**Program**

2014 SID International Symposium

June 3-6, 2014 (Tuesday – Friday)
San Diego Convention Center
San Diego, California, USA

**Session 1: Annual SID Business Meeting**
Tuesday, June 3 / 8:00 – 8:20 am / Room 6A

**Session 2: Opening Remarks / Keynote Addresses**
Tuesday, June 3 / 8:20 – 10:20 am / Room 6B

1.1: **Keynote 1:** Trends in China’s Display Industry and BOE’s Role
Mr. Dongsheng Wang, Chairman, BOE Technology Group Co., Beijing, China

1.2: **Keynote 2:** The Role of Materials in New Display Technology Developments
Dr. Michael Heckmeter, Senior VP, Liquid Crystals Research and Development, Merck, Darmstadt, Germany

1.3: **Keynote 3:** Toward an Immersive Image Experience
Dr. Kazumasa Nomoto, Senior GM, Display Device Development Division, R&D Platform, Sony Corp., Kanagawa, Japan

**Session 3: Oxide vs. LTPS TFTs I (Oxide vs. LTPS / Active-Matrix Devices)**
Tuesday, June 3 / 10:50 am – 12:10 pm / Room 6A
Chair: Arokia Nathan, University of Cambridge
Co-Chair: Yoshitaka Yamamoto, Semiconductor Energy Laboratory Co., Ltd.

3.1: **Invited Paper:** Oxide versus LTPS TFTs for Active-Matrix Displays
Jin Jang, Kyung Hee University, Seoul, South Korea

3.2: **Invited Paper:** Application of Rotation Magnet Sputtering Technology to a-IGZO Film Depositions
Tetsuya Goto, Tohoku University, Sendai, Japan

3.3: **Invited Paper:** Future Possibility of C-Axis-Aligned Crystalline Oxide Semiconductor: Comparison with Low-Temperature Polysilicon
Shunpei Yamazaki, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

3.4L: **Late-News Paper:** Advanced ELA for Large-Sized AMOLED Displays
Minhwan Choi, Samsung Display Co., Ltd., Kyunggi-do, South Korea

**Session 4: Display Manufacturing: LCD Materials (Display Manufacturing)**
Tuesday, June 3 / 10:50 am – 12:10 pm / Room 6B
Chair: Chiuwoo Kim, Samsung Display Co., Ltd.
Co-Chair: Dawei Wang, BOE Technology Group Co., Ltd.

4.1: **Distinguished Paper:** Cavity-Shape Control of the Roll-to-Roll Fabricated Novel Microstructure Film for Improving the Viewing-Angle Characteristics of LCDs
Yasushi Asaoka, Sharp Corp., Chiba, Japan

4.2: **Vertical Electrode Fabrication Using Conventional LCD Processes**
Kang-il Kim, LG Display Co., Ltd., Kyunggi-do, South Korea

4.3: **Novel Photosensitive Organic Insulator for High-Definition FPD Applications**
Hideyuki Nakamura, FUJIFILM Corp., Shizuoka, Japan

4.4: **Vacuumless Lamination of Printable LOCA**
Christopher Campbell, 3M Co., St. Paul, MN, USA

**Session 5: OLED Devices I (OLEDs)**
Tuesday, June 3 / 10:50 am – 12:10 pm / Room 1
Chair: Denis Kondakov, DuPont
Co-Chair: Franky So, University of Florida

5.1: **Invited Paper:** Degradation Analysis of OLEDs by Time-Resolved Photoluminescence Measurements
Hideyuki Murata, Japan Advanced Institute of Science and Technology, Ishikawa, Japan

5.2: **Evidence for the Involvement of Water in the Long-Term Degradation of Green Phosphorescent OLEDs**
Tetsuo Tsutsui, Chemical Materials Evaluation and Research Base (CERERA), Tsukuba, Japan

5.3: **Highly Efficient OLEDs Fabricated on Corrugated High-Index Substrates**
Franky So, University of Florida, Gainesville, FL, USA

5.4L: **Late-News Paper:** ALA Mediated Metronomic Photodynamic Therapy in Mouse Gliomas Model Using OLEDs
Meng-Huan Ho, AU Optronics Corp., Hsinchu, Taiwan, ROC

**Session 6: Display Manufacturing: Flexible Substrates (Display Manufacturing / e-Paper and Flexible Displays)**
Tuesday, June 3 / 10:50 am – 12:10 pm / Room 2
Chair: Tian Xiao, CBRITE, Inc.
Co-Chair: Ryoichi Ishihara, Delft University

6.1: **Invited Paper:** Handling Technology of Plastic Substrates in Flexible Display Manufacturing
Min-Feng Chiang, AU Optronics Corp., Hsinchu, Taiwan, ROC

6.2: **Invited Paper:** A New Automated Manufacturing Line of All-Printed TFT-Array Flexible Film
Toshihide Kamata, Japan Advanced Printed Electronics Technology Research Association (JAPERA), Tsukuba, Japan
Session 7: Electroluminescent Quantum Dots (Emissive Displays)
Tuesday, June 3 / 10:50 am – 12:20 pm / Room 5
Chair: Seth Coe-Sullivan, QD Vision, Inc.
Co-Chair: Qun Yan, Sichuan COC Display Devices Co. Ltd.
7.1: Invited Paper: Quantum Dot and Other Nano-Technologies as Extremely Thin Displays and Active Surfaces
Vladimir Bulovic, MIT, Cambridge, MA, USA
7.2: Red Quantum Dots under the Electron Microscope
George Fern, Brunel University, Uxbridge, UK
7.3: Influence of Layer Thickness on the Performance of Quantum-Dot Light-Emitting Devices
Jing Chen, Southeast University, Nanjing, China
7.4: Invited Paper: High-Efficiency Quantum-Dot LEDs for Displays
Jin-Jang, Kyung Hee University, Seoul, South Korea
7.5L: Late-News Paper: Cathodoluminescence Quantum Efficiency of Quantum-Dot Thin Films
Heayoung Yoon, National Institute of Standards and Technology, Gaithersburg, MD, USA

Session 8: Oxide vs. LTPS TFTs II (Oxide TFTs vs. LTPS / Active-Matrix Devices)
Tuesday, June 3 / 2:00 – 3:20 pm / Room 6A
Chair: James Chang, Apple, Inc.
Co-Chair: Hyun Jae Kim, Yonsei University
Hiroaki Ohshima, Japan Display, Inc., Tokyo, Japan
8.2: Invited Paper: Current Status and Future Promise of Excimer-Laser Annealing for LTPS on Large Glass Substrates
Rainer Paetzol, Coherent LaserSystems GmbH & Co. KG, Gottingen, Germany
8.3: Invited Paper: Advantages of IGZO Oxide Semiconductors
Shigeyasu Mori, Sharp Corp., Nara, Japan
8.4L: Late-News Paper: Electrical Properties of α-IGZO Films Depending on Trap States
Ju-Yeon Kim, Hoseo University, Chungnam-do, South Korea

Session 9: High-Resolution LCDs (Liquid-Crystal Technology)
Tuesday, June 3 / 2:00 – 3:00 pm / Room 6B
Chair: Cheng Chen, Apple, Inc.
Co-Chair: Takahiro Ishinabe, Tohoku University
9.1: Invited Paper: Fast High-Resolution Ferroelectric LCDs
Vladimir G. Chigrinov, Hong Kong University of Science and Technology, Kowloon, Hong Kong
9.2: High-Image-Quality Reflective Color LCD Using Novel RGBW Technology
Masashi Mitsui, Japan Display, Inc., Kanagawa, Japan
9.3: Analysis of Liquid-Crystal Drop Muras in High-Resolution Mobile TFT-LCDs
Hong-Lee, BOE Optoelectronics Technology Co., Ltd., Beijing, China
9.4: Invited Paper: Highly Birefringence Nematic Liquid Crystals and Mixtures
Przemyslaw Kula, Military University of Technology, Warsaw, Poland

