FIRST
CALL FOR PAPERS

Display Week 2015

Society for Information Display
INTERNATIONAL SYMPOSIUM, SEMINAR & EXHIBITION

May 31 – June 5, 2015

SAN JOSE CONVENTION CENTER
SAN JOSE, CALIFORNIA, USA

DISPLAY WEEK 2015
SID SAN JOSE

www.displayweek.org

The Display Week 2015 Symposium will be placing special emphasis on five Special Topics of Interest to address the rapid growth of the field of information display in the following areas: *Oxide and LTPS TFTs, Wearable Displays, Curved and High-Resolution Displays, Disruptive Display Materials, and SID/IES Special Lighting Track.* Submissions relating to these special topics are highly encouraged.

1. OXIDE AND LTPS TFTs

Advancements and manufacturing issues related to low-temperature polycrystalline silicon (LTPS) and oxide semiconductor thin-film transistors (TFTs), including high- performance devices; TFT integration at the systems level; application for flexible and bendable devices; and innovative applications. Submissions include:

• **High-Performance TFTs**
• **Novel Oxide Materials**
• **Device Structures and Processing Techniques**
• **Solution Processing of Oxides and Ink-Jet Printing of TFTs**
• **Bias, Thermal, Optical, and Environmental Stability and Reliability of TFTs**
• **TFT Device Physics, Compact Modeling, and Parameter Extraction Circuits**
• **Design and Compensation Techniques for Instability and Non-Uniformity in Pixelated Arrays**
• **Oxide and LTPS TFT Sensors and Applications**
• **Integration on Flexible Substrates and Novel Applications**
• **Towards Systems-on-Panel and Very-Large-Scale Integration**

2. WEARABLE DISPLAYS

This special topic will cover the emerging development of wearable-display concept, design, products, applications, and technologies. Benefiting from low-power RF, MCU, and display technology, this super mobile application is becoming a reality. Many exiting electronics device makers and start-up companies are all developing products to further simply our life styles and enhance our capabilities. Wearable application has become the most mentioned area in the technological field. Papers in following areas are solicited:

• **Wearable Design and Concept**
• **Wearable Display Technology Implementation**
• **Low-Power Displays for Wearable Applications**
• **Visual Factors and Related Evaluation Matrix**
• **Durability and Related Evaluation Matrix**
• **Fashion and Wearable Displays**
• **Near-to-Eye Systems**
• **Direct-View Systems**
• **Projection Systems**
• **Textile Displays**
• **Displays with Integrated Sensor Function**
• **Power Management of Wearable Displays**
• **Full Function versus Reduced Function Displays**

• **Flexible Wearable Displays**
• **Interaction of Wearable Display Systems with Other Existing Displays**
• **See-Through-Type Displays for Augmented-Reality Systems**
• **Head-Mounted Displays for Virtual-Reality Systems**
• **Image Processing for Wearable Displays**
• **Flexible Electronics for Wearable Displays**
• **Readability of Wearable Displays: Outdoor, Indoor, and Dark Room**
• **Extreme Environmental Durability of Wearable Displays**

3. DISRUPTIVE DISPLAY MATERIALS

This special topic will cover materials innovations in the display industry. Submissions on material improvements for all types of displays are encouraged, including novel liquid crystals, OLED materials, downconversion materials, and LED materials innovations.

• **Liquid Crystals**
• **In-Cell Materials (*e.g.,* alignment layers)**
• **TFT Materials**
• **Color-Filter Pigments and Dyes**
• **Downconversion Materials (Phosphors, Quantum Dots)**
• **Polarization Generalization or Conversion Materials (meaning to convert non-polarized light into polarized light with a conversion efficiency more than 50%, preferred 80% to 90%)**
• **OLED Materials**
• **Transparent Conductors**
• **Novel Lighting Materials for Backlights**

4. CURVED AND HIGH-RESOLUTION DISPLAYS

In applications ranging from smartphones to large televisions, the recent advances in display technologies include immersive visual experiences offered by the emerging curved surfaces and an inexorable march towards higher pixel densities. The first wave of consumer products in both small and large form factors are starting to appear in the market from a number of companies. This special topic will cover the technologies and applications of curved and high-resolution displays, including, but not limited to, the following areas:

