

# 13<sup>th</sup> European Coating Symposium

Advances in Coating, Printing and Drying of Thin Films, Smart Coatings and Materials

September 8-11, 2019

Marriott Hotel  
Vangerowstraße 16  
69115 Heidelberg  
Germany



## Conference Program

### Schedule 08.09.2019

18:00 Registration and get together at Marriott hotelbar

### Schedule 09.09.2019 – 1<sup>st</sup> Conference Day

8:30 Registration

9:00 Opening and Welcome Address by W. Schabel (ECS 2019 Chair & Vice President of ECS) and P. Schweizer (President of ECS)

#### Invited Talks - 1 (Chairs: Schabel, Scharfer)

9:30 Coating research for mass production technologies of next-gen electronics  
*J. Nam, K. H. Ahn; Seoul National University*

10:00 Stratification in Drying Coatings  
*C. Rees-Zimmermann, A. Routh; University of Cambridge*

10:30 Coffee break

#### Plenary Talks - 1 (Chairs: Benkreira, Schabel)

11:00 T-02 Thin liquid film formation on hemispherical and conical substrate  
*P. H. Gaskell, M. Scholle, F. Marnier, A. Morris; Durham University*

11:25 T-05 Dynamics of unstable dewetting at soft solid interfaces  
*M. Chudak, A. A. Darhuber; Eindhoven University of Technology*

11:50 T-07 Aerosol Jet Printing of Regenerated Silk Fibroin Solutions  
*Y. Xiao, K. Kalaitzidou, D. Yao, W. H. Yeo, T. A. L. Harris; Georgia Institute of Technology*

12:15 T-12 Statics and dynamics of contact lines on a deformable coating  
*M. Zhao, R. Masurel, I. Ionescu, T. Narita, F. Lequeux, J. Dervaux, M. Roché, L. Limat; Université Paris Diderot*

12:40 Lunch break

#### Session A - 1 (Chairs: Buchlin, Durst)

14:00 T-19 Transient rheological response of co-solvent dilute suspensions  
*T. Kai, M. Yamamura; Kyushu Institute of Technology*

14:20 T-16 A potential based field description for gravity-driven film flow over piece-wise planar topography  
*M. Scholle, F. Marnier, P. H. Gaskell; Heilbronn University*

14:40 T-33 Validation of high and low fidelity CFD simulations of the jet wiping process  
*D. Barreiro Villaverde, A. Gosset, M. A. Mendez, J.-M. Buchlin; University of A Coruña*

15:00 T-34 Breakdown of a thin film in rivulets: Approach with a shallow water solver  
*A. Gosset, D. Barreiro Villaverde; University of A Coruña*

#### Session B - 1 (Chairs: Darhuber, Mages-Sauter)

T-13 Contact line advancing on a cold substrate: arrest condition and stick-slip behaviour  
*R. Herbaut, P. Brunet, J. Dervaux, L. Limat, L. Royon; Université Paris Diderot*

T-46 Superhydrophobic coating based on phase-change material and its application in thermal management  
*S. Naderizadeh, J. A. Heredia-Guerrero, G. Caputo, S. Graselli, A. Malchiodi, A. Athanassiou, I. S. Bayer; Istituto Italiano di Tecnologia*

T-42 Controlling grain size and growth direction of single-crystal perovskite by coalescing anti-solvent droplets  
*S.-Y. Peng, Y.-C. Liao; National Taiwan University*

T-29 Experimental Investigations on Phase Equilibria and Diffusion Kinetics of Nanolayers for Printed Electronics  
*T. Böhnhorst, S. Ternes, P. Scharfer, W. Schabel; Karlsruhe Institute of Technology*

15:20 Coffee break

15:50 Poster presentations

17:15 Postersession, Exhibitor presentation & Live music

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## Schedule 10.09.2019 - 2<sup>nd</sup> Conference Day

