

pmTUC EVENTS

Upcoming opening of Indo-German lab at Manipal University

In October 2012, two researchers of the pmTUC went to Manipal, India, with the task to set up an Indo-German lab for applied research in printed solar cells. The joint lab is set up in cooperation with Manipal University and Manipal University Technology Business Incubator (MUTBI), under the guidance of Dr. Manohara Pai M. M., Associate Director of Manipal University Innovation Centre and CEO of MUTBI.



Currently, Deep Prakash and Björn Engler work eagerly on setting up the lab, which will be officially opened with a ceremony on January 24, 2013. The two researchers were recently joined by Manuela Heinze, student of pmTUC, who went to India for a 3-month research internship. She will support Mr. Engler and Mr. Prakash in their activities and conduct first tests on printed solar cells and their behaviour under Indian conditions. These experiments will provide the basis for potential 3PV (printed paper photovoltaics) applications for the Indian market. A conference on anti-counterfeiting issues,



held in Mumbai in mid October, was a first opportunity to introduce the lab, research and India activities of pmTUC to representatives of the Indian printing community. Events like this help the pmTUC research team to get a clear idea about the demands of the Indian market and potential India-specific applications of printed paper-based solar cells. *BE*

pmTUC RESEARCH NEWS

Printed carbon nanotube sensor on flexible substrate

Research at the Institute for Print and Media Technology currently focuses on printed photovoltaics and loudspeakers. Both devices need printed sensors based on carbon nanotubes (CNT). The research project "CarboSens", funded by the German Federal Ministry of Education and Research (BMBF), deals with this topic. It is a cooperation project of pmTUC, Fraunhofer ENAS, Ilmenau University of Technology and several industrial monitoring partners, including Senslab, UST, BAM and Future Carbon. All of them are linked to the field of sensors for detecting not only bioactive materials, like glucose or dopamine, but also toxic gasses, like NO_x , NH_3 and CH_4 . The project's goal is to use carbon nanotube composite materials and dispersions as printable formulations for mass-printing technologies in order to realise printed structures made of carbon nanotube materials, which can be used as sensors and electrochemically active layers.

Carbon nanotubes have remarkable properties, e.g. a very large surface area. The excellent electrical conductivity makes CNT an ideal candidate for chemical detection. The CNT-based films are fabricated through transfer of water dispersed MWCNTs onto polycarbonate (PC) substrate by means of flexographic printing processes. Cyclic voltammetry and electrochemical impedance spec-



trosopy are used for characterisation. The printed sensor is a new generation of sensors which can be used, for instance, as disposable element in microsystems (microfluidic cells) for the analysis of biochemical substances or chemically reactive gases. NW

pmTUC STUDENT NEWS

Holi celebration in Chemnitz

It's a great and special experience to celebrate Holi – the festival of colours – away from India. I had never expected that foreigners also relish and celebrate the Indian Hindu cultural event. But I am glad that they like this Indian celebration. In spite of being such a colourful and lively festival, there are various aspects of Holi which makes it so significant for our lives. Holi is the festival of colours which is celebrated by Hindus in various parts in India. Ranging from socio-cultural, religious to biological aspects, Holi unites many reasons why people should heartily enjoy and cherish it. The festival is celebrated with vibrancy and vigour. Holi is also the most expressive and energetic festival. People exchange colours in the form of gulaal and abeer (types of colour) and distribute sweets. Squirting water over each other personifies the joy and mirth. This festival also dilutes all boundaries of class, creed or gender. After getting people's faces painted by myriad colours and splashes of water, it becomes hard to differentiate the class and cast. Hence it also signifies the equality of being human.

We celebrated Holi in Chemnitz on September 9th, 2012. The event was named 'Holi Open Air Chemnitz' an event conducted by Sinnkonzept. They offered us two packs of eco-friendly colours which contain no harmful ingredients and are water-soluble. Two packs were too little compared to the amount we get in India. Foreigners seemed excited at the entrance gate and eager to participate.



During the event, people were just throwing colours over each other and they enjoyed the atmosphere of Holi at its best. Special Bollywood songs and Bhangra performances were presented on stage and added spice to the event. To me it was most fascinating to see that people were keen to learn about the importance of this fun-filled celebration. In my opinion, festivals like this provide a fantastic opportunity to strengthen ties and emotional bonds between individuals and to revitalise relationships. DP

FURTHER NEWS

DAAD conference on double degree programmes held in Berlin

On November 8 and 9, 2012, the German Academic Exchange Service (DAAD) hosted a conference for project managers of international double degree projects in Berlin, Germany. As representative of pmTUC and coordinator of the Indo-German double degree programme "Print and Media Technology", which is funded by DAAD since 2007, Ms. Sylvia Strauss attended the event. Ms. Strauss got useful information about the status and further development of the DAAD double degree initiative and had the opportunity to get in touch with other project coordinators and exchange experiences and ideas. SS



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Imprint: Institute for Print and Media Technology
at Chemnitz University of Technology [pmTUC]
Professorship Print Media Technology
Reichenhainer Straße 70
09126 Chemnitz, Germany
Phone: +49 (0)3 71/5 31 23 61 0
Fax: +49 (0)3 71/5 31 23 61 9
Editorial content: Björn Engler, pmTUC (BE)
Nora Wetzold, pmTUC (NW)
Digvijay Patil, pmTUC (DP)
Sylvia Strauß, pmTUC (SS)
Layout: Thunk Design Co., Mumbai, India
Sylvia Strauß, pmTUC
Maria Stiehl, pmTUC