



Nr. 14,
March 2003

SOCIETY FOR INFORMATION DISPLAY

SID-ME Chapter Spring 2003 meeting on Display Components and Technology organised by the Applied Optics Group of the IMT, Neuchatel and Asulab, Marin, Neuchatel-Switzerland, March 6-7, 2003

The SID-ME Chapter Spring 2002 meeting on Display Components and Technology was organised jointly by the IMT, Neuchatel and Asulab, Marin. More than 60 people attended the meeting in Neuchatel. The meeting was opened by Prof. R. Dandliker of the institute of microtechnology (IMT) from the University of Neuchatel. He remarked that important contributions to LCDs were made by Swiss researchers, for instance: M. Schadt and W. Helfrich, TN-effect in 1971, and T. Scheffer and J. Nehring, STN-effect in 1982. J. Kimmel and N. Fruehauf welcomed the attendants on behalf of the SID-ME Chapter.

Session 1, March 6 afternoon Technology and nano-technology for displays

U. Kroll (IMT) discussed low temperature deposition of silicon using the very high frequency (VHF)-PECVD approach. In

comparison with default deposition at 13.6 MHz, VHF deposition at 30-150 MHz has the advantage of: better utilization of silane, higher deposition rate and less ion bombardment induced interface damage.

J. Brugger (EPFL-Lausanne) talked about progress in shadow mask evaporation of metals and dielectrics for nano-structures. Miniature shadow masks with apertures covering multiple length scales ranging from 100 nm to 100 μ m can be made in a low stress silicon nitride membrane. Using shadow masking fine patterns can thus be made on a chemically active or mechanically unstable surface.

Mrs. M.L. Lee (Thales Research) gave a talk on sub-wavelength volume holography for the viewing angle compensation of liquid crystal displays. Very fine structures can be made using nano-technology and replica techniques. By varying the fill factor on a sub-wavelength scale the effective refractive index of the "artificial material" can be controlled. The improvement

of the viewing angle characteristic with such a “form birefringence” index grating film was illustrated.

T. Scharf (IMT) discussed nano-structures for liquid crystal alignment. It was shown that replicated nano-structures allow a wide interaction potential for liquid crystal alignment, such as tailored tilt and azimuthal angles, and multi-stability for bistable device.

Session 2, March 6, afternoon **Light emitting displays and display systems**

O. Gröning (EMPA-Thun) talked about the role of nano-carbon (CNT) electron emitters in field emission flat panel displays (FED). Although being a promising technology FED has been abandoned by several major companies in recent years, mainly for reasons of costly production technology. CNT emitters appear to allow for a cheap printing technology and require relatively low driving voltages and relatively low vacuum conditions. Thus CNTs may be a key element for FED production technology.

R. Ganter (Stanford University) discussed plasma display (PDP) technology and market development. While PDP performance has improved greatly over the past years, the cost, about USD 3500 for a 42 inch, is still rather high. The on-going improvement of luminous efficiency will help to further increase performance, reduce panel cost and increase market share. For 2003 a market between 1 and 2 billion panels is predicted.

W. Wiemer (Wiemer GmbH-Germany) presented a talk on light converters, a new tool for outdoor LCDs with brilliant colors. Small “Stokes shift” daylight fluorescent colorants are incorporated in translucent plastic materials, as a replacement for the standard transfectors in LCDs for outdoor use. The bright state of the art was demonstrated.

Conference dinner.

The conference dinner was organized in a restaurant located in a very beautiful building in the old town of Neuchatel (see photo). The stimulating atmosphere promoted open discussions and the making of new acquaintances, while the meat part of the exquisite meal was grilled at the fireplace. J. Kimmel (director) stated that meal was illustrative for the quality of the conference.



The beautiful conference dinner restaurant in the old town of Neuchatel

Apparently the combination of content and location, with the surrounding of the Swiss alps, attracted participants from far away regions (see photo).



Meeting fellow display researchers before dinner

SID-MEC General Meeting

During the SID-ME meeting the activities of the Chapter were reported.

The healthy financial situation of the Chapter was explained. The administration has been approved by two members.

The installation of a SID-ME award to acknowledge and highlight relevant display work by its members was discussed. Details on the award content and the application procedure are being worked out.

