

Nr. 17,  
December 2004

**SOCIETY FOR INFORMATION DISPLAY**

## **SID-ME Chapter Fall 2004 meeting and SID-MEC General Meeting "10th Anniversary Meeting" October 11-12, 2004**

**at Chair of display Technology, University of Stuttgart,  
Germany**

*The SID-ME Chapter Fall 2004 meeting, the "10th Anniversary Meeting", was organized at the Chair of Display Technology of the University of Stuttgart. Special topics of this meeting were: organic and inorganic active matrix, multimedia displays, flexible displays and process technology for displays. The University of Stuttgart is special in that it has a Chair of Display Technology that is equipped with a high quality clean room facility for display processing. Indeed, a visit to this facility was one of the attractions of this meeting. The site is also special because it is the place where the SID-ME chapter was founded 10 years ago. In his welcome word in the lecture hall, the meeting chair Prof. N. Fruehauf (Director of the SID-ME Chapter) memorized the birth of the chapter with just a few members in a room next door. The almost 90 people that attended the present meeting, illustrate the healthy growth of the SID-ME Chapter that has matured into an intimate network with biannual meetings of this size. The conference comprised 23 oral presentations, the SID-MEC general*

*meeting, a Chair of Display Technology tour and the conference dinner event at the "Schloss Solitude".*

### **Session 1, October 11, afternoon Characterization and Simulation**

*K. Blankenbach (University of Applied Sciences, Pforzheim) discussed a lowest cost USB display measurement system for multimedia monitors. A display tester for PC monitor ergonomics was developed, with hardware with standard components with an estimated cost of 50 euro.*

*S. Valyukh (Dalarna University, Borlange, Sweden) talked about measuring parameters of liquid crystal cells. From an optical interference pattern the developed semiautomatic system can derive important LC cell parameters such as cell gap, twist angle, and wavelength dispersion of birefringence in all types of nematic LC cells (empty as well as filled, reflective*

and transmissive, with large and small cell gaps, with big and small twist angles).

*Y. Bonnassieux ( LPICM Ecole Polytechnique, Palaiseau, France)* presented results from a Spice model for the PIN diode in hydrogenated amorphous silicon technology. The model takes into account the serial resistance, direct dark current, reverse dark current and light current and fits the measured data very well.

*D. Bui Van ( LPICM Ecole Polytechnique, Palaiseau, France)* talked about a TFT based on microcrystalline silicon and the extraction of parameters and static Spice modeling for AMOLED displays. Low leakage microcrystalline silicon TFTs can be made and their properties modeled.

*K. Skarp (Dalarna University, Borlange, Sweden)* presented spectroscopic ellipsometry characterization of the ITO film with different coatings on its top. Data fits with several models were evaluated and it is concluded that the microstructure of ITO changes with depth.

*H. Becker (Covion Organic Semiconductors GmbH, Frankfurt)* emphasized that industrial manufacturing of organic semiconductors is pushing the limits in chemical industry. Synthesis of monomers, polymers, and final customized inks are sophisticated processes, which need a high level of quality control to achieve reproducible results.

## Session 2, October 11, afternoon Flexible Displays

*J. Lewis (MCNC R&D Institute, NC, USA)* gave a talk on the mechanical performance of thin films in flexible OLED displays. Challenges for developing flexible OLED displays include sufficiently durable brittle films and improved thin film permeation barriers. DMD multilayer transparent conductors provide excellent transparency, sheet resistance, and mechanical durability.

*J. Specht (Chair of Display Technology, University of Stuttgart, Germany)* talked about bistable LC effects for flexible displays. These effects reduce power consumption and thus improve portability. Structured spacers are preferred and the addressing scheme must be carefully chosen.

*T. Bert (Ghent University, Ghent, Belgium)* studied transient current properties in electrophoretic electronic paper devices. Memory effects and the influence of free charge in the pixel on the switching time were discussed.

*S. Gottling (Chair of Display Technology, University of Stuttgart, Germany)* discussed the properties of pentacene TFTs for LCD applications. High (on/off)-ratios  $> 10^6$  have been realized, where a proper purification of the pentacene via a sublimation process is essential.

