Session 1: Annual SID Business Meeting  
Tuesday, May 10, 2022 / 8:00 – 8:20 am / Room 220A

Session 2: Opening Remarks / Keynote Addresses  
Tuesday, May 10, 2022 / 8:20 – 10:20 am / Room 220A  
Chair: Ruiqing (Ray) Ma, Nanosys  
2.1: Keynote Address 1: The New Normal and Displays, Soo-Young Yoon, LG Display Co., Ltd.  
2.2: Keynote Address 2: Displays for AR/VR: Challenges and Trends, Joseph O’Keeffe, Meta  
2.3: Keynote Address 3: Empowering IoT with Displays — the Future and the Pathways, Xiaguoang Xu, BOE Technology Group Co., Ltd.

Session 3: QD-LEDs I (Emissive, Micro-LED, and Quantum-Dot Displays)  
Tuesday, May 10, 2022 / 11:10 AM - 12:30 PM / Room 220C  
Chair: Norman Bardsley, Bardsley Consulting  
Co-Chair: Jonathan Steckel, ST Microelectronics  
3.1: Invited Paper: Failure Mechanism of Cadmium-Based Blue Quantum Dot Light-Emitting Diodes by using Electrochemical Impedance Spectroscopy and Stabilization of Core-Shell ZnO Nanoparticles  
Baek Kim, NanoPhotonica, Gainesville, FL US  
3.2: Analyzing the Degradation Process of Quantum-Dot LEDs (QLEDs) by Mass Spectrometry  
Hinwai Ma, Fukuoka i3-Center for Organic Photonics and Electronics Research (i3-opera), Fukuoka, Japan  
3.3: Distinguished Paper: All Inkjet-Printed RGB Cd-Free EL-QD Devices with Top-Emission Structure  
Myoungjin Park, Samsung Display Co., Ltd., Yongin, South Korea  
3.4: Highly Efficient Green Top-Emission Light-Emitting Diodes Based on Indium Phosphide Quantum Dot  
Di Zhang, BOE Technology Group Co., Ltd., Beijing, China

Session 4: Oxide TFTs for OLED Displays (Active Matrix Devices)  
Tuesday, May 10, 2022 / 11:10 AM - 12:10 PM / Room LL21CD  
Chair: Mike Hack, Universal Display Corporation  
Co-Chair: Yustin Lin, Applied Materials, Inc.  
4.1: Development of Ultra-Large 95inch 8K 120Hz OLED Display  
Zhongyuan Wu, Hefei BOE Joint Technology Co., Ltd., Hefei, China  
4.2: High Performance, Coplanar Polycrystalline InGaO Thin Film Transistor for Large Area, High Resolution AMOLED Display  
Jin Jang, Kyung Hee University, Seoul, South Korea  
4.3: Invited Paper: High Mobility Oxide Thin-Film Transistors for AMOLED Displays  
Joon Seok Park, Samsung Display, Inc., Yongin, South Korea

Session 5: Advanced Compensation Techniques (Display Electronics)  
Tuesday, May 10, 2022 / 11:10 AM - 12:10 PM / Room LL21EF  
Chair: Taesung Kim, Google LLC  
Co-Chair: Soo-Yeon Lee, Seoul National University  
5.1: Implementation of Full-Panel Circuit Models for Interference Estimation Between Touch and Display Operation in On-Cell Touch AMOLED  
Seung-Hun Choi, Korea University, Seoul, South Korea  
5.2: Tracing-Based Degradation Estimation Method for Stress Profile Algorithm  
Seokha Hong, Samsung Display, Yongin, South Korea  
5.3: A Random Access Gate Driver Using a-IGZO TFTs for External Compensation of High-Resolution, High-Frame-Rate AMOLEDs  
Byong-Deok Choi, Hanyang University, Seoul, South Korea

Session 6: AR/MR - LC Optics and Displays (Liquid Crystal Technology)  
Tuesday, May 10, 2022 / 11:10 AM - 12:10 PM / Room LL20BC  
Chair: Lu Lu, Facebook Reality Labs  
Co-Chair: Shin Tson Wu, University Of Central Florida  
6.1: Invited Paper: Tutorial on Diffractive Liquid Crystal Devices for AR/VR Displays  
Shin-Tson Wu, University of Central Florida, Orlando, FL US  
6.2: Invited Paper: High-PPI Fast-Switch Display Development for Oculus Quest 2 VR Headsets  
Cheonhong Kim, Meta, Sunnyvale, CA US

Session 7: Under Display Camera Systems (Interactive Displays and Systems / Display Electronics / OLEDs)  
Tuesday, May 10, 2022 / 11:10 AM - 12:50 PM / Room LL20A  
Chair: Jongseo Lee, Google
Co-Chair: Martin Grunthaner, Apple

7.1: Invited Paper: UDC Technology for OLED Display
Junhui Lou, Visionox Technology Inc., Kunsan, China

7.2: High Transmittance Under-Display Camera Structure with COE
Chuanxiang Xu, BOE, Beijing, China

7.3: OLED Camera-Under Panels with Improved Imaging Quality
Lei Wang, Wuhan Tianma Microelectronics, Wuhan, China

7.4: Correction Algorithm for Under-Display Camera Area on AMOLED Display
Shang-Yu Su, Novatek Microelectronics Corporation, Hsinchu, Taiwan ROC

7.5: Synthetic Dataset for Improving UDC Video Restoration Network Performance
Hyunjoo Hwang, Samsung Display, Youngin, South Korea

Session 8: QD-LEDs II (Emissive, Micro-LED, and Quantum-Dot Displays)
Tuesday, May 10, 2022 / 2:00 PM - 3:40 PM / Room 220C
Chair: Jean-Jacques Drolet, Osram Opto Semiconductors
Co-Chair: Jonathan Steckel, ST Microelectronics

8.1: Invited Paper: Development of High Efficiency QLED Technology for Display Applications
Yanzhao Li, BOE Technology Group Co., Ltd., Beijing, China

8.2: Invited Paper: Development of Active-Matrix nanoLED Display Using Heavy Metal Free QDs Patterned by Photolithography Process
Yohei Nakanishi, Sharp Display Technology Corporation, Nara, Japan

8.3: Development of Highly Efficient RGB Cadmium-Free Quantum Dot Light-Emitting Diodes
Tatsuya Ryowa, Sharp Corporation, Tenri, Japan

8.4: Degradation Analysis of InP-Quantum Dot Light-Emitting Diodes
Raju Lampande, Kyung Hee University, Seoul, South Korea

8.5: Inkjet-Printed Quantum Dot/Organic Semiconductor Nanohybrids for Efficient InP-Based Quantum Dot Light-Emitting Diodes
Yohan Kim, Fraunhofer Institute for Applied Polymer Research (IAP), Potsdam, Germany

Session 9: High Performance TFT Sensors (Active Matrix Devices / Emerging Technologies and Applications)
Tuesday, May 10, 2022 / 2:00 PM - 3:20 PM / Room LL21CD
Chair: Yusin Lin, Applied Materials, Inc.
Co-Chair: Vincent Gu, Apple, Inc.

9.1: Evaluation of X-Ray Resistance of Submicron-Size c-Axis Aligned Crystalline Oxide Semiconductor
Kazuki Tsuda, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

9.2: Oxide TFT Behavior Under X-ray Irradiation in DXD Backplane
YounGyoung Chang, LG Display, Seoul, South Korea

9.3: Widening the Wavelength Absorption Range of Indium Gallium Zinc Oxide Phototransistors through the Capping Layer
Hyon Jae Kim, Yonsei University, Seoul, South Korea

9.4: Fabrication of the Indirect X-Ray Detector Using Organic Photodiode
Kyung-Tae Kang, Korea Institute of Technology (KITECH), Ansan, South Korea

Session 10: High-PPI OLED and Micro-LED Displays (Display Electronics)
Tuesday, May 10, 2022 / 2:00 PM - 3:00 PM / Room LL21EF
Chair: Carlin Vieri, Google
Co-Chair: Hyoungsik Nam, Kyung Hee University

10.1: Layout of 1.50-inch, 3207-ppi OLED Display with OSLSI/SiLSI Structure Capable of Division Driving Fabricated through VLSI Process with Side-by-Side Patterning by Photolithography
Toshio Saito, Semiconductor Energy Laboratory Co. Ltd., Atsugi, Japan

10.2: Dual-Driver Pixel Circuit and Associated Drivers for Low-Power OLEDs Microdisplays
Sheida Gohardehi, University of Waterloo, Waterloo, ON Canada

10.3: A Novel PAM-PWM Hybrid Driving Method for Micro-LED Displays
Yingteng Zhai, Tianma Microelectronics Co., Ltd., Shanghai, China

Session 11: AR/MR - High Speed LC (Liquid Crystal Technology)
Tuesday, May 10, 2022 / 2:00 PM - 3:00 PM / Room LL20BC
Chair: Takahiro Ishinabe, Tohoku University
Co-Chair: Hoi-Sing Kwok, Hong Kong University of Science & Technology

11.1: 100 Microseconds Response In-Plane Only Retardation Switching by Applied Voltage Polarity Dependent Smectic Liquid Crystals
Akhtiro Mochizuki, i-CORE Technology, LLC, Louisville, CO US

11.2: High Brightness and Ultra-high PPI Field-Sequential-Color (FSC) Display based on Deformed Helix Ferroelectric Liquid Crystal for VR/AR
Zhibo Sun, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

11.3: Invited Paper: New Materials for Film Optics and Game Changing Head Mount Devices
Owain Parri, Merck Performance Materials Ltd., Southampton, United Kingdom

Session 12: Integrated Optical Sensing Displays (Interactive Displays and Systems)
Tuesday, May 10, 2022 / 2:00 PM - 3:20 PM / Room LL20A
Chair: Jeff Han, Consultant
Co-Chair: Steven Bithich, Microsoft

12.1: Invited Paper: Through-OLED Ambient Color Sensing
Kenneth Vampola, Apple, Cupertino, CA US

12.2: High Accuracy In-Cell Integrated Ambient Light and Color Temperature Sensor LCD
Hui Guang Liu, TCL China Star Optoelectronics Technology Co., Ltd., Wuhan, China
Session 13: QD-LEDs III (Emissive, Micro-LED, and Quantum-Dot Displays)
Tuesday, May 10, 2022 / 3:40 PM - 5:20 PM / Room 220C
Chair: Seth Coe-Sullivan, NS Nanotech
Co-Chair: Jonathan Steckel, ST Microelectronics

Wenyong Liu, TCL, Shenzhen, China

13.2: Modification of ZnMgO NPs for Improving Device Performance of All-Inkjet-Printed Quantum Dot Light-Emitting Diodes
Jaekook Ha, Samsung Display Co., Ltd., Yongin, South Korea

13.3: Invited Paper: Large-Area Solution-Processed NIR and SWIR Sources Based on Colloidal Quantum Dots
Ted Sargent, University of Toronto, Toronto, Canada

13.4: Invited Paper: Progress in SWIR Colloidal Quantum Dot Light Emitters: LEDs, Downconverters and Lasers
Gerassimos Konstantatos, ICFO, Castelldefels, Spain

13.5: Quantum Dot-in-Perovskite Near Infrared Light-Emitting Diodes
Abd. Rashid Yusoff, Pohang University of Science and Technology (POSTECH), Pohang, South Korea

Session 14: Advanced IGZO/LTPS Devices (Active Matrix Devices)
Tuesday, May 10, 2022 / 3:40 PM - 5:00 PM / Room LL21CD
Chair: Kenichi Takatori, Huawei Technologies Japan K.K.
Co-Chair: James Chang, Apple, Inc.