• **Curved TVs and Large Displays**
• **Curved Smartphones and Other Emerging Mobile Form Factors**
• **Benefits and Disadvantages of Curved Display Surfaces**
• **Display Technologies for Curved Devices (LCDs, OLEDs, and Other Emerging Displays)**
• **Backplane Technologies, Pixel Structures, and Driving Techniques**
• **Manufacturing Processes, Materials, System Integration, Reliability, and Cost-Reduction Efforts**
• **Content Generation, Image Quality, and Processing for Curved and High-Pixel-Density Displays**
• **Human Factors and Visual Experiences for Curved and High-Resolution Displays**

5. SID/IES Special Lighting Track
At the Intersection of Advanced Lighting and Displays

– A 1-day mini-symposium in collaboration with the
Illuminating Engineering Society of North America (IESNA)

There has always been a great deal of overlap in the technology behind lighting and displays. In recognition of the newly signed Friendship Agreement between SID and IESNA, this mini-symposium aims to deliver in-depth coverage in a diverse range topics of common interests to both lighting and display professionals. Papers are being sought in the following four topical sessions

Advanced Light Sources and Drivers
- Edge-lit and other flat-panel LED light sources
- Advances in high-brightness white LEDs

The Effect of Lighting and Lighting
- Applications on Health and Perception
- Impact on Circadian Rhythm and Other Health Effects
- Visual neuroscience behind lighting or display design
- Perception of glare from light sources
- Visualizing lighting on displays

Advanced Lighting Applications
- Display panels and projectors as illumination sources
- Luminaires/backlights with CCT and color-tuning
- OLED lighting application*
- Optics and optical design for solid-state lighting

Materials and Systems for Displays and Lighting
- Phosphors/quantum dots
- OLED technology status update*
- High-brightness LEDs and modules

*There will be additional OLED sessions outside of this 1-day session for more in-depth discussions in OLED device physics and materials.

Access to this 1-day session is included for those attending the Display Week Symposium. It is also available as a stand-alone event to our guests from IESNA.

Symposium Topics

As growing and multi-faceted fields, work relating to these topics can fit under a number of different topics, including Active-Matrix Displays, Applied Vision/Human Factors, Display Applications, Display Electronics, Display Manufacturing, Display Measurements, Display Systems, Emissive Displays, e-Paper and Flexible Displays, Liquid-Crystal and Other Non-Emissive Displays, OLEDs, Projection, and Touch and Interactivity. While the special topics sessions will be arranged in a unified program for the benefit of attendees, authors should indicate the appropriate topical track for their abstract in addition to special topic designation (if any).

The Society for Information Display (SID) encourages the submission of original papers on all aspects of the research, engineering, application, evaluation, and utilization of displays. Display Week 2015 will feature topical sessions that focus specifically on selected issues or key developments. Paper submissions are welcome for any of the general symposium topics or any of the specific topical sessions listed below.

The Society plans to include coverage of every aspect of display technology and applications, especially the emergence of Wearable Displays. Special attention will also be given to all aspects of novel input technologies for displays. Papers are solicited in all aspects of motion-image technology, including device technology (LCD, OLED, PDP, projector, *etc.*) and related system technology. Papers are also solicited in the area of technology development that enables lower-power-consumption and higher-performance display devices for battery-powered applications (mobile phones, tablets, e-books, *etc.*).

(1) ACTIVE-MATRIX DEVICES: Advances in the innovative development and implementation of active matrix electronics into displays and other related devices. Active-Matrix Devices focus on TFTs themselves, their circuit design and application, including TFTs electrical/optical characteristics, reliability, new structures, and processing.

- **Oxide TFTs and Display Circuits**
- **LTPS TFTs and Display Circuits**
- **Sensor Integrated Active-Matrix Devices**
- **New Driving Method for Field-Sequential Color and 3D Displays**
- **Novel TFTs and Processing Techniques**
- **Ultra-Low-Power Active-Matrix Displays**
- **New AMOLED Pixels and Backplanes**
- **Active Matrix for TV and Flexible Displays**
- **Active-Matrix for Mobile Displays**
- **System-on-Panel (SOP)**
- **Novel Emerging Active-Matrix Displays and Devices**

(2) APPLICATIONS: Advances in the development, use, and characterization of display technologies, components, and systems resulting in new capabilities, improved performance or better user experience in (i) existing display applications (*e.g.*, consumer, industrial, commercial, security), (ii) novel or emerging display applications, and (iii) non-display applicatins.