## Session 3 October 11, afternoon SID-ME Chapter Student Award

The SID-ME Chapter Student Award was given for the first time at this 10<sup>th</sup> anniversary meeting. From now on this award will be given yearly in the Spring Meeting of the SID-ME Chapter (see announcement below). This year's award is given to *M.A. Islam (Dalarna University, Borlange, Sweden)* for his contribution on inkjet printing for LCD applications, that was presented in this session. The award committee selected his paper out of 6 applications.



The SID-ME Chapter Student Award winner *M.A. Islam* (center) and two committee members *Prof. K. Skarp* (left) and *Prof. N. Fruehauf* (right).

## Lab Tour Chair of Display Technology

In conjunction with this SID-MEC meeting a lab tour around the facility of the Chair of Display Technology was organized. Enthusiast local tour guides, with groups of about 15 people, showed of the high quality and fully furnished clean room of almost 500 m<sup>2</sup>, class 10-100. Here many types of active and passive matrix displays are processed, including a-Si and LTPS matrices, MIM matrices, color filter processing, flexible substrates and organic TFT test structures. Several working prototypes further illustrated the state of the art. It is impressive to see how, with limited permanent staff, dedicated students and a tradition of industrial collaboration, a professionally operated clean room is maintained.

The tour, a combination of an impressive working environment, highlighted with well-explained display technology know-how and prototypes of future products, was appreciated very much by the participants.



A view inside the "professional" clean room of the Chair of Display Technology at the University of Stuttgart.

### Conference dinner

The meeting included a conference dinner at the "Schloss Solitude". In this beautiful 17<sup>th</sup> century baroque residence an excellent dinner was served. The already great atmosphere was completed by live dinner music made by a trio dressed for the occasion; see picture. The conference presentations, the lab tour and the dinner event clearly show that in Stuttgart top quality is, and has been, strived for at all times.



In style dinner music accompanied an excellent dinner at "Schloss Solitude"

## Session 4, October 12, morning Display Manufacturing

*C. Doornkamp* (Philips Research, Eindhoven, The Netherlands) talked about next generation mobile LCDs with in-cell retarders. It was shown that especially in transfective LCDs an improved brightness, a thinner cell, a better viewing angle and less power consumption is achieved.

*D. Wurczinger* (Sen Vac. Thin Film Technologies GmbH, Friedberg, Germany) presented an overview of applied sputter technologies for the production of flat panel displays with a review of systems, cathodes, power supplies and materials.

*N. Nathan* (Physical Optics Corporation, Torrance, California, USA) discussed large size non-lambertian diffuser screens, the optics and the physical chemistry of the processes involved. The unique features of PALM, Patterning by Adhesive of Large-size Micro-structures, were emphasized.

*M. Schwampera* (AIXTRON AG, Aachen, Germany) gave a presentation on co-deposition of homogeneously mixed layers of a-NPD and Alq3 by organic vapor phase deposition and their characterization by variable angle spectroscopic ellipsometry. High rate deposition with high uniformity and good reproducibility has been achieved. PHOLED devices with state of art performance were prepared.

*J. Amelung* (Fraunhofer-Institute for Photonic Microsystems, Dresden) discussed a vertical in-line deposition system for next generation RGB-OLED fabrication. New in-line sources are developed and a first OLED with a doped transport layer has been fabricated.

### SID-MEC General Meeting

*N. Fruehauf* (Director SID-MEC) headed the SID-MEC general meeting, where the activities of the chapter were reported. The Chapter committee is composed as follows: *Kent Skarp* (Chair), *Gerrit Oversluizen* (Vice-Chair), *Herbert de Smet* (Secretary), *Jutta Rasp* (Treasurer). *J. Rasp* gave a treasurer update. She presented a detailed account of the healthy financial situation of the Chapter. The membership fluctuates about 550 members and the SID-ME chapter remains the second largest chapter. Also the next meeting was announced. The SID-MEC Spring'05 meeting is to be held jointly with Le Club Visu (SID-France) on 10 and 11 March in Ghent, Belgium.

