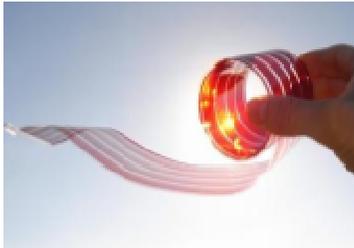
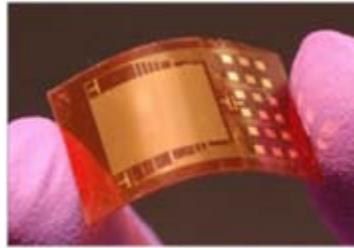


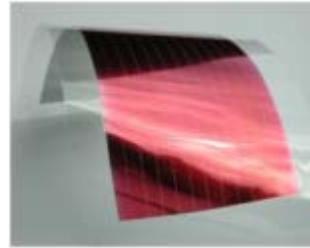
Table of Contents – December 31, 2010 edition #57



NIST, 8



Georgia Tech, p11



UCLA, p12



Clemmet, p44

Letter from the publisher: The 7th year... by <i>Mark Fihn</i>	2
News from around the world	3
Printed Electronics Asia , October 13-14, 2010, Hong Kong, China	16
Large-area, Organic and Printed Electronics Convention , May 31-June 2, 2010, Frankfurt, Germany	20
SID Display Week , May 25-28, 2010, Seattle, Washington	24
Printed Electronics Summit , May 10-11, 2010, San Jose, California	28
FINETECH JAPAN , April 14-16, 2010, Tokyo, Japan	30
Smart Fabrics , April 14-16, 2010, Miami, Florida	33
Flexible Electronics & Displays Conference , February 1-4, 2010, Phoenix, Arizona	37
New applications for conductive carbon nanotube inks	41
Now possible using standard commercial printing equipment by <i>William Hurley, David Arthur, and Robert Praino</i>	
Organic Lighting: A glimpse into the future by <i>Stephen Clemmet</i>	44
Fashion wear in its best light by <i>Louis M. Brill</i>	50
Now You See It – Now You Don't by <i>Louis M. Brill</i>	53
Last Word: OLEDs and flexible products by <i>Sung Kim and Barry Young</i>	56
Display Industry Calendar	60

The *Flexible Substrate* is focused on bringing news and commentary about the activities of the companies and technologies related to the development of flexible substrates for the displays industry. The *Flexible Substrate* is published electronically 10 times annually by Veritas et Visus, 3305 Chelsea Place, Temple, Texas, USA, 76502. Phone: +1 254 791 0603. <http://www.veritasetvisus.com>

Publisher & Editor-in-Chief Mark Fihn mark@veritasetvisus.com

Managing Editor Phillip Hill phill@veritasetvisus.com

Contributors: David Arthur, Louis M. Brill, Stephen Clemmet, William Hurley, Sung Kim, Robert Praino, and Barry Young

Subscription rate: US\$47.99 annually. Single issues: US\$7.99 each. Hard copy subscriptions are available upon request, at a rate based on location and mailing method. Copyright 2011 by Veritas et Visus. All rights reserved. Veritas et Visus disclaims any proprietary interest in the trademarks or names of others.

The 7th year...

by Mark Fihn

In my youth I learned that the human body completely regenerates itself every 7 years. I’ve since learned that there are some cells, (particularly the neurons in the cerebral cortex), that are never replaced, and others that regenerate much more slowly, (at age 70, about half of your cardiomyocyte heart cells have been with you since birth).

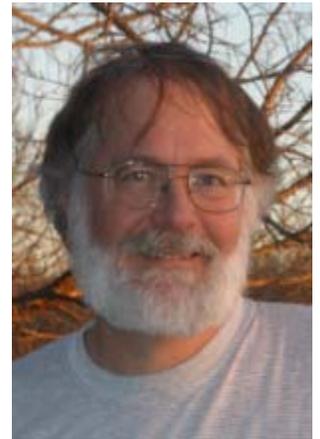
We finish 2010 with this edition of the *Flexible Substrate* newsletter. This completes our 6th year of publication, the 57th edition of the *Flexible Substrate* newsletter, and the 250th edition of our five core newsletters, (which include the *Flexible Substrate*, *Display Standard*, *3rd Dimension*, *High Resolution*, and *Touch Panel*). And when you add in our compilation newsletters, (*Forty Favorites*, *Twenty Interviews*, and *MultiView*), and our commissioned newsletters, (*UKDL Newsletter*, *LCD TV Matters*, and *FlexTech Trends*), we’ve now published 302 newsletters totaling 16,709 pages of news and information about the display and related industries.