- **Applications of Electronic Displays**
- **Novel and Emerging Display Applications**
- **Applications of Ubiquitous and Multi-Functional Displays**
- **Non-Display Applications**
- **Highly Demanding Display Applications**
- **Medical Display Applications**
- **Mobile Display Applications (Smartphones, Tablets, *etc.*)**
- **Near-to-Eye Display Applications**
- **Other Wearable Display Applications.**
- **Virtual- and Augmented-Reality Applications**
- **3D Applications Including Stereoscopic and Holographic**
- **Touch and Interactive Display Applications**
- **Kiosks, Signage, and Outdoor Applications**
- **Entertainment Applications**
- **Display Software Applications**
- **Smart / Solid-State Lighting Applications**
- **Environmentally Friendly Display Applications**

(3) APPLIED VISION / HUMAN FACTORS: Current stereoscopic or 3D display technologies and content often provide visual cues that differ significantly from the visual cues in our natural viewing environment. Submissions which discuss the impact of 3D and head-mounted display technologies on viewer performance, engagement, enjoyment, comfort, and fatigue are encouraged. Included are proposals and evaluations of novel evaluation techniques; novel technologies for improving specific aspects of the human experience; and studies quantifying the effect of display parameters, system configurations, content generation technologies, or 2D to 3D conversion algorithms on user performance when using stereoscopic and 3D displays.

- **Stereoscopic and 3D Display Perception**
- **Lighting and Adaptation**
- **Display-Centric Interaction**
- **Display Perception and Image Quality**
- **Vision and Human Factors and Emerging Displays**

(4) DISPLAY ELECTRONICS: All aspects of circuits (integrated or otherwise) for displays, electronic components for displays and imaging devices, and image- and video-processing algorithms.

- **Electronics and Image Processing for Wearable Displays**
- **Driving Electronics for UHD (4K x 2K) and Beyond**
- **Driving and Compensation Circuits for Curved Displays**
- **Electronics for Touch and Interactive Displays**
- **OLED Driving Techniques**
- **Display Drivers, TCONs, and New Driving Schemes**
- **Driving Circuits Integrated on Glass**
- **High-Speed Interfaces**
- **Low-Power and Low-Cost Driving Techniques**
- **Image/Video Capture and ProcessingbTechniques**
- **3D/Depth Imaging and Augmented/Virtual Reality**

(5) DISPLAY MANUFACTURING: Materials, process, and equipment developments for the manufacturing of display panels, components, and module assemblies.

- **Manufacturing-Related Advances Enabling Current and Emerging Display Applications (Including Flexible or Curved Devices, 3D Displays, Wearable, Multifunctional Display or Component Architectures, *etc.*)**
- **Manufacturing of OLED and Other Emissive Display Panels**
- **Manufacturing of AMLCDs and of Other LCD Panels**
- **Manufacturing of e-Paper and of other Reflective Display Panels**

- **Display-Component Manufacturing (*e.g.,* Optical Films, LEDs, Backlights, Touch Panels, Cover Glass, *etc.*)**
- **Display-Module Manufacturing Including Panel and Module Assembly for all Display Technologies (*e.g.,* AMLCDs, OLED, e-Paper, Projection, *etc.*)**
- **Materials including Substrates, Films, Adhesives, and Consumables**
- **Manufacturing Equipment for Front- and Back-End Processing Including Packaging, Encapsulation, Interconnect, Assembly, and Roll-to-Roll Processing**
- **Inline Manufacturing Test, Repair, and Metrology**
- **Manufacturing Productivity**
- **Green Manufacturing – Reducing Energy Consumption and Waste, Strategies for Product End-of-Life recycling and Disposal, *etc.***

(6) DISPLAY MEASUREMENT: Characterization and measurements of displays and display components.

