ADVANCE PROGRAM

2024 DISPLAY WEEK INTERNATIONAL SYMPOSIUM

May 14-17, 2024 (Tuesday – Friday)
San Jose Convention Center
San Jose, California, US

Session 1: Annual SID Business Meeting
Tuesday, May 14, 2024 / 8:00 – 8:20 am / Room 220A

Session 2: Opening Remarks / Keynote Addresses
Tuesday, May 14, 2024 / 8:20 – 10:20 am / Room 220A
Chair: *Hyun-Jae Kim, Yonsei University*

2.1: *Keynote Address 1*
2.2: *Keynote Address 2*
2.3: *Keynote Address 3*

Session 3: AR Optical Combiner *(AR/VR/MR)*
Tuesday, May 14, 2024 / 11:10 AM - 12:50 PM / Room 220B
Chair: *Dr. Robert Visser, Applied Materials*
Co-Chair: *Michael Wittek, Merck Electronics KGaA*

3.1: ***Invited Paper:*** **Reality Versus Simulations in Diffractive Waveguide Combiners**
Guillaume Genoud, Dispelix Oy, Espoo, Finland

3.2: ***Invited Paper:*** **Current Technologies and Developments of AR Optics**
Jee Myung Kim, LetinAR, Anyang, South Korea

3.3: **Anamorphic-XR: Imaging Waveguide Technology for Efficient and Wide Field-of-View Near-Eye Display**
Graham Woodgate, Rain Technology Research Ltd., Oxford, United Kingdom

3.4: **Near-Eye Display with Curved Waveguide for Fashionable Form Factor**
Jaeyeol Ryu, Samsung Research, Seoul, South Korea

3.5: ***Distinguished Paper:*** **Full-Color, Wide FoV Single-Layer Waveguide for AR Displays**
Qian Yang, University of Central Florida, Orlando, FL US

Session 4: Nobel Prize in Quantum Dots *(Emissive, Micro-LED, and Quantum-Dot Displays)*
Tuesday, May 14, 2024 / 11:10 AM - 12:10 PM / Room 220C
Chair: *Dr. Jonathan Steckel, ST Microelectronics*
Co-Chair: *Seth Coe-Sullivan, NS Nanotech*

4.1: ***Invited Paper:*** **Harnessing Colloidal Nanocrystal Synthesis and Self-Assembly to Create Modular Optical and Optoelectronic Materials and Devices**
Chris Murray, University of Pennsylvania, Philadelphia, PA, US

4.2: ***Invited Paper:*** **Quantum Dots: Even Brighter?**
ETH Zurich, Zurich, Switzerland

4.3: ***Invited Paper:*** **Overview of QD-LED Development: Current Status and Future Prospect**
Yeo-Geon Yoon, Samsung Display Co., Ltd., Yongin, South Korea

Session 5: Integrated EMR Stylus Displays *(Interactive Displays and Systems / Sensors Integration and Multi-Functional Displays)*
Tuesday, May 14, 2024 / 11:10 AM - 12:10 PM / Room LL21CD
Chair: *Hiroshi Haga, Tianma Japan, Ltd.*
Co-Chair: *Derek Solven, Synaptics*

5.1: **Incell Electromagnetic Resonance Touch LCD with Antenna Coil Integrated in Array Substrate**
Chuan Shuai, TCL China Star Optoelectronics Technology Co., Wuhan, China

5.2: **Integrated Design of Capacitive Touch and Electromagnetic Sensor for Flexible OLED Display**
Lihua Wang, Hefei Visionox Technology Co.,Ltd., Hefei, China

5.3: **Pixel Design of Electromagnetic Resonance Touch Sensor Integrated LCD**
Zhiqiang Yu, Beijing BOE Optoelectronics Technology Co., Ltd., Beijing, China

Session 6: AMOLED Driving TFTs *(Active Matrix Devices)*

Tuesday, May 14, 2024 / 11:10 AM - 12:30 PM / Room LL21EF
Chair: *Dr. Kalluri Sarma, Display Technology Consulting*
Co-Chair: *Norbert Fruehauf, University of Stuttgart*

6.1: **Pragmatic Low-Temperature Polycrystalline Thin-Film Transistor Technologies for High-Brightness and High-Temperature Environments in AMOLED Displays**
Keunwoo Kim, Samsung Display, Yongin, South Korea

6.2: **High Subthreshold Swing a-IGZO Driving TFTs Without Mobility Degradation for Low-Gray Level Image Quality Improvement in Active-Matrix OLED**
Soobin An, Seoul National University, Seoul, South Korea

6.3: **Development of Internal Compensation Technology for Medium Size OLED Display Based on Oxide TFTs**
Pan Xu, Hefei BOE Joint Technology Co., Ltd., Hefei, China

6.4: ***Invited Paper:*** **Improvement of the Low Temperature Poly-Silicon AMOLED Pixel Circuit with Independent Threshold Voltage Detection**

Session 7: FLC/LCoS *(Liquid Crystal Technology)*

Tuesday, May 14, 2024 / 11:10 AM - 12:10 PM / Room LL20BC
Chair: *Hoi-Sing Kwok, Hong Kong University of Science & Technology*
Co-Chair: *Michael Wand, LC Vision, LLC*

7.1: **Developing New Ferroelectric Liquid Crystal Mixtures for LCOS**
Tomohiro Ando, Citizen Finedevice Co., Ltd., Tomi, Japan

7.2: **Truly Bistable Ferroelectric Liquid Crystal Based Modulators**
Vigneshwaran Swaminathan, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

7.3: **Analysis of a 1.2" 4k2k LCOS display phase modulator for Holographic Display applications**
Jhou-Pu Yang, National Yang Ming Chiao Tung University, Hsinchu, Taiwan Roc

Session 8: Color and HDR *(Applied Vision)*

Tuesday, May 14, 2024 / 11:10 AM - 12:30 PM / Room LL20A
Chair: *Youngshin Kwak, Ulsan National Institute of Science and Technology*
Co-Chair: *Sakuichi Ohtsuka, International College of Technology, Kanazawa*

8.1: **Riemannian Color Difference Metric**
Patrick Candry, Ghent University, Ghent, Belgium

8.2: ***Distinguished Paper:*** **Adaptive Display White Point under Various Ambient Conditions**
Minchen Wei, Hong Kong Polytechnic University, Hong Kong, Hong Kong

8.3: **Relationship Between Metameric Color Matching and Hue Estimation**
Minjeong Ko, Ulsan National Institute of Science & Technology, Ulsan, South Korea

8.4: **A New SDR Twilight Visual Image Display System Employing Ultra-High-Dynamic-Range Image Capturing Technology aligned with Human Circadian Behavior**
Sakuichi Ohtsuka, International College of Technology, Kanazawa, Kanazawa, Japan

Session 9: Flexible Displays I *(Flexible Displays and e-Paper)*

Tuesday, May 14, 2024 / 11:10 AM - 12:30 PM / Room LL20D
Chair: *Jennifer Lin, AUO Corporation*
Co-Chair: *Kyung-Tae Kang, Korea Institute of Industrial Technology*

9.1: ***Invited/Distinguished Paper:*** **Flexible TFT Backplane Development for Extremely Small Bending Radius with Organic ILD and Island Structure**
Taewoong Kim, Samsung Display, Yongin, South Korea

9.2: ***Invited Paper:*** **Research on Strain Sensor Embeded in Foldable AMOLED Display**
Zhao Li, BOE Technology Group Co., Ltd., Beijing, China

9.3: **The Latest Technology Breakthroughs for 31" 4K Flexible Printed OLED TV Display Technology**
Jueng Gil (James) Lee, Guangdong Juhua Printed Display Technology Co.Ltd., Guangzhou, China

9.4: **Studies of Physical Properties and Mechanism of Films for Improving Flexibility of Flexible Display**
Jaesik Kim, Samsung Display Company, Hwaseong, South Korea

Session 10: Emerging Display Enhancements *(Emerging Technologies and Applications)*

Tuesday, May 14, 2024 / 11:10 AM - 12:30 PM / Room LL21AB
Chair: *Ian Underwood, University of Edinburgh*
Co-Chair: *Adi Abileah, Adi - Displays Consulting LLC*

10.1: **Optical Simulation and Improvement of the Reflection Pattern of Polarizer-Free OLED Panel**
Long Chen, Tianma Microelectronics Co., Ltd., Shanghai, China

10.2: **Temperature-Dependent Electrical and Emissive Behavior of UV-Excited Cd-Free QD MicroLED Display**
Chin-Yueh Liao, Foxconn Technology Co., Ltd., New Taipei City, Taiwan Roc

10.3: ***Distinguished Paper:*** **Reducing Resolution Loss in Naked Eye 3D Display Using Dual Ferroelectric Liquid Crystal Shutters for Time-Multiplexed Light Field Display**
Zhi-Bo Sun, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong

10.4: ***Late-News Paper:*** **Precise Compensation of Device Variability in IGZO-based Ferroelectric Thin-Film Transistors for Enhanced Transparent Display Performance**
Daniel Joch, Fraunhofer Institute for Integrated Systems and Device Technology IISB, Erlangen, Germany

Session 11: Micro-LED for AR *(AR/VR/MR / Emissive, MicroLED, and Quantum-Dot Displays)*
Tuesday, May 14, 2024 / 2:00 PM - 3:20 PM / Room 220B
Chair: *Nikhil Balram, Mojo Vision*
Co-Chair: *Joon Young Yang, LG Display Co. Ltd*

11.1: ***Invited Paper:*** **MicroLED Display for Smart Glasses**
Qiming Li, Jade Bird Display, Shanghai, China

11.2: ***Invited Paper:*** **Full Color MicroLED Technology for AR Applications with μ-PixeLED Solutions**
Chih-Ling Wu, PlayNitride Inc., Miaoli, Taiwan Roc

11.3: ***Invited Paper:*** **Advanced MicroLED Technologies for AR/MR Systems**
Chien-Chung Lin, National Taiwan University, Taipei, Taiwan Roc

11.4: ***Invited Paper:*** **Advanced Augmented Reality Head-Up Display Utilizing MicroLED Technology**
Chiulien Yang, Innolux Corp., Miaoli, Taiwan Roc

Session 12: QD Color Conversion Materials *(Emissive, Micro-LED, and Quantum-Dot Displays)*
Tuesday, May 14, 2024 / 2:00 PM - 3:20 PM / Room 220C
Chair: *Yong Seog Kim, Hongik University*
Co-Chair: *Michele Ricks, EMD Electronics*

12.1: ***Invited Paper:*** **Narrowing the Emission Linewidth of I-III-VI Quantum Dots**
Hunter McDaniel, UbiQD, Inc., Los Alamos, NM US

12.2: **A Universal High-Resolution Patterning Technology for Quantum Dot Color Converters in Micro-LED Displays**
Lih Lin, University of Washington, Seattle, WA US

12.3: **Materialization of Mid-Resolution Quantum Dot Color Converters on G2.5 TFT-LCD Production Line for Micro-LED Displays**
Ray-Kuang Chiang, Taiwan Nanocrystals Corp. Ltd., Tainan, Taiwan Roc

12.4: **Inorganic Halide Perovskite Thin Films Realized by Pulsed Laser Deposition Over Large Area for MicroLEDs Color Conversion Layers**
Elsa Parrat, Univ. Grenoble Alpes, CEA, LETI, Grenoble, France

Session 13: OLED Fingerprint Sensing Displays *(Interactive Displays and Systems / OLEDs / Sensors Integration and Multi-Functional Displays)*
Tuesday, May 14, 2024 / 2:00 PM - 3:20 PM / Room LL21CD
Chair: *Martin Grunthaner, Apple*
Co-Chair: *Nicholas Thompson, Universal Display Corporation*

13.1: ***Invited Paper:*** **New Frontier in Display Technology: OPD Sensor in OLEDs for Healthcare Application**
Sunghan Kim, Samsung Display Co., Ltd., Yongin, South Korea

13.2: **Organic Light-Emitting Diode Display Constituted Side-by-Side OLED and Organic Photodiode Pixels Integrated in the Same Plane by Adopting MML (Metal Mask-Less Lithography) Technology**
Kazuya Sugimoto, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

13.3: **Full Screen Fingerprint Display with Embedded Organic Photo-Detectors**
Kwang Soo Bae, Samsung Display, Yongin, South Korea

13.4: **OLED/Organic Photodetector Dual-Mode Device Integrated into Side-by-Side Patterned OLED Display**
Taisuke Kamada, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Session 14: Highly Reliable TFT for OLEDs *(Active Matrix Devices)*
Tuesday, May 14, 2024 / 2:00 PM - 3:00 PM / Room LL21EF
Chair: *Junho Song, Korea University*
Co-Chair: *Sang Hee Park, KAIST*

14.1: **A Study on Flexibility Improvement of AMOLED Back Plane and Mask Reduction Process Architecture Using Photo-sensitive Organic Insulation Films**
In Young Chung, Samsung Display Co., Ltd., Yongin, South Korea

14.2: **Development of High Mobility and Reliability Metal Oxide TFT for 13.2 inch AMOLED Display**
Fa-Hsyang Chen Chen, Kunshan Govisionox Optoelectronics Co., Ltd., Kunshan, China

14.3: ***Late-News Paper:*** **Channel Etched Coplanar TFTs for Applying a-IGZO to High-Resolution and IT Applications**
Heung Jo Lee, LG Display Co., Ltd, gyeonggi-do, South Korea

Session 15: Innovative LCTs *(Liquid Crystal Technology)*
Tuesday, May 14, 2024 / 2:00 PM - 3:20 PM / Room LL20BC
Chair: *Lu Lu, Meta Reality Labs*
Co-Chair: *Gang Xu, Jingce Electronics, USA*

15.1: ***Invited Paper:*** **Intuitive Understanding of the Limitation of Pancharatnam–Berry Optical Beam Deflectors**

Philip Bos, Kent State University, Kent, OH US

15.2: ***Invited Paper:*** **Development of Novel Liquid Crystal on Silicon Microdisplays and Future Application**
Yoshitomo Isomae, Sony Semiconductor Solutions Corporation, Atsugi, Japan

15.3: **Reflective Liquid Crystal Polarization Volume Grating for SWIR with High Diffraction Efficiency and Large Diffraction Angle and Sensor Application**
Kazuya Hisanaga, FUJIFILM Corporation, Minamiashigara, Japan

15.4: **11.45' WUXGA LTPS Pad with Only 1-IC-Chip and 8-Photo-Mask Processes**
Wu Jing, XiaMen Tianma Microelectronics Co., Ltd., Xiamen, China

Session 16: Human Factors of Stereoscopic Displays *(Applied Vision / AR/VR/MR)*

Tuesday, May 14, 2024 / 2:00 PM - 3:00 PM / Room LL20A

Chair: *Scott Murdison, Reality Labs at Meta*

Co-Chair: *Joohwan Kim, NVIDIA*

16.1: **A Model for the Appearance of Interocular Colorimetric Differences in Binocular XR Displays**
Minqi Wang, Samsung Display America Lab, San Jose, CA US

16.2: ***Invited Paper:*** **Causes and Consequences of IPD Mismatch in XR Devices**
Laurie Wilcox, Centre for Vision Research, Department of Psychology, York University, Toronto, ON Canada

16.3: ***Distinguished Paper:*** **Vergence-Accommodation Conflict Increases Time to Focus in Augmented Reality**
Daniel Spiegel, Meta Reality Labs, Redmond, WA US

Session 17: Flexible Displays II *(Flexible Displays and e-Paper)*

Tuesday, May 14, 2024 / 2:00 PM - 3:20 PM / Room LL20D

Chair: *Masayoshi Higuchi, National Institute for Materials Science*

Co-Chair: *Jeong-Ik Lee, ETRI*

17.1: **Cylindrical Fiber-Based Oxide TFTs with a 2T1C Pixel Circuit for Wearable Textile Displays**
Kyung Cheol Choi, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

17.2: **Geometric Optimization of the Standard 4-edge Curved Display**
Haoran Wang, BOE Technology Group Co., Ltd., Beijing, China

