PRELIMINARY PROGRAM

2015 SID INTERNATIONAL SYMPOSIUM

June 2-5, 2015 (Tuesday – Friday)
San Jose Convention Center
San Jose, California, USA

Session 1: Annual SID Business Meeting
Tuesday, June 2 / 8:00 – 8:20 am / Ballroom 220A

Session 2: Opening Remarks / Keynote Addresses
Tuesday, June 2 / 8:20 – 10:20 am / Ballroom 220A

2.1: ***Keynote 1: TBA***
2:2: ***Keynote 2: TBA***
2.3: ***Keynote 3: TBA***

Session 3: Wearable Display Systems *(Wearable Displays / Display Systems / Projection)*
Tuesday, June 2 / 10:50 am – 12:10 pm / Ballroom 220B
Chair: *Brian Schowengerdt, University of Washington*
Co-Chair: *Matthew Brennesholtz, Display Central*

3.1: **Achieving Inconspicuous Head-Mounted-Display Optics**
Timothy Wong, 3M Co., St. Paul, MN, USA

3.2: **High-Iimage-Quality Wearable Displays with Fast-Response Liquid Crystal**
Zhenyue Luo, University of Central Florida, Orlando, FL, USA

3.3: **Single-Mirror IMOD Display for Practical Wearable Devices**
Tallis Chang, Qualcomm MEMS Technologies, Inc., San Jose, CA, USA

Session 4: Flexible Display Manufacturing *(Display Manufacturing)*
Tuesday, June 2 / 10:50 am – 12:10 pm / Ballroom 220C
Chair: *Bradley Bowden, Corning Incorporated*
Co-Chair: *Chiwoo Kim, Samsung Display*

4.1: **Apparatus for Manufacturing Flexible OLED Displays: Adoption of Transfer Technology**
Satoru Idojiri, Advanced Film Device, Inc., Tochigi, Japan

4.2: **Study of ACF Bonding Technology in Flexible Display Module Packages**
Yen Lai, AU Optronics Corp., Hsinchu, Taiwan, ROC

4.3: **Ultra-Thin LTPS TFT-LCD by Using Glass-on-Carrier Technology**
Shun-Ping Chiao, AU Optronics Corp., Hsinchu, Taiwan, ROC

4.4: **Dimension Control of a Color Filter Fabricated by Using a Transfer Method**
Tadahiro Furukawa, Yamagata University, Yamagata, Japan

Session 5: Image Quality of Displays *(Applied Vision/Human Factors)*
Tuesday, June 2 / 10:50 am – 12:10 pm / Room LL20A
Chair: *Sakuichi Ohtsuka, Kagoshima University*
Co-Chair: *David Hoffman, Samsung Semiconductor*

5.1: **Influence of Pixel Density on Image Quality of Smartphone Displays**
Yuzo Hisatake, Japan Display, Inc., Tokyo, Japan

5.2: **Simulation of Color-Breakup Perception Using Eye-Tracking Data**
Keita Hirai, Chiba University, Chiba, Japan

5.3: **Extending the Flicker Visibility Metric to a Range of Mean Luminance**
Andrew Watson, NASA Ames Research Center, Moffett Field, CA, USA

5.4: **Subpixel Rendering for a High-Resolution OLED Display with Low-Resolution Photomasks**
Hui-Chun Lin, National Taiwan University of Science and Technology, Taipei, Taiwan, ROC

Session 6: Novel Display Applications I *(Applications)*
Tuesday, June 2 / 10:50 am – 12:10 pm / Room LL20BC
Chair: *Ian Underwood, University of Edinburgh*
Co-Chair: *Jean-Noel Perbet, THALES Avionics*

6.1: **A New Application of a Touch-Screen Display for Data Transfer**
Philippe Coni, THALES Avionics SAS, Le Haillan, France

6.2: **Hybrid-Type Temperature Sensors Using TFTs**
Mutsumi Kimura, Ryukoku University, Otsu, Japan

6.3: **Adaptable Light Beaming and Shaping Using an LED Matrix and Fresnel Lens Array**
Feixia Wang, Southeast University, Nanjing, China

6.4: **Local Tone-Mapping-Based Dynamic Backlight Control Algorithm**
Viacheslav Chesnokov, Apical Ltd., London, UK

Session 7: OLED Driving Techniques *(Display Electronics)*
Tuesday, June 2 / 10:50 am – 12:10 pm / Room LL20D
Chair: *Wei Yao, Apple, Inc.*
Co-Chair: *Dick McCartney, Consultant*

7.1: ***Invited Paper:*** **Novel OLED Display Technology for Large-Sized UHD OLED TVs**
Hong-Jae Shin, LG Display Co., Ltd., Gyeonggi-do, South Korea

7.2: **A Pixel Structure Using a Switching Error-Reduction Method for High-Image-QualityAMOLED Displays**
Oh-Kyong Kwon, Seoul, South Korea

7.3: **Depletion-Mode Oxide-TFT Shift Register with Wide Operating Frequency Range for AMOLED Displays**
Inhyo Han, LG Display Co., Ltd., Gyeonggi-do, South Korea

7.4: **A Slim Border Design for Wearable Displays: Using a Novel P-Type Shift Register and an Optimal Layout Arrangement**
Yung-Sheng Tsai, AU Optronics Corp., Taiwan, ROC

Session 8: Quantum-Dot Materials *(Emissive Displays / Disruptive Materials)*
Tuesday, June 2 / 10:50 am – 12:10 pm / Room LL20EF
Chair: *Seth Coe-Sullivan, QD Vision, Inc.*
Co-Chair: *Tomokazu Shiga, The University of Electro-Communications*

8.1: ***Invited Paper:*** **Alignment of Quantum Rods**
Masaki Hasegawa, Merck, Ltd., Japan, Kanagawa, Japan

8.2: **Semiconductor Quantum Rods for Display Applications**
Ehud Shaviv, Qlight Nanotech, Ltd., Jerusalem, Israel

8.3: **Next-Generation Display Technology: Quantum-Dot LEDs**
Jesse Manders, NanoPhotonica, Gainesville, FL, USA

Session 9: Wearable Displays: Direct View *(Wearable Displays / e-Paper and Flexible Displays)*
Tuesday, June 2 / 2:00 – 3:20 pm / Ballroom 220B
Chair: *Ruiqing (Ray) Ma, Universal Display Corp.*
Co-Chair: *Yongtaek Hong, Seoul National University*

9.1: ***Invited Paper:*** **Status and Outlook of Organic Electronic Materials for Flexible and Strechable Displays**
Zhenan Bao, Stanford University, Stanford, CA, USA

9.2: **A Novel Lamination Process for Flexible AMOLED Encapsulation**
Wang Tao, BOE Technology Group Co., Ltd., Beijing, China

9.3: **The First Flexible LCD Applied to a Wearable Smart Device**
Wen-Yuan Li, AU Optronics Corp., Hsinchu, Taiwan, ROC

9.4: **Stretchable 45 x 80 RGB-LED Display Using Meander Wiring Technology**
Hideki Ohmae, Panasonic Corp., Moriguchi, Japan

Session 10: OLED Encapsulation and Reliability *(Display Manufacturing)*
Tuesday, June 2 / 2:00 – 3:20 pm / Ballroom 220C
Chair: *Ion Bita, Apple, Inc.*
Co-Chair: *Dawei Wang, BOE Technology Group Co., Ltd.*

10.1: ***Invited Paper:*** **Roll-to-Roll Manufacturing of Functional Substrates and Encapsulation Films for Organic Electronics: Technologies and Challenges**
John Fahlteich, Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, Dresden, Germany

10.2: **High-Performance Barrier Films for Flexible Organic Display and Lighting Applications**
Jyrki Kimmel, Nokia Technologies, Tampere, Finland

10.3: **An Empirical Analysis of the Factors Effecting the Reliability of AMOLED Displays**
Jang-Yeon Kwon, Yonsei University, Incheon, South Korea

10.4: **Non-Contact Current Measurements for AMOLED Backplanes Using Electron-Beam-Induced Plasma Probes**
Daniel Toet, Photon Dynamics, an Orbotech Company, San Jose, CA, USA

Session 11: Human Factors and Applications *(Applied Vision/Human Factors)*
Tuesday, June 2 / 2:00 – 3:20 pm / Room LL20A
Chair: *Yi-Pai Huang, National Chiao Tung University*
Co-Chair: *Takashi Shibata, Tokyo University of Social Welfare*

11.1: ***Invited Paper:*** **Brain–Display Interaction and Its Biomedical Application Using Steady-State Visual Evoked Potentials**
Fang-Cheng Lin, Display Institute, National Chiao Tung University, Hsinchu, Taiwan, ROC

11.2: **Usefulness of Stereoscopic 3D Images in Elementary-School Classes**
Takashi Shibata, Tokyo University of Social Welfare, Gunma, Japan

11.3: **Readability Performance and Subjective Appraisal of Curved Monitors**
Hyeon-Jeong Suk, KAIST, Daejeon, South Korea

11.4: **Study on the Saccadic-Eye-Movement Metric of Visual Fatigue Induced by 3D Displays**
Yue Liu, Beijing Institute of Techonology, Beijing, China

Session 12: Novel Display Applications II *(Applications)*
Tuesday, June 2 / 2:00 – 3:20 pm / Room LL20BC
Chair: *Gary Jones, Nanoquantum Corp.*
Co-Chair: *Bao-Jen Pong, ITRI*

12.1: ***Invited Paper:*** **Simulating Human Vision and Vision-Correcting Displays**
Fu-Chung Huang, University of Caifornia at Berkeley, Berkeley, CA, USA

12.2: **Flame-Resistant and Heat-Resistant Lithium-Ion Battery Used to Operate Heat-Resistant OLEDs**
Teppei Oguni, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

12.3: **Creation of a Wavy Ag Nanowire Network and Its Implication for Transparent Electrodes with Robust Stretchability**
Jun Beom Pyo, KIST, Seoul, South Korea

12.4: **A Liquid-Crystal Biosensor for Liver Diseases**
Sihui He, University of Central Florida, Orlando, FL, USA

Session 13: Advanced Displays and Imaging *(Display Electronics)*

Tuesday, June 2 / 2:00 – 3:20 pm / Room LL20D

Chair: *Haruhiko Okumura, Toshiba Corp.*

Co-Chair: *Achin Bhowmik, Intel Corp.*

13.1: ***Invited Paper:*** **Head-Up Displays with MEMS Laser Microprojection Technology**
Nicolas Abelé, Lemoptix SA, Lausanne, Switzerland

13.2: **360° Multi-Faced Tracking and Interaction Using a Panoramic Camera**
Li Feng, Zhejiang University, Hangzhou, China

13.3: **Efficient Direct Light-Field Rendering for Autostereoscopic 3D Displays**
Young Ju Jeong, Samsung Advanced Institute of Technology, Suwon, South Korea

13.4: **An Electro-Optical Transfer Function with Improved Uniformity of Palette-Color Distribution in Absolute Color Space**
Senfar Wen, Yuan Ze University, Chung-Li, Taiwan, ROC

Session 14: Photoluminescent Quantum Dots *(Emissive Displays)*

Tuesday, June 2 / 2:00 – 3:20 pm / Room LL20EF

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

Co-Chair: *Larry Weber, PLEXIE*

14.1: ***Invited Paper:*** **Heavy-Metal-Free Quantum Dots for DisplayApplications**
Nigel Pickett, Nanoco Technologies, Ltd., Manchester, UK

14.2: ***Invited Paper:*** **Cadmium- and Indium-Based Quantum-Dot Materials**
Seth Coe-Sullivan, QD Vision, Lexington, MA, USA