Session 10: Flexible OLEDs I (OLEDs)
Tuesday, June 3 / 2:00 – 3:20 pm / Room 1
Chair: Tariq Ali, eMagin Corp.
Co-Chair: Yasunori Kijima, Sony Corp.
10.1: Invited Paper: OLED Lighting Commercialization on Flexible Barrier Film Substrates
Takatoshi Tsuchiya, Konica Minolta, Inc., Tokyo, Japan
10.2: Strategic Approach to the Reliable Evaluation of the Water Vapor Barrier Properties for Flexible OLED Displays
Akira Suzuki, Chemical Materials Evaluation and Research Base (CEREBA), Tsukuba, Japan
10.3: Predicting the Lifetime of Flexible Permeation Barrier Layers for OLED Displays
Bhadri Visweswaran, Princeton University, Princeton, NJ, USA
10.4: A Delamination Method for Flexible OLED Displays
Chi-Huan Tu, AU Optronics Corp., Hsinchu, Taiwan, ROC

Session 11: Flexible Interactive Displays (Touch and Interactivity / e-Paper and Flexible Displays)
Tuesday, June 3 / 2:00 – 3:00 pm / Room 2
Chair: Steven Bathiche, Microsoft Research
Co-Chair: Chao-Yuan Chen, Jiangsu Hecheng Display Technology
11.1: A 4-mm-Radius Curved Display with a Touch Screen
Takayuki Reda, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
11.2: Invited Paper: Imperceptible Electronic Skin
Tsunoshi Sekitani, University of Tokyo, Tokyo, Japan
11.3: A Curvature Sensing Circuit for Flexible Displays
Po-Yang Lin, AU Optronics Corp., Hsinchu, Taiwan, ROC
Session 12: Photoluminescent Quantum Dots (Emissive Displays)
Tuesday, June 3 / 2:00 – 3:40 pm / Room 5
Chair: Masayuki Nakamoto, Shizuoka University
Co-Chair: Yong-Seog Kim, Hong-ik University

Jonathan Steckel, QD Vision, Inc., Lexington, MA, USA

12.2: Invited Paper: Colloidal Quantum Rods and Wells for Lighting and Lasing Applications
Dmitri Talapin, University of Chicago, Chicago, IL, USA

12.3: Core-Shell Quantum Dots Synthesized by Using Tri-n-Octylphosphine-Assisted Method for High-Color-Saturation Displays
Kai Wang, South University of Science and Technology of China, Shenzhen, China

12.4: Surface Exciton Properties of MgO in ZnO-MgO Core-Shell Quantum Dots
Wen-Jian Kuang, Southeast University, Nanjing, China

12.5L: Late-News Paper: Quantum Dots for High-Color-Gamut LCDs Using an On-Chip LED Solution
Julian Osinski, Pacific Light Technologies, Portland, OR, USA

Session 13: Oxide vs. LTPS TFTs III (Oxide vs. LTPS / Active-Matrix Devices)
Tuesday, June 3 / 3:40 – 5:00 pm / Room 6A
Chair: Man Wong, Hong Kong University of Science & Technology
Co-Chair: Takatoshi Tsujimura, Konica Minolta, Inc.

Paul Christian van der Wilt, Coherent Laser Systems GmbH & Co. KG, Goettingen, Germany

Reza Chaji, IGNIS Innovation, Waterloo, Ontario, Canada

13.3L: Late-News Paper: Roll-to-Roll Processed and Top-Gate-Structured a-InGaZnO TFTs with Large Source/Drain Offsets
Kyung Min Kim, LG Display Co., Ltd., Kyunggi-do, South Korea

13.4: Flexible Low-Temperature Solution-Processed Oxide-Semiconductor TFT Backplanes for Use in AMOLED Displays
Brian Cobb, TNO/Holst Centre, Eindhoven, The Netherlands

Session 14: Blue-Phase LCDs (Liquid-Crystal Technology)
Tuesday, June 3 / 3:40 – 5:00 pm / Room 6B
Chair: Michael Wand, LC Vision, LLC
Co-Chair: Philip Bos, Kent State University

14.1: Low-Temperature and High-Frequency-Operation Limits of a Blue-Phase Liquid Crystal
Fenglin Peng, University of Central Florida, Orlando, FL, USA

14.2: Distinguished Student Paper: Low-Voltage High-Transmittance Blue-Phase LCDs
Daming Xu, University of Central Florida, Orlando, FL, USA

14.3: Improving Kerr Constant of Polymer-Stabilized Blue-Phase Liquid Crystal with Multiple Dopants
Jian-Gang Lu, Shanghai Jiao Tong University, Shanghai, China

14.4: A Hysteresis-Free Polymer-Stabilized Blue-Phase Liquid Crystal
Yifan Liu, University of Central Florida, Orlando, FL, USA

Session 15: Flexible OLEDs II (OLEDs)
Tuesday, June 3 / 3:40 – 5:00 pm / Room 1
Chair: Yusin Lin, AU Optronics Corp.
Co-Chair: Chin Hsin (Fred) Chen, Guangdong Aglaia Optoelectronic Materials Co., Ltd.

15.1: Invited Paper: Printed Organic TFT Arrays and Integrated Circuits
Shizuo Tokito, Yamagata University, Yamagata, Japan

15.2: Method to Measure the Optical Performance of Flexible OLED Displays
Jong-Ho Chong, Samsung Display Co., Ltd., Kyunggi-do, South Korea

15.3: Development of Side-Roll and Top-Roll Panels for an RGBW High-Resolution Flexible Display Using a White OLED with Microcavity Structure
Riho Kataishi, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

15.4L: Late-News Paper: A 7-in. Full-Color Flexible PMOLED Displays on Plastic Substrates

Session 16: Touch Sensor Materials (Touch and Interactivity)
Tuesday, June 3 / 3:40 – 4:40 pm / Room 2
Chair: John Zhong, Apple, Inc.
Co-Chair: Reiner Mauch, Schott AG

16.1: Sub-Micron Transparent Metal-Mesh Conductor for Touch-Screen Displays
Boris Kobrin, Rolith, Inc., Pleasanton, CA, USA

16.2: Reverse-Offset Printed Single-Layered Metal-Mesh Touch-Screen Panel
Young-Man Choi, Korea Institute of Machinery and Materials, Daejeon, South Korea

16.3: Printed Touch Sensors Using Carbon NanoBud Material
Erkki Soininen, Canatu Oy, Helsinki, Finland

Session 17: Plasma Displays (Emissive Displays)
Tuesday, June 3 / 3:40 – 5:00 pm / Room 5
Chair: Larry Weber, Consultant
Co-Chair: Ryuichi Murai, Panasonic Co., Osaka, Japan

17.1: Distinguished Student Paper: Origin of Short Statistical Delay of an ACPDP with MgO Nano-Powders
Seung-Yeon Yang, Hong-ik University, Seoul, South Korea

17.2: Calcium Magnesium Oxide Nano-Crystals for Improving Priming of High-Xe-Content PDPs
Qun Yan, Sichuan COC Display Device Co., Ltd., Mianyang, China

17.3: First-Principles Study on the Secondary Electron Emission of MgO (200) and (111) Surfaces
Yan Tu, Southeast University, Nanjing, China

17.4: Fluid Simulations and Experiments for Ultra-Thin Shadow-Mask PDPs
Lanlan Yang, Southeast University, Nanjing, China

Special Event: Celebration of the 50th Anniversary of Plasma Display Panels
Tuesday, June 3 / 5:00 – 6:30 pm / Room 5
Chair: Larry F. Weber

PDP.1 Invention of the Plasma Display Panel
Donald I. Bitzer, NC State University, Raleigh, NC, USA

PDP.2 50 Years of Plasma Display Contributions to the Display Industry
Larry F. Weber, New Palz, NY, USA

PDP.3 PDP Technology Version 3.0
Roger Johnson, Information Technology, Ltd., La Jolla, CA, USA

PDP.4 Opening the Super-Large-Area Display World with Flexible-Film Displays
Tsutae Shinoda, Shinoda Plasma, Kobe, Japan

Plasma Pioneers Reception
Tuesday, June 3 / 6:30 – 8:30 pm / West Terrace

Session 18: Wearable Displays I: Imaging Devices (Wearable Displays)
Wednesday, June 4 / 9:00 – 10:30 am / Room 6A
Chair: Gary Jones, Nanoquantum Corp.
Co-Chair: Jean-Pierre Guillou, Apple, Inc.

