

## 2<sup>nd</sup> Thin Film Technology Forum



The 2<sup>nd</sup> Thin Film Technology Forum will take place linked to the 9<sup>th</sup> Short Course Coating and Drying of Thin Films. Renowned scientists will present and discuss new trends in industry and academia with a focus on Printed Electronics, Battery and Smart Coatings.



June 1-2, 2017

KIT-Tagungszentrum (FTU), Lecture hall

Hermann-von-Helmholtz-Platz 1  
76344 Eggenstein-Leopoldshafen



Organisation: Prof. Dr.-Ing. Wilhelm Schabel  
Dr.-Ing. Philip Scharfer  
with 11 experts from industry and academia

## TFT Forum program

### Schedule 01.06.2017 – TFT Forum Thursday

- 13:00 *TFT Forum get-together lunch (Finger Food)*
- 13:30 *Forum registration and materials handout*
- 14:00 *Welcome & Introduction to TFT Forum*  
Prof. Dr.-Ing. W. Schabel / Dr.-Ing. P. Scharfer
- 14:10 *Welcome address to the 2<sup>nd</sup> TFT Forum at KIT*  
Prof. Dr. Thomas Hirth, Vice President (KIT)  
Innovation and International Affairs

### Printed and organic electronics processing

- 14:20 *Advances in organic & printed electronics processing*  
Ir. Ike de Vries (Holst Centre, NL)
- 15:20 *Multilayer polymer LEDs from solution*  
Prof. Dr. Paul Blom (MPI Polymer Research)
- 16:05 *Discussion and coffee break*
- 16:35 *Multilayer coating of organic electronics*  
Dipl.-Ing. Sebastian Raupp (KIT)
- 16:55 *Printed Perovskite Photovoltaics*  
Dr. Ulrich Paetzold (KIT)
- 17:25 *Drying and diffusion in printed nanofilms*  
Prof. Dr.-Ing. Wilhelm Schabel (KIT)

- 19:30 *Get-together at BESITOS (Karlsruhe town square)*

### Schedule 02.06.2017 – TFT Forum Friday

#### Smart Coatings

- 08:45 *Advances in digital direct printing*  
Prof. Fritz Bircher (iPrint, CH)
- 09:30 *Self-cleaning antireflective optical coatings*  
Dr. Stefan Guldin (University College London, UK)
- 10:00 *Solvent-borne acrylic pressure-sensitive adhesive films*  
Dr. Stephan Zöllner (tesa SE)
- 10:30 *Powerdrop: Jetting difficult materials*  
Dr. Guy Newcombe (Archipelago Tech., Cambridge UK)
- 11:00 *Discussion and coffee break*

#### Battery Coatings

- 11:30 *Industrial production of Li-ion battery cells*  
Dr. Armin Modlinger (Litarion)
- 12:15 *Industrial experiences in production of Li-ion cells*  
Dr. Andreas Huth (VW-VARTA Microbattery)
- 12:45 *Limitations in industrial coating of battery electrodes*  
Dipl.-Ing. Ralf Diehm (KIT)
- 13:05 *Cryo SEM morphology characterisation and drying research on Li-ion battery electrodes*  
Dr.-Ing. Philip Scharfer (KIT)
- 13:25 *TFT Forum closing session lunch (Finger Food)*



**Ir. Ike de Vries (HOLST CENTRE, NL)** studied Chemistry at the Wageningen University, Netherlands. From 1988 to 2006 Ike was a project leader and process/research engineer in the field of extrusion coating and substrate development for ink jet and photographic paper at Fuji Photo Film. Since 2006, he is a research scientist at the Holst Centre in Eindhoven, The Netherlands. He utilizes his experience to develop new (R2R) processes which enable large scale production of organic light emitting diodes (OLEDs) and photovoltaic (PV). He is a board member of the European Coating Symposium (ECS) and the International Coating Science and Technology Symposium (ISCST).