9:00	Welcome Address by T. Hirth, Vice President of Karlsruhe Institute of Technology	
	Invited Talks - 2 (Chairs: Schabel, Scharfer)	
9:10	Two-Photon Polymerization - a key enabling technology: From maskless lithography to 3D printing <i>M. Hermatschweiler; Nanoscribe GmbH</i>	
9:40	Adhesion Science for Coaters <i>S. Abbott; TCNF Ltd</i>	
10:10	Coffee break	
	Plenary Talks - 2 (Chairs: Scharfer, Schweizer)	
10:40	T-11 Methods for Local Property Investigations of Liquid Curtain Flows <i>A. Kutz, Ü. Acikel, D. Eggerath, A. Al-Zoubi, J. Domnick, T. Hellmuth, F. Durst; FMP Technology GmbH</i>	
11:05	T-09 Slot die coating of nanographite/nanocellulose-based electrodes for metal-free supercapacitors <i>M. Toivakka, R. Koppolu, N. Blomquist, C. Dahlström; Åbo Akademi University</i>	
11:30	T-10 Advantages and Limitations of Structured Coatings of Lithium-ion Battery Electrodes <i>R. Diehm, J. Kumberg, P. Scharfer, W. Schabel; Karlsruhe Institute of Technology</i>	
11:55	T-35 Integral Boundary Layer Simulations of the Jet Wiping Process <i>M. A. Mendez, A. Gosset, B. Scheid, J.-M. Buchlin; von Karman Institute for Fluid Dynamics</i>	
12:20	Lunch break & Posteraward	
	Session A - 2/1 (Chairs: Kleine Jäger, Routh)	Session B - 2/1 (Chairs: Wang, Yamamura)
13:40	Marangoni-induced flow fields in drying films and printed structures measured with $\mu$ PTV T-24 <i>M. Tönsmann, P. Scharfer, W. Schabel; Karlsruhe Institute of Technology</i>	Latest industrial developments in the field of impingement free drying systems T-48 <i>D. Eggerath; FMP Technology GmbH</i>
14:00	Modelling gravity-driven film flow on inclined, periodically corrugated, uniformly heated substrate T-36 <i>G. Daly, P. H. Gaskell, S. Veremieiev; Durham University</i>	Improving Coating Performance with Graphene Nano-Platelets T-18 <i>W. Weaver, L. Chikoshia, P. Grimoldby, M. Sharp; Applied Graphene Materials Ltd</i>
14:20	Development of an Extrusion-Based Coating Process for High-Energy Li-Ion Batteries T-17 <i>J. Seeba, S. Reuber, M. Wolter, A. Michaelis; Fraunhofer IKTS</i>	Drying of polymer particle composites T-28 <i>V. Gracia, P. Scharfer, W. Schabel; Karlsruhe Institute of Technology</i>
14:40	Water mass transport in the post-drying process of lithium ion batteries T-31 <i>J. Eser, T. Wirsching, P. Scharfer, W. Schabel; Karlsruhe Institute of Technology</i>	Drying dynamics of colloidal dispersion during film formation: A lattice Boltzmann Study T-22 <i>B. Chun, T. Yoo, H. Wo. Jung; Korea University</i>
15:00	Coffee break	
	Session A - 2/2 (Chairs: Gugler, Toivakka)	Session B - 2/2 (Chairs: Döll, Müller)
15:30	Development of a screw extrusion-based 3D printer and its biomedical / microfluidic applications T-43 <i>J.-W. Tseng, Y.-W. Tsao, P.-H. Tsai, H.-N. Chiu, M.-C. Hsieh, J. Belkner, T. Bremicker, T.-J. Sun, B. H. Liu, C.-L. Chin, K.-L. Cheng, A.-B. Wang; National Taiwan University</i>	Processing of Thick Electrodes for Li-Ion Batteries with increased Microstructure Homogeneity T-26 <i>J. Kumberg, R. Diehm, P. Scharfer, W. Schabel; Karlsruhe Institute of Technology</i>
15:50	Selective inkjet coating of Printed Circuit Boards with paraffin wax T-41 <i>J. Renner, R. von Arx, M. Soutrenon, G. Gugler, F. Bircher; iPrint, University of Applied Sciences of Western Switzerland</i>	Spanwise Pattern Formation in Blade Coating T-23 <i>O. Kim, K. Ahn, J. Nam; Seoul National University</i>
16:10	Formation of satellite droplets during dip-coating of partially-wettable surface protrusions on hydrophobic substrates T-45 <i>M. v. Gestel, B. He, A. A. Darhuber; Eindhoven University of Technology</i>	Modelling compound redistribution due to droplet evaporation on a thin film T-25 <i>T. W. G. van der Heijden, A. A. Darhuber, P. van der Schoot; Eindhoven University of Technology</i>
16:30	Simulation of Reactive Droplets in Porous Medium T-40 <i>T.-Y. Cheng, J.-X. Wu, P. Doshi, Y.-C. Liao; National Taiwan University</i>	Experimental and theoretical investigation of the interdiffusion behavior in polymer-multilayers T-27 <i>L. Merklein, S. Raupp, P. Scharfer, W. Schabel; Karlsruhe Institute of Technology</i>
16:50	Break	
18:00	Boat tour & Barbecue	