17.3: **Study on Rollable AMOLED Performance Improvement**
Shiming Shi, BOE Technology Group Co., Ltd., Beijing, China

17.4: **Quantifying Surface Quality Due to Periodic Linear Waviness of a Rollable Display**
Sangjun Lee, Samsung Display, Hwaseong, South Korea

Session 18: Emerging Communications Applications *(Emerging Technologies and Applications / Liquid Crystal Technology / Sensors Integration and Multi-Functional Displays)*

Tuesday, May 14, 2024 / 2:00 PM - 3:20 PM / Room LL21AB

Chair: *Fang-Cheng Lin, Apple, Inc.*

Co-Chair: *Daiichi Suzuki, Japan Display Inc.*

18.1: **A Super-Fast and Precise Moiré Pattern Simulation Algorithm for Improving Antenna-on-Display Moiré Effect**
Yiming Jia, Hefei Visionox Technology Co., Ltd., Hefei, China

18.2: **A Novel Design for Reconfigurable Intelligent Surfaces (RIS) with Thin Liquid Crystal Layer for Wireless Communications**
Changhyeong Lee, Corning Technology Center Korea (CTCK), Asan, South Korea

18.3: **Mini-LED LCDs Integrated with High-Capacity MIMO Visible Light Communication**
Zong Qin, Sun Yat-Sen University, Guangzhou, China

18.4: ***Distinguished Paper:*** **TDDI Panel of NFC Integration Driving Method Based on Part-time Driving Strategy**

Boshi Feng, Beijing BOE Display Technology Co., Ltd., Beijing, China

Session 19: AR/VR Microdisplays *(AR/VR/MR / Emissive, MicroLED, and Quantum-Dot Displays)*

Tuesday, May 14, 2024 / 3:40 PM - 5:00 PM / Room 220B

Chair: *Dr. Joon Young Yang, LG Display Co. Ltd*

Co-Chair: *Nikhil Balram, Mojo Vision*

19.1: ***Invited Paper:*** **Zonal Illuminated Non-Emissive Displays for AR Glass**
Fenglin Peng, Reality Labs Research, Meta, Redmond, WA US

19.2: ***Invited Paper:*** **Ultra High Brightness Color Sequential Front-lit LCOS**
Yuet-Wing LI, Himax Display Inc., Tainan, Taiwan Roc

19.3: ***Distinguished Paper:*** **High-Luminance, Large-Size 4K OLED Microdisplays for VR/MR Applications**
Jang Jo, LG Display, Seoul, South Korea

19.4: ***Invited Paper:*** **Digital Driving on Silicon Microdisplay for XR**
Jun-Han Han, Reality Labs, Redmond, WA US

Session 20: Quantum-Dot Electroluminescence: Fabrication *(Emissive, Micro-LED, and Quantum-Dot Displays)*

Tuesday, May 14, 2024 / 3:40 PM - 5:20 PM / Room 220C

Chair: *Peter Palomaki, Palomaki Consulting*

20.1: ***Invited Paper:*** **Development of Photolithgraphic Patterning of Quantum Dots for Electroluminescent Applications**
Zhuo Chen, BOE Technology Group Co., Ltd., Beijing, China

20.2: **High-Resolution Pixelated Quantum Dot Light Emitting Diodes via Electrohydrodynamic Printing Technology**
Xu Yuan, BOE Technology Group Co., Ltd., Beijing, China

20.3: ***Invited Paper:*** **Characteristics of Cadmium-Free Blue NanoLEDs with Protection Technology Applied to Quantum Dots**
Yuki Fukunari, Sharp Corporation, Tenri, Japan

20.4: **Efficient and Stable Red Quantum Dot Light-Emitting Diode with Modified ZnMgO Nanoparticles**
Xiao Wei Sun, Southern University of Science and Technology, Shenzhen, China

20.5: **Quantum Dots and Device Optimizations towards Ink Jet Printing Quantum Dots Light Emitting Diodes Displays**
Yiran Yan, TCL Research, Guangzhou, China

Session 21: OLED Physics *(OLEDs)*

Tuesday, May 14, 2024 / 3:40 PM - 5:00 PM / Room LL21CD

Chair: *Nicholas Thompson, Universal Display Corporation*

Co-Chair: *Anna Hayer, Merck KGaA*

21.1: ***Invited Paper:*** **Analysis of Capacitance Characteristics of Highly Efficient Blue OLEDs by Impedance Spectroscopy**
hyosup shin, Samsung Display Corporation, Yongin, South Korea

21.2: **Modulus Spectroscopy and Capacitance-Voltage Measurement of OLEDs as Tools for Estimating Charge Dynamics at High Temperature.**
Ji Nan, Tianma Microelectronics Co. Ltd., Shanghai, China

21.3: **Closed-Form Expression for the Current-Voltage Characteristics of OLEDs**
Khaled Ahmed, Intel Corporation, Santa Clara, CA US

21.4: **The Understanding of Bottom Emission Blue OLED Efficiency, Lifetime Trends and Capacitance Curves with Different EILs**
Jia Wenbin, Hefei BOE Joint Technology Co., Ltd., Hefei, China

Session 22: Novel Structure *(Active Matrix Devices)*

Tuesday, May 14, 2024 / 3:40 PM - 5:00 PM / Room LL21EF

Chair: *Prof. Dr. Jin-Seong Park, Hanyang University*

Co-Chair: *Takashi Nakamura, Japan Display Inc.*

22.1: ***Invited Paper:*** **About a Trench Oxide TFT**
Sang-Hee Park, KAIST, Daejeon, South Korea

22.2: **Significant Improvement of a-IGZO Source-Gated Transistor Current over Traditional Design Through Architecture Modification**
Juan Paolo Bermundo, Nara Institute of Science and Technology (NAIST), Nara, Japan

22.3: **Negative Capacitance ZAO/ZnO Ferroelectric Thin-Film Transistor for Neuromorphic Computing**
Jin Jang, Kyung Hee University, Seoul, South Korea

22.4: ***Invited Paper:*** **Fiber-Like Oxide Thin-Film Transistors for Large-Area Smart Textile Systems**
Pedro Barquinha, NOVA University Lisbon, Caparica, Portugal

Session 23: LCD New Development *(Liquid Crystal Technology)*

Tuesday, May 14, 2024 / 3:40 PM - 4:40 PM / Room LL20BC

Chair: *Dr Akihiro Mochizuki, I-CORE Technology, LLC*

Co-Chair: *Xibin Shao, BOE*

23.1: ***Invited Paper:*** **Research on High Contrast Ratio 3000:1 for ADS MNT Products**
Tao Fang, Fuzhou BOE Optoelectronics Technology Co., Ltd., Fuzhou, China

23.2: **MOVED TO P.264**

23.3: **High Optical Efficiency Liquid Crystal Display Structure Design Utilizing Dielectric Interference Filter**
Yujie Liu, BOE Technology Group Co., Ltd., Beijing, China

23.4: **The Research of LCDs Strength Improvement Based on Neural Networks Algorithm**
Deng Yong, Chongqing BOE Optoelectronics Technology Co., Ltd., Chongqing, China

Session 24: Spatial and Temporal Graphics and Displays *(Applied Vision)*

Tuesday, May 14, 2024 / 3:40 PM - 4:40 PM / Room LL20A

Chair: *Jennifer Gille, Consultant*

Co-Chair: *Benjamin Watson, North Carolina State University*

24.1: ***Invited Paper:*** **Visible Difference Predictors: A Class of Perception-Based Metrics**
Alexandre Chapiro, Meta, Sunnyvale, CA US

24.2: **Interaction Between Duty Ratio and Eye Movement About Motion Artifact**
Chang-Yeong Han, Department of Biomedical Engineering, UNIST, Ulsan, South Korea, Ulsan, South Korea

24.3: **WITHDRAWN**

24.4: **Visual Optical Simulation System and Quantitative Evaluation Criteria**
Bo Shi, Chengdu BOE Optoelectronics Technology Co., Ltd., Chengdu, China

Session 25: e-Paper for Digital Signage *(Flexible Displays and e-Paper / Digital Signage))*

Tuesday, May 14, 2024 / 3:40 PM - 5:00 PM / Room LL20D

Chair: *Norihisa Kobayashi, Chiba University, Department of Image and Materials Science*

Co-Chair: *Karlheinz Blankenbach, Pforzheim University*

25.1: ***Invited Paper:*** **Technical Roadmap to Realise Reflective Full Colour Video Displays for Street Furniture**
Doeke Oostra, Etulipa, Eindhoven, Netherlands

25.2: **Capacitor-Based Driving Scheme of Electrophoretic E-Paper Display for Future Self-Powered Applications**
Bo-Ru Yang, State Key Laboratory of Optoelectronic Materials and Technologies, Guangdong Province Key Laboratory of Display Material and Technology, and School of Electronics and Information Technology, Sun Yat-Sen University, Guangzhou, China

25.3: **WITHDRAWN**

25.4: **Electrochromic Display Devices with Metallo-Supramolecular Polymers**
Masayoshi Higuchi, National Institute for Materials Science, Tsukuba, Japan

Session 26: Optical Sensor Components *(Emerging Technologies and Applications / Sensors Integration and Multi-Functional Displays)*

Tuesday, May 14, 2024 / 3:40 PM - 5:00 PM / Room LL21AB

Chair: *Vincent Gu, Apple, Inc.*

Co-Chair: *Jong-Ho Hong, Samsung*

26.1: **Embedded a-Si Photo-Transistor Sensors Integration in Remote Optical Touch-input Panel Using Four-Mask Process Architecture Technology**
An-Thung Cho, Chuzhou HKC Optoelectronics Technology Co., Ltd., Chuzhou, China

26.2: **WITHDRAWN**

26.3: **Room Temperature Bias-Selectable Dual-Band Ultraviolet/Infrared Detectors Based on PTAA/MAPbCl3 Single Crystal Film Heterojunction**
Qing Li, Southeast University, Nanjing, China

26.4: **PbS Quantum Dot Photodetector for High Resolution and Low Light Night Vision of Phone Camera**
Wei Chen, Shenzhen Technology University, Shenzhen, China

26.5: **Feasibility Analysis of Image Sensors Scanner on Glass**
Ruihua Guo, Beijing BOE Display Technology Co., Ltd., Beijing, China

Session 27: AR/VR Optical Systems I *(AR/VR/MR)*

Wednesday, May 15, 2024 / 9:00 AM - 10:20 AM / Room 220B

Chair: *Cheng Chen, Apple, Inc.*

Co-Chair: *Yan Li, Shanghai Jiao Tong University*

27.1: **Flat-Based Double Path Pancake Optics to Improve Productivity**
Naru Usukura, Sharp Display Technology Corporation, Tenri, Japan

27.2: **Nine-Depth Switchable Augmented Reality Display with Bi-Stacked Quarter-Waveplate-Based Geometric Phase Lenses**
Jung-Yeop Shin, Kyungpook National University, Daegu, South Korea

27.3: ***Invited Paper:*** **3D Visual Fatigue-Free AR Displays**
Yan Li, Shanghai Jiao Tong University, Shanghai, China

27.4: **Design of a Statically Foveated Head-Mounted Displays with a Novel Perceptual-Driven Approach**
Hong Hua, University of Arizona, Tucson, AZ US

Session 28: Quantum-Dot Electroluminescence: Physics *(Emissive, Micro-LED, and Quantum-Dot Displays)*

Wednesday, May 15, 2024 / 9:00 AM - 10:40 AM / Room 220C

Chair: *Peter Palomaki, Palomaki Consulting*

28.1: ***Invited Paper:*** **Analyzing Charge Dynamics in Quantum Dot Light-Emitting Diodes via Impedance Spectroscopy**
Xiao Wei Sun, Southern University of Science and Technology, Shenzhen, China

28.2: ***Distinguished Paper:*** **Optimization of Ink Formulation and Ligand Engineering for QD-LED Displays with Improved Performance**
Jaekook Ha, Samsung Display Co., Ltd., Yongin, South Korea

28.3: **Analytic Model of Quantum Dot LED Current-Voltage Characteristics**
Khaled Ahmed, Intel Corporation, Santa Clara, CA US

28.4: **Positive Aging Resulted in Highly Efficient Blue Quantum Rod Light Emitting Diodes**
Kumar Mallem, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong

28.5: ***Late-News Paper:*** **Investigation on Enhanced Performance of All-Solution Inverted Quantum Dot Light Emitting Diode via Changing a Solvent**
Jeong-Beom Kim, Department of Electrical and Computer Engineering, Sungkyunkwan University, Jangan-gu, Suwon-si, South Korea

Session 29: OLED Devices I *(OLEDs)*

Wednesday, May 15, 2024 / 9:00 AM - 10:20 AM / Room LL21CD

Chair: *Jang Hyuk Kwon, Kyung Hee University*

Co-Chair: *Denis Kondakov, DuPont*

29.1: ***Invited Paper:*** **Spin-Orbital Coupling Enhancement and Exciton Manipulating Targeting Narrowband and Highly Stable OLEDs**

Xun Tang, Kyushu University, Center for Organic Photonics and Electronics Research (OPERA), Fukuoka, Japan

29.2: ***Distinguished Paper:*** **High Efficiency and High Color Purity Deep-Blue Organic Light-Emitting Diodes with Blue Index >500**
Long Chen, Tianma Microelectronics Co., Ltd., Shanghai, China

29.3: **Improving Lateral Leakage Current in OLED Pixels by New Hole Transport Materials: Resolving the Crosstalk Issue**
You-Hyun Kim, Merck Electronics KGaA, Darmstadt, Germany

29.4: **TOF SIMS for OLED Film 3D Detection and Real-Time Failure Analysis**
Zheng Kening, Chengdu BOE Technology Group Co., Ltd., Chengdu, China

Session 30: Oxide TFT Innovations *(Active Matrix Devices)*

Wednesday, May 15, 2024 / 9:00 AM - 10:00 AM / Room LL21EF

Chair: *James Chang, Apple, Inc.*

Co-Chair: *Man Wong, The Hong Kong University of Science & Technology*

30.1: **Development of High-integration HOP Panel with High-frequency & VRR Driving**
Hyeongseok Kim, Samsung Display, Yongin, South Korea

30.2: **Hydrogen Content Controlled Silicon Nitride Passivation Layer for Highly Reliable IGZO Thin Film Transistor**
Bokyoung Lee, LG Display Co., Paju, South Korea

30.3: **Direct Observation of 2 Delta L in a-IGZO TFT Using Scanning Capacitance Microscopy**
Hyunsoo Lee, Samsung Display, Asan, South Korea

Session 31: Viewing Angle Control and Privacy *(Liquid Crystal Technology)*

Wednesday, May 15, 2024 / 9:00 AM - 10:20 AM / Room LL20BC

Chair: *Matthew Sousa, 3M*

Co-Chair: *Yukito Saitoh, FUJIFILM Corporation*

31.1: ***Invited Paper:*** **C-PS-VA and SA-VA – Technologies for Next-Generation TV LCDs**
Fred Chen, Merck Performance Materials Ltd, Taoyuan, Taiwan Roc

31.2: **Switchable View Control Using a Vertically Aligned Polarizer and Polarization Control**
André Heber, siOPTICA GmbH, Jena, Germany

31.3: ***Invited Paper:*** **Novel Chiral VA Liquid Crystal Display Mode Based on Photo Alignment**
Fan Li, Chengdu BOE Display Sci-tech Co., Ltd., Chengdu, China

31.4: **Curved and Fast Response Time Vertical-alignment (VA) Liquid Crystal Gaming Display Development**
An-Thung Cho, Chuzhou HKC Optoelectronics Technology Co., Ltd., Chuzhou, China

Session 32: AI/ML for Display Manufacturing *(Display Manufacturing / Artificial Intelligence Including Machine Learning for Imaging)*

Wednesday, May 15, 2024 / 9:00 AM - 10:00 AM / Room LL20A

Chair: *Prof. Hyoungsik Nam, Kyung Hee University*

Co-Chair: *Daniel Lee, AU Optronics Corp*

32.1: **Improving QD Backplane Defect Image Generation Using Automatic Masking in Diffusion Models**
Zhihong Pan, Samsung Display America Lab, San Jose, CA US

