaard Pedersen, Bang & Olufsen, Struer, Denmark, and Aki M. kivirta, Genelec Oy, Iisalmi, Finland

C2 14:30 h  
**Multichannel Level Alignment, Part IV: The Correlation between Physical Measures and Subjective Level Calibration**  
Nick Zacharov, Nokia Research Center, Speech and Audio Systems Laboratory, Tampere, Finland and Soren Bedh, Bang & Olufsen, Struer, Denmark

C3 15:00 h  
**Ergonomic Evaluation of Audio Components and Systems**  
Franco C. Grossi, University of Trieste, Italy

C4 15:30 h  
**Simulating Acoustics of Hearing Aids Employing Non Linear Signal Filtering and Waveguide Modeling**  
Grzegorz Szwocz, Bozena Kostek and Andrzej Czyszewski, Technical University of Gdansk, Poland

C5 16:00 h  
**The Audibility of Time-Shifted Signals with Constant Long-Term Spectral Content**  
D. T. Ives, S. C. Budbridge, R. Thomas, School of Engineering, University of Brighton, Brighton, UK and C. J. Plack, Department of Psychology, University of Essex, Colchester, UK

C6 16:30 h  
**Assessment of the Pertinence of Perceived Attributes for Listening Tests**  
Laurent Allard, Mario Rossi and Marc-Antoine Zufferey, Federal Institute of Technology EPFL, Lausanne, Switzerland

**Session D**
Saturday, 19 February, 14:00 h – 17:30 h  
**AUDIO MEASUREMENT AND INSTRUMENTATION**  
Session Chair: M. end Kleiner, Sweden

D1 14:00 h  
**Perceptual Transfer Function Measurement for Automotive Sound Systems**  
David Clark, DLC Design, Wixom, MI, USA

D2 14:30 h  
**Measurement of Sound Scattering Properties of Diffusing Panels through the Wave Field Synthesis Approach**  
Angelo Farina and Michele Zanolini, Dipartimento di Ingegneria Industriale, Universita' di Parma, Italy

D3 15:00 h  
**Active Control of Noise by Wave Field Synthesis**  
Michele Zanolini, Massachusetts Institute of Technology, Cambridge, MA, USA, Prof. Paolo Podini, Physics Department, University of Parma, Italy, Stefano De Stabile, Paola Vezzoni, Acoustic Consultant, Gamma Engineering, Reggio Emilia, Italy, and Angelo Farina, Industrial Engineering Department, Area delle scienze, Parma, Italy

D4 15:30 h  
**Simultaneous Measurement of Impulse Response and Distortion with a Swept-Sine Technique**  
Angelo Farina, Industrial Engineering Department, Area delle scienze, Parma, Italy

D5 16:00 h  
**Expert System for Hearing Aids Fitting**  
Andrzej Czyszewski and Bozena Kostek, Technical University of Gdansk, Poland

D6 16:30 h  
**Diffusivity Properties of Distributed Mode Loudspeakers**  
Vladimir Gottscharov and Nick Hill, New Transducers Limited, Huntingdon, UK

D7 17:00 h  
**A New Framework for Unified Analysis and Evaluation of Loudspeakers and Listening Rooms**  
Lars G. Johansen and Per Rubak, DSP Research Group, Institute of Electronic Systems, Aalborg University, Denmark
Session E
Sunday, 20 February, 09:00 h - 10:30 h
SOUND REPRODUCTION SYSTEMS
Session Chair: Ronald Aarts, The Netherlands
E1 09:00 h
Study and Comparison of Efficient Methods for 3D Audio Spatialization Based on Linear Decomposition of HRTF Data
Veronique Larcher, IRCAM, Paris, France, Jean-Marc Jot, J. Guyard, CreativeE-mu Technology Center, Scotts Valley, CA, USA, and Olivier Warusfel, IRCAM, Paris, France
E2 09:30 h
Practical Implementation of a Data-Based Wave Field Reproduction System
Ulric Horbach and Attila Karamustafaoglu, Studer Professional Audio AG, Regensdorf, Switzerland
E3 10:00 h
Implementation of an Auralization Scheme in a Digital Mixing Console Using Perceptual Parameters
Ulric Horbach, Attila Karamustafaoglu, Studer Professional Audio AG, Regensdorf, Switzerland, Etienne Corteel, Ecole Nationale Supérieure des Télécommunications (ENST), Paris, France, and Renato Pellegrini, Ruhr University Bochum, Institut für Kommunikationsakustik, Bochum, Germany