Taeyoung Khim, Samsung OLED Business, Yongin, South Korea

14.2: Enhanced Electrical Characteristics of Low-Temperature Processed In-Ga-Zn-O Thin-Film Transistors with Oxygen Scavenging Layer
Hyun Jae Kim, Yonsei University, Seoul, South Korea

14.3: Extremely Short-Channel LTPS TFT Technologies for High-Performance Low-Power and Reliable AMOLED Displays
Kwonwoo Kim, Samsung Display, Yongin, South Korea

14.4: Enhanced Low Temperature Polycrystalline Silicon Thin Film Transistor Device Structure by Doping at Channel Edge
Seunghyun Jung, Samsung Display Company, Yongin, South Korea

Session 15: Ultra Low Power Driving, High-Speed I/F and IC Architecture (Display Electronics)
Tuesday, May 10, 2022 / 3:40 PM - 4:40 PM / Room LL21EF
Chair: Dr. Bong-Hyun You, Samsung Display Co.
Co-Chair: Dr. Juhn Yoo, LG Display

15.1: A Novel Multi-Frequency Driving of OLED for Low Power Consumption
Sangun Kwon, Samsung Display, Yongin, South Korea

15.2: A 6.0Gbps Clock Embedded Interface for Advanced Mobile Display
Dongwon Park, Samsung Display, Yongin, South Korea

15.3: Cost-Effective Display Driver IC Architecture for First Frame Drop Compensation with Shared Memory Interface
Jin-Yong Park, Samsung Electronics Co., Gyeonggi, South Korea

Session 16: AR/MR - LC Lenses and Components (Liquid Crystal Technology)
Tuesday, May 10, 2022 / 3:40 PM - 4:40 PM / Room LL20BC
Chair: Linghui Rao, Meta (Facebook)
Co-Chair: Michael Wittek, Merck KGaA

16.1: Optical Performance Characterization of 5 cm Aperture Size Continuous Focus Tunable Liquid Crystal Lens for Resolving Accommodation-Convergence Mismatch Conflict of AR/VR/3D HMDs
Amit Blowowick, Kent State University, Kent, OH US

16.2: Distinguished Paper: Thin and Low-Reflection Metal Black Matrix for High PPI LCD
Keisuke Yoshida, Sharp Display Technology Corporation, Tenri, Japan

16.3: Compact Tunable Alvarez Lens Based on Pancharatnam-Berry Optical Elements
Yan Li, Shanghai Jiao Tong University, Shanghai, China

Session 17: Capacitive Touch (Interactive Displays and Systems)
Tuesday, May 10, 2022 / 3:40 PM - 5:00 PM / Room LL20A
Chair: Dr. John Zhong, Apple, Inc.
Co-Chair: Patrick Worfolk, Synaptics

17.1: Self-Capacitive Touch Sensor Design for OLED On-Cell Touch
Yu-Ting Tang, Novatek Microelectronic Corp., Hsinchu, Taiwan ROC

17.2: Integrated Self-Capacitance Touch Panel for Flexible OLED Display
Feng Lu, Shanghai Tianma Micro-electronics Co., Ltd., Shanghai, China

17.3: A Novel Solution to Proximity Detection with On-Cell Capacitive Touch Sensor
Sooong Lee, Samsung Display, Yongin, South Korea

17.4: An Avionics Touchscreen Display for Safety Critical Applications
Philippe Coni, Thales Avionics SAS, Merguez, France

Wednesday, May 11, 2022 / 9:00 AM - 10:00 AM / Room 220B
Chair: Jisoo Hong, Korea Electronics Technology Institute
Co-Chair: Soon-Gi Park, LetinAR
Qi Sun, New York University, Brooklyn, NY US
18.2: Assessment of Image Quality in Augmented Reality Displays Using a Computational Model of Target Detectability
Chumin Zhao, U.S. Food and Drug Administration, Silver Spring, MD US
18.3: 3D Image Quality Evaluation Method Based on Image Comparison Metrics
Young-sang Ha, Samsung Display, Yongin, South Korea

Session 19: QD Color Conversion I (Emissive, Micro-LED, and Quantum-Dot Displays)
Wednesday, May 11, 2022 / 9:00 AM - 10:20 AM / Room 220C
Chair: John Van Derlofske, 3M
Co-Chair: Michele Ricks, EMD Electronics
19.1: Invited Paper: Quantum Dot Display
Shinae Jun, Samsung Advanced Institute of Technology, Suwon, South Korea
19.2: Design Heuristics of Color Conversion Films in Micro LED Displays
Khaled Ahmed, Intel Corporation, San Jose, CA US
Ray-Kuang Chiang, Taiwan Nanocrystals Corp. Ltd., Tainan City, Taiwan ROC
19.4: Triboelectric Discharging Problems in QD-OLED Manufacturing and Solutions Using Electromagnetic Analysis
Hyun Sung Park, Samsung Display, Yongin, South Korea

Session 20: Advanced Active Matrix Backplanes (Active Matrix Devices)
Wednesday, May 11, 2022 / 9:00 AM - 10:20 AM / Room LL21CD
Chair: Hyun Jae Kim, Yonsei University
Co-Chair: Sang-Hee Park, KAIST
20.1: Distinguished Paper: Advanced Hybrid Process with Back Contact IGZO-TFT
Masatomo Honjo, Sharp Display Technology Corporation, Nara, Japan
20.2: Integration of Through Glass Via Interconnects within Thin Film Transistor Active Matrix Backplanes
Rajesh Va, Corning Research & Development Corporation, Corning, NY US
20.3: Invited Paper: BEOL-Compatible Ferroelectric Field-Effect Transistors with Atomic Layer Deposition of Oxide Semiconductor Channel Toward Monolithic 3D Integration
Mengwei Si, Shanghai Jiao Tong, 800 Dongchuan Rd, China
20.4: High-Performance p-Channel Tellurium Thin-Film Transistor Applications Fabricated at a Low Temperature of 150 °C
.Jae Kyeong Jeong, Hanyang University, Seoul, South Korea

Session 21: OLED Optics (OLEDs)
Wednesday, May 11, 2022 / 9:00 AM - 10:20 AM / Room LL21EF
Chair: CC Lee, Visionox
Co-Chair: Yifan Zhang, Apple, Inc.
21.1: Invited Paper: Polarized Emission Thin-Film Light Emitting Diodes
Franky So, North Carolina State University, Raleigh, NC US
L. Jay Guo, University of Michigan, Ann Arbor, MI US
21.3: Effect of Ag Adhesion Layer on Plasmon Outcoupling Efficiency
Nicholas Thompson, Universal Display Corporation, Exton, PA US
21.4: Implications of Spatial Coherence on Minimizing Diffractive Reflection Artifacts in OLED Displays
S. Matthew Menke, 3M, St. Paul, MN US

Session 22: Emerging Liquid Crystal Technologies (Liquid Crystal Technology)
Wednesday, May 11, 2022 / 9:00 AM - 10:20 AM / Room LL20BC
Chair: Xiaoyang Huang, Ebulent Technologies Corp
Co-Chair: Gang Xu, Huawei
22.1: Invited Paper: Electrically Switchable Privacy Technology Suitable for Laptop PC
Dong Jin Lee, LG Display, Paju, South Korea
22.2: Field Sequential Color See-Through Panel Development
Shinichi Terashita, Sharp Display Technology Corporation, Nara, Japan
22.3: A New Near Infrared Polorizer with High Visible Transparency and its Sensor Applications
Mayumi Nojiri, FUJIFILM Corporation, Minamiashigara, Japan
22.4: Invited Paper: Display on Demand
Ya-Ling Hsu, AU Optronics Corporation, Hsinchu, Taiwan ROC

Session 23: Advanced Display Characterization Methods (Display Measurement)
Wednesday, May 11, 2022 / 9:00 AM - 10:20 AM / Room LL20A
Chair: Stephen Atwood, Consultant
Co-Chair: Thomas Fiske, Microsoft
23.1: Invited Paper: Visualization of Color Gamut Coverage—Gamut Ring Intersection
Kenichiro Masaoka, NHK Science & Technology Research Laboratories, Setagaya, Japan
23.2: Characterization of Directional Chromaticity of Cylindrically Curved OLED
**Session 24: Emerging Applications of Display Technology (Emerging Technologies and Applications)**

**Wednesday, May 11, 2022 / 9:00 AM - 10:20 AM / Room LL20D**

**Chair:** Adi Abileah, Adi - Displays Consulting LLC

**Co-Chair:** Susan Jones, Nulumina Corp.

*24.1: Can Light Microscopes Be Really Chip-Sized?*
Angel Dieguez, University of Barcelona, Barcelona, Spain

*24.2: Development of Methods to Reduce Blue Light Hazard from Displays*
Derek Harris, Eyesafe Inc., St. Paul, MN US

*24.3: Distinguished Paper: Towards a Solid-State LiDAR Using Holographic Illumination and a SPAD-Based Time-Of-Flight Image Sensor*
Konstantinos Bantounos, University of Edinburgh, Edinburgh, United Kingdom

*24.4: High Precision Beam Angle Expander Based on Polymeric Liquid Crystal Polarization Lenses for LiDAR Applications*
Yannanqi Li, University of Central Florida, Orlando, FL US

**Session 25: Innovations in Microdisplays for AR/VR/MR (Hyper-Realistic Displays (AR/VR/MR) / Display Manufacturing)**

**Wednesday, May 11, 2022 / 10:40 AM - 12:00 PM / Room 220B**

**Chair:** Ion Bita, Google LLC

**Co-Chair:** Yunhee Kim, Samsung Electronics

*25.1: Invited Paper: OLED Microdisplays for AR/VR Applications: Technical Approaches Toward Realization of over 10,000 Nits Full Color Panels*
Jang Jo, LG Display, Seoul, South Korea

*25.2: Invited Paper: Ultra-High-Resolution nanoLED Panel for AR/VR by UV Patterning Technology*
Kazuya Tsuji, Sharp Display Technology Corporation, Tenri, Nara, Japan

*25.3: RGB Direct Patterning for 3,000ppi OLED Micro-Displays*
Chiwoo Kim, APS Research, Hwaseong, South Korea

*25.4: Invited Paper: Contact Lens Embedded MicroLED Micro-Displays*
Paul Martin, Mojo Vision, Saratoga, CA US

**Session 26: QD Color Conversion II (Emissive, Micro-LED, and Quantum-Dot Displays)**

**Wednesday, May 11, 2022 / 10:40 AM - 12:00 PM / Room 220C**

**Chair:** Juanita Kurnt, OSRAM Opto Semiconductors

**Co-Chair:** John Van Derlofske, 3M

*26.1: Invited Paper: Challenges in QD OLED Display Technology*
Ingo Koehler, Merck KGaA, Darmstadt, Germany

*26.2: How Perovskite Quantum Dots are Supporting the Rise of Mini-Led-Based LCD Displays*
Norman Luechinger, Avantama AG, Staefa, Switzerland

*26.3: Optical Modeling of Quantum Dot-OLED (QD-OLED) Color Conversion*
Peter Palomaki, Palomaki Consulting, LLC, Billerica, MA US

*26.4: Perovskite Inks and Photoresists for In-Pixel Color Conversion*
Bernard Wenger, Helio Display Materials Ltd., Oxford, United Kingdom