18.1: A 0.23-in. High-Resolution OLED Microdisplay for Wearable Displays
Reo Asaki, Sony Corp., Kanagawa, Japan

18.2: Color-Filter LCOS with Double-Mirror Structure
Yuet-Wing Li, Himax Display, Inc., Tainan, Taiwan, ROC

18.3: Fully Integrated CMOS Microdisplays for Wearable Sports and HMD Applications
Petrus Venter, University of Pretoria, Pretoria, South Africa

Mark Spitzer, Google, Mountain View, CA, USA

18.5L: Late-News Paper: Front-Lit LCOS for Wearable Applications
Yuet-Wing Li, Himax Display, Inc., Tainan, Taiwan, ROC

Session 19: Quantum Dots for LCDs (Liquid-Crystal Technology)
Wednesday, June 4 / 9:00 – 10:00 am / Room 6B
Chair: Shui Chih Lien, TCL Group
Co-Chair: Gang Xu, Hewlett-Packard Co.

19.1: Invited Paper: Color Workshop on Quantum-Dot-Enhanced Displays
James Hills, 3M Co., St. Paul, MN, USA

Hiroya Ishino, Sony Corp., Tokyo, Japan

19.3: Distinguished Student Paper: Quantum-Dot-Enhanced LCD Color and Optical Efficiency
Zhenyue Luo, University of Central Florida, Orlando, FL, USA

Session 20: Flexible AMOLEDs I (Active-Matrix Devices / e-Paper and Flexible Displays)
Wednesday, June 4 / 9:00 – 10:20 am / Room 1
Chair: Kalluri Sarmma, Honeywell, Inc.
Co-Chair: Hsing-Hung Hsieh, Polyera Taiwan Corp.

20.1: Flexible AMOLED Display and Gate Driver with Self-Aligned IGZO TFTs on Plastic Foil
Soeren Steudel, IMEC, Leuven, Belgium

20.2L: Late-News Paper: A 4-in. QVGA Flexible AMOLED Driven by Solution-Processed Metal-Oxide TFTs
Liang Lin, AU Optronics Corp., Hsinchu, Taiwan, ROC

20.3L: Late-News Paper: Flexible AMOLED Display Driven by Organic TFTs on a Plastic Substrate
Charlotte Harrison, Plastic Logic, Cambridge, UK

20.4L: Late-News Paper: A Flexible AMOLED Display on a PEN Substrate Driven by Oxide TFTs
Lei Wang, South China University of Technology, Guangzhou, China

Session 21: Display Manufacturing: Oxide TFTs (Display Manufacturing)
Wednesday, June 4 / 9:00 – 10:00 am / Room 2
Chair: Fang Chen Luo, AU Optronics Corp.
Co-Chair: Toshiaki Arai, Sony Corp.

21.1: A 513-ppi FFS-Mode TFT-LCD Using CAAC Oxide Semiconductor Fabricated by a Five-mask Process
Akito Yamashita, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

21.2: Invited Paper: Manufacture of MOTFT Backpanel for 440-ppi True-Full-Color AMOLED Displays
Gang Yu, CBRITE, Inc., Goleta, CA, USA

21.3: A 13.5-in. Quad-FHD Flexible CAAC-OS AMOLED Display with Long-Life OLED Device Structure
Shogo Uesaka, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
Session 22: Low-Power and High-Speed Interface (Display Electronics)
Wednesday, June 4 / 9:00 – 10:40 am / Room 5
Chair: Dick McCartney, Samsung Display Co., Ltd.
Co-Chair: Taesung Kim, Intel, Inc.
22.1: Invited Paper: Challenges and Requirements on Power-Saving Techniques on Mobile Platforms
Taesung Kim, Intel, Inc., Santa Clara, CA, USA
22.2: WITHDRAW
22.3: Invited Paper: Intra-Panel Interface Technology for High-Resolution Tablet PC Applications
Jae-Youl Lee, Samsung Electronics Co., Ltd., Kyunggi-do, South Korea
22.4: Invited Paper: A 1.8-Gbps Intra-Panel Interface with Power Reduction and EMI Suppression Schemes for Tablet PC Applications
Kil-Hoon Lee, Samsung Electronics Co., Ltd., Kyunggi-do, South Korea
22.5: A 7-in. Digital Micro-Shutter Display Driven by IGZO TFT
Taketoshi Nakano, Mie, Japan

Session 23: Wearable Displays II: Optics Design (Wearable Displays)
Wednesday, June 4 / 10:40 am – 12:00 pm / Room 6A
Chair: David Eccles, Rockwell Collins
Co-Chair: Yi-Pai Huang, National Chiao Tung University
23.1: Optical Design of a Compact See-Through Head-Mounted Display with a Light-Guide Plate
Jui-Wen Pan, National Chiao Tung University, Taiwan, Taiwan, ROC
23.2: Binocular Holographic Waveguide Visor Display
William Bleha, Holoeye Systems, Inc., San Diego, CA, USA
23.3: Quality of Augmented Information for Different Distances on See-Through Near-to-Eye Displays
Toni Järvenpää, Nokia Research Center, Tampere, Finland
23.4: Augmented Edge Enhancement for Vision Impairment Using Google Glass
Alex Huang, Schepps Eye Research Institute, Harvard Medical School, Boston, MA, USA

Session 24: FFS/IPS (Liquid-Crystal Technology)
Wednesday, June 4 / 10:40 am – 12:00 pm / Room 6B
Chair: Hyun Chul Choi, LG Display Co., Ltd.
Co-Chair: Ki Chul Shin, Samsung Display Co., Ltd
24.1: A Method for Analyzing the Eye Strain in Fringe-Field-Switching LCDs under Low-Frequency Driving
Kung-Ching Chu, AU Optronics Corp., Hsinchu, Taiwan, ROC
24.2: Investigation of Flexoelectric Effect in VA IPS Mode by Low-Frequency Driving
Cheng-Wei Lai, AU Optronics Corp., Hsinchu, Taiwan, ROC
24.3: Viewing-Angle Property of Single-Domain AH-IPS Liquid-Crystal Mode Optimized with Polymer-Stabilized Polystyrene Alignment Layer
Hak-Rin Kim, Kyungpook National University, Daegu, South Korea
24.4: Late-News Paper: High-Performance Advanced Super Dimension Switch (ADS) Mode LCD with Negative Dielectric Anisotropy LC Optimization
Falu Yang, BOE Optoelectronics Technology Co., Ltd., Sichuan, China

Session 25: Flexible AMOLEDs II (e-Paper and Flexible Displays/Active-Matrix Devices)
Wednesday, June 4 / 10:40 am – 12:00 pm / Room 1
Chair: Doug Loy, Intellectual Adventures
Co-Chair: Ki-Yong Lee, Samsung Display Co., Ltd.
25.1: Tri-Fold Flexible AMOLED with High Barrier Passivation Layers
Yasuhiro Jimbo, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
25.2: Repeatedly Bendable Book-Type AMOLED Display
Ryu Komatsu, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
25.3: A 9.55-in. Flexible Top-Emission AMOLED with a-IGZO TFTs
Shiming Shi, BOE Technology Group Co., Ltd., Beijing, China
25.4: Invited Paper: Development of Commercial Flexible AMOLEDs
Soonkwang Hong, LG Display Co., Ltd., Kyunggi-do, South Korea

