SMPTE 2018 Annual Technical Conference and Exhibition at All-New Venue in Downtown Los Angeles

By Dianne Purrier and Aimée Ricca

Artificial intelligence (AI) and its growing influence on the motion imaging industry, the ongoing adoption of the SMPTE ST 2110 standards suite, the expanding role of the cloud in media production applications, and how to promote a culture of diversity and inclusion were just a few of the buzzed-about topics presented at the SMPTE 2018 Annual Technical Conference and Exhibition (SMPTE 2018).

Drawing more paid registrants than in previous years, the annual SMPTE event was held on 23–25 October at its new venue, the Westin Bonaventure Hotel & Suites in Downtown Los Angeles. SMPTE 2018 featured 78 technical presentations (from a remarkable 156 paper proposals). In addition, the conference hosted features such as advanced technology exhibitors, recognition for SMPTE Fellows, the Annual Awards Gala, on-location video coverage by *postPerspective*, and a daily newsletter published by *The Broadcast Bridge*.

SMPTE 2018 technical presentations addressed topics on professional media networking; better pixels projects; managing complex and seemingly unmanageable workflows; evaluating image quality for brighter displays, immersive visual experiences, and high dynamic range (HDR); AI algorithms and why they will become a must for any content producer and provider; the evolution of streaming services; the cloud; the metamorphosis of today's encoding technologies; advances in display technologies; and taming metadata by harnessing the power of media asset management.

Monday Pre-Conference Activities

Held a day ahead of the technical conference on Monday, 22 October, the SMPTE 2018 Symposium drew a crowd with the topic "Driving the Entertainment Revolution: Autonomous Cars, Machine Intelligence, & Mixed Reality." Chaired by newly elevated SMPTE Fellow Michael Zink, vice president of technology at Warner Bros., the Symposium explored how AI and machine learning, coupled with improvements in picture and sound, are coming together to create fully immersive experiences that will revolutionize the entertainment industry.

Zink opened the symposium with the session titled "How Today's Tech Advances Will Drive Future Opportunity." This session explored how recent advancements in multiple technologies—autonomous cars, machine intelligence, and mixed reality—have positioned the mobility sector for significant transformation. Zink provided an overview of the current market, predictions for

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Symposium keynote speaker Douglas Davis.

developments in the next few years, and insights into potential opportunities for media and entertainment companies to develop new experiences for the mobile environment.

Next up was the keynote session by Intel Automated Driving Group Senior Vice President Douglas Davis, titled "Safety Today for the Autonomous Tomorrow." Davis focused on the potential of autonomous vehicles to save lives by reducing or eliminating human error on the roads. He also discussed how consumers' embrace of such vehicles will give rise to a massive new passenger economy and, in turn, drive change across a variety of industries.

"According to surveys, a majority of people are apprehensive about riding in an autonomous car. But 1.3 million people worldwide die every year in auto accidents, including about 38,000 in the U.S. We humans really aren't very good drivers," Davis said in a follow-up interview with *postPerspective* magazine. "We have so much technology now, and it's advanced very rapidly over the past few years, that can make cars much better drivers—and manage the task of driving in a more predictable way—than humans. We have a long way to go to make this technology pervasive, but we've come a long way in a short period."

Following the keynote, a panel discussion titled "How Innovative Content Applications Will Fuel In-Car Entertainment" took a further look at the opportunities arising from consumer adoption of autonomous vehicles. Panelists discussed how the concept of in-car entertainment will be redefined when passengers have far more time to consume entertainment content on the go. Highlighting innovative ideas for content applications—from screen extensions to mixed reality—specifically designed for this new environment, the session offered real-life examples, giving a glimpse into what the in-car entertainment experiences of the future will bring.

The afternoon session, titled "How Cutting-Edge Tech Will Power Future Consumer Experiences," highlighted some of the most exciting developments enabling new entertainment experiences. Speakers shared their knowledge about the latest innovations in glass and display technologies, improvements in communication and electronics, advancements in AI and robotics, and implementations of cutting-edge biometric sensors—all of which will be used to develop the best consumer experiences of the future.

