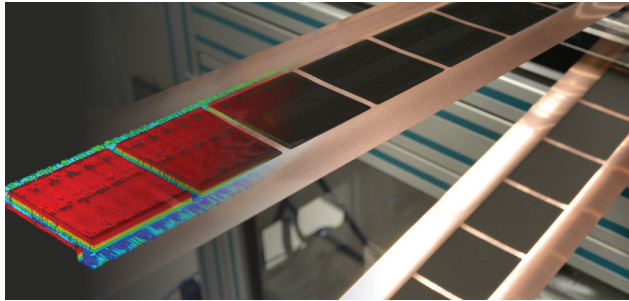


15th Short Course (in person) Coating and Drying of Thin Films

3(+2)-day short course on fundamentals and applications with practical workshop in the coating and printing lab (in person)



8th Thin Film Technology Forum (virtual) Advances in Processing of Functional Films, Electrodes for Battery, Fuel Cell & Electrolyzer Applications

2-day virtual forum on June 6-7, where renowned scientists will present and discuss recent research results and new trends in industry and academia



June 3-5, 2024

Fortbildungszentrum (FTU)
Hermann-von-Helmholtz-Platz 1
76344 Eggenstein-Leopoldshafen

June 6-7, 2024

Virtual Thin Film Technology Forum

Organization Team:

Prof. Dr.-Ing. Dr. h. c. Wilhelm Schabel
Dr.-Ing. Philip Scharfer
with 32 experts from industry and academia

Program Short Course and Forum

42 contributions / 34 speakers

Schedule 03.06.2024 – Short Course Monday

- 08:30 *Registration and check-in*
- 09:00 *Welcome and group introduction*
Prof. Dr.-Ing. W. Schabel / Dr.-Ing. P. Scharfer (KIT-TFT)
- 09:45 *Rheology of coating fluids*
Prof. Dr. Norbert Willenbacher (KIT-MVM)
- 10:45 *Coffee break*
- 11:15 *Coating and printing fluids characterization*
Prof. Gilbert Gugler (iPrint, CH)
- 12:30 *Lunch break*
- 13:30 *Ink preparation for catalyst layer coatings for hydrogen applications*
Dr.-Ing. Benjamin Schmidt-Hansberg (BASF SE)
- 14:15 *Fluid flow in coating tools*
Prof. Dr. Dr. h. c. mult. Franz Durst (FAU Erlangen, em.)
- 15:15 *Coffee break*
- 15:45 *Special issues on curtain and slot coating*
Dr. Peter Schweizer (Schweizer Coating Consulting, CH)
- 19:30 *Social dinner at Enchilada Karlsruhe (Waldstr. 63, KA City)*

Schedule 04.06.2024 – Short Course Tuesday

- 09:00 *Stability of coating flows in two-layer slot dies*
Alexander Hoffmann M. Sc. (KIT-TFT)
- 09:20 *Industrial perspectives on curtain & slot die coating*
Dipl.-Ing. Harald Döll (TSE, CH)
- 09:50 *Knife and blade coating*
Prof. Dr. Hadj Benkreira (University of Bradford, UK)
- 10:30 *Coffee break*
- 11:00 *Gravure and roll coating*
Prof. Dr. Hadj Benkreira (University of Bradford, UK)
- 11:40 *Fundamentals of film drying technology I + II*
Prof. Dr.-Ing. Wilhelm Schabel (KIT-TFT)
- 13:00 *Lunch break*
- 14:00 *Film drying phenomena and drying studies*
Prof. Dr.-Ing. Wilhelm Schabel (KIT-TFT)
- 15:40 *Coffee break*
- 16:10 *Drying of multicomponent mixtures*
Dr.-Ing. Philip Scharfer (KIT-TFT)
- 16:30 *Drying and cracking of particulate coatings*
Prof. Dr. Alex Routh (University of Cambridge, UK)