Session 26: Applications (Applications)
Wednesday, June 4 / 10:40 am – 12:00 pm / Room 2
Chair: Jean-Noel Perbet, THALES Avionics
Co-Chair: Adi Abileah, Consultant
26.1: Distinguished Paper: Single-Layer Fabry-Pérot Interferometric Display for Both Color and Intensity Modulations
Chao Ping Chen, Shanghai Jiao Tong University, Shanghai, China
26.2: Super-Durable Cover Lens Film
Richard Pokorny, 3M Co., St. Paul, MN, USA
26.3: Edge Adaptive Method of Image Resampling and Enhancement
Vladimir Lachine, Qualcomm Canada, Inc., Toronto, Ontario, Canada
26.4: Display Color Error in the Medical Digital Image Workflow
Paul Boynton, National Institute of Standards and Technology, Gaithersburg, MD, USA

Session 27: Computational Visual Fidelity (Applied Vision/Human Factors)
Wednesday, June 4 / 10:40 am – 12:00 pm / Room 5
Chair: James Larimer, ImageMetrics LLC
Co-Chair: Jeffrey Mulligan, NASA Ames Research Center
27.1: TBA
Joyce Farrell, Stanford University, Stanford, CA, USA

Session 27: Computational Approaches to Aberration Compensation for Vision-Correcting Displays
Fu-Chung Huang, University of California at Berkeley, Berkeley, CA, USA

Session 27: Late-News Paper: VESA Display Stream Compression: An Overview
Frederick Walls, Broadcom Corp., Grafton, WI, USA

Session 28: Wearable Displays III: Direct View (Wearable Displays)
Wednesday, June 4 / 3:30 – 5:10 pm / Room 6A
Chair: Ruiqing Ma, Universal Display Corp.
Co-Chair: Susan Jones, Nuluminia Corp.

28.1: OLEDs on Textile Substrates with Planarization and Encapsulation Using Multilayers for Wearable Displays
Kyung Cheol Choi, KAIST, Daejeon, South Korea

28.2: Genuinely Wearable Display with a Flexible Battery, a Flexible Display Panel, and a Flexible Printed Circuit
Ryota Tajima, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

28.3: Flexible Substrate with Low Reflection, Low Haze, Self-Cleaning, and High Hardness by Nano-Structured Hard Coating and Surface Treatment
Jian-Hao Lee, National Taiwan University, Taipei, Taiwan, ROC

28.4: Wearable Display for Dynamic Spatial and Temporal Fashion Trends
Wallen Mphatso, University of Sunderland, Sunderland, UK

28.5: Invited: Wearable-Display Expectations: Enabling Mobile-Display Experiences of the Future
Brian Gally, Qualcomm MEMS Technologies, Inc., San Jose, CA, USA

Session 29: Film and Alignment (Liquid-Crystal Technology)
Wednesday, June 4 / 3:30 – 4:50 pm / Room 6B
Chair: Philip Chen, National Chiao Tung University
Co-Chair: Yukito Saitoh, FUJIFILM Corp.

29.1: A New Achromatic Quarter-Wave Film Using Liquid-Crystal Materials for Anti-Reflection of OLEDs
Yuta Takahashi, FUJIFILM Corp., Kanagawa, Japan

29.2: Distinguished Paper: Wide-Viewing LCDs Using Novel Microstructure Film
Emi Yamamoto, Sharp Corp., Chiba, Japan

29.3: Performance of Novel LC Photo-Aligning Cinnamoyl Side-Chain Polymers
Hiroshi Hasebe, DIC Corp., Saitama, Japan

29.4: Polymer-Stabilized Electrically Suppressed Helix Ferroelectric Liquid Crystal
Abhishek Srivastava, Hong Kong University of Science and Technology, Kowloon, Hong Kong

Session 30: Display Manufacturing: OLEDs (Display Manufacturing)
Wednesday, June 4 / 3:30 – 4:50 pm / Room 1
Chair: Greg Gibson, FAS Holdings Group
Co-Chair: Ion Bita, Qualcomm MEMS Displays, Inc.

PengYu Chen, AU Optronics Corp., Hsinchu, Taiwan, ROC

Conor Madigan, Kateeva, Inc., Menlo Park, CA, USA

Sven Murano, Novaled AG, Dresden, Germany

30.4: Distinguished Student Paper: Development of a Novel Pattern-Coating Technology: Air-Bubble Coating for the Manufacture of OLED Devices
Yu-Wen Hsieh, National Taiwan University, Taipei, Taiwan, ROC

Session 31: Laser Speckle (Display Measurement / Projection)
Wednesday, June 4 / 3:30 – 4:50 pm / Room 2
Chair: Chuck Yin, Square, Inc.
Co-Chair: Alan Sobel, Flatscreen Technologies Corp

31.1: Speckle Reduction Due to the Use of Electro-Optical Cell with Helix-Free FLC
Igor Kompanets, P. N. Lebedev Physical Institute of RAS, Moscow, Russian Federation

31.2: Speckle Contrast Reduction with a Small-Vibrated Reflective Intermediate Screen for a MEMS Scanning Laser Projector
Shih-Yu Tu, National Taiwan University, Taipei, Taiwan, ROC

31.3: Classification of Subjective Speckle for the Evaluation of a Laser Display
Makio Kurashige, Dai Nippon Printing Co., Ltd., Chiba, Japan

31.4: Standardization of Speckle Measurement for Large-Screen Laser-Illuminated Video Projection Systems
Terry Schmidt, Christie Digital Systems, Wellesley, Ontario, Canada

Session 32: Flexible TFTs (e-Paper and Flexible Displays)
Wednesday, June 4 / 3:30 – 4:50 pm / Room 5
Chair: Shawn O'Rourke, dpiX, LLC
Co-Chair: Ryochi Ishihara, Delft University of Technology

32.1: Invited Paper: Novel Approaches for Fabricating High-Performance Low-Temperature Solution-Processed Metal-Oxide Transistors
Hsing-Hung Hsieh, Polyera Taiwan Corp., Hsinchu, Taiwan, ROC

32.2: Invited Paper: Integration of Flexible AMOLED Displays Using Oxide Semiconductor TFT Backplanes
Gerwin Gelinck, TNO/Holst Centre, Eindhoven, The Netherlands
32.3: **Invited Paper:** Demonstration of High-Mobility Unisolated Corbino OTFTs with Improved Switching Ratio for Application to Flexible Displays.
Michael Cowin, SmartKem, Ltd., St. Asaph, UK

32.4: **Invited Paper:** Solution-Processed Single-Grain Si TFTs on a Plastic Substrate
Ryoichi Ishihara, Delft University of Technology, Delft, The Netherlands

### Session 33: Active-Matrix TFTs (Active-Matrix Devices)

**Thursday, June 5 / 9:00 – 10:20 am / Room 6A**

**Chair:** Jerzy Kanicki, University of Michigan

**Co-Chair:** Chien Hung Chen, AU Optronics Corp.

#### 33.1: Channel-Etched C-Axis-Aligned Crystalline Oxide Semiconductor FETs Using Cu Wiring
Kengo Akimoto, Advanced Film Device, Inc., Tochigi, Japan

#### 33.2: A New Plasma Process and Structure for Oxide Semiconductor LCDs
Joon-Young Yang, LG Display Co., Ltd., Kyunggi-do, South Korea

#### 33.3: High Mobility and Highly Stable Aluminum-Doped Indium Tin Oxide TFTs
Sang Haeng Cho, ETRI, Daejeon, South Korea

33.4: **Distinguished Paper:** Oxide-Semiconductor TFTs Using Oxygen Barriers and a Wet-Chemical Back-Channel Etch Step
Marcus Herrmann, University of Stuttgart, Stuttgart, Germany

### Session 34: LC Beyond Displays I (Liquid-Crystal Technology)

**Thursday, June 5 / 9:00 – 10:20 am / Room 6B**

**Chair:** Terry Scheffer, Motif, Inc.

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

#### 34.1: Invited Paper: Slowing Light in Liquid Crystals
Umberto Bortolozzo, INLN, Université de Nice Sophia-Antipolis, Valbonne, France

#### 34.2: Invited Paper: Active Plasmonic Tunable Metamaterials and Ultra-Fast Non-Linear Optics with Liquid Crystals
Iam Choonk, Pennsylvania State University, University Park, PA, USA