32.2: **Multi AI Approaches for Improving OLED Display Pattern Repair in Manufacturing Processes**
Hong Bin Lim, Samsung Display, Asan, South Korea

32.3: **Heterogeneous Resource Constrained Reinforcement Learning Photolithography Scheduler With Heterogeneous Graph Attention Network**
Shuhui Qu, Samsung Display American Lab, San Jose, CA US

Session 33: Display Image Quality *(Display Systems / Digital Signage)*

Wednesday, May 15, 2024 / 9:00 AM - 10:00 AM / Room LL20D

Chair: *W. Hendrick, Collins Aerospace*

Co-Chair: *Sam Phenix, Phenix Consulting*

33.1: **Development of Transflective 54.5-inch IGZO-TFT LCD with Super-Low Refresh Rate Driving**
Yutaka Sawayama, Sharp Display Technology Corporation, Kameyama, Japan

33.2: **Proposal of Novel Random Depolarization Film for Real-Color Displays with Sharp Images**
Shizuki Sasaki, Keio University, Kawasaki, Japan

33.3: **An Autostereoscopic Display with Time-Multiplexed Directional Backlight Using an Electroluminescent Display as a Light Source**
Riku Shiobara, University of Tsukuba, Tsukuba, Japan

Session 34: Healthcare and Biomedical Sensing Applications *(Emerging Technologies and Applications / Sensors Integration and Multi-Functional Displays)*

Wednesday, May 15, 2024 / 9:00 AM - 10:20 AM / Room LL21AB

Chair: *Ying Zheng, Microsoft*

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

34.1: ***Invited Paper:*** **High Throughput TFT Technology for In-situ DNA Synthesis and Signal Sensing**

Yixing Yang, Hangzhou LinkZill Technology Co., Ltd., Hangzhou, China

34.2: **Deformable OLEDs: from Design to Applications**
Seunghyup Yoo, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

34.3: **Sensing and Biomimetic Stimulation of Cardiomyocyte Cell Culture with a Thin-Film-Transistor Active-Matrix Platform**
Satoshi Ihida, Sharp Corporation, Tenri, Japan

34.4: **A 270fps Large-Area Organic Optical Biosensor Array for Digital Physiology and Vein Biometrics**
Chung-Kai Chen, JDI Display America, Inc., San Jose, CA US

Session 35: AR/VR Optical Systems II *(AR/VR/MR)*

Wednesday, May 15, 2024 / 10:40 AM - 12:00 PM / Room 220B

Chair: *Yan Li, Shanghai Jiao Tong University*

Co-Chair: *Yi Pai Huang, Apple, Inc.*

35.1: ***Invited Paper:*** **Smart Pixelated Dimmer for High Ambient Contrast AR Displays**
Hung-Shan Chen, Liqxtal Technology, Inc., Tainan City, Taiwan Roc

35.2: **Multispectral Pancharatnam-Berry Phase Liquid Crystal Lens and its Application in AR displays**
Yan Li, Shanghai Jiao Tong University, Shanghai, China

35.3: **Modeling Eye Movement and Reflection in Virtual Environments for Eye Tracking**
Xiaochen Zhou, GravityXR Electronics and Technology Co., Ltd., Zhejiang, China

35.4: ***Invited Paper:*** **Next Generation Eye-tracking Technology for AR/VR Devices**
Shao-Yi Chien, Ganzin Technology, Inc., New Taipei City, Taiwan Roc

Session 36: Quantum Dot Materials *(Emissive, Micro-LED, and Quantum-Dot Displays)*

Wednesday, May 15, 2024 / 10:40 AM - 12:00 PM / Room 220C

Chair: *Dr. Zhuo Chen, BOE Technology Group Co., Ltd.*

Co-Chair: *Keunchan Oh, Samsung Display*

36.1: ***Invited Paper:*** **Submicron Narrow-Band Phosphors in Luminescent Color Filters & Next Generation MiniLED and MicroLED Displays**
James Murphy, GE, Niskayuna, NY US

36.2: **Pure-Blue Emissive Perovskite Nanoplatelets with Face-Down Orientation**
Naoaki Oshita, Yamagata University, Yamagata, Japan

36.3: **Perovskite QDs – Essential for Color, Brightness and Power**
Norman Luechinger, Avantama Ltd., Stafa, Switzerland

36.4: **CQD-Based Sensors for Large Format SWIR Imaging**
Dexi Kong, Beijing BOE Optoelectronics Technology Co., Ltd., Beijing, China

Session 37: OLED Devices II *(OLEDs)*

Wednesday, May 15, 2024 / 10:40 AM - 12:00 PM / Room LL21CD

Chair: *Yifan Zhang, Apple, Inc.*

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

37.1: ***Invited Paper:*** **Efficient Single-Layer Blue-emitting OLEDs**
Paul Blom, Max Planck Institute for Polymer Research, Mainz, Germany

37.2: **Impact of Thermal Factors on Carrier Density in OLED under Low-Voltage Condition**
Sang Ho Jeon, Samsung Display, Yongin, South Korea

37.3: **Donor-Acceptor Alignment and Charge Separation in Small Molecule Organic Semiconductors**
Tobias Neumann, Nanomatch GmbH, Karlsruhe, Germany

37.4: **Degradation Analysis on Li-doped Organic Charge Generation Layer**
Ki Ju Kim, Hongik University, Seoul, South Korea

Session 38: TFT for MicroLED *(Active Matrix Devices)*

Wednesday, May 15, 2024 / 10:40 AM - 11:40 AM / Room LL21EF

Chair: *Jae-Hoon Lee, Samsung Display Co*

Co-Chair: *Kazuyoshi Omata, Konica Minolta*

38.1: ***Invited Paper:*** **Micro Light-Emitting Diode Pixel Circuit and Driving Method Considering Wavelength Shift**
Yong-Sang Kim, Sungkyunkwan University, Suwon, South Korea

38.2: **Multimodal Transistor-Based 7T2C LTPS Pixel Circuit for Simultaneous PAM and PWM Control in µLED Display**
Radu Sporea, University of Surrey, Guildford, United Kingdom

38.3: ***Invited Paper:*** **Integration Challenges for MicroLED on CMOS for AR**
Soeren Steudel, MICLEDI microdisplay BV, Leuven, Belgium

Session 39: Innovative Display Electronics *(Display Electronics)*

Wednesday, May 15, 2024 / 10:40 AM - 12:00 PM / Room LL20BC

Chair: *Wei Yao, Apple Inc*

Co-Chair: *Moon-Sang Hwang, Samsung Display Co., Ltd.*

39.1: ***Invited Paper:*** **An Improved Gate Driver Using Oxide TFTs for Large Size OLED Displays**

Hong Jae Shin, LG Display, Paju, South Korea

39.2: ***Distinguished Paper:*** **A Mobile OLED Display Driver IC with High-Gain Fast-Slew Circuit and On-the-Fly Self-Repair for Displays 4K Resolution and Above**
Yun-Rae Jo, Samsung Electronics, Hwaseong, South Korea

39.3: ***Invited Paper:*** **Kirameki Display: Technical Approaches to Represent Real Texture with Light Fields**
Minoru Shibazaki, Innolux Japan Co., Ltd., Kobe, Japan

39.4: **An Innovative Decoder-Type GOA for Intelligent Split-Screen and External Compensation Technology**
Zhidong Yuan, Hefei BOE Joint Technology Co., Ltd., Hefei, China

Session 40: Machine Learning in Display Manufacturing *(Display Manufacturing / Artificial Intelligence Including Machine Learning for Imaging)*

Wednesday, May 15, 2024 / 10:40 AM - 12:00 PM / Room LL20A

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

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

40.1: **Development of the Auto Monitoring Method of Laser Beam Shape and Size by Employing the AI and Computer Vision Algorithm.**
Sang-Hoon Lim, Samsung Display Co., Ltd., Yongin-si, South Korea

40.2: **A Novel Gamma Prediction Algorithm for AMOLED Display Based on Residual Network Model**
ChaoFan Xu, Chengdu BOE Optoelectronics Group Co., Ltd., Chengdu, China

40.3: **Waveform Analysis System for GAN-Based Anomaly Detection of Coater Pressure in Photolithography**
Junkyun Lim, Samsung Display, Yongin, South Korea

40.4: **Improving Visibility Coherence between Auto Macro Inspection and Auto Visual Inspection Using AI Image Translation**
Jewoon Woo, Samsung Display Corp., Yongin, South Korea

Session 41: Tiled Displays *(Display Systems / Digital Signage)*

Wednesday, May 15, 2024 / 10:40 AM - 11:40 AM / Room LL20D

Chair: *Karlheinz Blankenbach, Pforzheim University*

Co-Chair: *Hidekazu Hatanaka, Ushio Inc.*

41.1: ***Invited Paper:*** **Next Generation LED Screens – How the Development of Customized LED Modules Helps to Save Resources and Lowers Complexity**
Michael Schmid, Ströer Media Deutschland GmbH, Cologne, Germany

41.2: **A Patterned Packaging Scheme for a MiniLED Tiled Display with High Transmittance and High Color Consistency in Light and Dark States**
Jiao Li, BOE MLED Technology Co., Ltd., Beijing, China

41.3: **Algorithm Compensation Solution for Tiled OLED Displays**
Ting Han, BOE Technology Group Co., Ltd., Chengdu, China

Session 42: Emerging Biomedical Applications *(Emerging Technologies and Applications)*

Wednesday, May 15, 2024 / 10:40 AM - 12:00 PM / Room LL21AB

Chair: *Jong-Ho Hong, Samsung*

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

42.1: **Artificial Retina-Based Metaverse with Bionic Vision Processing**
Haiyang Hu, Shanghai Jiao Tong University, Shanghai, China

42.2: **Self-Scalable UV Blocking Artificial Iris Operated by Radially Controlled Crosslinking Density with Fast Switching Dynamics**
Hak-Rin Kim, Kyungpook National University, Daegu, South Korea

42.3: **An Anti-Bacteria and Anti-Virus Liquid Crystal Display**
Xianqin Meng, BOE Technology Group Co., Ltd., Beijing, China

42.4: ***Late-News Paper:*** **A Radiation-Hardened Oxide TFT with a Multi-Layered Gate Dielectric**
Takayuki Ishino, New Business Integration Office, Tianma Japan, Ltd., Kawasaki, Kanagawa, Japan

Session 43: AR/VR Display Systems *(Display Systems / AR/VR/MR)*

Wednesday, May 15, 2024 / 3:30 PM - 4:50 PM / Room 220B

Chair: *Brian Schowengerdt, Meta*

Co-Chair: *Shin Tson Wu, University Of Central Florida, College of Optics and Photonics*

43.1: ***Invited Paper:*** **Review and Perspective of XR Technologies for Immersive Experience**
Hiroshi Mukawa, Sony Semiconductor Solutions Corporation, Atsugi, Japan

43.2: ***Distinguished Paper:*** **Varifocal augmented reality head-up display using Alvarez freeform lenses**
Zong Qin, Sun Yat-Sen University, Guangzhou, China

43.3: ***Distinguished Paper:*** **Breaking the Optical Efficiency Limit of Pancake Optics in Virtual Reality**
Yuqiang Ding, University of Central Florida, Orlando, FL US

43.4: ***Invited Paper:*** **Display System Optimization for Augmented Reality Glasses**
Kevin Curtis, Magic Leap, Boulder, CO US

43.5: ***Invited Paper:*** **Enabling High Performance AR Waveguide Display with Semiconductor Manufacturing Technologies**
Robert Visser, Applied Materials, Santa Clara, CA US

Session 44: Emerging Materials and Components *(Emerging Technologies and Applications / Emissive, Micro-LED, and Quantum-Dot Displays)*

Wednesday, May 15, 2024 / 3:30 PM - 5:10 PM / Room 220C

Chair: *Abhishek Srivastava, Hong Kong University of Science & Technology*

Co-Chair: *Jonathan Steckel, ST Microelectronics*

44.1: **Top-Emitting Quantum-Dot Light-Emitting Diodes with Rainbow Emission Color and Their Application in Anti-Counterfeiting Recognition**
Lujun Zhai, Southern University of Science and Technology, Shenzhen, China

44.2: **Towards 10-Watt Radiant Flux——Applications and Challenges of Photoluminescent Quantum Rods in High-Power LEDs**
Jianxin Song, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

44.3: **High Efficiency and Brightness Green Quantum Rods Light Emitting Diode**
Zebing Liao, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong

44.4: **MicroLED Arrays as Light Source for Optical Sectioning-SIM and Targeted Illumination Imaging**
Vikrant Kumar, Columbia University, New York, NY US

44.5: ***Late-News Paper:*** **Investigating Thymine, a DNA Base, as the Hole Transport Layer for Enhanced Performance in Quantum Dot Light Emitting Diodes**
Su-Hyeon Lee, Department of Electrical and Computer Engineering, Sungkyunkwan University, Jangan-gu, Suwon-si, South Korea

Session 45: OLED Materials I *(OLEDs)*

Wednesday, May 15, 2024 / 3:30 PM - 5:10 PM / Room LL21CD

Chair: *Yasunori Kijima, Huawei Technologies Japan K.K.*

Co-Chair: *Anna Hayer, Merck KGaA*

45.1: ***Invited Paper:*** **Design Strategies for NIR Emitting Materials**
Yun-Hi Kim, Gyeongsang National University, Jinju, South Korea

45.2: ***Invited Paper:*** **Emitter Based on Europium as Alternative for Stable, Deep Blue OLED-Emission**
Carsten Rothe, beeOLED GmbH, Dresden, Germany

45.3: **Molecular Design of Blue Phosphorescent Platinum Complexes for Highly Efficient, Long-Lived Blue Organic Light-Emitting Diodes**
Tomoya Yamaguchi, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

45.4: **On the Determination of Ionization Potentials**
Tobias Neumann, Nanomatch GmbH, Karlsruhe, Germany

45.5: ***Late-News Paper:*** **Green Phosphor Sensitized Multiple Resonance OLEDs with Current Efficiency of More Than 250 cd/A**
Xiao Liang, Jiangsu Sunera Technology, Wuxi Jiangsu, Wuxi, China

Session 46: TFTs for AVR *(AR/VR/MR)*

Wednesday, May 15, 2024 / 3:30 PM - 4:30 PM / Room LL21EF

Chair: *Hyun Jae Kim, Yonsei University*

Co-Chair: *Mike Hack, Universal Display Corporation*

46.1: **1218 ppi Quest 3 Display by Hybrid Backplane with Highly Reliable IGZO TFTs**
Atsushi Hachiya, Sharp Display Technology Corporation, Kameyama, Japan

46.2: **Reliable Gate Driver for Eye-Tracking in high PPI VR Display Using LTPS TFTs**
Wei Yan, BOE Technology Group Co., Ltd., Beijing, China

Session 47: Display Data Transmission and Processing *(Display Electronics / Ultra-High Bandwidth Display Data Transmission and Processing)*

Wednesday, May 15, 2024 / 3:30 PM - 5:10 PM / Room LL20BC

Chair: *Paolo Sacchetto, Apple Inc*

Co-Chair: *Seung Woo Lee, Kyung Hee University*

47.1: ***Invited Paper:*** **A 6Gbps Intra-Panel Interface with Video Image Compression for Next Generation Displays**
Wonho Jang, Samsung Electronics, Hwaseong, South Korea

47.2: ***Invited Paper:*** **Modulated Analog Driving and Evaluation of Image Quality**
Alex Henzen, HYPHY USA Inc., Zoetermeer, Netherlands

47.3: **Novel Display Interface Technique Using Adaptive Sub-Color Optimization with DCT (Discrete Cosine Transform)**
Yongchul Kwon, LG Display, Korea, Seoul, South Korea

47.4: **A Novel Demura Compensation Data Compression Algorithm based on JPEG-LS**
Lin Chen, Hefei Visionox Technology Co., Ltd., Hefei, China