Schedule 05.06.2024 – Short Course Wednesday

- 08:30 *Sorption equilibrium in polymeric and porous films*
Nadine Zimmerer M. Sc. / Philipp Barbig M. Sc. (KIT-TFT)
- 08:55 *Simulation and design of industrial thin film dryers*
Dr.-Ing. Philip Scharfer (KIT-TFT)
- 10:15 *Coffee break*
- 10:45 *Homogeneous drying with comb nozzles*
Dipl.-Ing. Philipp Cavadini (CN Drying Technology GmbH)
- 11:10 *Coating of thin films in industrial environment*
Dr. Robert Beer (Polytype Converting AG, CH)
- 11:40 *Coating, drying and web handling apps*
Prof. Dr. Steven Abbott (TCNF, UK)
- 13:00 *Group formation and lunch break*
- 14:00 *Walking to workshop building 717*
- 14:30 *Experimental workshop at the TFT coating and printing laboratory*
 - Rheology & wetting
 - Pilot-scale coating trials
 - Heat and mass transfer coefficients
 - Experimental drying curves
- 16:30 *Walking back to FTU*

Schedule 06.06.2024 – Virtual TFT Forum Thursday

- 09:15 *Welcome and introduction to KIT*
Prof. h.c. Dr. Joachim Knebel (KIT)
(Head of KIT Division III)
- 09:30 *Welcome and introduction to TFT-Forum*
15 years TFT anniversary
Prof. Dr.-Ing. W. Schabel / Dr.-Ing. P. Scharfer (KIT-TFT)
- 10:00 *Production of Li-ion battery cells*
Dr.-Ing. Jana Kumberg (Leclanché SA)
- 10:30 *Coffee break*
- 11:00 *Mixing and vice versa*
Prof. Dr.-Ing. habil. Hermann Nirschl (KIT-MVM)
- 11:30 *High-speed & intermittend battery electrode coatings*
Alexander Hoffmann M. Sc. (KIT-TFT)
- 12:00 *Process innovations for a sustainable battery cell production*
Prof. Dr.-Ing. Arno Kwade (Director iPAT, TU Braunschweig)
- 12:30 *Lunch break*
- 13:30 *High Power Li-ion battery cells from Varta*
Rainer Hald (CTO VARTA AG)
- 14:00 *Challenges for Gigafactory production*
Dr. Christoph Weber (Automotive Cells Company SE)

- 14:30** *New methods for optimized inline monitoring of the drying process of battery electrodes*
Jonas Mohacsi M. Sc. (KIT-TFT)
- 14:50** *Coffee break*
- 15:10** *Laser- & IR-based drying of battery electrodes*
Julian Borho M. Sc. (KIT-TFT)
- 15:30** *Sodium-ion (SIB) and Li-ion battery electrodes*
David Burger M. Sc. (KIT-TFT)
- 15:50** *Moisture management / post-drying in LIB production*
Thilo Heckmann M. Sc. (KIT-TFT)
- 16:10** *Drying of concentrated granule-based systems for battery applications*
Kevin Ly M. Sc. (KIT-TFT)

Schedule 07.06.2024 – Virtual TFT Forum Friday

- 08:30** *From manufacture to series production - Production research for PEM fuel cells*
Prof. Dr. Markus Hölzle (Director ZSW)
- 09:00** *Coating and printing of catalyst layers for fabrication of PEM fuel cells*
Dr. Zohreh Kiaee (Fraunhofer ISE)
- 09:30** *Processing of catalyst coated membranes for fuel cell applications*
Philipp Quarz M. Sc. (KIT-TFT)
- 09:50** *Advances in drying of catalyst layers for PEM water electrolysis*
Nadine Zimmerer M. Sc. (KIT-TFT)
- 10:10** *Coffee break*
- 10:30** *A research factory for battery cell production*
Prof. Dr. Jens Tübke (KIT-MVM, Director FFB)
- 11:00** *Recycling of battery electrodes and electrolytes*
Lukas Lödige M. Sc. (KIT-TFT)
- 11:30** *Advanced battery recycling by continuous drying and sorting*
Dr.-Ing. Mathias Trojosky (Allgaier Process Technology)
- 12:00** *Multilayer coating films in chemical industry*
Prof. Dr.-Ing. Frank Kleine Jäger (BASF SE)
- 12:30** *TFT Forum closing session*

Registration fees Short Course and TFT Forum

	Early Bird (until 15.04.24)	later
Short Course & TFT Forum*	€ 1950.– + legal tax	€ 2150.– + legal tax
General	€ 1950.– + legal tax	€ 2150.– + legal tax

Information, Registration and Contact

Organizer:
KIT Campus Transfer GmbH
Haid-und-Neu-Straße 7
76131 Karlsruhe

Registration Short Course and TFT Forum*
register@course-forum.de
info@course-forum.de

Note: The Short Course registration includes the registration to the TFT Forum.