Since the start of *Veritas et Visus*, I’ve also traveled to 189 events around the world, at which I’ve presented in some form or another at 52. Add in 4 kids (at least one teenager at all times during the life of *Veritas et Visus*, and no wonder I’m a bit tired! But maybe I’m just getting old...

As we enter the 7th year of *Veritas et Visus*, we envision some level of regeneration. Things you can look for:

- We intend to bring out at least two new publications during 2011, and perhaps more. This is mostly a matter of finding time, as there is no lack of content.
- We will be significantly reducing our travel this year. While all the conferences and exhibitions are great opportunities to see new products, learn about new technologies, and meet and discuss various topics with industry experts, it’s also very tiring and disruptive to family life.
- We will continue to publish single editions (rather than the double edition format we used for much of the past two years). As such, you can expect to get the *Flexible Substrate* (60-70 pages each time) about once/month.
- We do not plan to make any price increases – extending our record into the 7th year as being the most affordable source of comprehensive news and information available.

*Every few years I grow a beard just to see if my face still regenerates any dark hair...
I don’t really need to wonder any more...*



As we enter our 7th year of publication for the *Flexible Substrate* newsletter, it’s worth considering if our initial perspectives about the industry are still valid. Originally, the focus of the newsletter was on flexible displays, but we’ve evolved to much more broadly cover the broader topic of “flexible electronics”. Thankfully, we named the newsletter the *Flexible Substrate*, which easily enabled us to make this jump to a broader topic. Over the course of the newsletter, the commercial realization of a flexible display has not really happened to any significant extent, but as we look forward, the ingredients needed to produce a commercially viable flexible display are finally coming together. As such, the focus of the newsletter may actually narrow as we move forward – back to our initial focus on flexible displays. (But don’t worry – we’ll still cover all of the other developments related to flexible electronics, although eventually this might be manifested in a spin-off newsletter).

I must admit to being somewhat disappointed to learn that my brain cells do not regenerate every 7 years – that I’m pretty much stuck with the brain that I was born with. In the case of the *Flexible Substrate* newsletter, you will be pleased to know that you will continue to see great coverage – with some new twists – hopefully in ways that help inspire your brain cells to greater things! Happy New Year!

“Days like this”...

by Jutta E. Rasp

Jutta E. Rasp, founder of FPExperts and FPDisplays, has worked in the flat panel displays market for nearly two decades. FPExperts and its companies offer technology services as well as market analysis on various technologies and solutions. Jutta’s experience in R&D, production, sales, and the marketing of various flat panel display technologies allows her to understand the importance of the activities, findings and news releases in this diverse industry.



“When all the parts of the puzzle start to look like they fit” sings Van Morrison in his famous song. And yes, 2010 offered a lot of such days. OLED, LED, printed electronics excelled performance because a few pieces of the big puzzle started to fit and allow better performance parameters in operation and storage.

OLED and organic electronics are now commonplace items in the daily newspaper. Titled “emerging” for a long time, these technologies made their way into the collective conscious. Thanks to applications like mobile devices and the need for safer pharmaceuticals, and even bank notes – more than just the technology community is now familiar with organic light emitting diodes and printed transistors.

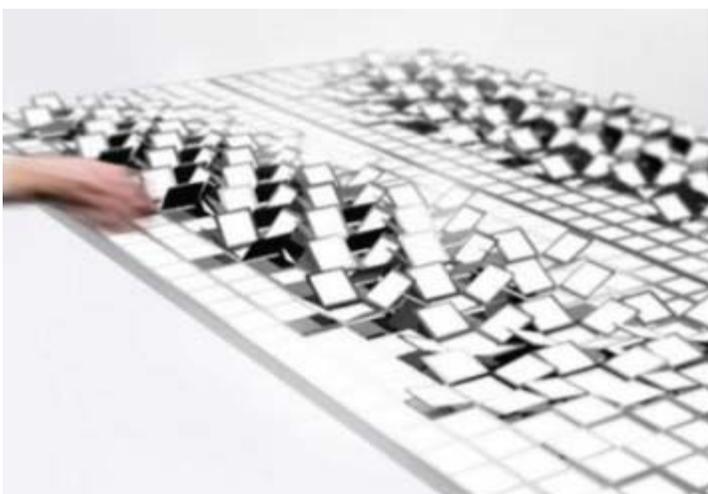
The results of 2010 achievements can all be seen at the CES 2011 in Las Vegas. Visitors will be able to see the stunning Samsung Mobile Display 14.0- and 19.0-inch AMOLEDs, each with a transparency of 30%. The prototypes are built for PC and TV applications. Most intriguing is the transparency feature.