Also the election of the officers of the SID-ME chapter for the coming period took place. The proposed candidates were elected unanimously. The new Chapter committee is now composed as follows:

Norbert Frühauf (Chair), Gerrit Oversluizen (Vice-Chair), Andre van Calster (secretary), Frank Rochow (treasurer).

Session 3 March 7 morning Components for displays

H.P. Herzig (IMT-University of Neuchatel) reviewed applications of micro and nano-optical elements. Micro-optics family members, including refractive and diffractive micro-optics, sub-wavelength structures, photonic bandgap structures and resonant filters were introduced. The application is promoted by the emergence of replication techniques that allow low cost mass production. A trend from micro-optics towards nano-optics forms one challenge, while another challenge is the efficient integration with other optical components.

T. Bachels (ROLIC) presented a talk on LPP/LCP technology-based viewing angle compensation film for TN displays. The design and properties of a novel compensation film with minimal color shift were explained.

H.J. Cornelissen (Philips Research) discussed options to use polarization selective light extraction from a backlight (and convert the non-extracted polarization) in order to improve LCD efficiency. He reported an efficiency improvement with a factor 1.7 and a contrast >100 for an embodiment employing an anisotropic film with micro-grooves, coated with an isotropic layer.

J. Doutrelaigne (University of Gent) talked about special driver architectures and innovative circuit concepts that allow low-power high-voltage driver capability for reflective bistable LCDs. Circuit schematics for high-efficiency high voltage generators and level shifters, that could be successfully integrated in 100 V extended CMOS technology, were introduced.

Session 4 March 7 morning OLED materials and simulations on OLEDs

B. Ruhstaller (Zurich University of Applied Science, Winterthur) explained how electronic, optical and thermal stimulation tools of OLED displays can contribute to design optimization.

He showed that OLED characteristics depend critically on the thicknesses in the thin film stack and the location of the emission zone.

S.M. Kelly (University of Hull) discussed the progress in OLEDs with polarized emission. Using crosslinked electroluminescent liquid crystal polymer networks a polarization ratio of 12:1 has been realized. A clean-up polarizer is still needed.

I.R. Laskar (National Chiao Tung University, Taiwan) talked about the effect of substituents on the photoluminescent and electroluminescent properties of substituted cyclometallated complexes of iridium(III). The peak wavelength of the yellowish/orange emission can be tuned with the substituents and an external efficiency of about 3 lm/W at a luminance of 2000 cd/m² is obtained.

Laboratory visits

In conjunction with the SID-ME meeting there was an opportunity to visit several research laboratories in the area, amongst others the ASULAB, the central research laboratory of the Swatch group, and the IMT laboratory. Dr. R. Dinger responsible for the ASULAB, a group of about 80 people, reviewed the wide range of research activities, that encompass displays, micro-systems, ceramics, polymers and electronics. Vertical integration of watch specific know how is important, where the combination of aesthetics and technology stands out. In the available time a selected set of activities was demonstrated. At the IMT the sections dealing with applied optics and photo-voltaics were visited.

These visits were appreciated very much by the participants and contribute much to the coherence of the display community.

Closing remarks

The Spring '03 SID MID-Europe meeting was experienced as a well-organized and scientifically high profile conference in a beautiful setting. A successful combination of aesthetics and technology.

Jaap Bruinink and Gerrit Oversluizen



SOCIETY FOR INFORMATION DISPLAY

Coming Event:

SID-ME fall meeting 2003, October 6- 7, 2003 Borlänge – Sweden

Special topics: FLEXIBLE DISPLAYS DISPLAY MANUFACTURING

Visit the website for latest information:
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SID payment.

The SID annual membership fee amounts US\$ 75. Please note that the membership is now a rolling membership, which means that it runs 12 months from the month in which the payment was made. For more information see the SID web-site www.sid.org.

We encourage our members to pay directly to SID-HQ in the USA, but if they want to pay to the ME-Chapter directly the annual fee should be EUR 90 with all bank fees covered by the member !

In case of direct payment to the SID-ME Chapter the payment in EURO should be done to

Account no.:	206 020 1104
at:	Berliner Sparkasse, Berlin, Germany
Bank code:	BLZ 100 500 00
Account name:	Frank Rochow, SID-ME

Please indicated your name on the remittance papers.

The Newsletter.

If you want to place an article in the Newsletter, which is interesting for the European display society, please send it to:
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