- **Evaluation of Measurements Methods for Near-to-Eye Displays and Other Applications**
- **Optical Characterization and Measurement of Displays with Front-of-Screen Treatments**
- **Optical Characterization and Measurement of Display Materials and Components**
- **Characterization of Perceptible Display Phenomena**
- **Optical Characterization and Measurement of 3D Displays**
- **Latest Advancements in Display Measurements and Display-Measurement Standards**
- **Optical Property Modeling of Display Technologies**
- **Calibration and Verification of Instrumentation**

(7) DISPLAY SYSTEMS: Novel integration of displays into specialized devices, as well as system-level aspects of electronic displays.

- **Display Systems**
- **Novel Displays**
- **Mobile Displays**
- **Wearable and Virtual-Reality Displays**
- **Ultra-Low-Power Displays**
- **Automotive, Avionics, and Military, Shipboard, and Simulator Displays**
- **Transparent Displays**
- **3D, Stereoscopic, Volumetric, and Holographic Displays**
- **Ultra-High-Resolution Display Systems**
- **Signage**
- **Backlight/Frontlight Systems**
- **Backlight/Frontlight Components**

(8) EMISSIVE DISPLAYS: All aspects of emissive displays, including PDPs, field-emission displays, light-emitting diodes, quantum-dot displays, inorganic EL displays, and field-emission lamps. Advances in materials and processing of such devices including phosphors, quantum-dot materials, and field emitters are also sought.

- Quantum-Dot Materials
- Quantum-Dot Application
- Quantum-Dot Cathodoluminescence and Electroluminescence
- Phosphors
- Plasma, Field-Emission, and Inorganic EL Displays
- Micro Light-Emitting Diodes

(9) e-PAPER AND FLEXIBLE DISPLAYS:
All aspects of e-Paper, flexible, and wearable display technologies, including flexible or paper-like displays (OLED, electrophoretic, MEMS, cholesteric LCD, electro-wetting, and other novel emissive and reflective displays), printed electronics (organic and inorganic), and sensors. Advances in flexible materials (substrates, transparent conductors, TFTs), printing and novel deposition techniques, manufacturing methods, electro-optical effects, sensor technologies, drive techniques, device performance and reliability, ergonomics, and applications for emerging paper-like, flexible, or wearable-display technologies are sought.

- Electronic Paper
- Flexible OLED and Other Emissive Materials, Displays and Devices
- EPD, MEMS, and Other Non-Emissive Flexible Displays and Devices
- Flexible Sensors and Wearable Displays
- Flexible Display Materials Including Substrates, Films, Adhesives, and Barriers
- Organic and Other Solution-Based TFTs, Flexible Active-Matrix Backplanes
- Integration, Packaging, Testing, and Reliability of e-Paper and Flexible Displays
- Flexible-Display Manufacturing of and Equipment for Printed Electronics
- Applications and Ergonomics of Integrated Flexible Electronics

(10) LIQUID-CRYSTAL AND OTHER NON-EMISSIVE DISPLAYS: Advances in the development of liquid-crystal and other passive-matrix displays, including electro-optical effects, materials, and devices.

- LCDs for Advanced Monitors and TVs
- LCs Beyond Displays
- Wearable Displays and Microdisplays
- Color Enhancement in LCDs
- LCDs for Automobile Applications
- Blue-Phase LCDs
- LCDs for Mobile Applications
- Bistable Displays/LC-Based e-Paper
- Reflective/Transflective Displays
- Ferroelectric/Anti-Ferroelectric LCDs
- Alignment and Photoalignment Technologies
- Non-Emissive Displays for Digital Signage
- Fast-Switching LCDs
- LCD Modeling
- Wide Viewing Angle
- Display Films
- LCD Materials and Components
- Nanotechnology for LCDs
- Driving Mechanisms
- Photonic Optical Components for LCDs
- Polymer Composites
- LC Technologies for 3D

(11) ORGANIC LIGHT-EMITTING DIODES (OLEDs):
Papers are sought on display design and performance of small–to–large-area panels, including OLED displays utilizing poly-Si, a-Si, microcrystalline silicon, CMOS crystalline silicon, and emerging areas of organic TFTs and mixed-oxide transistors, including ZnO-based materials. Papers that discuss the progress and challenges for OLED display performance and manufacturing issues as compared to LCDs and plasma displays are of particular interest. Furthermore, papers on OLED signage and OLED lighting solutions are welcome.

