

AES

Amsterdam RAI
May 17-20, 2008

PRO AUDIO EXPO
& CONVENTION

Discover New

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Horizons in Audio

Amsterdam RAI May 17-20, 2008

↑ Entrance & Registration ↑



AES 124th CONVENTION

Returning to Amsterdam for the 124th Convention at the RAI Centre, after an absence of five years, the Audio Engineering Society met to *Discover New Horizons in Audio*, the title of this exciting and diverse event. Peter Swarte, convention chair, along with his dedicated and able committee, had prepared an outstanding line up of activities showcasing the latest in audio engineering research as well as offering a wide range of educational opportunities.

OPENING CEREMONY

Roger Furness, AES executive director, welcomed the delegates to Amsterdam. "This is the first major event in our 60th anniversary year," he said, "and we are launching a series of DVDs to mark the occasion. The oral history project, led by Irv Joel, has created a series of twenty disks and

there will be some ten a month from now on. They contain a series of interviews with the great and the good of the audio industry." Bob Moses, AES president, welcomed delegates and said that it was a joy to be in Amsterdam. When he looked at all that was in the program, he wondered how anybody could fit it all in. "The cross pollination ➡

Opening Ceremonies and Awards



Roger Furness,
AES executive director



Bob Moses,
AES president



Peter Swarte,
convention chair



Neil Gilchrist,
awards chair



A large crowd at the opening ceremonies enjoyed the keynote presentation by Tammo Houtgast



between engineers, researchers, and users is one of the unique aspects of the AES," he said, "you won't find this anywhere else."

Neil Gilchrist, Awards Committee chair, announced those receiving awards. The Gold Medal Award was given to Jens Blauert for outstanding contributions, sustained over more than 40 years, to audio engineering, communication acoustics, electroacoustics, and spatial hearing. "As an old guy," Blauert remarked after accepting his award, "you need a kick now and again to stay motivated, and this is just the thing to do it." Günther Theile, beaming with obvious pleasure, received the Silver Medal Award in recognition of outstanding contributions, sustained over more than 25 years, to research in

stereophony, binaural and multichannel sound, involving perception, standardization, and recording and reproduction systems related to broadcasting. The Board of Governors Award was presented to Werner Deutsch in recognition of his chairing of the 122nd Convention last year in Vienna.

Peter Swarte introduced the entire convention planning team. He said that it had been an honor to guide them through the process of creating this convention. "I am still shaking a little bit," he said. It is now 100 years since the electron tube and 25 years since the launch of the CD, Swarte reminded the audience, and we must remember that students and educational events at the convention are the future of our Society. He said that hearing is a delicate



Jens Blauert, left, receives Gold Medal from Bob Moses, AES president



Günther Theile receives Silver Medal



Werner Deutsch receives Board of Governors Award

mechanism that judges the (emotional) quality of the audio signal. He showed an animation made by Brandon Pletsch that illustrated the hearing process in remarkable graphical detail. “Be careful with your hearing,” Swarte warned, “learn and broaden your horizons.”

When Peter Swarte introduced the keynote speaker, Tammo Houtgast, he called him the “godfather” of the speech intelligibility index. In his talk, Houtgast suggested that audio and engineering are different but related worlds, the former being concerned with the perception of sound and its quality, and the latter with the physical world. He had been interested in the relationship between the perceptual and the physical world, in particular the relation to

speech intelligibility. He had been looking for a physical measure of speech intelligibility. It had been based on an evaluation of the intensity envelope, whose fluctuations had to be preserved to maintain speech intelligibility. The rate of these fluctuations would be typically in the range up to about 13 Hz, with the main concentration at about 4 Hz, which represents the syllable rate. Houtgast presented a number of examples showing the trade-offs between signal-to-noise ratio and reverberation time for different values of speech transmission index (STI). He went on to show how hearing damage could affect this. The shaping of our communication environment, he pointed out, is typically engineered for the normal hearing population, and it is increasingly important to take the hearing-impaired into account.

