



# SMPTE 2017 Annual Technical Conference and Exhibition Draws Record Crowds

## Plans for 2018 Already Underway: Annual SMPTE Event Will Move to a New Downtown Los Angeles Venue to Accommodate Sustained Growth

By Dianne Purrier and Aimée Ricca, with contributions from Newbay Media

**T**he promise of artificial intelligence and its scary future, advances in immersive storytelling, workflow systems, next-generation television, and the emerging SMPTE ST 2110 suite of standards were just some of the topics addressed at the SMPTE 2017 Annual Technical Conference and Exhibition.

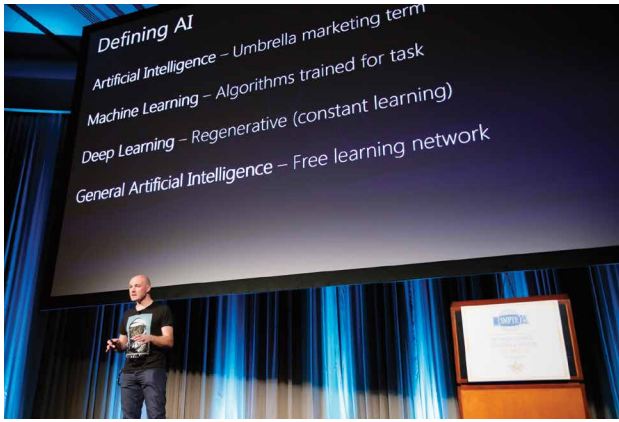
The event, held at the Hollywood & Highland Center in Hollywood, CA, from 23 to 27 October, drew

a record-breaking crowd of more than 2500 attendees. SMPTE 2017 featured 70 expert presentations, 105 exhibitors spread across two nearly sold-out exhibit halls, an IP Showcase featuring ST 2110, a beer garden, Broadcast Beat's Live! Studio, and more.

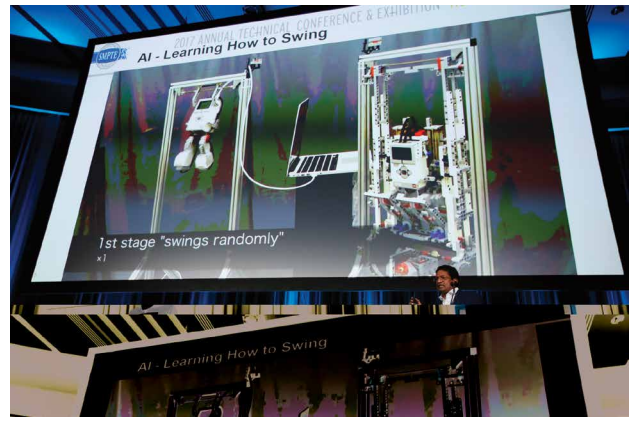
A full-day SMPTE Symposium kicked off the event on Monday, 23 October. Titled "Artificial Intelligence and Machine Learning in Digital Media Creation: The Promise, The Reality, and the (Scary?) Future," the symposium was standing room only.

Richard Welsh, co-founder and CEO of Sundog Media Toolkit, Jeff Kember, technical director of media in the CTO Office at Google Cloud, and Jay Yogeshwar, director of media and entertainment at Hitachi Vantara, set the stage by bringing delegates up to speed on an area of technology that has recently come into orbit.

Welsh, who also serves as an SMPTE Education Vice President, began by laying out the basics on artificial intelligence (AI). He divided the AI domain into three areas: machine learning (ML),



Richard Welsh discusses AI during the SMPTE Symposium.



Jay Yogeshwar demonstrates a robot using a swing.

which relies on algorithms to train a machine to do a task; deep learning, which is similar but regenerative, in other words, learns as it executes a task; and general AI, a free-learning AI that may be conscious and is without constraints, adding that the latter does not exist. Providing illustrations throughout his talk, Welsh concluded that AI tools can be used to make quick decisions. "Once you have trained the network, it's not that difficult to traverse the network," he said.

Yogeshwar discussed the impact of AI and ML in the media workflows, illustrating how ML will advance media workflows. He showed a video demonstrating how Hitachi is already using AI to enable a robot to learn how to swing suspended from a bar, like a gymnast, using ML algorithms running on a laptop.