Also on Monday, the annual Women in Technology Luncheon, presented by SMPTE and the Hollywood Professional Association (HPA), highlighted "A Conversation with Tech Entrepreneur and Philanthropist Rachel Payne." CEO of FEM Inc., a holding company founded by women whose mission is to serve and empower diverse audiences, Payne has launched and sold tech companies, run for a congressional seat, managed foundations, and built global strategies for an impressive list of companies. At the luncheon, she shared her experiences and insights with moderator Kari Grubin, chair of HPA Women in Post and vice president of mastering at The Walt Disney Studios, and audience members.

AI was a hot topic of the luncheon conversation. "AI is the next frontier for transformation in society and our economy, and it will touch every human on the planet," Payne said in a *postPerspective* interview following the luncheon. "It's already started, but it's not diverse. It's a very narrow field, and with narrowness comes blind spots. Until we have greater numbers of women building AI technology, we're going to miss out—if you don't involve different perspectives, world views, and

Kari Grubin (left) and Rachel Payne.

Women in Technology Luncheon attendees. (L-R) Naida Albright, Jana Spotts, Lisa Griffin, Karen Raz, and Jessi Laday.

Patrick Griffis.

backgrounds, you will build technology that not only amplifies bias, but scales it in a global way instantly."

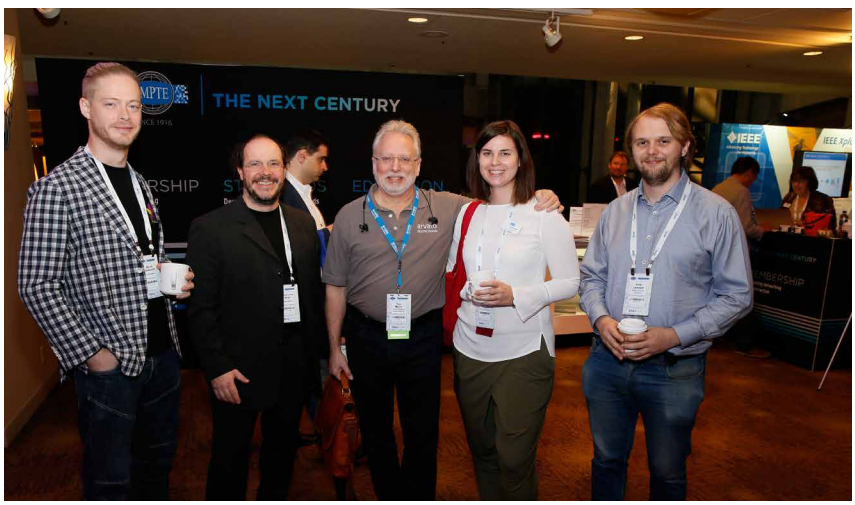
She added, "AI is scary, but it's also a huge opportunity. It's a call to arms for more women to go into more fields like AI, knowing that their voice is not only important but absolutely fundamental to the future of our civilization!"

Payne also addressed the struggle of women entrepreneurs. "Women entrepreneurs also need mentors inside of the industry. It's a very lonely job—we don't get access to capital the same way that men do. It's harder to sell into big companies because we don't have the same networks. If you are thinking about mentoring or you want to do business in a way that supports more women, don't forget the women entrepreneurs."

On Monday evening, attendees enjoyed an evening luau reception—a first for SMPTE.

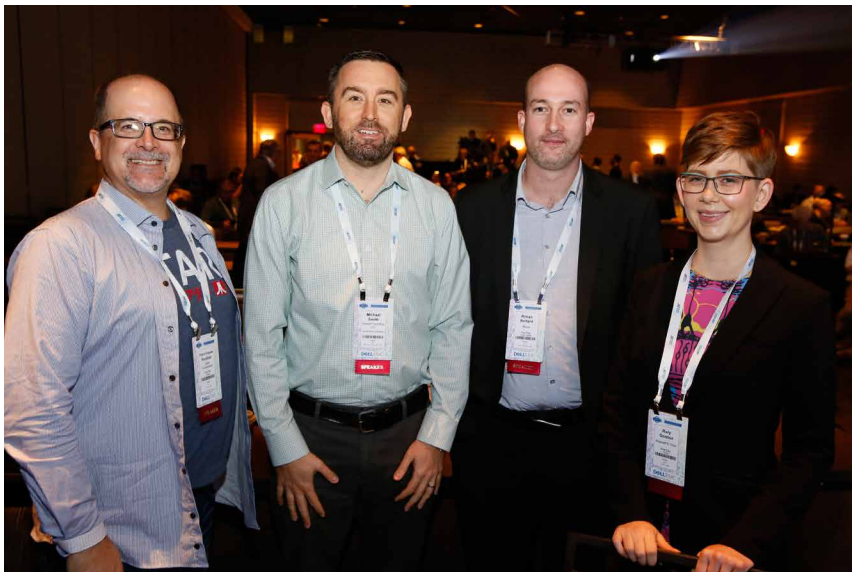
Tuesday: Annual General Membership Meeting, Keynote, Technical Sessions, and Oktoberfest