**Session 27: High Resolution Display Technology I (Active Matrix Devices)**

**Wednesday, May 11, 2022 / 10:40 AM - 11:40 AM / Room LL21CD**

**Chair:** Dr. Kalluri Sarma, Display Technology Consulting

**Co-Chair:** Chen Xi, BOE Technology Group Co., Ltd.

*27.1: Fabrication Method for Miniaturized CAAC-OS FET for High-Definition AR/VR Displays*
Ryota Hodo, Semiconductor Energy Laboratory Co. Ltd., Atsugi, Japan

*27.2: Novel LTPS TFF Backplane Structure on Glass for 1443ppi 4.3” AMOLED VR Displays*
Kummi Oh, LG Display, Paju, South Korea

*27.3: Invited Paper: High Performance Sub-50nm Channel Length 3-D Monolithically Stackable Vertical IGZO TFTs for Active Matrix Application*
Di Geng, Chinese Academy of Sciences, Beijing, China

**Session 28: OLED Physics and Simulations (OLEDs)**

**Wednesday, May 11, 2022 / 10:40 AM - 12:00 PM / Room LL21EF**

**Chair:** Denis Kondakov, DuPont

**Co-Chair:** Nicholas Thompson, Universal Display Corporation

*28.1: Invited Paper: Bottom-Up OLED Development By Virtual Design: Systematic Elimination of Performance Bottlenecks Using a Microscopic Simulation Approach*
Tobias Neumann, Nanomatch GmbH, Karlsruhe, Germany

*28.2: Invited Paper: Accelerating OLED R&D with Digital Twins*
Arthur Vauzelle, Sinbeyond B.V., Eindhoven, Netherlands

*28.3: Invited Paper: Enhanced Current Efficiency and Accumulation Charge in Model OLEDs by Light Irradiation During Deposition of Polar Molecule*
Yuya Tanaka, University, Chiba, Japan

*28.4: Invited Paper: Effects of Guest Clustering Morphology in Phosphorescent OLEDs*
Jeramy Zimmerman, Colorado School of Mines, GOLDEN, CO US

**Session 29: Green, Low Power/Stretchable /LCDs (Liquid Crystal Technology)**
Wednesday, May 11, 2022 / 10:40 AM - 12:00 PM / Room LL20BC
Chair: Dr. Philip Chen, National Chiao Tung University
Co-Chair: Matthew Sousa, 3M

29.1: **Invited Paper:** Strategies to Improve Carbon Footprint of TFT Liquid Crystal Display  
Deeder Aurongzeb, Dell Company, Austin, TX US

29.2: **Invited Paper:** An Ultra-Low Power FFS LCD Using Zero-Anchoring interface  
Hiroaki Asagi, Sharp Display Technology Corporation, Nara, Japan

29.3: **Invited Paper:** Ultra-Thin Stretchable LCD Using Deformable Polarizer  
Ryo Kawamura, Nitto Denko Corporation, Osaka, Japan

29.4: Novel High Impedance Driving of Zenithal Bistable LCDs  
Guy Bryan-Brown, New Vision Display, Malvern, United Kingdom

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**Session 30: Spatial and Temporal Display Metrology (Display Measurement)**  
Wednesday, May 11, 2022 / 10:40 AM - 12:00 PM / Room LL20A
Chair: Stephen Atwood, Consultant
Co-Chair: Frank Rochow, Adviser

30.1: High-Precision High-Resolution Measurements within Moiré  
Ingo Rotscholl, TechnoTeam Bildverarbeitung GmbH, Rinteln, Germany

30.2: Visualization and Rating of Motion Artifacts by Analyzing Asymmetric Response Time Behavior  
Isao Kawahara, FairSpec & Co. LLC, Toyonaka, Japan

30.3: A Moving Camera and Synthetic Calibration Target Solution for Non-Planar Scene Estimation and Projector Calibration  
Katherine Arnold, University of Waterloo, Waterloo, ON Canada

30.4: Requirements for Reliable Display Sparkle Contrast Measurement: Analysis in Spatial Frequency Domain  
Masaanobu Ishiki, AGC Inc., Yokohama, Japan

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**Session 31: Novel Display Technology Approaches (Emerging Technologies and Applications)**  
Wednesday, May 11, 2022 / 10:40 AM - 11:40 AM / Room LL20D
Chair: Mr Timothy Large, Microsoft Corp
Co-Chair: Abhishek Srivastava, Hong Kong University of Science & Technology

31.1: Numerical Approach for Sound Quality Prediction of the Large-Sized OLED Panel Speaker  
Hyundo Shin, Samsung Display Co., Ltd., Yongin-si, South Korea

31.2: Fermi Level Prediction of Solution-Processed Ultra-wide Band gap a-Ga2Ox via Supervised Machine Learning Models  
Juan Bermudo, Nara Institute of Science and Technology, Ikoma, Japan

31.3: Multi-Primary Wide Gamut Color Systems  
Gary Feather, 6p Color, Portland, OR US

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**Session 32: High Resolution Display Technology II (Active Matrix Devices)**  
Wednesday, May 11, 2022 / 3:30 PM - 4:50 PM / Room LL21CD
Chair: Norbert Fruehauf, University of Stuttgart
Co-Chair: Man Wong, Hong Kong University of Science & Technology

32.1: Oxide Semiconductor Field-Effect Transistor for High-Resolution Displays Capable of Deep Black Display  
Yuuta Okaizaki, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

32.2: An Optical Compensation Scheme for High PPI AMOLED Display  
Ying Han, Hefei BOE Joint Technology Co. Ltd., Hefei, China

32.3: 1.5-inch, 3207-ppi Side-by-Side OLED Display Capable of 32-Division Driving with OSLSI/SILSI Structure Fabricated by Photolithography  
Munehiro Kozuma, Semiconductor Energy Laboratory Co. Ltd., Atsugi, Japan

32.4: Metal Oxide Thin-Film Transistors with 0.1 ?m Channel Length Formed by Self-Aligned Nanogap Patterning  
Sung Woong Cho, Electronics and Telecommunications Research Institute, Daejeon, South Korea

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**Session 33: Printed OLED (OLEDs)**  
Wednesday, May 11, 2022 / 3:30 PM - 4:50 PM / Room LL21EF
Chair: Sven Zimmermann, Novaled GmbH
Co-Chair: Denis Kondakov, DuPont

33.1: **Invited Paper:** All-Inkjet-Printed AMOLED Display with Improved Efficiency and Lifetime  
Sehun Kim, Samsung Display Co., Ltd., Yongin, South Korea

33.2: **Invited Paper:** Flexible OLED Displays with Inkjet Printing Technology  
Weirun Cao, Shenzhen China Star Optoelectronics Semiconductor Display Technology Co., Ltd., Shenzhen, China

33.3: **Invited Paper:** Research and Applications of Inkjet Printing for OLED Mass Production  
Gerry Chen, Kateeva, Inc., Newark, CA US

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**Session 34: High Dynamic Range LCDs (Liquid Crystal Technology)**  
Wednesday, May 11, 2022 / 3:30 PM - 5:30 PM / Room LL20BC
Chair: Jenn Jia Su, AU Optronics Corporation
Co-Chair: Koichi Miyachi, JSR Corporation

34.1: Novel Liquid Crystal Display Mode SUVA4&SUVA5 with Double Photo Alignment Technology for High Definition Display  
Fan Li, BOE Technology Group Co., Ltd., Chengdu, China

34.2: **Invited Paper:** Analysis of Temperature Effect of RGB Mini/Micro LED Chips  
Yuanhao Sun, BOE MLED Technology Co., Ltd., Beijing, China

34.3: High Contrast Research of 4K ADS TV Technology  
Hongling Hu, Hefei BOE Display Technology Co., Ltd., Hefei, China

34.4: **Invited Paper:** UBplus/UB-FFS – Premium Performance for Liquid Crystal TV and IT Displays
Session 35: Halo Measurements (Display Measurement / Automotive/Vehicular Displays and HMI Technologies)
Wednesday, May 11, 2022 / 3:30 PM - 4:50 PM / Room LL20A
Chair: Frank Rochow, Adviser
Co-Chair: Thomas Fiske, Microsoft
35.1: Halo Mura of OLED and FALD LCD: Measurements & Perception for (Automotive) Displays
Karlheinz Blankenbach, Pforzheim University Display Lab, Pforzheim, Germany
35.2: Proposal for Improved Calculation Method for the Halo Effect in Digital Displays Based on Human Brightness Perception
Han Byul Lim, Samsung Display, Yongin, South Korea
35.3: The Measurement Method of Halo: Halo Length, Angular Halo
Hyunah Sa, Samsung Display, Yongin, South Korea
35.4: Systematic Comparisons on Display Performances Including Halo Effect
Zhiyong Yang, University of Central Florida, Orlando, FL US

Session 36: Novel Processes & MicroOptics (Emerging Technologies and Applications)
Wednesday, May 11, 2022 / 3:30 PM - 4:50 PM / Room LL20D
Chair: Fang-Cheng Lin, Apple, Inc.
Co-Chair: Jim Zhuang, Meta
36.1: Invited Paper: Liquid Crystal Lasers: Recent Advances and Future Opportunities
Philip Hands, School of Engineering, University of Edinburgh, Edinburgh, United Kingdom
36.2: Optimizing Brightness with Micro Lens Array Gain Enhancing Films for Edge-Lit Back Light Units
Bing Shen, BrightView Technologies, Durham, NC US
36.3: Novel Silicone Hotmelt Adhesive for Display Assembly Applications
Ryosuke Yamazaki, Dow Toray Co., Ltd., Ichihara, Japan
36.4: Precision Micro-Optics on Display Technical Glass for Innovative Display Designs
Casey Kang, Corning Incorporated, Corning, NY US

Session 37: Holographic and Autostereoscopic 3D Displays (Hyper-Realistic Displays (AR/VR/MR) / Display Systems)
Thursday, May 12, 2022 / 9:00 AM - 10:40 AM / Room 220B
Chair: Yifan (Évan) Peng, Stanford University
Co-Chair: Zong Qin, Sun Yat-Sen University
37.1: Invited Paper: Advances in Neural Holographic Displays for Virtual and Augmented Reality
Manu Gopakumar, Stanford University, Stanford, CA US
37.2: Invited Paper: Enabling Augmented Reality Near-eye and Head-Up Displays with Neural Holography
Siyeon Choi, Stanford University, Stanford, CA US
37.3: Method of Color Amplitude-Only Hologram Generation for Speckle Noise Suppression
Qiong-Hua Wang, Beihang University, Beijing, China
37.4: Depth-Enhanced 2D/3D Switchable Display Based on Integral Imaging
Qiang Li, Sichuan University, Chengdu, China
37.5: Invited Paper: Flat Panel Holographic Display
Yunhee Kim, Samsung Electronics Co., Ltd., Suwon, South Korea

Session 38: Micro-LEDs I (Emissive, Micro-LED, and Quantum-Dot Displays)
Thursday, May 12, 2022 / 9:00 AM - 10:20 AM / Room 220C
Chair: Chris Bower, X Display Company
Co-Chair: Jonathan Steckel, ST Microelectronics
38.1: GaN Nanowire LED Technology: Moving to Products.
Xavier Hugon, Aledia, Echirolles, France
38.2: Latest Breakthroughs in 200 and 300 mm epi Technology to Unlock the Micro LED Revolution for the Metaverse and Beyond
Atsushi Nishikawa, ALLOS Semiconductors GmbH, Dresden, Germany
38.3: Invited Paper: MicroLED Device Technology for Low Power Wearable Displays
Oleg Shchekin, Lumileds, San Jose, CA US
38.4: Invited Paper: Inline Screening Known Good Die Mapping for MicroLED
John Robinson, KLA Corporation, Milpitas, CA US

