

# I-Zone

## The Innovation Zone at Display Week 2013

Welcome to the Society for Information Display's Innovation Zone. The I-Zone was created to provide researchers with space to demonstrate their prototypes or other hardware demo units at the premier display exhibition in North America. The I-Zone also offers Display Week attendees a chance to view best-in-class emerging information-display technologies in a dedicated area on the show floor. Access to the free exhibition space was earned through a highly competitive selection process designed to encourage participation by small companies, startups, universities, government labs, and independent research labs.

The I-Zone, sponsored by E Ink, takes place Tuesday, May 21, and Wednesday, May 22.



### **Canatu Ltd.**

Canatu is a leading developer and manufacturer of carbon nanomaterial-based touch sensors and films. Canatu has developed a unique material, Carbon NanoBud®, and a cost-effective roll-to-roll manufacturing process, Direct Dry Printing®, which enable the manufacture of 3D, bendable, and flexible touch sensors. The thermoformable, transparent, and electrically conductive NanoBud® films are industry-leading in optical clarity. Canatu's touch sensors can be used on flat, formed, or flexible touch surfaces such as in wearable or portable communication devices, consumer electronics, automobiles, and home appliances. At Display Week's I-Zone, Canatu will demonstrate a 3D shaped capacitive touch sensor.

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### **Center for Display Research, Hong Kong University of Science and Technology**

A full-color, field-sequential color display (FSCD) prototype based on Electrically Suppressed Helix Ferroelectric Liquid Crystal (ESHFLC) has been developed by a research team at Hong Kong University of Science and Technology. The ESHFLC mode reveals a high contrast ratio (>10000:1) and fast switching time (~ 10  $\mu$ s) at low power consumption. A frame rate of more than 240 Hz, and a wide viewing angle and color triangle (130 % of NTSC) are real advantages of the disclosed FSC ESHFLCD prototype. Moreover, the ESHFLC shows good shock stability. The optical contrast restores within 8 sec, after the removal of mechanical stress.

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### **Citizen Holdings Co., Ltd. / Development Division**

An LD module project team in the development division of Citizen Holdings Co., Ltd. has been developing a novel integrated RGB laser module based on Si-platform technology. The integrated laser module, which consists of R,G, and B lasers and a driver IC on the same Si-platform, is connected to a MEMS projection head via a fiber bundle combiner. The head is flexible enough for realizing a versatile layout in a limited space. The projection system can be applied to head-up-displays (HUDs), head-mounted-displays (HMDs), and virtual-remote-controller (VRC) systems. A "foot-tap mode" VRC system using the integrated laser module will be shown in the I-Zone at Display Week.

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### **Fogale**

Fogale revolutionizes touch panels with a new breakthrough multi-touch and multi-touchless technology called Sensation. One hundred times more precise than current technologies, Sensation can measure multiple fingertips, a passive stylus, or any object at up to 5cm away from the screen. It's now possible to fundamentally change the way people interact with devices and change the way people do things, with the ability to zoom in on small icons from a distance, use the edge of a device to

replace buttons and switches, measure angle and size of fingers/stylus, and turn a page, open a map and zoom in, and more.

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#### **HoloDigilog Human Media Research Center**

HoloDigilog Human Media Research Center of Kwangwoon University is the National Engineering Research Center (ERC) honored and sponsored by the Ministry of Education, Science and Technology of Korea. The aim of the HoloDigilog is to research and develop the original core technologies of "Emotionally Interactive Holographic Human Media" as a future vision, including touchable free-space holographic 3D display technology, human-hologram interaction technology, realism-enhanced interactive hologram content, and more.

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*www.holodigilog.org; www.3drc.org*

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#### **Holografika**

The HoloVizio 80 WLT full-angle visualization system allows users to see 3D data "as is." Making the next step in 3D beyond stereo, to overcome the known limitations of auto-stereo multiview systems, Holografika is pushing its proprietary light-field technology to produce natural 3D views. The new monitor-style 30-in. HoloVizio glasses-free 3D display offers total freedom in viewing experience, with continuous horizontal parallax in the entire field-of-view, allowing users to see behind objects. There are no sweet spots, no invalid zones or repeated views, and no ideal viewing distances. Viewers can be anywhere in front of the display in a range up to almost 180 degrees.