EXHIBITION

Sharing its 60th birthday with the AES, Studer launched its OnAir 2500 digital broadcast console, adding to its line up of digital mixing, routing, and call-management systems. Also in the console field, Lawo announced the European debut of its mc²56 console, with 512 DSP channels and a reduced fader width to enable more compact installation.

MADI (the multichannel audio digital interface, standardized by AES) is now available for your laptop computer, thanks to a new solution known as the MADIface from RME, which is based on a PCI express card and a small breakout box. This enables the connection of up to 64 channels of audio input and output at up to 192-kHz sampling rate. Prism Sound had also upgraded its Orpheus FireWire multichannel audio interface, enabling ADAT inputs and outputs. This interface has eight analog inputs, a built-in mixer, a low-jitter internal clock and synchronous sampling rate conversion. Further offerings in this field included Apogee’s Duet portable audio interface, featuring control integration with Apple’s Garage Band and Logic Pro software, which uses a single multifunction control knob. There was also an interesting innovation from broadcast manufacturer MARIAN in the form of the Trace AES42 low-latency soundcard designed together with Neumann and Schoeps to enable connection with digital microphones. This card can be synchronized with others from the family using the TDM SyncBus.

On the plugin front, Tube-Tech showed its new CL1B limiter, which is intended to bring the sound of the hardware device to users of Pro Tools. Algorithmix contributed to the enormous range of plugin tools with the VST 3.0 version of its K-stereo processor, originally designed by Bob Katz to extract and spread a recording’s ambience around the entire stereo field, enhancing depth and width without using artificial reverberation.

On the microphone front, AKG launched a new low-cost microphone based on the highly successful C414, known as the C214. This is a cardioid-only microphone capable of handling SPLs of up to 156 dB, having only a single diaphragm. Neumann also joined in the birthday fun, celebrating its 80th anniversary with a competition offering three of its new TLM 67 microphones as prizes. Based on the well-known U67, the TLM 67 attempts to recreate the “tube sound” of the original microphone using a novel ➡

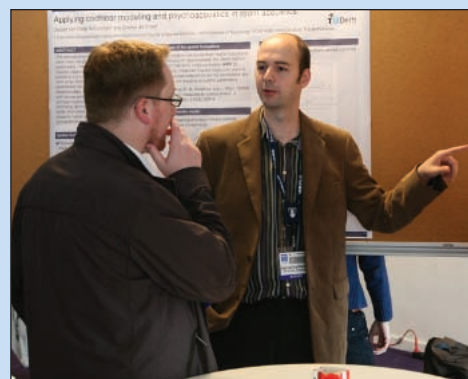


Among the authors presenting papers in lecture sessions were, from left, top row, Aki Härmä, Sasha Spors, Takahiro Miura, Nadia Wallaszkovits, and Jon Allen; middle row, Shamail Saeed, Ben Shirley, Damian Murphy, Julia Turku, and Julio Jose Carabias-Orti; bottom row, David Moore, Ville Pulkki, Christof Faller, Yuliya Smyrnova, and Juha Backman.

circuit. Bespoke mics are the speciality of CharterOak Acoustic Devices, which was showing its new hand-built M900T small-diaphragm vacuum tube condenser microphone for the first time at the 124th Convention.

Audio Precision displayed its wide range of test equipment options, including a new offering in the form of a two-channel version of its award-winning APx500 Series audio analyzer. AP also caused a stir with its new APx585 multichannel audio analyzer, which has the unique feature of being able to handle HDMI and Blu-ray audio signals. This enables signals to be sent and received directly ➡

Three of the authors who presented papers in poster sessions were, clockwise from right, Jasper van Dorp Schuitman, Bee Suan Ong, and Ryota Saito.





Tutorial presenters included, clockwise from top, Ben Kok, Helmut Wittek and Geoff Martin, Jan de Laat, and Christopher Struck.



