INVITED SPEAKERS

– Academic Speakers

- **Prof. Dr. Moritz Diehl**
  University of Freiburg, DE
- **Prof. Dr. Hanno Gottschalk**
  TU Berlin, DE
- **Prof. Dr. Fabian Jirasek**
  RPTU Kaiserslautern-Landau, DE
- **Prof. Dr. Maria Papathanasiou**
  Imperial College London, UK
- **Prof. Victor Zavala, Ph.D.**
  University of Wisconsin-Madison, US

– Industrial Speakers

- **Dr. Norbert Asprion**
  BASF SE, Ludwigshafen a. R., DE
- **Dr. Andreas Bamberg**
  Merck Electronics KGaA, Darmstadt, DE
- **Dr. Jürgen Bausa**
  Covestro AG, Leverkusen, DE
- **Dr. Nichola McCann**
  Lonza Group Ltd., Basel, CH
- **Dr. Hugh Stitt**
  Johnson Matthey plc., Billingham, UK

GENERAL INFORMATION

– Entry Fee

Participation is free of charge.
Coffee, refreshments and lunch will be provided during the event.

– Registration

Please register online by
October 9, 2026:
https://s.fhg.de/mmipe-2026

– Contact with Regard to Scientific Program

Prof. Dr. Michael Bortz
Department Optimization – Technical Processes
Fraunhofer Institute for Industrial Mathematics ITWM
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– Contact with Regard to Organization

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– Conference Venue

Fraunhofer Institute for Industrial Mathematics ITWM
Fraunhofer-Platz 1
67663 Kaiserslautern
www.itwm.fraunhofer.de

Directions: www.itwm.fraunhofer.de/contact

LEISTUNGSZENTRUM
SIMULATIONS- UND SOFTWARE-BASIERTE INNOVATION

INTERNATIONAL WORKSHOP

6TH MATHEMATICAL METHODS IN PROCESS ENGINEERING – MODELING, SIMULATION, OPTIMIZATION

October 22 to 23, 2026
Fraunhofer ITWM, Kaiserslautern
Germany

Fraunhofer ITWM

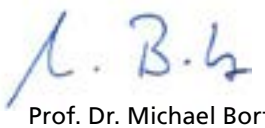
PREFACE

Model-based simulation and optimization is seen as an essential part of unlocking the potential for increased energy and resource efficiency and maintaining high levels of value creation. Mathematical models, algorithms and data science are in the core of this development.

On October 22 to 23, 2026, the Fraunhofer High Performance Center Simulation and Software Based Innovation will organize the international workshop »Mathematical Methods in Process Engineering« with 5 internationally outstanding invited speakers and 10 short contributions from researchers of the center and from industry.

All lectures are invited, and also attendance will require invitation. The number of invited participants is limited to about 80, including selected partners from the process industry.

The workshop will provide a unique opportunity for scientific discussions and personal networking between scientists from academia and industrial practice to reflect and shape the topics of future process engineering.



Prof. Dr. Michael Bortz
Fraunhofer ITWM

PROGRAM – THURSDAY, OCTOBER 22, 2026

13:15	Registration open, lunch snack
13:30	**Opening** Prof. Dr. Michael Bortz, Fraunhofer ITWM
13:45	**KEYNOTE** **How AI Supports Usage of Mathematical Methods in Process Engineering** Dr. Peite Bao, Head of Scientific Modeling, Group Research BASF SE, Ludwigshafen a.R., DE
S1	**SESSION 1: MSO IN PROCESS ENGINEERING I** Session Chair: Prof. Dr. Karl-Heinz Küfer, Fraunhofer ITWM
14:15	**Graph Theory for the Modeling, Simulation, and Optimization of Process Systems** Prof. Victor Zavala, Ph.D., University of Wisconsin-Madison, US
14:55	**Conceptual Design Tools for the Chemical Industry** Dr. Norbert Asprion, BASF SE, Ludwigshafen a. R., DE
15:20	**Advancing Conceptual Process Design Through New and Established Shortcut Techniques** PD Dr. habil. Tobias Seidel, Fraunhofer ITWM, Kaiserslautern, DE
15:45	Coffee break (foyer)
S2	**SESSION 2: BIOPHARMA AND CHEMISTRY** Session Chair: Dr. Dietmar Hietel, Fraunhofer ITWM
16:15	**Biopharma 4.0: How Far Are We?** Prof. Dr. Maria Papathanasiou, Imperial College London, UK
16:55	**Design2Optimize – Accelerating Early Phase Drug Development With Lonza** Dr. Nichola McCann, Lonza Group Ltd., Basel, CH
17:20	**Modeling and Simulation of Heterogeneous Catalysis in Fixed Bed Reactors** Dr. Sebastian Osterroth, Fraunhofer ITWM, Kaiserslautern, DE
19:00	Round table discussions and networking dinner for speakers and interested attendees. Speakers participate automatically; interested participants must register online in advance.

PROGRAM – FRIDAY, OCTOBER 23, 2026

8:30	Arrival and welcome coffee
S3	**SESSION 3: MACHINE LEARNING AND AI** Session Chair: Dr. Dietmar Hietel, Fraunhofer ITWM
8:40	**Generative Design using Invertible Neural Networks and AI generated Simulations** Prof. Dr. Hanno Gottschalk, TU Berlin, DE
9:30	**Machine Learning – An Industrial Practitioner's View: ML Also Stands for Murphy's Law** Dr. Hugh Stitt, Johnson Matthey plc., Billingham, UK
9:55	**Conditional Flow Matching: Using GenAI to Calibrate Models** Prof. Dr. Michael Bortz, Fraunhofer ITWM, Kaiserslautern, DE
10:20	Coffee break (foyer)
S4	**SESSION 4: FLEXIBILITY IN PROCESS DESIGN** Session Chair: Dr. Konrad Steiner, Fraunhofer ITWM
10:50	**Recent Advances in Robust Model Predictive Control for Nonlinear Systems** Prof. Dr. Moritz Diehl, University of Freiburg, DE
11:40	**Application of Modelling and Simulation in Process Engineering at Covestro** Dr.-Ing. Jürgen Bausa, Covestro AG, Leverkusen, DE
12:05	**Monetize Your Flexibilities: Predictive, AI-Based Energy Management** M.Sc. Matthias Klein-Schlößl and Dr. Neele Leithäuser, Fraunhofer ITWM, Kaiserslautern, DE
12:30	Lunch (foyer)
S5	**SESSION 5: MSO IN PROCESS ENGINEERING II** Session Chair: Prof. Dr. Michael Bortz, Fraunhofer ITWM
13:30	**Hybrid Thermodynamic Models – Combining Physical Knowledge and Machine Learning** Prof. Dr. Fabian Jirasek, RPTU Kaiserslautern-Landau, DE
14:20	**Keeping Born – Digital Speed During Technology Transfers** Dr. Andreas Bamberg, Merck Electronics KGaA, Darmstadt, DE
14:45	**Physics-Based Simulations Across Scales for Improving Materials, Design and Operation of Batteries** Dr. Jochen Zausch, Fraunhofer ITWM, Kaiserslautern, DE
15:10	Wrap up
15:30	End of the workshop