

SYMPOSIUM PROGRAM

2013 SID INTERNATIONAL SYMPOSIUM

May 21-24, 2013 (Tuesday – Friday)
Vancouver Convention Centre
Vancouver, British Columbia, Canada

Session 1: Annual SID Business Meeting

Tuesday, May 21, 2013/ 8:00 – 8:20 am / Concourse Hall

Session 2: Opening Remarks / Keynote Addresses

Tuesday, May 21, 2013 / 8:20 - 10:20 am / Concourse Hall

- 2.1: *Keynote 1: Displays and Innovation: An Exciting Future***
Dr. Kinam Kim, President & CEO, Samsung Display Co., Chungcheongnam-do, Korea
- 2.2: *Keynote 2: The Social Life of Devices***
Mr. Bill Buxton, Principal Researcher, Microsoft Research, Microsoft Corp., Redmond, WA, USA
- 2.3: *Keynote 3: Exciting Developments in Oxide-TFT Technology***
Professor John Wager, Oregon State University, Corvallis, OR, USA

Session 3: Autostereoscopic and Multi-View I (3D/Display Systems)

Tuesday, May 21, 2013, / 10:50 - 11:50 am / Ballroom A

Chair: Kälil Kälântär, Global Optical Solution

Co-Chair: Jean-Pierre Guillou, Apple, Inc.

- 3.1: A Novel Architecture for Autostereoscopic 2D/3D Switchable Display Using Dual-Layer OLED Backlight Module**
Yi-Jun Wang, Shanghai Jiao Tong University, Shanghai, China
- 3.2: Application of a Flexible LCD in a High-Resolution Switchable Autostereoscopic 3D Display**
Shiuan-Iou Lin, AU Optronics Corp., Hsinchu, Taiwan, ROC
- 3.3: Optimized Parallax Control of 3D Images on an Autostereoscopic Display**
Takefumi Hasegawa, NLT Technologies, Ltd., Kanagawa, Japan

Session 4: Oxide TFTs I (Oxide TFTs/Active-Matrix Devices)

Tuesday, May 21, 2013 / 10:50 - 12:00 Noon / Ballroom B

Chair: Arokia Nathan, University College London

Co-Chair: Junho Song, Samsung Display Co., Ltd.

- 4.1: *Invited Paper: Electronic Structure, Carrier Transport, Defects, and Impurities in Amorphous Oxide Semiconductors***
Toshio Kamiya, Tokyo Institute of Technology, Yokohama, Japan
- 4.2: *Invited Paper: Development of High-Mobility Zinc-Oxynitride TFT***
Yan Ye, Applied Material, Santa Clara, CA, USA
- 4.3: *Invited Paper: High-Mobility Oxide TFT for Large-Area High-Resolution AMOLED Displays***
Sang-Hee Park, ETRI, Daejeon, Korea
- 4.4L: *Late-News Paper: Modeling Current-Voltage Behavior in Oxide TFTs Combining Trap-Limited Conduction with Percolation***
Sungsik Lee, University of Cambridge, Cambridge, UK

Session 5: LCD or OLED? (Liquid-Crystal Technology)

Tuesday, May 21, 2013 / 10:50 - 11:50 am / Ballroom C

Chair: Akihiro Mochizuki, I-CORE Technology, LLC

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

- 5.1: *Invited Paper: LCD or OLED: Who Wins?***
David Barnes, BizWitz, LLC, Georgetown, TX, USA
- 5.2: *Invited Paper: TFT-LCDs as the Future Leading Role in FPDs***
Yasuhiro Ukai, Ukai Display Device Institute, Hyougo, Japan
- 5.3: *Invited Paper: AH-IPS, Superb Display for Mobile Devices***
Joun Ho Lee, LG Display Co., Ltd, Gyeonggi-do, Korea

Session 6: e-Paper I (e-Paper and Flexible Displays)

Tuesday, May 21, 2013 / 10:50 am - 12:10 pm / Room 118

Chair: Makoto Omodani, Tokai University

Co-Chair: Yong Taek Hong, Seoul National University

- 6.1: *Invited Paper: Electronic-Paper System Using High-Resolution Electrophoretic Display***
Satoshi Nebashi, Seiko-Epson Corp., Nagano, Japan
- 6.2: Flexible Electrophoretic Display Driven by Solution-Processed OTFTs Manufactured Using All-Sputtered Electronic**
Jung Eun Lee, LG Display R&D Center, Gyeonggi-do, Korea
- 6.3: *Distinguished Paper: A 9-in. Flexible Color Electrophoretic Display with Projected-Capacitive Touch Panel and Integrated a-Si Gate Driver***
Yen Lai, AU Optronics Corp., Hsinchu, Taiwan, ROC

- 6.4: **Invited Paper:** The Effect of Touching Documents in Reading: Comparing Paper and a Touch-Based Tablet Device in Intensive Proofreading
Hirohito Shibata, Fuji Xerox Co., Ltd., Kanagawa, Japan

Session 7: Plasma-Display Devices (*Emissive Displays*)

Tuesday, May 21, 2013 / 10:50 - 12:00 Noon / Room 202

Chair: *Larry Weber, Consultant*

Co-Chair: *Qun Yan, Sichuan COC Display Devices Co., Ltd.*

- 7.1: **Invited Paper:** Progress in Luminous Array Film with Plasma-Tube Technology for Seamless-Tiling Super-Large-Area Display.
Terukazu Kosako, Shinoda Plasma Co., Ltd., Kobe, Japan
- 7.2: **Determination Method of Pixel Values for Combined Single-Line and Multi-Line Scanning Method for 120-Hz PDP**
Tomokazu Shiga, The University of Electro-Communication, Tokyo, Japan
- 7.3: **Simulation Study of a Flat-Panel Radiation Detector Based on Shadow-Mask PDP**
Yan Tu, Southeast University, Nanjing, China
- 7.4L: **Late-News Paper:** New, Thinner Phosphor Layer Fabrication Process for ACPDPs
Ryuichi Murai, Panasonic AVC Networks Company, Osaka, Japan

Session 8: Emerging Displays (*Applications*)

Tuesday, May 21, 2013 / 10:50 - 11:50 am / Room 205

Chair: *Jean-Noel Perbet, THALES Avionic*

Co-Chair: *Adi Abileah, Planar Systems, Inc.*

- 8.1: **Invited Paper:** Optical and System Considerations for Mobile Touch-Screen Applications
Steven Bathiche, Microsoft, Redmond, WA, USA
- 8.2: **Semi-Transparent Inverted Quantum-Dot Light-Emitting Diodes**
Jin Jang, Kyung Hee University, Seoul, Korea
- 8.3: **Blur-Free Transparent LCD with Hybrid Transparency**
Chia-Wei Kuo, AU Optronics Corp., Hsinchu, Taiwan

Session 9: Autostereoscopic and Multi-View II (*3D/Display Systems*)

Tuesday, May 21, 2013 / 2:00 - 3:00 pm / Ballroom A

Chair: *Matthew Brennesholtz, Insight Media*

Co-Chair: *Jae Hyeung Park, Chungbuk National University*

- 9.1: **Frontal-Projection-Type Three-Dimensional Display with Enhanced Brightness Uniformity**
Byoung-ho Lee, Seoul National University, Seoul, Korea
- 9.2: **A Wide-View High-Resolution 3D Display Using Real-Time Rendering Regarding Viewer Position**
Yingbao Yang, Japan Display, Inc., Kanagawa, Japan
- 9.3: **Round-View-Display Motion-Parallax-Based 3D Display with Super-Wide Viewing Angle**
Hidefumi Takamine, Toshiba Corp., Kawasaki, Japan

Session 10: Oxide TFTs II (*Oxide TFTs/Active-Matrix Devices*)

Tuesday, May 21, 2013 / 2:00 - 3:00 pm / Ballroom B

Chair: *Tohru Nishibe, Japan Display Central, Inc.*

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

- 10.1: **High-Mobility Self-Aligned Top-Gate Oxide TFT for High-Resolution AMOLEDs**
Narihiro Morosawa, Sony Corp., Kanagawa, Japan
- 10.2: **Invited Paper:** Development of Advanced Co-Planar Oxide TFT for OLED Displays
Jong Uk Bae, LG Display Co., Ltd., Gyeonggi-do, Korea
- 10.3: **Invited Paper:** High-Mobility Oxide TFTs for Future LCDs
Junho Song, Samsung Display Co., Ltd., Gyeonggi-do, Korea
- 10.4: **Improvement in Stability of a-IGZO LCDs**
Chun Wei Wu, BOE Technology Group Co., Ltd., Beijing, China

Session 11: 4K x 2K Displays (*Liquid-Crystal Technology*)

Tuesday, May 21, 2013 / 2:00 - 3:00 pm / Ballroom C

Chair: *Shui Chih Lien, TCL Group*

Co-Chair: *Matthew Sousa, 3M*

- 11.1: **Invited Paper:** Development of Largest 110-in. 4K x 2K 3D TFT-LCD
Chung-Yi Chiu, Shenzhen China Star Optoelectronics Technology Co., Ltd., Guangdong, China
- 11.2: **Invited Paper:** Development of Large-Sized Oxide-TFT LCD TV with ADSDS Technology
Chao Ping Chen, Shanghai Jiao Tong University, Shanghai, China
- 11.3: **Distinguished Paper:** High-Transmission VA-LCD with a Three Dimensionally Shaped Pixel Electrode for 4K x 2K Displays
Masashi Miyakawa, Sony Corp., Kanagawa, Japan

Session 12: e-Paper II (*e-Paper and Flexible Displays*)

Tuesday, May 21, 2013 / 2:00 - 3:20 pm / Room 118

Chair: *Paul Drzaic, Apple, Inc.*

Co-Chair: *Nick Colaneri, Flexible Display Center*

- 12.1: **Invited Paper:** Electrofluidic Imaging Films for Brighter, Faster, and Lower-Cost e-Paper
Jason Heinkenfeld, University of Cincinnati, Cincinnati, OH, USA
- 12.2: **Invited Paper:** Electrochemical Display for Color e-Paper and Dual-Mode Display

Norihisa Kobayashi, Chiba University, Chiba, Japan

- 12.3: **Development of Electro-Osmotic Color e-Paper**
Alex Henzen, IRX Innovations BV, Son en Breugel, The Netherlands
- 12.4: **Recent Development of Transparent Electrowetting Display**
Kuo Lung Lo, ITRI, Chutung, Taiwan, ROC

Session 13: Plasma-Display Protective Layer (*Emissive Displays*)

Tuesday, May 21, 2013 / 2:00 - 3:00 pm / Room 202

Chair: Ryuichi Murai, Panasonic AVC Devices Development Center

Co-Chair: Kyung Cheol Choi, KAIST

- 13.1: **Improvement of Luminous Efficacy by Applying Ca_xMg_{1-x}O Protecting Layer with High-Xe-Content-Discharge Gas**
Qun Yan, COC Display Device Co., Wallkill, NY, USA
- 13.2: **Effects of Sealing Conditions and CaO Contents on Aging Behavior of ACPDP with (Mg,Ca)O Protective Layer**
Yong-Seog Kim, Hong-ik University, Seoul, Korea
- 13.3: **Secondary Electron Emission of Modified MgO Surfaces in Plasma Displays Based on First Principle**
Yan Tu, Southeast University, Nanjing, China

Session 14: Human Enhancement and Diagnostics (*Applications*)

Tuesday, May 21, 2013 / 2:00 - 3:20 pm / Room 205

Chair: Jyrki Kimmel, Nokia Research Center

Co-Chair: Susan Jones, Nulumina Corp.

