Session 1: Annual SID Business Meeting

Session 2: Opening Remarks / Keynote Addresses
2.1: Keynote Address 1: Robert Wisnieff, IBM T.J. Watson Research Center
2.2: Keynote Address 2: David Luebke, NVIDIA Corp.
2.3: Keynote Address 3: Michael Heckmeier, Merck KGaA
2.4: Keynote Address 4: Frank Ko, AU Optronics Corp.

Session 3: 8K, High Resolution LCDs (Liquid Crystal Technology)
Chair: Miyoshi Ayama, Utsunomiya University
Co-Chair: Philip Chen, National Chiao Tung University
3.1: Invited Paper: Super Bright 8K LCD with 10,000 nit has been Realized with Excellent Light-Resistance Characteristics of IGZO TFT Backplane
Jun Nishimura, Sharp Corp. Display Device Company, Kameyama, Japan
3.2: Invited Paper: A Wide Color Gamut LCD with a Polarized Laser Backlight
Shinichi Komura, Japan Display Inc., Mobara, Japan
3.3: Novel Microstructure Film to Improve Viewing Angle of Multi-Domain Polymer Sustained Alignment LCD
Kan-Cheng Tien, AU Optronics, Hsinchu, Taiwan
3.4: Novel LCD Pixel Design with Extra Large Aperture Ratio for PsVA Mode Display
Surigalatu Borjigin, Shenzhen China Star Optoelectronics Semiconductor Display Technology Co.Ltd., Shenzhen, China
3.5: Late-News Paper: Two-Dimensionally Aligned Array with 1µm Pixel Pitch Using Ferroelectric Liquid Crystal Pixels for Holography Application
Shintaro Aso, Japan Broadcasting Corporation, Tokyo, Japan

Session 4: Automotive Display Components (Automotive/Vehicular Displays and HMI Technologies)
Chair: David Hermann, Volvo Car Corporation AB
Co-Chair: Karlheinz Blankenbach, Pforzheim University
4.1: Invited Paper: Technical Cover Glass Designed for Automotive Infotainment Display
Casey Kang, Corning Incorporated, Corning, NY US
4.2: Anti-Glare Cover Glass Optical Properties Dependence on the Display Module Configuration
Masanobu Isshiki, AGC Inc., Yokohama, Japan
4.3: Late-News Paper: OLED Device Technologies for Automotive Application
Shigeru Mori, Tianma Japan, Ltd., Kawasaki, Japan
4.4: Increase of Contrast in 3D HUD Using an Active Parallax Barrier
Akinori Sato, KYOCERA Corporation, Shiga, Japan

Session 5: AR/VR Invited Session (Augmented, Virtual and Mixed Reality / Display Systems)
Chair: Achin Bhowmik, Starkey Hearing Technologies
Co-Chair: Seung Woo Lee, Kyung Hee University
5.1: Invited Paper: Human Factors in Virtual and Augmented Reality
Martin Banks, University of California Berkeley, Berkeley, CA US
5.2: Invited Paper: Computational Eyeglasses and Near-eye Displays with Focus Cues
Gordon Wetzstein, Stanford University, Stanford, CA US
5.3: Invited Paper: Towards Cost-Effective AR/MR Displays Mass Production: The Emergence of an Industrial Hardware Ecosystem for Waveguide Combiners and Micro iLED Displays
Bernard Kress, Microsoft, Redwood City, CA US
5.4: Invited Paper: Current Challenges in Augmented-Reality Waveguide Display Technology
Jonathan Waldern, DigiLens Inc., Sunnyvale, CA US

Session 6: OLED Materials I (OLEDs)
Chair: Denis Kondakov, DuPont
Co-Chair: Sven Zimmermann, Novaled GmbH
6.1: Invited Paper: Lifetime Improvement of TADF-OLEDs
Jun-Yun Kim, LG Display, Seoul, South Korea
6.2: Invited Paper: Innovative Technological Progress of Lifetime in Hyperfluorescence
Session 7: Reliability (Active Matrix Devices)
Chair: Hsing-Hung Hsieh, HP International Pte. Ltd.
Co-Chair: Xiaojun Guo, Shanghai Jiao Tong University
7.1: Distinguished Paper: Alleviation of Abnormal NBTI Phenomenon in LTPS TFTs on Polyimide Substrate for Flexible AMOLED
Jaeseob Lee, Samsung Display Co., Ltd., Yongin, South Korea
7.2: Invited Paper: Hot Carrier Degradation in High Mobility Metal Oxide Thin Film Transistors
Yukiharu Uraoka, Nara Institute of Science and Technology, Ikoma, Japan
7.3: High ESD Robustness and Low Visible Light Reflectance Design for LTPS-TFTs on Glass Substrates in Modular Micro-LED Displays
Seongho Son, Samsung Electronics Co., Ltd., Suwon, South Korea
7.4: Late-News Paper: Development of High-Mobility Top-Gate IGZTO-TFT and Suppression of Threshold Voltage Shift in Short Channel Utilizing Laser Irradiation Process
Mitsuru Nakata, NHK Science & Technology Research Laboratories, Tokyo, Japan

Session 8: Advances in Lighting: OLEDs, Materials, and Manufacturing (Lighting)
Chair: Eric Margulies, Universal Display Corporation
Co-Chair: J. Norman Bardsley, Bardsley Consulting
8.1: Invited Paper: Development of High-Temperature Stable Red OLEDs for Automotive Lighting
Marina Kondakova, OLEDWorks LLC, Rochester, NY US
8.2: Invited Paper: High Refractive Index Material for Display and Lighting Applications
Selina Monickam, Pixelelligent Technologies, LLC, Baltimore, MD US
8.3: Invited Paper: OLED Lighting Design and Roll-to-Roll Manufacturing
Christian May, Fraunhofer-Institute for Organic Electronics, Dresden, Germany
8.4: Invited Paper: Flexible Glass Substrate for OLED Lighting Application and Efficient Internal Light Extraction for OLED Lighting Devices
Dipak Chowdhury, Corning Technology Center Korea, Seoul, South Korea

Session 9: MicroLED Manufacturing (Display Manufacturing)
Chair: Ion Bita, Google LLC
Co-Chair: Bradley Bowden, Corning Research and Development Corporation
9.1: Invited Paper: Colloidal Lead Halide Perovskite Nanocrystals as Classical and Quantum Light Sources
Maksym Kovalenko, ETH Zurich and Empa, Zurich, Switzerland
9.2: Manufacturing Process for Mass-Production of Micro LED Displays
Koichi Kajiyama, V-Technology Co., Ltd, Yokohama, Japan
9.3: Advanced Process and Structure of Backplane for Micro LED Display
Hua-Fei Xie, Peking University, Shenzhen, China
9.4: Applying FPD Panel and Manufacturing Technologies to Alternative Applications and New Business Models
Charles Annis, IHS Markit, Tokyo, Japan
9.5: Late-News Paper: A 3.9-inch LTPS TFT Full Color MicroLED Display with Novel Driving and Reflector Cavity Process
Masaya Tamaki, Kyocera Corporation, Shiga, Japan

Session 10: HDR LCDs I (Liquid Crystal Technology / Display Systems / High-Dynamic-Range LCDs)
Chair: Brian Berkeley, Highlight Display LLC
Co-Chair: Shin-Tson Wu, University of Central Florida
10.1: Invited Paper: High Dynamic Range Mini-LCD and Dual-Cell LCDs
Shin-Tson Wu, University of Central Florida, Orlando, FL US
10.2: Invited Paper: Development of Dual-Cell LCD with Mega Contrast
Lei Guo, Hefei Xinteng Optoelectronics Technology Co., Ltd., Hefei, China
10.3: Invited Paper: Active Matrix Mini-LED Backlight on Glass for 75-inch LCDs
Jiayang Fei, TCL China Star Optoelectronics Technology Co., Ltd, Shenzhen, China
Mingxia (Vincent) Gu, Apple Inc., Cupertino, CA US

Session 11: Automotive Display Technologies and Systems (Automotive/Vehicular Displays and HMI Technologies)
Chair: Casey Kang, Corning Incorporated
Co-Chair: Rashmi Rao, Harman International
11.1: High Reliability Flexible AMOLED Display with Algorithm Compensation for Automotive Application
Youxiong Feng, BOE Technology Group Co., Ltd., Chengdu, China
11.2: *Late-News Paper:* Display/Projection Features: The Next Growth Driver for Automotive Lighting
Paree Mukish, Yole Développement, Villeurbanne, France

11.3: *Distinguished Paper:* Advanced Methods for Safe Visualization on Automotive Displays
Benjamin Axmann, Daimler AG Group Research, Boeblingen, Germany

11.4: *Invited Paper:* Virtual prototyping and testing of automotive capacitive touch sensors
George Bouzianas, Fieldscale PC, Thessaloniki, Greece

Session 12: OLED AR/VR (Augmented, Virtual and Mixed Reality / OLEDs)
Chair: Qi Wang, eMagin Corporation
Co-Chair: Franky So, North Carolina State University

12.1: *Invited Paper:* Directional SPP Emission in OLEDs Using Diffractive Optical Elements
Xiangyu Fu, North Carolina State University, Raleigh, NC US

12.2: *Late-News Paper:* High Performance OLED Microdisplays Made with Multi-Stack OLED Formulations
John Hamer, OLEDWorks LLC, Rochester, NY US

12.3: *Organic Light-Emitting Diode Microdisplay with a 32:9 Aspect Ratio for Wide Field of View*
Hyunkoo Lee, Electronics and Telecommunications Research Institute, Daejeon, South Korea

12.4: *1000PPI LTGS OLED Display for VR Application*
Ziyang Yu, Chengdu BOE Optoelectronics Technology Co., Ltd., Chengdu, China

Session 13: OLED Materials II (OLEDs)
Chair: Hitoshi Kuma, Idemitsu Kosan Co., Ltd.
Co-Chair: Nicholas Thompson, Universal Display Corporation

Russell Holmes, University of Minnesota, Minneapolis, MN US

13.2: *Late-News Paper:* How to Reduce Harmful Blue Light on OLED Device
Jusook Bang, Samsung Display Corporation, Youngin, South Korea

13.3: Improvement of Blue Pixels in OLED Panels with More Efficient Fluorescent and TADF Emitters
Thomas Baumann, Cynora GmbH, Bruchsal, Germany

13.4: *Late-News Paper:* Effect of Molecular Structure of Host Materials on Thermal Stability and Device Characteristics of Solution Processed OLEDs
Min Chul Suh, Kyung Hee University, Seoul, South Korea

Session 14: Image Sensors (Active Matrix Devices)
Chair: Sang Hee Park, KAIST
Co-Chair: Tse Nga Tina Ng, University of California San Diego

14.1: *Invited Paper:* Flexible Large-Area Multi-Fingerprint Sensors Based on Thermal Mass Detection
Florian De Roose, imec, Leuven, Belgium

Yasuhiro Niiura, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

14.3: Flexible Image Sensor Array Using IGZO TFT Backplane Technology for X-Ray Detector
Rikuya Takita, Sharp Corporation, Taki, Japan

14.4: *Late-News Paper:* Large-Area Optical Fingerprint Sensors for Next Generation Smartphones
Noémie Ballot, Isorg, Limoges, France

Session 15: Advanced TFT Manufacturing (Display Manufacturing)
Chair: Dr. Chiwoo Kim, APS Holdings
Co-Chair: Greg Gibson, nTact

15.1: *Invited Paper:* Manufacturing Technology of LTPO TFT
Ui-Jin Chung, LG Display Co., Ltd., Paju, South Korea

15.2: Gen 10 Excimer Laser Annealing System
Takahiro Fuji, The Japan Steel Works, Ltd., Yokohama, Japan

15.3: Resistance Reduction of Molybdenum Metallization by Tungsten Seed Layer
Harald Kostenhauer, Plansee SE, Reutte, Austria

15.4: New Gen. 6 Exposure Tools for 1.2 µm Resolution
Nobuhiko Yabu, Canon Inc., Utsunomiya, Japan

Session 16: MicroLED Color Conversion (Emissive, Micro-LED, and Quantum-Dot Displays)
Chair: Seth Coe-Sullivan, Luminit, LLC
Co-Chair: Ioannis Kymissis, Columbia University

Yang Gu, X-Vision Lab, Visionox Technology Inc., Kunshan, China

16.2: A 4-inch Full Color Active-matrix Mini-LED Display Based on 0408 Chip and 500um Pixel
Hong Meng, Peking University, Shenzhen, China
16.3: **High-End Displays Applications by Micro-LEDs**
Chien-Chung Lin, Industrial Technology Research Institute, Hsinchu, Taiwan ROC

16.4: **Late-News Paper: High Color Gamut Mini-LED Backlight Demon Based on Dual-Emissive Perovskite Quantum Dots Films**
Haizheng Zhong, Beijing Institute of Technology, Beijing, China

16.5: **Late-News Paper: High Flux Stable Perovskite Quantum Dots-Polymer Composite for Down-Converting Applications**
Lutfan Sinatra, Quantum Solutions LLC, Thuwal, Saudi Arabia