On Tuesday, 23 October, the SMPTE 2018 technical conference program began with the SMPTE Annual General Membership (AGM) Meeting. In addition to introducing new officers and members of the SMPTE Board of Governors for 2019–2020, the Society's leadership announced the completion of a strategic business plan that will guide the Society in becoming an even more valuable resource for individuals and organizations within the media and entertainment industry. Introduced by SMPTE President-Elect Patrick Griffis, the new business plan articulates SMPTE's guiding principles, core values such as acting as a



(L-R) Manuel Hellendorff, Jean Francois Nivert, Tom Mauro, Yvonne Thomas, and Andy Lampard.

Conference keynote speaker Julina Tatlock.



(L-R) Pierre Hugues Routhier, Michael Smith, Ronan Boitard, and Rory Gordon.

global organization, and its ongoing commitments to being both inclusive and objective.

"The new strategic business plan reflects the initiative championed by SMPTE President Matthew Goldman to examine the Society and to establish our guiding principles, vision, mission, and value propositions resulting in this new three-year strategic plan," said SMPTE Executive Director Barbara Lange. "I look forward to working with current and newly-elected SMPTE Board of Governors leadership to achieve the ambitious objectives set out in this plan."

The SMPTE Board of Governors will be responsible for overseeing the Society's new strategic business plan. Following recent elections for 2019–2020, the Executive Committee of the Board of Governors will include Griffis, vice president of technology at Dolby Laboratories; Executive Vice President Hans Hoffmann, senior manager, media production technologies, for the European Broadcasting Union (EBU) Technology and Innovation Department; Education Vice President Sara Kudrle, product marketing manager at Imagine Communications; Secretary/Treasurer John E. Ferder; and immediate Past President Matthew Goldman, senior vice president of technology at MediaKind. Officers continuing in their current terms include SMPTE Standards Vice President Bruce Devlin of Mr. MXF and SMPTE Membership Vice President Peter Wharton, president of Happy Robotz.

In addition to the previously elected officers and governors, Lange announced that the Board of Governors has appointed Patricia Keighley of IMAX as finance vice president and Thomas Mauro of Arvato as New York regional governor, together with two governors-at-large: HPA President Seth Hallen and Brian Claypool of Christie Digital Systems.

Among the other topics covered at the AGM meeting, Lange provided updates on the status of membership and recent standards developments. SMPTE Past President Wendy Aylsworth, the Society's first woman president, was recognized during the meeting for earning the prestigious Charles F. Jenkins Lifetime Achievement Award, handed out by the Academy of Television Arts & Sciences, which was presented to her at the Television Academy's Engineering Emmy Awards ceremony on Wednesday, 23 October, at LA Live.

Following the AGM meeting, Tuesday's technical conference sessions began with conference program committee co-chairs and SMPTE Fellows Thomas Edwards, vice president of engineering and development at Fox, and Kudrle.

Edwards and Kudrle introduced SMPTE 2018 Keynote Speaker Julina Tatlock, an award-winning writer–producer, virtual reality (VR) director, and social TV specialist. Tatlock specializes in producing and directing VR, creating social media and web-based narrative games for movies and broadcast properties, as well as collaborating with developers on integrating new tech intellectual property into popular interactive stories. She is CEO of 30 Ninjas, an award-winning immersive-entertainment company she founded along with director Doug Liman (*Bourne Identity*, *Mr. & Mrs. Smith*, *Edge of Tomorrow*, and *American Made*, among others).

During her keynote presentation, Tatlock provided SMPTE 2018 attendees with a rich and rare perspective on how leading-edge creatives are working with next-gen technologies to redefine the very nature of media and entertainment. She discussed the ways that content creation and entertainment production can leverage emerging technologies, and she covered topics such as how best to evaluate what might be the next popular entertainment technology and platform as well as how to write, direct, and build for technology and platforms that do not exist yet.