- 14.1: **Invited Paper: Sonification: Multimodal and Auditory Display of Data**
Bruce Walker, Georgia Institute of Technology, Atlanta, GA, USA
- 14.2: **Invited Paper: Development of Auditory and Cross-Modal Displays for Assistive Technology**
Tony Stockman, Queen Mary University of London, London, UK
- 14.3: **A Novel Concept for a Blood-Vessel Viewer Based on a Bidirectional OLED Microdisplay**
Constanze Großmann, Fraunhofer IOF, Jena, Germany
- 14.4: **Polychromatic High-Frequency Steady-State Visual Evoked Potentials for Brain-Display Interaction**
Yu-Yi Chien, National Chiao Tung University, Hsinchu, Taiwan, ROC

Session 15: LC Technology for 3D I (*3D/Liquid-Crystal Technology*)

Tuesday, May 21, 2013 / 3:40 - 5:00 pm / Ballroom A

Chair: Philip Bos, Kent State University

Co-Chair: Terry Scheffer, Motif, Inc.

- 15.1: **Invited Paper: High-Performance Autostereoscopic 2D/3D Switchable Display Using Liquid-Crystal Lens**
Shinichiro Oka, Japan Display, Inc., Chiba, Japan
- 15.2: **Distinguished Paper: LC GRIN Lens Mode with Wide Viewing Angle for Rotatable 2D/3D Tablet**
Masako Kashiwagi, Toshiba Corp., Kawasaki, Japan
- 15.3: **A Novel Liquid-Crystal Lens for Autostereoscopic 3D Displays**
Sheng-Chi Liu, AU Optronics Corp., Hsinchu, Taiwan
- 15.4: **Function-Integrated LC GRIN Lens for Partially Switchable 2D/3D Display**
Ayako Takagi, Toshiba Corp., Kawasaki, Japan

Session 16: Oxide-TFT Reliability (*Oxide TFTs/Active-Matrix Devices*)

Tuesday, May 21, 2013 / 3:40 - 5:00 pm / Ballroom B

Chair: Yoshitaka Yamamoto, Sharp Corp.

Co-Chair: Takatoshi Tsujimura, Konica-Minolta

- 16.1: **Negative-Bias Photodegradation Mechanism in SnO TFTs**
Masashi Tsubuku, Semiconductor Energy Laboratory Co., Ltd, Kanagawa, Japan
- 16.2: **A 4.8-in. AMOLED Display Panel Driven by Stable Amorphous InZnO TFT**
Lei Wang, Guangzhou New Vision Opto-Electronic Technology Co., Ltd., Guangzhou, China
- 16.3: **AC and DC Bias-Temperature Stability of Coplanar Homo Junction a-InGaZnO TFT**
Eric Yu, University of Michigan, Ann Arbor, MI, USA
- 16.4: **Photostability Improvement of a-InGaZnO TFTs by Introducing a Transparent UV-Shielding Layer**
Min-Yen Tsai, National Chiao Tung University, Hsinchu, Taiwan, ROC

Session 17: Blue-Phase LCDs I (*Liquid-Crystal Technology*)

Tuesday, May 21, 2013 / 3:40 - 4:30 pm / Ballroom C

Chair: Shin-Tson Wu, University of Central Florida

Co-Chair: Martin Schadt, MS Hightech Consulting

- 17.1: **Invited Paper: Polymer-Stabilized Blue-Phase LCDs Applying Novel Groove Cell Structure**
Cheng-Yeh Tsai, AU Optronics Corp., Hsinchu, Taiwan, ROC
- 17.2: **Low-Voltage Blue-Phase LCD with Red-Shifted Bragg Reflection**
Jin Yan, University of Central Florida, Orlando, FL, USA
- 17.3L: **Late-News Paper: Enhancing the Contrast Ratio of Blue-Phase LCDs**
Yifan Liu, University of Central Florida, Orlando, FL, USA

Session 18: Flexible AMOLED Displays (*e-Paper and Flexible Displays*)

Tuesday, May 21, 2013 / 3:40 - 4:50 pm / Room 118

Chair: Ruiqing Ma, Universal Display Corp.

Co-Chair: *Rashmi Rao, Qualcomm MEMS Technology*

- 18.1: **Invited Paper:** Roll-to-Roll Manufacturing of Printed OLEDs
Jukka Hast, Oulu, Finland
- 18.2: **A 3.4-in. Flexible High-Resolution Full-Color Top-Emitting AMOLED Display**
Akihiro Chida, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
- 18.3: **Flexible Barrier Technology for Enabling Rollable AMOLED Displays and Upscaling Flexible OLED Lighting**
Flora Li, Holst Centre/TNO, Eindhoven, The Netherlands
- 18.4L: **Late-News Paper:** Full-Color Flexible Top-Emission AMOLED Display on Polyethylene Naphthalate (PEN) Foil with IGZO TFTs Backplane
Yusuke Fukui, Panasonic Corp., Osaka, Japan

Session 19: Phosphors and Quantum-Dot LEDs (Emissive Displays)

Tuesday, May 21, 2013 / 3:40 - 5:20 pm / Room 202

Chair: *Ravi Rao, Specialty Phosphors, Inc.*

Co-Chair: *Masayuki Nakamoto, Shizuoka University*

- 19.1: **Efficiency Enhancement of Indium-Phosphide-Based Quantum-Dot Light-Emitting Diodes by Shell Thickness Tuning**
Jiwan Kim, Korea Electronics Technology Institute, Seongnam, Korea
- 19.2: **Distinguished Paper:** Characterization of Electron-Hole-Pair Migration and Trapping in Rare-Earth-Doped YBO₃ under Vacuum-Ultraviolet Excitation
Anthony Diaz, Central Washington University, Ellensburg, WA, USA
- 19.3: **Morphology-Controlled Single-Crystal ZnO Nanostructures Fabricated by a Novel Mist Chemical Vapor Deposition**
Chaoyang Li, Kochi University of Technology, Kami, Japan
- 19.4L: **Late-News Paper:** Development of Stable Alkaline-Earth-Sulfide LED Phosphors for LCD Backlights
Ravi Rao, Specialty Phosphors, Inc., Cupertino, CA, USA
- 19.5L: **Late-News Paper:** High-Efficiency and Long-Lifetime Quantum-Dot Light-Emitting Diodes for Flat-Panel-Display Application
Paul Holloway, University of Florida, Gainesville, FL, USA
- 19.6L: **Late-News Paper:** How to Fabricate Much Brighter AC Electroluminescent Lamps: Optimizing the Alignment of the Emitting ZnS:Cu Phosphor Particles to the AC Field
Jack Silver, Brunel University, London, UK

Session 20: LC Technology for 3D II (3D/Liquid-Crystal Technology)

Wednesday, May 22, 2013 / 9:00 - 10:00 am / Ballroom A

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

Co-Chair: *Allan Kmetz, Consultant*

- 20.1: **Color Holographic Display Based on Fast-Response Liquid-Crystal Cell**
Yikai Su, Shanghai Jiao Tong University, Shanghai, China
- 20.2: **Enlarged Viewing Angle of Integral-Imaging System by Liquid-Crystal Prism**
Chih-Wei Chen, National Chiao Tung University, Hsinchu, Taiwan, ROC
- 20.3: **Novel Adaptive Liquid Lens Actuated by Liquid-Crystal Piston**
Su Xu, University of Central Florida, Orlando, FL

Session 21: OLED TV (Active-Matrix Devices/OLEDs)

Wednesday, May 22, 2013 / 9:00 - 10:10 am / Ballroom B

Chair: *Hyun Jae Kim, Yonsei University*

Co-Chair: *Sven Murano, Novaled AG*

- 21.1: **Invited Paper:** Technological Progress and Commercialization of AMOLED TV
Chang-Ho Oh, LG Display Co., Ltd., Gyeonggi-do, Korea
- 21.2: **Distinguished Paper:** A 55-in. AMOLED TV Using InGaZnO TFTs Using WRGB Pixel Design
Woo-Jin Nam, LG Display Co., Ltd., Gyeonggi-do, Korea
- 21.3: **A 65-in. Amorphous-Oxide-TFT AMOLED TV Using Side-by-Side and Fine-Metal-Mask Technology**
Jen-Yu Lee, AU Optonics Corp., Hsinchu, Taiwan, ROC
- 21.4L: **Late-News Paper:** Recent Developments in Carbon-Nanotube-Enabled Vertical Organic Light-Emitting Transistors for OLED Displays
Mitchell McCarthy, nVerPix, LLC, and University of Florida, Gainesville, FL, USA

Session 22: Blue-Phase LCDs II (Liquid-Crystal Technology)

Wednesday, May 22, 2013 / 9:00 - 10:20 am / Ballroom C

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

Co-Chair: *Kei-Hsiung Yang, National Chiao Tung University*

- 22.1: **Invited Paper:** Low-Voltage Polymer-Stabilized Blue-Phase Liquid Crystal
Yasuhiro Haseba, JNC Petrochemical Corp., Chiba, Japan
- 22.2: **Invited Paper:** Liquid-Crystalline Cubic Blue Phase in Photo-Responsive Bent-Core Molecular System
Suk-Won Choi, Kyung Hee University, Seoul, Korea
- 22.3: **Polymer-System Effect on Polymer-Stabilized Blue-Phase Liquid Crystal**
Jian Gang Lu, Shanghai Jiao Tong University, Shanghai, China
- 22.4: **Multi-Stable LCD with Dual-Frequency Reverse-Mode Polymer-Stabilized Cholesteric Texture**
Jiun-Haw Lee, National Taiwan University, Taipei, Taiwan, ROC

Session 23: Flexible TFTs (e-Paper and Flexible Displays)

Wednesday, May 22, 2013 / 9:00 - 10:20 am / Room 118

Chair: *Bruce Gnade, University of Texas at Dallas*

Co-Chair: Jin Jang, Kyung Hee University

- 23.1: **Invited Paper: Jet-Printed TFTs and Circuits for Flexible Electronics**
Robert Street, Palo Alto Research Center, Palo Alto, CA, USA
- 23.2: **Invited Paper: Solution-Processed Metal-Oxide TFTs and Circuits on Plastic by Photochemical Activation Process**
Sung Kyu Park, Chung-Ang University, Seoul, Korea
- 23.3: **Invited Paper: Upgrading Self-Aligned Imprint Lithography (SAIL) in Preparation for Roll-to-Roll Manufacturing of Large-Sized High-Performance Flexible Electronics**
Han-Jun Kim, Hewlett-Packard Labs, Palo Alto, CA USA
- 23.4: **Delamination Effect on Flexible LTPS-TFTs**
Ssu-Hui Lu, AU Optronics Corp., Hsinchu, Taiwan, ROC

Session 24: Novel Measurements (Display Measurement)

Wednesday, May 22, 2013 / 9:00 - 10:20 am / Room 202

Chair: Stephen Atwood, Azonix Corp.

Co-Chair: Xiao-Hua Li, Southeast University

- 24.1: **Invited Paper: Photography of Display Surfaces Using Consumer Cameras: Three Regimes and Tristimulus Imagery**
Edward Kelley, KELTEK, Longmont, CO, USA
- 24.2: **Distinguished Paper: Viewing-Angle Measurements on Flexible Reflective e-Paper Displays**
Dirk Hertel, E Ink Corp., Cambridge, MA, USA
- 24.3: **Characterization and Modeling of Light-Diffusing Sheet**
Yue Cui, Liquid Crystal Institute, Kent State University, Kent, OH, USA
- 24.4: **A Novel Measurement Method for Sparkle "Characterization"**
Ellen Kosik-William, Corning Incorporated, Corning, NY, USA

Session 25: Advanced LCD Electronics (Display Electronics)

Wednesday, May 22, 2013 / 9:00 - 10:00 am / Room 205

Chair: Ya Hsiang Tai, National Chiao Tung University

Co-Chair: Achin Bhowmik, Intel Corp.