14.3: **Optimizing Quantum-Dot LCD Systems to Achieve Rec. 2020 Color Performance**
James Thielen, 3M Co., Maplewood, MN, USA

Session 15: Applied Vision and Applications of Wearable Displays *(Wearable Displays / Applications)*

Tuesday, June 2 / 3:40 – 5:00 pm / Ballroom 220B

Chair: *Jyrki Kimmel, Nokia Technologies*

Co-Chair: *Jeffrey Mulligan, NASA Ames Research Center*

15.1: **Data Glasses for Improved User Interaction in 3D**
Rigo Herold, Westsächsische Hochschule Zwickau, Zwickau, Germany

15.2: **High-Luminance Monochromatic See-Through Eyewear Display with Volume Hologram**
Takashi Oku, Sony Corp., Kanagawa, Japan

15.3: **Optimal Monitor Gamma for Transparent Displays**
Youngshin Kwak, Ulsan National Institute of Science and Technology, Ulsan, South Korea

15.4: **Weight Optimization of Near-to-Eye Light-Field Displays Based on the Human Visual System**
Li Feng, Zhejiang University, Hangzhou, China

Session 16: OLED Deposition and Patterning *(Display Manufacturing)*

Tuesday, June 2 / 3:40 – 5:00 pm / Ballroom 220C

Chair: *Greg Gibson, FAS Holdings Group*

Co-Chair: *Ake Hornell, EuroLCDs SIA*

16.1: ***Invited Paper:*** **Measurement Methods for Quality Control of Coating Uniformity in Solution-Processed OLED Displays**
Ian Parker, DuPont Displays, Santa Barbara, CA, USA

16.3: **True-Color 640-ppi OLED Arrays Patterned by CA In-Line Photolithography**
Pawel Malinowski, imec, Leuven, Belgium

16.4: **Fully R2R-Processed Flexible OLEDs for Lighting**
Takashi Minakata, Chemical Materials Evaluation and Research Base (CEREBA), Ibaraki, Japan

16.5: **Electroforming Technology for Manufacturing Thin Metal Masks with Very Small Apertures for OLED Display Manufacturing**
Sundaram N. Kumar, Advantek US, Inc., Pittsburgh, PA, USA

Session 17: Color Appearance of Displays *(Applied Vision/Human Factors)*

Tuesday, June 2 / 3:40 – 5:00 pm / Room LL20A

Chair: *Miyoshi Ayama, Utsunomiya University*

Co-Chair: *Jennifer Gille, Qualcomm Technologies*

17.1: ***Invited Paper:*** **Closing in on Rec. 2020: How Close Is Close Enough?**
James Hillis, 3M Co., Maplewood, MN, USA

17.2: **Kansei Evaluation of Color Images Presented in Color Gamuts of Different Blue Primaries**
Miyoshi Ayama, Utsunomiya University, Utsunomiya, Japan

17.3: **D-CIELab: A Color Metric for Dichromatic Observers**
Haomiao Jiang, Stanford University, Stanford, CA, USA

17.4: **Image-Quality Assessment of Large UHD LCDs Using Quantum-Dot and RGBW Technologies**
Ji-Yuan Huang, National Taiwan University, Taipei, Taiwan, ROC

Session 18: Applications of Flexible Display Technology *(Applications / e-Paper and Flexible Displays)*
Tuesday, June 2 / 3:40 – 5:00 pm / Room LL20BC
Chair: *Jin Jang, Kyung Hee University*
Co-Chair: *Lauren Palmateer, Rovi Corp.*

18.1: ***Invited Paper:*** **Foldable AMOLED Displays with a Touch Panel**
Jia-Chong Ho, ITRI, Hsinchu, Taiwan, ROC

18.2: ***Invited Paper:*** **Flexible eWriter Technology and Applications**
Asad Khan, Kent Displays, Inc., Kent, OH, USA

18.3: **A 8.67-in. Foldable OLED Display with an In-Cell Touch Sensor**
Kazunori Watanabe, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

18.4: **A 13.3-in. 664-ppi Foldable AMOLED Display with Crystalline Oxide-Semiconductor FETs**
Kei Takahashi, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Session 19: Image Processing for Display Enhancement *(Display Electronics)*
Tuesday, June 2 / 3:40 – 5:00 pm / Room LL20D
Chair: *Seung Woo Lee, Kyung Hee University*
Co-Chair: *Ya Hsiang Tai, National Chuao Tung University*

19.1: **OLED Power-Reduction Algorithm Using Gray-Level Mapping Conversion**
Yong-Duck Ahn, Dong-A University, Busan, South Korea

19.2: **Compensation of OLED I-V Drift for Suppressing Image Sticking in a Digital AMOLED Display Module**
Pascal Volkert, Saarland University, Saarbruecken, Germany

19.3: **A Novel Rendering Algorithm with Adaptive Weighting Factors**
Shang-Yu Su, AU Optronics Corp., Hsinchu, Taiwan, ROC

19.4: **Denoising for Polarizer-Free Imaging of a Liquid-Crystal Lens**
Mao Ye, SuperD Co., Ltd., Quanqdong, China

Session 20: Electroluminescent Quantum Dots *(Emissive Displays / Disruptive Materials)*
Tuesday, June 2 / 3:40 – 5:00 pm / Room LL20EF
Chair: *Masayuki Nakamoto, Shizuoka University*
Co-Chair: *Yong-Seog Kim, Hongik University*

20.1: ***Invited Paper:*** **Red and Green Quantum-Dot-Based LEDs Demonstrating Excellent Color Coordinates**
Poopathy Kathirgamanathan, Brunel University London, Uxbridge, UK

20.2: **Ultra-Bright Highly Efficient Low-Roll-Off Inverted Quantum-Dot LED Devices (QLEDs)**
Yajie Dong, University of Central Florida, Orlando, FL, USA

20.3: **Optimizing the Balance of Holes and Electrons in Inverted Quantum-Dot LEDs by Inserting an Electron-Transport Barrier Layer**
Yibin Jiang, Hong Kong University of Science & Technology, Kowloon, Hong Kong

20.4: **Quantum-Dot LEDs with Charge-Generation Layers**
Jin Jang, Kyung Hee University, Seoul, South Korea

Session 21: Oxide-TFT Manufacturing *(Display Manufacturing)*
Wednesday, June 3/ 9:00 – 10:20 am / Ballroom 220B
Chair: *Toshiaki Arai, JOLED, Inc.*
Co-Chair: *Tian Xiao, CBRITE, Inc.*

21.1: ***Invited Paper:*** **High-Throughput Metal-Oxide TFT with Organic Etch Stopper and SiN_x Gate Insulator**
Gang Yu, CBRITE, Inc., Goleta, CA, USA

21.2: **Highly Reliable Oxide TFT with Novel Oxide Passivation Layers by All-Printing Processes**
Shinji Matsumoto, Ricoh Co., Ltd., Yokohama, Japan

21.3: **A Novel 5-Mask Etch-Stopper Pixel Structure with a Short-Channel Oxide-Semiconductor TFT**
Joon-Young Yang, LG Display Co., Ltd., Gyeonggi-do, South Korea

21.4: **Deposition Conditions and High-Resolution TEM Characterization of CAAC IGZO**
David Lynch, Cornell University, Ithaca, NY, USA

Session 22: OLED Materials I *(OLEDs)*
Wednesday, June 3 / 9:00 – 10:20 am / Ballroom 220C
Chair: *Denis Kondakov, DuPont Displays*
Co-Chair: *C. C. Lee, BOE Technology Group Co., Ltd., Bejing, China*

22.1: ***Invited Paper:*** **New Fluorescent Blue Host Materials for Achieving Low Voltage in OLEDs**
Hitoshi Kuma, Idemitsu Kosan Co., Ltd., Chiba, Japan

22.2: ***Invited Paper:*** **Development of Electron-Transport Material to Improve the Efficiency and Lifetime of Blue-Emitting Devices in OLEDs**
Tae-Hyung Kim, Doosan Corp., Gyeonggi-do, South Korea

22.3: **CbzTAZ Hosts in Blue OLED Device Demonstrates an High Current Efficiency of Over 52 cd/A**
Tien-Lung Chiu, Yuan Ze University, Chung-Li, Taiwan, ROC

22.4: **Synthesis of Host Materials for Blue Phosphorescent OLEDs with High Efficiency and Low Driving Voltage**
Jun Yeob Lee, Dankook University, Yongin, South Korea

Session 23: e-Paper *(e-Paper and Flexible Displays)*
Wednesday, June 3 / 9:00 – 10:20 am / Room LL20A
Chair: *Chao-Yuan Chen, Jiangsu Hecheng Display Technology*
Co-Chair: *Makoto Omodani, Tokai University*

23.1: ***Invited Paper:*** **Colloidal Dispersion Materials for Electrophoretic Displays and Beyond**
Mark Goulding, Merck Chemicals, Ltd., Southampton, UK

23.2: **Predicting the Viewing-Direction Performance of e-Paper Displays with a Front Light under Ambient Lighting Conditions**
Dirk Hertel, E Ink Corp., Billerica, MA, USA

23.3: **Flexible Semitransparent eWriter Displays**
Clinton Braganza, Kent Displays, Inc., Kent, OH, USA

Session 24: 3D Light-Field Displays and Imaging *(Display Systems)*
Wednesday, June 3 / 9:00 – 10:20 am / Room LL20BC
Chair: *Nikhil Balram, Ricoh Innovations Corp.*
Co-Chair: *K. Käläntär, Global Optical Solutions*

24.1: ***Invited Paper:*** **Design Principles for Light-Field Image Capture and Display**
Kathrin Berkner, Ricoh Innovations Corp., Menlo Park, CA, USA

24.2: **Real-Time Rendering 360° Floating Light-Field 3D Display**
Li Feng, Zhejiang University, Hangzhou, China

24.3: **Adaptive Optimization of Rendering for Multi-Projector-Type Light-Field Display**
Li Feng, Zhejiang University, Hangzhou, China

24.4: **Floating 3D Image for High-Resolution Portable Device Using Integral Photography Theory**
Chih-Wei Shih, National Chiao Tung University, Hsinchu, Taiwan, ROC

Session 25: Laser Phosphor Light Sources for Projectors *(Projection)*
Wednesday, June 3 / 9:00 – 10:20 am / Room LL20D
Chair: *David Eccles, Rockwell Collins*
Co-Chair: *Frederic Kahn, Kahn International, Inc.*

25.1: **The Progress in International Safety Standards for Laser-Illuminated Projection Systems**
Heidi Hoffman, LIPA, San Jose, CA, USA

25.2: **High-Brightness Solid-State Light Source for 4K Ultra-Short-Throw Projector**
Yuki Maeda, Sony Corp., Kanagawa, Japan

25.3: **A Miniature Laser-Driven Visible-Light Source**
Nayef Abu-Ageel, Michigan State University, East Lansing, MI, USA

25.4: **Laser-Excited Phosphor/Dye in Liquid for High-Power Digital Projectors**
Kenneth Li, Wavien, Inc., Valencia, CA, USA

Session 26: Micro LED Displays and Electroluminescence *(Emissive Displays)*
Wednesday, June 3 / 9:00 – 10:20 am / Room LL20EF
Chair: *Poopathy Kathirgamanathan, Brunel University London*
Co-Chair: *Qun Yan, Sichuan COC Display Devices Co., Ltd.*

26.1: ***Invited Paper:*** **Quantum Photonic Imager (QPI): A Novel Display Technology that Enables More Than 3D Applications**
Chih-Li Chuang, Ostendo Technologies, Inc., Carlsbad, CA, USA