#### 34.3: Invited Paper: On the Correlation between Electron Polarizability of Molecular Core and Its Input into Optical Anisotropy
Piotr Harmata, Military University of Technology, Warsaw, Poland

34.4: **Invited Paper:** THz Devices Based High-Birefringence Liquid Crystals
Yan-qing Lu, Nanjing University, Nanjing, China

### Session 35: OLED Materials (OLEDs)

**Thursday, June 5, / 9:00 - 10:20 am / Room 1**

**Chair:** Chihaya Adachi, Kyushu University

**Co-Chair:** Chishio Hosokawa, Idemitsu Kosan Co., Ltd.

#### 35.1: Invited Paper: High-Performance OLED materials
Holger Heil, Merck KGaA, Darmstadt, Germany

#### 35.2: Invited Paper: Improving Efficiency without Compromising Lifetime in Blue Fluorescent OLEDs by ETL Design
Angar Werner, Novaled AG, Dresden, Germany

#### 35.3: Invited Paper: The Soluble Hole-Injection Materials and the Inks Applicable to OLED Devices
Kazuhiko Monzen, Nissan Chemical Industries, Ltd., Funabashi, Japan

#### 35.4: Enhancement of Emission Efficiency in a White OLED Device by Highly Efficient Narrow Spectrum Red-Emission Material
Tomoya Yamaguchi, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

### Session 36: Light-Field and Multi-View Displays (3D/Display Systems)

**Thursday, June 5 / 9:00 - 10:20 am / Room 2**

**Chair:** Nikhil Balram, Ricoh Innovations, Inc.

**Co-Chair:** Brian Schowengerdt, University of Washington

#### 36.1: Wide-Field-of-View Compressive Light-Field Display Using a Multilayered Architecture and Viewer Tracking
Gordon Wetzstein, MIT, Cambridge, MA, USA

#### 36.2: Distinguished Paper: Dual-Layer Three-Dimensional Display with Enhanced Resolution
Na-Young Jo, Inha University, Incheon, South Korea

#### 36.3: Surround-Type Light-Field Display Provide Immersive Experience
Li Feng, Zhejiang University, Hangzhou, China

#### 36.4: Design and Calibration of 100-Mpxiel Multi-Projection 3D Display with an Enhanced Image Quality
Jin-Ho Lee, Samsung Advanced Institute of Technology, Kyunggi-do, South Korea

### Session 37: Novel Measurement Standards and Methods (Display Measurement)

**Thursday, June 5 / 9:00 - 10:20 am / Room 5**

**Chair:** Chuck Yin, Apple, Inc.

**Co-Chair:** Stephen Atwood, Azonix Corp.

#### 37.1: OLED Displays under Ambient Illumination: An Implementation of IEC 62341-6-2
Michael Becker, Display-Messtechnik & Systeme, Karlsruhe, Germany

#### 37.2: Simplified Ambient Performance Assessment for Mobile Displays Using Easy Measurements
William Cummings, Qualcomm MEMS Displays, Inc., San Jose, CA, USA

#### 37.3: Viewing-Direction Measurements with Hemispherical Diffuse Illumination on e-Paper Displays
Dirk Hertel, E Ink Corp., Billerica, MA, USA

#### 37.4: Improved Display Color Measurements with the WP214 Imaging Spectral Colorimeter
Chad Greene, Westboro Photonics, Ottawa, Ontario, Canada
Session 38: Capacitive Touch *(Touch and Interactivity)*  
Thursday, June 5 / 10:40 - 11:50 am / Room 6A  
Chair: Jeff Han, Microsoft  
Co-Chair: Joohyung Lee, Samsung Display Co., Ltd.  
38.1: A Fast Readout Circuit for Capacitive Touch-Screen Panels Using A Dual-Mode Sensing Algorithm  
Hyeon-June Kim, KAIST, Daejeon, South Korea  
38.2: High-Performance Mutual-Capacitive Touch Screen Using Double-Layered Metal-Mesh Electrodes with Separated Floating Electrodes  
Isao Nojiri, Mitsubishi Electric Corp., Kumamoto, Japan  
38.3: One Glass Solution with a Single Layer of Sensors for Projected-Capacitive Touch Panels  
Shi-Yu Liu, Shanghai Jiao Tong University, Shanghai, China

Session 39: LC Beyond Displays II *(Liquid-Crystal Technology)*  
Thursday, June 5 / 10:40 am - 12:00 pm / Room 6B  
Chair: Shin Tson Wu, University of Central Florida  
Co-Chair: Terry Scheffer, Motif, Inc.  
39.1: *Invited Paper:* Emerging Areas for Liquid-Crystal Technologies Beyond Displays  
Sin-Doo Lee, Seoul National University, Seoul, South Korea  
39.2: *Invited Paper:* Stimuli-Responsive Cholesteric-Liquid-Crystal Composites for Optics and Photonics  
Timothy White, AFRL, Wright-Patterson AFB, Dayton, OH, USA  
39.3: *Invited Paper:* Recent Advances on Liquid-Crystal-on-Silicon Spatial Light Modulators  
Haruyoshi Toyoda, Hamamatsu Photonics K.K., Hamamatsu, Japan  
39.4: *Invited Paper:* Liquid Crystal for Ophthalmic Lenses and Biosensing Applications  
Yi-Hsin Lin, National Chiao Tung University, Hsinchu, Taiwan, ROC

Session 40: OLED Devices II *(OLEDs)*  
Thursday, June 5 / 10:40 am - 12:00 pm / Room 1  
Chair: Yasunori Kijima, Sony Corp.  
Co-Chair: Jang Hyuk Kwon, Kyung Hee University  
40.1: Novel Two-Mask AMOLED Display Architecture  
Michael Hack, Universal Display Corp., Ewing, NJ, USA  
40.2: Building Up Electrical Modeling of a White Fluorescent Top-Emitting OLED: Material Parameter Extraction and Impact of Poole Frenkel and ECDM Mobility Models  
Karim Bouzid, CEA-LETI, Grenoble, France  
40.3: One FMM Solution for Achieving AMOLED with 413-ppi Real Pixel Density  
Meng-Ting Lee, AU Optronics Corp., Hsinchu, Taiwan, ROC  
40.4: Design Tool for Light-Scattering Enhancement in OLEDs  
Stéphane Altazin, Fluxim AG, Winterthur, Switzerland

Session 41: Autostereoscopic Systems and Measurement *(3D / Display Systems / Display Measurement)*  
Thursday, June 5 / 10:40 am - 12:00 pm / Room 2  
Chair: Jae Hyeung Park, Inha University  
Co-Chair: Bill Cummings, Qualcomm MEMS Displays  
41.1: High-Resolution Glassless 3D with Head-Tracking System  
Takeo Kato, Japan Display, Inc., Kanagawa, Japan  
41.2: *Invited Paper:* An UHD Active-Barrier 3D module  
Yanbing Wu, BOE Technology Group Co., Ltd., Beijing, China  
41.3: Image Quality Factors for Designs of an Autostereoscopic Display  
Yun-Ting Cheng, National Taiwan University, Taipei, Taiwan, ROC  
41.4: Characterization of Multi-View Autostereoscopic Displays Using a Fourier Optics Viewing-Angle Instrument and Video-Luminance Meter  
Pierre Boher, ELDIM, Herouville, France

Thursday, June 5 / 10:40 am - 12:20 pm / Room 5  
Chair: Ingrid Heynderickx, Eindhoven University of Technology  
Co-Chair: Tom Fiske, Qualcomm MEMS Displays  
Kartheinz Blankenbach, Pforzheim University, Pforzheim, Germany  
42.2: *Invited Paper:* Analysis of Background Illuminance Levels During Television Viewing  
Kyle Sills, California Lighting Technology Center, Davis, CA, USA  
Frédéric Leloup, KU Leuven, KAHO Sint-Lieven, Gent, Belgium  
42.4: Sparkle Measurement Revisited: A Closer Look at the Details  
Michael Becker, Display-Messtechnik & Systeme, Karlsruhe, Germany  
42.5: Cross Media Color Reproduction of Real Lighting Environment Using CIECAM02  
Ronnier Luo, University of Leeds, Leeds, UK
Session 43: Novel Interactivity (Touch and Interactivity)
Thursday, June 5 / 1:30 - 2:30 pm / Room 6A
Chair: Bob Senior, Canatu Oy
Co-Chair: Deuksu Lee, LG Display Co., Ltd.
43.1: Invited Paper: Touch-Technology Diversity in Commercial Applications
Joel Kent, Elo Touch Solutions, Milpitas, CA, USA
43.2: Optical Multi-Touch on a Circular Device
Richard Berglid, Neonode, Stockholm, Sweden
43.3: Electrostatic Tactile Display Using a Beat Phenomenon of Voltage Waveforms
Hiroshi Haga, NLT Technologies, Ltd., Kawasaki, Japan