**Session 17: HDR LCDs II (Liquid Crystal Technology / Display Systems / High-Dynamic-Range LCDs)**
Chair: Jenn Jia Su, AU Optronics Corporation
Co-Chair: Matthew Sousa, 3M
17.1: **Invited Paper: An Overview of Solutions for Achieving HDR LCDs**
Jenn Jia Su, AU Optronics Corporation, Hsinchu, Taiwan ROC
17.2: **A Method for Improving Image Contrast Based on Dual Cell Display**
Yizhuo Zhao, TCL China Optoelectronics Technology Co., Shenzhen, China
17.3: **Novel Mini-Led Backlit for 75-inch HDR LCD**
Enhui Guan, BOE Technology Group Co., Ltd., Beijing, China
17.4: **Enhancing the Picture Quality of Local Dimming Mini-LED LCD**
Chun-Chi Chen, TCL China Star Optoelectronics Technology Co., Ltd., Shenzhen, China
17.5: **Distinguished Paper: Birefringent Light-Shaping Films for Mini-LED Backlights**
Ziqian He, University of Central Florida, Orlando, FL US
17.6: **Invited Paper: 4K HDR "Stacked-Panel" TV Based on Dual-Cell LCD**
Weidong Liu, Hisense Visual Technology Co., Ltd, Qingdao, Shandong, China

**Session 18: Head-Up Displays (HUD) (Automotive/Vehicular Displays and HMI Technologies)**
Chair: Philippe Coni, THALES Avionics
Co-Chair: Haruhiko Okumura, Toshiba Corporation
18.1: **Invited Paper: Holographic Optical Elements for Automotive Windshield Displays**
Ian Redmond, Ceres Holographics Ltd, St. Andrews, FL United Kingdom
18.2: **Improvement of Light Leakage in HUD System**
Kenta Kamoshita, KYOCERA Corporation, Shiga, Japan
18.3: **Impact Study of Windshield Geometry on the Subjective Customer Perception for Augmented Reality Head-Up Displays (AR-HUD)**
Daniel Wagner, Mercedes-Benz AG, Sindelfingen, Germany
18.4: **Invited Paper: Switchable Lightfield Displays for Automotive Applications**
David Fattal, Leia Inc, Menlo Park, CA US

**Session 19: Human Factors with AR/VR (Augmented, Virtual and Mixed Reality / Applied Vision)**
Chair: Takashi Shibata, Tokyo University of Social Welfare
Co-Chair: Paolo Sacchetto, Apple, Inc.
19.1: **Distinguished Paper: Differences Between Oculomotor and Perceptual Artifacts for Temporally Limited Head-Mounted Displays**
Alexander Goettker, Facebook, Redmond, WA US
19.2: **Vergence-Accommodation Conflicts in Augmented Reality: Impacts on Perceived Image Quality**
Ian Erkelens, Facebook, Redmond, WA US
19.3: **Foveated Brightness Control Technology for VR Applications**
Seung-Woo Lee, Kyung Hee University, Seoul, South Korea
19.4: **Research on Reducing Motion Sickness of Playing First Person Shooting VR Game with Texture Blur**
Ting-Lan Tsai, National Taiwan University of Science and Technology, Taipei City, Taiwan ROC

**Session 20: OLED Materials III (OLEDs)**
Chair: Jong Hye Kwon, Kyung Hee University
Co-Chair: Changwoong Chu, Samsung Display Corporation
Ken-Tsung Wong, National Taiwan University, Taipei, Taiwan ROC
20.2: **High Efficiency and Long Device Lifetime Green Organic Light Emitting Fodes Using a Pt Complex**
Sunghun Lee, Samsung Electronics, Suwon, South Korea
20.3: **Universal Method to Inject Electrons Into Organic Semiconductors Utilizing Hydrogen Bonds**
Hirohiko Fukagawa, NHR Science & Technology Research Laboratories, Tokyo, Japan
20.4: **Study on the Effect of OLED Device Lifetime Improvement According to Hole Injection Barrier and p-Dopants**
Jaechul Hong, Samsung Display Co., Ltd., Yongin, South Korea

**Session 21: Super Resolution and Gen 11 (Active Matrix Devices)**
Chair: Dr. Kalluri Sarma, Honeywell, Inc
Co-Chair: Hyun Jae Kim, Yonsei University
21.1: **Invited Paper: 5291-ppi Microdisplay Using CAAC-IGZO FET with Channel Length of 60 nm**
Hideaki Shishido, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan
Session 22: Flexible Technologies I: Manufacturing (Display Manufacturing / Flexible Displays and E-Paper)
Chair: Yukio Endo, AGC Inc.
Co-Chair: Kyung-Tae Kang, Korea Institute of Industrial Technology
22.1: Formation of Silicon-Based Thin Film Encapsulation for Fabrication of Highly Flexible OLED Devices
Eun Jung, Samsung Display, Yongin, South Korea
22.2: An Ultra-Thin Flexible Thin Film Encapsulation Structure with High Transmittance and Reliability
Youwei Wang, BOE Technology Group Co., Ltd., Beijing, China
22.3: Sum Thickness of Low-Retardation Plastic Foil with Gas Barrier and Transparent Conductive Layer for Bendable Devices
Hiroki Kinoshita, LITEC Corporation, Saitama, Japan
22.4: Development of Rolled Long Ultra-thin Glass and Its Mass Production Technology
Hiroki Mori, Nippon Electric Glass Co., Ltd., Otsu, Japan
22.5: Late-News Paper: Silicone-Based Low-k Material for Display
Brandon Swatowski, Dow Chemical, Midland, MI US

Session 23: MicroLED Display Systems (Emissive, Micro-LED, and Quantum-Dot Displays)
Chair: Yong-Seog Kim, Hongik University
Co-Chair: Larry Weber, Consultant
Reza Chaji, VueReal, Waterloo, ON Canada
David Pastel, Corning Inc., Corning, NY US
23.3: Highly Transparent, Ultra-Thin Flexible, Full Color Mini-LED Display with IGZO TFT Substrate
Jinyang Sun, TCL Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China
23.4: Full Color, Active-Matrix Micro-LED Display with Dual Gate a-IGZO TFT Backplane
Jin Jang, Kyung Hee University, Seoul, South Korea
23.5: Late-News Paper: High-Resolution Monolithic Micro-LED Full-Color Micro-Display
Xu Zhang, Hong Kong University of Science and Technology, Kowloon, Hong Kong

Session 24: LTPO (Active Matrix Devices)
Chair: James Chang, Apple, Inc.
Co-Chair: Man Wong, Hong Kong University of Science & Technology
24.1: Invited Paper: Development of High Quality IGZO-TFT with Same On-Current as LTPS
Kazuatsu Ito, Sharp Corporation, Tenri, Japan
24.2: Distinguished Paper: Fluorination for Enhancing the Resistance of Indium-Gallium-Zinc Oxide Thin-Film Transistor against Hydrogen-Induced Degradation
Sisi Wang, The Hong Kong University of Science and Technology, Hong Kong, China
24.3: Complementary LTPO Technology, Pixel Circuits and Integrated Gate Drivers for AMOLED Displays Supporting Variable Refresh Rates
Jiahao Kang, Royole Corporation, Fremont, CA US
24.4: Distinguished Paper: High Refresh Rate and Low Power Consumption AMOLED Panel Using Top-gate n-Oxide and p-LTPS TFTs
Ryo Yonebayashi, Sharp Corporation, Tenri, Japan

Session 25: Innovative Display Driving Circuits (Display Electronics)
Chair: Ya Hsiang Tai, National Chuao Tung University
Co-Chair: Soo-Yeson Lee, Seoul National University
25.1: Multi-Bit MIP(Memory-in-Pixel)-Based Pixel Circuit of CMOS Backplane for Micro-LED Display
Jewoo Seong, Ulsan National Institute of Science and Technology (UNIST), Ulsan, UNK South Korea
25.2: LTPO TFT Technology for Level Shifter Integrated Gate Driver in UHD 4K Displays
Kwang-Joong, Kyung Hee University, Seoul, South Korea
25.3: Fault-Tolerant Integrated Gate Driver for Flexible Displays
Seung-Woo Lee, Kyung Hee University, Seoul, South Korea

Session 26: Novel Waveguides for AR Glasses (Augmented, Virtual and Mixed Reality / Display Systems)
Chair: Nikhil Bafream, Google Inc.
Co-Chair: Brian Schowengerdt, Magic Leap
26.1: Distinguished Paper: Chirped Polarization Volume Grating for Wide FOV and High Efficiency Waveguide-Based AR Displays
Kan Yin, University of Central Florida, Orlando, FL US
Yuning Zhang, Southeast University, Nanjing, China

26.3: Tolerancing Capabilities of Crossed Gratings Versus Linear Gratings

Alexandra Crai, WaveOptics Ltd., Abingdon, United Kingdom

26.4: Late-News Paper: Super-Light Smart Glasses Using a Thin Plastic Light Guide Plate
Shigenobu Hirano, Ricoh Company, Ltd., Ebina, Japan

Session 27: Printed OLEDs I (OLEDs)

Chair: Changwoong Chu, Samsung Display Corporation
Co-Chair: Yasunori Kijima, Huawei Technologies Japan K.K.

Daisuke Fukushima, Sumitomo Chemical Co., Ltd., Tsukuba, Japan

Sebastian Meyer, Merck KGaA, Darmstadt, Germany

27.3: Improved Device Performance for Inkjet Printed OLEDs via Interfacial Mixing Control
Heung Gyu Kim, Samsung Display Co., Ltd., Yongin, South Korea

27.4: Late-News Paper: Key Materials for High Performance Solution-Process OLEDs
Koichiro Iida, Mitsubishi Chemical Corporation, Yokohama, Japan

Session 28: Seeing Through the Display (Interactive Displays and Systems)

Chair: Steven Bathiche, Microsoft
Co-Chair: Jeff Han, Consultant

28.1: Image Capture Through TFT Arrays
Neil Emerton, Microsoft Applied Sciences, Redmond, WA US

Quan Tang, Wuhan China Star Optoelectronics Technology Co., Ltd., Wuhan, China

28.3: Pixel Design for Transparent MicroLED Display with Low Blurring
Zhengyu Feng, Peking University, Shenzhen, China

28.4: Investigation of Moiré Interference in Pinhole Matrix Fingerprint on Display Technology
Yang Zeng, Shanghai Tianma Microelectronics, Shanghai, China

Session 29: Flexible/Foldable Device Manufacturing (Display Manufacturing)

Chair: Tian Xiao, NEXT Biometrics Inc.
Co-Chair: Wei Lung Liau, AU Optronics Corp.

29.1: Invited Paper: Analysis of Dynamic Strain on Foldable Devices
Naotsugu Ando, Yuasa System, Okayama, Japan

29.2: Invited Paper: Mechanics of Bendable Glass Substrates
Timothy Gross, Corning Incorporated, Corning, NY US

29.3: WITHDRAWN

29.4: Edge Strength Measurement of Free-Form Displays
Bosun Jang, Corning Incorporated, Corning, NY US

Session 30: MicroLED Displays (Emissive, Micro-LED, and Quantum-Dot Displays)

Chair: Francois Templier, CEA-LETI
Co-Chair: Jean-Jacques Drolet, Osram Opto Semiconductors

30.1: Invited Paper: Development of MicroLED Display by PixelLED Display Technology
Ying-Tsung Liu, PlayNitride Inc., Zhubei, Taiwan ROC

30.2: WITHDRAWN

30.3: Distinguished Paper: Sub-Micron Full-Color LED Pixels for Micro-Displays and Micro-LED Main Displays
Seth Coe-Sullivan, NS Nanotech, Ann Arbor, MI US

30.4: MicroLED Display Technology Trends and Intellectual Property Landscape
Eric Virey, Yole Development, Portland, OR US

30.5: Late-News Paper: Glass Based High Brightness AMLED Using Dual Gate Coplanar a-IGZO TFT
Ju-Woo Choi, Samsung Display, Yongin, South Korea

Session 31: Structure Engineering (Active Matrix Devices)

Chair: Norbert Fruehauf, University of Stuttgart
Co-Chair: Kwon-Shik Park, LG Display

31.1: Invited Paper: The Multimodal Thin-Film Transistor (MMT): A Versatile Low-Power and High-Gain Device with Inherent Linear Response
Radu Sporea, University of Surrey, Guildford, United Kingdom

31.2: Invited Paper: Nanostructures Oxide Thin-Film Transistors Fabricated by Near-Field Nanolithography with Enhanced Device Performance
Chuan Liu, Sun Yat-sen University, Guangzhou, China
Session 32: Algorithms for Image Quality Improvement (Display Electronics)
Chair: Mainak Biswas, Google
Co-Chair: Moon-Sang Hwang, Samsung Display Co., Ltd.
32.1: Weak Sub-Color Sub-Sampling for High Resolution Image Bandwidth Reduction
JoonHee Lee, LG Display, Seoul, South Korea
32.2: Improvement in Directional Cubic Convolution Image Interpolation
Liu-Xiao Lei, Beijing BOE Optoelectronics Technology Corporation, Beijing, China
32.3: AMOLED IR Drop Compensation for Channel Length Modulation
Feng-Ting Pai, Novatek Microelectronics Corp., Hsinchu, Taiwan ROC
32.4: Late-News Paper: OLED Display Gamma LUT Optimization Based on Principal Component Analysis
Hyunchul Kim, Google Inc, Mountain view, CA US

Session 33: 3D and Holographic (Augmented, Virtual and Mixed Reality / Display Systems)
Chair: W. Hendrick, Collins Aerospace
Co-Chair: Zong Qin, National Chiao Tung University
33.1: Invited Paper: Tabletop True 3D Display Systems Based on Projection Light Field and Integral Imaging
Qiong-Hua Wang, Beihang University, Beijing, China
33.2: Improving Image Quality of 360-Degree Tabletop 3D Screen System
Motohiro Makiguchi, NTT Service Evolution Laboratories, Kanagawa, Japan
33.3: Viewing Angle Enhanced DMD Holographic Display with Reduced Speckle Noise
Byounghyo Lee, School of Electrical and Computer Engineering, Seoul National University, Seoul, South Korea