Registration online via: <http://www.course-forum.de>

*Only the virtual TFT Forum can be participated for a reduced fee of 250 Euro.

For academia, students, university participants a contingent for "special reduced fees" for the virtual TFT Forum are as well available. Please contact margit.morvay@kit-ct.de for further details and registration to "TFT Forum" only.

Venue

The Short Course will take place in person.
Fortbildungszentrum für Technik und Umwelt (FTU)
KIT - Campus Nord - Gebäude 101
Hermann-von-Helmholtz-Platz 1
76344 Eggenstein-Leopoldshafen

The TFT Forum will take place in a virtual format. After registration, all "login details" of the virtual venue provider for the TFT Forum will be provided via email as soon as available.

Who has been attending last Short Course

Participants from Germany and **more than 12 EU countries, the US, China, Korea, Taiwan, Japan and others (80 % from industry / average value of the last 12 years)**

Further information and registration

<http://www.course-forum.de>



Feedback about the last Short Courses

- "Excellent introduction in coating and drying of films. Demonstrates the complexity, offers better understanding of processes"
- "Very interesting course, lots of information on all coating application! Building bridge from university to industrial applications"
- "Well built-up structure, wide range of theory and application covered, too short time for discussion/break"
- "High level talks with broad range of topics but with good scientific and practical depth, also on application"
- "Hat extrem viel Spaß gemacht! Herzlichen Dank! Theorie und Praxis waren wunderbar abgedeckt"
- "Ich war sehr angetan von den lebhaft präsentierten und informativen Vorträge!"
- "Sehr viele nutzbare Infos"
- "Great and practical"
- "Very good, excellent speakers and good dinner"
- "Excellent foundation and application"

Feedback workshop

- "Good to see how the theory of the courses works in real life"
- "Experiments were very well prepared and perfectly organized"
- "Interesting, well organized"
- "Good coverage of application of topics covered in course"
- "Interesting material analysis; nice discussions"

Feedback TFT Forum

- "Broad topics --> nice"
- "Good to see more application topics after the short-course"
- "Good content"
- "Very good selection of topics; all very good speakers"
- "The TFT Forum 2023 was an excellent overview and provided appropriate depth for the topics covered"
- "Conference content very good, good electronic presentation and definitely worthy of repetition"

For further information please follow us on:

www.course-forum.de | www.tft.kit.edu/745.php and

LinkedIn: <https://www.linkedin.com/company/thin-film-technology/>

Introduction

The short course **Coating and Drying of Thin Films** addresses engineers, scientists and technicians working in the areas of coatings, functional films, direct printing, inkjet printing, sensors, adhesives, paints, automotive coatings, patches, optical foils, tapes, diagnostics, membranes, printed electronics, fuel cells, electrolyzers and battery coatings, who intend to get insight into more fundamental aspects with industrial applications or to deepen their expertise. Leading national and international scientists and experts from academia and industry will report on topics of coating technologies, rheology, preparation of coating fluids and about fundamentals and industrial aspects of drying technology. Coating and printing processes and drying technology are explained interactively by easily accessible examples and in a **practical workshop in the TFT Coating and Printing Lab**.

The **8th Thin Film Technology Forum** will take place **virtually** on the last two days, where renowned scientists will present and discuss new trends in industry and academia with a focus on **advances in processing of functional films, electrodes for battery, fuel cell and electrolyzer applications**.

The Short Course and the TFT Forum provide a platform for scientific and technical exchange with advanced learning.