Session 44: Ultra-High-Resolution Displays (Active-Matrix Devices)
Thursday, June 5 / 1:30 - 2:50 pm / Room 6B
Chair: Tohru Nishibe, Japan Display, Inc.
Co-Chair: Norbert Fruhauf, University of Stuttgart
44.1: Distinguished Paper: A 13.3-in. 8K x 4K 664-ppi OLED Display Using CAAC-OS FETs
Susumu Kawashima, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
44.2: 512-ppi Mobile Displays with High Aperture Ratio, Slim Border, and Wide Color Gamut
Ming-Hsien Lee, AU Optronics Corp., Hsinchu, Taiwan, ROC
44.3: A 513-ppi LCD Using a C-Axis-Aligned Crystalline Oxide Semiconductor with a Narrow Bezel and an Aperture Ratio Greater than 50%
Kouhei Toyotaka, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
44.4L: Late-News Paper: Large-Area-Display Backplane Using Embedded Single-Crystal-Silicon Particles
Douglas Dykaar, DiTek Lasers, Inc., Waterloo, Ontario, Canada

Session 45: OLED Devices III (OLEDs)
Thursday, June 5 / 1:30 - 2:30 pm / Room 1
Chair: Michael Weaver, Universal Display Corp.
Co-Chair: Yustin Lin, AU Optronics Corp.
45.1: An Improved Method for Lifetime Prediction Based on the Decoupling of the Joule Self-Heating Effect from Coulombic Degradation in Accelerated Aging Tests of OLEDs
Tetsuo Tsutsui, Chemical Materials Evaluation and Research Base (CERERA), Tsukuba, Japan
45.2: Extraction-Efficiency Enhancement of an AMOLED Display with Acceptable Blur by Attaching Trapezoid Array Film
Jui-Haw Lee, National Taiwan University, Taipei, Taiwan, ROC
45.3: Distinguished Student Paper: High-Efficiency Tandem Top-Emitting OLEDs
Jang Hyuk Kwon, Kyung Hee University, Seoul, South Korea

Session 46: Holographic Display Systems (3D / Display Systems / Applications)
Thursday, June 5 / 1:30 - 3:00 pm / Room 2
Chair: Ian Underwood, University of Edinburgh
Co-Chair: K. Käläntär, Global Optical Solutions
46.1: Colorful Holographic Display Using Variable Spatial Sampling
Chentiang Chang, Southeast University, Nanjing, China
46.2: Phononic Hologram Based on Bilayer Metallic Nanowire Gratings
Zhi-cheng Ye, Shanghai Jiao Tong University, Shanghai, China
46.3: Improvement of Holographic Video Display Using a Super-Fast Refresh and Non-Pixilated Liquid-Crystal Film
Hongye Gao, Shanghai University, Shanghai, China
46.4: Influence of Space-Variant Effect on Axial Error in Digital Holography
Chao Ping Chen, Shanghai Jiao Tong University, Shanghai, China
46.5L: Late-News Paper: Waveguide Display System with Variable Output Intensity
Nannan Zhang, Beijing Institute of Technology, Beijing, China

Session 47: OLED Lighting I (Lighting/OLEDs)
Thursday, June 5 / 1:30 - 2:50 pm / Room 5
Chair: Jang Hyuk Kwon, Kyung Hee University
Co-Chair: Denis Kondakov, DuPont
47.1: Invited Paper: Color Tunable Phosphorescent White-OLED Lighting Panel
Michael Weaver, Universal Display Corp., Ewing, NJ, USA
47.2: Invited Paper: Efficient Tandem Hybrid White OLEDs for Solid-State Lighting Applications
Yuan-Sheng Tyan, First O-Lite, Inc., Nanjing, China
47.3: Invited Paper: Performance Improvement of Blue Phosphorescent OLEDs by Designing an Intermolecular and Interlayer Combination
Kunimasa Hiyama, Konica-Minolta, Inc., Tokyo, Japan
47.4: Distinguished Paper: Realization of Outstandingly High-Efficiency White OLED by Controlling Evanescent Mode and Wide Angular Incident Light
Kazuyuki Yamae, Panasonic Eco Solutions Company, Osaka, Japan

Session 48: Touch Display Manufacturing (Touch and Interactivity / Display Manufacturing)
Thursday, June 5 / 3:10 - 4:30 pm / Room 6A
Chair: Willem Den Boer, Guardian Industries
Co-Chair: Bradley Bowden, Corning Incorporated
48.1: Invited Paper: Design and Manufacture of a Slim Notebook-Embedded Touch Panel
Ching Cheng, AU Optronics Corp., Hsinchu, Taiwan, ROC
Session 49: Active-Matrix Design (Active-Matrix Devices)
Thursday, June 5 / 3:10 – 4:50 pm / Room 6B
Chair: Roger Stewart, Sourland Mountain Associates
Co-Chair: Kazuyoshi Omata, Konica Minolta

49.1: Flexible Flat-Panel-Display Designs with Gate Driver Circuits Integrated within the Pixel Area
Hidefumi Yoshida, Sharp Corp., Nara, Japan

49.2: Corbino TFTs for Large-Area AMOLED Displays
Mallory Mativenga, Kyung Hee University, Daejeon, South Korea

49.3: High-Resolution Active-Matrix Imager Using Poly-Si Phototransistors in a Magnifying Viewer
Masahiro Kasano, Panasonic Corp., Osaka, Japan

49.4L: Late-News Paper: Novel Pixel Structure for Quadrupling of Pixel Voltage
Dahye Sim, LG Display Co., Ltd., Kyung-gi-do, South Korea

49.5L: Late-News Paper: An Organic TFT Backplane for Foldable Displays Fabricated by Scalable and Low-Cost Processes
Mao Katsuhara, Sony Corp., Kanagawa, Japan

Session 50: Advanced OLED Driving (Display Electronics)
Thursday, June 5 / 3:10 - 4:30 pm / Room 1
Chair: Ya Hsiang Tai, National Chiao Tung University
Co-Chair: Seung Woo Lee, Kyung Hee University

50.1: Invited Paper: Technological Progress of Pixel Compensation for OLED TVs
Hong-Jae Shin, LG Display Co., Ltd., Kyung-gi-do, South Korea

50.2: Real-Time TFT Compensation through Power-Line Current Sensing for High-Resolution AMOLED Displays
Jun-Suk Bang, KAIST, Daejeon, South Korea

50.3: A Novel Power-Saving Technology for OLED TVs with External TFT Compensation
Tae-Gung Kim, LG Display Co., Ltd., Kyung-gi-do, South Korea

50.4: Perception-Optimized Signal Scaling for OLED Power Saving
Min Dai, Qualcomm, Inc., San Diego, CA, USA

Session 51: Liquid-Crystal Lens and Doping for 3D (3D / Liquid-Crystal Technology)
Thursday, June 5 / 3:10 - 4:30 pm / Room 2
Chair: Kei-Hsiung Yang, National Chiao Tung University
Co-Chair: Jenn Jia Su, AU Optronics Corp.

