ENTRY FEES/REGISTRATION

– Entry fees

- Industry: 690 EUR*
  (VAT is not charged according to § 4 No. 22a UStG)
- Research staff (TU Kaiserslautern, Fraunhofer ITWM): free of charge

*The participation fee includes the entitlement to participate in the event, the conference documents, a certificate of participation as well as catering during the workshop and the networking dinner. Invoicing takes place after the event.

– Registration

Please register online by **August 17, 2018**:
www.leistungszentrum-simulation-software.de/DCI

GENERAL INFORMATIONS

– Contact with regard to scientific program

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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/en/contact

LEISTUNGSZENTRUM
SIMULATIONS- UND SOFTWARE-BASIERTE INNOVATION

INTERNATIONAL WORKSHOP

MATHEMATICAL METHODS IN PROCESS ENGINEERING – DIGITIZATION IN THE CHEMICAL INDUSTRY

Thursday, September 6 to Friday, September 7, 2018
Fraunhofer-Zentrum, Kaiserslautern

PREFACE

Digitization has become a megatrend in industries and societies of many countries around the world. Mathematical models, algorithms and data science are in the core of this development.

In fall 2018, September 6 to September 7, the Fraunhofer High Performance Center Simulation- and Software-based Innovation will organize an international workshop "Mathematical Methods in Process Engineering – digitization in the chemical industry" with 6 internationally outstanding invited speakers and 12 short contributions from researchers of the Center and industry.

All lectures are invited, and also attendance will require invitation.

The number of invited participants is limited to about 80, which will include selected partners from process industry as well. The conference venue will be the Fraunhofer site at Kaiserslautern. The workshop will provide a unique opportunity for scientific discussions and personal networking between scientists from academia and industrial practice to render and to shape the topics to come in future process engineering.

Prof. Dr. Karl-Heinz Küfer
Fraunhofer ITWM

Prof. Dr.-Ing. Hans Hasse
TU Kaiserslautern

PROGRAM

– Thursday, September 6

10:00	Registration open, welcome coffee
10:20	**Welcome** Prof. Dr. Karl-Heinz Küfer, Prof. Dr.-Ing. Hans Hasse
10:30	**Opening keynote** Dr.-Ing. Martin Strohrmann, BASF SE
	SESSION 1 – Session chair: Prof. Dr. Karl-Heinz Küfer
11:00	**Beyond number 42: A Hitchhiker's Guide to Optimization-based Design of Energy Supply Systems** Univ.-Prof. Dr.-Ing. André Bardow, RWTH Aachen (D)
11:50	**Artificial Intelligence in Materials Research - at a Glance** Dr. Hergen Schultze, BASF SE
12:15	**Digitalization and Thermodynamic Modeling** Prof. Dr.-Ing. Hans Hasse, TU Kaiserslautern
12:45	Lunch (foyer)
	SESSION 2 – Session chair: Dr. Michael Bortz
13:30	**Network Flow Problems with Physical Transport** Prof. Dr. Alexander Martin, FAU Erlangen (D)
14:20	**Improving Energy Efficiency of Drinking Water Supply by Multicriteria Optimization** Dr. Dimitri Nowak, Fraunhofer ITWM
14:45	**Production Scheduling: Learning from other Industry Sectors** Dr. Heiner Ackermann, Fraunhofer ITWM
15:10	Coffee break (foyer)
	SESSION 3 – Session chair: Prof. Dr.-Ing. Hans Hasse
15:50	**Advanced Optimization Strategies for the Next Generation of Computer Aided Process Engineering** Prof. Larry Biegler, PhD, Carnegie Mellon, Pittsburgh (USA)
16:40	**Plantwide Modeling and Optimization: Challenges and Industrial Requirements** Dr. Kai Dadhe, Evonik Technology & Infrastructure GmbH
17:05	**Supporting Flowsheet Simulation by Machine Learning** Dr. Michael Bortz, Fraunhofer ITWM
19:00	For speakers and external participants: Round table discussions, networking dinner and software demonstrations

– Friday, September, 7

8:30	Arrival of participants, welcome coffee
	SESSION 4 – Session chair: Dr. Raimund Wegener
8:40	**Recent Developments in Real-time Optimization** Prof. Dominique Bonvin, PhD, EPFL Lausanne (CH)
9:30	**Characteristics of a Digital Twin in Process Engineering** Dr. Andreas Kröner, Linde AG
9:55	**Adjusting Substance Property Data in an Industrial Context** Dr. Johannes Höller, Fraunhofer ITWM
10:20	Coffee break (foyer)
	SESSION 5 – Session chair: Dr. Dietmar Hietel
10:50	**Basics of Reactive Flow in Porous Media** Prof. Majid Hassanizadeh, PhD, Utrecht University (NL)
11:40	**Modeling and Simulation of Protein Transport Processes in Chromatographic Media** Dr. Sebastian Osterroth, Fraunhofer ITWM
12:05	**Pore Scale Simulation of Reactive Flow in Porous Media** Dr. Torben Prill, Fraunhofer ITWM
12:30	Lunch (foyer)
	SESSION 6– Session chair: Prof. Dr. Karl-Heinz Küfer
13:30	**Nonsmooth Differential-algebraic Equations in Chemical Engineering** Prof. Paul Barton, PhD, MIT, Cambridge (USA)
14:20	**Challenges and Opportunities to Improve Process Models by Using Plant Experiments** Dr. Norbert Asprion, BASF SE
14:45	**Optimization of Distillation Sequences** Dr. Jan Schwientek, Fraunhofer ITWM
15:10	Wrap up/closing
15:30	End of the workshop

Invited speakers

- Univ.-Prof. Dr.-Ing. André Bardow, RWTH Aachen (D)
- Prof. Paul Barton, PhD, MIT, Cambridge (USA)
- Prof. Larry Biegler, PhD, Carnegie Mellon, Pittsburgh (USA)
- Prof. Dominique Bonvin, PhD, EPFL Lausanne (CH)
- Prof. Dr. Alexander Martin, FAU Erlangen (D)
- Prof. Majid Hassanizadeh, PhD, Utrecht University (NL)