Prof. Dr.-Ing. Dr. h. c. Wilhelm Schabel (KIT) studied process engineering and is professor for Thin Film Technology at KIT. His doctoral thesis in the field of film drying was awarded with the Carl Freudenberg Prize by University of Karlsruhe in 2005. In 2007 he received the Arnold-Eucken Award (VDI) and in 2008 the Scriven Young Investigator Award from the International Society of Coating Science (ISCST). In 2007 he started in industry at Lonza Foils (LOFO/TAC Bright) in Basel/Taiwan in the R&D department for film casting and coating applications. In 2009 he was appointed to the first professorship for Thin Film Technology at KIT, initially funded by the KIT Elite Future Concept and a consortium of BASF, BAYER, and ROCHE with 3 million euros. Since 2007 and 2017, Schabel is a member of the Board of Directors of the International Society of Coating Science & Technology and the European Coating Society. In 2021 he was honored by the University of Cambridge as an "EDWARDS FELLOW" for research visits in Cambridge. In 2022, the International Drying Symposium (IDS) community honored Schabel with the "EXCELLENCE IN DRYING AWARD" in recognition of his individual lifetime achievements in drying research. In 2023, he was elected by his European colleagues as the new President of the European Coating Society (ECS) for the next term.



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. Dr. Scharfer is former Vice President Europe of the ISCST and organized ECS 2009 (Karlsruhe) and ECS 2019 (Heidelberg) as Chairman together with Prof. Schabel.



Dr. Peter M. Schweizer (Schweizer Coating Consulting, CH) received his PhD in Mechanical Engineering from the Swiss Federal Institute of Technology in 1979, and he did postdoctoral research in coating flows at the University of Minnesota with Prof. Scriven from 1979 – 1980. From 1981 – 1986, Dr. Schweizer worked in the Coating Flow Research Group at Kodak in Rochester, New York, and from 1987 – 1996, he worked at ILFORD in Fribourg, Switzerland. From 1997 – 2000, Dr. Schweizer was Managing Director of TSE Troller Schweizer Engineering in Switzerland. From 2001 – 2016, he worked for Polytype Converting in Fribourg, Switzerland. Since 2016, he is heading his own company called Schweizer Coating Consulting GmbH. In 1997, Dr. Schweizer co-edited the book entitled Liquid Film Coating, and in 2022, he published the book entitled Premetered Coating Methods. In 2006, he received the John Talmadge Award from International Society of Coating Science and Technology, and from 2018 - 2023 he acted as President of the European Coating Society (ECS).



Prof. Dr. Norbert Willenbacher (KIT) is head of the Institute of Mechanical Process Engineering and Mechanics at Karlsruhe Institute of Technology (KIT) since 2004. He received his diploma degree in Physics and his PhD from the University of Mainz. After his dissertation at the Max-Planck-Institute for Polymer Research he joined BASF SE as a research associate in the fields of rheology of complex fluids and adhesion of soft polymers for 15 years. Prof. Willenbacher is member of the advisory board of the German Society of Rheology, assigned member of the ProcessNet Technical Committee on Rheology, and member of the Editorial Board of Rheologica Acta, Materials and Electronic Materials.



Prof. Gilbert Gugler (iPrint, CH) received his diploma in Material Science from the ETH Zurich in 1992. From 1992 to 1998 he worked in the area of chemical and physical vapour deposition. From 1998 on, he worked at Ilford Imaging Switzerland GmbH. Leading the Technology Center of Wifag-Polytype Technologies AG since 2014 he was responsible for all coating and process related topics. End of 2016 he joined the university of applied science and arts of Western Switzerland. Since 2020 he is one of the director of iPrint institute and competence center. Gilbert Gugler was elected Vice President of the European Coating Society (ECS) in 2023. Gilbert Gugler is an expert in multilayer curtain coating technology, starting from the preparation of coating fluids, characterization, processing, to the multilayer curtain coating and drying. Since 2017, he is heading his own company called Gugler Coatech Consulting.