51.1: Real-Time Holographic Display Using Quantum-Dot Doped Liquid Crystal
Yikai Su, Shanghai Jiao Tong University, Shanghai, China

51.2: Large-Angle Image Steering Using a Liquid-Crystal Device
Hsien-Hui Cheng, Liquid Crystal Institute, Kent State University, Kent, OH, USA

51.3: Design for Reducing Autostereoscopic Display Crosstalk Using a Liquid-Crystal Gradient-Index Lens
Masahiro Kasano, Panasonic Corp., Osaka, Japan

51.4: Dielectric-Force-Induced Liquid-Crystal Lenticular Microlenses
Hong Ren, Chonbuk National University, Jeonju, South Korea

Session 52: OLED Lighting II (Lighting/OLEDs)
Thursday, June 5 / 3:10 - 4:30 pm / Room 5
Chair: Chin Hsin (Fred) Chen, Guangdong Aglaia Optoelectronic Materials Co., Ltd.
Co-Chair: Lee-Mi Do, ETRI

52.1: Invited Paper: Highly Efficient Transparent OLEDs with An Internal Random Nano-Structured Scattering Layer
Jeong-Ik Lee, ETRI, Daejeon, South Korea

52.2: Invited Paper: Development and Manufacture of OLED Lighting Panels for Health-Care Application
John Hamer, OLEDWorks LLC, Rochester, NY, USA

52.3: Understanding Extrinsic Degradation in Phosphorescent OLEDs
Hitoshi Yamamoto, Universal Display Corp., Ewing, NJ, USA

52.4: Highly Efficient Single-Unit White OLED Device with Emission from Both Singlet and Triplet Excitons
Takahiro Ishihara, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Session 53: OLED TV I (OLED TV/OLEDs)
Friday, June 6 / 9:00 - 10:20 am / Room 6A
Chair: Sven Murano, Novaled AG
Co-Chair: Michael Weaver, Universal Display Corp.

53.1: Development of Oxide-TFT OLED-TV Technologies
Yu-Hsin Lin, AU Optronics Corp., Hsinchu, Taiwan, ROC

53.2: Invited Paper: Advanced Technologies for Large-Sized OLED TV
Chang-Wook Han, LG Display Co., Ltd., Kyung-gi-do, South Korea

53.3: Structural Advantage of WRGB OLED Displays for Edge Enhancement
Taeseong Han, LG Display Co., Ltd., Kyung-gi-do, South Korea

53.4: Color Optimization for OLED Displays
Sang Choi, Samsung Display Co., Ltd., Kyung-gi-do, South Korea
Session 54: e-Paper I (e-Paper and Flexible Displays)  
Friday, June 6 / 9:00 - 10:20 am / Room 6B  
Chair: Chao-Yuan Chen, Jiangsu Hecheng Display Technology  
Co-Chair: Rashmi Rao, Apple, Inc.

54.1: Invited Paper: Structural Colors for Display and e-Paper Applications  
L. Guo, University of Michigan, Ann Arbor, MI, USA

54.2: Reliable and High-Performance Transparent Electrowetting Displays  
Ruo-Lan Chang, ITRI, Hsinchu, Taiwan, ROC

54.3: Human and Mechanical Writing Performance of eWriters  
Clinton Braganza, Kent Displays, Inc., Kent, OH, USA

54.4: Late-News Paper: Single-Mirror Interferometric Display: A New Paradigm for Reflective Display Technologies  
John Hong, Qualcomm MEMS Technologies, Inc., San Jose, CA, USA

Session 55: Human Factors for 3D Displays (3D / Applied Vision/Human Factors)  
Friday, June 6 / 9:00 - 10:20 am / Room 1

Chair: Sakuichi Ohtsuka, Kagoshima University  
Co-Chair: David Hoffman, Samsung Display Co., Ltd.

55.1: Distinguished Paper: Motion Artifacts on 240-Hz OLED Stereoscopic 3D Displays  
Paul Johnson, University of California at Berkeley, Berkeley, CA, USA

55.2: Luminance Asymmetry in Stereoscopic Content: Binocular Rivalry or Luster  
Marja Salmimaa, Nokia Research Center, Tampere, Finland

55.3: Enhance Users’ Air-Touch Accuracy with 3D Virtual References for 3D Display User Interface  
Chih-Hung Tung, National Chiao Tung University, Hsinchu, Taiwan, ROC

55.4: Optimized Parallax Control of Arbitrary Viewpoint Images with Motion Parallax on Autostereoscopic Displays  
Takefumi Hasegawa, NLT Technologies, Ltd., Kanagawa, Japan

Session 56: Projection Components and System Configurations (Projection)  
Friday, June 6 / 9:00 - 10:40 am / Room 2

Chair: Frederic Kahn, Kahn International, Inc.  
Co-Chair: Ming Hsien Wu, Hamamatsu Corp.

56.1: Distinguished Paper: A Higher-Contrast Ghost-Ray-Deflecting Total-Internal-Reflection Light Separator for LED DLP Projectors  
Jui-Wen Pan, National Chiao Tung University, Tainan, Taiwan, ROC

56.2: DPR Recycling Collar for Simpler and Brighter RGBW Pico Projectors  
Kenneth Li, Wavien, Inc., Valencia, CA, USA

56.3: High-Power Laser-Excited-Phosphor Suspension in Liquid for Digital Projection  
Kenneth Li, Wavien, Inc., Valencia, CA, USA

56.4: A Head-Up-Display Illuminator Design and Virtual-Image Estimation Method  
Kenneth Li, Wavien, Inc., Valencia, CA, USA

56.5: Late-News Paper: A Real 3D Image Projected “Out-of-the-Box” Using Dual Parabolic Reflectors  
Kenneth Li, Wavien, Inc., Valencia, CA, USA

56.6: Late-News Paper: Modular Multi-Projection Multi-View Autostereoscopic Display Using MEMS Laser Projectors  
Kaan Akşit, Koç University, Istanbul, Turkey

Session 57: Advanced Backlighting Technology (Display Systems)  
Friday, June 6 / 9:00 - 10:10 am / Room 5

Chair: Masaru Suzuki, SKC Haas Display Films  
Co-Chair: Akihiro Tagaya, Keio University

57.1: Directional BLU for Full-Resolution Field-Alternative Autostereoscopic 3D/2D and 2D/3D LCDs  
K. Kälänätä, Global Optical Solutions, Tokyo, Japan

57.2: Enhancing LCD Optical Efficiency with a Linearly Polarized Backlight and Polarization-Preserving Light-Guide Plate  
Zhenyue Luo, University of Central Florida, Orlando, FL, USA

57.3: Invited Paper: A Wide-Color-Gamut Display Using Laser Light Sources  
Koji Minami, Mitsubishi Electric Corp., Kyoto, Japan

57.4: Late-News Paper: Intelligent Backlight: A Controllable Illumination System for High-Efficiency and Sunlight-Readable Mobile Displays  
Michael Robinson, RealD Inc., Boulder, CO, USA

Session 58: OLED TV II (OLED TV / OLEDs / Active-Matrix Devices)  
Friday, June 6 / 10:40 am - 11:40 am / Room 6A

Chair: Hyun Jae Kim, Yonsei University  
Co-Chair: Mike Hack, Universal Display Corp.