124th workshops included *Uneven Bass Reproduction in Automobiles* (left) with (from left) David Clark, Alfred Svobodnik, Richard Stroud, David Calistrom, Robert Klacza, and Tom Nousaine, and *Practical Uses of Acoustic Modeling* with (from left) Ben Kok, Peter Mapp, Dirk Noy, and Henrick Møller



Master Class presenters included, from left, Dick Small, Master Class chair Ben Kok, Neville Thiele, and Jens Blauert.



from HDMI-connected devices, and it is capable of generating signals in lossy and lossless coding formats such as DTS HD and Dolby Digital. On the acoustic testing front, B&K was showing a range of updated audio measurement and analysis tools including the new Type 2270 hand-held

analyzer. Close by, DTS was explaining the merits of its successful encoding tools for Blu-ray HD mastering. Further developments in the coding field included APT's introduction of its apt-X technology for Bluetooth connections, which is apparently offering much better quality ➔



Peter Swarte (2nd from right), convention chair, welcomed a group of students from Russia to the convention.



Student Events chairs, from left, Tin Jonker, Roland Bolz, and Bert Kraaijpoel



Han Tendeloo, program coordinator



Marinus Boone (left) and Diemer de Vries (right), papers cochairs, present 124th Student Paper Award to Konrad Kowalczyk (see the paper on page 569).



Thierry Bergmans (right), exhibit organization, with Korneel Taeckens, registration



Menno van der Veen, technical tours chair



From left, Michiel van Eeden, facilities cochair, Tin Jonker, student events chair, and Frits Vroom, facilities cochair



From left, Stefani Renner, press relations, Roger Furness, executive director, and Florian Camerer, broadcast events chair

for headphone listening, owing to its ability to deliver high-quality audio at a bit rate compatible with the Bluetooth link.

In order to explain the latest products and technology, the exhibitors also held a program of seminars coordinated by Martin Wöhr. These included sessions with Sennheiser, Ferrotec, Adam Audio, Minnetonka, Odeon, and Trinnov.

TECHNICAL PAPERS

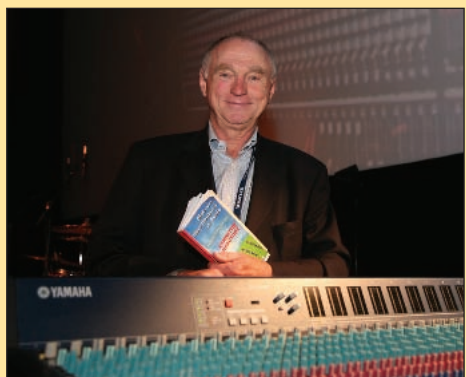
Diemer de Vries and Rinus Boone, papers cochairs, had selected an impressive range of technical papers to be presented in lecture or poster sessions. Two parallel papers sessions plus a poster session for most of the convention provided something for every delegate, with topics ranging from audio networking to psychoacoustics. Among the interesting highlights was a paper (7328) from Aki Härmä and colleagues at Philips on the topic of using highly directional loudspeakers to create the illusion that a source is

very close to a listener. It was also interesting to note that a complete poster session was devoted to the topic of mobile phone audio, including papers on codecs for Bluetooth devices. Mobile phones are not renowned for the sound quality of their loudspeakers, requiring additional enhancement to improve them in many cases. This was the topic of a paper (7350) from Rory Turnbull and his colleagues from BT Laboratories, which included studies of dynamic compression and equalization. This was followed by an interesting study from Peter Eastty and colleagues from Oxford Digital on a low-noise filter architecture for bass processing (7351).

Appropriately, since we were in the Netherlands and close to the Technical University of Delft, a substantial session was devoted to wavefield synthesis. WFS, according to Guus Berkhout during his Heyser Memorial Lecture, had arisen out of his work on the geophysical mapping of sea beds using acoustic holography. At the 124th Convention, the the-



Jan Romijn (left), social events chair, and Alex Balster, historical events cochair