Session 34: Printed OLEDs II (OLEDs)
Chair: CC Lee, BOE Technology Group Co., Ltd.
Co-Chair: JJ Lih, CPT Technology Group
34.1: Invited Paper: Towards Efficient and Stable Printed Single-Layer OLEDs
Paul Blom, Max Planck Institute for Polymer Research, Mainz, Germany
34.2: Distinguished Paper: Development of 55-inch 8K AMOLED TV by Inkjet Printing Process
Zhongyuan Wu, BOE Technology Group Co., Ltd., Hefei, China
34.3: OLED Display with High Resolution Fabricated by Electrohydrodynamic Printing
Lan Mu, South China University of Technology, Guangzhou, China

Session 35: Touch Sensing on Flexible Displays (Interactive Displays and Systems / Flexible Displays and E-Paper)
Chair: Martin Grunthaner, Apple
Co-Chair: Shiming Shi, BOE Technology Group Co., Ltd.
35.1: The Mechanism and Solution of Horizontal Line Defects by Mutual Interference of Flexible OLED and Touch Sensor
Hyeon Wook Cho, Samsung Display, Yongin, South Korea
35.2: Influence of Low Ground Mass and Moisture Touch in On-Cell Touch with Foldable AMOLED
Shih-Hsuan Huang, AC Optronics Corporation, Hsinchu, Taiwan ROC
35.3: The Application of Metal Mesh Manhattan Patterns in Flexible Touch Panel
Shuang Wang, Shanghai Tianma Micro-Electronics Co. Ltd., Shanghai, China
35.4: High Sensitive Pen Writing Solution Based on Mechanical Sensing
Hee Seoomoon, Samsung Display, Yongin, South Korea

Session 36: Novel Process for Printed Displays (Display Manufacturing / Printed Displays)
Chair: Toshiaki Arai, JOLED Inc
Co-Chair: Yong Taek Hong, Seoul National University
36.1: Invited Paper: High-Resolution Induced-Electrohydrodynamic (iEHD) Jet Printing for Display
Doyoung Byun, Sungkyunkwan University, Suwon, South Korea
36.2: Invited Paper: The Latest Breakthrough of Printing Technology for Next Generation Premium TV
Jueng Gil(James) Lee, Guangdong Juhua Printed Display Technology Co. Ltd., Guangzhou, China
36.3: Novel and Simple Patterning process of Quantum dots via Transfer Printing for Active Matrix QD-LED
Soo Deok Han, University of Cambridge, Cambridge, United Kingdom
36.4: Solution-Processed Transparent Top Electrode for QD-LED
Hywel Hopkin, Sharp Laboratories of Europe Ltd., Oxford, United Kingdom

Session 37: MicroLEDs: Manufacturing and Characterization (Emissive, Micro-LED, and Quantum-Dot Displays)
Chair: Ioannis Kymissis, Columbia University
Co-Chair: Zhaojun Liu, Southern University of Science and Technology
37.1: Yield Statistics for Fault Tolerant Micro LED Displays


Khaled Ahmed, Intel Corporation, Santa Clara, CA US
37.2: Efficient MicroLED Display Manufacturing Necessitates New Functional Production Test Technologies to Replace Traditional LED Parametric Test
Francois Henley, Tesoro Scientific, Inc., Saratoga, CA US
37.3: Power Consumption of OLED and µLED Displays
En-Lin Hsiang, University of Central Florida, Orlando, FL US
37.4: Micro LED Defect Analysis via Photoluminescent and Cathodoluminescent Imaging
Keith Behrman, Columbia University, New York, NY US

Session 38: Circuit and New Application of TFTs (Active Matrix Devices)
Chair: Takashi Nakamura, Japan Display Inc.
Co-Chair: Chen Xi, BOE Technology Group Co., Ltd.
38.1: Invited Paper: High-Performance Metal-Oxide Semiconductor Based Optoelectronics
Sung Kyu Park, Chung-Ang University, Seoul, South Korea
38.2: Magnifying Viewer Using Poly-Si Thin-Film Phototransistor and Liquid-Crystal Microlens Array
Mutsumi Kimura, Ryukoku University, Otsu, Japan
38.3: A Novel Gate Driver Circuit Employing IGZO TFTs for External Compensation
Xuehuan Feng, BOE Technology Group Co., Ltd., Hefei, China
38.4: AMOLED Display Global Dimming Using PWM on Backgate
Lynn Verschure, imec, Leuven, Belgium

Session 39: Advanced Pixel and Driving Circuits (Display Electronics)
Chair: Richard McCartney, Pixel Scientific, Inc.
Co-Chair: Carlin Vieri, Google
39.1: 8K Broadcast Monitor Display System
Ran Duan, BOE Technology Group Co., Ltd., Beijing, China
39.2: Distinguished Paper: A 14-Gb/s Dual Mode Receiver with MIPI D-PHY and C-PHY Interfaces for Mobile Display Drivers
Tae-Jun Kim, Samsung Electronics, Hwasung, South Korea
39.3: Distinguished Paper: In-Pixel Temperature Sensor for High-Luminance Active-Matrix Micro-LED Display Using LTPO TFTs
Jin Jang, Kyung Hee University, Seoul, South Korea
39.4: A Method of Panel-Current Limitation for Automotive OLED Displays
Hyun-Chang Kim, Samsung Display Co., Yongin, South Korea

Session 40: Novel Optics for HMDs (Augmented, Virtual and Mixed Reality / Emerging Technologies and Applications)
Chair: Susan Jones, Nulumina Corp.
Co-Chair: Gary Jones, Nanoquantum Corporation
40.1: Invited Paper: Fast-Switching Liquid Crystal Devices for Near-Eye and Head-Up Displays
Shin-Tson Wu, University of Central Florida, Orlando, FL US
40.3: Invited Paper: A Large RGB-Achromatic Metalens for Virtual/Augmented Reality Applications
Federico Capasso, Harvard University, Cambridge, MA US
40.4: Cost-Efficient Polymer Flat Lens for Chromatic Aberration Correction in Virtual Reality Displays
Tao Zhan, University of Central Florida, Orlando, FL US
Hong Hua, University of Arizona, Tucson, AZ US
40.5: Distinguished Paper: A Scanning Waveguide Display with 100° FOV
Jianghao Xiong, University of Central Florida, Orlando, FL US

Session 41: Printed OLEDs III (OLEDs)
Chair: DZ Peng, Tlanma
Co-Chair: Yifan Zhang, Apple, Inc.
41.1: Invited Paper: Recent Technology of Printed OLED Display and Its World's First Commercialization
Kazuhiro Noda, JOLED Inc., Kyoto, Japan
41.2: Invited Paper: Recent Developments in Inkjet-Printed OLEDs for High Resolution, Large Area Applications
Jin-Goo Kang, Samsung Display Co., Ltd., Yongin, South Korea
41.3: 17.3 Inch UHD Resolution AMOLED Panel Fabricated by Ink Jet Printing Process
Peng-Yu Chen, AU Optronics Corporation, Hsinchu, Taiwan ROC
41.4: Preparation of High Performance Top-Emission OLED for Large Size Display
Chunjing Hu, BOE Technology Group Co., Ltd., Beijing, China

Session 42: Fingerprint Sensing Displays (Interactive Displays and Systems)
Chair: Patrick Worfolk, Synaptics
Co-Chair: Hong-Jye Hong, AU Optronics
42.1: A Controller IC for On-Display Touch and Multi-Fingerprint Sensor
Session 43: OLED Analysis and Mechanisms (OLEDs)
Chair: Nicholas Thompson, Universal Display Corporation
Co-Chair: Hitoshi Kuma, Idemitsu Kosan Co., Ltd.
43.1: Invited Paper: A Quantitative Microscopic Kientic Model for Efficiency Roll-Off in OLEDs
Troy Van Voorhis, MIT, Cambridge, MA US
43.2: Application of Liquid Extraction Surface Analysis (LESA)-NanoESI-Orbitrap-MS to a Degradation Analysis of Organic EL Elements
Hikaru Takano, Toray Research Center, Inc., Otsu, Japan
43.3: Ab-Initio Simulation of Doped Injection Layers
Tobias Neumann, Nanomatich GmbH, Karlsruhe, Germany
43.4: Combining Steady-State, Frequency, and Time Domain Data for a Comprehensive Analysis of Multilayer TADF OLEDs
Sandra Jenatsch, Fluxim AG, Winterthur, Switzerland

Session 44: Highly Integrated Semiconductor Information Displays (Emissive, Micro-LED, and Quantum-Dot Displays)
Chair: Qun Yan, Fuzhou University
Co-Chair: Kevin Gahagan, Corning Incorporated
44.1: Invited Paper: Micro-LEDs for Technological Convergence between Displays, Optical Communications, and Sensing and Imaging Systems
Martin Dawson, University of Strathclyde, Glasgow, United Kingdom
44.2: Invited Paper: More Than MicroLED: Mass Transfer of Pixel Engines for Emissive Displays
John Rogers, Northwestern University, Evanston, IL, US
44.3: Invited Paper: Integration of Additional Functionalities into the Frontplane of AMOLED Displays
Pawel Malinowski, imec, Leuven, Belgium
44.4: A Brief Survey of MicroLED Technologies
Ioannis Kymisisis, Columbia University, New York, NY, US

Session 45: Conformable LCDs (Liquid Crystal Technology)
Chair: Takahiro Ishinabe, Tohoku University
Co-Chair: Linghui Rao, Microsoft
45.1: Invited Paper: Multi-Spliced LCDs for Foldable Mobile Device - Seamless Technology and Applications
Yung Hsun Wu, Innolux Corporation, Malli County, Taiwan ROC
45.2: Distinguished Paper: Ultra-Narrow Border Display with a Cover Glass Using LCDs with a Polyimide Substrate
Shinichiro Oka, Japan Display Inc., Mokara, Japan
45.3: Late-News Paper: Homogeneous Alignment LCDs Could be Prime Candidate for Multiple Scene Interactive Interface and Devices
Ruizhi Yang, BOE Technology Group Co., Ltd., Beijing, China
45.4: Late-News Paper: Zero Light Leakage ADS Display Technology
Feifei Wang, BOE Technology Group Co., Ltd., Beijing, China

Session 46: Variable Refresh Rate (Display Electronics)
Chair: Taeung Kim, Google LLC
Co-Chair: Bong-Hyun You, Samsung Display Co.
46.1: Invited Paper: Variable Refresh Rate Displays
Gerrit Slavenburg, NVIDIA, Santa Clara, CA US
46.2: A Novel Hybrid Frame Rate Driving Method for Low Frequency OLED Displays
Naoki Koi, Tianma Micro-Electronics Co., Ltd., Shanghai, China
46.3: Invited Paper: Image Adaptive Refresh Rate Technology for Ultra Low Power Consumption
Bonghyun You, Samsung Display, Yongin, South Korea
46.4: Novel OLED Low Frame Frequency Driving Method with Minimized Flicker
Jieliang Li, XiaMen Tianma Microelectronics, Xiamen, China

Session 47: Micro-Projection Technology (Augmented, Virtual and Mixed Reality / Display Systems)
Chair: Satoshi Ouchi, Hitachi, Ltd
Co-Chair: Fujio Okumura, NEC Corporation
Session 48: OLED Devices I (OLEDs)
Chair: Yasunori Kijima, Huawei Technologies Japan K.K.
Co-Chair: Denis Kondakov, DuPont
48.1: Invited Paper: Next Generation Highly Efficient and Stable Phosphorescent Emitting Materials For OLEDs
Byoung ki Choi, Samsung Electronics, Suwon, South Korea
48.2: Design Strategies of Fluorescent Dopants toward Pure Blue for Highly Efficient Top Emission OLEDs
Ryota Takabashi, Idemitsu Kosan Co., Ltd., Sodegaura, Japan
48.3: Efficiency Color-Shift Tradeoffs in Strong-Cavity, Top-Emitting OLEDs
S. Matthew Menke, 3M, Saint Paul, MN US
48.4: Toward the Achieving Excellent Longevity of Blue OLED Device: A Computation Study on Importance of the Co-Optimization of Material and Device
Sangho Jeon, Samsung Display, Yongin, South Korea

Session 49: E-Paper (Flexible Displays and E-paper)
Chair: Makoto Omodani, Tokai University
Co-Chair: Keisuke Hashimoto, E Ink Holdings
49.1: Fast-Switching Electrophoretic E-Paper with Mixture of Liquid Crystal and E-ink for Charging and Rheological Optimizations
Bo-Ru Yang, Sun Yat-sen University, Guangzhou, China
49.2: Color Reproduction in Reflective Displays: Stacked CMY
Alex Hencen, South China Normal University, Guangzhou, China
49.3: Late-News Paper: Hybrid Capacitor Type Organic Electrochromic Device for Multicolor Representation
Norihisa Kobayashi, Chiba University, Chiba, Japan
49.4: Late-News Paper: Prototyping of Practical e-Tile and Estimation of its Image Impression from Distant Observers
Makoto Omodani, Tokai University, Hiratsuka, Japan