Keynote speaker Kember examined the problems that ML can solve today. In his talk, Kember charted advancements in ML and pointed to the performance of AlphaGo; Alphabet's Google DeepMind to learn gameplay at a championship level, which subsequently was outdone by AlphaGo Zero, as well as in language translation from a phrase-based approach to a neural network method.

Regarding what is possible today for media, Kember said Google has application program interfaces for images, motion, movies, text, and audio. The company also has the ML algorithms to allow users to build apps and Tensor Processing Units to power services. Kember stated that Google is discovering ways to insert ML into the entire production cycle from camera raw to debayering, transcoding, and

dailies, to visual effects processes such as rendering and simulation to final color correction, distribution, and archiving. Kember's keynote is available for on-demand viewing at [www.smppte.org/smppte-2017-wrapup](http://www.smppte.org/smppte-2017-wrapup).

In keeping with the AI theme on Monday, the Women in Technology Luncheon, co-presented by SMPTE and HPA Women in Post, addressed innovative, actionable solutions to recognize and treat gender bias.

Madeline Di Nonno, CEO of the Geena Davis Institute on Gender in Media, introduced tools developed by the Institute, an organization that studies how media portrays women and girls and how negative gender stereotypes influence cultural and social behaviors and beliefs.

Di Nonna described the development of the Geena Davis Inclusion Quotient (GD-IQ), a software tool



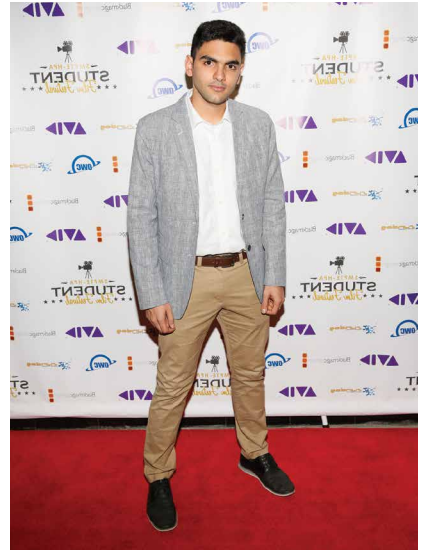
Symposium keynote speaker Jeff Kember.



Madeline Di Nonna.



Women in Technology Luncheon.



Audience choice award winner Ninaad Kulkarni.

that analyzes audio and video media content. She explained that the GD-IQ tool has learned to detect different characters on screen, determine their gender, and calculate how often and for how long they spoke in relation to one another. Sharing data from software to analyze 100 highest grossing live action films from the past three consecutive years, Di Nonna stated that results revealed an underrepresentation of women. She stressed that these images become etched into our consciousness and have a significant impact on gender bias. “What we see onscreen greatly influences our views on society,” she said. In closing, Di Nonna noted that she views GD-IQ as a “magic bullet for systematic change.”

The SMPTE-HPA Student Film Festival was held on Monday evening, 24 October, at the TCL Chinese Theatre. Hosted by Howard Lukk, SMPTE director of engineering, and Aimée Ricca, SMPTE marketing and communication, the festival screened 17 official selections demonstrating creative use of technology in storytelling. From the 119 submissions received, 17 were selected and eight received awards in the following categories.

**Innovative Use of Entertainment Technology to Engage the Audience in the Story—Animated Short (tie):**

- “Tom in Couchland” by James Just of Ringling College of Art and Design (Sarasota, Florida, U.S.)
- “Verge” by ChingTien Chu of School of Visual Arts (New York, New York, U.S.):

**Innovative Use of Entertainment Technology to Engage the Audience in the Story—Live-Action Short:**

- “Mind Game” by Weisi Dai of School of Visual Arts (New York, New York, U.S.)

**Innovative Use of Technology in an Experimental Short:**

- “Jazz Orgie” by Irina Rubina of Filmakademie Baden-Württemberg (Ludwigsburg, Germany)

**Innovative Use of Mobile Device or Tablet to Convey a Story—Narrative Short**

- “London Strike” by Jiranant Kanjanagawin of University of Greenwich (London, U.K.)

**Innovative Use of Analog Technologies in a Live-Action Narrative Short**

- “Home” by Vivian Lau of Emerson College (Boston, Massachusetts, U.S.)

**Documentary Short with Technology as the Subject Matter**

- “Baylor VirtuOso Documentary Short on Use of Technology in

VR Music Video” by Gustavo Raskowsky, Marcos Luna Hoyas, and team of Baylor University (Waco, Texas, U.S.)