Martin Wöhr, exhibitor seminars chair



Ben Kok (left), tutorials and workshops chair, with Dick Small

Gisele Clark, promotion



We thank...124th Committee

Peter Swarte
chair

Marinus Boone and Diemer de Vries
papers cochairs

Ben Kok
tutorials and workshops chair

Florian Camerer
broadcast events chair

Tin Jonker, Bert Kraaijpoel, and Roland Bolz
student events chairs

Jan Romijn
social events chair

Stan Tempelaars and Alex Balster
historical events cochairs

Martin Wöhr
exhibitor seminars chair

Michiel van Eeden and Frits Vroom
facilities cochairs

Menno van der Veen
technical tours chair

Steven van Raalte
research advisor

Han Tendeloo
program coordinator



Steven van Raalte, research advisor

ory of WFS was revisited by Sascha Spors and colleagues in paper 7358. They presented a unified theory covering arbitrarily shaped loudspeaker arrays for two- and three-dimensional reproduction. The authors also provided some results on the artifacts arising from practical setups and discussed some extensions to traditional concepts of WFS. A special event devoted to the topic of WFS, *20 Years of WFS*, ran throughout the convention, with a program in which traditional and electronic music, acoustic landscapes, and movie fragments illustrated the possibilities of WFS.

In the spatial audio sessions, Christof Faller (in paper 7380) described a novel way of deriving a highly directional center channel from coincident stereo microphone signals. This center channel can be steered in appropriate directions and used as a digitally steerable shotgun microphone if required, without the off-axis coloration traditionally associated with shotguns.

The winner of the AES 124th Student Paper Award was

Konrad Kowalczyk for “Modeling Frequency-Dependent Boundaries as Digital Impedance Filters in FDTD and K-DWM Room Acoustic Simulations,” coauthored with Maarten van Walstijn. The paper (7430), chosen from 42 student papers at the 124th, has been expanded and published, starting on page 569. (An order form for purchasing copies of the 124th papers has been inserted with this issue.)

WORKSHOPS, TUTORIALS, AND MASTER CLASSES

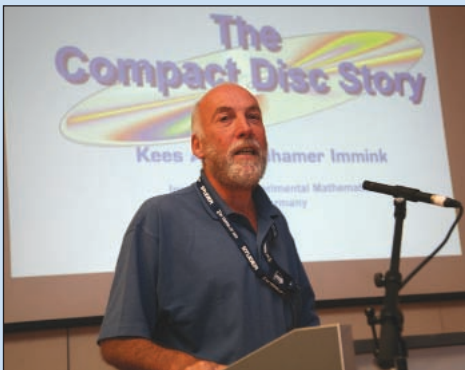
Thanks to the prodigious efforts of Ben Kok, the educational opportunities for delegates to the 124th convention were wide and varied. These included a series of four master classes given by luminaries from their respective fields. The first of these was on loudspeaker parameters, given by Richard Small and Neville Thiele of the famous Thiele-Small parameters, during which they aimed to explain the parameters in a unified way and correct some misconceptions that have arisen over ➔



Heyser Memorial Lecturer A. J. (Guus) Berkout (2nd from left) receives certificate from Jürgen Herre (left), Technical Council vice chair, Bob Schulein, TC chair, and Jim Kaiser (right), TC vice chair



Guus Berkout (2nd from left) with a few of the researchers who have used his ideas on wavefield synthesis to develop new products and applications: from left, Karlheinz Brandenburg, Diemer de Vries, and Marinus Boone.



Kees Immick's presentation on the audio compact disc was one of the events in the 124th Historical Program.



Geoff Emerick, the engineer on the original recording of *Sgt. Pepper's Lonely Hearts Club Band*, discusses his work on the 40th Anniversary rerecording.



20 Years of WFS ran throughout the convention, with traditional and electronic music, acoustic landscapes, and movie fragments illustrating the possibilities of WFS

time. Jens Blauert gave a master class on concepts in sound quality, describing his thoughts on the formation of percepts and a structure for approaching so-called subjective evaluation. The well-known amplifier designer, Douglas Self, presented a class on linear power amplification. He said that this is an area in which analog still has the upper hand when high quality is required. This was partnered by a final session from Bruno Putzeys, putting forth the other side of the story by describing "a universal grammar of Class-D audio amplification." Putzeys attempted to show how all Class-D amplifier designs are actually permutations of the same basic structure, but showing how some configurations have real performance advantages.