Session F
Sunday, 20 February, 09:00 h - 12:00 h
AUDIO CODING Part II
Session Chair: Francis Rumsey, UK
F1 09:00 h
Secure Delivery of Compressed Audio by Compatible Bitstream Scrambling
Eric Allamanche and Jürgen Herre, Fraunhofer Institute for Integrated Circuits, Erlangen, Germany
F2 09:30 h
Audio Watermarking of MPEG-2 AAC Bit Streams
Christian Neubauer and Jürgen Herre, Fraunhofer Institute for Integrated Circuits, Erlangen, Germany
F3 10:00 h
Direct Digital Processing of “Super Audio CD” Signals
James A.S. Angus, Department of Electronics, University of York, UK
F4 10:30 h
Restructured Audio Encoder for Improved Computational Efficiency
YeWang, Mikka Vilermo, Mauri Väänänen, Nokia Research Center, Speech and Audio Systems Lab., Tampere, Finland, and Leonid Yaroslavsky, Department of Interdisciplinary Studies, Tel Aviv University, Ramat Aviv, Israel
F5 11:00 h
Audio Coding Tools for Digital Television Distribution
Louis D. Fielder and Grant A. Davidson, Dolby Laboratories Inc., San Francisco, CA, USA
F6 11:30 h
Methods for Efficient Multi-Program Audio Broadcasting

Session G
Sunday, 20 February, 14:00 h - 17:00 h
TRANSDUCERS Part I
Session Chair: Umberto Nicolao, Italy
G1 14:00 h
Loudspeaker Crossovers with Notched Responses
A. N. Thiele, Consultant, Epping, NSW, Australia
G2 14:30 h
Symmetrical Loudspeaker Band-Pass Systems of Eighth Order with Passive Filter
Grzegorz Mateuskak and Andrzej Dobrucki, Institute of Telecommunications and Acoustics, Wroclaw University of Technology, Poland
G3 15:00 h
Directivity and Distortion in Digital Transducer Array Loudspeaker
Mr. Yaxiong Huang, Simon C. Busbridge and Denshinder S. Gill, University of Brighton, Brighton, UK
G4 15:30 h
Distortion Analyzer - A New Tool for Assessing and Improving Electrodynamic Transducer
Wolfgang Klippel, Klippel GmbH, Drezden, Germany
G5 16:00 h
Current Controlled Vented Box Loudspeaker System with Motional Feedback
Philippe Robineau, Tannoy, Coatbridge, Scotland, and Mario Rossi, Federal Institute of Technology EPFL, Lausanne, Switzerland
G6 16:30 h
The Influence of Measurement Accuracy on the NARMAX Model of Dynamic Loudspeakers
Piotr Pruchnicki, Institute of Telecommunications and Acoustics, Wroclaw University of Technology, Poland

Session H
Sunday, 20 February, 14:00 h - 16:00 h
MUSICAL INSTRUMENT ACOUSTICS AND ELECTRONIC MUSIC TECHNOLOGY
Session Chair: Wieslaw Woszczyk, Canada
H1 14:00 h
Extraction of Physical and Expressive Parameters for Model-Based Sound Synthesis of the Classical Guitar
Cumhur Erkut, Vesa Välímäki, Matti Karjalainen, Helsinki University of Technology, Laboratory of Acoustics and Audio Signal Processing, Espoo, Finland, and Mikael Laurson, Sibelius Academy, Centre for Music Technology, Helsinki, Finland
H2 14:30 h
An Approach to the Automatic Classification of Musical Sounds
Bozena Kostek and Andrzej Czyzewski, Technical University of Gdansk, Poland
H3 15:00 h
Jason S. Flaks and Rich Frantz, Gibson Guitar Corp, Nashville, TN, USA
H4 15:30 h
The Investigation of Acoustical Characteristics of Russian Bells
I. Aldoshina, S-Pb. State University of Telecommunication, St. Petersburg, Russia, and A. Nicanorov, Russian Institute History of Arts, St. Petersburg, Russia
Session I
Sunday, 20 February, 16:00 h - 18:00 h
NETWORKING IN THE PROFESSIONAL ENVIRONMENT
Session Chair: Wieland Woszczyn, Canada