Prof. Dr. Hadj Benkreira (Univ. of Bradford, UK) (CEng, FIChemE, FHEA) obtained his PhD on the Fluid Mechanics of Coating Flows in 1980 under the supervision of Professor WL Wilkinson (CBE, FRS). Following five years of EPSRC postdoctoral research, he joined the academic staff of the University of Bradford in 1985 and was endowed a Personal Research Chair in 1998 for research in Thin Film Coating and in Polymer Processing and became in 2004-2009 Associate Dean for Research. Professor Benkreira is member of several learned societies including the UK EPSRC Peer Review College, the International Society of Coating Science and Technology (ISCST) of which he was the Vice President in 2006-8 and the European Coating Society (ECS), of which he is the current Vice President and member of its steering committee. He has published widely on coating science and technology and is the editor of the Special Issues of the ISCST conferences and a member of the editorial board of the Journal of Coating Research and Technology and Research (JCTR) and the journal Coatings.



Dipl.-Ing. Harald Döll (TSE Troller AG, CH) successfully graduated from the Technical University in Darmstadt in Mechanical Engineering in 1989. After some years in web-guiding systems Harald Doell joined TSE Troller AG in 1997. In the beginning, he was the head of the engineering team; since 2008, he is in charge of the entire application technology. Design of die internals, experiments with customers, start-ups and technical customer support are part of his assignment. Furthermore, he is giving talks at several short courses and international conferences in the US, Europe and Asia.



Dr.-Ing. Benjamin Schmidt-Hansberg (BASF SE) is a principal scientist for Coating and Film Processing at BASF. His work mainly relates to materials science, processing and manufacturing of novel thin film products in the field of lithium-ion batteries, electrolysis, fuel cells, composites and packaging materials. He holds a PhD in Chemical Engineering (Karlsruhe Institute of Technology) and worked at the University of Cambridge and the start-up Eight19 on the commercialization of organic photovoltaics before joining BASF.



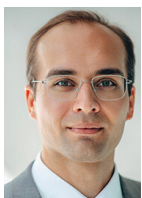
Prof. Dr. Dr. h. c. mult. Franz Durst (FAU Erlangen, em.) graduated from Imperial College at the London University and received his doctor's degree in 1972 (PhD). In 1972, he returned to Germany and worked as project leader of various research projects at the Collaborative Research Center 80 at the University of Karlsruhe for ten years. Prof. Durst was offered a C3 professorship for Fluid Mechanics at the University of Karlsruhe in 1978 and was appointed chair of the Institute of Fluid Mechanics at the University of Erlangen-Nuremberg in 1982. In 2006, Prof. Durst retired from the University of Erlangen-Nuremberg and founded the company FMP TECHNOLOGY GMBH, whose CEO he has been until 13 August 2018. He is now still one of the three shareholders of the company.



Prof. Dr. Alex Routh (University of Cambridge, UK) received his PhD from Princeton University in the United States in 2000. He has been lecturing in Chemical Engineering at the University of Cambridge since 2006 and was promoted to full professor in 2017. His position is a joint appointment with the Institute for Energy and Environmental Flows; a multi-disciplinary research institute, within the university, spanning the physical sciences. His research is in the field of colloid science and Prof Routh has worked in the areas of encapsulation, dispersion stability, formulation and drying. Within the film drying topic, Prof. Routh has been active for the past 20 years and has published extensively in the specifics of film cracking and the flows within thin films.



Dr. Robert Beer (Polytype Converting AG, CH) completed his PhD in Physical Chemistry in 1988 at the University of Berne. After a postdoctoral stay at the Loughborough University of Technology he returned to the University of Berne continuing the studies in photophysics and photochemistry as scientific assistant. From 1992 to 2014, he was working at Ilford Imaging GmbH in Switzerland, starting in R&D. From 2006, he moved to the process technology department, engaging himself in the curtain coating technology and production scale-up. After 2014, Robert Beer increased his competence in coating technology at Polytype Converting AG. Since 2016, he is co-heading the Technical Center, leading the customer trials on the pilot machines, and advises on the coating and process-related topics.



Dipl.-Ing. Philipp Cavadini (CN Drying Technology GmbH) graduated in Aerospace Engineering at the University of Stuttgart. In his PhD studies at KIT/TFT until 2015 he investigated surface tension driven convection and the optimisation of impinging jet systems from the viewpoint of homogeneity of the distribution of the heat and mass transfer coefficient. Currently Mr. Cavadini acts as program lead with focus on advanced cooling technologies in the department of "Aero-Thermal and Tools" at Siemens Energy. In secondary employment, he is working on the spin-off creation "CN Drying Technology GmbH", developing highly homogeneous comb nozzle dryers for lab application.