Nineteen tutorials covered subjects as diverse as intelligent audio systems and absorbers and diffusers. A substantial three-hour tutorial on the first morning, given by Søren Bech and Nick Zacharov, described the process of perceptual audio evaluation, based on a recent book written by the two. Two other tutorials dealt with hearing impairment: *Music Induced Hearing Disorders* presented by Jan de Laat and *Tinnitus, Just Another Buzz Word?* presented by Neil Cherian, Michael Santucci, and Jan Voetmann. Both of these offered the results of recent research and served to make audio engineers more aware of the importance of looking after their most important sensory organ.

Among the many excellent workshops were a number of broadcast events organized by Florian Camerer, including the innovative *Mix Your Own New Year's Concert*, during which a selection of experienced mixers with different backgrounds (classical, pop, rock) had about 5 to 7 minutes to set up a five-channel mix of the last New Year's concert from Vienna with the original multitrack recording. The willing victims for this event included Jean-Marie Geijssen, Morten Lindberg, Ronald Prent, and Josef Schultz. In a second session, the resulting mixes were synchronized so that one could switch easily between them and compare the results.

HISTORICAL PROGRAM

A special historical cafe, coordinated by Stan Tempelaars and Alex Balster, formed the venue for a display of vintage

EDUCATION EVENTS



1 Student Delegate Assembly: the large number of students attending the meeting, led by Suzana Jakovic (right), SDA chair, was beyond a standing-room-only crowd, it was a sitting-on-every-inch-of-the-floor crowd.



2 Recording Competition Awards: Joanna Popowicz (right), was just one of many students winning awards. She receives a copy of *Pyramix 6* from Claude Cellier (left) of Merging Technologies and a certificate from Jason Corey for winning 1st prize, classical stereo.



3 Recording Competition Judges: Darcy Proper was one of many industry pros who judged the recording competition.

4 Education Fair: Wroclaw University of Technology was one of many schools and universities with audio programs to offer information to prospective students.



5 Education Forum: from left, Andreas Meyer, Konrad Strauss, Theresa Leonard, Jason Corey, Mark Drews, and Cornelis Van der Gragt.



CD and compact cassette equipment from the early days, along with numerous other items from audio history. A series of presentations bore witness to the numerous developments that have shaped the current state of audio technology, including the intriguingly titled “Shannon, Beethoven, and the Compact Disc,” presented by Kees Immink. Marking the 25th year since the CD’s launch, Immink described the various crucial technical decisions that had determined the success of the new medium, reminding the audience that the CD’s capacity of 74 minutes of music was designed to accommodate a mono recording of Beethoven’s Ninth Symphony at probably the slowest pace it had ever been played. In similar vein, Willem Andriessen told the story of the compact cassette, another incredibly successful format that had suffered a sudden demise. Probably never again will we see two formats that stand the test of time for such long periods and touch so many people’s lives.

SPECIAL EVENTS

Among a wide range of special events was an immensely popular session with Geoff Emerick to mark the 40th anniversary of the release of the Beatles’ *Sgt. Pepper’s Lonely Hearts Club Band* album. Emerick (see photo on page 590, in red shirt), the original engineer of the album, had been commissioned by the

BBC to rerecord all the songs on the original vintage equipment using contemporary musicians in order to make a unique TV program. This session was presented in association with the APRS, the UK Association of Professional Recording Services, which was celebrating its own 60th anniversary.

The Richard C. Heyser Memorial Lecture, organized by the AES Technical Council, was given at this convention by A.J. (Guus) Berkhout. Berkhout had undertaken a long and distinguished career in the fields of acoustical and geophysical imaging, having also held a chair in innovation management at Delft University of Technology in the Netherlands. He spoke on the subject of “The Big Challenges in Audio, a Glance into the Future,” during which he described his work in wavefield synthesis, which formed the basis for a vision of the future involving complex array technology in conjunction with such things as “hearing glasses.” The message of his talk was “Do not try to predict the future, but have the ambition to create the future.”