I 1  16:00 h
AES-24 and MIDI.net - A Comparative Study of their Object Models and Implementations
Richard John Foss and Bradley Klinkradt, Computer Science Dept., Rhodes University, South Africa

I 2  16:30 h
3-D Reverberation Sound Rendering based on Random Sound Field Statistics
Seiichiro Shoji, Terumi Koizumi and Mikio Toyama, Kagokuin University, Tokyo, Japan

I 3  17:00 h
Real Time Streaming of Multi-Channel Audio Data through Internet
Aoxiang Xu and Jeremy Cooperstock, Dept. of Electrical and Computer Engineering, McGill University, Montreal, Canada

I 4  17:30 h
Deployment of Internet Resources for Digital Audio Distance Learning Courses
G. Papankololou, G. Kalliris, C. Dimoulas, C. Pastiadis, and F. Galatsospoulou, Aristotle University of Thessaloniki, Greece

Session J
Monday, 21 February, 09:00 h - 12:00 h
SIGNAL PROCESSING Part I
Session Chair: Matti Karjalainen, Finland

J 1  09:00 h
Identification of Discrete Volterra Series Solving for One Kernel at the Time
Marni Tyrl, Research & Development, Bang & Olufsen, Struer, Denmark and Institute of Electronic Systems, Aalborg University, Aalborg, Denmark, Jan Abildgaard Pedersen, Research & Development, Bang & Olufsen, Struer, Denmark, and Per Rubak, Institute of Electronic Systems, Aalborg University, Aalborg, Denmark

J 2  09:30 h
On the Nature of Digital Audio PWM Distortions
Andrew C. Floros and John N. Mourtoupolous, Audio Group, Wire Communications Laboratory, Electrical and Computer Engineering Department, University of Patras, Greece

J 3  10:00 h
An Efficient Second-order Dynamic Element Matching Design for an 120dB Audio DAC
Xue-Ming Gong, Cirrus Logic, Austin, TX, USA

J 4  10:30 h
Forecasting Sound Impulse Response using Neural Network
Zihou Meng, M. Morimoto, Environmental Acoustics Laboratory, Kobe University, Kobe, Japan, Guoan Bi and C. Alex Kot, School of EEE, National University of Singapore

J 5  11:00 h
Sound Compression/Interpolation by Granulation
Takebuni Itagaki, Department of Engineering, Glasgow Caledonian University, Scotland

J 6  11:30 h
Cancelling Acoustic Feedback with the A.L.M.I. Algorithm
Manuel Almifiana Iturbe, Telecommunications Technology, Engineer, Albacete, Spain

Session K
Monday, 21 February, 09:00 h - 11:00 h
SOUND SYSTEM DESIGN AND INSTALLATION Part I
Session Chair: Mario Rossi, Switzerland

K 1  09:00 h
An Educational Software to Evaluate RASTI
Juan José Gómez Alfageme, D eparmento de Ingeniería Audiovisual y Comunicaciones, M anuel Recuero López, Instituto Superior de Investigación del Automóvil, and José Luis Sánchez Bote, Universidad Politécnica de Madrid, Madrid, Spain

K 2  09:30 h
Accurate Electroacoustic Prediction Utilizing the Complex Frequency Response of Far-Field Polar Measurements
Wolfgang Ahnert, ADA - Acoustic Design Ahnert, Berlin, Germany, Stefan Fiedel, ADA - Acoustic Design Ahnert, Berlin, Germany, Justin Baird and Perrin Meyer, Meyer Sound Laboratories, Berkeley, CA, USA

K 3  10:00 h
Prediction of Sound Pressure Fields of Loudspeaker Arrays using Loudspeaker Polar Data with Limited Angular and Frequency Resolution
Henrik Staffeldt, Department of Applied Electronics, Technical University of Denmark, Lyngby, Denmark

K 4  10:30 h
Acoustical Conditions in Computer Working Places
Ernst-Joachim Voeker, Institut for Acoustics and Building Physics, Oberursel, Germany

Session L
Monday, 21 February, 14:00 h - 18:30 h
PSYCHOACOUSTICS Part II
Session Chair: Jan Voetmann, Denmark