Session 50: Display Measurement Standards I (Display Measurement)
Chair: Stephen Atwood, Consultant
Co-Chair: Thomas Fiske, Microsoft
50.1: Invited Paper: Color/White Light Output, Luminance Contours, and Colour Volume
David LeHoty, Independent, Mountain View, CA US
50.2: Distinguished Paper: Measuring the Color Capability of Modern Display Systems
Euan Smith, Kaptivo Ltd, Cambridge, United Kingdom
50.3: Electro-Optical Transfer Characteristic, the Undervalued Display Feature
Michael Becker, Instrument Systems GmbH, München, Germany
50.4: Standardizing Fundamental Criteria for Near Eye Display Optical Measurements: Determining the Eye-Box
Rupal Varshneya, Night Vision Electronic Sensors Directorate Department of the Army, Fort Belvoir, VA US

Session 51: Quantum Dot Electroluminescence I (Emissive, Micro-LED, and Quantum-Dot Displays)
Chair: Michele Ricks, EMD Performance Materials
Co-Chair: Jean-Jacques Drolet, Oram Opto Semiconductors
51.1: Invited Paper: Charge Injection Control of Cadmium-Free Quantum Dot Light-Emitting Diodes
Baek Kim, NanoPhotonica Inc., Gainesville, FL US
51.2: High Efficiency and Long Lifetime InP-Based Red Quantum Dot Light-Emitting Diodes
Jang-Hyuk Kwon, Kyung Hee University, Seoul, South Korea
51.3: Efficient InP/ZnS Quantum Dot Light-Emitting Diodes with Improved Electron Confinement
Zhenghui Wu, Southern University of Science and Technology, Shenzhen, China
51.4: QLED-on-Silicon Microdisplays with Peripheral-Circuit-Compensation Design
Sikai Su, Peking University, Shenzhen, China

Session 52: Fast Switching LCDs (Liquid Crystal Technology)
Chair: Dr. Akihiro Mochizuki, J-CORE Technology, LLC
Co-Chair: Prof. Jian Gang Lu, Shanghai Jiao Tong University
52.1: Invited Paper: Liquid Crystal Materials and Devices for Displays and Photonics
Vladimir Chigrinov, Foshan University, Foshan, China
52.2: Fast-Response Liquid Crystals for AR and Head-Up Displays
Session 53: Emerging Processes and Materials (Emerging Technologies and Applications)
Chair: Abhishek Srivastava, Hong Kong University of Science & Technology
Co-Chair: Ian Underwood, University of Edinburgh

53.1: 2D and 3D Printed Copper Conductors from Chemically Designed Nanomaterials
Sunho Jeong, Kyung Hee University, Yongin-si, South Korea

53.2: Composite Films with Ultra-Thin Glass and Polymer for Novel Optically-Functional Films
Takeshi Murashige, Nitto Denko Corporation, Osaka, Japan

53.3: CdSe/CdS Nanorod Enhancement Film for Blue-Laser Based Visible Light Communication Systems
Jerry Cheng, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong

53.4: Dielectric Metasurfaces: Design for Manufacturability
Khaled Ahmed, Intel Corporation, Santa Clara, CA US

53.5: Late-News Paper: a-IGZO TFT Based Active Matrix Pressure Sensor by Integrating ZnO Nanowires as Sensing Unit
Xuewen Shi, Institute of Microelectronics of Chinese Academy of Sciences, Beijing, China

Session 54: AR/VR Technologies (Augmented, Virtual and Mixed Reality / Display Systems)
Chair: Sergei Yakovenko, Apple
Co-Chair: Grace Lee, Google

54.1: Improved Polarizing Film for PBS Applications in HMDs
David Aastuen, 3M Display Materials & Systems Division, St. Paul, MN US

54.2: Distinguished Paper: Doubling the Pixel Density for VR Displays with a Polymer Grating
Junyu Zou, University of Central Florida, Orlando, FL US

54.3: Digitally Switchable Micro-Lens Array for Integral Imaging
Hong Hua, University of Arizona, Tucson, AZ US

54.4: Prediction of Saccadic Eye Movement for Foveated Rendering
Anna Kruchinina, Lomonosov Moscow State University, Moscow, Russian Fed.

54.5: Measuring Direct Retinal Projection Displays
John Penczek, University of Colorado, Boulder, Boulder, CO US

Session 55: OLED Devices II (OLEDs)
Chair: Sven Zimmermann, Novaled GmbH
Co-Chair: Qi Wang, eMagin Corporation

55.1: Invited Paper: Self-Assembled Cathode Patterning in AMOLED for Under-Display Camera
Zhifin Wang, OTI Lumionics Inc., Toronto, ON Canada

55.2: Methods for Overcoming the Trade-Off Between Efficiency and Lifetime of Organic Light-Emitting Diodes: OLED Lifetime Simulation
Jangyoung Lee, Samsung Display Corporation, Yongin, South Korea

55.3: Efficient, Low Haze Light Extraction for OLED Displays Using Micro-Optic Patterns Imprinted on Glass
Dmitrii Kuksenkov, Corning Research & Development Corporation, Corning, NY US

55.4: Novel Methodology for Reproducibility of OLED Lifetimes and Identification of Killer Impurities
Hiroshi Fujimoto, Fukuoka i3-Center for Organic Photonics and Electronics Research (i3-opera), Fukuoka, Japan

Session 56: Foldable Displays I (Flexible Displays and E-paper)
Chair: Kyung Cheol Choi, KAIST
Co-Chair: Cheng-Chung Lee, ITRI

56.1: Invited Paper: Research on a Commercial Foldable AMOLED and Relevant Technologies
Shiming Shi, BOE Technology Group Co., Ltd., Beijing, China

56.2: A Foldable AMOLED Module with Excellent Bending Capability and Pencil Hardness after Low Temperature Testing
Takehiro Murao, Sharp Corporation, Kameyama, Japan

56.3: Quantitative Evaluation of Neutral-plane Splitting for Foldable Displays
Masami Nishimura, Japan Display, Inc., Mobara, Japan

56.4: Suppression of Angular Color Shift for Foldable OLEDs by Integrating an Advanced Circular Polarizer
Wei-Feng Xu, BenQ Materials Corporation, Taoyuan, Taiwan ROC

Session 57: Display Measurement Standards II (Display Measurement)
Chair: Udo Krueger, TechnoTeam
Co-Chair: Frank Rochow, Adviser

57.1: Spatiotemporal Noise Targets Inspired by Natural Imagery Statistics
Timo Kunkel, Dolby Labs, Inc., San Francisco, US

57.2: A New Approach to Motion Frequency Metrics Quantifies Motion-Induced Blur
Session 58: Quantum Dot Electroluminescence II (Emissive, Micro-LED, and Quantum-Dot Displays)
Chair: Chang Hee Lee, Samsung Display Corporation
Co-Chair: Xiao Wei Sun, Southern University of Science and Technology
58.1: Invited Paper: Progress in High Efficiency Heavy Metal Free QD-LED Development
Christian Ippen, Nanosys, Inc., Milpitas, CA US
58.2: Distinguished Paper: Active Matrix QD-LED with Top Emission Structure by UV Lithography for RGB Patterning
Yohei Nakanishi, SHARP Corporation, Tenri, Japan
58.3: Distinguished Paper: High Efficient Quantum Dot Light Emitting Diodes with Blue Cadmium-Free Quantum Dots
Tatsuya Ryowa, Sharp Corporation, Tenri, Japan
58.4: Efficient Cadmium-Free Quantum Dot Light-Emitting Diodes
Mo Hinwai, Fukuoka i3-Center for Organic Photonics and Electronics Research (i3-opera), Fukuoka, Japan

Session 59: Privacy and Sunviewable Displays (Liquid Crystal Technology)
Chair: Xiao-Yang Huang, Ebulent Technologies Corp
Co-Chair: Gang Xu, Huawei
59.1: FFS-Based Privacy LCD With High Contrast and Transmittance
Koji Murata, SHARP, Nara, Japan
59.2: Brightness Improvement of Reflective LCD
Xindi Ma, Beijing BOE Display Technology Co., Ltd., Beijing, China
59.3: A Transreflective 31.5" IGZO-TFT LCD with Twisted VA Mode
Takahiro Sasaki, SHARP, Tenri, Japan
59.4: Late-News Paper: High Transmittance and High Charging Rate 8K 120Hz ADS LCD TV
He He Hu, BOE Technology Group Co., Ltd., Beijing, AL China

Session 60: Machine Learning for Display Algorithms and Electronics (Machine Learning for Displays / Display Electronics)
Chair: Chaohao Wang, Apple Inc.
Co-Chair: Hyoungsik Nam, Kyung Hee University
60.1: Novel Image Sticking Prevention Method Using Deep Learning
Youngwook Yoo, Samsung Display, Youngin, South Korea
60.2: Self-Supervised Perceptual Motion Deblurring Using a Conditional Generative Neural Network Guided by Optical Flow
Jaihyun Koh, Samsung Display Corporation, Yongin, South Korea
60.3: Invited Paper: Machine Learning Approaches to Active Stylus for Capacitive Touch-Screen Panel Applications
Hyoungsik Nam, Kyung Hee University, Seoul, South Korea
60.4: Implementation and Optimization of FSRCNN++ Algorithm Based on SDSoC Platform
Yanan Ji, TCL China Star Optoelectronics Technology Co. Ltd., Guangdong, China

Session 61: High-Resolution OLED Display Manufacturing (Augmented, Virtual and Mixed Reality / Display Manufacturing)
Chair: Dr Robert Visser, Applied Materials
Co-Chair: Joerg Winkler, Plansee SE
61.1: A New Fine Metal Mask Pixel Patterning Technology for High Resolution OLED Displays
Chiwoo Kim, APS Holdings, Hwaseong, South Korea
61.2: 2-inch, 2000 ppi Silicon Nitride Mask for Patterning Ultra-high-Resolution OLED Displays
Yihin Jiang, Hong Kong University of Science and Technology, Kowloon, Hong Kong
61.3: Distinguished Paper: Vertically Integrated, Double-Stack Oxide-TFT Layers for High Resolution AMOLED Backplane
Jin Jang, Kyung Hee University, Seoul, South Korea
61.4: Invited Paper: Development of the OLED Mass Production System (2:30 PM - 2:50 PM)
Eiichi Matsumoto, Canon Tokki Corporation, Mitsuke Japan

Session 62: OLED Devices III (OLEDs)
Chair: Chang-Wook Han, LG Display Co., Ltd
Co-Chair: Jang Hyuk Kwon, Kyung Hee University
Youngmin You, Ewha Womans University, Seoul, South Korea
62.2: Deep-Red and Near-Infrared OLEDs with High Efficiency and Long Lifetime for Display and Light-Source Applications
Satoshi Seo, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan
62.3: Design of High-Performance Tandem Blue Devices for Quantum Dot OLED Display
Linlin Wang, Hefei BOE Joint Technology Co., Ltd., Beijing, China
62.4: Ultrathin Cu-Ag Anode for High Light Outcoupling Efficiency by Eliminating Waveguide Mode in OLED
Yong-Bum Park, University of Michigan, Ann Arbor, MI US

Session 63: Foldable Displays II (Flexible Displays and E-paper)
Chair: Kyung Cheol Choi, KAIST
Co-Chair: Meng-Ting Lee, Huawei Technology
63.1: Numerical Study on Module Stacking Design of Flexible Panel with Water-Drop Folding Shape
Liming Dong, BOE Technology Group Co., Ltd., Beijing, China
63.2: Continuous Observation of Neutral-Plane Splitting throughout the Folding Process of Foldable Displays Using Optical Microscopy and Digital Image Correlation Method
Masatomo Hishinuma, Japan Display, Inc., Mobara, Japan
63.3: Translating 2 Point Bend with Step Stress Methodology
Kurt Gerber, Corning Incorporated, Corning, NY US

Session 64: Flexible Technologies II: Measurement (Display Measurement)
Chair: Makoto Omodani, Tokai University
Co-Chair: Stephen Atwood, Consultant
64.1: Separating Specular Reflection from Diffuse Haze for ePaper Using the Extended Variable Aperture Source Method
Dirk Hertel, E Ink Corporation, Billerica, MA US
64.2: Metrology of Non-Planar Light Sources Using Near-Field Goniometric Measurement Method
Kenta Kato, Global Optical Solutions, Tokyo, Japan
64.3: Simulation of Beam Shaping by Micro-Textures for Curved Displays
Urs Aeberhard, Fluxim AG, Winterthur, Switzerland

Session 65: Quantum Dot Electroluminescence III (Emissive, Micro-LED, and Quantum-Dot Displays)
Chair: Dr. Jonathan Steckel, ST Microelectronics
Co-Chair: Yajie Dong, University of Central Florida
65.1: Invited Paper: Enhanced Efficiency of InP-Based Red and Green Quantum Dot Light-Emitting Diodes
Yanzhao Li, BOE Technology Group Co., Ltd., Beijing, China
65.2: High Luminescent Red Quantum Dot Light-Emitting Diodes by Inkjet Printing
Xiao Wei Sun, Southern University of Science and Technology, Shenzhen, China
65.3: Green Top-Emission Quantum Dot Light-Emitting Diodes (TE-QLED) with Normal and Inverted Structure
Juan-Haw Lee, National Taiwan University, Taipei, Taiwan ROC
65.4: Control of Carrier Injection and Transport Behavior in QLEDs via Modulating the Schottky Barrier
Yong-Seog Kim, Hongik University, Seoul, South Korea