"With emerging media, you always have to keep an open mind. There might be some brand-new technology you want to try, but it also depends on the nugget of your creative idea," Tatlock said to *postPerspective* following her keynote address. "If the project is technology-driven, it's about figuring out the entertainment

SMPTE Fellows Lars Borg, David Baylor, Matthew Goldman, and Renard Jenkins.

possibilities for that tech. And sometimes the project begins with a creative idea, and the question is how to open it up to be something new with available technologies. Technology and creative have to work hand in glove." Tatlock's keynote address sets the tone for the technical sessions to follow.

The three-part session, "Better Pixels," chaired by Sally Hattori of 20th Century Fox Film and David Long of the Rochester Institute of Technology (RIT), went beyond physics and engineering to consider the holistic quality of experience for the human observer adequately. Presentations included "HDR Image Analysis for Better Storytelling," "Production and Distribution Technologies for a Better Pixel Ecosystem," and "Image Processing Technologies for Better Pixels." Presenters included Andrew Cotton and Simon Thompson of the BBC, JD Vandenberg of The Walt Disney Studios, and Edward G. Callway of AMD.

Another three-part session on AI posed the question, "Is AI more than automation in our industry?" Chaired by Yvonne Thomas of Arvato Systems, the session explained why AI algorithms will become a must for any content producer and provider and an integrated component in our system landscapes. Presentations offered practical examples of AI's use in the media industry and showed how to create and develop machine-learning practices to ensure the highest-quality metadata. Presenters included Ray Thompson of Avid, Thomas Gunkel of Skyline Communications, and Christopher Witmayer of NASCAR.

Chaired by Mark Zorn of HBO, the companion sessions, "Will Blockchain Solve All Our Problems in M&E?" and "Exploring Security and Blockchain in New Media Space," provided use cases exploring whether there is a practical use for blockchain in media and entertainment and if operators can embed security technologies that will protect against new threats. Presenters included Leigh Whitcomb of Imagine Communications, Shruti Tripathi of Techtel, and Eric Diehl of Sony Pictures Entertainment.

Managing the seemingly unmanageable was the essence of a session on file-based workflows, especially as workflows continue to evolve and the size and complexity of productions continue to increase. Chaired by Massimiliano Gasparri of elev8+ Inc. and Kudrle, the session included papers covering new tools, techniques, and technologies for managing even the most complex workflows.

Also on Tuesday, the Fellows Luncheon honored the 15 industry leaders who were elevated to Fellow status. The new SMPTE Fellows include Lars Borg, Frans de Jong, Luke Fay, John Fletcher, Joe Inzerillo, Renard Jenkins, Simon T. Jones, David Lyon, James E. O'Neal, Prinyar Saungsomboon, Nigel Seth-Smith, John F. Snow, Wesley D. Simpson, Christopher Witham, and Michael Zink. Tuesday's program wrapped up with the third annual SMPTE Oktoberfest reception, complete with imported beer and German-themed snacks.

Wednesday: Fun Run, Technical Sessions, and Spooktacular

The SMPTE 2018 Wednesday program began with a 4K 4Charity Fun Run hosted by Amazon Web Services (AWS) Elemental, an AWS company, in Los Angeles' Elysian Park. Race proceeds, which totaled $10,380, supported the Geena Davis Institute on Gender in Media, the first and only research-based organization within the media and entertainment industry to educate on and advocate for gender equity in media.

A big topic of the day's technical sessions was the continued adoption of the SMPTE ST 2110 suite of standards for professional media over managed IP networks. Thomas Edwards of Fox Networks Engineering and Operations and SMPTE Finance Vice President Hans Hoffmann, of the EBU, chaired a four-part IP session that included papers on the practical implementation of SMPTE ST 2110, timing and documentation of IP plants, higher-level IP functionality, and advances in IP. Presenters included Robert Porter and Gareth Sylvester-Bradley of Sony Europe Limited, John Mailhot of Imagine

Communications, and Jean Lapierre of Matrox.

Scott Barella of PESA chaired the session, "Encoding: The Never-Ending Story," with presenters taking a look at the new wrinkles confronting codec developers—UHD, streaming, HDR, and mezzanine compression—as the tug-of-war between bandwidth, bit rate, and "buck$" continues. Presenters such as Jill Boyce of Intel, Gary Clow of Videastream, and Julien Le Tanou of Ericsson Media Solutions offered the latest technical developments from the front lines of encoding.