L 1  14:00 h
Audibility of All-Pass Components in Head-Related Transfer Functions
Pauli Minnaar, Jan Plogstø, Søren Krarup Olesen, Flemming Christensen and Henrik Möller, Acoustics Laboratory, Aalborg University, Denmark

L 2  14:30 h
The Interaural Time Difference in Binaural Synthesis
Pauli Minnaar, Jan Plogstø, Søren Krarup Olesen, Flemming Christensen and Henrik Möller, Acoustics Laboratory, Aalborg University, Denmark

L 3  15:00 h
Direct Comparison of the Impact of Head Tracking, Reverberation, and Individualized Head-Related Transfer Functions on the Spatial Perception of a Virtual Speech Source
Durand R. Begault, Alexandra S. Lee, San Jose State University, Moffett Field, CA, USA, Elizabeth M. Wenzel, NASA Ames Research Center, M offett Field, CA, USA, San Jose State University, Moffett Field, CA, USA, and Mark R. Anderson, Raytheon STX Corporation, Moffett Field, CA, USA

L 4  15:30 h
Head-Tracker Based Auralization Systems: Additional Consideration of Vertical Head Movements
Philip M. Ackerman, Marcus Fruhmann, Mathias Thanner, Günther Theile, Institut für Rundfunktechnik, München, Germany, Ulrich Orbach and Attila Karamustafaoglu, Studer Professional Audio AG, Regensdorf, Switzerland

L 5  16:00 h
The Placebo Method, A Comparison of In-Situ Subjective Evaluation Methods for Vehicles
Neal House and Roger Shively, Harman Motive Inc., Martinsville, USA
Session M
Monday, 21 February, 14:00 h - 16:00 h
SOUND SYSTEM DESIGN AND INSTALLATION Part II
Session Chair: Ivan Stamac, Croatia

M1 14:00 h
Room Acoustics and Sound System Design of a Prototype
Teaching Room with Video Conferencing Facilities
C. Dimoulas, C. Sevastiadis, G. Kalliris, M. Matola, and
G. Papanikolaou, Aristotle University of Thessaloniki, Greece

M2 14:30 h
Acoustical Adaptation of a Closed Amphitheater Designated
for 3D Sound Reproduction
C. Sevastiadis, C. Dimoulas, G. Kalliris, and G. Papanikolaou,
Aristotle University of Thessaloniki, Greece

M3 15:00 h
The Audio and Video Systems for the Casino of Portorose,
Slovenija
Franco C. Grossi, University of Triest, Italy

M4 15:30 h
Sound Localization in a Video Conferencing System based on
Wave Field Synthesis
Werner de Bruin, Marinus M. Boone, Diemer de Vries, Laboratory of
Acoustical Imaging and Sound Control, Delft University of Technol-
ogy, The Netherlands

Session P
Tuesday, 22 February, 09:00 h - 10:00 h
AUDIO RESTORATION AND ENHANCEMENT
Session Chair: to be announced

P1 09:00 h
The Application of Psychoacoustic Criteria to the Restoration of
Musical Recordings
Patrick J. Wolfe and Simon J. Godsill, Signal Processing Group,
Cambridge University Engineering Department, UK

P2 09:30 h
Perceiving Low Pitch through Small Loudspeakers
Erik Larson and Ronald M. Aarts, Philips Research, Eindhoven, The
Netherlands

Session Q
Tuesday, 22 February, 10:00 h - 11:00 h
AUDIO ELECTRONICS
Session Chair: to be announced

Q1 10:00 h
An Improved Balanced, Floating Output Driver IC
Gary K. H ebert, TH AT Corporation, Milford, MA, USA

Q2 10:30 h
Quality Audio Circuits - Limitations of the Usual Design
Methods
Gerard Perrot, E phaistos Laboratories, Tours, France
### Session R
**Tuesday, 22 February, 09:00 h – 11:30 h**
**MULTICHANNEL SOUND SYSTEMS**
**Session Chair: Ben Bernfeld, Germany**