Session 66: Self-Aligned LCDs (Liquid Crystal Technology)
Chair: Michael Wittek, Merck KGaA
Co-Chair: Shui Chih Lien, CSOT
66.1: Invited Paper: Liquid Crystal Mixture with a Composition Including Highly Reliable Fluorinated Diluter and RM-Monomer for PSVA and PI-less IPS LCDs
Toshihiro Shibuta, Chiracol Co.LTD, Saitama, Japan
66.2: Invited Paper: Reactive Mesogen Multi-Twist Retarders for Advanced AR/VR Displays
Michael Escuti, ImagineOptix Corporation, Durham, NC US
66.3: The Way To Improve Black Circle Mura in Curved Display by Polyimide-Less Technology
Wei Cui, Peking University, Shenzhen, China
66.4: Reactive Monomers Optimized for Fast Response Liquid Crystals with High Reliability
Wei Chen, TCL China Star Optoelectronics Technology Co., Ltd., Shenzhen, China
66.5: Late-News Paper: Fast Response Texture Free Polymer Stabilized Vertically Aligned Liquid Crystal Displays
Yong-Woon Lim, Samsung Display, Asan, South Korea

Session 67: Emerging Applications with Machine Learning (Machine Learning for Displays / Emerging Technologies and Applications)
Chair: K Käläntär, Global Optical Solutions
Co-Chair: Fang-Cheng Lin, Apple Inc
67.1: Distinguished Paper: Efficient Multi-Quality Super-Resolution Using a Deep Convolutional Neural Network for an FPGA Implementation
Min Beom Kim, LG Display Co., Ltd., Seoul, South Korea
67.2: Lightweight Tone-Mapped HDRNET with Exposure Stack Generation
Sukju Kang, Sogang University, Seoul, South Korea
67.3: ColorNet: A Neural Network-Based System for Consistent Display of Brand Colors for Video
Erica Walker, Clemson University, Clemson, SC US
67.4: Visual Simultaneous Localization and Mapping with Deep Neural Network Based Loop Detection for Augmented Reality
Chao Ping Chen, Shanghai Jiao Tong University, Shanghai, China
Session 68: Light Field 3D (Display Systems)
Chair: Shinichi Uehara, AGC Inc.
Co-Chair: K Käläntär, Global Optical Solutions
68.1: Investigation on Defocusing-Induced Accommodation Shift in Microlens Array-Based Near-Eye Light Field Displays
Zong Qin, Sun Yat-Sen University, Guangzhou, China
68.2: View-Dependent Light-Field Display that Supports Accommodation Using a Commercially-Available High Pixel Density LCD Panel
Ronald Azuma, Intel Labs, Santa Clara, CA US
68.3: A Super-Multiview Display with Horizontal and Vertical Parallax by Time Division and Color Multiplexing
Yuta Watanabe, University of Tsukuba, Tsukuba, Japan
68.4: Late-News Paper: 3D/2D Partially Convertible Integral Imaging Display Using Geometric Phase Lens Array
Hayato Watanabe, NHK (Japan Broadcasting Corporation), Tokyo, Japan

Session 69: OLED Devices IV (OLEDs)
Chair: Franky So, North Carolina State University
Co-Chair: Chihaya Adachi, Kyushu University
Jaesang Lee, Seoul National University, Seoul, South Korea
69.2: Transparent Conductive Hybrid Cathode Structure for Top-Emitting Organic Light-Emitting Devices
Wei Quan, Hefei BOE Joint Technology Co., Ltd., Beijing, China
69.3: Examination of Degradation Analysis of p-i-n Type OLEDs Device
Daichi Shirakura, Toray Research Center, Inc., Otsu, Shiga, Japan
69.4: Late-News Paper: High Transparency Adhesive Encapsulation Film for OLED Device
Satoru Ohashi, Ajinomoto Fine-Techno Co., Inc., Kawasaki, Japan

Session 70: Flexible Technologies III (Flexible Displays and E-paper)
Chair: Yong Taek Hong, Seoul National University
Co-Chair: Simon Kang, Apple
70.1: Invited Paper: Advances in the Development of Flexible AMOLED Display
Ze Yuan, Royole Corporation, Fremont, CA US
70.2: Invited Paper: Low Temperature Process and Material Development for Flexible/Stretchable Transparent Conductor
Seung Hwan Ko, Seoul National University, Seoul, South Korea
70.3: Distinguished Paper: Flexible OLED Display with 620 Degree Celsius LTPS TFT and Touch Sensor Manufactured by Weak Bonding Method
Tsung-Ying Ke, AU Optronics Corp., Hsinchu, Taiwan ROC
70.4: Distinguished Paper: Flexible OLED-based Photonic Skin for Attachable Phototherapeutics
Kyung Cheol Choi, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

Session 71: Spatial Uniformity (Display Measurement)
Chair: Thomas Fiske, Microsoft
Co-Chair: Frank Rochow, Adviser
71.1: Fractional Pixel Method for Improved Pixel-Level Measurement and Correction (Demura) of High-Resolution Displays
Douglas Kreysar, Radiant Vision Systems LLC, Redmond, WA US
71.2: Subpixel Non-Uniformity Correction for Displays
Xiaofan Feng, Jingce Electronic (USA), Camas, WA US
71.3: Meeting Optical Testing Challenges of High-Resolution µLED-Displays
Martin Wolf, Instrument Systems GmbH, Munich, Germany
71.4: Imaging Luminance Measuring Devices (ILMDs) – Characterization and Standardization with Respect to Display Measurements
Udo Krüger, TechnoTeam Bildverarbeitung GmbH, Ilmenau, Germany

Session 72: Quantum Dot Electroluminescence IV (Emissive, Micro-LED, and Quantum-Dot Displays)
Chair: Kevin Gahagan, Corning Incorporated
Co-Chair: Yanzhao Li, BOE Technology Group Co., Ltd.
72.1: Invited Paper: Realizing Long Lifetime Blue Quantum Dots Light Emitting Diodes (QLEDs) through Quantum Dot Structure Tailoring
Longjia Wu, TCL Corporate Research, Shenzhen, China
72.2: Highly Efficient Cadmium-Free Quantum Dot Light-Emitting Diodes Employing Top-Emitting Architecture
Myoung Park, Samsung Display Co., Ltd., Yongin, South Korea
72.3: Influence of Mobility Effect on Top-Emission Red Quantum Dot Light Emitting Diode with Weak-Cavity Structure
Ming-Yi Lin, National United University, Miaoli, Taiwan ROC
72.4: Spectrum Narrowing and Efficiency Enhancement of Quantum Dot Light-Emitting Diodes by Microcavity
Xiao Wei Sun, Southern University of Science and Technology, Shenzhen, China
Session 73: Displays and Health (Applied Vision / Lighting)
Chair: Chien-Yu Chen, National Taiwan University of Science & Technology
Co-Chair: Marina Kondakova, OLEDWorks
73.1: Invited Paper: Pediatric Device Use: Implications for Myopia Development
Elise Harb, UC Berkeley School of Optometry, Berkeley, CA US
73.2: Invited Paper: Effects of Displays on Myopia and Possible Countermeasures Based on Epidemiology in Japan
Takashi Kawamorita, Kitasato University, Sagamihara, Japan
73.3: Invited Paper: Influences of Circadian Illuminances from Lighting and TV on the Human Locomotor Activity, Sleep Disorder, EEG, HRV, and Melatonin Secretion
Dae Hwan Kim, Kookmin University, Seoul, South Korea
73.4: Invited Paper: Are Displays Giving Us the Blues?
John Bullough, Rensselaer Polytechnic Institute, Troy, NY US

Session 74: Seeing Through the Display Image Reconstruction Techniques (Machine Learning for Displays / Interactive Displays and Systems)
Chair: Steven Bathiche, Microsoft
Co-Chair: Jeff Han, Consultant
74.1: Image Restoration for Display-Integrated Camera
Sehoon Lim, Microsoft Applied Sciences, Redmond, WA US
74.2: Diffracted Image Retrieving with Deep Learning
Seungin Baek, Samsung Display, Yongin, South Korea
74.3: WITHDRAWN

Session 75: Display Systems and Backlights (Display Systems)
Chair: Jean-Pierre Guillou, Apple, Inc.
Co-Chair: Masaru Suzuki, Kriya Materials
75.1: Invited Paper: Digital Signage: Advances, Requirements, and Solutions
Michael Schmid, Strüer SE & Co. KGaA, Köln, Germany
75.2: Design Criteria in the Development of Anti-Glare Surfaces
Brett Sitter, 3M, Saint Paul, MN US
75.3: Highly Collimated Backlight for Liquid Crystal Displays
Brecht Berteloot, Ghent University, Ghent, Belgium
75.4: All-Glass Light Guide Plate with Tapered Lenticular Lens Array by Mask and Etch
Shenping Li, Corning Research & Development Corporation, Corning, NY US

Session 76: OLED Displays I (OLEDs)
Chair: Yifan Zhang, Apple, Inc.
Co-Chair: DZ Peng, Tianma
76.1: Invited Paper: Electroforming Fine Metal Mask for High Resolution OLED Displays
Xialing Chen, Changzhou U.G.Oled Technology Co., Ltd., Changzhou, China
76.2: Distinguished Paper: A High Image Quality OLED Display with Motion Blur Reduction for Ultra-High Resolution and Premium TVs
Hong-Jae Shin, LG Display, Paju, South Korea
76.3: Ultra High Efficiency OLED Display by 3D Pixel Configuration
Robert Visser, Applied Materials, Santa Clara, CA US
76.4: Late-News Paper: Aromatic Hydrocarbon Macrocycles for Highly Efficient Organic Light-Emitting Devices with Simple-Layer Architectures
Tomoo Izumi, Konica Minolta, Inc., Hachioji, Japan

Session 77: Free Form Displays I (Flexible Displays and E-paper)
Chair: Jennifer Lin, AU Optronics
Co-Chair: Hajime Yamaguchi, Japan Display Inc.
77.1: Design of Stretchable AMOLED Display with Transitional Area
Qian Yang, BOE Technology Group Co., Ltd., Beijing, China
77.2: Stretchability Improvement of stretchable OLED by Rotation Plate Structure and Pillar Array Substrate
Young Hyun Son, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea
77.3: Wearable Organic Light-Emitting Diode Displays – From Fibers to Textiles
Sung-Min Lee, Kookmin University, Seoul, South Korea
77.4: High Efficiency Flexible Fiber-Based Light-Emitting Devices Processed by Phosphorescent Solution
Kyung Cheol Choi, Korea Advanced Institute of Science and technology (KAIST), Daejeon, South Korea

Session 78: Novel Display Applications (Emerging Technologies and Applications)
Chair: Gary Jones, Nanoquantum Corporation
Co-Chair: Vincent Gu, Apple, Inc.
Session 79: Quantum Dot Color Conversion I (Emissive, Micro-LED, and Quantum-Dot Displays)
Chair: John Van Derlofske, 3M
Co-Chair: Seth Coe-Sullivan, Luminit, LLC
79.1: Invited Paper: A New Generation of QD Diffusion Plate Technology for TV
Honglei Ji, TCL Electronics Holdings Limited, Shenzhen, China
79.2: Ambient Light Excitation in Quantum Dot-Converted Micro-LED Displays
Fangwang Gou, University of Central Florida, Orlando, FL, US
79.3: Invited Paper: The Past, the Present and the Future of Perovskite QDs
Norman Lüchinger, Avantama AG, Stafa, Switzerland
79.4: Theoretical Prediction of Changes in Spectra of InP- and InGaP-Based Quantum Dots and Comparison with Experimental Measurement of InP-Based Quantum Dots
Seungin Baek, Samsung Display, Yongin, South Korea
79.5: Late-News Paper: Bright and Narrow Green Emitting InP-based Quantum Dots for Wide Color Gamut Displays
Eunjoo Jang, Samsung Electronics, Suwon, South Korea

Session 80: Color Perception (Applied Vision)
Chair: Youngshin Kwak, Ulsan National Institute of Science and Technology
Co-Chair: Youn Jin Kim, Xiaomi Corporation
80.1: OLED Gamut Mapping Method to Generate Exact Standard Color Results
Jongwoong Park, Samsung Display Co., Ltd., Yongin, South Korea
80.2: Spatiotachromatic Model for Image Quality Prediction of High Dynamic Range and Wide Color Gamut Content
Robert Wanat, Dolby Laboratories, Inc, Sunnyvale, CA, US
80.3: Immanent Dichromaticity in Trichromatic Observer: 2nd Coordinate in MDS Analyses of R-G Neutral- and Y-B Only Changed-Stimuli Reflect Chromatic Saliency
Shoko Hira, Kagoshima University, Kagoshima, Japan
Sakaechi Otsuka, Kagoshima University, Kagoshima, Japan
80.5: An Experimental Study of the Effect of Subpixel Arrangements on Subjective Spatial Resolution
Midori Tanaka, Chiba University, Chiba, Japan

Session 81: Machine Learning for Manufacturing and Calibration (Machine Learning for Displays / Display Manufacturing / Display Measurement)
Chair: Dr. Andriy Romanyuk, Glas Troesch AG
Co-Chair: Stephen Atwood, Consultant
81.1: Invited Paper: Data Augmentation for Applying Deep Learning to Display Manufacturing Defect Detection
Wei Xiong, Samsung Electronics, Co., Ltd., San Jose, CA, US
Yusuke Bamba, EIZO Corporation, Hakusan, Japan
81.3: Display Graylevel Gamma Tuning Algorithm and System Implementation
Gang Xu, Jinge Electronics (USA) Inc., San Jose, CA, US
81.4: Array Defect Detection and Repair Based on Deep Learning
Kai Guo, BOE Technology Group Co., Ltd., Beijing, China
81.5: Image Quality Prediction System in Display Fabrication Process
Yongwoo Lee, Samsung Display, Yongin, South Korea