- 25.1: **Invited Paper: Capacitively Coupled 13.56-MHz Resonance-Controlled Wireless Power Transfer System for e-Paper Modules**
Reiji Hattori, Kyushu University, Fukuoka, Japan
- 25.2: **Invited Paper: ESD and EOS Impact During Module Assembly Processes of Display Panel**
Ming-Dou Ker, National Chiao-Tung University, Hsinchu, Taiwan, ROC
- 25.3: **Pixel Circuit with Bootstrapping Structure for Blue-Phase LCDs**
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan, ROC

Session 26: Holographic and Volumetric Displays (3D/Display Systems)

Wednesday, May 22, 2013 / 10:40 - 11:40 am / Ballroom A

Chair: Jean-Pierre Guillou, Apple, Inc.

Co-Chair: Masaru Suzuki, SKC Haas Display Film

- 26.1: **A Coarse Integral Holographic Display**
Quinn Smithwick, Disney Research, Glendale, CA, USA
- 26.2: **A Two-Step Wave-Field Projection Method for Fast Hologram Pattern Generation**
Hocheon Wey, Samsung Advanced Institute of Technology, Gyeonggi-do, Korea
- 26.3: **Volumetric Display System Using Multiple Mini-Projectors**
Yongtian Wang, Beijing Institute of Technology, Beijing, China

Session 27: OLED Displays I (OLEDs)

Wednesday, May 22, 2013 / 10:40 - 11:50 am / Ballroom B

Chair: Sven Murano, Novaled AG

Co-Chair: Yusin Lin, AU Optronics Corp.

- 27.1: **A 13.3-in. CAAC-IGZO-FET OLED Display with Narrow Driver Area Using a Highly Efficient Deep-Blue Device**
Tsunenori Suzuki, Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan
- 27.2: **The Study of Picture Quality of AMOLED TV with WRGB OLED Structure.**
Jong-Kun Yoon, LG Display Co., Ltd., Gyeonggi-do, Korea
- 27.3L: **Late-News Paper: Subpixel Structured OLED Microdisplay**
Rigo Herold, Fraunhofer COMEDD, Dresden, Germany

Session 28: Advanced Displays (Liquid-Crystal Technology)

Wednesday, May 22, 2013 / 10:40 am - 12:10 pm / Ballroom C

Chair: Anthony Lowe, Lambent Consultancy

Co-Chair: Cheng Chen, Apple, Inc.

- 28.1: **Distinguished Student Paper: High-Performance Fringe-Field Switching with a Negative-Dielectric-Anisotropy Liquid Crystal**
Yuan Chen, University of Central Florida, Orlando, FL, USA
- 28.2: **Driving Method of FFS-Mode Oxide LCD for Reducing Eye Strain**
Ryo Hatsumi, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
- 28.3: **A Novel Vertically Aligned In-Plane-Switching LCD Mode with a Charge-Shared Structure**
Sau-Wen Tsao, AU Optronics Corp., Hsinchu, Taiwan, ROC
- 28.4: **A Novel Liquid-Crystal Mode with High Picture Quality**
Mei-Ju Lu, AU Optronics Corp., Hsinchu, Taiwan, ROC

28.5L: *Late-News Paper*: Wide-Color-Gamut and Wide-Viewing-Angle Color Reflective LCD with Novel Anisotropic Diffusion Layer
Takahiro Ishinabe, Tohoku University, Sendai, Japan

Session 29: Flexible Barriers and Substrates (*e-Paper and Flexible Displays*)

Wednesday, May 22, 2013 / 10:40 - 11:40 am / Room 118

Chair: *Kevin Gahagan, Corning Incorporated*

Co-Chair: *Ryoichi Ishihara, Delft University of Technology*

- 29.1: Ultra-High Barriers for Encapsulation of Flexible Displays and Lighting Devices**
John Fahlteich, Fraunhofer Institute for Electron Beam and Plasma Technology FEP, Dresden, Germany
- 29.2: Atomic Layer Deposition of Al₂O₃/ZrO₂ Nanolaminate on Plastic Substrates for Flexible Displays**
Hyun Gi Kim, Kyung Hee University, Yongin, Korea
- 29.3: *Invited Paper*: The Mechanical Reliability of Flexible ALD Barrier Film**
Samuel Graham, Georgia Institute of Technology, Atlanta, GA, USA
- 29.4: *Invited Paper*: Paper Electronics: A Challenge for the Future**
Rodrigo Martins, Universidade Nova de Lisboa (UNL), Caparica, Portugal

Session 30: Challenges in 3D Characterization, Motion-Blur Analysis, and Monitor Calibration (*Display Measurement*)

Wednesday, May 22, 2013 / 10:40 - 11:50 am / Room 202

Chair: *Thomas Fiske, Qualcomm MEMS Technology*

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

- 30.1: *Invited Paper*: Techniques and Challenges in the Measurement of Stereoscopic Displays**
Adi Abileah, Planar Systems, Beaverton, OR, USA
- 30.2: Driving Scheme Required for Blur-Free Motion of a Target Moving at 480 pps**
Owen Watson, Lockheed Martin Corp., Gaithersburg, MD, USA
- 30.3: Comparison of On-Screen Display-Based and ICC Profile-Based Calibration for OLED Displays**
Wei-Chung Cheng, U.S. Food and Drug Administration, Silver Spring, MD, USA
- 30.4L: *Late-News Paper*: A High-Resolution Method for Measuring 3D Crosstalk Spatial Uniformity**
John Penczek, NIST, Boulder, CO, USA

Session 31: High-Speed Driver Technologies (*Display Electronics*)

Wednesday, May 22, 2013 / 10:40 am - 12:00 Noon / Room 205

Chair: *Dick McCartney, Samsung Display Co.*

Co-Chair: *Taesung Kim, Apple, Inc.*

- 31.1: A 3.5-Gbps/Lane Intra-Panel Interface with a PVT-Robust VCO-Based CDR for UD TV Applications in 0.18- μ m High-Voltage CMOS Technology**
Young-Hwan Chang, Samsung Electronics Co., Ltd., Yongin, Korea
- 31.2: Power-Efficient 5.0-in. 440-ppi Full-HD a-Si TFT-LCD Single-Chip Driver IC**
Young-Sun Na, LG Electronics, Seoul, Korea
- 31.3: A 10-bit CMOS Digital-to-Analog Converter with Logarithmic Time Interpolation**
Young-Chan Jang, Kumoh National Institute of Technology, Gyeongsang-do, Korea
- 31.4: A 3.4-Gbps/Lane Low-Overhead Clock-Embedded Intra-Panel Interface for High-Resolution and Large-Sized TFT-LCDs.**
Woon-Taek Oh, Samsung Electronics Co., Ltd., Yongin, Korea

Session 32: Light-Field Display (*3D/Display Systems*)

Wednesday, May 22, 2013, / 3:30 - 4:50 pm / Ballroom A

Chair: *Brian Schowengerdt, University of Washington*

Co-Chair: *Jae Hyeung Park, Chungbuk National University*

- 32.1: Optimal Projector Configuration Design for a 300-Mpixel Light-Field 3D Display**
Jin-Ho Lee, Samsung Institute of Advanced Technology, Gyeonggi-do, Korea
- 32.2: 360° Floating Light-Field 3D Display Based on a High-Frame-Rate Color Projector**
Xu Liu, Zhejiang University, Hangzhou, China
- 32.3: Light-Field Approximation Using Basic Display Layer Primitives**
Nicola Ranieri, ETH Zurich, Zurich, Switzerland
- 32.4: A Scalable, Collaborative, Interactive Light-Field Display System**
Michael Klug, Zebra Imaging, Inc., Austin, TX, USA

Session 33: OLED Displays II (*OLEDs*)

Wednesday, May 22, 2013 / 3:30 - 4:30 pm / Ballroom B

Chair: *Chihaya Adachi, Kyushu University*

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

- 33.1L: *Late-News Paper*: High-Resolution 4.4-in. AMOLED Display with 413-ppi Real Pixel Density**
Chung-Chia Chen, AU Optronics Corp., Hsinchu, Taiwan, ROC
- 33.2: Spatial-Resolution Characteristics of OLED Displays: A Comparative Analysis of MTF for Handheld and Workstation Formats**
Asumi Yamazaki, U.S. Food and Drug Administration, Silver Spring, MD, USA
- 33.3L: *Late-News Paper*: Optimizing Nanostructures to Enhance Optical Outcoupling of OLED Microdisplays**
Richard Pfeifer, Fraunhofer COMEDD, Dresden, Germany
- 33.4L: *Late-News Paper*: High-Resolution Vacuum Patterning of Organic and Metal Layers for Organic Electronic Devices**
Markus Burghart, VON ARDENNE Anlagentechnik GmbH, Dresden, Germany

Session 34: Fast-Switching LCDs (*Liquid-Crystal Technology*)

Wednesday, May 22, 2013 / 3:30 - 4:30 pm / Ballroom C

Chair: Philip Chen, National Chiao Tung University

Co-Chair: Michael Wand, LC Vision, LLC

- 34.1: **Novel Super-Fast-Response Ultra-Wide-Temperature-Range VA-LCD**
Yosuke Iwata, Sharp Corp., Nara, Japan
- 34.2: ***Distinguished Student Paper*: A Nematic LCD with Submillisecond Gray-to-Gray Response Time**
Daming Xu, University of Central Florida, Orlando, FL, USA
- 34.3: **Dual π -Cell Fast-Response LCD for 3D Application**
Philip Bos, Kent, OH, USA

Session 70: Late-News Papers: Flexible OLEDs and Printing Electronics (*e-Paper and Flexible Displays*)

Wednesday, May 22, 2013 / 3:30 - 4:20 pm / Room 118

Chair: Makoto Omodani, Tokai University

Co-Chair: Rashmi Rao, Qualcomm

- 70.1L: ***Late-News Paper*: 10.2-in. WUXGA Flexible AMOLED Display Driven by Amorphous-Oxide TFTs on Plastic Substrate**
Nobuyoshi Saito, Toshiba Corp., Kawasaki, Japan
- 70.2L: ***Late-News Paper*: 14.7-in. Active-Matrix PhOLED Displays on Temporary Bonded PEN Substrates with Low-Temperature IGZO TFTs**
Barry O'Brien, Arizona State University, Flexible Display Center, Tempe, AZ, USA
- 70.3L: ***Late-News Paper*: All-Wet-Processable Barrier Film for Flexible OLED Displays**
Tomoyuki Kikuchi, Samsung Yokohama Research Institute, Yokohama, Japan
- 70.4L: ***Late-News Paper*: Flexible PIN Diode Sensor Array with In-Ga-Zn-Ox Transistor**
Michael Marr, Arizona State University, Flexible Display Center, Tempe, AZ, USA
- 70.5L: ***Late-News Paper*: Low-Temperature Curable Cu Ink and Fine Ink-Jet-Printed Patterning**
Miyako Fukuda, Asahi Glass Co., Ltd., Tokyo, Japan

Session 35: OLED Pixel and Driving (*Display Electronics*)

Wednesday, May 22, 2013 / 3:30 - 4:50 pm / Room 205

Chair: Hyungsik Nam, Kyung Hee University

Co-Chair: Seung Woo Lee, Kyung Hee University

- 35.1: **High-Resolution AMOLED Pixel Using Negative Feedback Structure for Improving Image Quality**
Oh-Kyong Kwon, Hanyang University, Seoul, Korea
- 35.2: **A New Feedback Programming Architecture Compatible with 2T1C AMOLED Displays**
Thoma Charisouli, Lehigh University, Bethlehem, PA, USA
- 35.3: **A 10-bit Linear R-String DAC Architecture for Mobile Full-HD AMOLED Driver IC**
Ki-Duk Kim, KAIST, Daejeon, Korea
- 35.4: **Programmable Pulse-Width LTPS TFT Shift Register for High-Resolution and High-Frame-Rate Active-Matrix Flat-Panel Display**
Hyungsik Nam, Kyung Hee University, Seoul, Korea

Session 36: Perception in 3D Display (*3D/Applied Vision/Human Factors*)

Thursday, May 23, 2013 / 9:00 - 10:20 am / Ballroom A

Chair: Yi Pai Huang, National Chiao Tung University

Co-Chair: David Hoffman, Samsung Display

- 36.1: **Visual Comfort and Viewing Time of S3D Content on Mobile Device**
Takashi Shibata, Tokyo University of Social Welfare, Gunma, Japan
- 36.2: **Age Differences in the Use of Binocular Disparity and Pictorial Depth Cues in 3D-Graphics Environment**
Ken Kihara, Kagoshima University, Kagoshima, Japan
- 36.3: **Effects of 3D Display System on Convergence and Accommodation**
Takehito Kojima, Nagoya University, Nagoya, Japan
- 36.4: **Comparison between Different Rating Scales for 3D TV**
Kjell Brunnström, Acreo Swedish ICT AB, Kista, Sweden

Session 37: OLED Materials (*OLEDs*)

Thursday, May 23, 2013, / 9:00 - 10:20 am / Ballroom B

Chair: Yasunori Kijima, Sony Corp.