26.2: ***Invited Paper:*** **High-Brightness Emissive Microdisplay Developed by Integration of III-V LEDs with Thin-Film Silicon Transistors**
Vincent Lee, Lumiode, Inc., New York, NY, USA

26.3: **High-Resolution Laser-Etched Circuitry for ACEL Lamps**
Jack Silver, Wolfson Centre, Brunel University, Uxbridge, UK

Session 27: Advanced Manufacturing Technologies *(Display Manufacturing)*
Wednesday, June 3 / 10:40 am – 12:00 pm / Ballroom 220B
Chair: *Joerg Winkler, PLANSEE SE*
Co-Chair: *Wei Lung Liau, AU Optronics Corp.*

27.1: ***Invited Paper:*** **Liquid-Crystal Mixtures for Creating Polymer Walls in LCDs**
Nils Greinert, Merck KGaA, Darmstadt, Germany

27.2: **The Fabrication of a New PSVA Pixel Structure by Using Gray-Tone Mask Technology**
Zhuming Deng, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

27.3: **Development of Highly Durable Achromatic Polarizer with High Heat and Moisture Resistance**
Noriaki Mochizuki, Nippon Kayaku Co., Ltd., Tokyo, Japan

27.4: **Selective Laser-Annealing System for LTPS-TFT Panels**
Shigeto Sugimoto, V Technology Co., Ltd., Kanagawa, Japan

Session 28: OLED Materials II *(OLEDs)*
Wednesday, June 3 / 10:40 am – 12:00 pm / Ballroom 220C
Chair: *Yasunori Kijima, JOLED, Inc.*
Co-Chair: *Chin Hsin (Fred) Chen, Guangdong Aglaia Optoelectronic Materials Co., Ltd.*

28.1: ***Invited Paper:*** **Triplet-Energy Control of PAHs by Heteroatom Incorporation for Development of Efficient Materials for PHOLEDs**
Takuji Hatakeyama, Kwansei Gakuin University, Hyogo, Japan

28.2: ***Invited Paper:*** **Reverse Intersystem Crossing from High-Lying Triplet Energy Levels to an Excited Singlet: A "Hot Excition" Path for OLEDs**
Yuguang Ma, South China University of Technology, Guangzhou, China

28.3: ***Invited Paper:*** **Progress on Phosphorescent OLED Materials**
Banumathy Balaganesan, e-Ray Optoelectronics Technology Co., Ltd., Taoyuan, Taiwan, ROC

Session 29: TFTs and Circuits for Flexible Devices *(e-Paper and Flexible Displays / Active-Matrix Devices / Oxide and LTPS TFTs)*

Wednesday, June 3 / 10:40 am – 12:00 pm / Room LL20A

Chair: *Ryoichi Ishihara, Delft University of Technology*

Co-Chair: *Sang-Hee Park, KAIST*

29.1: **Solution-Processed Poly-Si TFTs at Paper-Compatible Temperatures**
Miki Trifunovic, Delft University of Technology, Delft, The Netherlands

29.2: **Silicon Ink-Based Poly-Si CMOS TFT Fabricated on 300-mm Stainless-Steel-Foil Substrates**
Mao Takashima, Thin Film Electronics, Inc., San Jose, CA, USA

29.3: **High-Resolution Flexible AMOLED Display with Integrated Gate Driver Using Bulk-Accumulation a-IGZO TFTs**
Jin Jang, Kyung Hee University, Seoul, South Korea

29.4: **Flexible AMOLED Display with Integrated Gate Driver Operating at an Operation Speed Compatible with a 4k x 2k Display**
Soeren Steudel, imec, Leuven, Belgium

Session 30: 3D Applications *(Applications)*

Wednesday, June 3 / 10:40 am - 12:00 pm / Room LL20BC

Chair: *Susan Jones, Nulumina Corp.*

Co-Chair: *Adi Abileah, Adi-Display Consulting, LLC*

30.1: **Review of Dynamic Holography in Materials for Large-Sized Holographic 3D Video Displays**
Jicheng Liu, Shanghai University, Shanghai, China

30.2: **Color Holographic Projection Based on Liquid Lens**
Qiong-Hua Wang, Sichuan University, Chengdu, China

30.3: **Design Parameters for a Curved Barrier-Type Autostereoscopic Display**
Wei-Chieh Lin, National Taiwan University, Taipei, Taiwan, ROC

30.4: **Multi-Plane Holographic Display with a Uniform 3D Gerchberg-Saxton Algorithm**
Yikai Su, Shanghai Jiao Tong University, Shanghai, China

Session 31: Disruptive LCD Materials *(Liquid-Crystal Technology / Disruptive Materials)*

Wednesday, June 3 / 10:40 am – 12:00 pm / Room LL20D

Chair: *Shui-Chih Lien, TCL Group*

Co-Chair: *Yukito Saitoh, FUJIFILM Corp.*

31.1: **Evolution of Cellulose Triacetate (TAC) Films for LCDs: Novel Technologies for High Hardness, Durability, and Dimensional Stability**
Ryo Suzuki, FUJIFILM Corp., Kanagawa, Japan

31.2: **Low-Dielectric-Constant Materials for High-Performance LCDs**
Haiwei Chen, University of Central Florida, Orlando, FL, USA

31.3: **New Approach to Developing Liquid-Crystal Materials for Idling Stop Driving on Reflective Displays**
Yasuhiro Niikura, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

31.4: **Nano-Phase-Separated Liquid Crystals (NPS LCs) with Fast Response Time**
Toru Fujisawa, DIC Corp., Ina, Japan

Session 32: Front Lighting and Reflective Displays *(Display Systems / e-Paper and Flexible Displays / Lighting)*

Wednesday, June 3 / 10:40 am – 12:00 pm / Room LL20EF

Chair: *K. Käläntär, Global Optical Solutions*

Co-Chair: *Kevin Gahagan, Corning Incorporated*

32.1: **Front Light for Color Electrophoretic Display Applications**
Hsin-Tao Huang, E Ink Holding, Inc., Hsinchu, Taiwan, ROC

32.2: **A Study on the Front Light Guide Used in Color Reflective LCDs**
Xinxing Wang, BOE Technology Group Co., Ltd., Bejing, China

32.3: **Enhancing Interferometric Display Color Viewing-Angle Performance Using a Fiber-Array Film**
Jian Ma, Qualcomm MEMS Technologies, Inc., San Jose, CA USA

Session 33: Novel Devices *(Active-Matrix Devices)*

Wednesday, June 3 / 3:30 – 4:50 pm / Ballroom 220B

Chair: *Kazuyoshi Omata, Konica Minolta*

Co-Chair: *Mike Hack, Universal Display Corp.*

33.1: ***Invited Paper:*** **A Novel Vertical-Type Light-Emitting Transistor**
Tadahiko Hirai, CSIRO, Clayton, Australia

33.2: **Neuron MOS Devices Using TFTs**
Mutsumi Kimura, Ryukoku University, Otsu, Japan

33.3: **Fabrication of an All-Screen-Printed Oxide-Semiconductor-TFT Active-Matrix Backplane**
Kazuhiro Fukada, Japan Advanced Institute of Science and Technology, Ishikawa, Japan

33.4: **Flexible IGZO TFTs with a Disruptive Photo-Patternable and Thermally Stable Organic Gate Insulator**
Hsing-Hung Hsieh, Polyera Taiwan Corp., Hsinchu, Taiwan, ROC

Session 34: Disruptive OLED Materials *(OLEDs / Disruptive Materials)*
Wednesday, June 3 / 3:30 – 4:50 pm / Ballroom 220C
Chair: *Seth Coe-Sullivan, QD Vision, Inc.*
Co-Chair: *Sven Zimmermann, Novaled AG*

34.1: ***Invited Paper:*** **Effect of Singlet Triplet Recycling in the Charge-Transfer-State Manifold and Molecular Geometry on Thermally Activated Delayed Fluorescence.**
Andrew Monkman, Durham University, Durham, UK

34.2: ***Invited Paper:*** **Highly Efficient and Stable OLEDs Using Hosts with Thermally Activated Delayed Fluorescence**
Lian Duan, Tsinghua University, Beijing, China

34.3: **Emitting Materials for ThermallyActivated Delayed Fluorescent OLEDs Using Benzofurocarbazole and Benzothienocarbazole as Donor Moieties**
Dong Ryun Lee, Dankook University, Yongin, South Korea

34.4: ***Invited Paper:*** **Combinatorial Design of OLED-Emitting Materials**
Alán Aspuru-Guzik, Harvard University, Cambridge, MA, USA

Session 35: Projection Optics *(Projection)*
Wednesday, June 3 / 3:30 – 4:50 pm / Room LL20A
Chair: *John Vieth, Christie Digital Systems*
Co-Chair: *Ming Hsien Wu, Hamamatsu Corp*

35.1: **Auto-Calibration for Screen Correction and Point Cloud Generation**
Jason Deglint, University of Waterloo, Waterloo, Ontario, Canada

35.2: **Design of Hybrid Refractive-Reflective Projection Optics for Family Theatres**
Xiao Wei Sun, Nanyang Technological University, Singapore

35.3: **Resolution Enhancement Based on Shifted Superposition**
Elnaz Barshan, University of Waterloo, Waterloo, Ontario, Canada

35.4: **A High Contrast Ratio and Compact-Sized Prism for DLP Projection System**
Jui-Wen Pan, National Chiao Tung University, Tainan, Taiwan, ROC

Session 36: Holographic 3D Displays *(Display Systems)*
Wednesday, June 3 / 3:30 - 4:50 pm / Room LL20BC
Chair: *W. Hendrick, Rockwell Collins Optronics*
Co-Chair: *K. Käläntär, Global Optical Solutions*

36.1: **Binocular Holographic Display Using the Pupil Space Division Method**
Jungkwuen An, SAIT, Samsung Electronics Co., Suwon, South Korea

36.2: **Speckle Suppression in a Scaled Holographic Display from Single-Phase-Only Computer-Generated Hologram**
Jun Xia, Southeast University, Nanjing, China

36.3: **Flat-Panel Coherent Backlight for Holographic Displays with Improved Diffraction Efficiency**
Yikai Su, Shanghai Jiao Tong University, Shanghai, China

36.4: ***Invited Paper:*** **Real-Time Light Amplification by Using Photorefractive Ferroelectric Liquid-Crystal Mixtures**
Takeo Sasaki, Tokyo University of Science, Tokyo, Japan

Session 37: Blue-Phase LCDs *(Liquid-Crystal Technology)*
Wednesday, June 3 / 3:30 – 4:50 pm / Room LL20D
Chair: *Michael Wittek, Merck KGaA*
Co-Chair: *Shin-Tson Wu, University of Central Florida*

37.1: **A Blue-Phase LCD with Wall Electrode and High-Driving-Voltage Circuit**
Cheng-Yeh Tsai, AU Optronics Corp., Hsinchu, Taiwan, ROC

37.2: **High-Performance Blue-Phase LCDs Stabilized by Linear Photopolymers**
Daming Xu, University of Central Florida, Orlando, FL, USA

37.3: **Polymer-Stabilized Blue-Phase Liquid Crystal Cured with a Visible Laser**
Yikai Su, Shanghai Jiao Tong University, Shanghai, China

Session 38: OLED Lighting *(OLEDs / Lighting)*
Wednesday, June 3 / 3:30 – 4:50 pm / Room LL20EF
Chair: *Jang Hyuk Kwon, Kyung Hee University*
Co-Chair: *Franky So, University of Florida*

38.1: **TBA**

38.2: **High-Efficiency Three-Stack Tandem White OLEDs**
Jang Hyuk Kwon, Kyung Hee University, Seoul, South Korea