Session 82: Projectors and Light Sources (Display Systems)
Chair: David Eccles, Collins Aerospace
Co-Chair: Hidekazu Hatanaka, Ushio Inc.
82.1: Invited Paper: Latest Status of Blue and Green Laser Diodes and Laser Packages for Display Applications
Eiichiro Okahisa, Nichia Corporation, Tokushima, Japan
82.2: Invited Paper: Latest Progress of Laser Phosphor Projection Display
Fei Hu, Appletronics, Shenzhen, China
82.3: Red-Enhanced Laser Phosphor Light Source with Quantum Dot Conversion Layer
Tomohiro Kaji, Sony Corporation, Asuqui, Japan
82.4: Invited Paper: Speckle Reduction in Laser Projectors by Angular, Wavelength, and Polarization Diversities
**Session 83: OLED Displays II (OLEDs)**
**Chair:** Chihaya Adachi, Kyushu University  
**Co-Chair:** Chang-Wook Han, LG Display Co., Ltd

*Huaiqing Fang, Beijing Summer Sprout Technology Co., Ltd., Beijing, China*

83.2: Reliability Characterization of Luminance Degradation of OLED Mobile Display Considering Color Difference Index Based on Usage Patterns  
*Yoonsuk Choi, Technology Quality Reliability, Samsung Display Co. Ltd., Yongin, South Korea*

83.3: TE-Type AMOLED Display with Wide Viewing Angle and Ultra-Low Reflectance  
*Kaoru Abe, Sharp Corporation, Sakai, Japan*

83.4: Techniques to Achieve an AMOLED Display with Ultra-Narrow Border  
*Quan Liu, Kunshan Govisionos Optoelectronics Co., Ltd., Kunshan, China*

**Session 84: Free Form Displays II (Flexible Displays and E-paper)**
**Chair:** Paul Drzaic, Apple, Inc.  
**Co-Chair:** Joon Young Yang, LG Display Co. Ltd

84.1: *Invited Paper*: 30-inch 4K Rollable OLED Display  
*Tohru Sonoda, Sharp Corporation, Osaka, Japan*

84.2: Study on Reliability for Impact and Rolling of Film Stacks in Rollable AMOLED Display by Finite Element Analysis  
*Aries Cherian, Tianma Micro-Electronics Group, Wuhan, China*

84.3: *Invited Paper*: Advanced Cover Window and Thin-film Encapsulation Technologies for Foldable AMOLED Display  
*Kuang-Jung Chen, ITRI, Hsinchu, Taiwan ROC*

84.4: New Barrier Fabrication Method Based on an Infiltration Technology for Flexible OLED Displays  
*Seung Han Kim, Samsung Display, Yongin, South Korea*

84.5: *Late-News Paper*: Flexible Cover Window Film with Improved Optical Clarity  
*Min Sang Park, SK Innovation, Daejeon, South Korea*

**Session 85: Novel Displays and Optics (Emerging Technologies and Applications)**
**Chair:** Timothy Large, Microsoft Corp  
**Co-Chair:** Adi Abileah, Adi - Displays Consulting LLC

85.1: *Invited Paper*: Organic LCDs Using Polarisers as Substrates - Enabling Pixel Level Dimming in Dual Cell LCDs  
*James Harding, FlexEnable, Cambridge, United Kingdom*

85.2: *Invited Paper*: Fourth Gen Optics - Planar Optics Revolutionized by LCD Technology  
*Nelson Tabiryan, BEAM Engineering for Advanced Measurements Co., Orlando, FL US*

85.3: In-Cell Optical Compensation Technology for OLED Demura Application  
*Yunke Qin, BOE Technology Group Co., Ltd., Beijing, China*

85.4: Enhancing Ambient Viewing Performance of Anisotropic Nano-Structure Light Control Film  
*Lung-Hai Wu, BenQ Materials, Taoyuan, Taiwan ROC*

85.5: *Late-News Paper*: Real Time Dynamic Holographic Display Based on Perovskite Doped Liquid Crystal  
*Guifeng He, Shanghai Jiao Tong University, Shanghai, China*

**Session 86: Quantum Dot Color Conversion II (Emissive, Micro-LED, and Quantum-Dot Displays)**
**Chair:** Jean-Jacques Drolet, Osram Opto Semiconductors  
**Co-Chair:** John Van Derlofske, 3M

86.1: *Invited Paper*: Nano-particle heat sinking for quantum-dot colour conversion  
*Jinhyun Cho, Samsung Electronics, Sunwon, South Korea*

86.2: Color Conversion Using Quantum Dots for LCD, OLED and MicroLED Displays  
*Ravisishbhash Tangirala, Nanosys Inc, Milpitas, CA US*

86.3: Ultra-Stable Deep-Dyed Perovskite-Polymer Composites as Tunable Downconverters  
*Caicai Zhang, University of Central Florida, Orlando, FL US*

86.4: Color Conversion Enhancement of Perovskite Quantum Dots by Integrating with Cholesteric Liquid Crystals  
*Su Pan, TCL China Star Optoelectronics Technology Co. Ltd., Shenzhen, China*

86.5: *Late-News Paper*: Giant Shell Quantum Dots for Color Conversion and as Active Material in QLEDs  
*Jan Niehaus, Fraunhofer CAN, Hamburg, Germany*

**Poster Session**

**Active Matrix Devices**

P.1: New P-Type LTPS Pixel Circuit with Negative Feedback for AMOLED Smartwatch Displays  
*Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan ROC*

P.2: Hydrogenated SnO for p-Channel Oxide Thin Film Transistor  
*Kenji Nomura, University of California, San Diego, La Jolla, CA US*
P.3: Effects of Negative Bias Illumination Stress on IGZO Device and Luminance Behaviors in OLED Display Panel Operated by AC Conditions
Kiju Im, Samsung Display Co., Ltd., Yongin, South Korea

P.4: Enhanced the Scalability and the Reliability of High Mobility Elevated-Metal-Oxide Thin-Film Transistors with Bandgap Engineering
Zhihe Xia, Department of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong

P.5: Compact Modeling of Independent Dual Gate TFTs and OLED for Display Panel Circuit Simulations
Jiahao Kang, Royole Corporation, Fremont, CA US

P.6: Four-Sided Micro-Border 8K4K LCD with Oxide-TFT Gate Driver Embedded Array
ManHong Na, AU Optronics Corp., Hsinchu, Taiwan ROC

P.7: Improvement of Electrical Stability of In-Ga-Zn-O Thin-Film Transistors by Incorporation of Polytetrafluoroethylene in the Back Channel Region
Hyun Jae Kim, Yonsei University, Seoul, South Korea

P.8: Degradation Model of LTPS TFT under Off-State Bias Stress on Flexible Substrate
Kihwan Kim, Samsung Display, Yongin, South Korea

P.9: Timing Model and Maximum-Aperture Pixel Design of an Active-Matrix Display
Xuchi Liu, Department of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong

P.10: Advantages of Active Pixel Circuit Using Gap-Type TFT as the Photo Device to Sense Low Intensity Light
Cheng-Chue Tu, National Chiao Tung University, Hsinchu, Taiwan ROC

P.11: High Performance All-Solution Processed InZnO Thin-Film Transistors via Photo-Functionalization at Varying Fluence and Annealing Environment
Dianne Corsino, Nara Institute of Science and Technology, Ikoma, Japan

P.12: A Robust a-IGZO TFT Integrated Scan/Emission Driver with Dynamic Inverter for AMOLED Display
Lei Tengteng, Peking University, Shenzhen, China

P.13: Large Subthreshold Swing of LTPS TFTs by Efficient Annealing Method for Light Emitting Diode Displays
Takao Saito, Sharp Corporation, Taki, Japan

P.14: Electrical Characteristics of P3HT:TIPS-Pentacene Blend Organic Thin-Film Transistor Under Light Irradiation
Hyanji Shin, Hongik University, Seoul, South Korea

P.15: Thermal Conductivity Measurement of Indium-Gallium-Zinc-Oxide Thin Films Utilizing Three-Omega Method
Reiji Hattori, Kyushu University, Fukuoka, Japan

P.16: Selective Activation Method of Homojunction Indium–Gallium–Zinc Oxide Thin-Film Transistors by Selective Simultaneous UV and Thermal Treatment
Hyon Jae Kim, Yonsei University, Seoul, South Korea

P.17: Low-Temperature, Solution-Processed Inorganic p-Channel Cu-based Thin-Film Transistors and Circuits
Ao Liu, POSTECH, Pohang, South Korea

P.18: Ultra-Compact Multi-Level Digital-to-Analog Converter Based on Linear Multimodal Thin-Film Transistors
Eva Bestelink, University of Surrey, Guildford, United Kingdom

P.19: A Study of Oxide TFT Vth Shift Behavior by Characterizing with Nano-Scale SIMS
Jung Hwa Park, Samsung Display Co. Ltd., Youngin, South Korea

P.191: Late-News Poster: Effects of Channel Doping on Flexible LTPS TFTs: Density of State, Generation Lifetime and Image Sticking
Hyojung Kim, Sungkyunkwan University, Suwon, South Korea

P.192: Late-News Poster: Study of IGZO Dual Gate with BCE Structure in a Touch In-Cell Smartphone
Ping Sheng Kuo, Mantix Display Technology, Putian, China

P.193: Late-News Poster: A Novel Charge Based TFT Compact Model Applicable to Image Retention Simulation of AMOLEDs
Jae Kyeong Jeong, Hanyang University, Seoul, South Korea

P.194: Late-News Poster: Selenium 4p Orbital Enables High Mobility p-Type Tin Oxyselenide Semiconductor for the Thin-Film Transistor Application
Jae Kyeong Jeong, Hanyang University, Seoul, South Korea

P.195: Late-News Poster: Data Retention in Pixel Drivers Based on Source-Gated Transistors
Eva Bestelink, University of Surrey, Guildford, United Kingdom

P.196: Late-News Poster: Amorphous Metal Thin-Film Transistors: High Mobility IGZO TFT Fabricated by a Low-Temperature All Sputter PVD Process
Sean Muir, Amorphyx Inc., Corvallis, OR US

Applied Vision
P.20: Image Distortion and Image Correction of Curved OLED Displays
Po-Jui Chen, National Chiao Tung University, Taipei, Taiwan ROC

P.21: A New Perceptual-Driven Approach to Foveated Head-Mounted Displays
Hong Hua, University of Arizona, Tucson, AZ US

P.22: Correlation Analysis for Subjective and Non-Subjective Evaluation of Holograms Generated by Digital and Analog Spatial Light Modulators
Chih-Hao Chuang, National Taiwan University, Taipei City, Taiwan ROC

P.23: A Subjective Method for Evaluating Foveated Image Quality in HMDs
Vijayaraghavan Thirumalai, Samsung Display America Lab, San Jose, CA US

P.24: The Visual Effect Evaluation of High Frame Rate Gaming LCD
Jian Chen, XiaMen Tianma Microelectronics Co., Ltd., Xiamen, China

P.197: Late-News Poster: Visual Advantages of Curved Displays for Working Efficiency
Automotive/Vehicular Displays and HMI Technologies

P.25: Effects of Image Distance on Cognitive Tunneling with Augmented Reality Head Up Displays
YungKyung Park, Ewha Womans University, Seoul, South Korea

P.26: Development of Image Enhancement Technology for 3D-HUD
Ryo Tadauchi, KYOCERA Corporation, Shiga, Japan

P.27: See-Through Projection System with Dot Matrix Phosphor Screen
Yu-Chen Chueh, National Chiao Tung University, Hsinchu, Taiwan ROC

P.28: Investigating the Usability of Touchscreens in a Turbulent Flight Deck
Mark Smith, GE Aviation Systems, Cheltenham, United Kingdom

P.29: Wide Visual Angle Anti-Reflection Film
Ya-Chun Chang, BenQ Materials Corporation, Taoyuan, Taiwan ROC

Display Electronics

P.31: Full Screen with High Refresh Frequency-120HZ and Low Power Consumption-30HZ for 5G
Liu Ping, XiaMen Tianma Microelectronics Co., Ltd., Xiamen, China

P.32: Novel Gate Driving Circuit Integrated within Active Area Based on Amorphous Oxide TFT
MingXin Wang, Nanjing CEC Panda LCD Technology Co., Ltd., Nanjing, China

P.33: A High Current-Drive, Step-Up Capacitive Power Converter for Display Driver
Min Zhang, Peking University, Shenzhen, China

Display Manufacturing

P.40: Glass Substrate Charging in Flat Panel Display Manufacturing
Robert Manley, Corning Incorporated, Corning, NY US

P.41: Mechanical Reliability of Glass in Curved Displays
Bonan Jang, Corning Incorporated, Corning, NY US

P.42: Novel Stress Profile for Chemically Strengthened Glass with High Drop Strength
Tomonori Ichimaru, Nippon Electric Glass Co. Ltd., Otsu, Japan

P.43: Application of High Stiffness Glass Substrate for Multi-Functional Large Area Displays
Kazutaka Hayashi, AGC Inc., Yokohama, Japan

P.44: Polysulfide Elastomers as Highly Elastic Materials for Flexible Displays
Radu Reit, Ares Materials, Plano, TX US