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<td>09:00 h</td>
<td>An Integrated Multichannel Audio Coding System for Digital Television Distribution and Emission</td>
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<td>Steve Vernon, Dolby Laboratories Inc., San Francisco, CA, USA, and Tony Spath, Laboratories Inc., Wootton Bassett, UK</td>
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<td>R2</td>
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<td>Enhanced Multichannel PCM/Dolby Pro Logic Decoder System using the Motorola D SP56364</td>
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<td>Chuan-Chang Hung, Motorola, Austin, TX, USA, Gerry Kwiecinski, Motorola, Glasgow, Scotland and Haku Sato, University of Miami, School of Music, Coral Gables, FL, USA</td>
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<td>Multichannel Natural Recording based on Psychoacoustic Principles</td>
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<td>Günther Theile, Institut für Rundfunktechnik, München, Germany</td>
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<td>R4</td>
<td>10:30 h</td>
<td>Multichannel Microphone Array Design</td>
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<td>Michael Williams, “Sounds of Scotland”, Paris, France and Guillaume Le Dû, Freelance Recording Engineer, Paris, France</td>
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<td>R5</td>
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<td>Multichannel Coding with RTF Enhancement for DVD-A and Virtual Sound Systems</td>
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<td>Malcolm O. J. Hawksford, Centre for Audio Research and Engineering, University of Essex, UK</td>
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### Session S
**Tuesday, 22 February, 14:00 h – 17:30 h**
**TRANSDUCERS PART II**
**Session Chair: Jacques Jouhaneau, France**

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<td>Loudspeaker Spider Linearity</td>
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<td>Steven Hutt, Harman OEM Group, Indiana, USA</td>
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<td>S2</td>
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<td>Comparison of Multiactuator Design</td>
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<td>Jean-Baptiste Greuet, Nokia Research Center, Tampere, Finland, Andrew Bright, Nokia Research Center, Helsinki, Finland, and Juha Backman, Nokia Mobile Phones, Espoo, Finland</td>
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<td>S3</td>
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<td>Amplitude and Phase Synthesis of Loudspeaker Systems</td>
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<td>Véronique Adam, LEM A (EPFL), Lausanne, Switzerland</td>
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<td>S4</td>
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<td>Finite Element Analysis in the Design of High-Quality Loudspeakers</td>
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<td>P. J. Anthony and J. R. Wright, KEF Audio Ltd, Maidstone, UK</td>
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<td>S5</td>
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<td>Diffuse Field Radiators in Automotive Sound System Design</td>
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<td>M. Roberts, J. Grieco and C. Ellis, New Transducers Ltd (NXT), Huntingdon, UK</td>
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<td>S6</td>
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<td>Distributed Mode Loudspeaker Radiation Mechanisms</td>
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<td>James A. S. Angus, Department of Electronics, University of York, UK</td>
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### Session T
**Tuesday, 22 February, 14:00 h – 17:30 h**
**SIGNAL PROCESSING Part II**
**Session Chair: John Mourjopaulos, Greece**

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<td>Music-based Coefficients for Wavelet Transform: A Contribution to Musical Signals Analysis</td>
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<td>T2</td>
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<td>Localization of Reflections in Auditoriums using Time Delay Estimation</td>
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<td>Eric Van Lander, EPFL DE LEM A, Lausanne, Switzerland</td>
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<td>A Flexible Architecture for Real-Time Sound Synthesis and Digital Signal Processing</td>
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<td>Jean-Michel Raczniski, Gerhard Marino, Stephane Sladek, and Vincent Fontalirant, CEM AM u, Issy-les-Moulineaux, France</td>
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<td>T4</td>
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<td>Study of Equalization Algorithms on a Fixed-Point DSP: Impact on Audible Quality, Headroom, and SNR</td>
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<td>Jayant Datta, Motorola, North Syracuse, NY, USA, and Leslie Jensen-Link, Momentum Data Systems, Atlanta, GA, USA</td>
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<td>T5</td>
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<td>Frequency-Warped Signal Processing for Audio Applications</td>
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<td>Aki Härmä, M ati Karjalainen, H elsinki University of Technology, Laboratory of Acoustics and Audio Signal Processing, Espoo, Finland, Jyri Huopaniemi, Nokia Research Center, Speech and Audio Systems Laboratory, H elsinki, Finland, Lauri Savioja and Vesa Välimäki, H elsinki University of Technology, Laboratory of Acoustics and Audio Signal Processing, Espoo, Finland, Lauri Savioja and Vesa Välimäki, H elsinki University of Technology, Laboratory of Acoustics and Audio Signal Processing, Espoo, Finland, Lauri Savioja and Vesa Välimäki, H elsinki University of Technology, Laboratory of Acoustics and Audio Signal Processing, Espoo, Finland</td>
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<td>T6</td>
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<td>Design and Evaluation of Digital Filters Applied to Loudspeaker/Room Equalization</td>
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<td>Per Rubak and Lars G. Johansen, Aalborg University, Department of Communication Technology, Denmark</td>
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<td>T7</td>
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<td>PC-Based Equalizer with Variable Gain and Delay in 31 Frequency Bands</td>
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<td>Sigmar Ries and Günter Frieling, Digital Signal Processing Laboratory, Universität-GH, Paderborn, Germany</td>
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Workshop W1
Saturday, 19 February, 10:00 h – 12:00 h
ALTERNATIVE TRANSDUCTION TECHNIQUES; BEYOND MOVING COIL DIRECT RADIATION
Workshop Chair: John Stewart, Principal Engineer, Harman-Motive, Inc., USA
What advantage can be gained from looking beyond the paradigm of axial pistonic sound reproduction? An eclectic collection of manufacturers and experimenters demonstrate transducers that reproduce sound without axial pistonic motion. A listening experience and a brief tutorial explaining the technologies are provided. This workshop offers a unique opportunity to compare these transducers first hand.