**The Audience Choice Award**

- “KCLOC” by Ninaad Kulkarni, School of Visual Arts (New York, U.S.)

The student filmmakers behind the winning selections received awards for their work, as well as prizes courtesy of Avid, Blackmagic Design, Other World Computing, and Sundog Media Toolkit. Video interviews with filmmakers and attendees are available to view on-demand at [www.smppte.org/smppte2017-wrapup](http://www.smppte.org/smppte2017-wrapup).

On Tuesday, 24 October, SMPTE President Matthew Goldman, who is also a senior vice president of technology, TV, and media at Ericsson opened the Annual Technical Conference and Exhibition highlighting the IP Showcase and IP Theatre in the Centennial Exhibit Hall, demonstrating how to enable the move to all-IP workflows. “In the IP Showcase, many of the media and entertainment industry’s leading vendors will show attendees that carrying video, audio, and data over IP networks is not only possible but also practical and realizable, thanks to the SMPTE ST 2110 standard,”



(L–R) Seth Hallen, Howard Lukk, Aimée Ricca, Barbara Lange, and Rich Welsh.



Matthew Goldman.

Goldman explained. “There is programming offered during the lunch breaks in the IP Theatre, so please check the mobile app for the schedule. We thank our friends at AIMS and IABM, especially Mike Cronk and Stan Moote, for putting this together for you.”

Following Goldman’s address, program committee chairs, Paul Chapman, vice president of engineering and technology at SIM Group; Thomas Edwards, vice president engineering and development at Fox; and SMPTE Education Director Sara J. Kudrle, product marketing manager for playout at Imagine

Communications, all SMPTE Fellows, introduced the technical conference program and the keynote speaker Andrew Shulkind.

In his presentation on Immersive Future, Shulkind, co-founder of Headcase VR, marveled at the importance of collaboration and alignment of filmmakers in making successful films, citing cinematic moments from Pixar’s *Up*, *Castaway*, *Glory*, and *Malcolm X*. He cautioned that what traditional films did well might not apply to the current changes within the film industry.

“Making movies as we know them has become kind of an impossible

proposition,” Shulkind said. He noted that the diverse options available, along with the well-enabled devices and immersive technologies, are well-timed to the growing appetite of audiences for consuming content in more engaging ways than the traditional flat screen.

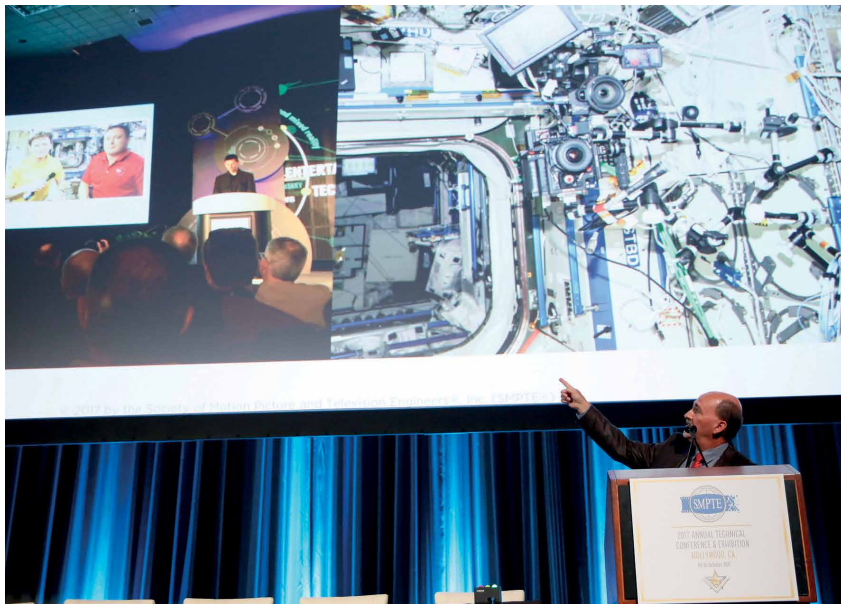
Shulkind explained that this new generation of immersive content is “a natural successor... 360 video has removed a frame from our content experiences.” In conclusion, he appealed a call to action. “Don’t let technology lead the story,” he said. “We’ll be selling ourselves short and underselling what could be. We have the potential and the render power to create that kind of empathy and connections to reconnect our world and shape the future.”

