

Exhibitors' Forum Schedule

TUESDAY, MAY 14, EXECUTIVE BALLROOM

Session F1: DISPLAY DESIGN AND MANUFACTURING

11:00 am – 12:45 pm

F1.1: Enabling Display Innovations Through New Developments in Open Industry Standards (11:00)

Craig Wiley, Video Electronics Standards Association (VESA), San Jose, CA

Booth 641

The Video Electronics Standards Association (VESA) will present new advancements in VESA display standards that push resolutions beyond 8K and enable life-like AR/VR. Also featured are high-dynamic-range (HDR) certification for monitors including OLED and notebooks, higher display interface compression rates, and new efforts for high-resolution automotive displays.

F1.2: Pixel-Grade Local Dimming for High Dynamic Range (11:15)

Ming Chen, BOE Technology Group Co, Ltd., Beijing, China

Booth 808

An ultra-high-definition display incorporating high dynamic range (HDR) and 5G content-delivery provides a great viewing experience. This presentation will introduce the HDR technology trend and describe future requirements for display devices to fulfill the HDR standard. Black Diamond is a technology that uses two LCD cells together to achieve a pixel-grade local-dimming approach that will highly improve the contrast detail for LCD devices. A comparison will be made among current mainstream HDR technologies, including Black-Diamond, miniLED, OLED, etc. Technology advances and marketing strategies for Black Diamond will be presented in detail.

F1.3: Lamination Automation and Integration (11:30)

Raymond Wiley, Sun-Tec, Scottsdale, AZ

Booth 1039

Factors such as rising labor costs and skilled-labor shortages are driving the demand for more automation in manufacturing lines around the world. This presentation covers how automation is being used to off-set those factors for the lamination process, and what display and material technologies are shaping future automation.

F1.4: Breakthrough Technology for Open Defects Repair (11:45)

Filip Granek, XTPL S.A., Wroclaw, Dolynslask, Poland

Booth 431

Printing a wide range of nanomaterials while making the process scalable is a central problem for industries that are shaping the technological landscape of the twenty-first century. In this regard, XTPL's technology can help transform the display industry. XTPL's presentation focuses mainly on three key aspects: repair of open defects, fabrication of transparent conductive films (TCFs), and deposition of quantum dots, all of which offer tremendous advantages to additive manufacturing.

(continued)

TUESDAY, MAY 14, EXECUTIVE BALLROOM

Session F1: DISPLAY DESIGN AND MANUFACTURING

11:00 am – 12:45 pm

F1.5: Creating New Applications with Next-Generation E-Paper

(12:00)

Flora Yang, CLEARink Displays, Fremont, CA

Booth 539

Reflective displays have been sought after for their low power and sunlight-readable attributes, but affordable color and video have been elusive until “e-Paper 2.0.” This talk will review the progress of a novel reflective display technology with video speeds and high luminance that can be manufactured in an LCD factory. CLEARink Displays is a Silicon Valley startup that was spun out of the University of British Columbia. The technology is based on total internal reflection (TIR) and electrophoresis. The displays were first shown at SID’s Display Week 2017, where they won a Best in Show award. Accompanying this presentation will be live display demos that feature 80-percent+ white-state reflectance and video running at over 30 frames per second (fps).

F1.6: Expanding the Universe of Electrophoretic Display Platforms

(12:15)

Michael McCreary, E Ink Corp., Billerica, MA

Booth 616

E Ink electrophoretic display (EPD) technology is widely known for its broad use in reflective displays such as those in electronic readers and, more recently, in electronic shelf labels, signage, wearables, and architecture. In addition, demonstrated E Ink technology platforms now also include flexible, no-CFA Advanced Color e-Paper (ACeP), magnetically writeable ink (JustWrite), and variable-transmission and variable-opacity window films. These new technologies and their potential applications will be described along with pictures and videos of the displays.

F1.7: Enabling Display Systems

(12:30)

James Henry, Digital View, Morgan Hill, CA

Booth 1622

Many of today’s mainstream applications for displays started as small-volume niches. Digital View has been helping companies with new display applications for nearly 25 years. This presentation will explore the development of new markets and uses for displays.

TUESDAY, MAY 14, EXECUTIVE BALLROOM

Session F2: DISPLAY METROLOGY

2:00 – 2:30 pm

F2.1: Augmented and Mixed-Reality Display Metrology for R&D and Production Quality Assurance (2:00)

Sonika Obheroi, Gamma Scientific, San Diego, CA

Booth 1434

Proper display metrology for AR and MR displays that yields repeatable and reproducible color, luminance, resolution, field curvature, binocular convergence, and distortion correlating to eye perception is difficult to achieve. The Gamma Scientific-patented HiResNEDcam telescope-based systems with autofocus and sub-arcminute resolution make these measurements routine.