Session 39: E-Paper and Transparent Display Measurements (Outdoor Displays / Display Measurement)
Thursday, May 12, 2022 / 9:00 AM - 10:20 AM / Room LL21CD
Chair: Stephen Atwood, Consultant
Co-Chair: Karlheinz Blankenbach, Pforzheim University
39.1: Distinguished Paper: Gamut Rings of Reflective ePaper Displays with Combined Frontlight and Ambient Illumination
Dirk Hertel, E Ink Corp., Billerica, MA US
39.2: Evaluating the Components of Reflected Glare in Displays
John Penczek, University of Colorado, Boulder, CO US
39.3: Fluorescence Enhanced Optical Resonator Constituted of Quantum Dots and Thin Film Resonant Cavity for High-Efficiency Reflective Color Filter
Qian Wu, BOE Technology Group Co., Ltd., Beijing, China
39.4: High Performance Micro-LED Transparent Display
Liqun Chen, Tianma Microelectronics Co., Ltd., Shanghai, China
Session 40: OLED Devices I (OLEDs)
Thursday, May 12, 2022 / 9:00 AM - 10:20 AM / Room LL21EF
Chair: Yasunori Kijima, Huawei Technologies Japan K.K.
Co-Chair: Larry Liao, Soochow University
40.1: Invited Paper: Marching Towards Theoretical Limits of Blue Fluorescent OLEDs with BI > 300
Xiao Liang, Jiangsu Sunera Technology, Wuxi, China
40.2: Invited Paper: Prolonging Device Lifetime of Blue Organic Light-Emitting Diodes
Sanghan Kim, Samsung Display Co., Ltd., Yongin, South Korea
40.3: Distinguished Paper: Realization of Ultra High Efficient Fluorescent Blue OLED
Satomi Tasaki, Idemitsu Kosan Co., Ltd., Chiba, Japan
40.4: Double EML Structure for High Efficiency Organic Light Emitting Diode
Eun-Hyung Lee, LG Display Co., Ltd., Seoul, South Korea

Session 41: Stretchable High-Resolution Displays (Conformable Wearable Displays)
Thursday, May 12, 2022 / 9:00 AM - 10:20 AM / Room LL20BC
Chair: Yong Taek Hong, Seoul National University
Co-Chair: Jeong-Ik Lee, ETRI
41.1: Invited Paper: The Technical Advances of Stretchable Display for High Pixel Density and High Stretchability
Jangyeol Yoon, Samsung Display, Yongin, South Korea
41.2: Invited Paper: Active-Matrix Micro-LED Stretchable Display and Technical Challenges
Hyewoon Jung, LG Display, Seoul, South Korea
41.3: Invited Paper: A High Resolution Stretchable Micro-LED Display
Cheng-Liang Wang, AU Optronics, Hsinchu, Taiwan ROC
41.4: Invited Paper: A 200 PPI Oval Shape Stretchable AMOLED Display
Pinfan Wang, BOE Technology Group Co., Ltd., Beijing, China

Session 42: Light Field Displays (Hyper-Realistic Displays (AR/VR/MR) / Display Systems)
Thursday, May 12, 2022 / 10:40 AM - 12:00 PM / Room 220B
Chair: Brian Schowengerdt, University of Washington
Co-Chair: Shinichi Uehara, AEC Inc.
42.1: Invited Paper: High-Resolution Light-Field AR at Comparable Computing Cost to Stereo 3D
Tomas Sluka, CREAL, Ecublens, Switzerland
42.2: Spatial Resolution-Tripled Integral Imaging Light Field Displays with No Loss of Angular Resolution by Recombining Subpixels with Zero Sampling Error
Wenchao Yang, Sun Yat-Sen University, Guangzhou, China
42.3: Real-time Rendering for Integral Imaging Light Field Displays Based on a Voxel-Pixel Lookup Table
Quanzhen Wan, Sun Yat-Sen University, Guangzhou, China
42.4: Near-Eye Light Field Displays with Computational Vision Correction by Manipulating Vector Sampling Rays
Yuqing Qiu, Sun Yat-Sen University, Guangzhou, China

Session 43: Micro-LEDs II (Emissive, Micro-LED, and Quantum-Dot Displays)
Thursday, May 12, 2022 / 10:40 AM - 11:40 AM / Room 220C
Chair: Francois Templier, CEA-LETI
Co-Chair: Larry Weber, Consultant
43.1: Invited Paper: Recent Advancements in microLED Testing and Inspection
David Lewis, InZiv, Jerusalem, Israel
43.2: Low Efficiency Attenuation and Stable Monochromaticity for Non-Polar m-Plane Micro-Light-Emitting-Diodes (Micro-LEDs)
Yibo Liu, Hong Kong University of Science and Technology, Hong Kong, Hong Kong
43.3: Enhanced External Quantum Efficiency in the Low-Current Region Using Three Terminal GaN-Based Blue Micro-Light-Emitting Diodes
Woo Jin Baek, Korea Advanced Institute of Science and Technology, Daejeon, South Korea

Session 44: E-Paper Display Technologies and Applications (Outdoor Displays / Flexible Displays and e-Paper)
Thursday, May 12, 2022 / 10:40 AM - 11:40 AM / Room LL21CD
Chair: Norihisa Kobayashi, Chiba University, Department of Image and Materials Science
Co-Chair: Shin Tson Wu, University Of Central Florida
44.1: Distinguished Paper: Electrophoretic Display Comprising Black, White, Red and Yellow Particles
HongMei Zang, E Ink California, LLC., Fremont, CA US
44.2: Electronic Tile for Decoration of Outdoor/Indoor Walls
Takashi Sato, Sharp Display Technology Corporation, Saitama, Japan
44.3: High-Performance Color MIP LCD with New Electrode Structure
Takashi Sato, Sharp Display Technology Corporation, Nara, Japan

Session 45: OLED Devices II (OLEDs)
Thursday, May 12, 2022 / 10:40 AM - 12:00 PM / Room LL21EF
Chair: Nicholas Thompson, Universal Display Corporation
Co-Chair: Ji Ho Baek, LG Display
45.1: Invited Paper: Charge Balance in OLEDs: Optimization of Hole Injection Layer
Huiqing Pang, Beijing Summer Sprout Technology Co., Ltd., Beijing, China
45.2: Invited Paper: Towards High-Performance Organic Transistors for Display and other Applications
Session 46: Wearable and Skin-Like Displays (Conformable Wearable Displays / Flexible Displays and e-Paper / Active Matrix Devices)
Thursday, May 12, 2022 / 10:40 AM - 12:00 PM / Room LL20BC
Chair: Xiaojun Guo, Shanghai Jiao Tong University
Co-Chair: Yong Taek Hong, Seoul National University
46.1: High-Performance Fiber-Based Red OLEDs and TFTs for Truly Wearable Textile Displays
Kyung Cheol Choi, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea
46.2: Invited Paper: Strip-Helix-Fiber Architecture for Stretchable TFTs and Circuits
Arokia Nathan, University of Cambridge, Cambridge, United Kingdom
46.3: Invited Paper: Skin-like Organic Optoelectronic System for Real-time Heart Rate Monitoring
Youngjun Yun, Samsung Electronics, Suwon, South Korea
46.4: Reconfigurable and Reusable Soft Modular LED Blocks Assembly
Yongtaek Hong, Seoul National University, Seoul, South Korea

Session 47: Automotive Display Optimizations (Automotive/Vehicular Displays and HMI Technologies)
Thursday, May 12, 2022 / 10:40 AM - 12:00 PM / Room LL20A
Chair: David Hermann, Volvo Car Corporation AB
Co-Chair: Eric Margulies, Universal Display Corporation
47.1: Display Outdoor Visibility Enhancement Using Adaptive Tone Mapping
Seungwan Kim, Samsung Electronics, Hwaseong, South Korea
47.2: Monocular Depth Perception Enhancement Based on Joint Shading/Contrast Model and Motion Parallax (JSM)
Seungchul Ryu, Faurecia Irystec Inc., Montreal, PQ Canada
47.3: Electromagnetic Compatibility Problem Analysis of Flexible Vehicle Organic-Light Emitting Display
Hang Dong, Chengdu BOE Optoelectronics Technology Co., Ltd., Chengdu, China
47.4: Color Acceptability Threshold for Mixed Display Technology Automotive Cockpit
Pooshpanjan Roy Biswas, Renault, Guyancourt, France

Session 48: LTPO Technology (Display Manufacturing / Active Matrix Devices)
Thursday, May 12, 2022 / 10:40 AM - 12:00 PM / Room LL20D
Chair: Dr. Chiwoo Kim, APS Holdings
Co-Chair: Jae-Hoon Lee, Samsung Display Co
48.1: Solid-State Laser Crystallization for Poly-Si TFTs and Their Applications
Hiroshi Tanabe, Tianma Japan, Ltd., Kawasaki, Japan
48.2: Invited Paper: Advanced LTPO Technology for CMOS Driving
KookChul Moon, Gachon University, Seongnam, South Korea
48.3: Invited Paper: Fiber-Laser Processing of Si and IGZO Films for Advanced AMOLED Displays on Gen 8 Substrates
James Im, Columbia University, New York, NY US
48.4: LTPO Technology Development for Enhanced Display Performance: Image Sticking Phenomena, Circuit Operation and Backplane Process Integration
D.-Y. Cho, Samsung Display, Yongin, South Korea

Session 49: Light Manipulation for VR/AR Optics (Hyper-Realistic Displays (AR/VR/MR) / Display Systems)
Thursday, May 12, 2022 / 1:30 PM - 3:10 PM / Room 220B
Chair: Nikhil Balram, Mojo Vision Inc.
Co-Chair: Jean-Pierre Guillou, Apple, Inc.
49.1: Distinguished Paper: Gaze Matched Pupil Steering Maxwellian-View Augmented Reality Display
Junyu Zou, University of Central Florida, Orlando, FL US
49.2: Holographic Near-Eye Display with Expanded Eyebbox Based on Exit Pupil Scanning
Xinxing Xia, Shanghai University, Shanghai, China
49.3: Building a Predictive Model of Contrast Ratio of Folded Optic Lens Systems for Virtual Reality
Bing Hao, 3M Company, St. Paul, MN US
49.4: Thin and Lightweight Head-Mounted Displays with Polarized Laser Backlights and Holographic Optics
Shinichi Komura, Japan Display Inc., Moba, Japan
49.5: Fast-response Panchromatic-Berry Phase LC lens for AR Display
Shuxin Liu, Shanghai Jiao Tong University, Shanghai, China

Session 50: Micro-LED Displays I (Emissive, Micro-LED, and Quantum-Dot Displays)
Thursday, May 12, 2022 / 1:30 PM - 2:50 PM / Room 220C
Chair: Dr. Khaled Ahmed, Intel Corporation
Co-Chair: Ioannis Kymissis, Columbia University
Matthew Metil, X Display Company Inc., Research Triangle Park, NC US
50.2: Invited Paper: Why Does the Road to High Volume Production of Micro-LED Displays Pass Through the Semiconductors Industry?
Makarem Hussein, LuxNova Technologies, Hillsboro, OR US
50.3: Status of MicroLED Mass Transfer Processes and Equipment
Session 51: Large and Tiled Display Technologies (Outdoor Displays / Display Systems)
Thursday, May 12, 2022 / 1:30 PM - 2:50 PM / Room LL21CD
Chair: K Käläntär, Global Optical Solutions
Co-Chair: Shin Tson Wu, University Of Central Florida
51.1: Method to Suppress Tiled Display Seam Visibility
Shenping Li, Corning Research & Development Corporation, Corning, NY US
51.2: Glass Solution for Zero Border Design (ZBD) TVs: Its Advantages and Prevention of Border Light Leakage
Tomohiro Ishikawa, Corning Incorporated, Corning, NY US
51.3: 65-inch Splicing Screen Adapted to a Wide Temperature Range and High Brightness
Peng Xi Wang, Hefei BOE Display Technology Co., Ltd., Hefei, China
51.4: Design, Measurements and Evaluation of Exterior Displays for Autonomous Cars
Karheinz Blankenbach, Pforzheim University Display Lab, Pforzheim, Germany