- OLED TV: Mobile and Large-Area Applications
- Novel OLED Materials and Architectures Enabling Emerging OLED Displays
- Active- and Passive-Matrix OLED Display Technology
- Emerging OLED Displays
- OLED Device and Materials Fundamentals
- Injection and Transport Mechanisms, Molecular Engineering, and Device Structure
- OLED Stability and Degradation Mechanisms
- OLED Applications for Lighting
- OLED Manufacturing
- OLED Systems Packaging, Integration & Cost Reduction

(12) PROJECTION DISPLAYS: Applications for projection displays continue to grow as they continue to dominate the large-screen market and become more common for digital signage, consumer devices, 3-D, and mobile devices. Authors are invited to submit papers on all aspects of projection displays, including components, finished projectors, complete projection systems, and projection applications. Projectors of all types will be covered.

- **Electronic Projection Systems Based on Microdisplays, Scanned Lasers, or Other Technologies**
- **Pico-/Micro-, Mainstream, and Large-Venue Projectors; Front and Rear Projection; Short-Throw; Consumer; and Other Designs for Specific Applications.**
- **Light Sources Including Laser, Laser/Phosphor, Hybrid, and LEDs**
- **Emerging Applications for Projection Systems**
- **High Resolution Including 4k and 8k**
- **Human Factors of Projection Systems and Projection Applications**
- **Multiple Projector Arrays and Systems**
- **Projection-System Components, Including Image-Generating Components, Light Sources, Optics, Projection Screens, and Electronics**
- **Opto-Mechanical Design of Projection Systems and Components, Including Laser-Speckle Reduction and Measurement, Lifetime, and Thermal Management**
- **Projection Screens including Emissive Screens**
- **Projection-Like Systems Generating Virtual Images, Including Head-Up and Head-Mounted Displays and Automotive Head-Up Displays**
- **Other topics Related to the Design, Manufacture, or Application of Projection Systems, Subsystems, or Components**

---

(13) TOUCH AND INTERACTIVE DISPLAYS:
Advances in touch-screen technologies, applications, driving electronics, system integration, and human interactions. The advanced materials and process technologies associated with touch design and applications will also be covered.

- **Touch Systems, Controllers, Sensor Design, and Signal-Processing Algorithms**
- **Novel Interactive Displays**
- **Materials and Process Technologies**
- **Human Factors and Touch Performance Evaluation Methodology and Standardization**

Format and Submission Requirements: Technical Summary

Submissions must consist of two separate parts. The first part should consist of a single page containing a 35–50 word abstract. The second part should contain a 4-page technical summary that follows the outline below. Please follow the following instructions for the preparation of the Abstract and Technical Summary.

35-50 Word Abstract: Your submitted 35-50 word abstract, highlighting the key details of your paper, will be published in the Advance Program if your paper is accepted. The abstracts are usually edited to accommodate the program format.

Technical Summary: Include the first author's name and the title of the paper on each page. Please include the information listed below in the Technical Summary.

(1) Objective and Background: Briefly describe the goals and intent of your project. and give background factors that led to the new results.

(2) Results: Describe the specific results that will be presented at the SID 2015 Symposium. Please provide a technical description of how the results were achieved. Sufficient detail (quantitative and/or graphical data) should be included so the Program Committee can properly evaluate your submission.

(3) Impact: Discuss the significance of your work and compare your findings with previously published work.

(4) References: List a few main references covering projects in related areas.

(5) Prior Publications: Generally, Symposium papers must be original contributions. If your organization has published or presented material on similar work in English, please explain how the present material differs. The only exception to this rule is that papers submitted to the Applications Subcommittee need not be original.

The Technical summary must be no longer than four pages. Material beyond four pages will not be considered in evaluating the paper.

All authors are required to upload their Abstract and Technical Summary to http://www.sheridanprinting.com/pcm/sid.