If you want to take a picture of SMD’s AMOLED technology breakthrough you might be able to do so with the new Olympus XZ1 digital camera. Rumors suggest that the new model will be on display with a 3.0-inch AMOLED. Or you can stay at Samsung’s booth and check out the NX11 which will be equipped with a VGA 3.0-inch AMOLED display and allows users to take great pictures and record videos.

And if the real action at the show is more 3D experiences, it will be only 28 grams away: Samsung will show the lightest 3D goggles yet, co-designed with Austria-based Silhouette.



Samsung’s 28-gram 3D glasses



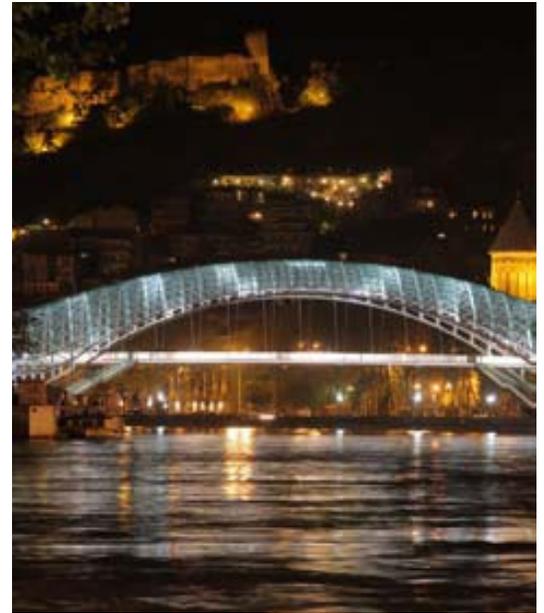
A new cooperation between Business Center OLED Lighting and Camline GmbH is planning to start production in 2011. Whether displays used for the project “Mimosa” or other tiles will be produced is not yet announced, but both Philips and Camline see multiple mass markets which can be addressed with the Lumiblade modular system.

“Mimosa” design from Jason Bruges using Philips Lumiblade modular OLED tiles

As such, it is not a surprise that leading stock market analysts have set Universal Display Corporation on “hot” for 2011. UDC’s 52-week is US\$10.30 and the 52-week high (and December’s intra-day high was at US\$32.00.

UDC recently announced expansion and diversification plans, (with the creation of a Korean subsidiary and the announcement of the co-development program with Acuity Brands to create an energy-efficient and color-tunable phosphorescent OLED lighting system through US\$2 million DOE grant).

A completely different experience is the LED-illuminated Bridge of Peace, in Tbilisi, Georgia. 1208 custom LED fixtures with 6040 high-power Luxeon Rebel LEDs from Philips shining with a color temperature of 4200K. The brilliant solution will allow an interactive light show created by Philippe Martinaud, to highlight the bridge and the Mtkvari river. The bridge, designed by Michele de Lucchi, will light up every hour from sunset to sunrise – commemorating the idea of peace both day and night.



LED-illuminated Bridge of Peace in Tbilisi, Georgia

One wonders how it would be like to see someone walking in the CuteCircuit dress with 24,000 LEDs, powered with iPod batteries, over this bridge. Might be a nice medley of colors. Rihanna and Katy Perry also recently sported a dress with integrated and programmable LEDs.

Regardless of the blend of colors, the LED bridge will make encounters with people sporting LED eyelashes a bit less frightening. This gadget by South Korean designer Soomi Park, is sold as the latest “must-have” for Lady Gaga fans.



Dresses with programmable LEDs integrated by CuteCircuit (left) and Parisian designer Alexandre Vauthier showcasing singer Rihanna (middle) and another CuteCircuit design for Katy Perry.



LED eyelashes – still a problem related to the power cord...