Session 52: OLED Displays I (OLEDs)
Thursday, May 12, 2022 / 1:30 PM - 3:10 PM / Room LL21EF
Chair: Yifan Zhang, Apple, Inc.
Co-Chair: Sangmoo Choi, Google LLC
52.1: Invited Paper: Technical Progress of OLED Displays for Premium TVs
Hong Jae Shin, LG Display, Paju, South Korea
52.2: Ultrawide-Color Gamut, Low-Power Consumption White OLEDs for Large-Sized 8K OLED TV
Juantian You, Hefei BOE Joint Technology Co., Ltd., Hefei, China
52.3: Enhanced Viewing Angle Performance of an Advanced WRGB OLED Technology
Don Gyou Lee, LG Display, Seoul, South Korea
52.4: Novel POL-less OLED Structure with High Optical Gain
Jongsoo Park, Samsung Display, Yongin, South Korea
52.5: A Color Gamut Mapping Method Using an OLED Display Model
Deoksoo Park, Samsung Display, Hwaseong, South Korea

Session 53: Foldable Displays (Flexible Displays and e-Paper)
Thursday, May 12, 2022 / 1:30 PM - 2:30 PM / Room LL20BC
Chair: Dr. Joon Young Yang, LG Display Co. Ltd
Co-Chair: Shiming Shi, BOE
53.1: The Foldable Display Architecture Technique Depending on Wide Temperature Range and Folding Curvature
Min-Ho Lee, LG Display, Seoul, South Korea
53.2: Analysis on the Advantages of Water-Drop Shape Foldable Display
Shi Shi, BOE Technology Group Co., Ltd., Beijing, China
53.3: Worldwide First Real Borderless and High Resolution Micro-LED Display
Tin Kang, AU Optronics Corp., Hsinchu, Taiwan ROC

Session 54: HUD and Transparent Automotive Displays (Automotive/Vehicular Displays and HMI Technologies)
Thursday, May 12, 2022 / 1:30 PM - 3:10 PM / Room LL20A
Chair: David Hermann, Volvo Car Corporation AB
Co-Chair: Haruhiko Okumura, Toshiba Corporation
54.1: Invited Paper: AR in an Automobile: 3D AR HUD
Jae Won Cha, Naver Labs, Seongnam, South Korea
54.2: A Measurement-Based Image Compositing for 3D Head-Up-Display
Akihiro Sato, Kyocera Corporation, Yazu, Japan
54.3: Reduced Solar-Loading Using Micro-Mirror Array in Automotive HUD
Kenneth Li, Optonomous Technologies Inc., Agoura Hills, CA US
54.4: Distinguished Paper: Low-Diffraction Transparent µLED Displays with Optimized Pixel Structure
Qian Yang, University of Central Florida, Orlando, FL US
54.5: Consideration of Image Distance on Cognitive Tunneling with Augmented Reality Head Up Displays
Joe Pullukat, NS North America/Nippon Seiki, Troy, MI US

Session 55: Advanced Manufacturing Process Technologies (Display Manufacturing)
Thursday, May 12, 2022 / 1:30 PM - 2:50 PM / Room LL20D
Chair: Joerg Winkler, PLANSEE SE
Co-Chair: Tian Xiao, NEXT Biometrics Inc.
55.1: Deposition of Conductive and Insulating Materials at Micrometer Scale for Display-Component Prototyping
Piotr Kowalczewski, XTPL SA, Wroclaw, Poland
55.2: Roll-to-Plate Nanoimprint Lithography as Etching Mask Creating Large Area Structured Surfaces
Jan Matthys ter Meulen, Morphotronics B.V., Veldhoven, Netherlands
55.3: Development Low Temperature Metal Dry Etching Equipment via ECR Plasma Source
Chiu-Woo Kim, APS Research Corporation, Cheonan, South Korea
55.4: True Printing Process for Integration of Optoelectronic MicroDevices into Functionalized Surfaces
Reza Chaji, VueReal Inc., Waterloo, ON Canada
Session 56: System Architectures for VR/AR/MR (Hyper-Realistic Displays (AR/VR/MR) / Display Systems)
Thursday, May 12, 2022 / 3:10 PM - 4:10 PM / Room 220B
Chair: W. Hendrick, Collins Aerospace
Co-Chair: Brian Berkeley, Highlight Display, LLC
56.1: Novel Optical Structure of OLED Panel for Immersive and Seamless VR
Kwangsoo Bae, Samsung Display, Yongin, South Korea
56.2: A Distraction-Free Display System Using Embedded Asynchronous Time Warp
Wook Hong, RAONTECH Inc., Seongnam, South Korea
56.3: New Ultra Low-Power High Brightness Microdisplays Enabling Broad Applications
Philipp Wartenberg, Fraunhofer Institute for Organic Electronics, Dresden, Germany

Session 57: Micro-LED Displays II (Emissive, Micro-LED, and Quantum-Dot Displays)
Thursday, May 12, 2022 / 3:10 PM - 4:30 PM / Room 220C
Chair: Ioannis Kymissis, Columbia University
Co-Chair: Jonathan Steckel, ST Microelectronics
57.1: ActiveHogel Light-Field Display: An Application of Next Generation µLED Pixels
Thomas Burnett, FoVI3D, Austin, TX US
57.2: Invited Paper: Self-Aligned Colored MicroLED Microdisplay for Compact AR Applications
Reza Chaji, VueReal Inc., Waterloo, ON Canada
57.3: MicroLED Display Integration on 300mm Advanced CMOS Platform
Soeren Steudel, MICLEDI Microdisplays BV, Leuven, Belgium
57.4: Invited Paper: Progress on Key Innovations in Direct-View µLED Display Manufacturing

Session 58: Smart Windows (Outdoor Displays / Liquid Crystal Technology / Emerging Technologies and Applications)
Thursday, May 12, 2022 / 3:10 PM - 4:30 PM / Room LL21CD
Chair: Abhishek Srivastava, Hong Kong University of Science & Technology
Co-Chair: Karlheinz Blankenbach, Pforzheim University
Michael Grand, Merck KGaA, Darmstadt, HI Germany
58.2: ELM: A Revolutionary New Smart Glass Technology
Romaric Massard, Elstar Dynamics, Eindhoven, Netherlands
58.3: Switchable Liquid Crystal Phase Grating with Rainbow-Free Hazy States
Chin An Lin, AU Optronics Corporation, Hsinchu, Taiwan ROC
58.4: Factors Affecting the Thermal Performance of Dye-Doped Liquid Crystal Smart Window
Zhan Li, Beijing BOE Sensor Technology Co., Ltd., Beijing, China

Session 59: OLED Displays II (OLEDs)
Thursday, May 12, 2022 / 3:10 PM - 4:30 PM / Room LL21EF
Chair: DZ Peng, Tianma
Co-Chair: Yuan-Chun Wu, China Star Optoelectronics
59.1: Invited Paper: Scaling Down of OLED Pixels Enabled by Photolithography
Jan Genoe, imec, Leuven, Belgium
59.2: Invited Paper: High Color Gamut Organic Light-emitting Diode Microdisplay for Augmented Reality/Virtual Reality Devices
Chan-mo Kang, Electronics and Telecommunications Research Institute, Daejeon, South Korea
59.3: A Thin, Transparent Encapsulation Film with Excellent Gap-filling Performance for Ultra-High-Resolution OLEDs via Vapor-Phase Deposited Polymeric Layer
Byeong Gyu Roh, LG Display, Paju, South Korea
59.4: Premium Black for Large sized White OLED
Garam Hong, LG Display, Paju, South Korea

Session 60: E-Paper Technologies (Flexible Displays and e-Paper)
Thursday, May 12, 2022 / 3:10 PM - 4:10 PM / Room LL20BC
Chair: Makoto Omodani, Tokyo Denki University
Co-Chair: HongMai Zang, E Ink California
60.1: Distinguished Paper: An Electrophoretic E-Paper Device with Stretchable, Washable, and Rewritable Functions
Borui Yang, Sun Yat-Sen University, Guangzhou, China
60.2: Image Plane Separation Artefacts in Multilayer Color Reflective Displays
Hanbin Ma, Guangdong ACXEL Micro & Nano Tech Co., Ltd., Foshan, China
60.3: Invited Paper: Active-Matrix Digital Microfluidics System for Single Cells Manipulation
Juergen Baethis, Continental Automotive GmbH, Babenhausen, Germany

Session 61: Novel Large-Area Automotive Displays (Automotive/Vehicular Displays and HMI Technologies)
Thursday, May 12, 2022 / 3:10 PM - 4:30 PM / Room LL20A
Chair: Casey Kang, Corning Incorporated
Co-Chair: Eric Margulies, Universal Display Corporation
61.1: Invited Paper: OLED Technology for Automotive Display Applications
Tomasz Tarnowski, Mercedes - Benz AG, Sindelfingen, Germany
61.2: Invited Paper: ShyTech DisplaysHigh Resolution Displays Hidden Behind Decorative Surfaces
Jurgen Baethis, Continental Automotive GmbH, Babenhausen, Germany
61.3: Research on Switchable Privacy Mode Applied to Automotive Displays
**Session 62: Innovative Glass Substrates and Processing (Display Manufacturing)**

**Thursday, May 12, 2022 / 3:10 PM - 4:30 PM / Room LL20D**

**Chair: Dr. Andriy Romanyuk, Glas Troesch AG**

**Co-Chair: Kazutaka Hayashi, AGC Inc.**

**62.1: Large Area Ion Implantation Source for Production of Anti-Reflection Surfaces in Glass and Sapphire Substrates**
Alexander Welsh, Malachite Technologies, Inc., San Francisco, CA US

**62.2: Ultra-Flat, Low-Density, and High-Refractive-Index Glass Wafers for Augmented Reality: Weight Reduction as Key Enabler for Consumer Devices**
Frederik Bachhuber, SCHOTT AG, Mainz, Germany

**62.3: Distinguished Paper: High Precise Laser Glass Cutting for Future Display**
Wencheng Hu, HeFei BOE Photoelectric Technology Co., Ltd., Hefei, China

**62.4: Investigation of the Influence of Film Stress on Glass Strength**
Wencheng Hu, HeFei BOE Photoelectric Technology Co., Ltd., Hefei, China

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**Session 63: Emerging Approaches for AR/VR/MR (Hyper-Realistic Displays (AR/VR/MR) / Emerging Technologies and Applications)**

**Friday, May 13, 2022 / 9:00 AM - 10:20 AM / Room 220B**

**Chair: Ian Underwood, University of Edinburgh**

**Co-Chair: Soon-Gi Park, LetinAR**

**63.1: Distinguished Paper: Microsecond High-Contrast Continuous 2.25pi Phase Modulation Based on Non-linear Kerr Effect of VADHFLC**
Zhengnan Yuan, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