Co-Chair: Denis Kondakov, DuPont

- 37.1: ***Invited Paper*: Third-Generation OLED by Hyper-Fluorescence**
Chihaya Adachi, Kyushu University, Fukuoka, Japan
- 37.2: **Efficiency Improvement of Fluorescent Blue Device by Molecular Orientation of Blue Dopant**
Hitoshi Kuma, Idemitsu Kosan Co., Ltd., Chiba, Japan
- 37.3: **Air-Stable Electron-Transport Materials for Low-Voltage OLEDs**
Tobia Canzler, Novaled AG, Dresden, Germany
- 37.4: ***Invited Paper*: Molecular Triplet Emitters: From Design to Assembly and Functions**
Vivian Yam, The University of Hong Kong, Clear Water Bay, Hong Kong

Session 38: Film and Alignment (*Liquid-Crystal Technology*)

Thursday, May 23, 2013 / 9:00 - 10:20 am / Ballroom C

Chair: Birendra Bahadur, Rockwell Collins

Co-Chair: Gang Xu, Tianma Microelectronics

- 38.1: ***Invited Paper*: Innovation of Optical Films Using Polymerized Discotic Materials: Past, Present, and Future**

- Yoji Ito, FUJIFILM Corp., Tokyo, Japan*
- 38.2: Comparative Analysis of Polyimide Film Alignment Using Near-Edge X-Ray Adsorption**
Musun Kwak, LG Display Co., Ltd., Gyeonggi-do, Korea
- 38.3: Fast Ferroelectric-Liquid-Crystal Modes Based on Photoaligning Technology**
Vladimir Chigrinov, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong
- 38.4: Novel Photoalignment Layer for In-Plane-Switching-Mode LCD Using 313-nm UV Light**
Kohei Goto, Nissan Chemical Industries, Ltd., Funabashi, Japan

Session 39: Touch-User Experience (Touch and Interactivity)

Thursday, May 23, 2013 / 9:00 - 10:00 am / Room 118

Chair: *Steven Bathiche, Microsoft*

Co-Chair: *Reiner Mauch, Schott AG*

- 39.1: Invited Paper: The Next Touch Evolution Advancing the Consumer Experience in Other Realms: Tasks and Tough Environment**
Donald Norman, Norman Neilsen Group, Fremont, CA, USA
- 39.2: Invited Paper: Natural and Intuitive User Interfaces: Technologies and Applications**
Achintya Bhowmik, Intel Corp., Santa Clara, CA, USA
- 39.3: Invited Paper: The Need for Speed in Touch Systems**
Albert Ng, Microsoft, Mountain View, CA, USA

Session 40: Automotive and Head-Up Displays (HUD) (Display Systems/Projection)

Thursday, May 23, 2013 / 9:00 - 10:00 am / Room 202

Chair: *Akihiro Tagaya, Keio University*

Co-Chair: *Cheng-Huan Chen, National Tsing-Hua University*

- 40.1: Invited Paper: Head-Up Display for Car Navigation System**
Osami Utsuboya, Pioneer Corp., Saitama, Japan
- 40.2: Automotive Display Visibility Consideration**
Paul Weindorf, Visteon, Van Buren Twp., MI, USA
- 40.3: High-Efficiency Dual-Mode Head-Up Display System for Vehicle Application**
I-Hsuan Shao, National Tsing Hua University, Hsinchu, Taiwan, ROC

Session 41: Colors and Image Quality (Applied Vision/Human Factors)

Thursday, May 23, 2013 / 9:00 - 10:20 am / Room 205

Chair: *Sakuichi Ohtsuka, Kagoshima University*

Co-Chair: *Miyoshi Ayama, Utsunomiya University*

- 41.1: Distinguished Paper: Viewer Preferences for Shadow, Diffuse, Specular, and Emissive Luminance Limits of High-Dynamic-Range Displays**
Scott Daly, Dolby Laboratories, Sunnyvale, CA, USA
- 41.2: Evaluation on the Colorfulness of Displays**
Takehiro Nakatsue, Sony Corp., Kanagawa, Japan
- 41.3: Evaluating the Effects of Environmental Illuminance on the Readability of e-Books**
Tatsuya Koizuka, Nagoya University, Nagoya, Japan
- 41.4: Subjective Image Quality of Viewing Angle beyond the Color-Difference Metric in FPDs**
Chao-Hua Wen, National Taiwan University of Science and Technology, Taipei, Taiwan, ROC

Session 42: 3D Algorithms and Driving (3D/Display Systems)

Thursday, May 23, 2013 / 10:40 - 12:00 Noon / Ballroom A

Chair: *Jean-Pierre Guillou, Apple, Inc.*

Co-Chair: *John Parker, Retired*

- 42.1: A Real-Time 3D Multi-View Rendering from a Real-Time 3D capture**
Didier Doyen, Technicolor, Sévigné, France
- 42.2L: Late-News Paper: Real-Time Up-Converter from HDTV to 4K with Super-High Resolution**
Seiichi Gohshi, Kogakuin University, Tokyo, Japan
- 42.3: Efficient Multi-View Input Data Format for Glasses-Free 3D Display**
Effendi Su, AU Optronics Corp., Hsinchu, Taiwan, ROC
- 42.4L: Late-News Paper: Footprint of Scalable 3D Telecommunication System: Using Integral Light-Field Display and Kinect-Based Capture**
Yifan Peng, Zhejiang University, Hangzhou, China

Session 43: OLED Devices I (OLEDs)

Thursday, May 23, 2013 / 10:40 am - 12:00 Noon / Ballroom B

Chair: *Denis Kondakov, DuPontDisplay*

Co-Chair: *Franky So, University of Florida*

- 43.1: Invited Paper: Demonstrating Ideal Injection Efficiency and Enabling Cost-Effective Manufacturing with Solution-Processed Hole-Injection Layer**
Mathew Mathai, Plextronics, Inc., Pittsburgh, PA, USA
- 43.2: Invited Paper: Light Outcoupling for OLEDs: Doubling the Efficiency while Keeping the Dark Current Low**
Guillaume Lecamp, Saint-Gobain Recherche, Aubervilliers, France
- 43.3: Inverted Top-Emitting White OLEDs with Improved Optical and Electrical Characteristic**
Tobia Schwab, TU Dresden, Institut für Angewandte Photophysik, Dresden, Germany

- 43.4: **Invited Paper: Non-Isotropic Emitter Orientation in OLED**
Tobia Schmidt, University of Augsburg, Augsburg, Germany

Session 44: Liquid Crystals with Reactive Mesogen (Liquid-Crystal Technology)

Thursday, May 23, 2013 / 10:40 am - 12:00 Noon / Ballroom C

Chair: *Jae Hoon Kim, Hanyang University*

Co-Chair: *Deng-Ke Yang, Kent State University*

- 44.1: **Ameliorating the Sticking Phenomenon of the Photosensitive Alignment Layer by Using Reactive Mesogen**
Tsu-Yu Ting, Chunghwa Picture Tubes, Ltd., Bade, Taiwan, ROC
- 44.2: **Critical Effect of Polymer Bumps in PS Vertically Aligned LCDs**
Xinhui Zhong, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China
- 44.3: **Characterization of Intra-Molecular Energy Transfer in Reactive-Mesogen Liquid-Crystal Mixture**
Chung-Ching Hsieh, Shenzhen China Star Optoelectronics Technology Co., Ltd., Shenzhen, China
- 44.4: **Development of Fast-Response 4.3-in. WVGA FFS-LCD Using Alignment Layer Mixed with Reactive Mesogen**
Jae-Hoon Kim, Hanyang University, Seoul, Korea

Session 45: Touch Integration and Controller (Touch and Interactivity)

Thursday, May 23, 2013 / 10:40 - 11:40 am / Room 118

Chair: *Jeff Han, Microsoft*

Co-Chair: *Byeong Koo Kim, LG Display Co., Ltd.*

- 45.1: **Distinguished Paper: 12.2-in. 1920 x RGBW x 720 IPS-LCD Integrating In-Cell Touch Panel for Automotive Use**
Chihiro Tanaka, Japan Display, Inc., Kanagawa, Japan
- 45.2: **A Capacitive Touch-Screen Controller IC with Noise-Based Hybrid Sensing Scheme**
Ki-Duk Kim,
- 45.3: **High-Intensity Radiated Field Effect on Projected-Capacitive Touch Screen**
Philippe Coni, THALES Avionics, Le Haillan, France

Session 46: OLED and Oxide-TFT Manufacturing (Oxide TFTs/Display Manufacturing)

Thursday, May 23, 2013 / 10:40 am - 12:10 pm / Room 202

Chair: *Toshiaki Arai, Sony Corp.*

Co-Chair: *Tian Xiao, CBRITE, Inc.*

- 46.1: **Invited Paper: Ink-Jet-Printed 17-in. AMOLED Display with Amorphous-IGZO TFT Backplane**
Ze Liu, BOE Technology Group Co., Ltd., Beijing, China
- 46.2: **Invited Paper: Micron-Patterned Deposition through Shadow Masks with High-Precision Alignment for OLED and e-Paper Application**
Thomas Ambrose, Advantech US, Inc., Pittsburgh, PA, USA
- 46.3: **Development of Source/Drain Electrodes for Amorphous-IGZO TFTs**
Chengyuan Dong, National Engineering Lab for TFT-LCD Materials and Technologies, Shanghai Jiao University, Shanghai, China
- 46.4: **Self-Aligned Bottom-Gate Amorphous-IGZO TFT Using the Back-Side Exposure Technique**
Sang-Moo Park, LG Display Co. Ltd., Gyeonggi-do, Korea
- 46.5L: **Late-News Paper: Large-Area Sputtered Al₂O₃ Films for High-Mobility Active-Matrix TFT Backplanes on PVD Array System**
Andrea Kloeppel, Applied Materials GmbH & Co. KG, Alzenau, Germany

Session 47: Human Factors on Lighting (Lighting/Applied Vision)

Thursday, May 23, 2013 / 10:40 am - 12:00 Noon / Room 205

Chair: *Ingrid Heynderickx, Philips Research Laboratorie*

Co-Chair: *James Larimer, ImageMetrics, LLC*

- 47.1: **Invited Paper: Displays as Light Sources: Resolving the Conflict between Gamut and Color Rendering**
Lorne Whitehead, University of British Columbia, Vancouver, British Columbia, Canada
- 47.2: **Novel Measurement Method of Bright-Light Contrast Ratio Based on Binocular Vision**
Karlheinz Blankenbach, Pforzheim University, Pforzheim, Germany
- 47.3: **The Impact of Watching Television on Evening Melatonin Levels**
Mariana Figueiro, Rensselaer Polytechnic Institute, Troy, NY, USA
- 47.4: **Invited Paper: Opportunities with LEDs for Increasing the Visual Benefits of Lighting**
Mark Rea, Rensselaer Polytechnic Institute, Troy, NY, USA

Session 48: 3D Applications (3D/Applications)

Thursday, May 23, 2013 / 1:30 - 2:50 pm / Ballroom A

Chair: *Ian Underwood, University of Edinburgh*

Co-Chair: *Bao-Jen Pong, Industrial Technology Research Institute*

- 48.1: **Research on the Fringe-Electric-Field Effect of a Liquid-Crystal Phase Modulator for Digital Holography**
Qing Li, Southeast University, Nanjing, China
- 48.2: **Light-Field Rendering of Multi-View Contents for High-Density Light-Field Displays**
J. Park, Samsung Advanced Institute of Technology, Samsung Electronics Co., Ltd., Gyeonggi-do, Korea
- 48.3: **Viewer's Eye-Position Estimation Using a Single Camera**
Seong-Hwan Ju, LG Display Co., Ltd., Gyeonggi-do, Korea
- 48.4: **Dead-Zone-Free 2D/3D Switchable Barrier-Type 3D Display**
Hsuan-Yi Wu, AU Optronics Corp., Hsinchu, Taiwan, ROC

Session 49: OLED Devices II (OLEDs)

Thursday, May 23, 2013 / 1:30 - 2:40 pm / Ballroom B

Chair: Tariq Ali, eMagin Corp.