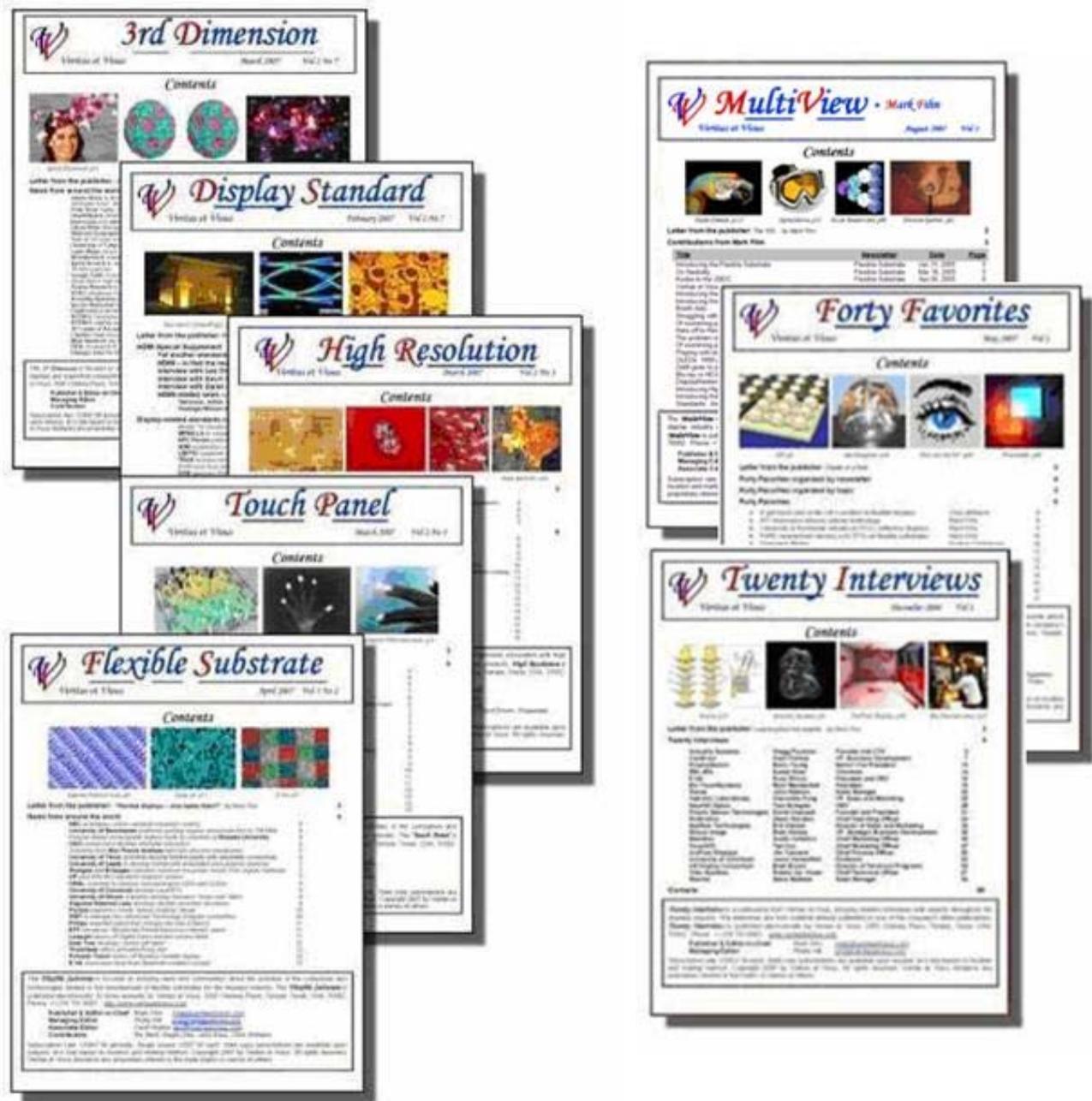
2011 will be the year in which we will see major advances and outstanding product ideas based on LED lighting – whether as direct lighting or back-lighting, on OLED technology, whether flexible, and/or on large screens with high resolution and OTFT. CES 2011 is only the start of the annual race to see which new product ideas will result in mass production success. There will be many more “Days like this”, during which bits and pieces fall into place and allow the researchers, developers, engineers, and production experts to help LED and OLED technology to be even more compelling. To all these people and to you, dear reader, come the very best wishes from FPExperts for a new year, during which health, good luck, and success shall be the ingredients of every day.





Veritas et Visus

Display-Industry Newsletters



<http://www.veritasetvisus.com>