47.5: **Analyzing and Enhancing Display Quality in FRC Algorithm**
YanYan Wang, Suzhou ESWIN Computing Technology Co., Ltd., Suzhou, China

Session 48: Narrow Border OLED Displays *(Display Manufacturing)*

Wednesday, May 15, 2024 / 3:30 PM - 4:50 PM / Room LL20A

Chair: *Ion Bita, Google LLC*

Co-Chair: *Joerg Winkler, PLANSEE SE*

48.1: **A Data-Driven Intelligent Stress Monitoring for a Robust Manufacturing of a Phone Display with the Extremely Narrow Bottom Bezel**
Sung Sik Yun, Samsung Display, Yongin, South Korea

48.2: **Research on Mechanical Simulation of Flexible AMOLED Module Bottom Frame**
Meiqiang Liang, Display Design Center,Visionox Technology Inc., Gu'an, China

48.3: ***Invited Paper:*** **Research on Pad Bending Technology for the Extremely Narrow Bezel of Flexible OLED Screens**
Guo Hong Wei, BOE Technology Group Co., Chengdu, China

48.4: ***Distinguished Paper:*** **Backside Bonding for Extremely Narrow Bezel at the Bottom of Flexible Displays**
Donghyun Lee, Samsung Display, Yongin, South Korea

Session 49: LCDs for Digital Signage *(Liquid Crystal Technology / Digital Signage)*

Wednesday, May 15, 2024 / 3:30 PM - 5:10 PM / Room LL20D

Chair: *Xiao-Yang Huang, Ebulent Technologies Corp*

Co-Chair: *Koichi Miyachi, JSR Corporation*

49.1: ***Invited Paper:*** **Novel Brightness Enhancement Technology for Reflective LCDs**
Ryosuke Saigusa, Sharp Display Technology Corporation, Nara, Japan

49.2: ***Invited Paper:*** **High Performance Cholesteric Liquid Crystal Technology Development**
Heng-Yi Tseng, AUO Corporation, Hsinchu, Taiwan Roc

49.3: ***Invited Paper:*** **High-Resolution Color-Reflective Bistable Cholesteric Liquid Crystal Technology for Signage Applications**
I-An Yao, Innolux Display Corporation, Miaoli, Taiwan Roc

49.4: ***Invited Paper:*** **Super High Ambient Contrast LCDs with Low Power Consumption**
Yuichi Kawahira, Sharp Display Technology Corporation, Nara, Japan

49.5: ***Invited Paper:*** **Innovative Systems Approach to Reduce Power for High-Bright LCD Digital Signage**
Paul Williams, Agile Display Solutions Co., Ltd., Portland, OR US

Session 50: Bio and Neuromorphic Application of Flexible Devices *(Interactive Displays and Systems)*

Wednesday, May 15, 2024 / 3:30 PM - 4:50 PM / Room LL21AB

Chair: *Kyung Cheol Choi, KAIST*

Co-Chair: *Ze Yuan, UltraReality Technology Limited*

50.1: ***Invited Paper:*** **Flexible Imager with Organic Photodetector for Sensing Applications**
Tomoyuki Yokota, The University of Tokyo, Tokyo, Japan

50.2: **Ultrathin Cantilever Type Flexible Device with Integrated micro-OLEDs using Biomedical Implantable Applications**
Kyung Cheol Choi, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

50.3: ***Invited Paper:*** **An Active-Matrix High-Channel-Count Neurostimulation System Enabled by Flexible Thin-Film Transistors**
Chen Jiang, Tsinghua University, Beijing, China

50.4: ***Invited Paper:*** **Low-Temperature Metal-Oxide Thin-Film Transistor Technology and the Realization of Electronic Systems on Flexible Substrates**
Runxiao Shi, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong

Session 51: Display Foveation for AR/VR/MR *(AR/VR/MR / Ultra-High Bandwidth Display Data Transmission and Processing)*

Thursday, May 16, 2024 / 9:00 AM - 10:20 AM / Room 220B

Chair: *Chaohao Wang, YLab*

Co-Chair: *Yun Wang, Meta*

51.1: ***Invited Paper:*** **Foveated Image Compression and Transmission for Virtual-Reality Headsets**
T Jia, Yongjiang Laboratory, Ningbo, China

51.2: ***Invited Paper:*** **Foveated Image Transmission with Anti-Aliasing Image Reconstruction**
Tzung-Yuan Lee, Viewtrix Technology, Shanghai, China

51.3: ***Invited Paper:*** **Optimization of XR Foveation with Coding Unit Rearrangement**
Wenhui Yu, Goertek Co., Ltd., Xi'an, China

51.4: ***Invited Paper:*** **High Refresh Rate 8K+ Display System with 80% Bandwidth Savings**
Zhang Hao, BOE Technology Group Co., Ltd., Beijing, China

Session 52: High Efficiency MicroLEDs *(Emissive, Micro-LED, and Quantum-Dot Displays)*

Thursday, May 16, 2024 / 9:00 AM - 10:20 AM / Room 220C

Chair: *Qun Yan, Fuzhou University*

Co-Chair: *Francois Templier, CEA-LETI*

52.1: ***Invited Paper:*** **On the Strive Towards All-InGaN Sub-2µm Sized RGB microLEDs**
Lars Samuelson, Lund University, Lund, Sweden

52.2: ***Invited Paper:*** **1µm Nanowire Based Micro-LED Chips For Efficient and High Performance Smart Watch Displays**
Ivan-Christophe Robin, ALEDIA, Échirolles, AL France

52.3: **Enhancing Micro-LED Display Efficiency with Reduced Ambient Light Reflectance**
Mao Kai Huang, National Taiwan University, Taipei, Taiwan Roc

52.4: **Micro LED Display Light Extraction Efficiency Improvement by Secondary Optics on Substrate**
Yang-En Wu, AUO Corporation, Hsinchu, Taiwan Roc

Session 53: OLED Materials II *(OLEDs)*
Thursday, May 16, 2024 / 9:00 AM - 10:20 AM / Room LL21CD
Chair: *Sven Zimmermann, Novaled GmbH*
Co-Chair: *Toshiaki Ikuta, SK materials JNC*

53.1: ***Invited Paper:*** **Deuteration of OLED Materials: Impact on Device Performance and Commercial Manufacturing**
Elvira Montenegro, Merck Electronics KGaA, Darmstadt, Germany

53.2: ***Invited Paper:*** **Highly Efficient and Pure Blue Organic Light-Emitting Diodes Using Boron Free Emitters**
Jun Yeob Lee, Sungkyunkwan University, Suwon, South Korea

53.3: ***Distinguished Paper:*** **Developing Pure Green Polycyclo-Heteraborin MR-TADF Scaffolds for Efficient, Stable Narrowband OLEDs**
Paramasivam Palanisamy, Kyung Hee University, Seoul, South Korea

53.4: **Boosting the Performance of Phosphor-Assisted Fluorescence Devices by Fine-Tuning the Peripheral Groups of Multi-Resonance Fluorescent Dopants**
Minghan Cai, Visionox Technology Inc., Beijing, China

Session 54: Under Display Camera/Sensing *(Display Systems / Sensors Integration and Multi-Functional Displays)*
Thursday, May 16, 2024 / 9:00 AM - 10:20 AM / Room LL21EF
Chair: *Sergei Yakovenko, consultant*
Co-Chair: *Grace Lee, Mojo Vision*

54.1: **Development of UDC Image Restoration Technology Using Space Variant CNN**
Daewook Kim, Samsung Display, Youngin, South Korea

54.2: **Diffraction Issues of Under Display IR Sensor in AMOLED Displays**
Zhibin Wang, OTI Lumionics Inc., Mississauga, ON Canada

54.3: **Design and Evaluation of Full Display OLED Panel for Face ID**
Fei Fang, Chengdu BOE Optoelectronics Technology Co., Ltd., Chengdu, China

54.4: **Innovative Research on Full Display Technology for Face Recognition**
Shoukun Wang, Visionox Technology Inc., Gu'an, China

Session 55: Display Compensation Algorithm *(Display Electronics)*
Thursday, May 16, 2024 / 9:00 AM - 10:20 AM / Room LL20BC
Chair: *Dr. Moon-Sang Hwang, Samsung Display Co., Ltd.*
Co-Chair: *Dr. Juhn Yoo, LG Display*

55.1: **A Novel Modeling & Compensation Algorithm for Medium-Term Image Sticking on AMOLED Display**
Xuan-Yong Lin, Novatek Microelectronics Corporation, Hsinchu, Taiwan Roc

55.2: **De-Halo & Adaptive Ratio Local Dimming Algorithm Based on Display Data Compensation**
Jianlong Liu, Beijing BOE Display Technology Co., Ltd., Beijing, China

55.3: **Simultaneous Optimization of Luminance and Color: A Novel Dimming Algorithm Utilizing Power-Law Mapping**
Nu ri Kim, Sogang University, Seoul, South Korea

55.4: **Optical Measurement of Lateral Leakage for Compensation in OLED Displays: Experimental Investigation of Algorithmic Approach**
Byoung-Yoon Jang, Samsung Electronics Co. Ltd., Hwaseong, South Korea

Session 56: Flexible/Foldable and Touch Display Manufacturing *(Display Manufacturing)*
Thursday, May 16, 2024 / 9:00 AM - 10:20 AM / Room LL20A
Chair: *Tian Xiao, NEXT Biometrics Inc.*
Co-Chair: *Bradley Bowden, Corning Research and Development Corporation*

56.1: ***Invited Paper:*** **Mechanical Strength Improvement of Foldable Panel with COE**
Haoyuan Fan, Mianyang BOE Optoelectronics Technology Co., Mianyang, China

56.2: **Study on Materials of Four-Edge Curved Polarizer**
Xuekai Yang, BOE Technology Group Co., Ltd., Beijing, China

56.3: **On-Cell Plus: A New Touch Display Module**
Chingwei Hsu, Henghao Technology Co., Ltd, Hsinchu, Taiwan Roc

56.4: **A Design of High Performance Touch Sensor Pattern for OLED On-Cell Structure**
Kosuke Nagata, Sharp Display Technology Corporation, Kameyama, Japan

Session 57: Automotive Display Characterization *(Automotive/Vehicular Displays and HMI Technologies)*
Thursday, May 16, 2024 / 9:00 AM - 10:20 AM / Room LL20D
Chair: *Karlheinz Blankenbach, Pforzheim University*
Co-Chair: *Haruhiko Okumura, Toshiba Corporation*

57.1: ***Invited Paper:*** **Key Challenges for the Optical Qualification of Vehicle Displays**
Markus Kreuzer, TZ Electronic Systems GmbH, Niefern, Germany

57.2: ***Invited Paper:*** **Reproducible Characterization of Automotive Full Area Local Dimming (FALD) LCDs**
Ingo Rotscholl, TechnoTeam Bildverarbeitung GmbH, Ilmenau, Germany

57.3: **Driver's Attention Retargeting for Automotive Displays**
Seungchul Ryu, Faurecia Irystec Inc., Montreal, PQ Canada

57.4: **Advanced Tone Mapping for Mini-LED Backlit LCDs for Automotive Displays**
Sung-Chun Chen, Department of Electrical Engineering, National Cheng-Kung University, Tainan, Taiwan Roc

Session 58: Color and Spatial Measurements *(Display Measurement)*

Thursday, May 16, 2024 / 9:00 AM - 10:20 AM / Room LL21AB

Chair: *Stephen Atwood, Consultant*

Co-Chair: *Jaejoong Kwon, Samsung Display*

58.1: **A Novel On-line, Fast Color Correction by Machine Learnings**
Tzu-Lung Pan, National Yang Ming Chiao Tung University, Hsinchu, Taiwan Roc

58.2: **Analyzing Observer Metamerism Characteristics Based on The Peak Wavelengths of Primary Colors**
Junwoo Jang, LG Display, Seoul, South Korea

58.3: **Impact of Calibration Sources on Accuracy of Chromaticity Measurements of LED Based Displays**
Tobias Steinel, Instrument Systems GmbH, Munich, Germany

58.4: ***Late-News Paper:*** **Dynamic MTF Measurements of Gaming Monitors**
Kenichiro Masaoka, NHK Foundation/NHK Science & Technology Research Laboratories, Tokyo, Japan

Session 59: Holographic Displays Leveraging AI *(Liquid Crystal Technology / Artificial Intelligence Including Machine Learning for Imaging)*

Thursday, May 16, 2024 / 10:40 AM - 12:00 PM / Room 220B

Chair: *Jisoo Hong, Korea Electronics Technology Institute*

Co-Chair: *Yi Pai Huang, Apple, Inc.*

59.1: **Enhancing Brightness with Multi-Color Holography**
Kaan Ak?it, University College London, London, United Kingdom

59.2: ***Invited Paper:*** **Deep Learning-Enhanced Self-Interference Incoherent Digital Holography**
Sung-Wook Min, Kyung Hee University, Seoul, South Korea

59.3: ***Invited Paper:*** **The Latest Advances in Computer-Generated Holography (CGH)**
Darran Milne, VividQ Ltd., Cambridge, United Kingdom

59.4: **Towards Real-Time 3D Computer-Generated Holography with Inverse Neural Network for Near-Eye Displays**
Yifan (Evan) Peng, The University of Hong Kong, Hong Kong, Hong Kong

Session 60: MicroLED Epitaxy *(Emissive, Micro-LED, and Quantum-Dot Displays)*

Thursday, May 16, 2024 / 10:40 AM - 12:20 PM Room 220C

Chair: *Jean-Jacques Drolet, Osram Opto Semiconductors*

Co-Chair: *Lars Samuelson, Lund University*

60.1: ***Invited Paper:*** **Epitaxial, Scalable Nanowire Emitters and Photodetectors**
Songrui Zhao, McGill University, Montreal, PQ Canada

60.2: **NanoLEDs for Augmented Reality Applications**
Seth Coe-Sullivan, NS Nanotech, Rolling Hills Estates, CA US

60.3: **CMOS Compatible MicroLED Epitaxy for Display Applications**
Mark Furlong, IQE Plc, Cardiff, United Kingdom

60.4: **Minimal Efficiency Degradation and Elevated Radiometric Power Density of Ultraviolet-A Micro-LED with Homoepitaxial Structure**
Yibo Liu, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

60.5: ***Late-News Paper:*** **Progress in MicroLED Efficiency at Small Pixel Sizes**
Brendan Moran, Lumileds LLC, San Jose, CA US

Session 61: OLED Novel Devices and Analysis *(OLEDs)*

Thursday, May 16, 2024 / 10:40 AM - 11:40 AM / Room LL21CD

Chair: *Franky So, North Carolina State University*

Co-Chair: *Chihaya Adachi, Kyushu University*

61.1: ***Invited Paper:*** **Polaritonic OLEDs with Assistant Strong-Coupling Layers: A New Approach to sub-20nm Emission Linewidth in OLED Displays**
Malte Gather, University of Cologne, Cologne, Germany

61.2: ***Invited Paper:*** **Light Emitting Diodes Based on Metal Halide Perovskites and Beyond**
Biwu Ma, Florida State University, Tallahassee, FL US

61.3: ***Distinguished Paper:*** **Realization of an Organic Semiconductor Electroluminescent Device with High Directionality and Color Purity**
Fatima Bencheikh, KOALA Tech Inc., Fukuoka, Japan

Session 62: Novel Display Systems *(Display Systems)*
Thursday, May 16, 2024 / 10:40 AM - 12:00 PM / Room LL21EF
Chair: *Shinichi Uehara, AGC Inc.*
Co-Chair: *Daming Xu, Apple Inc*

62.1: **High Performance OLED with Microlens Array, Metal Mask-Less Lithography, and RGB Side-by-Side Patterning**
Nozomu Sugisawa, Semiconductor Energy Laboratory Co. Ltd., Atsugi, Japan

62.2: **High Frame Rate Scanning Backlight System for Privacy Display with Active Retarder**
Masamitsu Kobayashi, Sharp Display Technology Corporation, Nara, Japan