P.45: Effect of Gas Flow Ratio of Ar and O2 During Sputtering of InZnO Active Layer on Photocurrent and Responsivity Characteristics of a-InZnO TFT
Changhun Fan, Peking University, Shenzhen, China

P.46: Fabrication and Characterization of Thick Cupper Film Deposited on G8.5 LCD Glass Substrate for 8k and Large TV Panel
Li Gao, Peking University, Shenzhen, China

P.47: Influences of Molybdenum Film Residual Stress on Capper/Molybdenum Interface and Undercut Performance
Li Gao, Peking University, Shenzhen, China

P.48: ITO Electrode Impact on the White Color Uniformity of TFT-LCD
Hai An, BOE Technology Group Co., Ltd., Hefei, China

P.49: The Ultimate Solution: Belt Plane Source Evaporators for Future AMOLED and QD OLED TV
Changhan Hwang, OLEDON, Yongin, South Korea

P.50: New Monitoring Method for Ion Implanter Using Microwave Photoconductive Response in Large-Size Glass
Steve Jeons, BOE Display Technology Co., Ltd, Chong qing, China

P.51: Investigation on ICP-CVD as a Polyvalent Low Cost Technology Dedicated to Low Temperature µ-Si TFT Prototyping
Olivier de Sagazan, University of Rennes, Rennes, France
P.52: A Novel Six-Mask Low-Temperature Polycrystalline Silicon Architecture for TFT-LCD Application
Chengzhi Luo, Wuhan China Star Optoelectronics Technology Co., Ltd., Wuhan, China

P.53: WITHDRAWN

P.54: Smooth Edge Curve Compensation Method for Circular Display
Yani Chen, Peking University Shenzhen Graduate School, Shenzhen, China

P.55: Hybrid Correlated-Color-Temperature (CCT) and Gamma Automatic Adjustment System based on Efficient Algorithm and Machine Learning Model for AMOLED Display
Chien Ming Ko, AU Optronics Corporation, Hsinchu, Taiwan ROC

P.56: Preparation of Patternable High Resolution and High Refractive Index Materials for AR/VR
Jiro Hikida, Tokyo Ohka Kogyo Co. Ltd., Samukawa, Japan

P.57: Properties of Diffraction Optical Elements on the Base of Discotic Liquid Crystal for Display Applications
Victor Belyaev, Moscow Region State University, Lobnya, Russian Fed.

P.58: An Analytical Method of Small Size Module Waving Based on the Finite Element Simulation
xianghao li, Wuhan China Star Optoelectronics Technology Company Limited, Wuhan, China

P.59: Single-Step Plasma-Enhanced Chemical Vapor Deposition of Graphene on Cu Ink and Sputtered Cu Thin Films
Nai-Chang Yeh, California Institute of Technology, Pasadena, CA US

P.60: Research on the Key Factors Affecting the LC Margin Lower Limit of LCD
Le Liu, TCL China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.61: Late-News Poster: Laser Assisted Plasma Enhanced Chemical Vapor Deposition for Damage-Resistive and Reliable Thin Film Encapsulation of Organic Light Emitting Diodes
Kyungtae Kang, Korea Institute of Industrial Technology, Ansan, South Korea

Display Measurement

P.62: Effect of Viewpoints of Integral Image 3D Display on Human Eye Accommodation Response
Huan Deng, Sichuan University, Chengdu, China

P.63: Micro Optics Array for Aerial Display System and its Imaging Performance Evaluation Method
Hayato Kikuta, Japan Electronics and Information Technology Industries Association (JEITA), Tokyo, Japan

P.64: Analysis on Local Area Cell Parameter Distribution Caused by Different Dosage on Photo Alignment PI of FFS Mode LCD
Qibin Feng, Hefei University of Technology, Hefei, China

P.65: Analysis of Random Depolarization Films with Birefringent Micro-Particles for Liquid-Crystal and OLED Displays
Shizuki Sasaki, Keio University, Tokyo, Japan

P.66: Proposal of Novel Polymer Materials with No Birefringence over Wide Temperature Range
Kohei Watanabe, Keio University, Tokyo, Japan

Display Systems

P.67: Analysis of Random Depolarization Films with Birefringent Micro-Particles for Liquid-Crystal and OLED Displays
Shizuki Sasaki, Keio University, Tokyo, Japan

P.68: Proposal of Novel Polymer Materials with No Birefringence over Wide Temperature Range
Kohei Watanabe, Keio University, Tokyo, Japan

P.69: Analysis of Light Transmittance of Rugged LCDs in Random Vibration Environment
Qibin Feng, Hefei University of Technology, Hefei, China

3D Displays

P.70: Elimination of Double Images and Stray Light of a Light Field Virtual Reality Near-to-Eye Display
Hung-Ta Chien, Coretronic Corporation, Hsinchu, Taiwan ROC

P.71: Concept of Stereoscopic Full-Screen Resolution Flicker-Free Imaging of Two Three-Dimensional Scenes Simultaneously for Two Observers Using a Single 120 Hz Amplitude-Polarization Imager
Vasily Ezhov, Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russian Fed.

P.72: An Autostereoscopic Display with a Deep Viewing Zone Using Time-Multiplexed Directional Backlight
Garimaga Borjigin, University of Tsukuba, Tsukuba, Japan

P.73: Depth-Enhanced Integral Imaging Display System Based on Transmissive Mirror Device
Qiong-Hua Wang, Beihang University, Beijing, China

P.74: Aerial Signage Formed with AIRR and DS3D Display
Daiki Nishimura, Utsunomiya University, Utsunomiya, Japan

P.75: Tabletop Integral Imaging 3D Display with Annular Viewing Zone
Qiong-Hua Wang, Beihang University, Beijing, China

AR/VR

P.76: Object Distance Adjustment and Location Technology in VR
Yuhong Liu, Beijing BOE Optoelectronics Technology Co., Ltd., Beijing, China

P.77: Late-News Poster: Impact of Optical and Surface Qualities of High Refractive Index Glass Wafer on Performance of AR/MR Glasses
Shin-ichi Amma, ACG Inc., Kanagawa, Japan

P.78: Late-News Poster: Stereoscopic AR Displays – Towards Solid-State Multi-Focal Architecture
Roberts Zabels, LightSpace Technologies SIA, Marsve, Latvia
Backlights
P.77: Angular Profile Shaping Film for LCD Backlight with Large Viewing Direction
Ssu-Tuan Huang, National Chiao Tung University, Hsinchu, Taiwan ROC

Late-News Poster: Head-Mounted Display with Aspherical Phase Plates to Reduce Visual Fatigue
Yasuhiro Takaki, Tokyo University of Agriculture and Technology, Tokyo, Japan

Late-News Poster: Lattice Patterned Micro Lens Array (MLA) Optical Films for Mini-LED Back Light Units (BLUs)
Bing Shen, Bright View Technologies, Durham, NC US

Projection
P.78: WITHDRAWN

Emerging Technologies and Applications
P.79: High Power Static Phosphor Plate Light Source for Digital Projections
Kenneth Li, Optomuous Technologies Inc., Westlake Village, CA US

P.80: Optoelectronic Neuromorphic Device Array for Environmental-adaptable Artificial Visual Display System
Sung Kyu Park, Chung-Ang University, Seoul, South Korea

P.81: Holographic Near-Eye Display for Vision Correcting Application
Byoungbo Lee, Seoul National University, Seoul, South Korea

P.82: Color Flexible Waveguide Display using Polymer Stabilized Liquid Crystal
Yunho Shin, Kent State University, Kent, OH US

P.83: Tuning the External Quantum Efficiency and Reverse Bias of PIN Photodiode
JiYoung Song, Wuhan China Star Optoelectronics Technology Co., Ltd., Wuhan, China

P.84: The Effects of Bias Sputtering on the Properties of ZnO Nanorods Prepared from As-Deposited Thin Films by Reducing Annealing Method
Chao Yang, Kochi University of Technology, Kashi, Japan

P.207: Late-News Poster: Infrared Down-Conversion of Organic Light Emitting Diode Emission for Medical Use and Vein Authentication
Yasuo Miyata, Konica Minolta Inc., Tokyo, Japan

P.208: Late-News Poster: Interdisciplinary Research on Acoustic and Human Cognitive Characteristics of Flat Panel TVs: Front-Firing Exciter Speaker Characteristic
Sungtae Lee, LG Display, Gyeonggi, South Korea

P.209: Late-News Poster: Electroluminescent Speaker
Jongsu Kim, Pukyong National University, Busan, South Korea

P.210: Late-News Poster: 3D Projection Display Based on Up-conversion Liquid Materials
Jicheng Liu, Shanghai University, Shanghai, China

Emissive, Micro-LED and Quantum Dot Display
P.85: Development of High-yield Laser Lift-off Process for Micro-LED Display
Xuan Cao, Visionox Technology Incorporation, Gu’an, China

P.86: Electrospinning of Perovskite Crystals with Strong Emission and Improved Electrical Conductivity
Yani Chen, Peking University Shenzhen Graduate School, Shenzhen, China

P.87: A Scheme to Manufacture a High Color Purity Quantum Dot Display
Yuan Yang, Wuhan China Star Optoelectronics Technology Co., Ltd., Wuhan, China

P.88: Measurement and Analysis of Current Efficiency of Blue and Green Micro-LED Arrays with Different LED Chip Sizes
Chenggong Wang, Visionox Technology Incorporation, Gu’an, China

P.89: Ink Formulation and Film Photo-Stability of Quantum Dot Color Converters for Micro-LED Applications
Ray-Kuang Chiang, Nanomaterials Laboratory, Far East University, Tainan, Taiwan ROC

P.90: A New PWM Pixel Circuit for Micro-LED Display with 60Hz Driving and 120Hz Lighting
Ting Wang, XiaMen Tianma Microelectronics Co., Ltd., Xiamen, China

P.91: Improving Light Extraction from QD-LED Pixels
David Montgomery, Sharp Laboratories of Europe, Oxford, United Kingdom

P.92: Low-Power Perovskite Photodetector Based on ZnO/CsPbBr3/TFB Heterojunction
Qing Li, Southeast University, Nanjing, China

P.93: Compact Stable Quantum Dots via Amide-Mediated Synthesis of PMO-Based Multifunctional Ligand
Junjie Hao, University of Bordeaux, Pessac, France

P.94: WITHDRAWN

P.95: A Facile Multi-Transfer Method by Flexible Tape for Micro-LED Display Applications
Zhibo Yao, Visionox Technology Incorporation, Gu’an, China

P.96: Design and Verification of A Driving System Suitable for LED Display Devices
Jianhang Fu, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.97: Applications of Metal Halide Perovskite as Passive and Active Light Emitting Materials
Bernard Wenger, Helio Display Materials, Oxford, United Kingdom

P.98: Inkjet Printed CsPbBr3 Quantum Dots for Full-Color Display
Miao Duan, TCL China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.99: The Size and Temperature Effect of Ideality Factor in GaN/InGaN Multiple Quantum Wells Micro Light Emitting Diodes (Micro-LEDs)
Yibo Liu, Hong Kong University of Science and Technology, Hong Kong, China
Yongwei Wu, TCL China Star Optoelectronics Technology Co. Ltd., Shenzhen, China

P.101: In-situ Fabrication Strategy of Perovskite Quantum Dots for Novel Display Technology
Zeling Bai, Beijing Institute of Technology, Beijing, China

P.102: WITHDRAWN

P.103: WITHDRAWN

P.104: Photo-Aligned Quantum Rods with T-shape Ligands Based on Liquid Crystal Polymer Matrix
Chengbin Kang, The Hong Kong University of Science and Technology, Hong Kong, China

P.105: Bright, Large Pixel, Flexible Quantum-Dot Light-Emitting Diodes for Photomedicine
Manuel Triana, University of Central Florida, Orlando, FL US

P.106: Highly Luminescent Blue Light-Emitting Diodes Based on Quasi-2D Multi-Cation Perovskites
Yongwei Wu, TCL China Star Optoelectronics Technology Co. Ltd., Shenzhen, China

P.107: Inkjet Printed Uniform Quantum Dots as Color Conversion for Active Matrix Micro-LED Displays
Zhiping Hu, Peking University, Shenzhen, China

P.108: Stable Thermal Distribution of Flexible Transparent InGaN/GaN Multiple Quantum Wells Mini-LED Arrays
Bo Lu, Southern University of Science and Technology, Shenzhen, China

P.109: Temperature-Dependent Forward Voltage of AlGaInP-Based Red Micro-LEDs
Yan Wang, Southern University of Science and Technology, Shenzhen, China

P.110: Investigation of Bowing Effect of 4° Epitaxial Wafer and Reliability of GaN-based Micro-LED Devices
Ke Zhang, Hong Kong University of Science and Technology, Hong Kong, China

P.111: Red, Green and Blue Quantum Rod based electroluminescent light emitting diodes
Kumar Mallem, The Hong Kong University of Science and Technology, Hong Kong, China

P.112: Ultra-Thin Graphene Oxide Encapsulation Film for Flexible OLED Displays via Self Assembly Coating Process
Woo Jin Lee, Hongik University, Seoul, South Korea

Flexible Displays and E-Paper
Flexible Displays and E-Paper

P.114: A Protection Structure of the Foldable Display for Preventing the Macro-Cracks
Yingteng Zhai, Tianma Microelectronics Co., Ltd., Shanghai, China

P.115: Research On Waviness Improvement For Foldable Display and Relevant Ultra-Thin Metal Plate Modeling Process
Haoran Wang, BOE Display Technology Co., Ltd., Beijing, China

P.116: Soft and Reconfigurable Wearable LED Display Using Soft Modular Blocks
Jaeyoung Yoon, Seoul National University, Seoul, South Korea

P.117: FLI Structure for R1 Foldable AMOLED Display
Chuanxiang Xu, BOE, Beijing, China

P.118: Optimization of Folding Process for Flexible Electronic Device
Ko-Chin Hung, AU Optronics Corp., Hsinchu, Taiwan ROC

P.119: Modeling of Mechanical Effects in Flexible Display Module by Finite Element Analysis
Ko-Chin Hung, AU Optronics Corp., Hsinchu, Taiwan ROC

P.120: High-Mobility IGZO Thin-Film Transistors Fabricated on a Flexible PET Monofilament Fiber for Wearing Display
Chen Young Kim, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

P.121: Solution Processed Organic-Inorganic Hybrid Perovskite TFTs with Excellent Ambient Air Stability
Hyeok Sung, KAIST, Daejeon, South Korea

P.122: Mechanical Bending Test of High Mobility ZnO TFTs on PI substrate by Spray Pyrolysis
Semyon Konstein, Sborka Laboratory LLC, Yaroslavl, Russian Fed.