Workshop W2
Saturday, 19 February, 10:00 h – 12:00 h
ACOUSTIC TREATMENT OF ASYMMETRICAL PLAYBACK ENVIRONMENTS
Workshop Chair: Vincent van Haaff, Consultant, USA
Environmental circumstances and the desired function of music studio control rooms may not always allow a strict symmetrical acoustic treatment about a central axis, while common sense would require such geometry. Many engineers and music composers have little choice but to make use of ever smaller spaces to do their work, and are forced to treat these spaces with the minimum loss of actual usable volume and floor space. What are some of the solutions proposed to treat such axially challenging spaces? What constitutes an impossible situation?

Workshop W3
Saturday, 19 February, 14:00 h – 16:30 h
MPEG-4 VERSION 2 AUDIO – WHAT IS IT ABOUT?
Workshop Chair: Jürgen Herre, Fraunhofer Institute for Integrated Circuits (FhG-IIS A), Germany
MPEG-4 is the most recent member of the well-known family of ISO/MPEG coding standards, and provides an integrated set of audio coders with attractive capabilities, including bit-rate and bandwidth scalability. After the release of the MPEG-4 standard in 1999, the new Version 2 Standards Addendum, to be published in 2000, defines extended functionalities, such as low delay audio coding, parametric audio coding, error resilience and spatialization. The workshop aims at answering the questions “what is MPEG-4 v2 and what can I do with it?” and includes a number of demonstrations.

Workshop W4
Saturday, 19 February, 14:00 h – 16:30 h
DESIGN AND MODELING OF LINEAR ARRAY SOUND SYSTEMS
Workshop Chair: Paul D. Bauman, L-Acoustics, France
The recent renaissance of linear arrays for sound reinforcement will be discussed, beginning with an historical overview and followed by a description of the theoretical principles and operating concepts behind a current example of a line array system. Techniques for modeling linear arrays will be discussed along with challenges involved in simulation and measurement. It is hoped that a technical tour of an installation at the Palais de Congrès will provide a demonstration of system performance and allow for the comparison of simulated versus in situ measurement results.

Workshop W5
Sunday, 20 February, 09:00 h – 11:30 h
MULTICHANNEL SOUND IN THE CINEMA
Workshop Chair: Graham Edmondson, Dolby Laboratories, U.K.
Multichannel sound has revolutionized an audience’s enjoyment of the motion picture experience. In this workshop, representatives of different film industry sectors will be presenting and discussing the film multichannel sound production and post-production procedure. Special emphasis will be given to the changes brought about by digital multichannel sound, which is now used on the majority of feature films.