62.3: **Glassless AR Display in Real Space Using Aerial Imaging**
Kazuaki Takiyama, Utsunomiya University, Utsunomiya, Japan

62.4: ***Invited Paper:*** **Diffractive Optics Based Augmented Reality 3D Display**
Wen Qiao, Soochow University, Suzhou, China

Session 63: Micro-LED Driving Circuits *(Display Electronics)*
Thursday, May 16, 2024 / 10:40 AM - 11:40 AM / Room LL20BC
Chair: *Dr. Juhn Yoo, LG Display*
Co-Chair: *Prof. Soo-Yeon Lee, Seoul National University*

63.1: **Integrated Scan/Emission/Sweep Driver Circuit Based on CMOS LTPS TFTs for Micro-LED Displays**
Yong-Sang Kim, Sungkyunkwan University, Suwon, South Korea

63.2: **Metal Oxide Thin-Fim Transistor Pixel Circuit with Progressive Emission Using Pulse Width Modulation for Micro Light-Emitting Diode Displays**
Yong-Sang Kim, Sungkyunkwan University, Suwon, South Korea

63.3: **An Enhanced Micro-LED Pixel Circuit: Achieving Low Error Rates through Stable Current Generation with LTPO Technology**
Yong-Sang Kim, Sungkyunkwan University, Suwon, South Korea

Session 64: Backplane Technologies for Display Manufacturing *(Display Manufacturing)*
Thursday, May 16, 2024 / 10:40 AM - 12:20 PM / Room LL20A
Chair: *Dr. Sangyeol Kim, Samsung Display*
Co-Chair: *Toshiaki Arai, Japan Display.Inc.*

64.1: **Protrusion-Free LTPS Using the CMP Process and its OLED Application**
Woojin Cho, Samsung Display Co., Ltd., Yongin, South Korea

64.2: **The Effect of Poly Silicon Grain Boundary Reduction on LTPS Devices and Display Effects Applied to Flexible AMOLED**
Bing Meng, YunGu(Gu'an) Technology Co.,Ltd., Hebei, China

64.3: **Laser Crystallization of Amorphous Silicon via Spot Beam Annealing Method**
Chiwoo Kim, APS Research, Hwasung, South Korea

64.4: **ECR Plasma Source for Copper Thin Film Dry Etching**
Chiwoo Kim, APS Research, Hwasung, South Korea

64.5: **Virtual ESD Failure Detection Methodology for Oxide TFT-Based OLED Panels**
Hyun Sung Park, Samsung Display, Yongin, South Korea

Session 65: Automotive Display Optical Hardware *(Automotive/Vehicular Displays and HMI Technologies)*
Thursday, May 16, 2024 / 10:40 AM - 12:20 PM / Room LL20D
Chair: *Dr David Hermann, Volvo Car Corporation AB*
Co-Chair: *Taewoong Kim, Samsung Display Co.*

65.1: ***Invited Paper:*** **Biaxially Formed LC Cells and Organic Transistors for 3D Curved Displays for Automotive Application**
Paul Cain, FlexEnable Technology Ltd, Cambridge, United Kingdom

65.2: **Switchable Privacy Backlight for Automotive LCD Utilizing an Advanced Light-Guide with a Multi-Prism Array (ALMA)**
Junichi Masuda, Sharp Display Technology Corporation, Nara, Japan

65.3: **Viewing Angle Control through Electrically-Induced Effective Out-of-Plane Retardation Differences in Automotive Displays**
Tae-Hoon Choi, Korea Automotive Technology Institute, Cheonan, South Korea

65.4: **Patterned Glass Diffusers (PGDs) for Automotive White LED Backlights**
Xiang-Dong Mi, Corning Incorporated, Corning, NY US

65.5: **Light Control Polarizer for Automotive as an Alternative to Light Control Films**
Jianeng Xu, Sharp Display Technology Corporation, Nara, Japan

Session 66: Advancements in Display Standards *(Display Measurement)*
Thursday, May 16, 2024 / 10:40 AM - 12:00 PM / Room LL21AB
Chair: *Thomas Fiske, Intuitive Surgical*
Co-Chair: *Jaejoong Kwon, Samsung Display*

66.1: ***Invited Paper:*** **Display Performance Standards: Clearing up OEM and Consumer Confusion**
Roland Wooster, Intel Corporation, Folsom, CA US

66.2: ***Invited Paper:*** **Standardization Efforts and Measurement Procedures by Displayforum (DFF)**
Donald Schaffer, Dexerials Europe BV, Frankfurt am Main, Germany

66.3: ***Invited Paper:*** **Standardizations of Ergonomics for Head Mounted Displays (HMDs)**
Hiroyasu Ujike, Tokyo Information Design Professional University, Tokyo, Japan
66.4: ***Invited Paper:*** **Recent Updated Activities of the IEC TC 110- Following Expanding Electronic Display Applications -**
Kei Hyodo, Yuasa System Co., Ltd., Okayama-shi, Japan

Session 67: Emerging Technologies for AR/VR/MR *(Emerging Technologies and Applications / AR/VR/MR)*

Thursday, May 16, 2024 / 1:30 PM - 2:50 PM / Room 220B
Chair: *Jim Zhuang, Meta*
Co-Chair: *Cheng Chen, Apple, Inc.*

67.1: **High-Performance Tandem White OLED Microdisplays for Virtual Reality and Mixed Reality**
Zhiyong Yang, University of Central Florida, Orlando, FL US
67.2: ***Invited Paper:*** **Displayable Liquid Crystal Glasses with Clear See-Through Vision**
Chia-Ming Chang, Liqxtal Technology, Inc., Tainan City, Taiwan Roc
67.3: **Development of the Novel Wearable AMOLED Display**
Bo Li, Everdisplay Optronics (Shanghai) Co., Ltd., Shanghai, China
67.4: ***Late-News Paper:*** **A New Semi-Transparent OLED-on-Silicon Microdisplay Technology Enabling New Optical Design Opportunities for Slim Near-to-Eye Optics**
Philipp Wartenberg, Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, Dresden, Germany

Session 68: Emissive Active Matrix Displays *(Emissive, Micro-LED, and Quantum-Dot Displays / Active Matrix Devices)*

Thursday, May 16, 2024 / 1:30 PM - 2:30 PM / Room 220C
Chair: *Seth Coe-Sullivan, NS Nanotech*

68.1: ***Distinguished Paper:*** **An Active-Matrix MicroLED Display Based on Monolithic Integration with IGZO Backplane**
Oliver Durnan, Columbia University, New York, NY US
68.2: **A New PWM Micro-LED Pixel Circuit Using LTPO TFTs with Threshold Voltage and IR-Drop Compensations**
Jin Jang, Kyung Hee University, Seoul, South Korea
68.3: ***Distinguished Paper:*** **A 4.7 inch 650 PPI AM-QLED Display Prepared by Direct Photolithography**
Di Zhang, BOE Technology Group Co., Ltd., Beijing, China

Session 69: OLED Displays I *(Active Matrix Devices)*

Thursday, May 16, 2024 / 1:30 PM - 2:50 PM / Room LL21CD
Chair: *DZ Peng, Tianma*
Co-Chair: *CC Lee, Visionox*

69.1: ***Invited Paper:*** **Recent Progress in High-Performance AMOLED Display with ViP Technology**
Yiming Xiao, Hefei Visionox Technology Co., Ltd., Hefei, China
69.2: **A Novel Ultra Large Size OLED Display Base on Small-Size OLEDs**
Zhang Yunpeng, Chengdu BOE Optoelectronics Group Co., Ltd., Chengdu, China
69.3: **A 6,000 Nits Ultra-high Brightness and Wide BT.2020 Color Gamut Wearable Tandem OLED Display**
Lei Zhang, Everdisplay Optronics (Shanghai) Co., Ltd., Shanghai, China
69.4: ***Distinguished Paper:*** **High-Luminance and Highly Reliable Tandem OLED Display Including New Intermediate Connector Designed for Photolithography Applications**
Shinya Fukuzaki, Semiconductor Energy Laboratory, Atsugi, Japan

Session 70: Light-Field 3D Display *(Display Systems)*

Thursday, May 16, 2024 / 1:30 PM - 2:50 PM / Room LL21EF
Chair: *Jean-Pierre Guillou, Apple, Inc.*
Co-Chair: *Sam Phenix, Phenix Consulting*

70.1: **A New Approach to High-Resolution Light Field Display for Higher Realistic Expression**
Hoon Kang, LG Display, Co. Ltd., Seoul, South Korea
70.2: **Viewing Zone Enhancement of Coarse Integral Imaging Using Eye Tracking**
Hiroto Omori, University of Tsukuba, Tsukuba, Japan
70.3: **Wide Field of View Flat Panel Light Field Display**
Hsin-You Hou, National Yang Ming Chiao Tung, Hsinchu, Taiwan Roc
70.4: ***Late-News Paper:*** **Integral 3D Display Using 2D Image Time-Division Multiplexing and Eye-Tracking Technologies**
Hayato Watanabe, NHK (Japan Broadcasting Corporation), Tokyo, Japan

Session 71: Micro Display Driving for AR/MR *(Display Electronics)*

Thursday, May 16, 2024 / 1:30 PM - 2:30 PM / Room LL20BC
Chair: *Prof. Soo-Yeon Lee, Seoul National University*
Co-Chair: *Jacob(Minhyuk) Choi, Meta(Facebook)*

71.1: **CMOS Backplane Technology and Its Challenge for mLEDoS AR/XR Display**
Myunghee Lee, Sapien Semiconductors Inc., Gyeonggi-do, South Korea
71.2: ***Distinguished Paper:*** **4,670-PPI OLEDoS Pixel Circuit Design for Wide Data Voltage Range in a 5V 0.13μm CMOS Process**

Byong-Deok Choi, Hanyang University, Seoul, South Korea

71.3: **High Resolution Pixel Circuit Using a Double-Gate LTPS TFT for AMOLED Displays in AR and VR Applications**
Yong-Sang Kim, Sungkyunkwan University, Suwon, South Korea

Session 72: Large Area Display Manufacturing *(Display Manufacturing)*
Thursday, May 16, 2024 / 1:30 PM - 2:30 PM / Room LL20A
Chair: *Yung-Yu Hsu, Meta*
Co-Chair: *Neetu Chopra, Apple Inc*

72.1: **Study on the Improvement of Light Board Breakage Based on MLED COG Backlight Products**
Jingran Niu, BOE MLED Technology Co., Beijing, China

72.2: **The Research on FSR Optimization and Efficiency Improvement of Needle Placement for Mini LED Transfer Process**
Bo Han, Hefei BOE Pixey Technology Co., Ltd., Hefei, China

72.3: **The Transparent 55-inch OLED Display Products with Improved Imaging Quality**
Bin Zhou, BOE Technology Group Co., Ltd., Hefei, China

Session 73: Automotive Sensing and Multifunctional Displays *(Automotive/Vehicular Displays and HMI Technologies / Sensors Integration and Multi-Functional Displays)*
Thursday, May 16, 2024 / 1:30 PM - 2:30 PM / Room LL20D
Chair: *Rashmi Rao, Harman International*
Co-Chair: *David Hermann, Volvo Car Corporation AB*

73.1: **Implementation of Eye Tracking Technology Based on Vehicle Glasses-Free 3D Prismdisplay**
Jia Bo Lyu, Shanghai Tianma Microelectronics, Shanghai, China

73.2: **Ultrasensitive Image Sensor Based on Amorphous Silicon Avalanche Photodiodes (a-Si APD) Used for Optical Fingerprint Identification and Flat-Panel X-ray Detector**
Lin Zhou, Beijing BOE Optoelectronics Technology Co., Ltd., Beijing, China

Session 74: Display Reflectance *(Display Measurement)*
Thursday, May 16, 2024 / 1:30 PM - 3:00 PM / Room LL21AB
Chair: *Stephen Atwood, Consultant*
Co-Chair: *Thomas Fiske, Intuitive Surgical*

74.1: **Display Reflectance Measurements Finally Made Simple, Comprehensive and Affordable**
Michael Becker, Display-Messtechnik & Systeme, Rottenburg am Neckar, Germany

74.2: **From BRDF to Gloss: Comparing Specular Reflectance Measurements**
Dirk Hertel, E Ink Corporation, Billerica, MA US

74.3: **Regular Reflectance and Transmittance Measured by the Annulus Source Method**
John Penczek, University of Colorado, Boulder, CO US

74.4: **Research of FMLOC Visibility Phenomena Based on Huygens Point Spread Function**
Yamei Gao, BOE Technology Group Co., Ltd., Chengdu, China

74.5: ***Late-News Paper:*** **Quality Assessment Towards Reflective Pattern Based on Diffraction Appearance**
Soyoung Kwon, Samsung Display, Yonginsi, South Korea

Session 75: Liquid Crystal Technology for VR/AR *(Liquid Crystal Technology / AR/VR/MR))*
Thursday, May 16, 2024 / 3:10 PM - 4:30 PM / Room 220B
Chair: *Dr. Yung-Hsun Wu, Innolux*
Co-Chair: *Yan Li, Shanghai Jiao Tong University*

75.1: ***Invited Paper:*** **Liquid Crystal Polarization Hologram for Eye Tracking Application**
Hsienhui Cheng, Reality Labs, Redmond, WA US

75.2: ***Invited Paper:*** **Advancements in Liquid Crystal Technology for AR/VR Devices**
Michael Wittek, Merck Electronics KGaA, Darmstadt, Germany

75.3: **Achromatic Liquid-Crystal Lens for Near-Eye Displays**
Zhenyi Luo, University of Central Florida, Orlando, FL US

75.4: ***Late-News Paper:*** **Metalens-Integrated Augmented Reality (AR) Waveguides for Eye-tracking: A Proof of Concept**
I-Hsuan Chuang, Department of photonics National Yang Ming Chiao Tung University, Hsinchu, Taiwan Roc

Session 76: Integration of Sensing into Micro-LEDs *(Emissive, Micro-LED, and Quantum-Dot Displays / Interactive Displays and Systems / Sensors Integration and Multi-Functional Displays))*
Thursday, May 16, 2024 / 3:10 PM - 4:50 PM / Room 220C
Chair: *Dr. Jonathan Steckel, ST Microelectronics*
Co-Chair: *Jeff Han, Consultant*

76.1: ***Invited Paper:*** **Can MicroLED Beat OLED?**
Eric Virey, Yole Intelligence, Portland, OR US

76.2: ***Invited Paper:*** **New Architectures for Multifunctional Displays**
Francois Templier, CEA-LETI, Grenoble, France

76.3: ***Invited Paper:*** **Integration of Sensing Technologies into MicroLED Displays**
Christopher Bower, X Display Company, , US

76.4: **Implementing a Photo-Detectable AM-LED Display Using Discrete ICs**
Seung-Woo Lee, Kyung Hee University, Seoul, South Korea

76.5: ***Invited Paper:*** **Sensor Integration into a Multifunctional µLED Display - New Paradigms**
Rainer Minixhofer, ams-OSRAM AG, Premstaetten, Austria

Session 77: OLED Displays II *(OLEDs)*
Thursday, May 16, 2024 / 3:10 PM - 4:30 PM / Room LL21CD
Chair: *Yuan-Chun Wu, China Star Optoelectronics*
Co-Chair: *Sangmoo Choi, Google LLC*

77.1: ***Invited Paper:*** **Towards Commercialization of Vertical, Organic, Light-emitting Transistors for Active-Matrix Displays**
Maxime Lemaitre, Mattrix Technologies, Gainesville, FL US

77.2: **Research on Suppressing the Electrical Crosstalk of Tandem OLED Sub-Pixels**
Danyang Jiang, Yungu (Gu'an) Technology Co., Ltd., Gu'an, China

77.3: **Power Efficient and High Color Gamut RGBY AMOLED Displays**
Woo-Young So, Universal Display Corporation, Ewing, NJ US

77.4: **Highly Efficient Side-by-Side Three-Stack Tandem Flexible OLED Displays with Yb-Doped n-CGLs**
Yuto Tsukamoto, Sharp Display Technology Corporation, Tenri, Japan