38.3: **Simulations, Measurements, and Optimization of OLEDs with a Scattering Layer**
Stéphane Altazin, Fluxim AG, Winterthur, Switzerland

38.4: **TBA**

Session 39: Advanced TFTs *(Active-Matrix Devices)*
Thursday, June 4 / 9:00 – 10:20 am / Ballroom 220B
Chair: *Hyun Jae Kim, Yonsei University*
Co-Chair: *Junho Song, Samsung Display Co., Ltd.*

39.1: ***Invited Paper:*** **High-Performance Flexible TFTs from Oxide/Carbon Heterostructures**
Xiangfeng Duan, Unversity of California at Los Angeles, Los Angeles, CA, USA

39.2: ***Invited Paper:*** **Printed Inorganic Transistors Based on Transparent Oxides**
Vivek Subramanian, University of California at Berkeley, Berkeley, CA, USA

39.3: ***Invited Paper:*** **Recent Progress of Oxide-Semiconductor-Based p-Channel TFTs**
Kenji Nomura, Qualcomm Technologies, Inc., San Jose, CA, USA

39.4: ***Invited Paper:*** **Novel Perspective of Nano-Material: Exploiting Graphene for Display Application**
Yongbin Jeong, LG Display Co., Ltd., Gyeonggi-do, South Korea

Session 40: OLED Devices I *(OLEDs)*

Thursday, June 4 / 9:00 – 10:20 am / Ballroom 220C

Chair: *Michael Weaver, Universal Display Corp.*

Co-Chair: *Denis Kondakov, DuPont Displays*

40.2: **Efficiency Enhancement in Phosphorescent and Fluorescent OLEDs Utilizing Energy Transfer from Exciplex to Emitter**
Tatsuyoshi Takahashi, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

40.3: **Optimization of Host-Dopant System for Realizing Efficient Thermally Activated Delayed Fluorescence OLEDs**
Min Chul Suh, Kyung Hee University, Seoul, South Korea

40.4: **High-Efficiency Blue Phosphorescent OLEDs with >57 cd/A, >50 lm/W, and >25% External Quantum Efficiency**
Jiun-Haw Lee, National Taiwan University, Taipei, Taiwan, ROC

Session 41: Automotive Display Applications and Systems *(Vehicular)*

Thursday, June 4 / 9:00 – 10:20 am / Room LL20A

Chair: *Jerzy Kanicki, University of Michigan*

Co-Chair:

41.1: **Development of RGBW LCD with Edge-Lit 2D Local-Dimming System for Automotive Applications**
Naoyuki Takasaki, Japan Display, Inc., Kanagawa, Japan

41.2: **High-Reliability Integrated Gate Driver Circuit in a Panel for Automotive Displays**
Dahye Sim, LG Display Co., Ltd., Gyeonggi-do, South Korea

41.3: ***Invited Paper:*** **Megatrends Driving Automotive Displays and Associated Mega Issues**
Paul M. Russo, GEO Semiconductor, Inc., San Jose, CA, USA

41.4: **TBA**

Session 42: Curved and High-Resolution Display Metrology *(Display Measurement)*

Thursday, June 4 / 9:00 – 10:20 am / Room LL20BC

Chair: *Stephen Atwood, Azonix Corp.*

Co-Chair: *Frank Rochow, Adviser*

42.1: **Comparison of Key Optical Measurements of Curved to Flat LCD TVs and Their Impact on Image Quality**
Karlheinz Blankenbach, Pforzheim University, Pforzheim, Germany

42.2: **Stress-Induced Substrate Mura in Curved LCDs**
K. Hemanth Vepakomma, Corning Incorporated, Corning, NY, USA

42.3: **Light-Leakage Study on Curved ADS-Mode LCDs**
Jaegeon You, BOE Technology Group Co., Ltd., Bejing, China

42.4: **How to Perform Viewing-Angle Measurements on Curved Displays**
Pierre Boher, ELDIM, Herouville, France

Session 43: FFS/IPS I *(Liquid-Crystal Technology)*

Thursday, June 4 / 9:00 – 10:20 am / Room LL20D

Chair: *Hyun Chul Choi, LG Display Co., Ltd.*

Co-Chair: *Ki Chul Shin, Samsung Display Co., Ltd.*

43.1: ***Invited Paper:*** **UB-FFS: New Materials for Advanced Mobile Applications**
Martin Engel, Merck Group, Darmstadt, Germany

43.2: **New Fast-Response-Time IPS Liquid-Crystal Mode**
Toshiharu Matsushima, Japan Display, Inc., Ebina, Japan

43.3: **Fast-Response-Time Fringe-Field-Switching LCD with Patterned Common Electrode**
Daming Xu, University of Central Florida, Orlando, FL, USA

43.4: **A Fast-Response A-Film-Enhanced FFS-LCD**
Haiwei Chen, University of Central Florida, Orlando, FL, USA

Session 44: Advanced Light Sources, Components, and Systems I *(IES Lighting Track)*

Thursday, June 4 / 9:00 – 10:20 am / Room LL20EF

Chair: *Mike Lu, Acuity Brands Lighting*

Co-Chair: *David Aurelien, Soraa, Inc.*

44.1: ***Invited Paper:*** **OLED Lighting for General Lighting Applications**
Seongsoo Jang, LG Chem, Ltd., Cheong, South Korea

44.2: ***Invited Paper:*** **Current and Future Projection of Edge-Lit LED Panel Adoption in Lighting**
Brett Shriver, Global Lighting Technology, Brecksville, OH, USA

44.3: **Display Technologies for LED Lighting. Part I: Optical Components**
William Edmonds, 3M Co., St. Paul, MN, USA

44.4: **Display Technologies for LED Lighting. Part II: Scalable Optical Architectures Enabled by Modular Film-Based Components**
William Edmonds, 3M Co., St. Paul, MN USA

Session 45: High-Performance Oxide TFTs I *(Active-Matrix Devices)*

Thursday, June 4 / 10:40 am – 12:00 pm / Ballroom 220B

Chair: *Hsing-Hung Hsieh, Polyera Taiwan Corp.*

Co-Chair: *Roger Stewart, Sourland Mountain Associates*

45.1: ***Invited Paper:*** **Future Possibilities of Crystalline Oxide Semiconductors, Especially C-Axis-Aligned Crystalline IGZO**
Shunpei Yamazaki, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

45.2: **Sputtering C-Axis-Aligned Crystalline (CAAC) IGZO Films: A Design of Experiment (DOE) Study**
Michael Thompson, Ithaca, NY, USA

45.3: ***Invited Paper:*** **High-Performance Nanocrystalline ZnO_xN_y for Imaging and Display Applications**
Eunha Lee, SAIT, Samsung Electronics Co., Suwon, South Korea

45.4: ***Invited Paper:*** **Amorphous-Metal-Oxide/1D Nanomaterial Hybrid TFTs: A New Avenue to High-Speed Macroelectronics**
Lei Liao, Wuhan University, Wuhan, China

Session 46: OLED Devices II *(OLEDs)*

Thursday, June 4 / 10:40 am – 12:00 pm / Ballroom 220C

Chair: *Eric Forsythe, Army Research Laboratory*

Co-Chair: *Denis Kondakov, DuPont Displays*

46.1: ***Invited Paper:*** **Recent Progress of LEDs Based on Colloidal Quantum Dots**
Changhee Lee, Seoul National University, Seoul, South Korea

46.2: **Transparent Inverted OLEDs with a Multilayered Graphene Top Anode Using a Novel Lamination Technique**
Jeong-Ik Lee, ETRI, Daejeon, South Korea

46.3: **Anchoring Energy of PEDOT:PSS Alignment Layer for High-Order Parameter and Polarized Luminescence of Organic Dyes**
Andrew Stankevich, Institute of Chemistry of New Materials, National Academy of Sciences Belarus, Minsk, Belarus

46.4: **Effects of Electron-Injection Layer on Storage and Operational Stability of Air-Stable OLEDs**
Hirohiko Fukagawa, NHK Science & Technology Research Laboratories, Tokyo, Japan

Session 47: Next-Generation Automotive Display Technologies I: HUDs (*Display Systems / Vehicular)*

Thursday, June 4 / 10:40 am - 12:00 pm / Room LL20A

Chair: *Rashmi Rao, Harman International*

Co-Chair: *Masaru Suzuki, SKC Haas Display Films*

47.1: **TBA**

47.2: ***Invited Paper:*** **Laser-Scanning Head-Up Display for Better Driving Assistance**
Koichiro Nakamaura, Ricoh Co., Ltd., Yokohama, Japan

47.3: **TBA**

47.4: **TBA**

Session 48: Display Standards and Their Application to Transparent Displays *(Display Measurement)*

Thursday, June 4 / 10:40 am – 12:00 pm / Room LL20BC

Chair: *Thomas Fiske, Consultant*

Co-Chair: *Marja Salmimaa, Nokia Research Center*

48.1: ***Invited Paper:*** **Recent Advances in the Standardization of Display Metrology and Light Measurement**
Michael Becker, Instrument Systems GmbH, Munich, Germany

48.2: ***Invited Paper:*** **Recent Developments in Standardization in IEC TC 110, Electronic Display Devices: Reflecting Market Interests**
Kei Hyodo, Konica Minolta, Inc., Hachioji, Japan

48.3: **Optical Measurement Method for Transparent LCDs**
Xinli Ma, BOE Technology Group Co., Ltd., Beijing, China

48.4: **General Metrology Framework for Determining the Ambient Optical Performance of Flat-Panel Displays**
John Penczek, University of Colorado, Boulder, CO, USA, and National Institute of Standards and Technology, Boulder, CO, USA

48.5: **Optical Measuring Methods for Transparent Displays**
John Penczek, University of Colorado, Boulder, CO, USA, and National Institute of Standards and Technology, Boulder, CO, USA

Session 49: FFS/IPS II *(Liquid-Crystal Technology)*

Thursday, June 4 / 10:40 am – 12:00 pm / Room LL20D

Chair: *Takahiro Ishinabe, Tohoku University*

Co-Chair: *Jae Hoon Kim, Hanyang University*

49.1: ***Invited Paper:*** **n-FFS vs. p-FFS: Who Wins?**
Shin-Tson Wu, University of Central Florida, Orlando, FL, USA

49.2: **Image-Sticking Reduction of FFS-LCDs**
Daming Xu, University of Central Florida, Orlando, FL, USA

49.3: **Analysis of Press Mura in FFS-LCDs**
Yu-Ling Yeh, AU Optronics Corp., Hsinchu, Taiwan, ROC

49.4: **A High-Transmittance IPS LC Mode Using a New Self-Aligned Structure**
Sun-Hwa Lee, LG Display Co., Ltd., Gyeonggi-do, South Korea

Session 50: Effect of Lighting on Health and Perception *(IES Lighting Track)*

Thursday, June 4 / 10:40 am – 12:00 pm / Room LL20EF

Chair: *James Larimer, ImageMetrics LLC*

Co-Chair: *Ingrid Heynderickx, Eindhoven University of Technology*

50.1: ***Invited Paper:*** **The Importance of Melanopsin Activation in Perception, Health, and Lighting Design**
Dingcai Cao, University of Illinois at Chicago, Chicago, IL, USA

50.2: ***Invited Paper:*** **Stroboscopic Effect of LED Lighting**
Lili Wang, Southeast University, Nanjing, China
50.3: ***Invited Paper:*** **Perceptual Accuracy in the Visualization of Lighting Scenes**
Michael Murdoch, Philips Research, Eindhoven, The Netherlands
50.4: **Relationship between Short-Term and Long-Term Assessment of Glare**
Yan Tu, Southeast University, Nanjing, China