58.1: A 31-in. FHD AMOLED Display Using Amorphous-IGZO TFTs and RGB Fine Metal Mesh  
Sai-Chang Liu, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

58.2: A 55-in. OLED TV Using Optimal Driving Method for Large-Sized Panel Based on InGaZnO TFTs  
Joong-Sun Yoon, LG Display Co., Ltd., Kyunggi-do, South Korea

58.3: Invited Paper: Highly Reliable InGaZnO TFT Backplane for 55-in. 4K x 2K OLED Displays  
Hiroshi Hayashi, Panasonic AVC Networks Company, Himeji, Japan
Session 59: e-Paper II (e-Paper and Flexible Displays)
Friday, June 6 / 10:40 am - 12:00 pm / Room 6B
Chair: Makoto Omodani, Tokai University
Co-Chair: Bo-Ru Yang, Sun Yat-Sen University
59.1: Invited Paper: Electrophoretic Display Platform Comprising BWR Particles
Michael McCreary, E Ink Corp., Billerica, MA, USA
59.2: The Contributions of Built-In Light on the Readability of e-Paper Devices
Tatsuya Koizuka, Nagoya University, Nagoya, Japan
59.3: Invited Paper: Developing e-Paper Standards for the Mobile Age
John Penczek, Luminex Technologies, Boulder, CO, USA
59.4: Late-News Paper: A First Demonstration of the Bi-Primary Color System for e-Paper with Complementary-Color Dual-Particle Electrophoretic Dispersions
Jason Heikenfeld, University of Cincinnati, Cincinnati, OH, USA

Session 60: 3D and Augmented-Reality Electronics (3D / Display Electronics)
Friday, June 6 / 10:40 am - 12:00 pm / Room 1
Chair: Achin Bhowmik, Intel Corp.
Co-Chair: Haruhiko Okumura, Toshiba Corp.
60.1: Invited Paper: 3D Model-Based Camera Tracking Technology for Augmented Reality
Koji Makita, National institute of AIST, Tsukuba, Japan
60.2: Efficient Light-Field Rendering Using Depth Map
Young-Ju Jeong, Samsung Advanced Institute of Technology, Giheung-gu, South Korea
60.3: 3D Glasses-Free Display with Dead-Zone Optimization for Multi-Users
Yi Yen, AU Optronics Corp., Hsinchu, Taiwan, ROC
60.4: Overdriving LC GRIN Lens to Stabilize Lens Profile for 2D/3D Display
Shinichi Uehara, Toshiba Corp., Kawasaki, Japan

Session 61: Projectors (Projection)
Friday, June 6 / 10:40 am - 12:10 pm / Room 2
Chair: Fujio Okumura, NEC Corp.
Co-Chair: Sergei Yakovenko, LensVector, Inc.
61.1: Invited Paper: How High-Frame-Rate Dual-Projector 3-D Made Its Movie Debut at the World Premiere of The Hobbit
Terry Schmidt, Christie Digital Systems, Wellesley, Ontario, Canada
61.2: Reflective Multi-View Screen and Mobile Projectors for Communication Displays
Munekazu Date, NTT Media Intelligence Laboratories, Nippon Telegraph and Telephone Corp., Kanagawa, Japan
61.3: High-Contrast Remodulation Projector with Constant Brightness and System Adjustments
David Eccles, Rockwell Collins, Salt Lake City, UT, USA
61.4: New 4000-lm Hybrid Solid-State Light-Source Data Projector
Tsuneharu Nomura, Sony Corp., Kanagawa, Japan
61.5: Late-News Paper: Latest Developments in 3D Projection Mapping Systems
John Vieth, Christie Digital Systems, Kitchener, Ontario, Canada

Session 62: Novel Displays (Display Systems)
Friday, June 6 / 10:40 am - 12:00 pm / Room 5
Chair: Bill Cummings, Qualcomm MEMS Displays
Co-Chair: Jean-Pierre Guillou, Apple, Inc.
62.1: Distinguished Paper: Multi-View 3D Display System Using Arrayed Beam-Steering Devices
Yunhee Kim, Samsung Electronics Co., Ltd., Kyunggi-do, South Korea
62.2: High-Performance Transmissive Electrowetting Display Based on Bilayered Metallic Nanowire Gratings
Zhicheng Ye, Shanghai Jiao Tong University, Shanghai, China
62.3: Hand-Waving Steganography by Using a High-Frame-Rate LED Panel
Hirotsugu Yamamoto, University of Tokushima, Tokushima, Japan
62.4: Late-News Paper: Light-Emitting Memory: A Modular LED Panel with 10K True-Color Frame Rate for 3D Display Applications
Bo Zhou, Altera Corp., San Jose, CA, USA

Poster Session
Thursday, June 5 / 5:00 – 8:00 pm / Exhibit Hall A

Active-Matrix Devices
P.1: Distinguished Poster: Fabrication of a Self-Aligned ZrInZnO TFT Using Polypropylene Carbonate Solution
H. T. C. Tu, Japan Advanced Institute of Science and Technology, Ishikawa, Japan
P.2: High-Mobility Zinc Oxynitride TFT for AMOLED Displays
Meili Wang, BOE Technology Group Co., Ltd., Beijing, China
P.3: Hybrid-Type Temperature Sensor Using TFTs
Mutsuni Kimura, Ryukoku University, Otsu, Japan
P.4: Effects of Surface Polarity on Nematic Liquid Crystal Alignment
Young Ju Kim, Kyung Hee University, Gyeonggi-do, Korea
P.5: Pseudo-CMOS Circuits Using Amorphous In-Sn-Zn-O TFTs
Mutsuni Kimura, Ryukoku University, Otsu, Japan
P.6: Static Reliability of Bridged-Grain Poly-Si TFTs
Meng Zhang, Hong Kong University of Science and Technology, Kowloon, Hong Kong
P.7: High-Speed a-IGZO TFT-Based Circuits Using Back-Channel Etched Structure
Jin Jang, Kyung Hee University, Seoul, South Korea
Display Electronics

P.41: Active-Matrix Display with In-Pixel D/A Conversion Driven by Digital Pulse Width Modulation
Ya-Hsiung Tai, National Chiao Tung University, Hsinchu, Taiwan, ROC

P.42: A New Driving Method for PS-BP LCD
Xinhui Zhong, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

P.43: A Novel TFT Pixel Design for Active-Matrix FLC with Gray-Scale Generation
Tsz Kin Ho, Hong Kong University of Science and Technology, Kowloon, Hong Kong

P.44: Master-Slave Pixel Concept Used for Improved Sensor Display Array Circuits
Nikolas Papadopoulos, University of Waterloo, Waterloo, Ontario, Canada

P.45: A Feedback Method for Assuring Reliable Visual Quality of Locally Dimmed LCDs
Daniel Schäfer, Saarland University, Saarbruecken, Germany

P.46: A Real-Time Computer-Generated integral-Imaging System Based on Multiple Orthographic Frustum Combining
Qiong-Hua Wang, Sichuan University, Chengdu, China

P.47: New Signal-Processing Method to Improve Image Quality of RGBW Display
Masaaki Kabé, Japan Display, Inc., Kanagawa, Japan

P.48: Development of a Novel RGBW Mobile Display with a Local-Dimming Backlight System
Tsutomu Harada, Japan Display, Inc., Kanagawa, Japan

P.49: New Blue-Phase LCD Driving Pixel Circuit for a-IGZO TFT with Large Operational Voltage
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan, ROC

P.50: Driving System for RGBW AMOLED Display
Scu-Heng Tseng, BOE Technology Group Co., Ltd., Beijing, China

P.51: a-IGZO TFT Based Operational Amplifier and Comparator Circuits for the Adaptive DC-DC Converter
Hojin Lee, Soongsil University, Seoul, South Korea

P.52: A New Dynamic Headroom Controller Using Storage Delay Time of BJT for Low-Power-Consumption LED Backlight
Jin Huh, KAIST, Daejeon, South Korea

P.53: Real-Time Super-Resolution for 4K x 2K TVs Using Edge-Directed Unsharp Masking Sharpening Method
Fang-Cheng Lin, National Chiao Tung University, Hsinchu, Taiwan, ROC

P.54: Image Segmentation Using Densely Constructed Mean Shift Vectors
HanJoo Cho, Pohang University of Science and Technology, Pohang, South Korea

P.55: Adaptive Noise-Reduction Method Using Variable Window Size Based on Region Analysis
Jae Hwan Lim, Pohang University of Science and Technology, Pohang, South Korea

P.56: A Single-Inductor Bipolar-Output DC/DC Converter with High Efficiency Over Wide Load Range for Active Matrix OLED
Ke-Horng Chen, NCTU, Hsinchu, Taiwan, ROC

P.57: Pixel Design of 5-in. Full-HD IPS-LCD Using Wall Electrodes
Takato Hiratsuka, Japan Display, Inc., Chiba, Japan

P.175L: Late-News Poster: A 2.0-Gbps Intra-Panel Interface with Automatic Calibration for Chip-on-Glass
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