Prof. Dr. Steven Abbott (TCNF, UK) has received his Oxford PhD in Chemistry from Harvard University in 1978 and was postdoc in the Nobel Prize winning lab of Prof. J.-M. Lehn in Strasbourg before working for ICI where he was Senior Manager before joining the high-tech coating company Autotype near Oxford as Research Director. He worked closely with coating experts at U. Leeds (appointed Visiting Professor in 2000) and co-created the TopCoat and TopWeb programs for the coating industry. At Autotype he also worked with U Leeds colleagues on the theory of screen printing, transforming an ill-defined art into a science.

Speakers at the 8th TFT Forum on June 6-7



Dr.-Ing. Jana Kumberg (Leclanché SA) graduated in Process Engineering at KIT in 2015. During her studies, she started to focus on processing of thin films, investigating thermal treatment of polymer solar cells and specializing on drying technology. During her PhD at the KIT/TFT group, she investigated the drying behavior of lithium-ion battery electrodes. After completing her PhD in 2021, she joined the Center for Electrochemical Energy Storage Ulm & Karlsruhe (CELEST) and worked on the next version of the Battery 2030+ roadmap at the European level. Today, she leads Leclanché's German cell R&D team in Willstätt, where she started in 2022. Together with her team, she is developing Leclanché's latest cell chemistries from the laboratory to the production scale.



Prof. Dr.-Ing. habil. Hermann Nirschl (KIT) received his PhD in Fluid Mechanics from the Technical University of Munich in 1994. For his Habilitation in 1997 he worked on the numerical simulation of the particle laden flows. He joined the 3M company in the dental division as the head of process engineering in the years between 1997 and 2002 where he worked as a project manager for different projects in Munich and St. Paul/Minnesota. Since 2003 he is Professor for Mechanical Process Engineering at KIT in Karlsruhe. The focus of the research is on particle technology with a special emphasis on separation processes, numerical simulations and the development of particle analysis technologies.



Prof. Dr.-Ing. Arno Kwade (TU Braunschweig) worked 9 years as a process engineer in leading industrial positions after finishing his doctorate in 1996. In 2005, he was appointed as Professor and Director of the Institute for Particle Technology (iPAT) at Braunschweig University of Technology. His research focus lies on developing deep knowledge, process-structure-property relationships and numerical simulations for processes in which particles are mechanically stressed and formulated, from milling and mechanochemical synthesis over mixing and powder handling and characterization to production of drug products and battery electrodes. Today he is Chairman of the interdisciplinary research centre Battery LabFactory Braunschweig (BLB) and received awards like the Lower Saxony Science Award and the Hans Rumpf medal.



Rainer Hald (VARTA AG) has been serving as the Chief Technology Officer at VARTA since 2013, since 2022 as a member of the executive board. In this role, he oversees the company's technology strategy and innovation efforts. Prior to this, from 2008 to 2012, he held the position of Head of Application Test Lab, where he was involved in significant research and development projects and contact person for sales and product management. From 2000 to 2008, he served first as Manager of Test Lab, later as Head of Production for lithium-polymer cells, optimizing manufacturing processes. Before joining VARTA AG, he worked as a Development Engineer for Electronics and Software at DSM Messtechnik GmbH from 1997 to 2000 after finishing his studies in Electronics and Technical Informatics at Hochschule Aalen.



Dr. Christoph Weber (ACC SE) joined Automotive Cells Company Deutschland GmbH (ACC) in 2021 as "Director Innovation and Engineering Germany". He currently establishes ACC's Research and Development Department in Kaiserslautern adjacent to the Gigafactory covering product design, process development and production topics. Prior to joining ACC he has been responsible for a new business incubator for lithium-ion battery separators and held various technical functions for battery separators and energy storage devices. He is member of the advisory board of Bundesministerium für Bildung und Forschung BMBF for Battery Research. In 1998, he finished his Ph.D. thesis at the Pennsylvania State University, USA in Materials Science. In 1994 he received his Diplom-Ingenieur Degree in Chemistry from the Technical University in Darmstadt.



