

## Press Release

### Subpixel metrology of $\mu$ LED and AR/VR display applications

An ultra-high resolution version of the LumiTop, known as a spectrally enhanced imaging colorimeter with unprecedented accuracy for high speed 2D measurements, will be presented by Instrument Systems at the Display Week I-Zone 2019.

**Munich, April 2019** – *At Display Week Exhibition in San Jose, CA / USA from May 14 - 16 Instrument Systems GmbH will put spotlight on applications representing the major trend in the display industry: more pixels.  $\mu$ LEDs are a strong candidate for the realization of very high display resolutions with pixel sizes as small as 10  $\mu$ m and equally small pixel pitches. A higher resolution means that imaging light measurement devices must advance accordingly. Within its LumiTop series, Instrument Systems developed an ultra-high resolution camera with an extraordinary technical design and outstanding measuring portfolio for unprecedented accuracy and high speed 2D measurements. In the Innovation-Zone of the Display Week Exhibition the light measuring device will be presented in an application for display testing in production lines where tact times are extremely short. At Instrument Systems GmbH booth #1528 the LumiTop is showcased with a head-mounted display to be measured as innovative AR/VR display application. Additionally, high-end measurement systems for quality control, automotive applications, and production testing will be presented by our light measurement experts.*

The ultra-high resolution LumiTop model merges a 150 megapixel camera with the high-end spectroradiometer CAS 140D. Using the extremely accurate spectral information of the CAS 140D measurements as live reference guarantees spectroradiometric test accuracy across the whole image of the camera. The resolution of 150 megapixels thereby allows (sub-)pixel level analysis of complete displays in one single shot. This measurement device is thus perfect for very fast and accurate quality control and pixel calibration of **OLEDs or  $\mu$ LED displays in production lines**. Many different test applications can be organized in a single test station, as, e.g., the evaluation of display uniformity, pixel defects, white balance, color gamut, contrast ratio or the measurement of intensity modulations. Notably, the LumiTop can be equipped with a fast photometer for flicker or luminance modulation measurements.

For **mixed reality technologies (AR/VR)** the LumiTop is the perfect system in R&D labs. These innovative display applications require more, i.e. smaller pixels with higher fill factors.

Luminance and color variations between pixels and subpixels are likely and strongly influence the visual quality of displays. Augmented reality glasses or virtual reality head-mounted displays are close-fitting to the observer's eye. Thus, screen-door effects and pixel non-uniformities are easily visible and disturbing to the consumer. To meet this high standard Instrument Systems GmbH developed the LumiTop series. An integrated pixel shift mechanism suppresses de-mosaicing artifacts by true full color measurements and even provides increased resolution of 600 megapixels. The product is integrated in Instrument Systems' comprehensive new software „LumiSuite”, which comes with a user-friendly GUI for laboratory applications and a powerful software development kit allowing an easy implementation into any production line.

Among these highlights more advanced lighting technology will be demonstrated at several photometric and spectroradiometric measuring stations at Display Week booth #1528:

### **High-power LED and $\mu$ LED Testing**

Instrument Systems will show a complete light measurement setup with the high-end array spectroradiometer CAS 140D and the positioning station DTS 140. As the entire spectrum is captured simultaneously, very short measuring times can be achieved in the order of milliseconds with highest measurement accuracy. This makes the solution ideal for the characterization of low-lumen or  $\mu$ LEDs. Typical application areas are display production and automotive interior lighting.

### **VCSEL Testing**

The design of the recently launched spectroradiometer CAS 120B-HR is geared to the measurement of narrow-band emission sources e.g., laser diodes (also VCSEL). An exceptionally high spectral resolution of up to 0.12 nm full width at half maximum and particularly short integration times as low as 4 ms enable fast tests in the lab and production. Time-resolved measurements of laser diodes with a pulsed operating mode in the nanosecond range are also possible in an expanded setup with a photodiode. Demo measurements and evaluations are presented at the booth.

### **Goniometric Display Measurement**

Using our established DMS 803 display measurement system we will be giving live demonstrations of the diverse possibilities of viewing angle dependent display analysis: motorized positioning unit, temperature chamber of -40 to +105°C, measurement of the spectral reflection value under direct/diffuse hemisphere lighting, determination of the contrast of OLED and LCD displays with different types of ambient light, etc. The latest features allow a qualification of curved displays.

We invite you to discuss your special measurement tasks with our experts at our booth and also to listen to Instrument Systems' expert lectures:

### **Display Metrology: Basics, Framework, and Applications**

*Monday, May 13 / Session 06 / 10:20 - 11:50 AM / Room LL21ABC*

*Speaker: Michael Becker, Instrument Systems GmbH Munich Germany*

### **Flicker from Electronic Displays: Reconsidering the Confusion**

*Thursday, May 16 / Session 50.1 / 09:00 - 10:20 AM / Room LL20A*

*Speaker: Michael Becker, Instrument Systems GmbH Munich Germany*

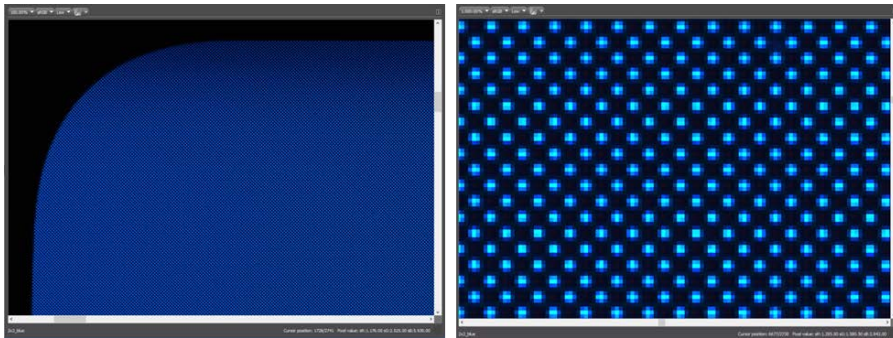
*Co-Chair: Jürgen Neumeier, Instrument Systems GmbH, Munich, Germany*

### **OLED vs. LC Displays - The Race toward Rec. 2020 and HDR1**

*Friday, May 17 / Session 83.1 / 10:40 - 11:00 AM / Room LL20A*

*Speaker: Michael Becker, Instrument Systems GmbH Munich Germany*

**More information under [www.instrumentsystems.com](http://www.instrumentsystems.com)**



**Figure:** Zoomed-in measurements of an OLED display measured with the prototype of LumiTop UHR to be shown at the Innovation-Zone.

### **Company portrait of Instrument Systems GmbH**

Instrument Systems GmbH, founded in Munich in 1986, develops, manufactures and markets all-in-one solutions for light measurement applications. Its core products are array spectrometers and imaging colorimeters. The company's main fields of activity are LED/SSL and display metrology, spectral radiometry and photometry, where today Instrument Systems is one of the world's leading manufacturers. The Optronik line of products for the automotive industry and traffic technology is developed and marketed at its Berlin facility. Instrument Systems has been a wholly-owned subsidiary of the Konica Minolta Group since 2012.

### **Further text material and photos:**

<https://services.instrumentsystems.com/owncloud/index.php/s/kAu6wQufYqQXjXs>

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