P.123: Tiled Display on the Textile Base
Semyon Konstein, Sborka Laboratory LLC, Yaroslavl, Russian Fed.

P.124: A 17.3-inch WQHD Top-Emission Foldable AMOLED Display with Outstanding Optical Performance and Visual Effects
Puyu Qi, BOE Technology Group Co., Ltd., Chengdu, China

P.125: Influence of Line Shape on the Durability of Bending Lines on Flexible OLED Panels
Lin Chen, Wuhu Tianma Microelectronics Co., LTD., Wuhu, China

P.126: Ultra-Thin Graphene Oxide Encapsulation Film for Flexible OLED Displays via Self Assembly Coating Process
Woo Joo Lee, Hongik University, Seoul, South Korea

Interactive Displays and Systems
Fingerprint Sensing Displays
P.128: High SNR Fingerprinting Structure with Switchable Backlight for Liquid Crystal Displays
Jiangang Lu, Shanghai Jiao Tong University, Shanghai, China

P.129: Operating Frequency and Sensitivity Prediction of In-Display Ultrasonic Fingerprint Sensing Systems
Hyun Sang Park, Samsung Display Co., Yongin, South Korea

P.130: A Full Screen Biometric Identification Approach for OLED Displays by Using Near-Infrared OLED
Chihao Lin, National Chiao Tung University, Tainan, Taiwan ROC

Force, Stylus and Haptics
P.126: Surveys on Stylus Technologies for Capacitive-Type Touch Systems
Jae-Sung An, Delft University of Technology, Delft, Netherlands

P.127: Multi-Touch Tactile Touch Display That Presents Tactile Texture Localized in Free Shape
Shin Takeuchi, Tianma Japan, Ltd., Kawasaki, Japan

P.217: Late-News Poster: Convolutional Neural Network-Based Multi-touch Detection Technique on Learning from Class-imbalanced Dataset
Hyeon-Seok Yoon, Sogang University, Seoul, South Korea

P.218: Late-News Poster: On the Scalability of On-Cell Touch for Flexible AMOLEDs
Wenbing Hu, Royole Corporation, Fremont, CA US

P.219: Late-News Poster: SurfaceWave - A Novel Ultrasonic Touch and Force Sensing Technology
Samuel Sheng, Sentons USA, Inc., San Jose, CA US

Seeing Through the Display
P.131: A Design of Under-Screen Face Recognition Based on Screen Miniature Blind Apertures
Hao Zhang, BOE Technology Group Co., Ltd., Beijing, China

P.132: An Under-Display Camera Optical Structure for Full-Screen LCD
Hailiang Wang, Xiamen Tianma Microelectronics Co., Ltd., Xiamen, China

Lighting
Advances in Lighting Optics and Design
P.133: WITHDRAWN

P.134: Optical Design of Encapsulation for High EQE and Color Purity in OLEDs
Yun Seon Du, Kyungpook National University, Daegu, South Korea

P.135: Halide Perovskite-Polymer Composite Films for the Two-Color White OLED Displays
Hyun Gi Kim, Kyunghee University, Yongin, South Korea

Liquid Crystal Technology
Bistable LCDs
P.136: A Low Voltage Switchable Bistable Twisted Nematic Display
Pengcheng Liu, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong

P.137: Developing Bistable FLC Mixtures
William Thurmes, Miyota Development Center of America, Inc., Longmont, CO US

Fast Response LCDs
P.138: Fringe Field Effect of Ferroelectric Liquid Crystal Study using High Pixel Density electrode pattern Displays
Zhibo Sun, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

P.139: A Double-Sided In-Plane-Switching Electrode Blue-Phase Liquid Crystal Display with Permittivity Protrusion
Qiong-Hua Wang, Beihang University, Beijing, China

Image Performance Improvement
P.140: Improvement of color washout and color shift of the skin tone of VA LCDs
Chun-Chi Chen, TCL China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.141: Color Washout Improvement of VA mode LCDs
Yani Chen, Peking University Shenzhen Graduate School, Shenzhen, China

P.142: Moire Analysis and Quantification in Oblique View
Qian Jia, BOE Technology Group Co., Ltd., Beijing, China

P.143: Effects of Dielectric Anisotropy and Electrode Structure on the Performance of VA-FFS LC Mode
Wing-Kit Choi, National Taiwan University, Taipei, Taiwan ROC

P.144: A New Optical Concept for High Duty Cycle Vertical Alignment Liquid Crystal Displays
Zirong Wu, Shenzhen AV-Display Co., Ltd., Shenzhen, China

P.145: Late-News Poster: Ultra-High Resolution ADS TV of BOE
Hui Zhang, BOE Technology Group Co., Ltd., Beijing, China
LC Photonics
P.146: Electrically Tunable Bandpass Filter with Narrow Bandwidth of 27 nm
Seung Hee Lee, Jeonbuk National University, Jeonju, South Korea
P.147: Multi-Phase and Multi-Pitch Twist Structure Liquid Crystals with Polymer Template
Jianguo Lu, Shanghai Jiao Tong University, Shanghai, China
P.148: Investigation of Photoluminescence and Birefringence of Nanoparticle-dispersed Nematic Liquid Crystal
Garumurthy Hegde, Centre for Nano-Materials and Displays, Bengaluru, India
P.149: Enhanced Electro-Optic Performances of the Optically Isotropic Liquid Crystal Displays Utilizing PEDOT: PSS
Seung Hee Lee, Jeonbuk National University, Jeonju, South Korea
P.221: Late-News Poster: Liquid Crystal Beam Shifting Device for Time-of-Flight Camera
Ming Syuan Chen, Liqxtal Technology Inc., Tainan, Taiwan ROC
P.222: Late-News Poster: Mechanically-Static Laser Speckle Reduction Solution
Kai-Han Chang, General Motors Research & Development, Warren, MI US
P.223: WITHDRAWN

LCD Modelling
P.150: Extended Jones Matrix for a Reflective Liquid-Crystal Display at Oblique Incidence
Bin Wang, Eastman Chemical Company, Kingsport, TN US
P.151: Content-Adaptive RGBW Algorithm
Yan Sun, BOE Technology Group Co., Ltd., Beijing, China
P.152: A High Precision and Contrast Algorithm of Dual-Cell LCDs
Yunhai Xi, BOE Technology Group Co., Ltd., Beijing, China

Liquid Crystal Alignment
P.153: High-Performance Photo-alignment for volume manufacturing of VA mode Liquid Crystal Displays
Man Chun Tseng, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong
P.154: New Carbon Nanotubes UV Polarizer for Photoalignment of Liquid Crystals
Hoon Sab Shin, Jeonbuk National University, Jeonju, South Korea
P.155: Quantum Rod Enhancement Film Based on Photo-Aligned Liquid Crystal Polymer Matrix
Abhishek Srivastava, The Hong Kong University of Science and Technology, Hong Kong, China
P.156: Distinguished Poster: Curved VA LCD with Uniform brightness: from Pixel Design to Verification
Jie Cao, Shenzhen China Star Optoelectronics Semiconductor Display Technology Co. Ltd., Shenzhen, China
P.157: Analysis of Self-Alignment Force of Reactive Additive Monomer
Yu Zhang, Peking University, Shenzhen, China
P.158: Generation of Pretilt Angle and an Alignment Layer Utilizing Binary Mixture in P1-Less Vertical Alignment Mode
Seung Hee Lee, Jeonbuk National University, Jeonju, South Korea

Transmittance Improvement
P.159: Transmittance Improvement of Polymer Stabilized Vertical Alignment Liquid Crystal Displays by Chiral Doping
Xingwa Chen, TCL China Star Optoelectronics Technology Co., Ltd., Shenzhen, China
P.160: Disclination Optimization for Transmittance Improvement in Ultrahigh-Definition 2-Domain VA LCD
Yinfeng Zhang, TCL China Star Optoelectronics Technology Co., Ltd., Guangdong, China
P.161: A Novel Approach for Higher Efficient LCD by Optimizing Thin Films
Fangzhou Zhang, BOE Technology Group Co., Ltd., Beijing, China
P.224: Late-News Poster: High Transmittance and Contrast Ratio ADS TV Technology with Negative Liquid Crystal Based on Rubbing Process
Dan Wang, BOE Technology Group Co., Ltd., Beijing, China

OLEDs
P.162: Improvement of Hole Injection in OLED Devices Through Fluorine Plasma
Eun-Hyung Lee, LG Display Co., Ltd., Seoul, South Korea
P.163: WITHDRAWN
P.164: Enabling High Performance Organic Light Emitting Diode with Novel Bi-Carbazole Host
Shahnawaz Shahnawaz, National Tsing Hua University, Hsinchu, Taiwan ROC
P.165: An Optimized Algorithm to Reconstruct the Structure of Transparent OLED Display Based on Monte Carlo Method
Rong Jie Lin, National Taiwan University, Taipei, Taiwan ROC
P.166: Tuning the Refractive Index of Silicon Oxynitride Films for Light Extraction Enhancement of OLED Devices
Yang Maos, Peking University, Shenzhen, China
P.167: UV Light Influence to OLED Filler Encapsulation
Xinwei Gao, Hefei BOE Joint Technology Co., Ltd., Hefei, China
P.168: High Efficiency (EQE>30%) TADF-OLED with Lightly-Doped Emitter (0.5%) by Using TADF-Host
Jiun-Haw Lee, National Taiwan University, Taipei, Taiwan ROC
P.169: Towards Fully Integrated 3D Master Equation – Kinetic Monte Carlo Predictive Device Simulations
Siebe van Mensfoort, Simbeyond B. V., Eindhoven, Netherlands
P.170: Green Phosphorescent Organic Light Emitting Diodes with Ultra-Thin Undoped Emission Layer of Nearly 24% External Quantum Efficiency
P.171: Investigation of the Improvement in Short-Term Stability by Post Annealing of Fluorescent Organic Light Emitting Diodes with Analysis of Exciton Dynamics
Duy Le, Japan Advanced Institute of Science and Technology, Nomi, Japan

P.172: WITHDRAWN

P.173: Improved Efficiency in Blue Fluorescent Organic Light-Emitting Devices Using Anthracene-Containing Dibenzofuran Type Host Materials
SookHee Jeong, Sungkyunkwan University, Suwon, South Korea

P.174: Pre-Test Procedure of Organic Material Degradation by Using Accumulative Monte-Carlo Simulation with 3D Mesh
Sungmoon Kim, R&D center of DepoLab Inc., Paju, South Korea

P.175: Machine Learning for Mura Compensation in OLED Applications
Chia-Hao Lin, AU Optronics Corporation, Hsinchu, Taiwan

P.176: High Efficiency Hole Transporting Host Materials for Blue Phosphorescent Organic Light-Emitting Diodes
Cho rong Kim, Sungkyunkwan University, Suwon, South Korea

P.177: A Novel OLED Pixel Circuit for High Resolution or High Frequency Application
Xu Qian, Tianma Micro-Electronics Co., Ltd., Shanghai, China

P.178: Rigid Indolocarbazole as New Donor Moiety for Highly Efficient Thermally Activated Delayed Fluorescent (TADF) Device
Jang-Hyuk Kwon, Kyung Hee University, Seoul, South Korea

P.179: A Numerical Analysis of Current Efficiency Hump at Low Grey in the OLED devices
Hyunguk Cho, Samsung Display, Yongin, South Korea

P.180: High Transmittance Top Conductive Electrodes of OLEDs by Using Conductive Interface Layer
Lee Haikyun, Hanyang University, Seoul, South Korea

P.181: Micro-Patternable AgNW-PEDOT:PSS Hybrid Electrodes for All-Solution-Processed Polymer Light-Emitting Diodes
Xuan Zhao, Visionox, Suzhou, China

P.182: Carboline Derived Hosts with Triazine Core for High Efficiency and Long Lifetime in Deep Blue Phosphorescent Organic Light Emitting Diodes
Soo Inn Lee, Sungkyunkwan University, Suwon, South Korea

P.183: Distinguished Poster: Coupled 3D Master Equation and 1D Drift-Diffusion Approach for Advanced OLED Modeling
Masaru Inoue, TOYOTech LLC, Fremont, CA, USA

P.184: Color Shift Improvement of AMOLED Device with Color Filter
Xuan Zhao, Visionox, Suzhou, China
P.231: WITHDRAWN