At the Thomas Aquinas Church in Amsterdam, Graham Blyth, ably assisted by stop-puller-in-chief David Griesinger, gave an organ recital on the delightful Flentrop organ, according to long-established tradition. Playing works from Bach to Muschel, Blyth showed off the wide tonal range of this excellent instrument from the organ reform move- ➔

AES MEETINGS



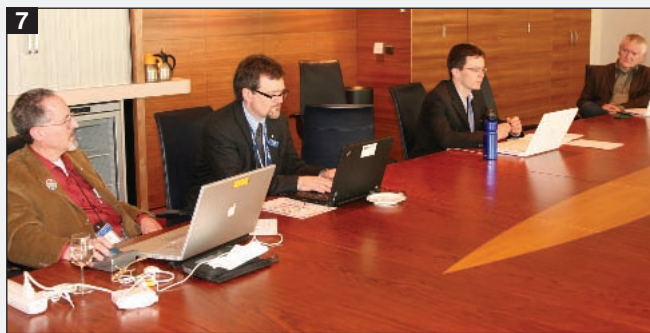
ment, built in 1959, in a surprisingly reverberant acoustical environment considering the size of the building.

In the event *New Revenue Streams for Studios* a distinguished panel of speakers, led by Peter Filleul and organized by the European Sound Directors Association together with the APRS, discussed the changing role of producers in the current recording market.

Social events, organized by Jan Romijn, were in plentiful supply in Amsterdam, and delegates were able to meet friends at a mixer party on the first evening of the convention. A boat trip took place later on the first evening, touring the canals of the city to see the hidden sights. The banquet on the Monday evening provided excellent dining in unique surroundings, the Kompaszaal, an arrival/departure hall of the old KNSM ship-company, built in 1956, with fine views of the harbor.

TECHNICAL TOURS

Through the good offices of Menno van der Veen, five technical tours were offered to those wishing to visit audio-related facilities near Amsterdam. A visit to Polyhymnia in Baarn provided a chance to experience the former Philips Classical mastering studios, now under independent management and one of the most successful classical recording companies in the world. Record Industry in Haarlem, the largest vinyl pressing plant in Europe, invited delegates to its premises to see its 31 presses with a capacity of at least 40,000 records per shift. The company offers all types of services including vinyl lacquer, DMM cutting, CD mastering, and archive restoration. A tour to TU Delft Acoustics Group enabled visitors to see research work in microphone arrays, WFS reproduction, and flat-panel loudspeakers among other things, while a tour to Philips



- 1 Standards:** Richard Chalmers (left), Standards Committee chair, and Mark Yonge, standards manager
- 2 Awards:** Neil Gilchrist (far end of table), chair, leads the discussion
- 3 Technical Council:** from left, Bob Schulein, chair, and Jürgen Herre and Jim Kaiser, vice chairs
- 4 Regions and Sections:** Francis Rumsey (left), chair, addresses representatives of sections from around the world
- 5 Conference Policy:** Geoff Martin (right), chair, listens to a conference proposal
- 6 Publications Policy:** From left, John Vanderkooy, editor, and Nick Zacharov and Søren Bech (cochairs) lead the discussion
- 7 Education:** from left, Ron Streicher, Bob Moses, Jason Corey, chair, and Jim Anderson

Research Laboratories provided an opportunity to find out about research in spatial audio reproduction, music information retrieval technology, and spatial audio coding, among other things. A final tour to the Vision & Sound Experience, which is the new archive of the Dutch Radio and Television broadcasting organization, showed off the immense collections and involved a discussion about optimal archiving procedures and techniques.

LIVE SOUND PROGRAM

Reflecting the increasing importance of live sound, a series of seven seminars at the 124th Convention dealt with a number of key technical and operational elements of the live sound process. In the first session, *Demystifying Audio*, Ralf Zuleeg presented an information set of demon-

strations, after which he proceeded to describe the principles of line arrays. The theoretical and practical aspects of signal processing and mixing were covered by Ruben van der Goor, while cables and connectors were discussed by Wolfgang Fess and Norbert Nachbauer. A live mixing workshop, led by Gregor Zielinsky, and a two-part special on event planning entitled *From Rider to Show* by Eberhard Müller, completed this exciting series of events.