Co-Chair: Michael Weaver, Universal Display Corp.

- 49.1: **Invited Paper:** Solution-Processed OLED Displays: Advantages and Challenge
Shiva Prakash, DuPont Display, Santa Barbara, CA, USA
- 49.2: **A Study on Electron-Injecting and Surface-Modifying Layer for Transparent OLEDs**
Jang Hyuk Kwon, Kyung Hee University, Seoul, Korea
- 49.3: **Highly Efficient OLED Device with Device Architecture for Reducing Drive Voltage.**
Yoshiharu Hirakata, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
- 49.4L: **Late-News Paper:** Highly Transmissive One-Sided-Emission OLED Panel for Novel Lighting Application
Akio Amano, Toshiba Corp., Kawasaki, Japan

Session 50: Low-Power and Sensor-Integrated Display (Active-Matrix Devices)

Thursday, May 23, 2013 / 1:30 - 2:30 pm / Ballroom C

Chair: Kalluri Sarma, Honeywell, Inc.

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

- 50.1: **Innovative 5-in. FHD and 7-in. WQXGA Displays for Next-Generation Smart Phones and Tablet**
Toshiki Kaneko, Japan Display, Inc., Mobara, Japan
- 50.2: **Adding Depth-Sensing Capability to an OLED-Display System Based on Coded Aperture Imaging**
Sungjoo Suh, Samsung Advanced Institute of Technology, Gyeonggi-do, Korea
- 50.3: **Low-Power High-Image-Quality Color-Reflective LCDs Realized by Memory-in-Pixel Technology and Optical Optimization Using Newly Developed Scattering Layer**
Yoko Fukunaga, Japan Display, Inc., Kanagawa, Japan

Session 51: Touch Application (Touch and Interactivity)

Thursday, May 23, 2013 / 1:30 - 2:30 PM / Room 118

Chair: John Zhong, Apple, Inc.

Co-Chair: Bob Senior, IsiQiri Interface Technologies GmbH

- 51.1: **Integrated Touch Sensing and Front-lit Device and Applications**
Ion Bitu, Qualcomm MEMS Technologie, San Jose, CA, USA
- 51.2: **Touch Mura Mechanisms and Its Suppression by Use of Cover Glass**
Tomohiro Ishikawa, Corning Incorporated, Corning, NY, USA
- 51.3: **Pulling-Force Sensing Unit for 3D Image Movement**
Tsun-Yi Chen, National Tsing Hua University, Hsinchu, Taiwan, ROC

Session 52: Oxide-TFT Manufacturing (Oxide TFTs/Display Manufacturing)

Thursday, May 23, 2013 / 1:30 - 2:50 pm / Room 202

Chair: Fang Chen Luo, AU Optronics Corp.

Co-Chair: Jerzy Kanicki, University of Michigan

- 52.1: **Invited Paper:** High-Performance Metal-Oxide TFT on Flexible Plastic Substrates
Chan-Long Shieh, CBRITE, Inc., Goleta, CA, USA
- 52.2: **Invited Paper:** Advanced Sputtering Technologies and Targets for Oxide Semiconductor TFT
Masasuke Matsudai, ULVAC, Inc., Kanagawa, Japan
- 52.3: **Development of the Back-Channel-Etched TFT Using C-Axis-Aligned Crystalline InGaZn Oxide**
Takuya Hirohashi, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
- 52.4: **Distinguished Paper:** Electrical Properties of Amorphous InGaZnO TFTs Prepared by Magnetron Sputtering Using Kr and Xe Gas
Tetsuya Goto, Tohoku University, Sendai, Japan

Session 53: Lighting Design (Lighting/Applications)

Thursday, May 23, 2013 / 1:30 - 2:50 pm / Room 205

Chair: Gary Jones, Nanoquantum Corp.

Co-Chair: Susan Jones, Nulumina Corp.

- 53.1: **Invited Paper:** Drivers in the Adoption Speed of Solid-State Lighting
Coen Liedebaum, Philips Research Laboratories, Eindhoven, The Netherlands
- 53.2: **An Optimization Design Method of an LED Freeform Lens for Uniform Circular Illumination**
Zhenrong Zheng, Zhejiang University, Hangzhou, China
- 53.3: **Properties of a Field-Emission Lighting Device Employing Highly Crystallized Single-Wall Carbon Nanotube**
Toshimasa Hojo, Tohoku University, Miyagi, Japan
- 53.4: **U-Shaped Daytime Running Light Using Textured TIR Lens**
Kuan-Yu Chen, Chilin Technology Co., Ltd., Tainan, Taiwan, ROC

Session 54: Projection Screens (3D/Projection)

Thursday, May 23, 2013 / 3:10 - 4:30 pm / Ballroom A

Chair: Sergei Yakovenko, LensVector, Inc.

Co-Chair: Alan Sobel, Flatscreen Technologies Corp.

- 54.1: **Achieving High Stereo Contrast Ratio in Polarization-Based 3D Front Projection**
Gary Sharp, RealD, Inc., Boulder, CO, USA
- 54.2: **Invited Paper:** High-Efficiency Polarization Preserving Cinema Projection Screen
Dave Coleman, RealD, Inc., Boulder, CO, USA
- 54.3: **Full-Color High-Contrast Front Projection on a Black Emissive Screen**

Ted Sun, Superimaging, Fremont, CA, USA

- 54.4: **Novel Transparent Emissive Display on Optically Clear Phosphor Screen**
Minghua Zhu, California State University, East Bay, CA, USA

Session 55: OLED Manufacturing (OLEDs)

Thursday, May 23, 2013 / 3:10 - 4:10 pm / Ballroom B

Chair: *Chin Hsin (Fred) Chen, National Chaio Tung University*

Co-Chair: *Yasunori Kijima, Sony Corp.*

- 55.1: **Invited Paper: Organic Vapor Jet MicroPrinting of OLED Displays and Lighting Panel**
Stephen Forrest, University of Michigan, Ann Arbor, MI, USA
- 55.2: **Ink-Jet-Printed AMOLED Displays Based on IGZO TFTs: Cost Does Matter!**
Chih-Lei Chen, AU Optronics Corp., Hsinchu, Taiwan, ROC
- 55.3: **Development of Transparent Filling-Type Desiccant for OLEDs**
Takahiro Niyama, Futaba Corp., Chiba, Japan
- 55.4: **Invited Paper: Development of Highly Productive In-line Vacuum Evaporation System for OLED Lighting**
Young Im, Sunic System, Suwon, Korea

Session 56: TFT Application (Active-Matrix Devices)

Thursday, May 23, 2013 / 3:10 - 4:30 pm / Ballroom C

Chair: *James Chang, Apple, Inc.*

Co-Chair: *Tohru Nishibe, Japan Display Central, Inc.*

- 56.1: **Invited Paper: Development of IGZO-TFT and Creation of New Devices Using IGZO-TFTs**
Hajime Imai, Sharp Corp., Mie, Japan
- 56.2: **Investigating IGZO-TFT Performance under Gate-Bias Stress with and without Light Illumination for 4K x 2K 65-in. Display**
Bo-Liang Yeh, AU Optronics Corp., Hsinchu, Taiwan, ROC
- 56.3: **Performance Improvement of Compensation Circuit Using p-Type SPC TFT for AMOLED Driving**
Jungmin Lee, LG Display Co., Ltd., Gyeonggi-do, Korea
- 56.4L: **Late-News Paper: 2.1-in. WXGA TFT-LCDs Driven by Solution-Processed Metal-Oxide TFTs**
Liang-Yu Lin, AU Optronics Corp., Hsinchu, Taiwan, ROC
- 56.5L: **Late-News Paper: All-Printed Oxide-TFT Arrays for High-Resolution Active-Matrix Displays**
Shinji Matsumoto, Ricoh Co., Ltd., Yokohama, Japan

Session 57: Touch Sensors, Materials, and Manufacturing (Touch and Interactivity/Display Manufacturing)

Thursday, May 23, 2013 / 3:10 - 4:50 pm / Room 118

Chair: *Willem Den Boer, Guardian Industries Corp.*

Co-Chair: *Lauren Palmateer, Subtle Energy Design*

- 57.1: **Transparent Conductive Films Using Roll Printed and Imprinted Grid Mesh Pattern**
Jeongdai Jo, Korea Institute of Machinery and Material, Daejeon, Korea
- 57.2: **Transparent Conductive Coatings Made by Electrochemical and Physicochemical Method**
A Smirnov, Belarusian State University of Informatics and Radioelectronic, Minsk, Belaru
- 57.3: **Touch Sensor Design with XSense**
Esat Yilmaz, Atmel Corp., San Jose, CA, USA
- 57.4: **Ink-Jet-Printed Silver Ring Coating to Replace ITO**
Robert Even, ClearJet, Yokneam, Israel
- 57.5L: **Late-News Paper: Flexible Transparent Conductors and Touch Sensors for High-Contrast Displays**
Erkki Soininen, Canatu Oy, Helsinki, Finland
- 57.6L: **Late-News Paper: Touch-Sensor ITO Thin Films Deposited Using Rotary Sputtering Technology: Comparison of Coating Properties and Cost for DC vs. MF-AC Deposition.**
Paul Lippen, Umicore Thin Film Products AG, Balzer, Liechtenstein

Session 58: Advanced Substrates and Manufacturing on Flex (Display Manufacturing/e-Paper and Flexible Displays)

Thursday, May 23, 2013, / 3:10 - 4:30 pm / Room 202

Chair: *Greg Gibson, FAS Holdings Group*

Co-Chair: *Ryoichi Ishihara, Delft University of Technology*

- 58.1: **Invited Paper: Advanced Glass Substrate for the Enhancement of OLED Lighting Out-Coupling Efficiency**
Nobuhiro Nakamura, Asahi Glass Co., Ltd., Yokohama, Japan
- 58.2: **Distinguished Paper: Roll-to-Roll Process on Ultra-Thin Flexible Glass for Manufacturing a Multi-Touch Sensor Panel**
Chia-Sheng Huang, ITRI, Hsinchu, Taiwan, ROC
- 58.3: **Reliability and Barrier-Layer Dependency of Flexible 2D/3D-Switchable Liquid-Crystal Cell**
Pin-Hsiang Chiu, AU Optronics Corp., Hsinchu, Taiwan, ROC
- 58.4: **A Novel Handling Method for Ultra-Thin Flexible Glass Substrates for Thin and Flexible Displays**
Ru-De Chen, ITRI, Hsinchu, Taiwan, ROC