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#### **Innovega Inc.**

Innovega provides components, core technology, and reference designs that enable its customers to develop new generations of personal media eyewear. Its novel iOptik™ architecture improves comfort and styling by eliminating bulky and heavy focusing optics from the eyewear and leveraging the performance of a modern soft contact lens. The media is overlaid across the

wearer's full field-of-view and is always available. Its familiar transparent lens eyewear eliminates the social barrier that has plagued earlier wearable displays.

*innovega-inc.com*

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#### **INSiAVA Inc.**

INSiAVA's novel CMOS microdisplay demonstrators showing stereo and 3D capability will be exhibited at Display Week in Vancouver. CMOS is the preferred semiconductor technology for VLSI applications for its low manufacturing cost, high reliability, and ease of use. INSiAVA's CMOS light sources are thus implemented in standard CMOS processes with no post-processing. Merging of this novel light source technology and VLSI presents a new solution for CMOS-integrated microdisplay (MD) applications. Two demonstrators, incorporating the CMOS MD technology, will be exhibited at the I-Zone in the form of head-wearable devices and telescopic viewers.

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#### **IRX Innovations**

IRX Innovations has developed the world's first commercially scalable, full-color, reflective, and bi-stable display technology, Electro-Osmosis, which provides magazine-like reading performance under all light circumstances, up to 30% faster reading compared to LCD, dramatically lower total cost of ownership, and compelling environmental benefits. Electro-Osmosis is based on IRX's proprietary application of an electro-osmotic pump principle that causes liquid holding colored nano-particles to flow through a pixel. The technology uses standard TFT equipment and processes and can be manufactured using an existing TFT display factory infrastructure.

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#### **MacroDisplay, Inc.**

MacroDisplay has developed a revolutionary power-saving, sunlight-readable, full-color TFT LCD device. By means of a novel Directional Light Guiding Film (DLGF) and a transparent window structure, both the internal backlight and external sunlight can be used synergistically for lighting the display to deliver vivid

full-color images with superior readability in both indoor and outdoor applications. In indoor environments, both the conventional and the novel displays exhibited the same brightness and image quality; in outdoor environments, however, the former was almost washed out while the latter remained its superior readability with brightness over 1200 nits. Thus, the human eye fatigue effect can be eliminated.

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#### **MpicoSys - Embedded Pico Systems**

MpicoSys develops low-/no-power, low-resource electronic systems, often with e-paper displays. Its new ultra-low-power driving technology for segmented electrophoretic displays reduces power by a factor of 10 to 100 compared to commercial systems. This allows display systems to operate without internal power source in ranges up to three meters with a standard UHF RFID reader providing communication and energy. It also enables fast-response HF RFID applications for e-paper displays like public transport or access control, where previously the display's switching speed was limiting. The demonstrated approach assures that the display will always be correctly written.

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#### **Opalux Inc.**

Opalux is a global leader in photonic color technology research and development. The company's mission is to accelerate the commercialization of new technologies and applications based on the exciting platform technology of photonic color. Opalux's P-Ink technology combines the photonic crystal structure with electrically active polymer materials. This technology shows the unique attributes of full-color tunability, with a single material giving rise to color reflection spanning the whole rainbow spectrum, through the reversible expansion/contraction of its microstructure. Opalux works directly with industry-leading companies in a process of open innovation to collaboratively create the next generation of photonic color technology applications.

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#### **SA Photonics, Inc.**

SA Photonics has developed the SA-30, the world's highest resolution commercially available head-mounted display (HMD). The SA-30 provides a 30-degree horizontal field of view with better than 20/20 Snellen resolution using WUXGA (1920 x 1200) OLED microdisplays, and has two completely independent visual channels for true stereoscopic viewing in maximized visual comfort. The SA-30's high throughput optics produce bright and high contrast imagery. The SA-30 has minimal peripheral obscuration, allowing users to easily view their surrounding environment, and its eyepieces have a large exit pupil and eye relief for ease of adjustment and use.

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#### **Shinoda Plasma Corp.**

Shinoda Plasma Corp., a venture company established by Tsutae Shinoda, who is known as an inventor of the plasma display panel, has developed a new film-type display using plasma tube arrays. Inside small tubes, phosphors and discharge gas are introduced. These tubes are arrayed and laminated by films with electrodes. A standard panel unit is made of a 1m length tube, and panel width is 1m. Arbitrary sizes of panels can be made using these units. Shinoda Plasma Corp. has already started production and provided displays to locations such as the Hyogo Prefectural Museum of Art and several shopping arcades.