Prof. Dr. Markus Hölzle (ZSW) is member of the ZSW Managing Board and Head of the Electrochemical Energy Technologies division in Ulm since October 2020. He also holds a position as Professor for Energy Storage and Energy Conversion within the faculty of natural sciences at University of Ulm. Before joining ZSW, Prof. Dr. Markus Hölzle held several management positions in BASF in the field of chemical catalysts, fuel cells and battery materials. He received his doctorate in electrochemistry from University of Ulm in 1996. Professor Hölzle is chairperson of the Advisory Board for Green Hydrogen at the Ministry of Environment of the State of Baden-Württemberg, member of the board of directors of KLiB (German industry network Lithium ion batteries) as well as appointed member of the battery advisory board at German Ministry of Science and Education (BMBF).



Dr. Ing. Zohreh Kiaee (Fraunhofer ISE) completed her doctoral studies in Material Science and Engineering at Seoul National University in 2017. Following this, she commenced a journey at the Fraunhofer Institute for Solar Energy Systems (ISE) in Freiburg, where she took roles as a scientist and project manager. Her primary focus at Fraunhofer ISE was on the development of coating and printing processes to facilitate the scale-up production of silicon and perovskite solar cells. In 2022, Dr. Kiaee transitioned to the fuel cell production team within the Hydrogen Division. Here, she dedicated her efforts to pioneering the development of catalyst inks tailored for various coating and printing technologies, such as screen printing, slot die coating, inkjet printing. Dr. Kiaee has established a diverse array of ex-situ characterization methods for catalyst inks, enhancing the understanding and optimization of this critical component for PEM fuel cells.



Prof. Dr. Jens Tübke (Fraunhofer FFB & ICT, KIT) is the institute director of the Fraunhofer Research Factory Battery Cell FFB in Münster and head of the department "Applied Electrochemistry" at the Fraunhofer Institute for Chemical Technology ICT in Pfinztal. In 2015, Jens Tübke was appointed to a professorship in "Materials and Processes for Electrochemical Storage" at the KIT. He studied chemistry with the specialization of technical and macromolecular chemistry at the Martin-Luther-University Halle Wittenberg and finished his PhD in 1997 with the topic "Structure-Properties-Relationships of Polymeric Gel Electrolytes for Lithium-Ion Batteries". From 1997-2000 followed an overseas stay at Kyoto University (Japan) in the working group Prof. Zempachi Ogumi and the Toyota Corp. with the aim of developing electrolyte and electrode materials for lithium-ion polymer batteries for hybrid and electric vehicles. Since 2000, he has been working with Fraunhofer Gesellschaft.



Dr. Mathias Trojosky (ALLGAIER Process Technology GmbH) completed his engineering studies and doctoral research at Technische Universität Magdeburg in 1990. Since 2015, he has held the position of Head of Research and Development at ALLGAIER Process Technology GmbH in Uhingen. Prior to this, Trojosky served as the Head of the Drying Technology Division at ALLGAIER from 2005 to 2015 and as the Sales Manager for Dryers & Coolers from 1995 to 2005. Before joining ALLGAIER, he worked as the Sales Manager for Drying Equipment at GEA Wiegand in Karlsruhe from 1991 to 1995.



Prof. Dr.-Ing. Frank Kleine Jäger (BASF SE) is currently Vice President and Head of Solids Formulation and Handling Group at BASF SE in Ludwigshafen. In this role, he manages the global R&D activities in this field of Solids and Film Processing ranging from development of new process technologies and optimization to troubleshooting and debottlenecking in BASF's global production plants. He is Chemical Engineer with Diploma and PhD degrees from RWTH Aachen University, Germany. He also received his Habilitation from RWTH Aachen in 2004. Since 2011 he holds a Professorship as apl. Prof. Dr.-Ing. at RWTH Aachen.

A total of 34 speakers, including 24 external and following PhD students of the TFT group at KIT:



Julian Klemens M. Sc. (KIT-TFT) completed his master's degree in Process Engineering in 2019 at KIT, majoring in Thermal Process Engineering and Chemical Process Engineering. In an internship at BASF SE he gained experience in the processing of various material systems from formulation to coating technologies and drying strategies. During his master thesis at BASF SE he was engaged in the investigation of process parameters on drying behaviour of pastose and ceramic films. Since 2019, he is working as research assistant in the KIT/TFT group, focussing on the processing of lithium-ion and post-lithium battery electrodes.