## Session 5, October 12, morning OLED Displays

*G. Kelly* (Institute for System Level Integration, Scotland) presented design challenges in OLED microdisplays. Voltage drive is becoming an increasingly attractive option as OLED degradation becomes less of a handicap and display unifor-

mity can be achieved via uniform layers for microdisplays.  
*D. Berner (CFG S.A. Microelectronics, Morges, Switzerland)* derived insights into OLED functioning through numerical modelling. Particularly the transport and recombination mechanism were elucidated.

*T. Beierlein (IBM Research GmbH, Ruschlikon, Switzerland)* talked about combinatorial experiments for OLED optimisation and extraction of device and material parameters. The method is a powerful tool to extract mobilities, and internal fields and optimise layer thickness.

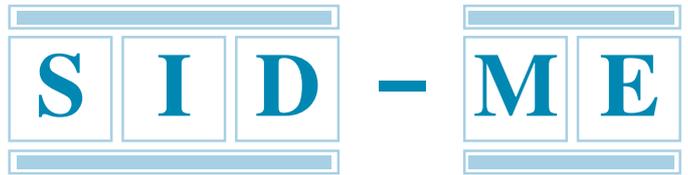
*J.Pillow (CDT Oxford Ltd, UK)* discussed improving the lifetime of green phosphorescent dendrimer OLEDs. A lifetime of 17000 hours for an initial luminance of 100 cd/m<sup>2</sup> was reported. The improvement was due to the hole transport layer, the increased material purity and optimised device design.

*E. Persidis (Chair of Display Technology, University of Stuttgart, Germany)* discussed LTPS-technology for active matrix OLED displays. The variation of device parameters and the use of a matched two TFT circuit were explained.

*M. Kroger (TU Braunschweig, Germany)* talked about inverted organic light emitting diodes for active matrix displays. High efficient structures with sputtered ITO anodes were fabricated.

*A. Nathan (University of Waterloo, Ontario, Canada)* gave an

extensive talk on a-Si back planes for AMOLED displays on flexible substrates. High performance TFTs have been fabricated on polymer films at 150 C. Proper circuit design and biasing can manage material shortcomings associated with metastability.



**SOCIETY FOR INFORMATION DISPLAY**

### **Closing remarks**

The fall'04 10<sup>th</sup> anniversary SID Mid-Europe chapter meeting was a successful event demonstrating the maturity, the high quality and the broad scope of the European display research.

*Gerrit Oversluizen*

---

**Coming Event:**  
**SID Mid-Europe Chapter Meeting**  
**jointly with Le Club Visu (SID-France)**  
10-11 March 2005, Ghent, Belgium

Visit the website for latest information:  
<http://www.elis.ugent.be/sid/>

---

## SID-ME Chapter committee

The SID-ME Chapter committee is now formed by:

*Prof. Dr. K. Skarp* (chair), Dalarna University, Forskargatan 3, SE-781 70 Borlänge, Sweden

Tel.: +46-23-778628 Mobile: +46-70-6214175

E-mail: ksa@du.se

*Dr. G. Oversluizen* (vice-chair), Philips Research, Prof. Holstlaan 4, 5656 AA, Eindhoven, The Netherlands,

Tel.: +31 40 2742454, Fax: +31 40 274 43 35,

E-mail: gerrit.oversluizen@philips.com

*Prof. Dr. H. De Smet* (secretary), University of Gent,

St.-Pietersnieuwstraat 41, B-9000 Gent, Belgium,

Tel.: +32 9 264 3459, Fax: +32 9 264 35 94,

E-mail: Herbert.desmet@elis.rug.ac.be

*J. Rasp* (treasurer), Flat Panel Displays, Alpenstrasse 12,

Postfach 1208, D-85619 Feldkirchen, Germany.

Tel.: +49 8990955494, Fax: +49 8990955495

E-mail: jutta.rasp@fpdisplays.com

Tel.: +49 711 68 57 330 or +49 711 68 57 332, Fax: +49 711 685 7311, E-mail: ernst.lueder@ins.uni-stuttgart.de

*Prof. Dr. P. Maltese*, University La Sapienza, Via Marmorata 169, I-00153 Roma, Italy,

Tel.: +39 644 585 428, Fax: +39 647 42 647.