**Prof. Dr. Paul Blom (MPI Polymer Research)** received his Ph. D. Degree in 1992 from the Technical University Eindhoven on picosecond charge carrier dynamics in GaAs. At Philips Research Laboratories he was engaged in the electro-optical properties of polymer light-emitting diodes. From 2000 he held a professorship at the University of Groningen in the field of electrical and optical properties of organic semiconducting devices. In September 2008 he became Scientific Director of the Holst Centre in Eindhoven, followed in 2012 by an appointment as director at the MPI for polymer research in the field of molecular electronics.



**Dipl.-Ing. Sebastian Raupp (KIT)** completed his studies in Chemical Process Engineering at KIT in 2012. At graduation, he was awarded with the Hans Rumpf and Emil Kirschbaum price for his excellent achievements in his studies. Since 2013 he is working as research assistant at KIT/TFT on solution processing of organic electronics including fundamental research on diffusion and drying processes in thin multilayer films.



**Dr. Ulrich W. Paetzold (KIT)** received his diploma in physics (2009) and PhD in physics (2013) from the RWTH Aachen University. He conducted his PhD thesis at Forschungszentrum Jülich and continued as a Post-Doc. In 2014, Dr. Paetzold moved to imec (Leuven, Belgium) and started researching new materials and processes for solution-processed perovskite thin-film solar cells. Since June 2016, Dr. Paetzold leads a Helmholtz Young Investigator Group at the KIT, focussing on light management, nanophotonics for energy as well as new materials and processes for inexpensive and stable perovskite optoelectronic devices.



**Prof. Dr.-Ing. Wilhelm Schabel (KIT)** holds a professorship in Thin Film Technology at KIT since 2009. He studied process engineering and his doctor thesis in the field of drying of thin films was honored with the Carl-Freudenberg Award. In 2007 he gained industrial experiences in coating technology as R&D engineer at LONZA High Tech Film. He was honored with the Arnold Eucken Award from VDI (2007), the L.E. Scriven Award from the International Society of Coating Science and Technology (2008) and a honorary doctorate from TU Iasi for his research achievements. Prof. Schabel is active in national and international coating, printing, drying and heat and mass transfer committees.

## Registration fee for 2-day TFT Forum

|  | Early Bird (until 15.03.17) | later   |
|--|-----------------------------|---------|
| 2-day TFT Forum participation          | € 350.–                     | € 450.– |
| Exhibition booth (incl. participation) | € 500.–                     | € 600.– |

## Payment

According to §4 Nr. 22a USTG the registration fee is purchase tax free. Registration fees include a printed copy of presentations, coffee, refreshments, lunch and the TFT Forum get-together on Thursday evening. The TFT Forum is included in the Short Course registration.

## Venue

The TFT Forum takes place at the KIT-Tagungszentrum (FTU), Lecture hall, Hermann-von-Helmholtz-Platz 1 in 76344 Eggenstein-Leopoldshafen.

## Hotel recommendations

Hotel Kaiserhof, Hotel Novotel Karlsruhe City, City Partner Hotel Berliner Hof, Hotel Rio

## Further information

[www.tft.kit.edu](http://www.tft.kit.edu) – TFT Courses

## Contact and Registration:

Organisation: [jana.kumberg@kit.edu](mailto:jana.kumberg@kit.edu)

Office TFT: [margit.morvay@kit.edu](mailto:margit.morvay@kit.edu)

Registration: [gvt-hochschulkurse@gvt.org](mailto:gvt-hochschulkurse@gvt.org)

## Further information and registration:

<http://www.tft.kit.edu/745.php>



**Fritz Bircher (iPrint, CH)** studied electrical engineering at ETH Zurich. After graduating he worked as an R&D engineer for different companies developing mechatronic system solutions. In 1993 he was appointed professor at Bern University of Applied Sciences, where he started his research in inkjet printing, studying and exploring all possible jetting and dispensing principles with all kinds of materials in a wide range of applications. In 2012 he joined the University of Applied Sciences Western Switzerland in Fribourg, where he founded iPrint institute and iPrint Center for Digital Printing on the Marly Innovation Center. Fritz's main research interests based on inkjet printing include: packaging printing, direct-to-shape printing, material printing including 3D printing and bio printing.