**63.2: Research on Stray Light Affecting the Imaging of Fresnel Lens in Virtual Reality Equipment**
Haitao Huang, BOE Technology Group Co., Ltd., Beijing, China

**63.3: High-Directivity Emitting Pixel Devices for Advanced Display Applications**
Chung-Chih Wu, National Taiwan University Co., Taipei, Taiwan ROC

**63.4: A Novel Real-Time Full-Color 3D Holographic (Diffractive) Video Capture, Processing And Transmission Pipeline Using Off-the-Shelf Hardware**
Ankur Samanta, University of Toronto, Toronto, ON Canada

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**Session 64: Mini-LED BLU for HDR Display (Display Systems)**

**Friday, May 13, 2022 / 9:00 AM - 10:40 AM / Room 220C**

**Chair: K Käläntär, Global Optical Solutions**

**Co-Chair: Daming Xu, Apple Inc.**

**64.1: A Local Dimming Technology of Scene Adaptation for Massive Mini-LED**
Ran Duan, BOE Technology Group Co., Ltd., Beijing, China

**64.2: Ultra-Thin RGB-Mini-LED Direct Back Light for High-end Professional Liquid Crystal Displays**
Xiaojun Meng, BOE Technology Group Co., Ltd., Beijing, China

**64.3: Patterned Glass Diffuser for Mini-LED Count Reduction**
Xiang-Dong Mi, Corning Incorporated, Corning, NY US

**64.4: Mini-LED Driving Circuit with Power Saving Mechanism for Use in LCD Backlight Module**
Chih-Lung Lin, National Cheng Kong University, Tainan, Taiwan ROC

**64.5: Glass Circuit Board for Mini-LED backlight of LCD**
Young-suk Lee, CTCK (Corning Technology Center Korea), Asan, South Korea

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**Session 65: Machine Learning for Image Enhancement (Machine Learning for Displays / Display Electronics / Applied Vision)**

**Friday, May 13, 2022 / 9:00 AM - 10:40 AM / Room LL21CD**

**Chair: Chaohao Wang, Apple Inc.**

**Co-Chair: Mainak Biswas, Google**

**65.1: Deep Learning-Enabled Image Content Adaptive Driving Algorithm for Field Sequential Color LCDs with Mini-LED Backlight**
Qin Zong, Sun Yat-Sen University, Guangzhou, China

**65.2: A Light and Fast Branched Neural Network using Perceptual Optimization for High-Quality Visual Restoration of UDC images**
Jihyun Koh, Samsung Display, Yongin, South Korea

**65.3: Invited Paper: Deep Learning-Based Image Enhancement for HDR Imaging**
Suk-Ju Kang, Sogang University, Seoul, South Korea

**65.4: Foveated Super Resolution Network for Virtual Reality Head Mounted Displays**
Hyounghik Nam, Kyung Hee University, Seoul, South Korea

**65.5: AI based Simulation and Design Space Exploration for Pixel Layout**
Keuk Jin Jeong, Samsung Display Co., Ltd., Yongin, South Korea

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**Session 66: OLED Materials I (OLEDs)**

**Friday, May 13, 2022 / 9:00 AM - 10:20 AM / Room LL21EF**

**Chair: Chihaya Adachi, Kyushu University**

**Co-Chair: Changwoong Chu, Samsung Display Company**

Jens Engelhart, Merck KGaA, Darmstadt, Germany

**66.2: Invited Paper: Delayed Fluorescence from Energetically Inverted Singlet and Triplet Excited States for Efficient Organic Light-Emitting Diodes**
Naoya Atsawa, Osaka University, Suita, Japan

**66.3: Active Learning for the Design of Novel OLED Materials**
Hadi Abroshan, Schrödinger Inc., Portland, OR US
Session 67: Flexible Displays (Flexible Displays and e-Paper)
Friday, May 13, 2022 / 9:00 AM - 10:20 AM / Room LL20BC
Chair: Arokia Nathan, Darwin College, University of Cambridge
Co-Chair: Winston Wang, AU Optronics Corp

67.1: Comparison of In-Folding and Out-Folding Stress on Electrical Performance of Poly-Si TFTs on Polyimide Substrate for Foldable AMOLED Display
Mohammad Billah, Kyung Hee University, Seoul, South Korea

67.2: Invited Paper: Organic Thin-Film Transistor Flexible Hybrid Integration for Low-Power Ubiquitous Sensor Systems
Xiaojun Guo, Shanghai Jiao Tong University, Shanghai, China

67.3: Predicting The Impact Resistance of Flexible Display Panels based on Mo Thin Film Residual Stress
Jung Hwa Park, Samsung Display Co., Ltd., Yongin, AL South Korea

67.4: Research on Design and Lamination of 180° Curly CG
Yang Yang, BOE OLED R&D Center, Chengdu, China

Session 68: Displays and Visual Performance (Applied Vision)
Friday, May 13, 2022 / 9:00 AM - 10:20 AM / Room LL20A
Chair: Jennifer Gille, Consultant
Co-Chair: Youngshin Kwak, Ulsan National Institute of Science and Technology

68.1: Evaluation for Reaction Time of Gaming Displays
Yan Jin, LG Display, Seoul, South Korea

68.2: Considering the Effects of Display Persistence on Eye Movements and Readability in Virtual Reality
T. Scott Murdison, Reality Labs at Meta, Redmond, WA US

68.3: Importance of Individual Adaptation in Visually-Fidelitous Dynamic-Range Compression from HDR to SDR Images
Saki Iwaida, Kagoshima Clinical Engineering College, Kagoshima, Japan

68.4: A Text Legibility Improvement Method for OLED Devices
Hyunkyung Song, Samsung Display Co., Ltd., Yongin, South Korea

Session 69: Materials and Processes for Flexible Displays (Display Manufacturing)
Friday, May 13, 2022 / 9:00 AM - 10:20 AM / Room LL20D
Chair: Dr Robert Visser, Applied Materials
Co-Chair: Toshiaki Arai, JOLED Inc

69.1: Inkjet-Printable Optically Clear Silicone Resin for Display Fabrication
Juyoung Yook, Dow Chemical Silicones Korea Co., Ltd, Jincheon, South Korea

69.2: A Universal Method for the Lamination of Arbitary Stretchable Substrate Pairs without Compromising the Elastic Properties of the Substrates
Sung Gap Im, KAIST, Daejeon, South Korea

69.3: Invited Paper: Opportunities for High Performance Display Manufacturing Enabled by OTFTs Using an 80 Degrees Celsius Maximum Process Temperature
Simon Ogier, SmartKem, Sedgfield, United Kingdom

69.4: Collimating and Recycling Linear Evaporation Source for AMOLED Mass Production
Sangmoon Kim, DepoLab, Paju, South Korea

Session 70: Light-Field and Foveated Imaging for AR/VR/MR (Hyper-Realistic Displays (AR/VR/MR) / Emerging Technologies and Applications / Liquid Crystal Technology)
Friday, May 13, 2022 / 10:40 AM - 12:00 PM / Room 220B
Chair: Gary Jones, Nanoquantum Corporation
Co-Chair: Akihiro Mochizuki, I-CORE Technology, LLC

70.1: Distinguished Paper: Foveated Imaging by Polarization Multiplexing for Compact Near-Eye Displays
Kun Yin, University of Central Florida, Orlando, FL US

70.2: A Design for Near Eye Light Field Display
Jian Gao, BOE, Beijing, China

70.3: Invited Paper: High Resolution Light Field VR LCD
Yung-Hsuan Wu, Innolux Corp., Miaoli County, Taiwan ROC

70.4: Invited Paper: Light Field Displays for Reverse Passthrough VR
Nathan Matsuda, Reality Labs Research, Meta, Redmond, WA US

Session 71: Projection Light Sources (Display Systems)
Friday, May 13, 2022 / 10:40 AM - 12:00 PM / Room 220C
Chair: David Eccles
Co-Chair: Hidekazu Hatanaka, Ushio Inc.

71.1: Invited Paper: GaN-Based Watt-Class High-Power Edge-Emitting Lasers and Milliwatt-Class Vertical-Cavity Surface-Emitting Lasers
Takuya Ozaki, Nichia Corporation, Anan, Japan

71.2: Invited Paper: High Power Red Laser Diodes for Display Applications
Satoshi Kawanaka, USHIO Inc., Shizuoka, Japan

71.3: Static Laser Phosphor for Projectors with Rotating Tilted Mirror
Kenneth Li, Optonomous Technologies Inc., Agoura Hills, CA US

71.4: Laser Phosphor Light Source using Compound Reflectors for Projection Display
Kenneth Li, Optonomous Technologies Inc., Agoura Hills, CA US
Friday, May 13, 2022 / 10:40 AM - 12:00 PM / Room LL21CD
Chair: Prof. Hyoungsik Nam, Kyung Hee University
Co-Chair: Dr. Robert Visser, Applied Materials
72.1: In-Line Mura Detection Using Convolutional Neural Network in Display Manufacturing
Satoru Tomita, Japan Display Inc., Chiba, Japan
72.2: A Proposal for Image Compression Algorithm For Display Test Images
Gang Xu, Jingce Electronics USA, San Jose, CA US
72.3: Deep Learning Based Visual Defect Detection in Noisy and Imbalanced Data
Qisen Cheng, Samsung Display America Lab, San Jose, CA US
72.4: Invited Paper: Synthetic Defect Generation for Display Front-of-Screen Quality Inspection: A Survey
Meng Cao, Apple, Cupertino, CA US

Session 73: OLED Materials II (OLEDs)
Friday, May 13, 2022 / 10:40 AM - 12:00 PM / Room LL21EF
Chair: Jang Hyuk Kwon, Kyung Hee University
Co-Chair: Hitoshi Kuma, Idemitsu Kosan Co., Ltd.
73.1: Invited Paper: Decoration Strategy in Para Boron Position: An Effective Way to Achieve Ideal Multi-Resonance Emitters
Lian Duan, Tsinghua University, Peking, China
73.2: Invited Paper: High Efficiency Organic Light-Emitting Diodes Based on Purely Organic Emitters
Shi-Jian Su, South China University of Technology, Guangzhou, China
73.3: Achieving Deep Blue Color in Diboron Embedded Multi-Resonance Thermally Activated Delayed Fluorescence Emitter for Narrowband OLEDs
Kenkera Naveen, Kyung Hee University, Seoul, South Korea
73.4: Novel Materials and Structures for High Efficiency and Long Lifetime Green Phosphorescent OLEDs in Automotive Applications
Soojung Yoon, Samsung Display, Yongin, South Korea

Session 74: Flexible Displays and Materials (Flexible Displays and e-Paper)
Friday, May 13, 2022 / 10:40 AM - 12:00 PM / Room LL20BC
Chair: Kyung Cheol Choi, KAIST
Co-Chair: Simon Kang, Apple
74.1: 31" Flexible Printed OLED TV Display Technology: It’s TV Mobile
Jueng Gil (James) Lee, Guangdong Juhua Printed Display Technology Co. Ltd., Guangzhou, China
74.2: Invited Paper: Highly Reliable Dielectric interlayers for Flexible Displays and e-Paper
Atsuko Yamamoto, Merck Electronics Ltd., Shizuoka, Japan
74.3: Invited Paper: Getting Thinner and Thinner with a New Flexible platform - Challenges and Solutions for Flexible Displays
Dong-Mee Song, The Electronics Business of Merck KGaA, Darmstadt, Germany
74.4: Development of Flexible Full-Color Mini-LED Display Using Simultaneous Transfer and Bonding (SITRAB) Technology
Jihoo Joo, Electronics and Telecommunications Research Institute, Daejeon, South Korea