The three-day technical program addressed topics on advances in display, content security, immersive storytelling, media infrastructure, workflow systems, UHD, cinema processing, diversity and mentoring, quality and monitoring, audio and metadata, visual perception, digital data management, digital data management, new technologies, next-generation TV, and much more. Here are some highlights.

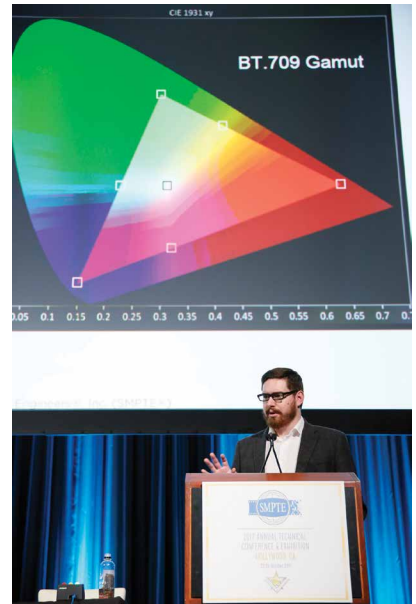
In a paper titled, “Engineering a Live UHD Program the International Space Station,” by Rodney Grubbs, NASA’s imagery experts



Keynote speaker Andrew Shulkind.



Rodney Grubbs discusses live 4K UHD.



Tyler Pruitt.

program manager, described the engineering involved in delivering live 4K UHD video via a RED Epic Dragon camera from the space station to an audience attending the 2017 NAB Show in Las Vegas.

Another presentation, “Proposed Measured Display Characterization File for HDR Consumer Displays,” by Tyler Pruitt of SpectralCal, examined a method that bypasses high dynamic range during calibration to determine the native gamma curve of a consumer display.

“HDR masters in almost all cases have a higher performance than consumer TVs,” said Pruitt. At the same time, there is a major display performance delta between the highest quality HDR consumer TV and the lowest. This requires color mapping in many cases to preserve the creative intent of the content producer. Some of the approaches include static metadata that accompanies content, dynamic metadata, and in higher end displays, GPUs and CPUs that analyze frames in realtime.

Pruitt described this method as “radical process” for calibrating HDR, stating that this technique would be appropriate for home theater displays, televisions, and theater projectors. He urged

SMPTE to take up the proposal for standardization.

With the approval of the SMPTE ST 2110 suite of standards for Professional Media Over Managed IP Networks, a session on Tuesday afternoon, “Is SMPTE ST 2110 the New Standards Superpower,” by Leigh Whitcomb of Imagine Communications, explained the significance of ST 2110 in the future of broadcast. Whitcomb outlined the requirements of the standard: what it does and how it addresses the industry’s needs.

Highlighting the SMPTE ST 2110 standard and the on-going rollout of IP connectivity in broadcast facilities, the on-site IP showcase, which Goldman introduced at the start of the technical conference, demonstrated the technology in action. The large equipment package demonstration, rooted in compatibility testing of IP-connected equipment from 50 equipment manufacturers, was also featured at the 2017 NAB Show and IBC 2017. Scaled down from 19 (at the IBC Show) to 8 racks for SMPTE 2017, the showcase was co-located with the IP Theatre that offered scheduled IP-related presentations.

A session on Wednesday morning explored recent technical

developments in UHD TV acquisition and processing, addressing the implementation of closed captioning for 4K/HDR, storytelling in 8K. Session Chair Hans Hoffmann noted that how far we’ve come with UHD TV.

YunHoung Kim, a research engineer at the Korean Broadcasting System (KBS), related the deployment of closed captioning at KBS as part of Korea’s deployment of over-the-air ATSC 3.0-based 4K television in his paper, “Implementation of Closed Captioning System for Terrestrial UHD Based on ATSC 3.0.” Describing a practical implementation of next-generation TV closed captioning that leverages the same captioning information generated by a stenographer for its ATSC 1.0 broadcasts, Kim stated that KBS simulcasts its programming in both HD and UHD TV, which was the advantage in taking this approach. Providing the components of the system, he explained that captions for the HD programs produced by the live stenography for the UHD programs are reused because the contents of the captions are the same. This system was implemented for both MPEG media transport and realtime object delivery over unidirectional



New SMPTE Fellows: Back row (L–R) Leigh A. M. Whitcomb, Charles S. Meyer, David Long, Bill Redmann, Edward Reuss, and Peter Weitzel; Front Row (L–R) Daniel G. Baker, Arjun Ramamurthy, Jean-Pierre Evain, David George Brooks, and David Leitner.

transport, which are transport protocols for the ATSC 3.0 standard.