Session 51: High-Performance Oxide TFTs II *(Active-Matrix Devices)*
Thursday, June 4 / 1:30 – 2:50 pm / Ballroom 220B
Chair: *Kalluri Sarma, Honeywell, Inc.*
Co-Chair: *Tohru Nishibe, Japan Display, Inc.*
51.1: **a-IGZTO TFTs with High Mobility and Reliability**
Chih-Yu Su, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China
51.2: **Development of a High-Mobility Zinc-Oxynitride TFT for AMOLED Displays**
Liangchen Yan, BOE Technology Group Co., Ltd., Beijing, China
51.3: **A Mobility-Enhancing Method Adopting a Multi-Active-Layer Structure in TFTs**
Ming-Yen Tsai, National Sun Yat-Sen University, Kaohsiung, Taiwan, ROC

Session 52: OLED Devices III *(OLEDs)*
Thursday, June 4 / 1:30 – 2:50 pm / Ballroom 220C
Chair: *Sven Zimmermann, Novaled AG*
Co-Chair: *Yasunori Kijima, JOLED, Inc.*
52.1: **Analysis of Self-Heating and Negative Capacitance in Organic Semiconductor Devices**
Evelyne Knapp, Zurich University of Applied Sciences, Winterthur, Switzerland
52.2: **Non-Destructive Analyses of Operational Degradation of OLED Devices**
Toshihiro Yoshioka, Chemical Materials Evaluation Research Base (CEREBA), Tsukuba, Japan
52.3: **Exciton Management in Non-Doped Ultra-Thin Emissive-Layer-Based OLED Displays**
Te Tan, Shanghai Jiao Tong University, Shanghai, China

Session 53: Touch, Interactivity, and Human-Machine Interface *(Vehicular / Touch and Interactivity)*
Thursday, June 4 / 1:30 – 2:50 pm / Room LL20A
Chair: *Silviu Pala, Denso International America*
Co-Chair:
53.1: **New Evaluation Method for Vibro-Tactile Haptic Systems in Terms of Human Perception**
Beomshik Kim, Samsung Display Co., Ltd., Yongin, South Korea
53.2: **Visual Search and Attention: What Eye-Tracking Reveals about Visual Performance in the Curved Display**
Hyeon-Jeong Suk, KAIST, Daejeon, South Korea
53.3: **TBA**
53.4: **Metal-Mesh Design for High-ppi LCD Application**
Chun Chen, General Interface Solution, Ltd., Miaoli, Taiwan, ROC

Session 54: Transparent Display Systems *(Display Systems)*
Thursday, June 4 / 1:30 – 2:50 pm / Room LL20BC
Chair: *Bill Cummings, BYDU Technology Services*
Co-Chair: *Jean-Pierre Guillou, Apple, Inc.*
54.1: **A Switched Emissive Transparent Display with Controllable Per-Pixel Opacity**
Quinn Smithwick, Disney Research, Glendale, CA, USA
54.2: **A Novel Flat-Type Transparent LCD**
Chia-Wei Kuo, AU Optronics Corp., Hsinchu, Taiwan, ROC
54.3: **A Polymer-Stabilized Cholesteric Texture (PCST) for Switchable Transparent LCDs**
Alireza Moheghi, Liquid Crystal Institute, Kent State University, Kent, OH, USA
54.4: **High-Contrast Smart-Window OLED Device with New Black-Screen Technique**
Jang Hyuk Kwon, Kyung Hee University, Seoul, South Korea

Session 55: LC Beyond Displays *(Liquid-Crystal Technology)*
Thursday, June 4 / 1:30 – 2:50 pm / Room LL20D
Chair: *Philip Chen, National Chiao Tung University*
Co-Chair: *Xiaoyang Sun, Chinese Academy of Sciences*
55.1: ***Invited Paper:*** **Liquid Crystals for Smart Antennas and Other Microwave Applications**
Michael Wittek, Merck KGaA, Darmstadt, Germany
55.2: ***Invited Paper:*** **Rethinking Wireless Communications: Advanced Antenna Design Using LCD Technology**
Ryan Stevenson, Kymeta Corp., Redmond, WA, USA
55.3: **A Low-Voltage Fast-Response IR Spatial Light Modulator**
Fenglin Peng, University of Central Florida, Orlando, FL, USA

Session 56: Advanced Lighting Applications *(IES Lighting Track)*
Thursday, June 4 / 1:30 – 2:50 pm / Room LL20EF
Chair: *Ingrid Heynderickx, Eindhoven University of Technology*
Co-Chair: *Po-Chieh Hung, Konica Minolta Sensing*

56.1: ***Invited Paper:*** **Creating an Effective Lighting Environment with Task, Surround, and Ambient Lighting**
Peter Ngai, Acuity Brands Lighting, Berkeley, CA, USA

56.2: ***Invited Paper:*** **Progress in Color-Rendition Metrics for Lighting**
David *Aurelien, Soraa, Fremont, CA, USA*

56.3: ***Invited Paper:*** **New Color-Rendering Standards and Implications for Displays that Provide Illumination**
Lorne Whitehead, University of British Columbia, Vancouver, British Columbia, Canada

56.4: **Forward-Looking Light-Sensor Utilization for Automatic Luminance Control**
Paul Weindorf, Visteon Corp., Van Buren Township, MI, USA

Session 57: Oxide and LTPS TFTs *(Active-Matrix Devices / Oxide and LTPS TFTs)*

Thursday, June 4 / 3:10 – 4:30 pm / Ballroom 220B

Chair: *James Chang, Apple, Inc.*

Co-Chair: *Norbert Fruehauf, University of Stuttgart*

57.1: ***Invited Paper:*** **High-Performance Poly-Si TFTs Using Pressure-Induced Nucleation Technology**
Myung-Koo Kang, Samsung Electronics Co., Gyronggi-do, South Korea

57.2: **Electrical Characterization of BCE-TFTs with IGZTO Oxide Semiconductor Compatible with Cu and Al Interconnections**
Mototaka Ochi, Kobe Steel, Ltd., Kobe, Japan

57.3: **New Pixel Circuits for Controlling Threshold Voltage by Back-Gate BiasVoltage Using Crystalline-Oxide-Semiconductor FETs**
Makoto Kaneyasu, Semiconductor Energy Laboratory, Co., Ltd., Kanagawa, Japan

57.4: ***Invited Paper:*** **Device Physics of Amorphous-Oxide TFTs**
Ananth Dodabalapur, The University of Texas at Austin, Austin, TX, USA

Session 58: OLED Displays I *(OLEDs)*

Thursday, June 4 / 3:10 – 4:30 pm / Ballroom 220C

Chair: *Tariq Ali, eMagin Corp.*

Co-Chair: *Chin Hsin (Fred) Chen, Guangdong Aglaia Optoelectronic Materials Co., Ltd.*

58.1: **A Study of Adaptive Temporal Aperture Control for OLED Displays with Motion Vector**
Takenobu Usui, NHK Science & Technology Research Laboratories, Tokyo, Japan

58.2: **High-Performance Large-Sized OLED TV with UHD Resolution**
Yu-Hung Chen, AU Optronics Corp., Hsinchu, Taiwan, ROC

58.3: **A Novel Highly Transparent 6-in. AMOLED Display Consisting of IGZO TFTs**
Chia-Tse Lee, Chunghwa Picture Tubes, Taoyuan, Taiwan, ROC

58.4: **A 31-in. 4K x 2K WRGB AMOLED TV with a High-Stability IGZO Backplane**
Chih-Yu Su, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

Session 59: Next-Generation Automotive Display Technologies II: Flexible, Curved, Coatings (*Vehicular)*

Thursday, June 4 / 3:10 – 4:10 pm / Room LL20A

Chair: *Takatoshi Tsujimura, Konica Minolta, Inc.*

Co-Chair:

59.1: **TBA**

59.2: **Highly Stable and Transparent Oxide TFTs for Rollable Displays**
Jin Jang, Kyung Hee University, Seoul, South Korea

59.3: **Functional Transparent Coatings for Displays**
Songwei Lu, PPG Industries, Inc., Allison Park, PA, USA

59.4: **A Curved Cover with Carbon-NanoBud Touch for Mobile Applications**
Erkki Soininen, Canatu Oy, Helsinki, Finland

Session 60: Capacitive Touch *(Touch and Interactivity)*

Thursday, June 4 / 3:10 – 4:30 pm / Room LL20BC

Chair: *Jeff Han, Microsoft*

Co-Chair: *John Zhong, Apple, Inc.*

60.1: **A Capacitive Touch Panel for Simultaneous Detection of Non-Conductive and Conductive Objects**
Christopher Brown, Sharp Laboratories of Europe, Oxford, UK

Session 61: Liquid-Crystal Lenses *(Liquid-Crystal Technology)*

Thursday, June 4 / 3:10 – 4:30 pm / Room LL20D

Chair: *Philip Bos, Kent State University*

Co-Chair: *Hoi-Sing Kwok, Hong Kong University of Science & Technology*

61.1: **Variable-Lens-Pitch LC GRIN Lens for Adapting a 3D Viewing Angle**
Ayako Takagi, Toshiba Corp., Kawasaki, Japan

61.2: **Dependence of Optical Power of an LC Lens on Cell Gap**
Mao Ye, SuperD Co., Ltd., Shenzhen, China

61.3: **Ultra-Compact Non-Mechanical Zoom Lens for Enhanced Machine Vision and Computer Input Applications**
Philip Bos, Liquid Crystal Institute, Kent State University, Kent, OH, USA

Session 62: Advanced Light Sources, Components, and Systems II *(IES Lighting Track)*

Thursday, June 4 / 3:10 – 4:30 pm / Room LL20EF

Chair: *Bob Horner, IES*

Co-Chair: *Mike Lu, Acuity Brands Lighting*

62.1: ***Invited Paper:*** **Application-Specific Spectral Power Distributions of White Light**
Po-Chieh Hung, Konica Minolta Laboratory U.S.A., Inc., San Mateo, CA, USA

62.2: ***Invited Paper:*** **LED Life vs. LED System Life**
Nadarajah Narendran, Lighting Research Center, Troy, NY, USA

62.3: **Speckle Contrast Reduction in a Blue-Laser-Diode-Pumped Micro-Vibrated Reflective Phosphor Paper for Lighting-Source Applications**
Shih-Yu Tu, GIPO and National Taiwan University, Taipei, Taiwan, ROC

Session 63: High-Resolution Displays *(Active-Matrix Devices / Oxide and LTPS TFTs)*

Friday, June 5 / 9:00 – 10:20 am / Ballroom 220B

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

Co-Chair: *Kenichi Takatori, NLT Technologies, Ltd.*

63.1: **An Ultra-High-Density 736-ppi LCD Using an InGaZnO Platform**
Naoki Ueda, Sharp Corp., Nara, Japan

63.2: **A 2K x 4K 550-ppi In-Cell Touch TFT-LCD Using 1.5-µm Channel-Width LTPS TFTs**
Takashi Nakamura, Japan Display, Inc., Saitama, Japan

63.3: **Fabrication of 8K x 4K Organic EL Panel Using High-Mobility IGZO Material**
Kenichi Okazaki, Advanced Film Device, Inc., Tochigi, Japan

63.4: **High-Performance 4K x 2K 65-in. TV with BCE-Type Oxide TFTs**
Bo-Liang Yeh, AU Optronics Corp., Hsinchu, Taiwan, ROC

Session 64: OLED Displays II: Curved and High Resolution *(OLEDs / Curved and High-Resolution Displays)*