F2.2: New Progressive Technological Instruments Enable Evaluation of VR/AR and Curved OLED Screens (2:15)

Randy Klimek, Konica Minolta Sensing Americas, Ramsey, NJ

Booth 1528

Konica Minolta Sensing Americas presents breakthrough technology for evaluating increasingly sophisticated modern display applications such as VR/AR and curved OLED screens. Come join the company as it introduces its Spectroradiometer CS-2000A, optimized for measuring absolute spectrums of virtual images. In addition, the discussion will include Konica's Color Analyzer CA-410, which is used for high-speed measurement of precise luminance, chromaticity, and flicker of HDR displays including curved OLED screens.

Session F3: TOUCH TECHNOLOGY

2:30 – 3:00 pm

F3.1: Advanced Infrared Interaction Sensors (2:30)

Richard Berglind, Neonode, Inc., San Jose, CA

Booth 742

Neonode provides infrared sensor modules suitable for a wide variety of interaction technology, ranging from touch to mid-air controls. The optical technology behind the sensors makes them suitable not only for flat surfaces but also for cylindrically concave surfaces, which makes it possible to add touch to curved or rollable displays.

F3.2: On-Cell Touch (2:45)

Straight Liu, JMO Display, Singapore

Booth 340

JMO's overview presentation will include a discussion of the company's milestones with regard to on-cell products; on-cell technology compared to G+G CTP; general advantages of on-cell technology; and a description of the different product models available.

WEDNESDAY, MAY 15, EXECUTIVE BALLROOM

Session F4: DISPLAY COMPONENTS

10:45 am – 12:00 pm

F4.1: Glass for the Growing Oxide Market

(10:45)

Po-Hua (PH) Su, Corning, Inc., Corning, NY

Booth 1119

The oxide display market continues to emerge as an important opportunity for the industry. In this presentation, Corning examines one view of the market and technology, and shares how Corning display glass fulfills and exceeds glass requirements for oxide panels.

F4.2: FTO, a Building Block for Transparent Electronics on Glass

(11:00)

Neil McSporran, Pilkington North America, Toledo, OH

Booth 1640

Although indium tin oxide (ITO) is the most well-known transparent conductive coating, fluorine-doped tin-oxide (FTO) is used in large volumes under the brand name NSG TEC. This presentation describes new NSG TEC developments and provides a variety of examples of its use in a wide range of applications.

F4.3: Test and Validation Techniques for Advanced Display Driver ICs and the Panels They Drive

(11:15)

Mohamed Hafed, Introspect Technology, Montreal, QC

Booth 1813

The proliferation of small-format displays in smartphones, AR/VR headsets, and mobility solutions is creating unprecedented demands on bandwidth, power dissipation, and color accuracy. This presentation explains the latest advances in DDIC high-speed interface technologies such as MIPI and best practices for verifying both the DDIC interface and the entire panel.

F4.4: The Magic of Transparency

(11:30)

Anthony Uhrick, Lumineq Beneq, Inc., Duluth, GA

Booth 1811

Learn about electroluminescent displays with glass-like transparency, high luminance, and a 360-degree viewing angle. In-glass laminated Lumineq displays add value to windows and improve the safety and ergonomics of transportation, aviation, marine, and optical devices.

F4.5: Capacitive Touch Panels

(11:45)

Wai Kuen Anthony Wong, Pacific Goal Optronics Limited, Yuen Long, Hong Kong

Booth 1703

Pacific Goal Optronics, Ltd., specializes in the research and development and manufacturing of high-quality display modules and capacitive touch panels.

WEDNESDAY, MAY 15, EXECUTIVE BALLROOM

Session F5: AR/VR

2:15 – 3:15 pm

F5.1: Key Factors of Optical Measurement for AR-Type Eyewear Displays (2:15)

Molly Mou, Sensing, Deqing, Zhejiang, China

Booth 1839

Augmented reality superimposes computer-generated scenes onto a user's view of the real physical world. The challenge for AR display systems is to convey a sense of reality to the user. How to accurately quantify the problem becomes critical in AR glass engineering. In this talk, optical performance and image quality are overviewed and introduced in factors that affect 1) the see-through image, 2) the virtual image under ambient performance, and 3) the fused image, which is the interaction between the see-through scene image and the virtual one.

F5.2: Latest Display Processing for Superior VR (2:30)

Vassilis Androutsopoulos, Arm, San Jose, CA

Booth 842

Arm's display solutions deliver superior image quality and address the performance, power, and costs needed for a wide range of devices. Arm's latest display offering – being launched at Display Week – will shape the way in which application processors drive future VR/AR head-mounted displays.