Pierre Hugues Routhier, advanced imaging specialist at Creat3 Inc., presented “Beyond 4K: Can We Actually Tell Stories in Motion Pictures and TV in 8K.” Routhier analyzed the value of achieving 8K resolution through the lens of the cinematic language, demonstrating that there are a few cinematic shots which benefit from 8K. He stated that in most cases, framing conventions would need to be drastically widened, and motion reduced to almost nothing, which would defeat the purpose of motion pictures. From a cinematographer’s standpoint, it is difficult to avoid motion blur at the risk of the experience, “motion is a limiting factor in taking advantage of 8K,” Routhier stated. “It is impossible to see 8K in a classic living room setup.” He suggested that progress in sensor technology, bandwidth, and compression would be more effectively leveraged in the delivery of “better pixels,” rather than more pixels.

Addressing “Emerging Research in Visual Perception,” a session on Thursday morning, chaired by David Long, Rochester Institute of Technology, explored new data from various characterizations of visual

perception trends, with the premise that emerging equipment and computer-generated imagery tools strive to push the bounds of our vision.

Elizabeth DoVale, who received the 2017 SMPTE Student Paper Award, for her paper on high frame rate psychophysics, provided a presentation on the same topic. Using knowledge from past framerate and psychophysics research, DoVale carried out an experiment to see if a just noticeable difference could be found for changes in framerate.

With 77 participants, DoVale tested thresholds with base conditions of 24, 48, and 72 frames/s. She shared the findings, which indicated that significantly noisier psychophysics signals were present for 48 and 72 frames/s due to lack of detectability in human perception at the higher frame rates.

Tackling the issue of real versus generated, Martyn Gates, Ravensbourne, presented “Is Seeing Still Believing” a critical review of the factors that allow humans and machines to discriminate between real and generated images. Providing a brief history of photo manipulation dating back to 1864 battle images, Gates cautioned on the implications of image and video manipulation to generate “fake news,” in research. Gates evaluated artifacts based on human visual perception factors, including degree of complexity, correlation of angular light rays, depth, and other image factors, as well as computer vision factors such as wavelet-based, noise-based features, and point spread functions that can be used to discriminate between real and generated images. Pointing out the importance of being able to decipher between manipulated and real images, Gates noted the impact this has on our community and the world



SMPTE Executive Director Barbara Lange addresses attendees at the Annual General Membership meeting.

as we see it. Governments are also looking at this problem, as images have been used in television news for propaganda, often resulting in polarized debates. “Ultimately, with respect to television, seeing may no longer be believing,” he said.

Other notable events during the SMPTE 2017 Annual Technical Conference included the Fellows Luncheon on Tuesday, 24 October, where 12 members joined the ranks of SMPTE Fellow.

At the SMPTE Annual General Membership meeting, Tuesday, SMPTE Executive Director Barbara Lange discussed the Society’s mission, current work, and vision for its next century. Lange highlighted the pending publication of ST 2110 suite of standards and previewed the Society’s upcoming book, *Magic and Miracles*. Rich in images and content, the book tells the story of SMPTE and its contributions to motion pictures, television, and digital video—from the advent of “talkies” in the 1920s to the networked media infrastructures of today. Lange also announced that the SMPTE 2018 Annual Technical Conference and Exhibition (SMPTE 2018) will take place on 22–25 October 2018, at the Westin Bonaventure Hotel and Suites in downtown Los Angeles, a new location for the Society’s flagship event. The 2018 installment of the annual technical conference will be chaired by SMPTE Fellows Thomas Edwards, vice president of engineering and development at Fox; and SMPTE Education Director Sara J. Kudrle, product marketing manager for pLAYOUT at Imagine Communications. The meeting was followed by the second annual Oktoberfest Reception in the event’s Centennial exhibition hall.

A Trick or Treat Spooktacular Reception event was held in the Exhibit Hall at the Dolby Theatre on Wednesday, 25 October.

Stepping up from previous years, the SMPTE Awards Gala, themed “Hollywood Through the Years,” was held on Thursday evening, 26 October, to cap the week’s activities. Hosted by top Hollywood entertainment anchor Sam Rubin, along with leadership from SMPTE and the HPA, Rubin guided guests through the awards ceremony, recognizing the evening’s honorees, while moving through Hollywood history from the 1950s to the present time. Guests dressed in black-tie attire with a nod to Hollywood glamour through the decades.

