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 / Ballroom C/D

Session 2: Opening Remarks / Keynote Addresses
Tuesday, May 21, 2013 / 8:20 - 10:20 am / Ballroom C/D
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 1 (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 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
     Sungskik 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 Uki, Uki Display Device Institute, Kobe, Japan
     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: Deng-Ke Yang, Seoul National University
     Satoshi Nebashi, Seiko-Epson Corp., Nagano, Japan
6.2:  Flexible Electrophoretic Display Driven by Solution Processed OTFTs Manufactured Using All Sputtered Electrodes
     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, Sotheast University, Nanjing, China  
7.4: 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 LEDs  
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: Invited Paper: Frontal Projection Type 3D 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  
Yingbo 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: Huyon Kim, Yonsei University  
10.1: High Mobility Self-Aligned Top Gate Oxide TFT for High Resolution AMOLEDs  
Narihiko 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 LCD Applications  
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: Development of Largest 110-in. 4K x 2K 3D TFT LCD  
Li-Yi Chen, 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: 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  
Jason Heinenfeld, 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,Mg1-xO 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, Nulumiina Corp.
14.1: Invited Paper: Sonification: Multimodal and Auditory Display of Data Bruce Walker, Georgia Institute of Technology, Atlanta, GA, USA
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 (3D/Liquid-Crystal Technology)
Tuesday, May 21, 2013 / 3:40 - 5:00 pm / Ballroom A
Chair: Philip Bos, Kent State University
Co-Chair: Tery Scheffer, Motif, Inc.
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: Takatashi Tsujimura, Konica-Minolta
16.1: Negative Bias Photodegradation Mechanism in SnO TFTs Masashi Tsabuku, 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
17.3: 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: Ruiging Ma, Universal Display Corp.
Co-Chair: Rashmi Rao, Apple, Inc.
18.1: Invited Paper: Roll-to-Roll Manufacturing of Printed OLEDs Jukka Hatl, Oulu, Finland
18.2: A 3.4-in. Flexible High Resolution Full Color Top Emitting AMOLED Display Akihito 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
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 LEDs 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 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
Chao Yang Li, Kochi University of Technology, Kaki, 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 LEDs 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
Yi-Kai 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
Chang-Ho Oh, LG Display Co., Ltd., Gyeonggi-do, Korea
21.2: Distinguished Paper: A 55-in. AMOLED TV with InGaZnO TFTs Using WRGB Pixel Design
Woo-Jin Nam, LG Display Co., Ltd., Gyeonggi-do, Korea
Chi-Chi-Wei Chen, AU Optronics Corp., Hsinchu, Taiwan, ROC
21.4L: Late News Paper: Recent Developments in CNT 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
Jian-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
SungKyoo Park, Chung-Ang University, Seoul, Korea
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
Su-Hua 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
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-Williams, 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.
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
Riko 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 IPS 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: Ryuichi 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

30.4: **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-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 DAC with Logarithmic Time Interpolation  
Young-Chan Jung, Kumoh National Institute of Technology, Gyeongbuk-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 - 4:50 pm / Ballroom B  
Chair: Chihaya Adachi, Kyushu University  
Co-Chair: Chishio Hosokawa, Idemitsu Kosan Co., Ltd.

33.1: **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  
Atsumi Yamazaki, U.S. Food and Drug Administration, Silver Spring, MD, USA

33.3: **Late News Paper:** Optimizing Nanostructures to Enhance Optical Outcoupling of OLED Microdisplays  
Richard Pfeifer, Fraunhofer COMEDD, Dresden, Germany

33.4: **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 n-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, Apple, Inc.

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 InGaZnOx Transistor
Michael Marr, Arizona State University, Flexible Display Center, Tempe, AZ, USA

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 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: Effects of 3D Display System on Convergence and Accommodation
Takehito Kojima, Nagoya University, Nagoya, Japan

36.3: 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 Kama, 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

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
Vladmir Chigrinov, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

38.4: Novel Photoalignment Layer for IPS 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 Nielsen 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 Nakatsu, 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 Angles 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 am - 12:00 Noon / Ballroom A
Chair: Jean-Pierre Guillon, 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 Goko, Kagakukin University, Tokyo, Japan
42.3: Efficient Multi-View Input Data Format for Glasses-Free 3D Display
Chia-Fen Hung, 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, DuPont Display
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, Chungwha 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, Samsung Electronics Co., Gyeonggi-do, Korea

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

46.5: Late News Paper: Large Area Sputtered AlOx 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 Laboratories
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
Karheinz 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, Gyeonggi-do, Korea

48.3: Viewer's Eye Position Estimation Using a Single Camera
Seong-Iwan 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
Yoshithara Hirakata, Semiconductor Energy Laboratory Co., Ltd., Kanagawa, 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
Toshiba Keuke, Japan Display, Inc., Mobra, Japan

50.2: Adding Depth Sensing Capability to an OLED Display System Based on Coded Aperture Imaging
Sungjo 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, Canatu, Inc.