F5.3: OLED Microdisplays: Choosing the Right Device for Your Application (2:45)

Judith Baumgarten, Fraunhofer FEP, Dresden, Germany

Booth 1417

This talk will discuss different near-to-eye applications and how to identify the most appropriate display types. This includes applications for rare content changes (<25 Hz), fully immersive applications in a VR environment (up to 120 Hz), and applications for displays combined with sensor functionality for creating a human-machine interface.

F5.4: OptoFidelity HMD IQ Near-to-Eye Display Testing in AR/VR Headsets (3:00)

Juha Lystila, Optofidelity, Inc., Tampere, Finland

Booth 333

OptoFidelity has developed "HMD IQ," a robotized display-analysis system for near-to-eye displays in AR/VR headsets. The system mimics human vision with full FoV image capture, realistic pupil distance, and 1-arcminute resolution. HMD IQ supports C-mount cameras and includes calibration as a package for flat-field, luminance, distortion, color aberration, and MTF.

WEDNESDAY, MAY 15, EXECUTIVE BALLROOM

Session F6: QUANTUM DOTS AND MICRODISPLAYS

3:15 – 3:45 pm

F6.1: The Future of MicroLED Displays Using Next-Generation Technologies

(3:15)

Clive Beech, Plessey Semiconductors, Ltd., Plymouth, UK

Booth 1922

This presentation will focus on Plessey's pioneering proprietary approach to enable the manufacturing of monolithic microLED arrays using gallium nitride (GaN)-on-silicon (Si) technologies to develop better optimized AR or MR display applications. It describes the problems associated with incumbent microdisplay technologies and the challenges that remain for pixel sizes of eight microns and subpixels of approximately four microns.

F6.2: QDNP Color-Conversion Technology

(3:30)

Chen Chen, Saphlux, Inc., Branford, CT

Booth 1914

Realizing both technical challenges and high costs in achieving full-color RGB microLEDs for consumer products, Saphlux developed an innovative color-conversion technology named NPQD that can enable high-efficiency, low-cost, and mass-producible full-color microLEDs. The company provides this solution for industry customers for microLED applications in mobile devices, AR/VR glasses, etc.

THURSDAY, MAY 16, EXECUTIVE BALLROOM

Session F7: AUTOMOTIVE TECHNOLOGY AND APPLICATIONS

9:30 – 10:00 am

F7.1: Technology for the Future

(9:30)

Robert Dohring, Futaba Corp. of America, Wixom, MI

Booth 534

Futaba Corp. has been producing vacuum fluorescent displays (VFDs) since the '50s for consumer products and since the '70s for the automotive industry. During the last few years, Futaba has added organic light-emitting diode (OLED) displays and projected-capacitive touch panels (CTPs) to its product offerings.

F7.2: New Advances in Optical Bonding for Current and Future Designs

(9:45)

Hiroyuki Ueno, Momentive Performance Materials, Inc., Waterford, NY

Booth 332

Momentive is a pioneer in automotive optical bonding. Its InvisiSil SnapCure silicones are widely used across the industry to provide long-term reliability to displays in extreme conditions. At Display Week, learn how different curing processes like UV, thermal, and delayed curing can help you achieve the best performance from your displays.

Session F8: OLEDs

10:00 – 10:45 am

F8.1: High-Entropy Noncrystallizable OLEDIQ Hosts for TADF and Phosphorescent OLEDs

(10:00)

Mike Moltaire, Molecular Glasses, Inc., Rochester, NY

Booth 1803

Managing excitons is essential for optimizing the performance of OLED devices. Molecular Glasses' high-entropy noncrystallizable OLEDIQ organic semiconductors efficiently prevent aggregation of emitter materials to minimize or avoid triplet-triplet annihilation (TTA), and/or triplet-polaron quenching (TPA). The result is enhanced device lifetime and performance. The HOMO/LUMO and triplet/singlet energies are tailored to the specific emitter molecule and emission mechanism: phosphorescent or TADF.

F8.2: Materials and Analytical Services for OLEDs

(10:15)

Ryoko Maeda, Toray Research Center, Inc., Chuo-ku, Tokyo

Booth 234

Toray Group provides a wide variety of cutting-edge materials and analytical services for display components of TFTs, LCDs, LEDs, and OLEDs. In particular, Toray Research Center (TRC) specializes in analytical services that can solve the problems in manufacturing processes and improve materials to realize next-generation displays.

F8.3: New High-Resolution ESJET Printing for Solution Processing of AMOLEDs

(10:30)

Christine Boeffel, Fraunhofer IAP, Munich, Germany

Booth 1417

The development of ESJET technology, a common project from Fraunhofer IAP, imec, and TNO/Holst Centre, is presented. ESJET has successfully overcome limitations of inkjet printing, thus allowing for high-resolution printing exceeding the current state-of-the-art technology in quality. A further increase of resolution down to 1 μm is foreseeable.