Friday, June 5 / 9:00 – 10:20 am / Ballroom 220C

Chair: *Yusin Lin, AU Optronics Corp.*

Co-Chair: *Changwoong Chu, Samsung Display Co., Ltd.*

64.1: **Slim Design of an 65-in. UHD OLED TV**
Koichi Miwa, LG Display Co., Ltd., Gyeonggi-do, South Korea

64.2: **Panel and Circuit Designs for the World's First 65-in. UHD OLED TV**
Ryosuke Tani, LG Display Co., Ltd., Gyeonggi-do, South Korea

64.3: **Development of 55-in. UHD AMOLED TV**
Zhong-Yuan Wu, BOE Technology Group Co., Ltd., Beijing, China

Session 65: Flexible Display Technology *(e-Paper and Flexible Displays)*

Friday, June 5 / 9:00 – 10:20 am / Room LL20A

Chair: *Janglin Chen, DTC/ITRI*

Co-Chair: *Chuyu Liu, AU Optronics Corp.*

65.1: ***Invited Paper:*** **World's First Large-Sized 18-in. Flexible OLED Display and Key Technologies**
Jong-Geun Yoon, LG Display Co., Ltd., Gyeonggi-do, South Korea

65.2: ***Invited Paper:*** **Bias-Stress-Induced Charge Trapping at Flexible Polymer Gate Dielectric in Organic TFTs**
Kilwon Cho, Pohang University of Science and Technology, Pohang, South Korea

65.3: **Development of Flexible Displays Using Back-Channel-Etched In–Sn–Zn–O TFTs and Air-Stable Inverted OLEDs**
Mitsuru Nakata, NHK Science & Technology Research Laboratories, Tokyo, Japan

65.4: **Organic-TFT-Driven Backplane for Flexible Electrophoretic Display**
Wen-Chung Tang, E Ink Holding, Inc., Hsinchu, Taiwan, ROC

Session 66: Stereoscopic 3D Displays *(Display Systems / Projection)*

Friday, June 5 / 9:00 – 10:20 am / Room LL20BC

Chair: *Fujio Okumura, NEC Corp.*

Co-Chair: *Han Ping Shieh, Display Institute, National Chiao Tung University*

66.1: **Feasibility of 3D Cinema with Uncompromised Performance**
Gary Sharp, RealD, Boulder, CO, USA

66.2: **Tracked Automultiscopic 3D Tabletop**
Quinn Smithwick, Disney Research, Glendale, CA, USA

66.3: **Smooth-Motion-Parallax Autostereoscopic 3D Display Using Linear Blending of Viewing Zones**
Munekazu Date, NTT Media Intelligence Laboratories, Nippon Telegraph and Telephone Corp., Kanagawa, Japan

66.4: ***Invited Paper:*** **Circularly Polarized (CPL) 3D Monitors Attract Attention Again for Medical Applications**
Takahito Tanabe, Arisawa Manufacturing Co., Ltd., Niigata, Japan

Session 67: Photo Alignment *(Liquid-Crystal Technology)*

Friday, June 5 / 9:00 – 10:20 am / Room LL20D

Chair: *Cheng Chen, Apple, Inc.*

Co-Chair: *Matthew Sousa, 3M Co.*

67.1: **Reactive Mesogen Stabilized Azodye Alignment for High-Contrast Displays**
Valerie Finnemeyer, Liquid Crystal Institute, Kent State University, Kent, OH, USA

67.2: **Fabrication of a Zero-Pretilt Liquid-Crystal Cell Using UV-Curable Polymer**
Tae-Hoon Yoon, Pusan National University, Busan, South Korea

67.3: **Photo-Stable Azo-Dye Photo-Alignment Polymer Surface for IPS-LCDs**
Man Chun Tseng, Hong Kong University of Science and Technology, Kowloon, Hong Kong

Session 68: Touch Systems and Materials *(Touch and Interactivity / Display Manufacturing / Vehicular)*

Friday, June 5 / 9:00 – 10:20 am / Room LL21EF

Chair: *Willem den Boer, Guardian Industries*

Co-Chair: *Reiner Mauch, Schott AG*

68.1: ***Invited Paper:*** **Panel-Structure Evolution of In-Cell Capacitive Touch Sensor**
Qijun Yao, Shanghai Tianma Microelectronics Co., Ltd., Shanghai, China

68.2: **Study of the Optimized Design for High-Resistance Black Matrix at In-Cell Touch Structure**
Younsung Na, LG Display Co., Ltd, Gyeonggi-do, South Korea

Session 69: Oxide-TFT Reliability *(Active-Matrix Devices)*

Friday, June 5 / 10:40 am – 12:00 pm / Ballroom 220B

Chair: *Yoshitaka Yamamoto, Semiconductor Energy Laboratory Co., Ltd.*

Co-Chair: *Hyun Jae Kim, Yonsei University*

69.1: ***Invited Paper:*** **Advantages of the Self-Aligned Top-Gate Oxide-TFT Technology for AMOLED Displays**
Toshiaki Arai, JOLED, Inc., Kanagawa, Japan

69.2: **Highly Reliable a-IGZO TFTs with Self-Aligned Coplanar Structure for Large-Sized UHD OLED TV**
Chanki Ha, LG Display Co., Ltd., Gyeonggi-do, South Korea

69.3: **a-IGZO TFT Reliability Improvement by Using a Dual-Gate Structure**
Kuo-jui Chang, AU Optronics Corp., Hsinchu, Taiwan, ROC

Session 70: OLED Displays III *(OLEDs)*

Friday, June 5 / 10:40 am – 12:00 pm / Ballroom 220C

Chair: *C. C. Lee, BOE Technology Group Co., Ltd.*

Co-Chair: *Yusin Lin, AU Optronics Corp.*

70.1: **High-Resolution OLED Display with the Lowest Level of Power Consumption Using a Blue/Yellow Tandem Structure and RGBY Subpixels**
Ryohei Yamaoka, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

70.2: **An 81-in. 8K x 4K OLED Kawara-Type Multidisplay Providing a Seamless Continuous Image**
Hisao Ikeda, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

70.3: **Low-Power-Consumption and Wide-Color-Gamut AMOLED Display Having Four Primary Colors**
Chung-Chia Chen, AU Optronics Corp., Hsinchu, Taiwan, ROC

70.4: **A 2.78-in 1058-ppi UHD OLED Display Using CAAC-OS FETs**
Kohei Yokoyama, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Session 71: Flexible Encapsulation *(e-Paper and Flexible Displays)*

Friday, June 5 / 10:40 am – 12:00 pm / Room LL20A

Chair: *Kyung Cheol Choi, KAIST*

Co-Chair: *Bo-Ru Yang, Sun Yat-Sen University*

71.1: **High-Throughput and Scalable Spatial Atomic Layer Deposition of Al_2O_3 as a Moisture Permeation Barrier for a Flexible OLED Display**
Hagyoung Choi, LIG ADP Co., Ltd., Seongnam, South Korea

71.2: **Mechanical Characteristics of Flexible AMOLED Displays**
Ji-Feng Chen, AU Optronics Corp., Hsinchu, Taiwan, ROC

71.3: **Quantification of Water Penetration and Degradation through Adhesives Applicable to Flexible OLED Design**
Yoshiko Ohzu, Chemical Materials Evaluation and Research Base (CEREBA), Ibaraki, Japan

Session 72: Curved or High-Resolution Large Displays *(Display Systems / Curved and High-Resolution Displays)*

Friday, June 5 / 10:40 am – 12:00 pm / Room LL20BC

Chair: *Wei Chen, Apple, Inc.*

Co-Chair: *Brian Berkeley, Independent*

72.1: **World's First 55-in. 120-Hz-Driven 8K x 4K IPS-LCDs with Wider Color Gamut**
Ryutaro Oke, Panasonic Liquid Crystal Display Co., Ltd., Himeji, Japan

72.2: **Development and Analysis of Technical Challenges in the World's Largest (110-in.) Curved LCD**
Ken Hsiao, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

72.3: **The Mechanical Reliability of Glass Displays in Bending**
K. Hemanth Vepakomma, Corning Incorporated, Corning, NY, USA

72.4: **Development of a Laser Optical System for a 4K Laser-Backlit LCD TV**
Nami Okimoto, Mitsubishi Electric Corp., Advanced Technology R&D Center, Nagaokakyo, Japan

Session 73: Ultra-Low-Power LCDs *(Liquid-Crystal Technology)*

Friday, June 5 / 10:40 am – 12:00 pm / Room LL20D

Chair: *Gang Xu, Hewlett-Packard Co.*

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

73.1: **A Novel Pixel Structure for High-Transmittance and High-Image-Quality LCDs**
Joon-Dong Lee, LG Display Co., Ltd., Gyeonggi-do, South Korea

73.2: **A Novel TFT Pixel and Driving Scheme of Electrically Suppressed-Helix FLC for Active-Matrix FPDs**
Tsz Kin Ho, Hong Kong Univeristy of Science and Technology, Kowloon, Hong Kong

73.3: **Elimination of Image Flicker in an FFS Mode under Low-Frequency Driving**
Tae-Hoon Yoon, Pusan National University, Busan, South Korea

73.4: **Reflective LCD with High Reflectivity and Color Reproductivity for Reduced Eye Strain**
Daisuke Kubota, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Session 74: Touch Applications *(Touch and Interactivity)*
Friday, June 5 / 10:40 am – 12:00 pm / Room LL20EF
Chair: *Deuksu Lee, LG Display Co., Ltd.*
Co-Chair: *Bob Senior, Canatu Oy*

74.1: **A Novel Near-Field Three-Dimensional User-Interface Technology**
Russ Gruhlke, Qualcomm Technologies, Santa Clara, CA, USA

74.2: ***Invited Paper:*** **What Lies Beyond Multitouch?**
Chris Harrison, Carnegie-Mellon University, Pittsburgh, PA, USA

Poster Session
Thursday, June 5 / 4:00 – 7:00 pm / Ballroom 220A

Active-Matrix Devices

P.1: **Current-Supplying Driving Method of Active-Matrix Ionic Polymer-Metal Composites for Stereoscopic Displays**
Mutsumi Kimura, Ryukoku University, Otsu, Japan

P.2: **A Novel Method for LTPS Model Extraction with Hysteresis and Transient Current Analysis**
Chen-Hao Kuo, AU Optronics Corp., Hsinchu, Taiwan, ROC

P.3: **A New LTPS Pixel Circuit for Compensating the Variation of TFT Characteristics and Alleviating OLED Degradation**
Wei-Chu Hsu, AU Optronics Corp., Hsinchu, Taiwan, ROC

P.4: **Feasibility Study of a Dual-Gate Photosensitive TFT for Fingerprint-Sensor-Integrated Active-Matrix Display**
Kai Wang, Sun Yat-Sen University – Carnegie-Mellon University Joint Institute of Engineering, Guangdong, China

P.5: **Oxide Semiconductor/Polypropylene Carbonate Paste for a TFT Using Screen Printing**
Akinari Matoba, Industrial Research Institute of Ishikawa, Ishikawa, Japan

P.6: **Impact of Buffer Layers on the Self-Aligned Top-Gate a-IGZO TFT Characteristics**
Manoj Nag, imec, Leuven, Belgium

P.7: **Improvement of PBTS Stability in Top-Gate Coplanar Amorphous-InGaZnO TFTs**
Saeroonter Oh, LG Display Co., Ltd., Gyeonggi-do, South Korea

P.8: **Investigation the Degradation Behavior of Bottom/Top-Gate Sweep under Negative-Bias Illumination Stress in Dual-Gate InGaZnO TFTs**
Ming-Yen Tsai, National Sun Yat-Sen University, Kaohsiung, Taiwan, ROC