Session 78: Color and HDR Metrology *(Display Systems / Display Measurement)*
Thursday, May 16, 2024 / 3:10 PM - 4:50 PM / Room LL21EF
Chair: *Brian Berkeley, Highlight Display, LLC*
Co-Chair: *Thomas Fiske, Intuitive Surgical*

78.1: ***Invited Paper:*** **Gamut Rings Color Scope for Use with Wide Gamut Display Systems**
Kenichiro Masaoka, NHK Foundation/NHK Science & Technology Research Laboratories, Tokyo, Japan

78.2: ***Invited/Distinguished Paper:*** **Assessing Color Capability with Gamut Ring Intersection**
Euan Smith, 42 Technology, St Ives, United Kingdom

78.3: **A Tristimulus Electro-Optical Model Describing Interactions of a RGB Backlight Unit and an LC Panel**
Ramazan Ayasli, Saarland University, Saarbruecken, Germany

78.4: ***Invited Paper:*** **Defining and Characterizing Programmatic Image Sequences for Multi-Disciplinary Applications**
Florian Friedrich, FF Pictures GmbH, Oberschleissheim, Germany

Session 79: Low-Power Driving Technologies *(Display Electronics)*
Thursday, May 16, 2024 / 3:10 PM - 4:30 PM / Room LL20BC
Chair: *Jacob(Minhyuk) Choi, Meta(Facebook)*
Co-Chair: *Carlin Vieri, Google*

79.1: ***Invited Paper:*** **Adaptive Local Backlight Dimming Control with Local Boosting**
Jaechan Cho, LX Semicon, Seoul, South Korea

79.2: **Peripheral Dimming Technique Depending on Field-of-View for Low-Power Head-Mounted Devices**
Seung-Woo Lee, Kyung Hee University, Seoul, South Korea

79.3: **Novel Mini-LED Pixel Circuit with PWM Driving Method for Decreasing Power Consumption**
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan Roc

79.4: **Efficient Deep Learning-based Backlight Extraction for Local Dimming Display**
Hanwook Chung, Faurecia IRYStec Inc., Montreal, PQ Canada

Session 80: Display Manufacturing Processes *(Display Manufacturing)*
Thursday, May 16, 2024 / 3:10 PM - 4:30 PM / Room LL20A
Chair: *Toshiaki Arai, Japan Display.Inc.*
Co-Chair: *Neetu Chopra, Apple Inc*

80.1: **Analysis of Side-By-Side RGB OLED Notebook Module Costs Patterned by Photolithography Compared to Conventional Fine Metal Mask Fabrication**
Charles Annis, Omdia, Kyoto, Japan

80.2: ***Distinguished Paper:*** **Mura-Free G8.5 220ppi Inkjet Printing Technology for QLED and OLED Display Panels**
Hidehiro Yoshida, Panasonic Production Engineering, Osaka, Japan

80.3: ***Distinguished Paper:*** **47.5 inch 8K Inkjet Printing AMOLED MNT with Local Boosting GOA Design**
Xu Minghong, Hefei BOE Joint Technology Co., Ltd., Hefei, China

80.4: **Highly Reliable, As-Grown Crystalline InGaZnO TFTs by Spray Pyrolysis for Low-Cost Manufacturing of High-Resolution AMOLED Display**
Jin Jang, Kyung Hee University, Seoul, South Korea

Session 81: Automotive Emissive Displays *(Automotive/Vehicular Displays and HMI Technologies)*
Thursday, May 16, 2024 / 3:10 PM - 4:30 PM / Room LL20D
Chair: *Dr David Hermann, Volvo Car Corporation AB*

Co-Chair: *Eric Margulies, Universal Display Corporation*

81.1: ***Invited Paper:*** **What Makes a Good Automotive Display and How MicroLEDs will Improve Them Even Further**
Anton Drott, Alps Alpine Europe GmbH - Sweden Filial, Västra Frölunda, Sweden

81.2: **Automotive OLED Life Extension Utilizing Automatic Luminance Control**
Paul Weindorf, Visteon Corporation, Van Buren Twp, MI US

81.3: **One-to-one Micro-Lens Array with Pixel for Full Color Organic Light Emitting Diode Display**
Tianhao Lu, BOE Technology Group Co., Ltd., Beijing, China

81.4: **Viewing Angle-Aware Color and Luminance Distortion Compensation for Automotive OLED Displays**
Jione Pak, Sogang University, Seoul, South Korea

Session 82: NED Measurements *(Display Measurement)*

Thursday, May 16, 2024 / 3:10 PM - 4:10 PM / Room LL21AB

Chair: *Udo Krueger, TechnoTeam Bildverarbeitung GmbH*

Co-Chair: *Ingo Rotscholl, TechnoTeam Bildverarbeitung GmbH*

82.1: ***Distinguished Paper:*** **Geometric Distortion on Video See-Through Head-Mounted Displays**
Chumin Zhao, U.S. Food and Drug Administration, Silver Spring, MD US

82.2: **Rapid Eyebox Measurements for Wide Field of View Near-Eye Displays**
John Penczek, University of Colorado, Boulder, CO US

82.3: **Optical Quality Requirements for Accurate MTF/CTF Measurements on Near-Eye-Displays**
Daniel Winters, Trioptics GmbH, Wedel, Germany

Session 83: LC Components for 3D/AR *(Liquid Crystal Technology)*

Friday, May 17, 2024 / 9:00 AM - 10:20 AM / Room 220B

Chair: *Takahiro Ishinabe, Tohoku University*

Co-Chair: *Philip Bos, Kent State University*

83.1: ***Invited Paper:*** **Development of Liquid Crystal Lenses for 3D Displays**
Yukie Ibata, Tianma Japan, Ltd., Kashimada, Japan

83.2: ***Invited Paper:*** **High-Performance Liquid Crystal Grating for Holographic 3D Display Application**
Yang Zeng, Shanghai Tianma Microelectronics, Shanghai, China

83.3: **Inverse Design of Liquid Crystal Phase Modulators for 2D/3D Switchable Display Based on Deep Learning**
Jiangang Lu, Shanghai Jiao Tong University, Shanghai, China

83.4: ***Invited Paper:*** **Development of Polarization Volume Hologram Waveguide for AR Smart Glasses**
Xinyue Zhang, Meta Reality Labs, Redmond, WA US

Session 84: MicroLED Manufacturing *(Emissive, Micro-LED, and Quantum-Dot Displays)*

Friday, May 17, 2024 / 9:00 AM - 10:20 AM / Room 220C

Chair: *Prof. Zhaojun Liu, Southern University of Science and Technology*

84.1: ***Invited Paper:*** **Flexible Transparent Micro-LED Array for Applications in Display and Visible Light Communication**
Pengfei Tian, Fudan University, Shanghai, China

84.2: ***Invited Paper:*** **High-Resolution Additive Manufacturing in the Fabrication of Micro-LED Displays**
Filip Granek, XTPL S.A., Wroclaw, Poland

84.3: **Breakthrough for Test Cost Reduction on Micro-LED Device with High Parallel Single Insertion Testing of Electric-Luminescence including External Quantum Efficiency and Electrical Test**
Hiroshi Kaga, Advantest Corporation, Tokyo, Japan

84.4: **Transfer of Flip-Chip Structure Micro-LED from Sapphire to Thin Film**
Jiayi Li, Southern University of Science and Technology, Shenzhen, China

Session 85: AI/ML for OLEDs *(OLEDs / Artificial Intelligence Including Machine Learning for Imaging)*

Friday, May 17, 2024 / 9:00 AM - 10:20 AM / Room LL21CD

Chair: *Eunkyung Koh, Samsung Display Research Center*

Co-Chair: *Yifan Zhang, Apple, Inc.*

85.1: ***Invited Paper:*** **A Novel OLED Material Discovery Based on AI Technology**
Hoilim Kim, Samsung Display Co., Ltd., Yongin, South Korea

85.2: **Prediction of Triplet Harvesting Ability in Blue Fluorescent Organic Light-Emitting Diodes Using Deep Learning**
Junseop Lim, Sungkyunkwan University, Suwon, South Korea

85.3: **Machine Learning Strategy Towards Inverse Design of Blue TADF Emitter: Training Excited State Properties Based on Density Functional Theory Calculations**
Hyun-Jung Kim, LG Display, Seoul, South Korea

85.4: **Digital Chemistry, Data Processing, and Collaborative Ideation for Development of OLEDs**
Hadi Abroshan, Schrödinger Inc., Portland, OR US

Session 86: Glasses-Free 3D Display *(Display Systems)*

Friday, May 17, 2024 / 9:00 AM - 10:00 AM / Room LL21EF

Chair: *David Eccles,*

Co-Chair: *Zong Qin, Sun Yat-Sen University*

86.1: **An Eye Tracking Method to Extend the Viewing Zone in Multiview 3D Displays**
Xiao Wei Sun, Southern University of Science and Technology, Shenzhen, China

86.2: **Spatial Reality Display System Based on Eye Tracking and Pixel Interleaving Technology**
Xitong Ma, BOE Technology Group, Beijing, China

86.3: **Binocular Camera Eye Tracking Algorithm for Naked Eye 3D Display**
Tingting Wang, BOE Technology Group, Beijing, China

Session 87: Design Methodology for Display Electronics *(Display Electronics)*

Friday, May 17, 2024 / 9:00 AM - 10:20 AM / Room LL20BC

Chair: *Carlin Vieri, Google*

Co-Chair: *Wei Yao, Apple Inc*

87.1: **A Study on the Optimal Design of ESD Protection Circuit in OLED Panel Using Electromagnetic Simulation**
Young Gu Kang, Samsung Display Co., Ltd., Yongin, South Korea

87.2: **Modeling and Simulation for Mitigating Display Noise Caused by PMIC Ripple**
Jiwon Kim, Samsung Display, Yongin, South Korea

87.3: **The Study of Brightness Drop of AMOLED Based on LTPS Process**
Haigang Qing, Chengdu BOE Optoelectronics Technology Co., Ltd., Chengdu, China

87.4: **Control of LTPS Flat-Band Voltage to Improve the Short-Term Image Sticking of AMOLED Displays**
San Ho Jeon, BOE Display Technology Co., Ltd., Chongqing, China

Session 88: Laser Processing for Display Manufacturing *(Display Manufacturing)*

Friday, May 17, 2024 / 9:00 AM - 10:00 AM / Room LL20A

Chair: *Greg Gibson, nTact*

Co-Chair: *Bradley Bowden, Corning Research and Development Corporation*

88.1: ***Distinguished Paper:*** **Direct Laser Patterning of Glass Mask for Micro Display Using GHz Bursts**
Woohyun Jung, Samsung Display, Yongin, South Korea

88.2: **Characteristics Analysis for Laser Cutting Process of Multilayer Display Panels**
Youngjin Oh, Samsung Display Co., Ltd., Yongin-si, South Korea

88.3: **Fast Selective Laser-Induced Etching and Asymmetric 3D Hologram Laser Beam for Narrow Bezel Thin Display**
Hyungsik Kim, Samsung Display, Yongin, South Korea

Session 89: Visibility in Automotive and Transparent Displays *(Display Measurement / Automotive/Vehicular Displays and HMI Technologies / Digital Signage)*

Friday, May 17, 2024 / 9:00 AM - 10:00 AM / Room LL20D

Chair: *Thomas Fiske, Intuitive Surgical*

Co-Chair: *Karlheinz Blankenbach, Pforzheim University*

89.1: **Method for Characterizing Display Washout Performance**
Shenping Li, Corning Incorporated, Corning, NY US

89.2: **An Evaluation Index for See-Through Image Quality on Transparent micro-LED Displays**
YuTang Tsai, AUO Corporation, Hsinchu, Taiwan Roc

89.3: ***Invited Paper:*** **An Investigation of Quantitative Measure of See-Through Image Quality for Transparent Displays**
Hyeok-Jun Kwon, LG Display, Seoul, South Korea

Session 97: Active-Matrix Devices Late News *(Active Matrix Devices)*

Friday, May 17, 2024 / 9:00:00 AM - 10:20:00 AM / Room LL21AB

Chair: *Kenichi Takatori, Huawei Technologies*

97.1: ***Late-News Paper:*** **Mechanism for the Irreversible Threshold Voltage Behavior by Polyimide Charging in Thin Film Transistors**
Do Hyung Kim, Samsung Display Company, Display R&D Center, Asan-si, South Korea

97.2: ***Late-News Paper:*** **Development of High-Mobility Indium-Rich IGZO TFT Device for IT OLED Display**
Huyn-Min Cho, LG Display, Paju-si, Gyeonggi-do, South Korea

97.3: ***Late-News Paper:*** **Enhanced IGZO TFT Performance with Atomic Layer Deposition Parameter Optimization for Large OLED Displays**
Heung Jo Lee, LG Display Co., Ltd, gyeonggi-do, South Korea

97.4: ***Late-News Paper:*** **Visible Light Detection Enhancement of Indium-Gallium-Zinc Oxide Phototransistor with a Formation of p-n Junction Using PEDOT:PSS Absorption Layer**
Hyun Jae Kim, Yonsei University, Seoul, South Korea

Session 90: High PPI LCDs for VR *(AR/VR/MR / Liquid Crystal Technology)*

Friday, May 17, 2024 / 10:40 AM - 12:00 PM / Room 220B

Chair: *Ruiqing Ma, Meta*

Co-Chair: *Jian Gang Lu, Shanghai Jiao Tong University*

90.1: ***Invited Paper:*** **Quest 3 Immersive Display with High PPI and Hybrid Backplane Technology**

Agnes Lee, Meta, Taipei, Taiwan Roc

90.2: ***Invited Paper:*** **Toward the Challenges of 4K MR Using AMLCD**
Yung-Hsun Wu, Innolux Corp., Miaoli, Taiwan Roc

90.3: ***Invited Paper:*** **Ultra High PPI VR Display Devices**
Jianyun Xie, BOE Technology Group Co., Ltd., Beijing, China

90.4: **Field Sequential Color Micro-LCD Enabling High-Resolution Light Field Displays**
Zong Qin, Sun Yat-Sen University, Guangzhou, China

Session 91: MicroLED Transfer and Repair *(Emissive, Micro-LED, and Quantum-Dot Displays)*

Friday, May 17, 2024 / 10:40 AM - 12:20 PM / Room 220C

Chair: *Jean-Jacques Drolet, Osram Opto Semiconductors*

Co-Chair: *Khaled Ahmed, Intel Corporation*

91.1: ***Invited Paper:*** **Micro-LED Stamp Transfer & Repair Technology for Tiling Display**
Xuan Cao, Chengdu Vistar Optoelectronics Co., Ltd, Chengdu, China

91.2: **Transfer, Bonding, and Repair of LEDs for µLED Display Fabrication via Simultaneous Transfer and Bonding (SITRAB) Technology**
Jungho Shin, Electronics and Telecommunications Research Institute, Daejeon, South Korea

91.3: **Placement Accuracy of MicroLEDs in the 5µm Size Range Being Laser Mass Transferred**
Oliver Haupt, Coherent LaserSystems GmbH & Co. KG, Goettingen, Germany

91.4: **Temperature Compensation Study of Micro-LED by Machine Learning**
Jia Bo Lyu, Shanghai Tianma Microelectronics, Shanghai, China

91.5: ***Late-News Paper:*** **The MicroAssembler: Deterministic Fluidic Assembly for Manufacturing MicroLED Displays**
Sourobh Raychaudhuri, SRI International, Palo Alto, CA US

Session 92: MicroLED Displays *(Emissive, Micro-LED, and Quantum-Dot Displays / Digital Signage)*

Friday, May 17, 2024 / 10:40 AM - 12:20 PM / Room LL21CD

Chair: *John Van Derlofske, 3M*

Co-Chair: *Jean-Jacques Drolet, Osram Opto Semiconductors*

92.1: ***Invited Paper:*** **Wide-Color-Gamut and Stable Micro-LED Displays Using UV-Pumped Cd-Free Quantum Dots**
Nag Patibandla, Applied Materials, Inc, Santa Clara, CA US