Workshop W6
Sunday, 20 February, 14:00 h – 16:30 h
ACTIVE REVERBERATION SYSTEMS FOR AUDITORIA
Workshop Chair: Mendel Kleiner, Chalmers University of Technology, Sweden
Active reverberation systems for auditoria have been commercially available for more than 30 years. Considerable research effort has been invested, and has resulted in many competing technologically different systems. Although some of these systems are quite efficient, relatively few active reverberation systems are in actual use, especially in Europe. After a brief overview of the reasoning and technology behind various active reverberation systems, this workshop will debate the reasons (economical, acoustical, scenographic, psychological) for their success or failure, and look for possible future systems and technologies.

Workshop W7
Sunday, 20 February, 14:00 h – 16:30 h
THE BINAURAL REPRODUCTION OF MULTICHANNEL SOUND
Workshop Chair: Günther Theile, IRT, Germany
There are now 5.1 sound channels. However, suitable 5.1 loudspeaker reproduction is not always practical or desired. In Part 1 of the workshop we will discuss auralization methods aiming at adequate headphone listening. Particular aspects will be: model-based versus data-based systems, relevancy and feasibility of headtracking, complexity levels versus scope of applications. Part 2 will focus on multimedia applications, and discuss possibilities and limits of virtual surround reproduction using two nearfield loudspeakers.

Workshop W8
Monday, 21 February, 09:00 h – 11:30 h
AUDIO ON-LINE
Workshop Chair: Bob Moses, Digital Harmony Technologies, USA
Online distribution of audio content has spawned a variety of new technologies and processes that affect every aspect of how audio is produced, distributed, and experienced. This workshop explores advances such as audio compression, digital rights management, e-commerce, and digital home entertainment systems. Panelists represent major players in the music, Internet, and consumer electronics industries.
Workshop W9
Monday, 21 February, 09:00 h – 11:30 h
COMPARATIVE STUDY OF 8 MULTICHANNEL SOUND RECORDING ARRAYS OF THE 40 VOICES "MOTET" BY TALLIS
AT THE PARIS NATIONAL CONSERVATORY OF MUSIC
Workshop Chair: Christian Hugonnet, France

The panel will consist of a representative from each of the authors or the group participating in this recording. The aim of this workshop is to compare 8 different microphone arrays according to 5.1 reproduction format as recommended by ITU-R BS 775-1. This comparative study is based upon the simultaneous recording in the same acoustical conditions of the same musical work: the 40 voices motet “Spem in alium” by Thomas Tallis, interpreted by “Le M a d r i g a l de Paris” in the Paris National Conservatory of Music on 11th November 1999. The circular placement of the vocal sound source around the audience will be of special interest in establishing the coherence of the reproduced sound field. The different systems will be discussed by their authors and the debate will include some results from the surround demonstration of the “motet”.

Workshop W10
Monday, 21 February, 14:00 h – 16:30 h
EVALUATION OF INTERMEDIATE AUDIO QUALITY
Workshop Chair: Thomas Sporer, Fraunhofer Institute for Integrated Circuits (FhG-IIS), Germany

Subjective and objective methods for the evaluation of the perceived audio quality are well established both for high-quality audio signals and speech quality levels. Low bit-rate coding enables the transport of audio signals on the Internet. The obtained quality is much better than the usual “telephone quality” but far from transparent. In this range, the classical measures of quality evaluations are no longer applicable. In this workshop the special problems of the evaluation of this so-called intermediate audio quality are discussed. Experts from EBU and ITU-R working groups will also give a preview on an up-coming recommendation for listening tests and insights to the activities concerning objective evaluation.

Workshop W11
Monday, 21 February, 14:00 h – 16:30 h
LOUDSPEAKER ARRAY RADIATED FIELD
Workshop Chair: François Delforges, ORPHEO, France

This workshop intends to draw a panorama of today’s situation and tomorrow’s expectations in the control of the radiated field of loudspeaker arrays. Control of the radiated field of a loudspeaker system is clearly a determinant factor in the success of a sound system design. Arrays assembled with the traditional sound reinforcement systems do not give satisfactory results as there is so much acoustic interference that the response is totally dependent on the listening position, and the resulting homogeneity is poor. Furthermore the concept of directivity is irrelevant because one is unable to characterise the radiated field. Over the last few years, new concepts in arrays have emerged: line sources, plane sources, parabolic sources, ... and day-to-day progress in DSP technology is introducing new methods that can be used to control the radiated field of an array.