Additional information must be provided in the online submission form. Authors must:

(A) Indicate if you wish to have your paper considered for oral or poster presentation, if you have a preference.

(B) Indicate the closest matching Symposium Topic from the list provided

(C) Include the 35-50 word abstract

(D) Include a minimum of three keywords for the submission;

(E) Indicate whether the presenter of the paper is currently a student; and

(F) Include the names of all authors with their affiliations, addresses, telephone numbers, and e-mail addresses. Please underline the name of the presenter when there are two or more authors.

Product Engineering/Applications

Please follow the instructions on the technical summary/ abstract submission site (http://www.sheridanprinting.com/pcm/sid. If you need further assistance, please contact Bill Klein at wklein@pcm411.com.

Attention Manufacturers and Suppliers: These sessions contain information on the practical aspects of display technology such as design, manufacturing, and testing of displays and display-related products. Papers are generally product or process oriented and deal with how something was engineered, how it works, what to use, how to use it, and what to avoid. Emphasis should be technical, not marketing. Abstract, paper submission, and presentation requirements are the same as for the Symposium papers, although the content does not have to be original. Applications Sessions will be conducted in parallel with the Symposium sessions. Applications papers are welcome in all areas of display technology previously listed under the applications symposium topics.

Timetable

The deadline for receipt of technical summaries/abstracts is December 1, 2014 (January 26, 2015 for Late-News Papers). Notification of acceptance will be e-mailed by February 9, 2015 (February 27 for Late-News papers). Authors of accepted papers will be directed to an on-line "Authors Kit" with instructions for the preparation of the paper to be published in the Symposium Digest. The paper shall consist of four pages, including all illustrations and is due March 9, 2015 (March 30 for Late-News papers).

Points of Contact

For further information contact:

Seonki Kim (Technical Program Chair)
Samsung Display Co., Ltd.
Gyeonggi-do, Korea
telephone: +82-31-8000-8030
e-mail: seon.k.kim@samsung.com

Ian Underwood (European Subcommittee Chair)
University of Edinburgh
Edinburgh, UK
+44-01-650-7474
e-mail: i.underwood@ed.ac.uk

Hyun Jae Kim (Asian Subcommittee Chair)
Yonsei University
Seoul, Korea
telephone: +81-2-2123-5865
e-mail: hjk3@yonsei.ac.kr

Bill Klein (Symposium Coordinator)
Palisades Convention Management, Inc.
New York, NY, USA
telephone: 1(212) 460-8090 x204 (fax -5460)
e-mail: wklein@pcm411.com

Jay Morreale (Symposium Coordinator)
Palisades Convention Management, Inc.
New York, NY, USA
telephone: 1(917) 301-5194
e-mail: jmorreale@pcm411.com

Display Week 2015 Features

- Technical Symposium
- Special Focus Sessions
- Poster Session
- Keynotes
- Invited Papers
- Distinguished Papers
- Author Interviews
- Short Courses
- Technical Seminars
- Awards Banquet
- Annual Awards Luncheon
- Best-in-Show Awards
- I-Zone
- Exhibition
- Vendor Forum
- Business Conference
- Investors Conference
- Market Focus Conferences

Deadlines and Key Dates

Technical Summaries . . . . Dec. 1, 2014

Late-News Technical Summaries. . . . . Jan. 26, 2015

Accept/Reject Letters . . . . Feb. 9, 2015

Late-News Accept/Reject Letters . . . . Feb. 27, 2015

Digest Paper Submission . . . . Mar. 9, 2015

Late-News Digest Submission. . . . . Mar. 30, 2015

Seminar/Short Course Notes . . . . Apr. 20, 2015

Display Week 2015. . . . . May 31 – June 5, 2015

Sunday Short Courses. . . . . May 31, 2015

Monday Technical Seminars. . . . . June 1, 2015

Business Conference . . . . June 1, 2015

Investors Conference . . . . June 2, 2015

Exhibition. . . . . June 2–4, 2015

Vendor Forum . . . . June 2–4, 2015

Symposium . . . . June 2–5, 2015

Market Focus Conferences . . . . June 3 & 4, 2015