Session 59: Novel Backlighting System (Display Systems)

Thursday, May 23, 2013 / 3:10 - 4:10 pm / Room 205

Chair: *Masaru Suzuki, SKC Haas Display Film*

Co-Chair: *Akihiro Tagaya, Keio University*

- 59.1: **A Backlight System with a Phosphor Sheet to Provide 90% NTSC Gamut with Improved Optical Efficiency**
Yasushi Ito, Dexerials Corp., Kanuma, Japan
- 59.2: **A Novel LED-Backlight System with Tilted Cylindrical Surfaces on the Light-Guide Plate**
Kazutada Takaira, Mitsubishi Electric Corp., Kumamoto, Japan
- 59.3: **Compact LED Pixelized Backlight for LCDs**
Chin Sher, National Tsing Hua University, Hsinchu, Taiwan, ROC
- 59.4: **WITHDRAWN**

Session 60: Projection Light Source (Projection)

Friday, May 24, 2013 / 9:00 - 10:30 am / Ballroom A

Chair: *David Eccles, Rockwell Collins*

Co-Chair: *Fujio Okumura, NEC Corp.*

- 60.1: **Integrated RGB Laser Flat Package Module Using Si-Platform Technology**
Masafumi Ide, Citizen Holdings Co., Ltd., Tokorozawa, Japan
- 60.2: **Distinguished Paper: A 30-W Pure-Blue Emission with NUV Laser-Diode-Pumped Phosphor for High-Brightness Projector**
Kiyoshi Morimoto, Panasonic Industrial Devices Co., Kyoto, Japan
- 60.3: **A 6-W Multi-Beam Green Laser for Companion Laser Projector**
Yi Gan, McMaster University, Hamilton, Ontario, Canada
- 60.4: **A Novel Full-Color 3LED Projection System Using R-G-B LEDs on Silicon (LEDoS) Microdisplay**
Wing Cheung Chong, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

Session 61: OLED Lighting I (Lighting/OLEDs)

Friday, May 24, 2013 / 9:00 - 10:20 am / Ballroom B

Chair: *Franky So, University of Florida*

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

- 61.1: **Invited Paper: 80-lm/W White OLEDs for Solid-State Lighting**
Jaemin Moon, LG Chem, Daejeon, Korea
- 61.2: **A Study of Static Push Test to Define Tensile Failure Stress for Rectangular Glass**
G-Tech Optoelectronics Corp., Miaoli, Taiwan
- 61.3: **High-Performance OLEDs on Graphene Electrode and Thin c-Si TFT for Flexible Display and Lighting**
Ning Li, IBM T. J. Watson Research Center, Yorktown Heights, NY, USA
- 61.4: **Bottom-Emitting Large-Area Stacked White OLED with Silver Nanowire Network as Transparent Anode**
Florian Pschenitzka, Cambrios Technologies Corp., Sunnyvale, CA, USA
- 61.5L: **Late-News Paper: Highly Efficient White OLEDs with Single Solution-Processed Emitting Layer Consisting of Three Kinds of Dopant**
Hirohisa Sakuma, Hitachi Research Laboratory, Ibaraki, Japan

Session 62: TFTs for Mobile Display (Active-Matrix Devices)

Friday, May 24, 2013 / 9:00 - 10:20 am / Ballroom C

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

Co-Chair: *Yoshitaka Yamamoto, Sharp Corp.*

- 62.1: **Invited Paper: The Joys of Being Digital: Low-Power Mobile Multimedia Display**
Richard Payne, Pixtronix, Inc., Andover, MA, USA
- 62.2: **Invited Paper: Bridged-Grain Poly-Si TFT**
Hoi-Sing Kwok, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong
- 62.3: **Six-Terminal OLED Display Using Low-Temperature Single-Crystal-Silicon (LTSS) Technology**
Masashi Fujita, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
- 62.4: **High-Performance Low-Temperature Polycrystalline-Silicon TFTs with Submicron-Dot-Array Doped Active Channel**
Meng Zhang, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

Session 63: Mechanical Reliability Testing for Displays (Display Manufacturing)

Friday, May 24, 2013 / 9:00 - 10:10 am / Room 202

Chair: *Bradley Bowden, Corning Incorporated*

Co-Chair: *Don Carkner, Research in Motion*

- 63.1: **Biaxial Stress in Thin Glass during Ring-on-Ring Testing with Large Deflection**
Suresh Gulati, Corning Incorporated, Corning, NY, USA
- 63.2: **A Study of the Static Push Test to Define Tensile Failure Stress for Rectangle Glass**
Yu-Chen Liu, G-Tech Optoelectronics Corp., Miaoli, Taiwan, ROC
- 63.3: **Best Practices in Strength Testing of LCD Glass**
K. Hemanth Vepakomma, Corning Incorporated, Corning, NY, USA
- 63.4L: **New Technology for Thinner Cover Glass Substrates: Improvement of Surface Strength by Polishing after Chemical Strengthening**
Hiroyuki Ohkawa, Asahi Glass Co., Ltd., Kanagawa, Japan

Session 64: Near-to-Eye, Transparent, and Floating Displays (Display Systems)

Friday, May 24, 2013 / 9:00 - 10:00 am / Room 205

Chair: *Bill Cumming, Qualcomm MEMS Technology*

Co-Chair: *W. Hendrick, Rockwell Collins Optronics*

- 64.1: **High-Efficiency Waveguide Display System with Achromatic Volume Hologram and a Prism In-Coupler**
Juan Liu, Beijing Institute of Technology, Beijing, China
- 64.2: **Objective LC lens Array for a Near-to-Eye Display**

Sergiy Valyukh, IFM, Linkoping University, Linkoping, Sweden

- 64.3L: *Late-News Paper: Aerial Imaging by Retro-Reflection (AIRR)***
Hirotsugu Yamamoto, University of Tokushima, Tokushima, Japan

Session 65: Projection-Display Components (*Projection*)

Friday, May 24, 2013 / 10:40 - 11:40 am / Ballroom A

Chair: *Frederic Kahn, Kahn International, Inc.*

Co-Chair: *Ming Hsien Wu, Hamamatsu Corp*

- 65.1:** **A Vertically Aligned LCOS with Submillisecond Response Time for Color-Field-Sequential Projection Display**
Yuan Chen, University of Central Florida, Orlando, FL, USA
- 65.2:** **Blue-Phase Liquid Crystals for Color-Field-Sequential Projection Displays**
Linghui Rao, University of Central Florida, Orlando, FL, USA
- 65.3:** **WITHDRAWN**
- 65.4:** **Speckle Suppression by Limited Phase Range in Laser Projection System**
Yan-Shuo Chang, National Taiwan University, Taipei, Taiwan, ROC

Session 66: OLED Lighting II (*Lighting/OLEDs*)

Friday, May 24, 2013 / 10:40 - 12:00 Noon / Ballroom B

Chair: *Michael Weaver, Universal Display Corp.*

Co-Chair: *Chin Hsin (Fred) Chen, National Chiao Tung University*

- 66.1:** ***Invited Paper: Outcoupling-Efficiency-Enhancement Strategies in OLED Lighting Panel***
Min-Hao Lu, Acuity Brands Lighting, Berkeley, CA, USA
- 66.2:** ***Invited Paper: Highly Efficient White OLEDs with Over 100-lm/W for General Lighting***
Kazuyuki Yamae, Panasonic Eco Solutions Company, Osaka, Japan
- 66.3:** **Highly Improved Light Out-Coupling of OLEDs by Utilizing a Simple and Easy Process Based on a Nano-Scale Random Light-Extraction Structure**
Young Wook Park, Korea University, Seoul, Korea
- 66.4:** **Large-Sized Flexible Display with Highly Efficient OLED**
Nobuharu Ohsawa, Advanced Film Device, Inc., Tochigi, Japan

Session 67: TFT Driver Circuit (*Active-Matrix Devices*)

Friday, May 24, 2013 / 10:40 am - 12:00 Noon / Ballroom C

Chair: *Roger Stewart, Sourland Mountain Associates*

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

- 67.1:** ***Distinguished Student Paper: A 40- μ m-pitch IGZO TFT Gate Driver for High-Resolution Rollable AMOLED Displays***
Jin Jang, Kyung Hee University, Seoul, Korea
- 67.2:** **Novel Driving Method to Compensate RC Delays in Ultra-Large-Sized and High-Resolution LCDs**
Seung-Woo Lee, Kyung Hee University, Seoul, Korea
- 67.3:** **New Driving Method for Reducing Eye-Strain Technology (REST) in Displaying Still Images Using C-Axis Aligned Crystalline IGZO LCDs**
Hiroyuki Miyake, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
- 67.4:** **Compensating Threshold-Voltage Circuit in the Transient State for AMOLED Displays Collocated with Uni-Type GOA Driving**
Shih-Song Cheng, AU Optronics Corp., Hsinchu, Taiwan, ROC

Session 68: Advances in Materials for Manufacturing (*Display Manufacturing*)

Friday, May 24, 2013 / 10:40 am - 12:00 pm / Room 202

Chair: *Ion Bitu, Qualcomm MEMS Technologies*

Co-Chair: *Elliott Schlam, Elliott Schlam Associates*

- 68.1:** ***Invited Paper: Quantum-Dot Manufacturing Requirements for the High-Volume LCD Market***
Seth Coe-Sullivan, QD Vision, Inc., Lexington, MA, USA
- 68.2:** ***Invited Paper: Development of Novel Optical Bonding Process and Materials for Flat-Panel-Display Modules***
Kozaburo Hayashi, Dexerials Corp., Tochigi, Japan
- 68.3:** **Liquid Optically Clear Adhesives for Next-Generation Display Applications**
Daniel Lu, Henkel China, Shanghai, China
- 68.4:** **Minimizing the Impact of Bonding-Induced Defect**
Grace Yeh, DuPont, Taoyuan, Taiwan, ROC

Session 69: Energy-Efficient Displays (*Display Systems/Display Electronics*)

Friday, May 24, 2013 / 10:40 am - 12:00 pm / Room 205

Chair: *Wei Chen, Apple, Inc.*

Co-Chair: *Haruhiko Okumura, Toshiba Corp.*

- 69.1:** **Image-Quality Assessment of Ultra-High-Resolution Mobile Display Utilizing New RGBW Method**
Akira Sakaigawa, Japan Display, Inc., Ebina, Japan
- 69.2:** **Compact Color Filter and Polarizer Based on Nanowire Grating for Energy-Efficient Displays**
Zhicheng Ye, Shanghai Jiao Tong University, Shanghai, China
- 69.3:** **Balancing Luminance Boosting and Color-Breakup Reduction for a Color-Sequential Display**
Martin Hammer, TP Vision, Eindhoven, The Netherlands
- 69.4:** ***Invited Paper: Extending Battery Life of Ultrabook through Use of Panel Self-Refresh Technology***
Kamal Shah, Intel Corp., Hillsboro, OR, USA

Poster Session

Thursday, May 23, 2013 / 4:00 - 7:00 pm / West Exhibit Hall B

3D

- P.1: **Distinguished Student Poster Paper:** Submillisecond-Response-Time Liquid-Crystal Cylindrical Microlens Array for 3D Display
Jie Sun, University of Central Florida, Orlando, FL, USA
- P.2: **3D Image Generation on Optically Rewritable Electronic Paper**
Jiatong Sun, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