"The Cloud" was the subject of a multipart session chaired by Willem Vermost of the EBU, with papers covering a wide range of media production applications making use of the cloud's flexibility, scalability, and sharing ability. Attendees discovered how the building blocks of the media industry are moving away from dedicated 19-in. equipment in a rack and toward a dematerialized version in the cloud. Presenters included Jack Wenzinger of AWS, Karsten Schragmann of Arvato Systems, Naruaki Kato of NHK, Julie McDonald of Nimble Collective, Christopher Witmayer of NASCAR, and Alex Giladi of Comcast.

Chaired by Blue Collar Post Collective (BCPC) President Kylee Peña, also of Netflix, the session "Image Quality" addressed the question, "What does image quality look like?" Presenters explored the various issues at stake for the present and future of evaluating image quality, from black levels and visibility thresholds to monitoring across platforms and assessing brightness and contrast in an HDR setting.

Increasing video resolution, high frame rates (HFRs), and numbers of 360° cameras are pushing the boundaries of storage solutions. From acquisition to post-production to archiving, now more than ever, storage remains an essential component of the media industry. The session "Storage: From Production to Archiving," chaired by Massimiliano Gasparri of elev8+ Inc. (formerly eCare Manage), presented case studies, survey results, trends, and insights on the future of digital storage for the entertainment industry. Presenters included Thomas Coughlin of Coughlin Associates and Brian Campanotti of Cloudfirst.io.

Many recent advances in professional media production, such as HDR and ultra-HDTV, are being driven by display technology. In the session "Advances in Display Technology," chaired by Peter H. Putnam of ROAM Consulting LLC, presenters explored new ways to format and show electronic images in the home and at the cinema, and perhaps even in viewers' heads. Presenters included Trevor Canham of RIT and Universitat Pompeu Fabra, Scott Daly of Dolby Laboratories, and SMPTE Past President Peter Ludé of Mission Rock Digital.

In three sessions chaired by SMPTE Secretary/Treasurer John E. Ferder, director of engineering at Multidyne Video and Fiber Optic Systems—"The Global Impact of OTT," "I Want My OTT!" "Meeting the Growing Demand for OTT Services," and "Rollin' on the OTT River: Avoiding the Rocks and Shoals in Your Content Delivery Stream"—presenters examined the explosion of global internet users and the development of OTT penetration in the world's largest markets. Papers also described the latest approaches and innovations for the improvement of delivery of OTT content to the ever-growing number of subscribers, as well as new techniques in monitoring, transmission schemes, and piracy prevention.

To round out these sessions, former SMPTE President Bob Seidel, CBS vice president of engineering and advanced technology, along with Ferder, gave attendees an inside look at the strategy and technical workflow behind the CBS All Access mobile and OTT service describing the technical systems that CBS has developed for the CBS All Access, which ensures ready access to mobile and OTT devices. CBS All Access currently has agreements with local and affiliated stations covering more than 99% of households.

Attendees closed out the day with a Trick or Treat Spooktacular reception, held in the exhibit hall.

Thursday: Technical Sessions and Annual Awards Gala

Thursday's technical conference opened with the session "Innovating People: Management, Culture, and Inclusion," chaired by John McCoskey of Eagle Hill Consulting and Peña of Netflix and BCPC. This session explored the often-overlooked importance of understanding, caring for, feeding, and nurturing the most essential resource in a media and technology organization: people. Presenters examined the roles of culture, core values, and inclusivity as tools to help understand and address the requirements of today's workforce.

New immersive technologies such as omnidirectional videos or augmented scene displays mandate new forms of storytelling. The session "Living in a Virtual World," chaired by Siegfried Foessel of Fraunhofer IIS, highlighted observed user behavior in omnidirectional videos and offered guidance for immersive virtual-world experiences.

Renard Jenkins of PBS chaired a session on production and post-production, with presentations including "Berlin Leichtathletik-EM: Lessons from a Live, HDR, HFR, UHD, and Object-Based Audio Sports Event" and "Case Study—The Mother of All Tests for UHD Introduction at the Canadian Broadcasting Corporation." Jenkins

also chaired an Image Acquisition session, featuring presentations such as "In-Camera, Photorealistic Style Transfer for On-Set Automatic Grading" and "Creative Grading—Or Why a New Way of Broadcast Camera Control Is Needed."