Renville “Ren” H. McMann Jr. (1927–2015) was posthumously awarded Honorary Membership, the Society’s highest honor. McMann’s many innovations include the CBS Minicam Mark VI, the first handheld color TV camera, and the magnetic scan conversion techniques used by NASA to bring color TV images from the moon to viewers around the world.

The Society’s most prestigious award, the Progress Medal, was presented to Paul E. Debevec. Debevec was recognized for his achievements, and ongoing work in techniques for illuminating computer graphics objects based on the measurement of real-world illumination and their application in films such as *The Curious Case of Benjamin Button*, *District 9*, and *Avatar*.

Other 2017 award recipients included David F. E. Corley, who was on hand to receive the Camera Origination Imaging Award. Corley graciously accepted and brought his wife Susan on stage with him to receive his award. Philip Bennett

received the David Sarnoff Medal Award; Michael A. Isnardi, the Digital Processing Medal Award; James M. Reilly, the James A. Linder Archival Technology Medal Award, sponsored by James A. Linder; Mark Robert Gander, the Samuel L. Warner Medal Award, sponsored by Warner Bros.; Joseph Goldstone, the Technicolor/Herbert T. Kalmus Medal Award; and Randy Ubillos, the Workflow Systems Medal Award, sponsored by Leon Silverman. Sean T. McCarthy received the SMPTE Journal Award, and Journal Certificate of Merit was awarded to Katy C. Noland, David Long, and Mark D. Fairchild. Elizabeth DoVale, a recent graduate of the Rochester Institute of Technology (RIT), received the SMPTE Student Paper Award and Jonathan Bouchard received special mention. Mark Schubin was the recipient of this year’s Presidential Proclamation Award, and Johann Safar picked up the Excellence in Standards Award. Elizabeth “Betty” Migliore, who recently retired from SMPTE after 45 years of service, received the rarely bestowed Society Citation. The Citation for Outstanding Service to the Society was awarded to Merrick Ackermans, Herbert Jay Dunmore, John Walsh, and David Wheeler. Trevor Canham, Emily Faw, and Catherine Marie Meininger received 2017 Louis F. Wolf Jr. Memorial Scholarship. The Annual Awards Gala also recognized a dozen Society members who were elevated to SMPTE Fellow status.

Must-see photos, keynotes, the Annual General Membership Meeting, and video interviews are available for on-demand viewing at [www.smpte.org/smpte2017](http://www.smpte.org/smpte2017). Information about the next year’s event is posted at [www.smpte2018.org](http://www.smpte2018.org).

# Spooktacular Reception event



Howard Lukk and Mimi Rossi.



(L-R) Tom Coughlin, Peter Wharton, and Barbara Lange.



Roberta Gorman.



(L-R) Mimi Rossi, Sally Ann D'Amato, John Maizels, Joyce Cataldo, and Alicia Rock.

# Awards Gala



SMPTTE Awards Gala host Sam Rubin.



Progress Medal recipient Paul E. Debevec (left) and SMPTTE Executive Vice President Patrick Griffis.



Workflow Systems Medal Award sponsor Leon D. Silverman (left) and Randy Ubillos.



(L-R) SMPTTE Education Vice President Richard Welsh, Catherine Marie Meininger, Emily Faw, Trevor Canham (2017 Louis F. Wolf, Jr. Memorial Scholarship Recipients), Greg Wolf (Lou Wolf's son and vice president, business development at Dynamic Captioning).



Mark Robert Gander (left) and Samuel L. Warner Medal award sponsor representative, Warner Bros.



David Corley and his wife Susan Corley.



(L-R) Michael A. Isnardi, Award Sponsor representative—SRI International; Philip Bennett, recipient; and John Ferder, 2017 award committee chair.



James M. Reilly, recipient (left); James A. Lindner award sponsor and 2017 committee chair (right).



Joseph Goldstone (left) and Joshua Pines award sponsor representative—Technicolor, Inc (right).



Herbert Dunmore (left) and 2017 Citation for Outstanding Service to the Society award committee chair Bill Miller (right).



Merrick Ackermans (left) and 2017 Citation for Outstanding Service to the Society award committee chair Bill Miller (right).