92.2: **What Type of MicroLED: Flip Chip, Vertical, or Lateral?**
Reza Chaji, VueReal Inc., Waterloo, ON Canada

92.3: **1.63-inch 403-PPI Full-Color Active-Matrix LTPS Micro-LED Display**
Wu Tianyi, Tianma Advanced Display Technology Institute (Xiamen) Co., Ltd., Xiamen, China

92.4: ***Invited Paper:*** **MicroLED Display Technology Entering Mass Production: Opportunities and Challenges in the New Era**
Ying-Tsang Liu, PlayNitride Inc., Miaoli, Taiwan Roc

92.5: ***Late-News Paper:*** **Development of a Full-Color Micro-LED Display Utilizing Novel Simultaneous Transfer and Bonding (SITRAB) Process and SITRAB Film Technology**
Jiho Joo, Electronics and Telecommunications Research Institute, Daejeon, South Korea

Session 93: Stretchable Displays *(Flexible Displays and e-Paper)*

Friday, May 17, 2024 / 10:40 AM - 12:20 PM / Room LL21EF

Chair: *Yong Taek Hong, Seoul National University*

Co-Chair: *Chan-Il Park, LG Display Co. Ltd.*

93.1: ***Invited Paper:*** **Meta-Elastomer for Biaxially Stretchable Displays Without Image Distortion**
Seungjun Chung, Korea Institute of Science and Technology, Seoul, South Korea

93.2: **Highly Stretchable Liquid Metal-Based Deformable Micro-LED Displays**
Masashi Miyakawa, NHK Science & Technology Research Laboratories, Tokyo, Japan

93.3: **Kerfed Pillar Platform for Deformable Double Curvature Display**
Kyung Cheol Choi, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

93.4: **Evaluation Method and Results for Measuring Stretchability of Two Dimensional Stretchable Display**
Myung Sub Lim, LG Display, Seoul, South Korea

93.5: ***Late-News Paper:*** **Highly Stretchable Display with Serpentine-shaped Design and Intrinsically Stretchable Materials**
Jangyeol Yoon, Samsung Display, Yongin, South Korea

Session 94: Acoustic Applications *(Emerging Technologies and Applications)*

Friday, May 17, 2024 / 10:40 AM - 11:40 AM / Room LL20BC

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

Co-Chair: *Fang-Cheng Lin, Apple, Inc.*

94.1: **Study on the Listening Room Sound Quality of OLED Thin Actuator Panel Speaker**
Jeong Man Lee, LG Display, Seoul, South Korea

94.2: **Improved Simulation Accuracy for a Front-Firing Panel Speaker (FFPS) with Thin-Actuator by Adopting Frequency-Dependent Viscoelastic Properties**
Eun Roh, LG Display Co., Ltd., Seoul, South Korea

94.3: **60 kHz Ultrasonic Actuators for Animal Friendly Haptic Displays**

Seung Hyun Sung, LG Display Co., Ltd., Seoul, South Korea

Session 95: AR/VR Device Manufacturing *(Display Manufacturing / AR/VR/MR)*
Friday, May 17, 2024 / 10:40 AM - 11:40 AM / Room LL20A
Chair: *Dr. Chiwoo Kim, APS Holdings*
Co-Chair: *Yung-Yu Hsu, Meta*

95.1: **Augmented Reality Display Based on Surface Relief Grating with Large Area Processing**
Guo Kang, BOE Technology Group Co., Ltd., Beijing, China

95.2: **Ultra-Small Pixel Size Color Conversion Arrays for Micro-LED Displays with Color-Purification Enhanced Color Gamut**
Ching-Fuh Lin, National Taiwan University, Taipei, Taiwan Roc

95.3: **Fabrication of Sub-Micron Organic/Inorganic Hybrid Thin Film Encapsulation on Ultra-High-Resolution Microdisplays Using Inkjet Printing Process**
Byoung-Hwa Kwon, Electronics and Telecommunications Research Institute, Daejeon, South Korea

Session 96: Physical Affordances on Displays *(Interactive Displays and Systems / Automotive/Vehicular Displays and HMI Technologies / Sensors Integration and Multi-Functional Displays)*
Friday, May 17, 2024 / 10:40 AM - 12:00 PM / Room LL20D
Chair: *Patrick Worfolk, AMD*
Co-Chair: *Haruhiko Okumura, Toshiba Corporation*

96.1: ***Invited Paper:*** **Flat Panel Haptics: Embedded Electroosmotic Pumps for Scalable Shape Displays**
Joe Mullenbach, Fluid Reality Incorporated, Chicago, IL US

96.2: **A Novel Capacitive Knob Design with Finger Detection using Automotive In-Cell Touch LCD**
Yao-Chung Chang, Novatek Microelectronics Corp., Hsinchu, Taiwan Roc

96.3: ***Invited Paper:*** **Next-Gen Interactions: Creative Sensing Solutions for Automotive Capacitive Knobs on Displays**
Kelvin Fong, Synaptics, Inc., San Jose, CA US

96.4: ***Invited Paper:*** **Surface Dial: Enabling Tangible Dual-handed Interactions on Capacitive Touchscreens**
Flavio Ribeiro, Microsoft Corp., Redmond, WA US

Poster Session
Thursday, May 16, 2024 / 5:00 PM - 8:00 PM / Room 220A

Active Matrix Devices

P.1: **LTPO Technology for Low Power Comsumption**
Yuqing Wang, Kunshan Govisionox Optoelectronics Co., Ltd., Kunshan, China

P.2: **Investigation of High Mobility Crystalline IGO TFT with Top-Gate Structure for LCD Display Application**
Haijiao Qian, Nanjing BOE Display Technology Corporation, Nanjing, China

P.3: **WITHDRAWN**
Lujiang Huangfu, BOE Technology Group Co., Ltd., Beijing, China

P.4: **The Technology of High-Mobility Oxide TFT for 14-inch AMOLED Display**
Zhuo Li, BOE Technology Group Co., BeiJing, China

P.5: **27-inch Ultra-Narrow-Border LCD with a Two-Stage Output Gate Driver Circuit**
ZhiXin Sun, Peking University, Shenzhen, China

P.6: **Redefining Pixel Circuit Analysis: Causal Discovery and Probabilistic Modeling**
Kyongtae Park, Samsung Display, Suwon, South Korea

P.7: **A High Resolution Design Methodology for Organic Photo Diode Sensor Integration**
Taehyun Kim, Samsung Display, Yongin, South Korea

P.8: ***Distinguished Poster:*** **Realization of Dynamic Local Refresh on LCD with Novel Partial Scan GOA**
Dong Chuan Chen, BOE Technology Group Co., Ltd., Beijing, China

P.9: **Integrated Ambipolar a-Si TFT with Active Pixel Sensing Array Applied for Ambient Color Temperature and UV Sensing**
Yi-Cheng Yuan, National Yang Ming Chiao Tung University, Hsinchu, Taiwan Roc

P.10: **Cost-Effective Solution of Low Gray-Level Performance Issue for MicroLED Driven by PWM Using Machine Learning**
Wei-Lin Wu, National Yang Ming Chiao Tung University, Hsinchu, Taiwan Roc

P.11: **High Mobility BCE Oxide TFT Technology for Demux Driving Notebook LCD**
Ming-Jiue Yu, Guangzhou China Star Optoelectronics Semiconductor Display Technology Co., Ltd., Guangzhou, China

P.12: **Improve the Reliability of a-IGZO TFT through Optimizing the Threshold Voltage and Channel Thickness in AMOLED Hybrid Backplane**
Ying Shen, Hefei Visionox Technology Co.,Ltd., Anhui, China

P.13: **Excessive Oxygen induced Threshold Voltage Shifts in High Mobility Top-Gate PrIZO TFTs**
Yu-Hua Dong, Guangzhou China Star Optoelectronics Semiconductor Display Technology Co., Ltd., Guangzhou, China

P.14: **High Mobility and High Light Stability Oxide Back-Channel-Etched TFT and Application to High-End LCD NB Production**
Jie Huang, BOE Technology Group Co., Ltd., Beijing, China

P.15: **The Back-Channel Effect in Low Temperature Poly-Si Thin Film Transistors**
Weibin Zhang, Hefei Visionox Technology Co., Ltd., Hefei, China

P.16: **A Novel Driving Scheme to Achieve Low Frame Rate and Low Power Consumption with Narrow Border**
Huiling Lu, Kunshan New Flat Panel Display Technology Center Co., Kunshan, China

P.17: **Development of Vertical Oxide Channel Thin Film Transistor Based on Hard-Mask Etching**

Binbin Tong, BOE Technology Group Co. Ltd, Beijing, China

P.18: **A Novel Ultra Low-loading Gate Driver Circuit for 14-inch 2.8K OLED Display**
YingHsiang Tseng, Everdisplay Optronics Corporation, Shanghai, China

P.19: **High Mobility and Reliability Oxide Stacked TFT for Application to Next Generation Display**
Chuanbao Luo, TCL China Star Optoelectronics Display Technology Co., Ltd., Shenzhen, China

P.20: **Memory Window and Endurance Improvement of In-Ga-Zn-O-Based Ferroelectric Thin Film Transistors by Inserting In-Ga-Zn-O Floating Gate**
SeungYoon Shin, Seoul National University, Seoul, South Korea

P.21: **Post-Annealing Optimization for Top-Gate Amorphous In-Ga-Zn-O Thin-Film Transistors with Atomic-Layer-Deposited Ultrathin AlOx Dielectric**
Jiye Li, Peking University, Shenzhen, China

P.22: **Fabrication of Ultra Short Channel Oxide Thin Film Transistors**
Nian Liu, TCL China Star Optoelectronics Display Technology Co., Ltd., Shenzhen, China

P.23: **Low Power A-PWM ?LED Pixel Circuit of Progressive-Mode Using Single Sweep Signal for Mobile Displays**
Yuxuan Zhu, Peking University, Shenzhen, China

P.24: **Ultra-Low Power Consumption Notebook LCD with High On-State Current Metal Oxide Device**
Dong Fang Wang, BOE Technology Group Co., Ltd., Beijing, China

P.25: **Tailoring the Threshold Voltage Control of Oxide Thin-Film Transistor by Controlling Electron Injection Using PN Semiconductor Heterojunction Structure**
Sooji Nam, Electronics and Telecommunications Research Institute, Daejeon, South Korea

P.26: **Low-Power MLED Pixel LTPS-Based Compensation Circuit**
Yicheng Lin, BOE MLED Technology Co., Ltd., Beijing, China

P.27: **Multi-Frequency Driving for Low Power Consumption by New Scan Circuit**
Heng Xu, Wuhan China Star Optoelectronics Semiconductor Display Technology Corporation, Wuhan, China

P.28: **High-speed Oscillator Using Polycrystalline InGaO TFTs by Spray Pyrolysis on Polyimide Substrate for Flexible Electronics**
Md. Hasnat Rabbi, Kyung Hee University, Seoul, South Korea

P.29: **A Bias TFT with High Photosensitive Current for Optical Sensors**
Chuanxiang Xu, BOE Technology Group Co., Ltd., Beijing, China

P.30: **Effect of High-k Oxide Materials on Amorphous Indium Gallium Zinc Oxide (a-IGZO) Channel in Top Gate Field Effect Transistors**
Reem Alshanbari, Columbia University, New York, NY US

P.31: **Investigation on Driving Backboard of Electronic Paper Based on Low-Temperature Polycrystalline Silicon**
Yu Jin, Visionox Technology Inc., Kunshan, China

P.32: **Dual Gate Amorphous Silicon Thin Film Transistor Technology for High Brightness and High Frame Rate Outdoor Display Panels**
Zhichao Zhou, China Star Optoelectronics Co., Ltd., Shenzhen, China

P.222: ***Late-News Poster:*** **Performance of Double Gate p-ch Cu-MIC Poly-Ge TFTs on Flexible Plastic Substrates and Their Feasibility for CMOS Inverter**
Akito Hara, Tohoku Gakuin University, Sendai, Miyagi, Japan

P.223: ***Late-News Poster:*** **Alleviating Gamma Curve OLED Device with Inductor by AC Driving**
Jincheol Jang, Department of Semiconductor and Display Engineering, Sungkyunkwan University, Suwon, South Korea

P.224: ***Late-News Poster:*** **Development of 660Hz LCD with Low Resistance Gate LTPS Backplane**
Jia-Hong Ye, AUO Corporation, Hsinchu, Taiwan, R.O.C.

P.225: ***Late-News Poster:*** **Improving Specific Contact Resistivity of a-IGZO Thin-Film-Transistors via Multi-Stack Interlayer**
Jae Kyeong Jeong, Department of Electronic Engineering, Hanyang University, Seoul, South Korea

P.226: ***Late-News Poster:*** **Compact AMOLED Pixel Circuit Employing Double-Gate TFT Achieving High Threshold Voltage Compensation Accuracy**
Minji Kim, Seoul National University, Seoul, South Korea

Applied Vision

P.33: **Differences in Visual Comfort of Smartphones between Comfortable and Uncomfortable Luminance**
Yan Tu, Southeast University, Nanjing, China

P.34: **Analysis of Display Quality based on AMOLED Pixel Arrangement**
Lan Lan, Yungu (Gu'an) Technology Co., Ltd., Gu'an, China

P.35: **Evaluation of the Performance of Gaming Monitors and Visual Fatigue**
Karlheinz Blankenbach, Pforzheim University, Pforzheim, Germany

P.36: **Optimizing TV Gamma and CCT for Enhanced Viewer Satisfaction: A Study on Backlight Brightness and Color Gamut**
Li-Yin Chen, National Yang Ming Chiao Tung University, Hsinchu City, Taiwan Roc

P.37: **Enhanced Text Display with Balanced Anti-Reflection and Anti-Glare Design**
Song Yang, Shanghai Tianma Microelectronics, Shanghai, China

P.38: **The Influence of Parallax and Shape Type Factors on the Perception of AR Equipment in Dark Environment**
Yan Tu, Southeast University, Nanjing, China

P.39: **Simulation of Perceived Motion Blur on 480Hz OLED Monitor**
Changmo Yang, LG Display, Seoul, South Korea

AR/VR/MR

P.40: **Reducing the crosstalk for high brightness mini-LED backlit VR displays**
Can Huang, Wuhan China Star Optoelectronic Technology Group Co., Ltd., Wuhan, China

P.41: **Diffraction Simulation of FFS VR LCD Panel**

Wei Cheng, Wuhan China Star Optoelectronics Technology Co., Ltd., Wuhan, China

P.42: **High Efficiency VR Optical System**
Zhang Hao, BOE Technology Group Co., Ltd., Beijing, China

P.43: **Compact and Lightweight Optical-Mechanical System**
Han Na, BOE Technology Group Co., Ltd., Beijing, China

P.44: **Smart Eye-Tracking System Based on Linear Array Sensors**
Kai Wang, Sun Yat-Sen University, Guangzhou, China

P.45: **Simulation Method for Crossed-Type Exit Pupil Based on Polarization Volume Grating**
Ran Wei, Southeast University, Nanjing, China

P.46: ***Distinguished Poster:*** **Contrast Ratio Enhancement Method of a Pancake Virtual Reality Head-Mounted Display**
Lei Xiao, BOE Technology Group Co., Ltd., Beijing, China

P.47: **Multi-Wavelength Achromatic Metacoupler for Augmented Reality Display Using Adjoint Method**
Xiao Wei Sun, Southern University of Science and Technology, Shenzhen, China

P.48: **Evaluation of Field of View in Optical See-through Near Eye Displays**
Xi Mou, Hangzhou SanTest Technology Co., Ltd., Hangzhou, China

P.49: **Angular Dependent Point Spread Function Analysis for Virtual Reality Head Mounted Displays**
Ryan Beams, U.S. Food and Drug Administration, Silver Spring, MD US

P.50: **Multi-Depth-SGD Based Tilted Plane Diffraction Propagation for Holographic Near-Eye Displays**
Xinxing Xia, Shanghai University, Shanghai, China