STUDENT EVENTS

Student-centered activities were buzzing at the RAI Convention Centre, with the chair of the student delegate assembly (SDA), Suzana Jakovic, handing over the reins to her successor Misato Yamada. In order to welcome them to Amsterdam, the Dutch student section had organized a party for all the students, sponsored by SAE Amsterdam, held at De Valk with the band Dear Watson.

Coordinated by Tin Jonker, Bert Kraaijpoel and Roland Bolz, in conjunction with education committee chair Jason Corey, students were able to attend two meetings of the SDA, an education fair, two recording competitions, a mentoring panel, and an education forum panel. A career and jobs fair gave a chance for students to talk to exhibitors and others about work opportunities. (For further information on the 124th student events see Education News on page 646.)

TECHNICAL COUNCIL AND STANDARDS MEETINGS

A comprehensive program of standards committee meetings were held during and prior to the convention, thanks to the diligent work of Richard Chalmers, Standards Committee chair, and Mark Yonge, AES Standards manager. Over 65 working groups are represented, covering fields as diverse as digital audio, preservation and restoration, acoustics, interconnections, networks, and file transfer. This was complemented by an extensive series of technical committee meetings planning the future activities and strategy of the Society in diverse audio fields, culminating in the final meeting of the Technical Council on the last day of the convention. The Board of Governors met on the last day of the convention (see next page) to debate the Society's future policies.

WE CAN'T FORGET TO MENTION...

A convention would not happen at all if it weren't for the sterling efforts of those responsible for organizing facilities, which on this occasion was handled by the efficient team of Michiel van Eeden and Frits Vroom. Their excellent forward planning and smooth operation behind the scenes ensured that all ran smoothly for presenters and audience alike. Similar mention should go to Han Tendeloo for his outstanding work on coordinating the convention program, which, with so many events often involving overlaps among people, rooms, and sessions, required the services of a man with a cool head.

The 125th Convention in San Francisco (October 2–5) is just around the corner now; see the preview starting on page 610. And preparations have begun in earnest for the 126th Convention next year (May 7–10) in Munich. See www.aes.org for the latest news and updates. ➔

Board of Governors Meets

The AES Board of Governors met on May 20
to hear reports from AES officials and standing committees:

- 1** Jim Anderson, president-elect; Wieslaw Woszczyk, past president and Nominations Committee chair
- 2** Karlheinz Brandenburg, governor; Jose de Oliveira, Europe Southern Region vice president; David Murphy, International Region vice president
- 3** Bob Moses, president; Han Tendeloo, secretary
- 4** Francis Rumsey, Regions and Sections Committee chair; Peter Swarte, Europe Northern Region vice president and 124th Convention chair; Bill Wray, Historical Committee cochair
- 5** Christopher Struck, governor; Søren Bech, Publications Policy Committee cochair; Nick Zacharov, Publications Policy Committee cochair; Theresa Leonard, governor and Membership Committee chair
- 6** Ron Streicher, governor and Laws and Resolutions Committee chair; Roger Furness, executive director; Andres Mayo, Latin America Region vice president; Jay Fouts, legal counsel
- 7** Neil Gilchrist, Awards Committee chair and Strategic Advisory Group chair
- 8** Jim Kaiser, USA/Canada Central Region vice president; Bob Schulein, Technical Council chair; Ewald Kerschbaum, Europe Central Region vice president
- 9** Geoff Martin, Conference Policy Committee chair; John Strawn, Convention Policy Committee chair and 125th Convention chair
- 10** Bob Lee, USA/Canada Western Region vice president; Bozena Kostek, governor; John Vanderkooy, editor
- 11** Peter Cook, USA/Canada Eastern Region vice president
- 12** Louis Fielder, treasurer and Finance Committee chair
- 13** Jason Corey, Education Committee chair; Misato Yamada, student representative; Suzana Jakovic, student representative
- 14** Richard Chalmers, Standards Committee chair