Presenters channeled Rod Serling from "The Twilight Zone" television series in the sessions "The Future of Light and Sound and The Future of Time and Space," chaired by William Redmann of Technicolor. Presentations included "Sound and Fury: Bringing Dolby Atmos to the National Hot Rod Association," "Architectural and Engineering Considerations for Direct View LED as Applied to the Cinema," "Beyond SMPTE Timecode," and "Broadcast Channel Origination as a Service."

The culminating event on Thursday evening was the SMPTE 2018 Awards Gala and afterparty, held in the San Francisco Ballroom of the Westin Bonaventure Hotel & Suites. Dean McFlicker, producer, director, and one of the Hollywood's leading marketing experts, served as host of the year's program, recognizing individuals for their technical achievements and contributions within the media and entertainment industry.

Along with leadership from SMPTE and the HPA, McFlicker guided guests through the awards ceremony. The Society's highest honor, Honorary Membership, was awarded to Charles A. Steinberg in recognition of his leadership role at both Ampex and Sony for more than 45 years, where he turned the technical visions of industry leaders into television realities. Steinberg has participated in and led engineering/technology and business teams that have brought many innovations to the broadcasting field.

SMPTE presented its most prestigious award, the Progress Medal, to Craig Todd in recognition of more than four decades of innovation in the delivery of digital multichannel sound to the theater and the home, as well as significant contributions to HDR imagery and steadfast support of the standards process worldwide.

Medal recipients included Robert Neuhauser, the Camera Origination and Imaging Medal; Hugo P. Gaggioni, the David Sarnoff Medal, sponsored by SRI International; Tim Borer, the Digital Processing Medal; Robert J. Heiber, the James A. Lindner Archival Technology Medal, sponsored by James A. Lindner; David R. Schwind, the Samuel L. Warner Memorial Medal sponsored by Warner Bros.; Rod Bogart, the Technicolor—Herbert T. Kalmus Medal, sponsored by Technicolor Inc.; and Fabrice Bellard, the Workflow Systems Medal, sponsored by Leon D. Silverman.

The Journal Award for the most outstanding paper originally published in *SMPTE Motion Imaging Journal* during the preceding calendar year was presented to Sean T. McCarthy for the article "A Biologically Inspired Approach to Making HDR Video Quality Assessment Easier." Two Journal Certificates of Merit were presented: one to Jaclyn Pytlarz, Elizabeth Pieri, and Robin Atkins for the article "Objectively Evaluating High-Dynamic-Range and Wide-Color-Gamut Color Differences," and the other to Nikolaus Kero, Thomas Kernen, and Tobias Muller for the article "Efficient Monitoring of ST 2059-2 Based Time Transfer Performance."

The Presidential Proclamation was presented to Phil Laven and John Ross in recognition of their established and outstanding status and reputation in the motion-picture, television, and motion-imaging industries worldwide. S. Merrill Weiss received the Excellence in Standards Award for his more than four decades of participation and more than three decades of leadership in the development of SMPTE's standards. The Citation for Outstanding Service to the Society, which recognizes individuals for dedicated service for the betterment of the Society over a sustained period, was presented to Charles Reti and Peter Stavrianos.

The Student Paper Award was presented to Jason Bud Ginsberg and Neil Movva, students at Stanford University, for their paper "Dynamic Field of View in a Tomographic Light Field Display." Emily Faw, a recent graduate of RIT who is now a color science technician at Technicolor, received an honorable mention for her paper "What Does a High Dynamic Range Mean: Creating a High Dynamic Range Workflow for Film Students." Catherine Meininger, a recent graduate of RIT who is now a color scientist at Portrait Displays Inc., received an honorable mention for her paper "Determining Visibility Thresholds for Spatial and Spatiotemporal Chromatic Noise."

The Louis F. Wolf Jr. Memorial Scholarship was presented to three SMPTE Student Members: Grace Annese, RIT; Angie Urbina, Pasadena City College; and Jake Zuena, RIT.

Full conference registrants received access to the presentations and technical papers just prior to the event. Videos of sessions are also available to attendees and then to the general public in the last week of January. Subscribers to conference proceedings in the SMPTE digital library hosted on the IEEE *Xplore* platform will have access to the presentations and papers around the same time that the videos become available. Information about next year's event is posted at www.smpte.org.

Videos of the conference are available for on-demand viewing at youtube.com/smpte.connect.

Event Highlights