Session 75: HDR and Color (Applied Vision)
Friday, May 13, 2022 / 10:40 AM - 12:00 PM / Room LL20A
Chair: Sakuichi Ohtsuka, International College of Technology
Co-Chair: David Hoffman, Google
75.1: Brightness and Vividness of High Dynamic Range Displayed Imagery
Luke Hellwig, Munsell Color Science Laboratory, Rochester, NY US
75.2: Effect of Chromatic Aberration Correction on Visually Lossless Compression
Sanjida Sharmin Mohona, York University, Toronto, ON Canada
75.3: Field Sequential Color Displays with Simultaneously Suppressed Color Breakup and Flicker Based on Multi-Objective Optimization
Qin Zong, Sun Yat-Sen University, Guangzhou, China
75.4: Low Luminance JND and JNCD
Sunyoung Park, Samsung Display, Yongin, South Korea

Session 76: Narrow Border Technologies (Display Manufacturing)
Friday, May 13, 2022 / 10:40 AM - 12:00 PM / Room LL20D
Chair: Greg Gibson, nTact
Co-Chair: Winston Wang, AU Optronics Corp
76.1: Invited Paper: MicroLED Display with Tiling Technology
Wen-Lung Chen, AU Optronics Corporation, Hsinchu, Taiwan ROC
76.2: Development of Custom Shaped OLED Display
Zhongyuan Wu, Hefei BOE Joint Technology Co., Ltd., Hefei, China
76.3: Invited Paper: Slim Mini LED Backlight for HDR Compatible Mobile Displays
Hisashi Watanabe, Sharp Display Technology Corporation, Tenri, Japan
76.4: Invited Paper: Innovation Solutions That Lead to AMLED Technologies
Minghua Xuan, Beijing BOE Display Technology Co., Ltd., Beijing, China

Poster Session
Thursday, May 12, 2022 / 5:00 PM - 8:00 PM / Room 220A

Active-Matrix Devices
P.1: Uni-Color Column Line Pentile-Type Pixel Arrangement Design for Low Driving Power Consumption AMOLED Displays  
Sangmoo Choi, Google LLC, Mountain View, CA US

P.2: Nitrogen Behaviors in PEALD-grown SiO2 Films Using N2O Plasma Reactant and Its Application in ALD-IZO TFTs  
Jin-Seong Park, Hanyang University, Seongdong, South Korea

P.3: High Temperature Annealing Behavior of IGZO Using Plasma Enhanced Atomic Layer Deposition  
Jin-Seong Park, Hanyang University, Seongdong, South Korea

P.4: A New Evaluation System for Metal Oxide Compound Semiconductor Film  
Ko-Chul Moon, Gachon University, Seongnam, South Korea

P.5: A New PWM Driving Circuit with Threshold Voltage and I-R Rise Compensating Capability for Mini-LED Backlight  
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan ROC

P.6: 2731-ppi OLED Display with Low Power Consumption and Wide Viewing Angle Using OS/Si VLSI Process Technology  
Kiyotaka Kimura, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

P.7: AMOLED Pixel Circuit for Strain Compensation in Stretchable Display  
Seok Yeon Lee, Seoul National University, Seoul, South Korea

P.8: Analysis on Degradation Mechanism of Oxide Semiconductor FETs with High Tolerance to Intense NBTIS  
Yukihiro Shima, Semiconductor Energy Laboratory Co., Ltd., Tochigi, Japan

P.9: Two-Mode PWM Driven Micro-LED Displays with Dual-Gate Metal-Oxide TFTs  
Jia Fu, Peking University, Shenzhen, China

P.10: Emit Signals Reused Gate Driver Design for Ultra-Narrow-Bezel Micro-LED Display Based on Metal-Oxide TFTs  
Xin Zheng, Peking University, Shenzhen, China

P.11: The Effects of As Dilution on N2O/SiH4 PECVD for the Growth of Silicon oxide Thin Films with Improved Breakdown Voltage Characteristics  
Aram Kim, LG Display, Paju, South Korea

P.12: Exponential Dependence of Photocurrent on Reciprocal of Channel Length in Amorphous InZnO Thin-Film Transistors with Short Channel  
Jie Chen, Peking University Shenzhen Graduate School, Shenzhen, China

P.13: Comprehensive Study of the TFTs Fabricated in the (100)-Oriented Grain-Boundary-Free Silicon Thin Film Obtained by Green CW-Laser Lateral Crystallization  
Nobuo Sasaki, Sasaki Consulting, Kanagawa, Japan

P.14: Effects of Film Density on IGZO Based TFT Device Reliability  
Jaeyoun Park, LG Display, Paju, South Korea

P.15: Charge Trap-Based Synaptic Transistor Employing In-Ga-Zn-O as Channel and Trap Layers for Bio-Inspired Neuromorphic Computing  
Junhyeong Park, Seoul National University, Seoul, South Korea

P.16: A New a-IGZO TFT Pixel Circuit Compensating Threshold Voltage and Mobility for Active-Matrix OLED with Source Follower Method  
Ji-Hwan Park, Seoul National University, Seoul, South Korea

P.17: Outstanding Image Sticking Performance via L-SWFTFT Channel Tuning in AMOLED Display Application  
Yinglong Huang, BOE Optoelectronics Technology Co., Ltd., Chengdu, China

P.18: Low Voltage Oxide Transistor with High Dielectric Tantalum Gate Insulator by Thermal Oxidation of Tantalum  
Byung Seong Baek, Hoseo University, Asan, South Korea

P.19: Performance Development of Oxide Semiconductor Photodiode with High Work Function Electrode Suitable for Mass Production  
Pengfei Gu, BOE Technology Group Co. Ltd., Beijing, China

P.20: High Quality Self-Aligned Coplanar Thin-Film Transistors with SOG Materials for High Transparent AMOLED Display  
Wei Liu, BOE Technology Group Co., Ltd., Beijing, China

P.21: Indium-Gallium-Zinc Oxide Thin-Film Transistors for High-Resolution Active-Matrix Ferroelectric Liquid-Crystal Displays  
Farhana Husna, Kyung Hee University, Seoul, South Korea

P.22: Effects of Self-Assembled Monolayer on Contact Resistance Between IGZO and Electrode for High-Resolution Display  
Yoonyoung Chang, POSTECH, Pohang, South Korea

P.23: A Monolithically Integrated Artificial Compound Eye for Proximity Pattern Recognition  
Zhou Zhi Chao, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

P.24: Distinguished Paper: Gate Driver with LTPO TFT Circuits for Low Power Consumption and Narrow Bezel AMOLED Displays  
Jin Jung, Kyung Hee University, Seoul, South Korea

P.25: Solution Processed CdSIn1.3Pb1.3/ZnO Phototransistor with High Photodetectivity  
Sisi Wang, The Hong Kong University of Science and Technology, Hong Kong, China

P.26: AMOLED Pixel Circuit Compensating for Stretching and I-R Drop  
Hyuck Su Lee, Hoseo University, Asan, South Korea

P.27: A Novel PWM Driving Pixel Circuit with Metal-Oxide TFTs for Micro-LED Display  
Ko-Ruey Jen, AU Optronics, Hsinchu, Taiwan ROC

P.28: Development of Low Resistivity Gate Metal Process for LTPS TFTs Array Backplane Applications  
Jae-Hong Ye, AU Optronics Corporation, Hsinchu, Taiwan, ROC

P.29: Influence of the Static Bending Stress on LTPS TFT  
Shuang Guo, Hefei Visionox Technology Co., Ltd., Hefei, China

P.30: Thermally Activated and Field-Enhanced Diffusion of Dopants in a-InGaZnO TFTs Under Circuit Operations and its Correlation to the Device Stabilities  
Zhou Zhi Chao, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

P.31: Low Temperature Annealing Behavior of IGZO Using Plasma Enhanced Atomic Layer Deposition  
Jin-Seong Park, Hanyang University, Seongdong, South Korea

P.32: Investigation on Mechanism of Illumination Mura in AMOLED Display with LTPS TFT Backplane After Long Term Localized Illumination  
Enqiu Guo, Visionox Technology Inc, Hebei, China

P.33: Process Simulation Reflecting Hydrogen/Oxygen for Oxide Semiconductor Thin Film Transistor  
Ko-Chul Moon, Gachon University, Seongnam, South Korea

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Jaeho Yoon, LG Display Co., Ltd., Paju, South Korea

P.36: Modulation of Subthreshold Current in In-Ga-Zn-O Thin-film Transistor for OLED Display using Electrohydrodynamic Jet Printing  
Hyeon-Jae Kim, Yonsei University, Seoul, South Korea

Applied Vision  
YungKyung Park, Ewha Womans University, Seoul, South Korea
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P.34: Automotive Local dimming Integrated System for LCD MDL
Xiaoxia Wang, BOE Optoelectronics Technology Co., Ltd., Beijing, China
P.35: The Study of Vehicle Bright Backlight with Local Dimming Effect
Yuanyuan Zhu, BOE Optoelectronics Technology Co., Ltd., Beijing, China
P.144: The Effect of the Reference Image on the Side Window of the Car of Motion Sickness
Chien Ju Li, Industrial Technology Research Institute, Hsinchu, Taiwan ROC
P.145: AR HUD System Realized By Holographic Display Technology
Chien Yu Chen, National Taiwan University of Science And Technology, Taipei, Taiwan ROC

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Hojin Lee, Soongsil University, Seoul, South Korea
P.38: Low-Power a-IGZO TFT Shift Register Featuring i-PUA Gate Dielectric
Hojin Lee, Soongsil University, Seoul, South Korea
P.39: The IR Drop Compensation Method of AMOLED Display for Dynamic Power Control
Wei-Jhe Ma, Novatek Microelectronics Corp., Hsinchu, Taiwan ROC
P.40: Techniques of Touch Sensing and Display Driving for Avoiding Display Artifacts for Flexible OLED Applications
Daisuke Ito, Synaptics Japan G.K., Nakano, Japan
P.41: A Combined PAM / PWM Driving Scheme for High Uniformity of Micro-LED Displays
Julian Ritter, Saarland University, Saarbrücken, Germany
Sang-Hyuck Ahn, Sungkyunkwan University, Suwon, South Korea
P.43: Finely Programmable Pulse Width Shift Register for Luminance Control of AMOLED Displays
Hyounghik Nam, Kyung Hee University, Seoul, South Korea
P.44: NBT Enhancement Gate Driver Circuit Employing IGZO TFTs for Image-Quality Improvement
Xuehuaun Feng, Hefei BOE-Joint Technology Co. Ltd., Hefei, China
P.45: High Efficiency DC-DC Converter for IT OLED Displays
Yoon-Young Lee, Samsung Display, Yongin, South Korea