*www.shi-pla.jp/english*  
*www.shi-pla.jp/english/contact-us*

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#### **Slim HMI Technology**

Slim HMI Technology applies a new action range communication (ARC) architecture to develop an interface for electronic devices. Both human-machine (display and input) and machine-machine (data communication) functions are implemented by different data transmitted in ARC. A user's body can function as a "wire" in the signal transmission either to conduct the position signal for finger touch input or to pick up data from other devices. ARC shares the same matrix for signal transmission and display. Various changes are necessary to activate such intrinsic properties. Such new interface modules could simplify the next generation of screen device architecture.

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**Strategic Polymers, Inc. (SPS)**

A revival of living devices and vivid user experiences is underway, and begins with Electro-mechanical (EMP) actuator technology developed by Strategic Polymers, Inc. (SPS). SPS is a San Francisco-based company dedicated to restoring the most natural typing experience. Paper-thin, flexible SPS actuators deliver localized HD haptics, high quality sound, and deformation capabilities enabling ultrathin devices responsive to human touch. This allows manufacturers and product designers to create innovative smartphones, tablets, and devices more appealing to consumers than ever before. At Display Week's I-Zone 2013, SPS will showcase EMP technology through the Awake™ haptic keyboard and haptic-enabled Backtouch™ smartphone.

[www.strategicpolymers.com](http://www.strategicpolymers.com)  
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**Sun Innovations**

Sun Innovations Inc. presents a patented emissive projection display (EPD) technology, which projects a dark optic image of higher energy to excite visible imagery from a novel optic clear fluorescent screen. By selectively exciting RGB emissions from a multilayer transparent emissive screen with three separate dark image wavebands, a full color image can be generated. EPD will turn any glass window or windshield to a water-clear digital display panel with unlimited viewing angles. It also enables a pitch-black emissive projection screen with high display contrast in ambient light.

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[www.superimaging.com](http://www.superimaging.com)

**SuperD Co., Ltd.**

SuperD is a glasses-free 3D solution vendor that combines optical design, new device structures, pixel algorithms, and other related technologies to provide dead-zone-free, glasses-free 3D. The solution can display 3D in one area, in any kind of shapes, simultaneously while 2D imagery is presented in another area. Multiple 3D areas are possible, and are also sizable and movable. The eye tracking technology is combined to achieve a wide viewing angle that is dead-zone free. The viewer can enjoy the 3D effect while watching on-line video and editing a document in 2D simultaneously.

[support@superd3d.com](mailto:support@superd3d.com)  
[www.superd3d.com](http://www.superd3d.com)

**Tactonic Technologies, LLC**

Tactonic Technologies, LLC. develops and markets sensing technologies with the expressed purpose of fostering a world where interaction everywhere is a reality. Tactonic Technologies' pressure imaging sensors are designed such that covering arbitrarily large (or small) surfaces with sensate materials is a cost-effective possibility. By providing cost-effective force-sensing materials, Tactonic Technologies helps its clients provide richer interaction between humans, their surroundings, and their digital devices. Using this technology, consumers will be able to interact *with* their devices and environments as opposed to *on* them.

[www.tactonic.com](http://www.tactonic.com)

**~ 2013 I-Zone Organizing Committee ~**

*Jerzy Kanicki, University of Michigan, Chair*

*Brian Schowengerdt, University of Washington*

*Steve Sechrist, Technology Writer, Sr. Analyst Insight Media, Contributing Editor Information Display*

*Helge Seetzen, TandemLaunch Technologies Inc.*

*Larry Weber, SID Past President*

**~ I-Zone Selection Committee ~  
includes above individuals and:**

*Phil Bos, Kent State University*

*Janglin (John) Chen, ITRI*

*Norbert Fruehauf, University of Stuttgart*

*Reiji Hattori, Kyushu University*

*Yongtaek Hong; EECS, Seoul National University*

*H.-S. Kwok, Hong Kong University of Science & Technology*

*Shin-Tson Wu, University of Central Florida*