# PRELIMINARY 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., Chungcheonnam-do, Korea*

**2:2:** ***Keynote 2:*** **The Social Life of Devices**
*Mr. Bill Buxton, Principal Researcher, Microsoft Research, Microsoft Corp., Redmond, VA, 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 Käläntär, 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 am / 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:** **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 am / Room 202**
**Chair:** *Larry Weber, Star*
**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**
*Byoungho 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**
*Mi Zhang, BOE Technology Group Co., Ltd., Beijing, China*

**11.3:** **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 Ga**
*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:** **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 Homojunction 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 Phopshors, 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:** **Characterization of Electron--Hole-Pair Migration and Trapping in Rare-Earth-Doped $YBO_3$ 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:** **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 Optronics Corp., Hsinchu, Taiwan, ROC*

**21.4L:** ***Late-News Paper:*** **Recent Developments in Carbon-Nananotube-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-Reponsive 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 Proces**
*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:** **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 Chuao 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:** **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 $Al_2O_3/ZrO_2$ 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 pm / 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-µm 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, Gyungbuk-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:** **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:** *Hyoungsik 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**
*Hyoungsik 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 Semiconductor*
**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 - 9:50 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:** **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**
*Tastsuya 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 - 11:30 am / 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*

## Session 43: OLED Devices I *(OLEDs)*
**Thursday, May 23, 2013 / 10:40 am - 12:00 pm / 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, Aubervillier, France*

**43.3:** **Inverted Top-Emitting White OLEDs with Improved Optical and Electrical Characteristic**
*Tobia Schwab, TU Dresden, Insitut 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 pm / 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-VA-LCDs**
*Xinhui Zhong, Shenzen China Star Optoelectronics Technology Co., Ltd., Shenzen, 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:** **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 $Al_2O_3$ Films for High-MobilityActive-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 pm / 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:** **Flexible Display Driven by Solution-Processed OTFTs Manufactured Using All-Sputtered Electrodes**
*Jung Eun Lee, LG Display 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 Bita, 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:** **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 Liedenbaum, 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 Niiyama, 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 - 4:40 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:** **Now Poster P.152**

**56.3:** **Performance Improvement of Compensation Circuit Using p-Type SPC TFT for AMOLED Driving**
*Jungmin Lee, LG Display Co., Ltd., Gyeonggi-do, Korea*

**56.4:** **All-Printed Oxide-TFT Arrays for High-Resolution Active-Matrix Displays**
*Shinji Matsumoto, Ricoh Co., Ltd., Yokohama, Japan*

**56.5L:** ***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*

## 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, Liechtnstein*

## 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:** **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 - 4:30 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 Eelectric Corp., Kumamoto, Japan*

**59.3:** **Compact LED Pixelized Backlight for LCDs**
*Chin Sher, National Tsing Hua University, Hsinchu, Taiwan, ROC*

**59.4:** **Design, Manufacture, and Application of Sub-Micron Grating in Color Separation for Display Backlight System**
*Chung-Che Wu, National Tsing Hua University, Hsinchu, Taiwan, ROC*

## Session 60: Projection Light Source *(Projection)*

**Friday, May 24, 2013 / 9:00 - 10:20 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:** **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**
*Hirotaka 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:** **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: Augmented Reality and Near-to-Eye Displays *(Display Systems)*

**Friday, May 24, 2013 / 9:00 - 9:40 am / Room 205**

**Chair:** *Bill Cumming, Qualcomm MEMS Technology*

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

**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*

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

**Friday, May 24, 2013 / 10:40 am - 12:00 pm / 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:** **Phase-Modulation LCoS Display System with Off-Axis LED Reconstruction Light**
*Li-Yuan Liao, National Tsing Hua University, Taiwan, ROC*

**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 pm / Ballroom B**
**Chair:** *Michael Weaver, Universal Display Corp.*
**Co-Chair:** *Chin Hsin (Fred) Chen, National Chaio 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 pm / Ballroom C**
**Chair:** *Roger Stewart, Sourland Mountain Associates*
**Co-Chair:** *Norbert Fruehauf, University of Stuttgart*

**67.1:** **40-µm-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 Bita, 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:** **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 Thicknes**
*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:** **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 Charateristics 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 Stres**
*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-$InGaZnO_4$ 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 Optronic Corp., Hsinchu, Taiwan, ROC*

**P.152:** **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*

## Applied Vision

**P.24:** **Relationship between Recognition of Illumination and Depth Perception**
*Hiroyuki 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:** **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., Being, 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: Behavior of OLED Panel During Four-Point Bending**
*Tzu-Chi Tseng, AU Optronics Corp., Hsinchu, Taiwan, ROC*

## 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**
*Kentaro 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***
*Yiying Pu, TCL Corporate Research, Shenzhan, Guangdong, China*

## Emissive Displays

**P.58: Quantitative Assessment of Host--to--Activator-Energy Transfer Efficiency of Multiple d-Orbital Trap States for Microcrystalline $YBO_3:Tb^{3+}$**
*Max Wallace, Central Washington University, Ellensburg, WA, USA*

**P.59: New Synthesis of Novel Phosphor for LED Technology: Synthesizing $Sr_3Y_2(BO_3)_4:Eu^{2+}$ 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 Mobilitie**
*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 Optronic 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:** **Effectively Lowering the Operating Voltage of a BPLCD Utilizing an Achiral-Mesogen Refilled Blue-Phase Template**
*Tsung-Hsien Lin, National Sun Yat-Sen University, Kaoshiung, 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*

## 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*

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*Seung Hoon Ji, LG Display Co., Ltd., Gyeonggi-do, Korea*

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