Workshop W12
Tuesday, 22 February, 09:00 h – 11:30 h
SHOULD NETWORKS HANDLE AUDIO?
Workshop Chair: Mark Yonge, Solid State Logic, UK

As digital audio techniques become dominant, computers become faster and network bandwidths increase, traditional methods of moving audio from place to place must be re-assessed. Why would you continue to use tape? This workshop explores the future of moving audio between professional production processes and will look at some alternatives.

Workshop W13
Tuesday 22 February, 09:00 h – 11:30 h
SPEECH INTELLIGIBILITY THROUGH PUBLIC ADDRESS AND TELECONFERENCING SYSTEMS
Workshop Chair: Peter M app, Consultant, UK

This workshop will focus on the influence of loudspeaker and room acoustic characteristics on the perceived intelligibility of voice. Aspects such as loudspeaker directivity, frequency response and distortion will be discussed, together with the effects of S/N and D/R ratios and echo perception. Methods of measurement and prediction will also be presented after an illustrated introductory talk presenting current knowledge. The discussion should be helpful to loudspeaker manufacturers, and to PA and sound reinforcement system designers.

Workshop W14
Tuesday, 22 February, 14:00 h – 16:30 h
RADIO@INTERNET: A PROGRESS WITH SEVEN-LEAGUE BOOTS?
Workshop Chair: Gerhard Stoll, Institut für Rundfunktechnik, Germany

The Internet’s impact on broadcasters has changed from its initial position as a site for posting broadcasting information to its emergence as a valuable additional medium to reach new customers through streaming audio and new interactive concepts using push and pull technologies. Audio, which is still using only a small part of the capacity of the Internet, has become a window to the World Wide Web – audio information delivered via IP, downloading or online streaming. Several software companies are developing the necessary tools to distribute audio and video on the Internet with the goal to develop the Web into a new mass medium, compared to traditional audio or video broadcasting.

Workshop W15
Tuesday, 22 February, 14:00 h – 16:30 h
USE OF CAD TOOLS IN ROOM ACOUSTICS AND SOUND REINFORCEMENT SYSTEM DESIGN
Workshop Chair: Jacques Martin, CSTB, Grenoble, France

A lot of effort has gone into developing CAD tools for the acoustic design of auditoria and sound reinforcement systems. Several powerful systems are now on the market (some with auralization), and results issued from these software programs can often be seen on technical reports. This workshop will address the following questions: What are these tools actually used for by acoustic consultants and other professionals? What are their true technical capabilities and limitations? How do they combine with other design methods? What is their commercial interest for convincing clients? How could they be improved? Participants will include acoustic consultants, sound system engineers, and researchers.
### PRELIMINARY AES CONVENTION EXHIBITORS

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- APRE GB
- AUDIO A MEDIA GB
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- AUDIO VIDEO ECHOCS FR
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- BROADCAST & Prod. Italy IT
- VIDEO BROADCAST FR
- HOME & STUDIO RECORDING FR
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- MEDIA BULLETIN DE
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- PRO SOUND NEWS EUROPE GB
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- RADIO WORLD US
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- TIME CODE MAGAZINE FR
- VIDEO PRO US
- WORLD BROADCAST NEWS US
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ORIENTATION

Preliminary Program
### Preliminary AES Convention Calendar

All information is believed to be accurate at press time, but is subject to change without notice.

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**Wednesday**
- AES Banquet at the Accor Club
- Heyser Lecture
- TC Open House

**Thursday**
- Registration
- Poster Sessions
- Job Forum
- Education Fair

**Friday**
- Student Assembly 1 & Sec. Rep.
- AES Convention Banquet
- Heyser Lecture
- TC Open House
- Registration

**Saturday**
- AES Convention Banquet
- Heyser Lecture
- TC Open House
- Registration

**Sunday**
- AES Convention Banquet
- Heyser Lecture
- TC Open House
- Registration

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**Legend**
- Registration
- Exhibition
- Paper Sessions
- Workshops
- Special Events
- Student Program

**Dates**
- 2000-02-18
- 2000-02-19
- 2000-02-20
- 2000-02-21
- 2000-02-22

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**AES Convention Calendar**

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**Title:** Preliminary AES Convention Calendar

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**Notes:** All information is believed to be accurate at press time, but is subject to change without notice.