Thilo Heckmann M. Sc. (KIT-TFT) completed his master's degree in Chemical Process Engineering in 2019 at KIT, majoring in Thermal Process Engineering and Technical Thermodynamics. He conducted his thesis work at the University of Massachusetts, Amherst as part of the Baden-Württemberg exchange program, investigating antibacterial polymer coatings. As of 2019 he is employed as research assistant at the KIT/TFT group. His research focuses on developing physical models to simulate the coating, drying, and post-drying of Li-ion batteries, with emphasis on the post-drying step, addressing the sorption behavior in porous media.



Philipp Quarz M. Sc. (KIT-TFT) graduated in Chemical Process Engineering at KIT in 2019 with a focus on food process engineering and product design. During his studies he specialized in the rheology of particular suspensions and product-oriented processing. In his master thesis he investigated the diffusion behavior in disperse systems via nuclear magnetic resonance (NMR). Since 2019 he is working as a research assistant at KIT/TFT. In his PhD he focuses on the processing of fuel cell membrane electrode assemblies (MEA), especially on the application and optimization of functional layers.



Jonas Mohacsi M. Sc. (KIT-TFT) graduated in Mechanical Engineering at KIT in 2019, majoring in Thermodynamics and Energy Technology. After he had completed his bachelor's degree at the University of Stuttgart in Automotive Engineering in 2016, he was able to gain practical experience during an internship at the Porsche AG. In his master's thesis, he dealt with the research of hydrogen investigating aspects of hydrogen safety. Since 2020 he is working as a research assistant in the KIT/TFT group. Predominately, he investigates the drying behavior of lithium-ion battery electrodes with a focus on the development of new drying systems.



Kevin Ly M. Sc. (KIT-TFT) completed his master's degree in Chemical Process Engineering at the Karlsruhe Institute of Technology (KIT) in 2019, majoring in Thermal Process Engineering and Chemical Process Engineering. In his master's thesis, he investigated the thermal behavior of lithium-ion batteries and developed a method for the validation of a thermal simulation model. Since 2020, he is working as a research assistant in the KIT/TFT group. His research focuses on the investigation of the drying behavior of lithium-ion battery electrodes.



Nadine Zimmerer M. Sc. (KIT-TFT) completed her master's degree in Process Engineering in 2020 at KIT, specializing in Food Process Engineering and Mechanical Process Engineering. During her studies, she got an insight into food drying technologies in her bachelor thesis and then found her way to drying battery anodes for sodium ion batteries in her master thesis. Since 2021, she is working as a research assistant in the KIT/TFT research group. Her research focuses on the processing of functional layers for fuel cells and electrolyzers.



Alexander Hoffmann M. Sc. (KIT-TFT) received his master's degree in chemical engineering at the Karlsruhe Institut of Technology (KIT) in 2021 with a focus on heat and mass transport as well as homogeneous and heterogeneous catalysis. Since the completion of his master thesis on the topic of the development of a CFD-model for slot-die coating of lithium-ion battery electrodes, he is working in the coating team in the TFT-group at KIT. Currently, he is researching in the field of single- and multilayer slot-die coating in terms of process stability, coating quality and die-geometry optimizations.



Lukas Lödige M. Sc. (KIT-TFT) graduated in process engineering at KIT in 2021, majoring in Thermal Process Engineering and Chemical Process Engineering. Topic of his master's thesis was the investigation of heat and mass transfer in liquid metal heat exchangers. Since 2021, he has been working as a research assistant in the KIT/TFT group. His research focuses on the drying behavior of multicomponent mixtures for lithium-ion batteries.

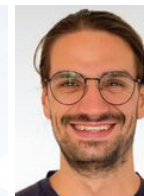
Additional speakers and workshop instructors



David Burger
(since 2022)



Julian Borho
(since 2023)



Philipp Barbig
(since 2023)



Linus Janning
(since 2023)