Active-Matrix Devices

- P.3: **3D Stacked Complementary TFT Devices Using n-Type a-IGZO and p-Type F8T2 TFTs: Operation Confirmation of NOT and NAND Logic Circuits**
Mutsumi Kimura, Ryukoku University, Otsu, Japan
- P.4: **Electroluminescence Properties of WOLED with a New Yellow Fluorescent Material**
Sungnam Lee, Hongik University, Seoul, Korea
- P.5: **Highly Uniform Solid-Phase Crystallized Bridged-Grain Poly-Si TFT**
Wei Zhou, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong
- P.6: **An Integrated a-Si:H Gate-Driver-Circuit Design for Large-Sized TFT-LCD Applications**
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan, ROC
- P.7: **New Pixel Structure with High Gray-to-Gray Response Time for Large-Sized and High-Resolution AMOLED TVs.**
Joong-Sun Yoon, LG Display Co., Ltd., Gyeonggi-do, Korea
- P.8: **Trap States in Amorphous-ITZO TFTs Analyzed Using the Dependence on Channel Thickness**
Mutsumi Kimura, Ryukoku University, Otsu, Japan
- P.9: **Power-Saving Sunlight-Readable TFT-LCD**
Yao-Dong Ma, MacroDisplay Inc., Richardson, TX, USA
- P.10: **Narrow-Bezel a-Si Gate Driver Circuit with Reduced Power Consumption**
Byeong Seong So, LG Display Co., Ltd., Gyeonggi-do, Korea
- P.11: **Recognition of Existence of n-Type IGZO Layer in CAAC-IGZO Film under a Source and Drain Electrode Made of Tungsten**
Ryo Tokumaru, Kanagawa, Japan
- P.12: **Development of Novel Post-Annealing Process for Flexible Oxide TFTs**
Po-Tsun Liu, National Chiao Tung University, Hsinchu, Taiwan, ROC
- P.13: **Rollable a-IGZO TFTs with Nanocomposite Dielectric on PEN Substrate**
Zingway Pei, National Chung Hsing University, Taichung, Taiwan, ROC
- P.14: **Distinguished Poster Paper:** Separate Extraction Technique of Intrinsic Donor- and Acceptor-Like Density of States over Full Energy Range Sub-Bandgap in Amorphous-Oxide Semiconductor TFTs by Using One-Shot Monochromatic Photonic Capacitance-Voltage Characteristic
Dong Kim, Kookmin University, Seoul, Korea
- P.15: **Influence of Photo-Thermal Pre-Treatment on Electrical Characteristics and Reliability of Zn-Sn-O TFTs**
Ting-Chang Chang, National Sun Yat-Sen University, Kaohsiung, Taiwan, ROC
- P.16: **Dynamic Supply-Voltage Scaling of Pixel Circuits for Static Power Reduction in AMOLED Displays**
Xiaojun Guo, Shanghai Jiao Tong University, Shanghai, China
- P.17: **Integration of Solution-Processed Oxide TFTs with Normal Structure OLEDs for Low-Voltage-Operation Top-Emitting AMOLED Display**
Xiaojun Guo, Shanghai Jiao Tong University, Shanghai, China
- P.18: **Effects of Interface and Bulk States on the Stability of Amorphous-InGaZnO TFTs under Gate Bias and Temperature Stress**
Runze Zhan, Shanghai Jiao Tong University, Shanghai, China
- P.19: **Density-of-States-Based Device-Circuit Co-Design Platform for Solution-Processed Organic Integrated Circuit**
Dae Kim, Kookmin University, Seoul, Korea
- P.20: **Transfer-Characteristic-Based Electro-Optical Technique for Characterization of Carrier Lifetimes with Associated Physical Mechanisms in Polymer-Based Organic TFTs**
Dong Kim, Kookmin University, Seoul, Korea
- P.21: **High-Input-Impedance Active Pixel Sensing Circuit with Threshold-Voltage Compensation Implemented by Dual-Gate IGZO TFTs**
Lu-Sheng Chou, National Chiao Tung University, Hsinchu, Taiwan
- P.22: **Improving Switching Characteristics of Amorphous-InGaZnO₄ TFTs by Dual-Gate Driving**
Jin Jang, Kyung Hee University, Seoul, Korea
- P.23: **Nano-Si Optical Pixel-Sensor Array Using TFT Technology as Image-Scan/Fingerprint Panel**
An-Thung Cho, AU Optronics Corp., Hsinchu, Taiwan, ROC
- P.157L: **Late-News Poster Paper:** Characterization of Asymmetrical Negative-Bias-Stress Effect on the Density-of-States and Parasitic Resistances in a-IGZO TFTs
Dong Kim, Kookmin University, Seoul, Korea

Applied Vision

- P.24: **Relationship between Recognition of Illumination and Depth Perception**
Hirokyu Kaji, Utsunomiya University, Utsunomiya, Japan
- P.25: **The Effect of Environmental Illumination and Screen Brightness on Accommodation and Convergence**
Yuki Okada, Nagoya University, Nagoya, Japan
- P.26: **Constant vs. Non-Constant Luminance Video Signals for UHDTV**
Seo Young Choi, SAIT, Yongin, Korea
- P.27: **Effect of Blue Primary Color on Preference and Colorfulness of Display**
Seung Hyun Kim, LG Display Co., Ltd., Gyeonggi-do, Korea
- P.28: **Hue-Blending Method: Improved Red-Green Color Segregation Capability for Dichromacy Support**
Sakuichi Ohtsuka, Kagoshima University, Kagoshima, Japan

- P.29: *Distinguished Poster Paper*: Perception of Sparkle in Anti-Glare Display Screen**
Jame Ferwerda, Rochester Institute of Technology, Rochester, NY, USA
- P.30: Effect of the Correlated Color Temperature of Light on Overhead Glare in Office Environment**
Yan Tu, Southeast University, Nanjing, China
- P.134L: *Late-News Poster*: Resolution Limits for Smartphones: Video Playback**
Lee Spencer, Sharp Devices Europe, Oxford, UK

Display Electronics

- P.31: Image Compression for Color-Sequential LCOS with Decompression at the Retina**
Andrew Russell, Syndiant, Inc., Dallas, TX, USA
- P.32: A New a-IGZO AMOLED Pixel-Circuit Design to Improve the OLED Luminance Degradation in 3D Display**
Chih-Lung Lin, National Cheng Kung University, Tainan, Taiwan, ROC
- P.33: Homogeneous Backlight Distribution Algorithm for SCC Local-Dimming Edge-Lit LCD**
Tobia Jung, Saarland University, Saarbruecken, Germany
- P.34: A Video-Signal Coding Method Based on an Absolute Color Space for Saving Bit Depth**
Senfar Wen, Yuan Ze University, Chung-Li, Taiwan, ROC
- P.35: Charge-Recycling Match Technique for Low-Power-Display Column Driver**
Ke-Horng Chen, National Chiao Tung University, Hsinchu, Taiwan, ROC

Display Manufacturing

- P.36: Analysis of Rubbing Mura in Fringe-Field-Switching LCD**
Wei Zhang, BOE Optoelectronics Technology Co., Ltd., Beijing, China
- P.37: Novel Gray-Toneless Technology for Mask Reduction in High-Aperture FFS Mode**
Seung-Jin Choi, BOE Technology Group Co., Ltd., Beijing, China
- P.38: Estimate of the Distribution of Contrast Ratio in Optically Compensated In-Plane-Switching-Mode Using the Response Surface Method**
Koji Yonemura, Mitsubishi Electric Corp., Kumamoto, Japan
- P.39: Study of Uncured Sealant Contamination of Liquid Crystal in One-Drop-Filling Process for TFT-LCDs**
Ang Xiao, BOE Optoelectronics Technology Co., Ltd., Beijing, China
- P.40: Encapsulated Flexible OLEDs: Progress toward a Simple and Cost-Effective Contact-Printing Technique**
Byeong-Kwon Ju, Korea University, Seoul, Korea
- P.41: Display Component Quality and Process Control with Advanced Automated Optical Inspection**
Jochen Koenig, Dr. Schenk Inspection Systems, Woodbury, MN, USA
- P.149L: *Late-News Poster*: Behavior of OLED Panel During Four-Point Bending**
Tzu-Chi Tseng, AU Optronics Corp., Hsinchu, Taiwan, ROC
- P.154L: *Late-News Poster*: Establishment of Evaluation Method of Surface Fracture mode with Front-Side Origin for Cover Glass**
Aya Nakagawa, Asahi Glass Co., Ltd., Kanagawa, Japan

Display Measurement

- P.42: Estimation and Evaluation of Image Sticking on OLED Devices**
Kyongho Lim, LG Display Co., Ltd., Gyeonggi-do, Korea
- P.43: Model Development for Cell-Gap-Induced Mura to Improve Quality of Glass Substrates to Display Manufacturers**
Michal Mlejnek, Corning Incorporated, Corning, NY, USA
- P.44: Display Aspect Simulation Using Measured Emissive and Reflective Display Imperfection**
Pierre Boher, ELDIM, Herouville, France
- P.45: The Study of LCD-Panel Touch Mura**
John Liang, Corning Incorporated, Corning, NY, USA

Display Systems

- P.46: Enhanced Single-Viewing-Zone Integral-Imaging Display Based on Medium Packing Technique**
Qiong-Hua Wang, Sichuan University, Chengdu, China
- P.47: Integral-Imaging Display Based on Space-Multiplexed Elemental-Image Array**
Qiong-Hua Wang, Sichuan University, Chengdu, China
- P.48: Flat-Panel Autostereoscopic Display with Wide Viewing Zone Using Time-Division Multiplexing Backlight**
Shuta Ishizuka, University of Tsukuba, Tsukuba, Japan
- P.49: Light-Diffusing Films Using Two-Step UV Irradiation for Various Displays**
Kentarō Kusama, LINTEC Corp., Warabi, Japan
- P.50: Design of a Novel Hybrid Light-Guide Plate for Viewing-Angle-Switchable Backlight Module**
Jui Pan, National Chiao Tung University, Tainan, Taiwan, ROC
- P.51: Local Gamma Adjustment for High-Frame-Rate LCDs**
Hyun-Dae Lee, Samsung Display Co., Gyeonggi-do, Korea
- P.52: A Colorful Holographic Display System with Enlarged Viewing Zone Using Multiplex SLM**
Juan Liu, Beijing Institute of Technology, Beijing, China
- P.53: Low Dynamic Crosstalk in Scanning Liquid-Crystal Prism-Type 3D Display**
Jian Gang Lu, Shanghai Jiao Tong University, Shanghai, China
- P.54: Light-Field Integral Display Using LCD and Eye-Tracking Technique**
Han Wang, Zhejiang University, Hangzhou, China
- P.55: Study of Optimal Viewing Distance in an Autostereoscopic 3D (AS3D) Display**
Hsu-Wan Hsuan, National Taiwan University, Taipei, Taiwan
- P.56: X-Shaped Pixel Alignment in Large-Scale Image Display System**
Satoshi Yamanaka, Mitsubishi Electric Corp., Kyoto, Japan
- P.57: Transmissive and Reflective Dual-Operational-Mode Display Device**
Ju-Ai Ruan, NOVA MEMS Display, Plano, TX, USA
- P.147: Adaptive Anisotropic Diffusion for Depth-Map Enhancement in 3D Video Coding**
Ilsoon Lim, Samsung Advanced Institute of Technology, Gyeonggi-do, Korea
- P.148L: *Late-News Paper*: 3D Integral-Imaging Display System Using Eye-Tracking Method**