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## Schedule 11.09.2019 - 3<sup>rd</sup> Conference Day

### Session A - 3 (Chairs: Gaskell, Seveno)

- 9:00 Low-temperature curing application using dual-curable  
T-20 clearcoats with radical and urethane reactions  
K. I. Jung, D. G. Lee, S. B. Jeong, Y. I. Park, S. M. Noh, H. W. Jung;  
*Korea University*
- 9:20 Effect of polycarbonate diol with hindered urea on tunable  
T-21 scratch-healing properties in polyurethane-based clearcoat  
systems  
D. G. Lee, J. C. Kim, S. M. Noh, H. W. Jung; *Korea University*
- 9:40 Analysis of inlet flow rate oscillations inside a coating  
T-37 die manifold  
H. Jung, J. Nam;  
*Seoul National University*
- 10:00 Rivulet Flow Down an Inclined Permeable Membrane  
T-32 A. Alshaihi, M. Grinfeld, S. K. Wilson;  
*University of Strathclyde*
- 10:20 Film processing challenges of electro-chromic coatings  
T-15 M. Schmitt, C. Mages-Sauter, F. Kleine Jäger;  
*BASF SE*

### Session B - 3 (Chairs: Limat, Pauchard)

- T-30 Perovskite Thin-Film Photovoltaics – Understanding and controlling the drying process in large-scale solution processing  
S. Ternes, T. Böhrhorst, J. A. Schwenzer, I. M. Hossain, U. Paetzold, B. Richards, P. Scharfer, W. Schabel; *Karlsruhe Institute of Technology*
- T-14 Latest developments in curtain coating  
H. Döll; *TSE Troller AG*
- T-39 Concentrated solar power spectrally selective absorber coatings: synthesis and characterization of new materials  
L. Noč, A. Kocjan, P. Gregorčič, I. Jerman;  
*National Institute of Chemistry Slovenia*
- T-47 Functional Properties Study of Polyurethane/Organoclay nanocomposite for coil coating application  
S. Sarma, M. Song, P. Barker, A. Smith;  
*Tata Steel Europe*
- Curtain Coating Technology  
T-44 M. Miller; *AIMCAL, Coating Tech Slot Dies, LLC*

10:40 Coffee break

### Plenary Talks - 3 (Chairs: Buchlin, Mendez)

- 11:10 T-08 Printing on textile: a wetting view  
Q. Si, J. Wang, Y. Zhang, C. Fuentes, Z. Dongxing, J. De Coninck, A. W. Van Vuure, D. Seveno; *KU Leuven*
- 11:35 T-01 Film Transfer in Reverse Roll Coating: Film Thickness and Stability Window  
H. Benkreira, Y. Shibata, K. Ito; *University of Bradford*
- 12:00 T-04 Crack patterns in drying films: Laboratory models to study paintings  
F. Giorgiutti-Dauphiné, D. McLroy, L. Pauchard; *University of Paris-Saclay*
- 12:25 T-03 Structure formation due to phase separation in polymer nanocomposite thin films during solution casting  
N. Kobayashi, S. Yagawa, M. Kubo, E. Shoji, T. Tsukada, T. Adschiri; *Tohoku University*

12:50 Closing Remarks & Announcement of ECS 2021 by

P. Schweizer (President of ECS), W. Schabel and P. Scharfer (ECS 2019 Chairs)

13:00 Lunch

15:20 Post conference tour:

Guided tour through Heidelberg city & old town