*Dr. M. Schadt*, Rolic Research Ltd, Gewerbestrasse 18, CH-4123 Allschwil, Switzerland,

Tel.: +41 61 487 22 22, Fax: +41 61 487 22 88,

E-mail: martin.schadt@rolic.com

*Dr. D. Theis*, Siemens AG, Tel.: +49 89 636 40550, Fax.: +49

89 636 40554, E-mail: dietmar.theis@siemens.com

*Dr. P.G. Wierer*, Balzers Thin Films, P.O. Box 1000,

FL-9496 Balzers/Liechtenstein.

Tel.: +423 388 47 42, Fax: +423 388 54 05

E-mail: wip@btf.balzers.net

*Dr. J. Bruinink*, Philips Research, Prof. Holstlaan 4, 5656 AA,

Eindhoven, The Netherlands, Tel.: +31 40 2743989,

Fax: +31 40 274 43 35, E-mail: Jaap.Bruinink@philips.com

## Additional members of the SID ME Chapter committee are:

*Dr. Michael E. Becker*, Display-Metrology & Systems, Marie-Alexandra Str. 44, D 76135 Karlsruhe-Germany,

Tel./Fax: +49 721 981 2268

E-mail: m.Becker@display-metrology.com

*Dr. W. Becker*, Merck KGaA

Frankfurter Str. 250, D-64293 Darmstadt, Germany,

Tel.: +49 6151 72 7360 ; Fax: +49 6151 72 3132

E-mail: werner.becker@merck.de

*Prof. Dr.-Ing. E. Lüder*, University of Stuttgart, Pfaffenwaldring

47, D-70550 Stuttgart-Vaihingen, Germany,

## European officer(s) of the SID:

*Dr.-Ing. N. Frühauf* (director), Universität Stuttgart,

Allmandring 3B, D-70550 Stuttgart-Vaihingen, Germany,

Tel.: +49 711 685 6922, Fax: +49 711 685 6924.

E-mail: norbert.fruehauf@lfb.uni-stuttgart.de

*Lic. Tech. J. Kimmel* (regional vice-president), Nokia Research

Center, P.O. Box 100, FIN-33721 Tampere, Finland,

Tel.: +358 7180 35484, Mobile: +358 50 48 35484, Fax:

+358 7180 35322, E-mail: jyrki.kimmel@nokia.com

## 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](http://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:

G. Oversluizen, fax: +31 40 274 4335,

E-mail: gerrit.oversluizen@philips.com

# SID-ME Chapter Student Award

## Call for SID-ME Chapter Student Award

The SID-ME Chapter Student Award is given for an outstanding scientific or technical achievement in, or contribution to, research on information display. The applicant is a student at a university/institute in the SID-ME region. The award amounts to 1500 Euro, with the obligation to present the contribution at the SID-MEC meeting where the award is presented. The conference fee is waived. The applicant must be a member of SID. For information on student membership, see below. The application deadline is February 1, 2005.

## Application for SID-ME Chapter Student Award

**Name:** \_\_\_\_\_

**SID Membership No.:** \_\_\_\_\_

**Institute/University:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Title of contribution:** \_\_\_\_\_

**Abstract (100-150 words):** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**References (SID-ME member):** \_\_\_\_\_

The application should be submitted to the award committee consisting of:

Prof. Dr.-Ing. N. Frühauf, Universität Stuttgart, Allmandring 3B, D-70550 Stuttgart-Vaihingen, Germany, Tel.: +49 711 685 6922, Fax: +49 711 685 6924.

E-mail: [norbert.fruehauf@lfb.uni-stuttgart.de](mailto:norbert.fruehauf@lfb.uni-stuttgart.de)

Dr. G. Oversluizen, Philips Research, Prof. Holstlaan 4, 5656 AA, Eindhoven, The Netherlands, Tel.: +31 40 2742454, Fax: +31 40 274 43 35.

E-mail: [gerrit.oversluizen@philips.com](mailto:gerrit.oversluizen@philips.com)

Prof. Kent Skarp, Swedish LCD Center, Forskargatan 3, 781 70 Borlänge, Sweden, Tel.: +46 23 77 86 78, Fax: +46 23 77 86 70.

E-mail: [kent.skarp@du.se](mailto:kent.skarp@du.se)

### **SID Student Membership:**

At <http://www.sid.org> you find information on SID student membership. Note the favourable offer of \$5.00 per year for student members.