**Dr. Stefan Guldin (University College London, UK)** is a University Lecturer and heads the Adaptive and Responsive Nanomaterials Group at University College London. Prior to his appointment in 2014 he was a postdoctoral fellow of the German Academy of Sciences (Leopoldina) at the École Polytechnique Fédérale de Lausanne, Switzerland. He obtained a PhD in 2012 from the University of Cambridge for his work on "Inorganic nanoarchitectures by organic self-assembly", mainly elucidating the structure-function relationship in self-organised materials. Previously, he studied applied physics with an emphasis on soft matter at the TU Karlsruhe and TU Munich. His research interests include the self-assembly of soft & hybrid matter, adaptive and responsive materials architectures as well as light-matter interactions.



**Dr. Stephan Zöllner (tesa SE)** studied chemistry at the University of Hamburg. After receiving his doctoral degree in 1990 he did postdoctoral research at the IBM Almaden Research Center. In 1992 he started his career in the chemical industry at the Beiersdorf AG, developing polymers for adhesives. Since 2000, he is responsible for acrylic adhesives at the tesa SE. Major areas of expertise include polymerization technologies, pressure sensitive adhesives in general, acrylate based pressure sensitive adhesives in particular, radiation cured adhesives and processing of adhesives.



**Dr. Guy Newcombe (Archipelago Tech., Cambridge UK)** is CEO at Archipelago Technology ([www.archipelagotechnology.com](http://www.archipelagotechnology.com)), a Cambridge-based company focused on developing precision droplet creation and deposition systems. Guy studied physics at the Cavendish Laboratory, Cambridge, UK before embarking on a career in the world of inkjet and microfluidics. In the course of the past 30 years Guy has created technology in piezo, electrostatic and continuous inkjet. At Archipelago Technology, he is driving the development and applications of the Powerdrop print platform.



**Dr. Armin Modlinger (Litarion)** graduated in Chemistry at the University of Bayreuth in 2000, followed by a doctoral degree in 2004 at the TU Munich. After a Postdoctoral fellowship at the University of Bristol he started his career at Evonik Industries in 2006, working at different positions in R&D departments associated with Lithium-Ion Technology. In 2013 he became head of process technology at Litarion GmbH with responsibility for the process chain of electrode and separator production for large format lithium ion cells. Since 2017 he is responsible for Product and Process Development at Litarion GmbH.



**Dr. Andreas Huth (VWVM-Forschungsgesellschaft)** finished his diploma in Mechanical Engineering and Business Administration at Technical University of Braunschweig in 2003. From 2004-2007 he participated in the PhD program at Volkswagen Group Research and received his PhD in Physical Chemistry at the Leibniz University of Hannover in the research group of Prof. Caro in 2007. From 2007-2009, he was scientific member in the research group for high temperature fuel cells at Volkswagen Group Research. Since 2010, Dr. Huth is Participant in the Joint Venture of Volkswagen and Varta Microbattery (VWVM), with responsibility for prototyping and upscaling of recipes, coatings and manufacturing processes for single cell formats in hard case and pouch cell housings.



**Dipl.-Ing. Ralf Diehm (KIT)** graduated in Process Engineering at KIT in 2014, majoring in Thermal Process Engineering and Chemical Energy Sources. Already during his studies he started to specialize on thin film coatings of organic electronics in his student research project and of lithium-ion battery electrodes in his diploma thesis. Since 2014 he is working as research assistant at the KIT/TFT group, focussing on stability and mechanism of slot die coating and in particular of intermittent coating to provide a fundamental understanding of the process and its limitations. In 2015 he was awarded with the first prize of the KIT "Neuland" award for his innovations in high speed intermittent slot die coating.



**Dr.-Ing. Philip Scharfer (KIT)** is head of the TFT group at KIT together with Prof. Schabel. He received his PhD in process engineering from the University of Karlsruhe (TH) in 2009. Dr. Scharfer is an expert in the fields of drying and thermodynamics of thin films. He deals with measuring methods for the investigation of polymer film drying and develops numerical simulation tools for industrial dryer applications. Since 2009, Dr. Scharfer is member of the scientific committee of the European Coating Symposium (ECS), since 2012 member of the Board of Directors of the International Society of Coating Science and Technology (ISCST). In 2014, he was awarded with the L. E. Scriven Young Investigator Award by the ISCST.