P.9: **Improved Electrical Stability of Double-Gate a-IGZO TFTs**
Zhang Shengdong, Peking University, Shenzhen, China

P.10: **Comparative Studies of ZnON and ZnO TFTs Fabricated by DC Reactive Sputtering Method**
Jin-Seong Park, Chungnam National University, Seoul, South Korea

P.11: **Channel-Etched CAAC-OS FETs Using Multi-Layered IGZO**
Yukinori Shima, Advanced Film Device, Inc., Tochigi, Japan

P.12: **A Study on the Characteristics of Crystalline IGZO TFTs**
Jang-Yeon Kwon, Yonsei University, Incheon, South Korea

P.13: **The Influence of Nano-Scale Crystal Structures of Oxide Semiconductors on FETs**
Yoichi Kurosawa, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

P.14: **A Narrow-Bezel FFS-Mode WQHD 4.9-in. 600-ppi LCD with a Modified ESL-Type a-IGZO TFT**
En-Chih Liu, Chunghwa Picture Tubes, Ltd., Taoyuan, Taiwan, ROC

P.15: **Self-Aligned Top-Gate Zinc-Oxide TFTs Fabricated by Reactive Sputtering of a Metallic Zinc Target**
Meng Zhang, Hong Kong University of Science and Technology, Kowloon, Hong Kong

P.16: **Research on Dual-Layer Channel ITO/MZO TFTs Fabricated on Glass at Low Temperature**
Pan Shi, Peking University, Shenzhen, China

P.17: **High-Mobility ITZO BCE-Type TFTs for AMOLED Applications**
Fengjuan Liu, BOE Technology Group Co., Ltd., Beijing, China

P.18: **Extraction and Simulation with Time-Dependent Voltage-Threshold-Shift Model for IGZO Panel**
Zhong-Yuan Wu, BOE Technology Group Co., Ltd., Beijing, China

P.19: **Effect of Strain on the Characteristics of a-IGZO TFTs Fabricated on Engineered Aluminum Substrates**
Forough Mahmoudabadi, Lehigh University, Bethlehem, PA, USA

P.20: **The Effect of Oxide-TFT Design on Voltage-Threshold Shift**
Xiaolin Wang, BOE Technology Group Co., Ltd., Beijing, China

P.21: **Effects of Low-Hydrogen Dielectric Film on a-IGZO TFT Properties**
Xiaodi Liu, BOE Technology Group Co., Ltd., Beijing, China

P.22: **High-Performance a-IGZO TFT with Cu Gate, Source, and Drain Electrodes**
Xiaming Zhu, BOE Technology Group Co., Ltd., Beijing, China

P.23: **Simulation Calibration Procedure of Leakage Current in TFTs**
Nam-Kyun Tak, Silvaco Korea, Seoul, South Korea

P.24: **Bridged-Grain Metal-Induced Crystallization of Poly-Si TFT Process with Shorter Annealing Time**
Rongsheng Chen, Hong Kong University of Science and Technology, Kowloon, Hong Kong

P.25: **Enhanced Positive-Bias-Stress Stability of a-IGZO TFTs with a Vertically Graded Oxygen-Vacancy Active Layer**
Hyun Jae Kim, Yonsei University, Seoul, South Korea

P.26: **High-Capacity Memory Using Oxide-Based Schottky Diode and Unipolar Resistive Array**
Po-Tsun Liu, National Chiao Tung University, Hsinchu, Taiwan, ROC

Applications

P.27: **Diffractive Color Splitter for High-Efficiency LCDs**
Jose Dominguez-Caballero, Intel Corp., Santa Clara, CA, USA

P.28: **Contrast Enhancement for an Imaging System Using Electrically Tunable Liquid-Crystal Lens**
Mao Ye, SuperD Co., Ltd., Shenzhen, China

P.29: **A Polymer/Fullerene-Based Material in Near-Infrared Photodetector Applications**
Hsia-Tsai Hsiao, AU Optronics Corp., Hsinchu, Taiwan, ROC

P.30: **A Study on the Viewing Zone of Curved Barrier-Type Autostereoscopic Displays**
Wei-Chieh Lin, National Taiwan University, Taipei, Taiwan, ROC

Applied Vision / Human Factors

P.31: **Will Curved Displays Become Mainstream in Electronics? Appraisal for Aesthetic and Usability Aspects of Curved Large Displays**
Hyeon-Jeong Suk, KAIST, Daejeon, South Korea

P.32: **Impact of 3D Visualization Conditions on the Contrast Sensitivity Function**
Johanna Rousson, Barco NV and iMinds-IPI-TELIN, Ghent University, Kortrijk, Belgium

P.33: **A Comprehensive Evaluation of Visual Fatigue When Viewing Small Autostereoscopic Displays**
Danli Wang, Institute of Software, Chinese Academy of Sciences, Beijing, China

P.34: **Curved OLED Displays to Effectively Enhance Natural3D**
Shunpei Yamazaki, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

P.35: **The Prospect Assessment of 65-in.+ TVs Based on the Size of Mainstream Living Rooms in China**
Feng Jiang, BOE Technology Group Co., Ltd., Beijing, China

P.36: **Subjective Size of News Presenation Shrinking with Recent Enlargement of Display Size in Japan**
Sakuichi Ohtsuka, Kagoshima University, Kagoshima, Japan

Display Electronics

P.37: **A 5-Gbps/Lane Intra-Panel Interface for UHD TFT-LCD Application**
Yu Chi Kang, AU Optronics Corp., Hsinchu, Taiwan, ROC

P.38: **A Narrow-Gate Driver Circuit with a-Si TFTs for 8-in. WQXGA TFT-LCD Panel**
Chun-Da Tu, AU Optronics Corp., Hsinchu, Taiwan, ROC

P.39: **High-Speed and Power-Savings Interface for High-Resolution and Low-Power Display Panel**
Chun-Jen Su, ILI Technology Corp., Hsinchu, Taiwan, ROC

P.40: **Development and Evaluation: Image-Processing Algorithms for Reducing Image Sticking**
Chia-Chun Chang, AU Optronics Corp., Hsinchu, Taiwan, ROC

P.41: **New a-IGZO TFT Gate Driver Circuit with Threshold Voltage Shift Recovery Driving Scheme**
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan, ROC

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P.43: **New Pixel Circuit to Improve Current Uniformity for High-Resolution AMOLED Displays**
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan, ROC

P.44: **New Pixel Circuit with Simple Driving Scheme for AMOLED Displays**
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan, ROC

P.45: **Simple Low-Noise Gate-Driver Circuit for Slim-Border and High-Resolution Applications**
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan, ROC

P.46: **Row-Division Driving Scheme for AMOLED Display**
Zhang Shengdong, Peking University, Shenzhen, China

P.47: **Algorithm for Regional Mura Reduction by Using Gamma-Curve Transformation in LCD Panels**
Hu Liang, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.48: **A Simple Low-Temperature Workable a-Si:H TFT Integrated Gate Driver on Array**
Liao Congwei, Peking University, Shenzhen, China

P.49: **The Sequential Vcom Swing Circuit for Contrast Improvement**
Kyujin Kim, LG Display Co. Ltd., Gyeonggi-do, South Korea

P.50: **Integrated Gate-Driver Circuit Employing IGZO TFTs for AMOLED Compensative Pixel Driving**
Kun Cao, BOE Technology Group Co., Ltd., Beijing, China

P.51: **A Compact a-IGZO TFT-Based Digital-to-Analog Converter for Flexible Displays**
Jin Jang, Kyung Hee University, Seoul, South Korea

P.52: **High-Gain Source Followers Driven by Corbino Oxide TFTs for Integrated Display Data Drivers**
Jin Jang, Kyung Hee University, Seoul, South Korea

Display Manufacturing

P.53: **Study on the Interface between Passivation and Insulator Layers in TFTs by Using an Organic Process**
Zhao Na, BOE Technology Group, Ltd., Hefei, China

P.54: **WCS Material Development of the FIT M+ Structure to Reduce Power Consumption of Large-Sized UHD TVs**
Chul Ho Park, LG Display Co., Ltd., Gyeonggi-do, South Korea

P.55: **Process Development of Integrated Vcom and PAS Using Wet-Etching Bias for High-Resolution TFT-LCDs**
Hee Young Kwack, LG Display Co., Ltd., Gyeonggi-do, South Korea

P.56: **High-Resolution OLED Panel Fabricated by Ink-Jet-Printing Process**
Peng Yu Chen, AU Optronics Corp., Hsinchu, Taiwan, ROC

P.57: **OLED Lighting Devices Fabricated by Flexography Printing Consisting of Silver Nanowire and a Conducting Polymer**
Tadahiro Furukawa, Yamagata University, Yamagata, Japan

P.58: **A Highly Stable Organic-TFT Array Fabricated on Glass Substrates Using Direct Photolithography**
Yingtao Xie, Jiao Tong University, Shanghai, China

P.59: **A 6-in. Full-Color AMOLED with Improved Bonding Strength of Laser-Frit Encapsulations**
Yi Chiu, Chunghwa Picture Tubes, Ltd., Taoyuan, Taiwan, ROC

P.60: **Newly Developed High-Strength Glass for Mobile Devices**
Hikaru Ikeda, Nippon Electric Glass Co., Ltd., Shiga, Japan

P.61: **Novel Silicone-Based Optical Bonding Sheet with Enhanced Adhesivity**
Yousuke Ono, Taica Corp., Tokyo, Japan

P.62: **Silicone Adhesive Providing Protection, Waterproofing, and Rework Ability for Precision Assembly of Electronic Devices**
Ryan Schneider, Dow Corning Corp., Midland, MI, USA

P.63: **Effect of Glass Substrate Characteristics on Pattern Tolerance in Inverted-Staggered-Type TFT-Array Fabrication**
Kazutaka Hayashi, Asahi Glass Co., Ltd., Kanagawa, Japan

P.64: **Influence of Laser-Sealing Process on the Frit Hermetical Performance**
Alex Xiao, BOE Ordos Yuansheng Optoelectronis Co., Ltd., Ordos, China

P.65: **Advanced Processing of ITO and IZO Thin Films on Flexible Glass**
Manuela Junghaehnel, Fraunhofer Institute for Organic Electronics, Dresden, Germany

P.66: **Crystallized Thin Film Using a Carbon-Nanotube Electron Beam (C-beam) for High-Performance TFTs**
Kyu Chang Park, Kyung Hee University, Seoul, South Korea

Display Measurement

P.67: **Viewing Angle and Imaging Multispectral Characterization of OLED Displays**
Pierre Boher, ELDIM, Herouville, France

P.68: **An Efficient Simulation Algorithm for Analysis of Moiré Patterns in Display Systems**
Taek-Sung Lee, KIST, Seoul, South Korea

P.69: **Compensation of View Profile for More-Reliable Cross-Talk Value of a Multi-View 3D Display**
Seondeok Hwang, Samsung Electronics Co., Gyeonggi-do, South Korea

P.70: **Novel Sparkle Measurement Method for Use on TFT-LCDs**
Yu-Han Chiang, AU Optronics Corp., Hsinchu, Taiwan, ROC

Display Systems

P.71: **A 3D/2D Convertible Integral-Imaging Display with High Optical Efficiency**
Qiong-Hua Wang, Sichuan University, Chengdu, China

P.72: **Non-Unified Elemental Image-Array Generation Method for Moiré-Reduced Integral-Imaging System**
Qiong-Hua Wang, Sichuan University, Chengdu, China