Display Manufacturing
P.46: New Type of Unbounded Screen Full-Attachment TV Set
Wenbo Dong, Hefei BOE Display Technology Co., Ltd., Hefei, China
P.47: A Repair Method for Improving Pad Damage of COG Mini-LED
Hai Tang, BOE MLED Technology Co., Ltd., Beijing, China
P.48: Analysis of Degree of Imidization of Polyimide Organic Film Through Retardation Measurement
Nakcho Choi, Samsung Display Co., Ltd., Yongin, South Korea
P.49: Physics-Based Simulator for Predictiction of Organic Layer Profile Using Microfluidics
Hyungkeon Cho, Samsung Display, Yongin, South Korea
P.50: Inkjet Printing Design and Analysis for Thin and Uniform Organic Encapsulation Layer on OLEDs
Heechang Yoon, Samsung Display Co., Ltd., Gyeonggi, South Korea
P.51: Study on the Sealing Property of Narrow Border Display
Zhenyu Zhang, Hefei Xinsheng Photoelectric Technology Co., Ltd., Hefei, China
P.52: Novel Forming Technology of 3D Cover Glass with Induction Heating System for Curved-Corner Display
Seungho Kim, Samsung Display Co., Ltd., Yongin, South Korea
P.53: A Study on Conceptual Design in Foam Tape of Curved Display using Topology Optimization
Min Gu Kim, Samsung Display Co., Ltd., Yongin, South Korea
P.54: Development of Heat Free / Low Temperature Process High Refractive Index Material for Display
Kazuki Urakawa, Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan
P.55: Improvement of Photosensitive Material for Mini/Micro LED Display
Yasuori Takahashi, Sumitomo Bakelite Co., Ltd., Fukuoka, Japan
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Hans-Juergen Kahlert, INNOVAVENT GmbH, Goettingen, Germany

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P.56: Simulation and Improvement of TCO Luminance Angular Uniformity Based on Techwiz and LightTools Software
Hanyan Sun, Beijing BOE Display Technology Co., Ltd., Beijing, China
P.57: Improved Modulation Transfer Function (MTF) for Aerial Image Formed with AIRR by Use of Two Transparent Spheres
Kazuki Takiyama, Utsunomiya University, Utsunomiya, Japan
P.58: Measurement of AR Displays in Positioning Accuracy
Xi Mou, Hangzhou Santest Technology Co., Ltd., Zhejiang, China
P.59: In-Fab Raman Spectroscopy for Defect Analysis of Random Failures
Yong-Woon Lim, Samsung Display, Yongin, South Korea

Display Systems: Emerging Display Technologies and Applications
P.60: New Flexible & Lightweight RGB LED Video-Foil for Digital Signage
Florian Kall, LightnTec GmbH, Karlsruhe, Germany
P.61: Dual Cell Display System for Intelligent Viewing-Adjustable LCDs
Yuxu Geng, Chongqing BOE Optoelectronics Technology Co., Ltd., Chongqing, China
P.62: Adaptive Pixel-Based Local Color Uniformity Compensation for AMOLED Displays
Wan-Nung Tsung, Novatek Microelectronics Corporation, Hsinchu, Taiwan ROC
Display Systems: Projection

P.63: Design and Fabrication of Wide-Viewing-Angle Ambient Light Rejection Front Projection Screen
Fung-Hsu Wu, BenQ Materials Corp., Taoyuan, Taiwan ROC

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P.64: The Micro-LC Lens for 2D/3D Switchable Displays
Weili Zhao, BOE Technology Group Co., Ltd., Beijing, China

P.65: Autostereoscopic Display for Two Viewers Providing Images Specific to Each Viewpoint
Hideki Kakeya, University of Tsukuba, Tsukuba, Japan

P.66: Application of Ergonomics in VR HMD Exit Pupil Positioning Design
Yuhong Liu, Beijing BOE Optoelectronics Technology Co., Ltd., Beijing, China

P.67: Design and Analysis of Deflection Structure for Light Field Display
Kai Siang Hsu, National Taiwan University, Taipei, Taiwan ROC

P.68: A Miniaturized Polarization-Multiplexed Dual-Plane Head-Mounted Display System for Augmented Reality
Zekun Yan, Shanghai Jiao Tong University, Shanghai, China

P.69: Omnidirectional and Self Adaptive High Dimensional 3D Display
Shiming Shang, BOE Technology Group Co., Ltd., Beijing, China

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Youru Chen, BOE Technology Group Company, Ltd., Beijing, China

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Grant Jennings, Gowin Semiconductor, Austin, TX US

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Yongtaek Hong, Seoul National University, Seoul, South Korea

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Eun Kyo Jung, Sungkyunkwan University, Suwon, South Korea

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En-Lin Hsiang, University of Central Florida, Orlando, FL US

P.75: MicroLED Pixel Circuit Capable of Always on Display Mode Operation for Mobile and Wearable Displays
Yong-Hoo Hong, Sungkyunkwan University, Suwon, South Korea

P.76: Elimination of Nanorods by Tetramethylammonium Hydroxide for the Fabrication of AlGaN-based UV-C Micro-LED Array
Feng Feng, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

P.77: Advanced Encapsulation Film for Micro-LED Display
Shih-Chieh Teng, BenQ Materials Corporation, Taoyuan, Taiwan ROC

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Jouko Lång, Comptek Solutions, Turku, Finland

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Khaled Ahmed, Intel Corporation, San Jose, CA US

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Da Bin Kim, Foundation Technology Laboratory, LG Display, Seoul, South Korea

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Hyunguk Cho, Samsung Display, Youngin, South Korea

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Yongtaek Hong, Seoul National University, Seoul, South Korea

P.85: Nanorod Down-Converted LED with Long Term Stability for Display Backlight
Chengbin Kang, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

P.86: Ink-Jet Printed Stable Full-Color Perovskite and Quantum Rod Color Filter
Yiyang Gao, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

Emissive, Micro-LED, and Quantum-Dot Displays Posters: QD-LEDs

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Heesun Yang, Hongik University, Seoul, South Korea

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Ju-Hw Lee, National Taiwan University, Taipei, Taiwan ROC

P.89: High-Efficiency Red Quantum Dot Light-Emitting Diodes with Acrylate-Treated ZnMgO as an Electron Transport Layer
Heesun Yang, Hongik University, Seoul, South Korea

P.90: Boosting the Efficiency of Cd-Free Blue Quantum Dot Light-Emitting Diodes via Charge Transport Layer Optimization
Meicheng Jiang, BOE Technology Group Co., Ltd., Beijing, China

P.91: Enhanced Carrier Transportation towards High Luminescent Light-Emitting Diodes with Multi-Cation Perovskite
Yongwei Wu, TCL China Star Optoelectronics Technology Co. Ltd., Shenzhen, China

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Urs Aeberhard, Fluxim AG, Winterthur, Switzerland

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Shuang DU, BOE Technology Group Co., Ltd., Beijing, China
P.94: Color-Tunable Textile-Based Organic Light-Emitting Diodes Toward a True Wearable Fashion Display
Kyung Cheol Choi, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

P.95: Optimization Analysis for R1.5mm Teardrop Shape Foldable AMOLED Module by Finite-Element Analysis
Jia Zeng, BOE OLED Product Development Center, Ltd., Chengdu, China

P.96: Activegrid™ Advanced Materials Enabling Next Generation Designs
Xiaoning Chen, C3Nano Inc., Hayward, CA US

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Ari Kärkkäinen, Optitune, Oulu, Finland

P.138: High Torque Hinge for Large Size Foldable Device
Insun Hwang, AUFLEX, Hwaseong, South Korea

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Cheng-Huan Chen, National Yang Ming Chiao Tung University, Hsinchu, Taiwan ROC

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Lin Zhou, Beijing BOE Optoelectronics Technology Co., Ltd., Beijing, China

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Yin-long Zhang, Beijing BOE Display Technology Co., Ltd., Beijing, China

P.101: Self-Capacitive Ring Like Touch Sensor Design and Algorithm for OLED On-Cell Touch Panel
Yi-Ting Lin, Novatek Microelectronics Corporation, Hsinchu, Taiwan ROC

P.102: Design Approach of NFC Antenna Integration into LCD Panel
Feng Long, Beijing BOE Display Technology Co., Ltd., Beijing, China

P.103: Imaging Quality Optimization of Full Display with Camera Based on Optical Simulation
Bo Shi, BOE Optoelectronics Technology Co., Ltd., Chengdu, China

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P.105: Cholesteric Liquid Crystal Filters with Single Layer template
Yao Gao, Shanghai Jiao Tong University, Shanghai, China

P.106: Highly Thermal Stable Polymer Stabilized Cholesteric Liquid Crystals Smart Window
Yang Liu, Donghua University, Shanghai, China

P.107: Switchable Privacy Monitor Display using Viewing Angle Control Film
Seung Hwa Baek, LG Display, Paju, South Korea

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Qian Qian Zhang, HeFei BOE PhotoelectricTechnology Co., Ltd., Hefei, China

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Bowen Li, Beijing BOE Display Technology Co., Ltd., Beijing, China

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Mei Liu, Wuhan China Star Photoelectric Technology Co., Ltd., Wuhan, China

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Kun Ma, Wuhan China Star Optoelectronics Technology Co., Ltd., Wuhan, China

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Yong-Woon Lim, Samsung Display, Yonin, South Korea

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Yang Liu, Donghua University, Shanghai, China

P.116: Transparent Displays Using Vertically Aligned Polyimide-Free Liquid Crystal-Polymer Composite
MinSu Kim, Jeonbuk National University, Jeonju, South Korea

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P.117: AI Analysis of HOP Circuit Failure and Improvement
kubeuue Park, Samsung Display, Gyeonggi, South Korea

P.118: A New Architecture and Algorithm For Display Defect Compensation Based on CNN
Gyeong Electronics USA, San Jose, CA US

P.119: Semi-Supervised Segmentation-Based Auto Design Rule Check Key Detection Performance Enhancement
Kookhyun Yoo, Samsung Display, Youngin, South Korea

P.120: The Solution for Imbalanced Image Data of Mass Production
Sukhin Jung, Samsung Display, Yongin, South Korea

P.121: CNN Based Edge Preserve Segmentation for FIB, TEM Image Analysis
seokkwon Kim, Samsung Display, Giheung, South Korea

P.122: Bayesian Optimization with Gradients for OLED Efficiency Enhancement
Richard James, Samsung Display, Yongin, South Korea

P.123: Machine Learning Assisted Efficient Sampling for Vertical Design Rule Check
MinKyu Yeo, Samsung Display, Youngin, South Korea

OLEDs

P.123: Study for Correlation Between Solution Processed OLED Performances and Film Profile
Insun Yoo, LG Display, Seoul, South Korea

P.124: Multiple Resonance Type Blue Fluorescent OLEDs with High Efficiency of Over 25% and Long Device Lifetime of Over 500 h
Jinho Park, Sungkyunkwan University, Suwon, South Korea

P.125: Investigation of Mechanisms to Enhance Efficiency and Lifetime of Blue Organic Emitting Diode
Wenfeng Song, Hefei BOE Joint Technology Co., Ltd., Hefei, China
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Ki Ju Kim, Hongik University, Seoul, South Korea

Seung Chan Kim, Sungkyunkwan University, Suwon, South Korea

P.128: Optimizing OLED Pixel Structures for Consistently Low Ambient Light Reflection over Viewing Angles
Chung-Chih Wu, National Taiwan University, Taipei, Taiwan ROC

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Stefano Sem, University of Augsburg, Augsburg, Germany

P.130: Organic Thin Films for OLED Applications: Simulating the Influence of Deposition Conditions and Substrate
Paul Winget, Schrödinger Inc., New York, NY US

P.131: Highly Efficient, Pure Hyperfluorescence Device with Organo Boron Based Thermally Activated Delayed Fluorescence Materials
Hyuna Lee, Kyung Hee University, Seoul, South Korea

Jiun-Haw Lee, National Taiwan University, Taipei, Taiwan ROC

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Jeong-suk Baek, Samsung Display Company, Yongin, South Korea

P.134: Detection of Ion Impurities in Organic Thin Films by Displacement Current Measurement Method
Takuro Iwata, Japan Advanced Institute of Science and Technology, Ishikawa, Japan

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Min Chul Suh, Kyung Hee University, Seoul, South Korea