P.51: **Field Stack Lighting Driving Method for Low Power Organic Light Emitting Diode-on-Silicon Microdisplay**
Yuan Ji, Shanghai University, Shanghai, China

P.52: **Scalable Multi-Layered Real-Time Holography Processor Architecture with High Bandwidth Memory (HBM)**
Wonok Kwon, Electronics and Telecommunications Research Institute, Daejeon, South Korea

P.227: ***Late-News Poster:*** **Design Freeform Metagratings for Eye-Glow Attenuation in Diffractive AR Waveguides**
Chuan-En Lin, National Yang Ming Chiao Tung University, Hsinchu, Taiwan Roc

P.228: ***Late-News Poster:*** **Color Uniformity Optimization for MR Display Based on Volume Holographic Light Guide**
Ching-Cherng Sun, Department of Optics and Photonics, National Central University, Taoyuan, Taiwan Roc

P.229: ***Late-News Poster:*** **Improving Image Quality of Light Field Display Based on Bilinear Interpolation Method**
Kuei Chun Yeh, , , Taiwan Roc

P.230: ***Late-News Poster:*** **Enhancement of the Color Uniformity of a VHOE-Waveguide-Based AR Eyewear Display Through Drive Signal Management Scheme**
Shiuan-Huei Lin, Department of Electrophysics, National Yang Ming Chiao Tung University, Hsinchu, Taiwan Roc

P.231: ***Late-News Poster:*** **Real-Time Analysis and Synthesis of Imagery for Light-Field Displays**
Tianyu Wu, North Carolina State University, Raleigh, NC US

Artificial Intelligence Including Machine Learning for Imaging

P.53: **Analysis of Dead Pixel Origins and Potential Defect Prediction using Machine Learning with Tabular Data**
Jun Hee Han, LG Display Co. Ltd., Seoul, South Korea

P.54: **XAI Models for Efficient Analysis of Temperature and Power Consumption in High-Brightness Panels and Modules**
Kyongtae Park, Samsung Display, Suwon, South Korea

P.55: **An Optimizing Finger Separation Method with Machine Learning Algorithm Used In-Cell Capacitive Touch Panel**
Ching-Yao Chao, Novatek Microelectronics Corporation, Hsinchu, Taiwan Roc

P.56: **WITHDRAWN**

P.57: **A Novel Compression Algorithm Using Machine Learning for Mura Compensation of OLED Panel**
Chang-Hoon Son, LX Semicon, Seoul, South Korea

P.58: **Novel Defect Data Augmentation in Display Manufacturing Process**
Jungsuk Hahn, Samsung Display, Asan, South Korea

P.59: **Deep Learning-Based Defect Map Classification and Similarity Search in Display Manufacturing**
Seokyoon Yang, Samsung Display, Asan, South Korea

P.232: ***Late-News Poster:*** **PixelAI: Designing AMOLED Pixel Circuits Using Reinforcement Learning**
Hyoungsik Nam, Dept. of Information Display, Kyung Hee University, Dongdaemun-gu, South Korea

P.233: ***Late-News Poster:*** **Real-Time Augmented Reality HUD Image Generated By Deep Learning**
Tzu Chou, National Taiwan University Of Science And Technology, Taipei, Taiwan Roc

P.234: ***Late-News Poster:*** **A Data-Centric Approach to Minimize Defect Leakage in an AI-Based Automated Surface Inspection System for Display Manufacturing Process**
Seung-Gi Kim, Mechatronics Technology Research Center, Samsung Display Co., Yongin-si, Gyeonggi-do, South Korea

P.235: ***Late-News Poster:*** **Optimization of Display Production Scheduling with Reinforcement Learning**
Yeonu Lee, Display Research Center, Samsung Display Co., Ltd., Yongin si, South Korea

P.236: ***Late-News Poster:*** **Hard Defect Detection and Classification for Display Panel Products**
Sanghoon Cho, Mechatronics Technology Research Center, Samsung Display, Yongin-si, Gyeonggi-do, South Korea

Automotive/Vehicular Displays and HMI Technologies

P.60: **Automotive Dual Cell microZone™LCD Gamma Control Algorithm**
Paul Weindorf, Visteon Corporation, Van Buren Twp, MI US

P.61: **Dynamic Edge Enhancement Method**
Paul Weindorf, Visteon Corporation, Van Buren Twp, MI US

P.62: **Fast Response LCD Under Low Temperature Environments Using In-Cell Heater Wires**
Yuto Goto, Sharp Display Technology Corporation, Kameyama, Japan

P.63: **In-Cabin Immersiveness Enhancement Based on Driving Environments and Driver's Emotion**

Seungchul Ryu, Faurecia Irystec Inc., Montreal, PQ Canada

P.64: **Research on Displayable Scheme of Camera Under Panel Based on Automobile Display**
Sen Liu, Wuhan China Star Optoelectronics Technology Co., Ltd., Wuhan, China

P.65: **A Novel Free-Form, High Contrast Emissive Projection Display and Vehicle Applications**
Ted Sun, Sun Innovations Inc., Fremont, CA US

P.66: **A Halo Test Standard and Specification Quantification Based on Mini-LED Project for Vehicle Display Module**
Mei You, Beijing BOE Display Technology Co., Ltd., Beijing, China

P.67: **Research on the Flashing Issue of the Large Integrated Automotive LCD MDL**
Qiannan Pan, BOE Corporation, Beijing, China

Display Electronics

P.68: **Oxide Semiconductor Thin-Film Transistor-Based Micro-LED Pixel Circuit with External Current Setting System**
Yong-Sang Kim, Sungkyunkwan University, Suwon, South Korea

P.69: **Cause Analysis of Water Ripple Issue on Charging-ratio Sensitive LCD Panels Based on TCON Timing Control Theory**
Junmin Zhang, BOE, Wuhan, China

P.70: **A Novel Peak Luminance Correction Method Based on Global IR Drop Compensation System on AMOLED**
Chunhui Ren, Kunshan Govisionox Optoelectronics Co., Ltd., Jiangsu, China

P.71: **An Analysis of Bright Vertical Chain-Like Spots Occurrence on Mobile OLED Screen Due to the Electromagnetic Interference of GSM Device Nearby**
Chelho Chung, Magnachip Semiconductor, Ltd., Cheongju, South Korea

P.72: **A Bidirectional Gate Driver Circuit with Scan Signal for Low-Frame- Rate LTPO AMOLED Displays**
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan Roc

P.73: **Gate Driver Circuit to Generating Multi-Frequency Pulses Using LTPO Technology**
Zhenghao Huang, Hefei Visionox Technology Co., Ltd., Hefei, China

P.74: **Study on Mechanism of ?Vp Impact on Picture Quality and Optimization**
Xinlan Yang, BOE Display Technology Co. Ltd., Beijing, China

P.75: **Extreme Low Power a-InGaZnO TFT Scan Driver with Extra Clock Signal Modulation**
Hyunwoo Kim, Soongsil University, Seoul, South Korea

P.76: **The Influence of Bending FFC Transmission Line on High-Speed Signal Channels**
Yuqi Liu, TCL China Star Optoelectronics Technology Co.Ltd., Shenzhen, China

P.77: **A Novel Frequency Doubling Technology with Adaptive Dither**
Qian Wang, TCL China Star Optoelectronics Technology Co.Ltd., Shenzhen, China

P.78: **Application of Hot Carrier Degradation Tolerant IGZO to High Frequency LCD/e-Poster**
Yohei Takeuchi, Sharp Display Technology Corporation, Kameyama, Japan

P.79: **Calibration Data Methods for In-Cell Integrated Ambient Light and Color Temperature Sensor Data**
Yi-Ting Chung, Novatek Microelectronics Corporation, Zhubei, Taiwan Roc

P.80: **4K Real 240Hz Technology In The Filed Of Large Size LCD-TFT TV**
Jun Wang, Hefei BOE Display Technology Co., Ltd., Hefei, China

P.81: **Multimodal Intelligent Display Backplane Blocks**
Nikolas Papadopoulos, imec, Leuven, Belgium

P.220: **A Novel Capacitive Touch Sensing Method with Folding Angle Detection using Foldable OLED TDDI Panel**
Yi-Ying Lin, Novatek Microelectronics Corporation. Zhubei, Taiwam Roc

P.247: ***Late-News Poster:*** **Integrated Gate Driver Circuit with Self-compensation Function Using Oxide TFTs for AMOLED Displays**
Xuehuan Feng, Hefei BOE Joint Technology Co., Ltd., Hefei, China

P.248: ***Late-News Poster:*** **Image Upscaling Techniques for IT Products; Evaluation and Analysis**
Jinpil Kim, Mobile Display Electronics Development Team, Samsung Display Co., Ltd, Yongin-City, Gyeonggi-Do, South Korea

P.249: ***Late-News Poster:*** **A Low Power Digital Logic Structure for High Resolution and High Frame Rate OLEDoS Micro Displays**
Jaemyung Lim, Department of Electronic Engineering, Hanyang University, Seoul,

Display Manufacturing

P.82: **Analysis and Validation of TFT-LCD Data Open Mechanism**
Zhongjing Xie, TCL China Star Optoelectronics Technology Co. Ltd., Shenzhen, China

P.83: **The Development of Mask-Reduction Technology in LTPS LCD**
Xuexin Lan, Xiamen Tianma Microelectronics Co., Ltd., Xiamen, China

P.84: **A Study and Improvement of Bacteria Contamination in TFT-LCD Manufacturing Industry**
Fei Guan, Chongqing BOE Optoelectronics Technology Co., Ltd., Chongqing, China

P.85: **The Methods to Improve Low-Gray Lens Mura**
Fei You, Chengdu BOE Display Technology Co., Ltd., Chengdu, China

P.86: **Prediction of Droplet Behavior in Piezoelectric Inkjet Printing Based on Waveguide Theory**
Taeho Yang, Samsung Display Research Center, Yongin, South Korea

P.87: **Research on the Influence Factor of Tearing Static Electricity Based on Display Module**
Fangyi Liu, Beijing BOE Display Technology Co., Ltd., Beijing, China

P.88: **Low Reflection Antistatic Material Design for Improving Ambient Contrast Ratio of LCD Panel**
Chang Eun Kim, LG Display, Seoul, South Korea

P.89: **Development of 30" 4K Active Matrix NanoLED Display Using Generation 4.5 Size Substrate with Photolithography Process in the Atmosphere**
Masayuki Kanehiro, Sharp Display Technology Corporation, Nara, Japan

P.90: **Automatic Design Optimization Platform for FMM Mask Dummy Pattern Simulation Based on AMOLED Display Screen**
Shengxiong Chen, Wuhan Tianma Microelectronics, Wuhan, China

P.91: **The Causes and Improvement of Circular Mura in Micro OLED Displays**
Yong Yang, Yunnan Invensight Optoelectronics Technology Co., Ltd., Kunming, China

P.92: **Photo-Sensitive Vertical Alignment Material with Room Temperature Dip-Coating Technique**
Xinyi Yu, Hong Kong University of Science and Technology, Hong Kong, Hong Kong

P.93: **Analysis and Improvement of Dark Spot Defects in TFT-LCD**
Mei Chun Li, TCL China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.94: **Strategies to Improve the Flowability of Photoresist from Aspects of Material Composition and Manufacturing Process**
Min Zhang, Peking University, Shenzhen, China

P.95: **Exploration of Microbial Control Methods in Wet Cleaning Equipment During LCD Production Process**
Yulong Chen, BOE Technology Group Co., Ltd., Beijing, China

P.96: **Alignment Optimization on Gen. 4.5 G for High-Frame-Rate Ultra-High-Resolution Ferroelectric Liquid Crystal Displays**
Zheng-Nan Yuan, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong

P.97: **Improved Electrical Performance and Reliability of a-IGZO TFT by N2O Plasma Treatment Optimization**
Hyojung Kim, Samsung Display Co., Ltd., Asan, South Korea

P.98: **High Quality OLED Display Panel Using Optimized IGZO TFT Process through Eliminating Sputter Target Mura**
Ce Zhao, BOE Technology Group Co. Ltd., Hefei, China

P.99: **A New Unit-cell Type Fine Metal Mask for IT & Gen8.x AMOLED Applications**
Mu-Gyeom Kim, Olum Material Co., Yongin, South Korea

P.100: **Control of Vacuum Pressure in Vacuum Drying Process for Uniform Film Formation of Inkjet-Printed OLEDs**
Kwan Hyun Choi, Korea Institute of Industrial Technology, Ansan, South Korea

P.101: **Zero-Cost Solution for TFT Panel Non-film Surface Strength Improvement**
Huiming Wen, Chongqing BOE Optoelectronics Technology Co., Ltd., Chongqing, China

P.102: **Measurement of Inkjet Droplet Volume based on Fraunhofer Diffraction**
Dong Yeol Shin, Korea Institute of Industrial Technology, Ansan, South Korea

P.103: **Ultra Fine Drop Volume Measurement Technic Using Chromatic Confocal Sensor(CCS) for Quantum Dot Inkjet Printing Process**
Jae Bum Pahk, Samsung Display Company, Yongin, South Korea

P.104: **Corrugated Silicon Nitride Masks with Enhanced Mechanical Strength for Patterning RGB-Stripe OLED Microdisplays**
Shou-Cheng Dong, The Hong Kong University of Science and Technology, Kowloon, Hong Kong

P.105: **Micro LED Total Repair Solutions for Display Application: EHD Printing, 1-by-1 Transfer, and Functional Nano-Ink material**
Vudat Nguyen, ENJET, Suwon, South Korea

P.106: **A Based Machine Learning Model for the Prediction of Intitial Gamma Value for OLED Panels**
Hao Shen, Guangzhou Govisionox Technology Co.,Ltd., Guangzhou, China

P.107: **High-Resolution Periodic Patterning for Volume Manufacturing on 300mm+ Size Substrates Using Displacement Talbot Lithography**
Kelsey Wooley, Eulitha US, Redmond, WA US

P.108: **High Conductivity Transparent Electrode with In2O3 – ZnO Periodic Structure and Gradient Oxygen Concentration**
Victor Belyaev, State University of Education, Moscow, Russian Fed.

P.109: **Investigation of Low Residual Stress Anti Reflection Coating with High Hardness for Display Applications**
Sungwoo Kim, Samsung Display, Giheung, South Korea

P.110: **WITHDRAWN**

P.111: **A Machine Learning Perspective for the Optimization of Annealing Parameters in Solution Processed Thin Film Devices**
Haodong Tang, Shenzhen Technology University, Shenzhen, China

P.112: **Analyzing Scrubber Failure Causes Using the CNN 1D Inception Module**
Seki Park, Samsung Display, Asan, South Korea

P.113: **WITHDRAWN**

P.237: ***Late-News Poster:*** **Advanced Technology for Circular Reutilization of High-Value Materials from Discarded LCD Panels through Non-Destructive Disassembly Processes**
Chou-Hsu HSU, Industrial Technology Research Institute, Taiwan, Hsinchu, Taiwan Roc

P.238: ***Late-News Poster:*** **Novel Method for Fast Assessment of Surface Conditions of Nano-Thin Films**
Jeong Do-Young, Dankook University, Yongin-si, UNK South Korea

P.239: ***Late-News Poster:*** **Modeling Particle Deposition in Evaporating Colloidal Droplets**
Minjeong Ko, Display Research Center, Samsung Display, Yongin-si, South Korea

P.240: ***Late-News Poster:*** **Smoke-Anti-Reflection Films for Display Visibility Improvement : Ambient Contrast Ratio Consideration**
Takashi Tachikawa, AGC Inc., Kanagawa, Japan

P.241: ***Late-News Poster:*** **A Study on the Transferable Functional Film of Mini LED or Micro LED**
Kwan-Young Han, Dankook University, Yongin-si, South Korea

P.242: ***Late-News Poster:*** **Development and Microstructure Analysis of New Low Melting Point Solder Ball for Semiconductor Packages**
Kwan-Young Han, Dankook University, Yongin-si, South Korea

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Gimin Gown, Sansung Display, Asan, South Korea

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