P.73: **Estimation of Lenticular Lens Parameters Using a Single Image for Crosstalk Reduction of a 3D Multi-View Display**
Hyoseok Hwang, Samsung Electronics Co., Gyeonggi-do, South Korea

P.74: **View-Map Redesign Method for Optical Error Compensation by 3D Panel**
Myung-Soo Park, LG Display Co., Ltd., Gyeonggi-do, South Korea

P.75: **Autostereoscopic 3D Projection Display with Low Crosstalk**
Qiong-Hua Wang, Sichuan University, Chengdu, China

P.76: **Autostereoscopic 2D/3D Switchable Display with Electrode-Driven Liquid-Crystal Lens**
Wu Kun, BOE Technology Group Co., Ltd., Beijing, China

P.77: **Power Savings by Combined Global and Local Dimming for Edge-LED LCDs**
Daniel Schäfer, Institute of Microelectronics, Saarland University, Saarbruecken, Germany

P.78: **A Novel Autostereoscopic Display without Moiré**
Lei Niu, Shanghai Tianma Microelectronics Co. Ltd., Shanghai, China

P.79: **Maximizing the 2D Viewing Field of a Computational Two-Layer 3D Display**
Xiao Wei Sun, Nanyang Technological University, Singapore

P.80: **Use of Multiple Orthographic Image Interleaving to Generate a Tilted Elemental Image Array at an Arbitrary Angle**
Qiong-Hua Wang, Sichuan University, Chengdu, China

Emissive Displays

P.81: **Non-Quasi-Static Measurement in Random-Network Carbon-Nanotube TFTs for Next-Generation Displays**
Changhee Lee, Seoul National University, Seoul, South Korea

P.82: **Doubling the Light Outcoupling Efficiency of Quantum-Dot LEDs**
Ruidong Zhu, University of Central Florida, Orlando, FL, USA

P.83: **Oxygen Annealing Effect on the Enhancement of Green Emission from ZnO Nanorods Recrystallized Growth from Sputtered ZnO Thin Film**
Chaoyang Li, Kochi University of Technology, Kami, Japan

P.84: **A Low-Cost High-Throughput Procedure Synthesis of Pure-Green Core-Multishell Quantum Dots**
Junjie Hao, South University of Science and Technology of China, Shenzhen, China

P.85: **Quantum-Dot-Enhanced Vivid-Color Liquid Displays**
Zhenyue Luo, Universityof Central Florida, Orlando, FL, USA

e-Paper and Flexible Displays

P.86: **High-Reliability Flexible OLED Display with Side-Sealing ALD Film**
Shunpei Yamazaki, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

P.87: **Applying Low-Temperature Thin-Film Encapsulation to a 6-in. IGZO Flexible AMOLED Disp;ay**
Ming Lai, Chunghwa Picture Tubes, Ltd., Taoyuan, Taiwan, ROC

P.88: **Enhancement of Electro-Optic Properties of Optically Isotropic Liquid-Crystal Device for Flexible Displays**
Seung Hee Lee, Chonbuk National University, Jeonju, South Korea

IES Lighting Track

P.89: **Effects of Nano-TiO_2 Particles on the Conversion Efficiency of a Quantum-Dot Light-Converting Nanocomposites**
Wei Chen, South University of Science and Technology of China, Shenzhen, China

P.90: **Phosphor-Converted White LED with High Angular CCT Uniformity by Adding Scattering Particles**
Wei-Shen Liao, National Taiwan University, Taipei, Taiwan, ROC

P.91: **Enabling a Low Circadian Rhythm to Impact Lighting on the Basis of "Candle-Light" Emitting OLEDs**
Jwo-Huei Jou, National Tsing-Hua University, Hsinchu, Taiwan, ROC

Liquid-Crystal Technology

Alignment

P.92: **Orientational Ordering of Nematic Liquid Crystal Aligned with a Directly Spinnable Carbon-Nanotube Web**
Hyojin Lee, Chonbuk National University, Jeonbuk, South Korea

P.93: **Highly Reliable Mobile LCD Using AlO_x Deposited by Atomic Layer Deposition for a Side-Sealing Structure**
Tetsuji Ishitani, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

P.94: **Fast-Response-Time Liquid-Crystal Using a Nanofiber and Polyimide Alignment Mixture**
Hyungmin Kim, Chonbuk National University, Jeonbuk, South Korea

P.95: **Anchoring-Energy Enhancement and Pre-Tilt-Angle Control of Liquid-Crystal Alignment on Polymerized Surfaces**
Libo Weng, Liquid Crystal Institute, Kent State University, Kent, OH, USA

Blue-Phase LCs

P.96: **Blue-Phase Dual-View LCD Based on Patterned Electrodes**
Qiong-Hua Wang, Sichuan University, Chengdu, China

P.97: **An Ultra-Low-Voltage Blue-Phase LCD for Mobile Applications**
Jiamin Yuan, University of Central Florida, Orlando, FL, USA

Display Modeling

P.98: **A New Blue-Pixel Design for Improving Side-View Performance**
Li-Xuan Chen, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.99: **Increasing the Rewriting Speed of Optically Rewritable e-Paper by Using an Electric Field**
Jiatong Sun, Hong Kong University of Science and Technology, Kowloon, Hong Kong

P.100: **Novel Method for Curved-Display Cell-Gap Measurement**
Wang-Shuo Kao, AU Optronics Corp., Hsinchu, Taiwan, ROC

P.101: **Temperature-Dependent Behavioral Model of Twisted-Nematic Pixel in AMLCDs**
Seung-Woo Lee, Kyung Hee University, Seoul, South Korea

FFS/IPS

P.102: **Drive Scheme for Fast Gray-to-Gray Response in a FFS LC Cell**
Tae-Hoon Yoon, Pusan National University, Busan, South Korea

P.103: **Improvement of Light Leakage in ADS-Mode LCDs**
Jaegeon You, BOE Technology Group Co., Ltd., Bejing, China

P.104: **A Novel Fringe-Field-Switching Mode with High Picture Quality**
Limei Jiang, InfoVision Optoelectronics (Kunshan) Co., Ltd., Kunshan, China

P.105: **Field-Induced Diffraction in Polymer-Stabilized IPS Liquid Crystals with Vertical Alignment**
Libo Weng, Liquid Crystal Institute, Kent State University, Kent, OH, USA

P.106: **A Simulation Method for an IPS-Mode Panel by Considering Light-Scattering Behavior**
Kazunori Okumoto, Mitsubishi Electric Corp., Kyoto, Japan

P.107: **Investigation of the Flexoelectric Effect in the Localized Area of an FFS Pixel Structure**
Kun-Tsai Huang, HannStar Display Corp., Tainan, Taiwan, ROC

P.108: **Eye-Tracking IPS 3D Display with a Liquid-Crystal Barrier**
Shinichiro Oka, Japan Display, Inc., Mobara, Japan

P.109: **Fast Flexoelectro-Optic Liquid-Crystal Device Operating at Room Temperature**
Andrii Varanytsia, Liquid Crystal Institute, Kent State University, Kent, OH, USA

New Display Components

P.110: **Negative Dispersion of Birefringence in Smectic Liquid-Crystal/Polymer Composite**
Seungbin Yang, Chonbuk National University, Jeonbuk, South Korea

P.111: **An LCD with OLED-Like Luminance Distribution**
Yating Gao, University of Central Florida, Orlando, FL, USA

P.112: **A Wavelength Converter Based on Electrowetting**
Qiong-Hua Wang, Sichuan University, Chengdu, China

Photo Alignment

P.113: **Improvement in the Surface Anchoring Energy of the Photoalignment Layer in a LCD Using the Two-Band UV-Exposure Method**
Gi-Dong Lee, Dong-A University, Busan, South Korea

P.114: **Application of Photoalignment on Fringe-Field-Switching Cells**
Tzu-Chieh Lin, Liquid Crystal Institute, Kent State University, Kent, OH, USA

P.115: **New Photoalignment Material: Azimuthal Anchoring Energy Decreases at Very-High Photo-Induced Order Parameters**
Alexander Muravsky, Institute of Chemistry of New Materials, NAS Belarus, Minsk, Belarus

P.116: **Investigation of In-Plane Liquid-Crystal Photoalignment Technology for Large-Sized Panels**
Yanjun Song, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.117: **A Transmittance Study of the Photoaligned FFS LC Mode**
Yongchao Zhao, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.118: **Low-Voltage Drive Tunable Liquid-Crystal Lens Using Photoalignment Method**
Chenxiang Zhao, Hong Kong University of Science and Technology, Kowloon, Hong Kong

Reflective Displays

P.119: **Full-Color Reflective Display Using Cholesteric Heliconical Structure**
Oleg Lavrentovich, Liquid Crystal Institute, Kent State University, Kent, OH, USA

P.120: **Temperature Dependence of Dynamic Holographic Displays Using Doped Liquid Crystals**
Yikai Su, Shanghai Jiao Tong University, Shanghai, China

P.121: **Angualr-Insensitive Color Filters Based on Compact Multilayered Film for Reflective Displays and Decorations**
Chenying Yang, Zhejiang University, Hangzhou, China

P.122: **Liquid Optical Switch Based on Total Reflection**
Qiong-Hua Wang, Sichuan University, Chengdu, China

P.123: **Field-Sequential-Color Displays Based on Reflective Electrically Suppressed Helix Ferroelectric Liquid Crystal**
Liangyu Shi, Hong Kong University of Science and Technology, Kowloon, Hong Kong

OLEDs

P.124: **Excimer Formation in Organic Emitter Films Associated with a Molecular Orientation Promoted by Steric Hinderance**
Jongwook Park, The Catholic University of Korea, Bucheon, South Korea

P.125: Maskless RGB Color Patterning via Dye Diffusion for Vacuum-Deposited Small-Molecule OLED Displays
Yoshitaka Kajiyama, University of Waterloo, Waterloo, Ontario, Canada

P.126: Stable Measurement of 10^{-6} g/m^2/day Water-Vapor Transmission Rate in Barrier Materials by Intermittent Accumulation and Release by a Cold Trap
Yoshikazu Takahashi, TI Corp., Tsukuba, Japan

P.127: Highly Efficient Light-Extraction Technologies Applicable for Transparent OLED Lighting Using Corrugated Substrate
Satoshi Masuyama, JX Nippon Oil & Energy Corp., Yokohama, Japan

P.128: High-Efficiency Hybrid Buffer Layer in Inverted Top-Emitting OLEDs
Cheol Hwei Park, Korea University, Seoul, South Korea

P.129: Comprehensive Analysis of Luminous Decay Curves for Accelerated Lifetime Testing of OLED Devices
Toshihiro Yoshioka, Chemical Materials Evaluation Research Base (CEREBA), Tsukuba, Japan

P.130: Highly Conductive Graphene and PEDOT:PSS Hybrid Film with the Treatment by Hydroiodic Acid for ITO-Free Flexible OLEDs
Gufeng He, Jiao Tong University, Shanghai, China

P.131: Synthesis and Device Application of a Dibenzothiophene Derivative as Thermally Activated Delayed Fluorescence Material for Green Fluorescence OLEDs
Jun Yeob Lee, Dankook University, Yongin, South Korea

P.132: Solution-Processable Optical Nanohybrid Films for Displays and Lighting
Norman Luechinger, Nanograde, Stäfa, Switzerland

P.133: Optimized Anodes for Flexible Large-Area OLEDs
Susan Mühl, Fraunhofer FEP, Dresden, Germany

P.134: Synthesis of Host Material for Blue Phosphorescent OLEDs Derived from a Bicarbazole Backbone Structure
Seung Gun Yoo, Dankook University, Yongin, South Korea

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