51.1: Integrated Touch Sensing and Front Lit Device and Applications
Ion Bita, Qualcomm MEMS Technology, 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, CBBITE, Inc., Goleta, CA, USA

52.2: Invited Paper: Advanced Sputtering Technologies and Targets for Oxide Semiconductor TFT
Masakazu Matsuoka, ULCAP, Inc., Kanagawa, Japan

52.3: Development of the Back Channel Etched TFT Using C Axis Aligned Crystalline InGaZn Oxide
Takaya 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 Liedenbaum, Philips Research Laboratories, Eindhoven, The Netherlands

53.2: An Optimization Design Method of an LED Freeform Lens for Uniform Circular Illumination
Zhe-Hong 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 Chiao 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-Wei 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 - 4:30 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., Kameyama, 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
Jun-Woo Lee, LG Display Co., Ltd., Gyunggi-do, Korea
56.4L: **Late News Paper:** 12.1-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 - 4:10 pm / Room 118
Chair: Willem Den Boer, Guardian Industries Corp.
Co-Chair: Lauren Palmateer, Subtle Energy Design
57.1: WITHDRAWN
57.2: Transparent Conductive Coatings Made by Electrochemical and Physicochemical Method
A Smirnov, Belarusian State University of Informatics and Radioelectronic, Minsk, Belarus
57.3: WITHDRAWN
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 Outcoupling 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: **Invited Paper:** 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: Aihiro Tagaya, Keio University
59.1: A Backlight System with a Phosphor Sheet to Provide 90% NTSC Gamut with Improved Optical Efficiency
Yasuhiro Ito, Dexerals Corp., Kanuma, Japan
59.2: A Novel LED Backlight System with Tilted Cylindrical Surfaces on the Light Guide Plate
Kazutada Takairi, 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
Jaemin Moon, LG Chem, Daejeon, Korea
61.2: Phosphorescent Stacked OLEDs for Warm White Lighting Applications
Xin Xu, Universal Display Corp., Ewing, NY, USA
61.3: High Performance OLEDs on Graphene Electrode and Thin e-Si TFT for Flexible Display and Lighting
Ning Li, IBM T. J. Watson Research Center, Yorktown Heights, NY, USA
61.4: Bottom Emitting White OLED with Silver Nanowire Network as Transparent Anode
Florian Pochenitska, Cambrios Technologies Corp., Sunnyvale, CA, USA
61.5: Late News Paper: Highly Efficient White OLEDs with Single Solution Processed Emitting Layer Consisting of Three Kinds of Dopant
Hiroyuki Sakuma, Hitachi Research Laboratory, Ibaraki, Japan

Session 62: TFTs for Mobile Displays (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.
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
63.4: Late News Paper: 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 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
64.3: Late News Paper: Aerial Imaging by Retro-Reflection (AHRR)
Hirotsugu Yamamoto, University of Tokushima, Tokushima, Japan

Session 65: Projection Display Components (Projection)
Friday, May 24, 2013 / 10:40 - 12:00 Noon / Ballroom A
Chair: Frederic Kahn, Kahn International, Inc.
Co-Chair: Ming Hsien Wu, Hamamatsu Corp
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 Chaio Tung University
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-µm-pitch IGZO TFT Gate Driver for High Resolution Rollable AMOLED Displays
Jin Jang, Kyung Hee University, Seou, 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-Hong 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 Noon / 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
Kazuharu Hayashi, Deserters 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 Teh, DuPont, Taoyuan, Taiwan, ROC

Session 69: Energy Efficient Displays (Display Systems/Display Electronics)
Friday, May 24, 2013 / 10:40 am - 12:00 Noon / 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 Sakaigaawa, Japan Display, Inc., Ehina, Japan
69.2: Compact Color Filter and Polarizer Based on Nanowire Grating for Energy Efficient Displays
Zhiceng 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: New Approach of Flexible e-Paper with Single Particles
Seung Yong Jeong, Korean Institute of Industrial Technology, Cheonan, Korea
**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, Ritsukou University, Otsu, Japan

P.4: A Charge-Cyclic Digital-to-Analog Converter for IGZO TFT Integrated Sata Driver
Congwei Liao, Peking University, Shenzhen, China

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

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