THURSDAY, MAY 16, EXECUTIVE BALLROOM

Session F9: DISPLAY COMPONENTS

11:00 am – 1:00 pm

F9.1: High-Performance Transparent Conductive Films (11:00)

Chung Pui Chan, Flectrode Technology, Ltd., Kowloon Bay, Hong Kong

Booth 1614

A new TCF technology with outstanding properties has been developed by Flectrode. With proprietary direct-pattern forming technology, Flectrode is able to offer TCF with outstanding electrical conductivity and reliability, which can be directly applied to a variety of electronic products like microLEDs, OLEDs, sensors, EM wave shielding, 5G antennas, and other emerging display applications. The unique embedded structure makes Flectrode's TCF outperform most of the existing technologies on the commercial market.

F9.2: Key Material for Flexible Touch: Silver Nanowire Transparent Conductive Films (11:15)

Haixia Dai, Cambrios Film Solutions, Taoyuan City, Taiwan

Booth 942

Curved, flexible, foldable, and stretchable are key technology trends for next-generation displays, touchscreens, and wearable electronic devices. Cambrios Film Solutions has developed and commercialized a flexible transparent conductive ITO-alternative material, Cambrios film, consisting of a percolated silver nanowire network that offers sheet resistances ranging from 5 to 300 ohms/square. The Cambrios film has excellent optical properties: >91 percent total transmission and <0.2 percent total haze at 70 ohms/square or higher. Moreover, the film has extreme flexibility and bendability, with stable film resistance for >400,000 cycles at 1 mm bend radius. ClearOhm silver nanowire transparent conductive film is one of the most promising transparent electrode materials for tomorrow's flexible and bendable devices.

F9.3: Functional Film Solutions: Recent Trends in Next-Generation Displays (11:30)

Chein-Yi Kao, BenQ Materials Corp., Taoyuan, Taiwan

Booth 1722

With the coming of technologies such as 8K, IoT, and foldable displays, BenQ, as a functional film maker, provides solutions for features such as high resolution, high durability, and flexibility.

F9.4: R&D Coating Center for Optical Applications (11:45)

Nic Newby, Yasui Seiki-Mirwec Coating, Bloomington, IN

Booth 841

Yasui Seiki-Mirwec Coating's technologies, both MICROGRAVURE and slot die, have contributed to developing optical films for displays for over 40 years in Japan. The company's R&D coating center in Indiana can provide support from sample production to contract coating, and its experienced coating engineers are readily available for consultation. In its presentation, the company will introduce the coating technologies, and describe successful coating examples for optical application, as well as its service details.

F9.5: High-Impact Absorbent Acrylic Foam and Silicone OCA Technology (12:00)

Kensuke Kato, Iwatani Corp., Houston, TX

Booth 1628

Iwatani Corp. provides high-performance film and industrial tape products specialized for electronic devices. Its acrylic foam, ISR-ACF series, has high impact-absorbing performance, and its silicone OCA has high optical properties suitable for mobile devices. With their innovative technologies and superb analysis, Iwatani's products provide the possibility of different design concepts for customers to develop freely.

(continued)

THURSDAY, MAY 16, EXECUTIVE BALLROOM

Session F9: DISPLAY COMPONENTS

11:00 am – 1:00 pm

F9.6: Technologies for Automotive Applications

(12:15)

Jerry Wu, Dexerials Corp., San Jose, CA

Booth 540

Dexerials Corp. started as a company that manufactured different products for consumer electronics. By advancing core material technologies as well as process technologies, it created a series of value-added products for automotive applications as well. Dexerials is presenting solutions for displays, cameras, mirrors, HUDs, and battery applications.

F9.7: Wide-format OPT Alpha-GEL for Optical Bonding Applications

(12:30)

Jim Su, Taica North America Corp., Santa Clara, CA

Booth 233

Taica Corp. has developed a 1.3-m (1,300 mm) wide version of its silicone-based optical bonding material, OPT Alpha-GEL. This material is designed for large-size displays/touch-panels (for >80 in. dia.), and is available in thicknesses from 0.2 mm (200 µm) to 1.8 mm. Wide-format OPT Alpha-GEL offers the same excellent yellowing resistance, wide use-temperature capability (-40 C to +150 C), and easy reworkability that OPT Alpha-GEL customers have come to expect.

F9.7: Optical Bonding; The Atmospheric Bonding Strategy

(12:45)

Alex Giordano, PVA, Cohoes, NY

Booth 442

Optical bonding is now considered a requirement in smart surface applications throughout industrial signage, aerospace, and most notably the automotive industry. We will review the atmospheric optical bonding strategy and technologies used to control the modern production line.