Emissive Displays

- P.58: Quantitative Assessment of Host-to-Activator-Energy Transfer Efficiency of Multiple d-Orbital Trap States for Microcrystalline $\text{YBO}_3:\text{Tb}^{3+}$**
Max Wallace, Central Washington University, Ellensburg, WA, USA
- P.59: New Synthesis of Novel Phosphor for LED Technology: Synthesizing $\text{Sr}_3\text{Y}_2(\text{BO}_3)_4:\text{Eu}^{2+}$ from Strontium Borate Precursor**
Troy Kilburn, Central Washington University, Ellensburg, WA, USA

e-Paper and Flexible Displays

Flexible TFTs

- P.60: Thermally Stable Organic Semiconductor for Solution-Processed Field-Effect Transistors with High Mobilities**
Takashi Fukuda, Tosoh Corp., Yokkaichi, Japan
- P.61: Negative Mold Transfer-Patterned Conductive Polymer Electrode for Flexible OLED Displays**
Byeong-Kwon Ju, Korea University, Seoul, Korea
- P.62: Effects of Amorphous-InGaZnO TFTs with Various Buffer Layers on a Polyimide Substrate under Negative-Bias-Temperature Stress**
Jin-Seong Park, Dankook University, Cheonan, Korea
- P.63: Low-Temperature Oxide TFTs on Plastic Films for Flexible-Display Application**
Wei-Ting Lin, AU Optronics Corp., Hsinchu, Taiwan, ROC
- P.64: High-Performance Solution-Processed Organic TFTs with Processing Temperature Not Exceeding 100°C**
Xiaojun Guo, Shanghai Jiao Tong University, Shanghai, China
- P.65: The Effect of Surface Polarity of Gate-Dielectric Buffer Layer on Operational Stability of Organic TFTs**
Changhee Lee, Seoul National University, Seoul, Korea

e-Paper

- P.66: An Electrowetting Light Valve Using ODF Assembly Process**
In-cha Hsieh, National Chung Hsing University, Taichung, Taiwan, ROC
- P.67: Reflective Color Displays Using Photonic Crystal**
Zhenyue Luo, University of Central Florida, Orlando, FL, USA
- P.68: Reflective Interferometric Modulator Display with Temporal Color Modulation**
Ji Zhong, Jiaxing Unipel Display Technologies, Ltd., Zhejiang, China
- P.69: Large-Area Seamlessly Tiled Flexible eBoard**
Erica Montbach, Kent Display, Kent, OH, USA
- P.70: Durability and Reliability of an eWriter**
Clinton Braganza, Kent Display, Kent, OH, USA
- P.135L: *Late-News Poster*: Development of Novel Cell Design for Flexible e-Paper Using Single-Type Particle**
Sangkug Lee, Korea Institute of Industrial Technology (KITECH), Cheonan-do, Korea
- P.136L: *Late-News Poster*: Using Independent Component Analysis for Colorant Estimation in Electrophoretic Displays**
Yen-Hsing Lu, National Chiao Tung University, Hsinchu, Taiwan, ROC
- P.150L: *Late-News Poster*: Conformal Display**
Huan Yang, ITRI, Hsinchu, Taiwan, ROC

Lighting Applications

- P.71: High-Efficiency and High-Uniformity Modularized Street-Lamp Light Engine with a Single LED Source**
Kuan-Yu Chen, Chilin Technology Co., Ltd., Tainan, Taiwan, ROC
- P.72: Glass-Based Color-Conversion Multilayer for White-Light-Emitted Diodes and Its Angular Color Performance**
Li-Yin Chen, National Sun Yat-sen University, Kaohsiung, Taiwan, ROC
- P.73: A Novel Structure for High-CRI and High-Efficiency White-Light LED**
Pei Tseng, National Taiwan University, Taipei, Taiwan, ROC

Liquid-Crystal Technology

Blue Phase

- P.74: Polymer-Stabilized Double-Twist Cylinders of Blue-Phase Liquid Crystal for Reduced Hysteresis and Operating Voltage**
Seung Hee Lee, Nano-Science and Engineering, Jeonju, Korea
- P.75: Temperature Dependence of Dielectric and Electro-Optical Properties and Disordered Structure in Polymer-Stabilized Blue Phases at Low Temperature**
Gihwan Lim, Kyushu University, Kasuga, Japan
- P.76: Threshold Temperature Effect on Phase Transition of Blue-Phase Liquid Crystal**
Jian Gang Lu, Shanghai Jiao Tong University, Shanghai, China
- P.77: High-Transmittance Blue-Phase LCD with a Floating Electrode**
Yifan Liu, University of Central Florida, Orlando, FL, USA
- P.78: A Tunable Microlens Using Two Blue-Phase Liquid-Crystal Layers with Different Kerr Constant**
Yan Li, University of Central Florida, Orlando, FL, USA
- P.79: WITHDRAWN**
Tsung-Hsien Lin, National Sun Yat-Sen University, Kaohsiung, Taiwan, ROC
- P.80: Analysis of Polymer Network Structure of Polymer-Stabilized Blue Phase**
Musun Kwak, LG Display Co., Ltd., Gyeonggi-do, Korea
- P.81: A Time-Multiplexed Dual-View Display Using Blue-Phase Liquid Crystal**
Qiong-Hua Wang, Sichuan University, Chengdu, China
- P.82: Entire Spectrum Measurement of Kerr Constant and Birefringence Dispersion in a Polymer-Stabilized Blue-Phase Liquid-Crystal Composite**
Hongqing Cui, infoVision Optoelectronics (Kunshan) Co., Ltd., Kunshan, China

P.137L: *Late-News Poster:* **Polymer-Dispersed Blue-Phase Liquid Crystal**
Emine Kemiklioglu, Kent State University, Liquid Crystal Institute, Kent, OH, USA

Fast Switching

- P.83:** **Electrically Suppressed Helix Ferroelectric LC Field-Sequential-Color Display**
Abhishek Srivastava, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong
- P.84:** **Increasing the Light Modulation Frequency Due to the Increase in FLC Viscosity**
Igor Kompanet, P. N. Lebedev Physical Institute, Moscow, Russia
- P.85:** **Fast Switching of an IPS Cell at Low Temperature by Forming Polymer Network**
Tae-Hoon Yoon, Pusan National University, Busan, Korea
- P.86:** **A Novel Bistable LCD Having Memory Display Mode and High-Speed-Switching Mode**
Taiju Takahashi, Kogakuin University, Tokyo, Japan
- P.87:** **The Study of Improvements in the Flatness of an LCD Panel Using an Advanced Polarizer**
Seong Han Hwang, LG Display Co., Ltd., Gyeonggi-do, Korea
- P.88:** **A Novel Design of a Polarizer with a Parallel Absorb Axis**
Chih-Tsung Kang, Shenzhen China Star Optoelectronics Technology Co., Shenzhen, Guangdong, China
- P.156L:** *Late-News Poster:* **Real-Time Dynamic Color Holographic Display Using a Super-Fast-Response Liquid-Crystal Thin Film**
Hongyue Gao, Virginia Tech, Blacksburg, VA, USA

LCD Optical Characteristics

- P.89:** **Direct Measurements of Asymmetric Pretilt Angles of Optically Compensated Bend (OCB) Nematic Liquid-Crystal Cell**
Sheng-Ya Wang, National Chiao Tung University, Tainan, Taiwan, ROC
- P.90:** **Optical Properties of LC Cells with Hybrid Orientation and Negative Birefringence**
V Belyaev, Moscow Region State University, Moscow, Russia
- P.91:** **Adobe RGB-LCD Monitor with Three Primary Colors by Using Deep-Green Color-Filter Technology**
Seung Hoon Ji, LG Display Co., Ltd., Gyeonggi-do, Korea
- P.92:** **Characterization of Complex Liquid-Crystal Polarization Gratings at Oblique Incidence Using Extended Jones Matrix Method**
Li Tan, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

Polymer-Dispersed Liquid Crystal

- P.93:** **Optically Isotropic Polymer-Dispersed Liquid-Crystal Composite for High Contrast Ratio and Fast Response Time**
Seung Hee Lee, Chonbuk National University, Jeonju, Korea
- P.94:** **A High-Sensitivity PDLC-Based Electro-Optic Modulator for TFT-Array Inspection**
Chang-Jae Yu, Hanyang University, Seoul, Korea
- P.95:** **Process Technology of Flexible and Transparent Display by Stacking OLED and PDLC Embedded with OPV**
Jiun-Haw Lee, National Taiwan University, Taipei, Taiwan, ROC
- P.96:** **Synthesis of Reactive Mesogen and Its Stabilizing Characteristics in Polymer-Stabilized Vertically Aligned LCD**
Seung Hee Lee, Chonbuk National University, Jeonju, Korea

Surface and Alignment

- P.97:** **Low Driving Voltage and Gray-Scale Capability of Nanostructure-Enhanced Cholesteric Liquid-Crystal Device**
Yi-Fan Liang, National Chiao Tung University, Hsinchu, Taiwan, ROC
- P.98:** **Novel Composite Photo-Alignment Layer for Ferroelectric LCD**
Qi Guo, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong
- P.99:** **Alignment Peculiarities of Cholesteric Liquid Crystals on the Surfaces Processed by Plasma Beam**
Oleg Yaroshchuk, Institute of Physics, National Academy of Science Ukraine, Kyiv, Ukraine
- P.100:** **Multi-Domain Vertical Alignment of Liquid Crystals through Control of the Anchoring Energy**
Tae-Hoon Yoon, Pusan National University, Busan, Korea
- P.146L:** *Late-News Poster:* **Practical Approach of New Photoalignment Material for High-Quality Competitive Retardation Film**
Gyo-jic Shin, Korea Institute of Industrial Technology (KITECH), Cheonan-do, Korea
- P.155L:** *Late-News Poster:* **Surface Monolayer Stabilized Vertically Aligned Liquid Crystals for Display Applications**
Shin-Woong Kang, Chonbuk National University, Jeonju, Korea

Wide-Viewing

- P.101:** **Investigation on Flexoelectric Effect in the Fringe-Field-Switching Mode**
Seung Hee Lee, Chonbuk National University, Jeonju, Korea
- P.102:** **Improvement of Gamma-Curve Distortion in VA-LCDs by Using an Optical Film-Patterned Retarder**
Gi Dong Lee, Dong-A University, Busan, Korea
- P.103:** **High-Transmittance LC-Mode Based on Fringe Field Switching of Vertically Aligned Negative LC**
Tae-Hoon Yoon, Pusan National University, Busan, Korea
- P.104:** **Two-Face Viewable Display Using Dye-Doped Liquid Crystal**
Chao Ping Chen, Shanghai Jiao Tong University, Shanghai, China
- P.105:** **Normally Black Electrically Controlled Birefringence Mode with Slit Electrode Structure**
Jin Seog Gwag, Yeungnam University, Gyeonggi-do, Korea

OLEDs

- P.106:** **Magnetic Resonant Wireless Power Transmission to Thin OLED Lighting Panel**
Yong-Hae Kim, ETRI, Daejeon, Korea
- P.107:** **New Emissive Materials for Mixed-Host Architectures to Achieve Longer Lifetime for Green-to-Red Phosphorescent-OLED Displays and Lighting Application**
Cheng Yao, E-Ray Optoelectronics Technology Co., Ltd., Chungli, Taiwan, ROC
- P.108:** **Organic Wrinkles as Optical Scattering Source**
Jaehyun Moon, ETRI, Daejeon, Korea
- P.109:** **Improvement of the Outcoupling Efficiency of Blue OLEDs**

Kyung Cheol Choi, KAIST, Daejeon, Korea

- P.110: High-Efficiency OLEDs Based on the Gradient Doping in Transport Layer**
Gufeng He, Shanghai Jiao Tong University, Shanghai, China
- P.111: Double Hybrid Tandem White OLEDs Employing a Novel Charge Generation Unit**
Gufeng He, Shanghai Jiao Tong University, Shanghai, China
- P.112: High-Efficiency Blue-Phosphorescence OLED Device with Novel CbzTAZ Host**
Tien-Lung Chiu, Yuan Ze University, Chung-Li, Taiwan, ROC
- P.113: Luminous-Efficiency Improvement of Photovoltaic-Device-Integrated OLED with Dual-Function Guiding-Mode Resonance Structure**
ChiaYu Shen, National Taiwan University, Taipei, Taiwan, ROC
- P.114: Cl-2 Plasma-Treated Indium-Tin-Oxide Electrodes with High Work Function for OLEDs**
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