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Education and Scientific Career

Since 09/2021 Full Professor, Chair of the “Reaction Engineering and Catalysis” Institute, TU Dortmund University
01/2012-08/2021 Professor, Head of Group “Catalytic Reactors and Process Technology”, FAU Erlangen-Nürnberg
09/2005-12/2011 Senior Scientist & Leader of Research Team “Process Intensification” Process Systems Engineering Department, Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg
06/2000-08/2005 Research Assistant & PhD Student (Dr.-Ing. *with distinction*) Institute of Technical Chemistry I, FAU Erlangen-Nürnberg
11/1994-05/2000 Master Studies in Chemical Engineering (Dipl.-Ing. *with distinction*) FAU Erlangen-Nürnberg

Further Appointments and Visiting Research Stays

Since 01/2024 Chairman of the Executive Board
EUROPIC – European Process Intensification Centre
Since 08/2023 Deputy Editor-in-Chief
“Chemical Engineering and Processing: Process Intensification” (Elsevier)
01/2018-12/2023 Executive Board Member
EUROPIC – European Process Intensification Centre
01/2022-07/2023 Executive Editor
“Chemical Engineering and Processing: Process Intensification” (Elsevier)
08/2016-12/2021 Associate Editor
“Chemical Engineering and Processing: Process Intensification” (Elsevier)
01/2012-06/2014 Guest Professor
Process Systems Engineering Department, Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg
09/2010-10/2010 Research Stay & Guest Lecturer
State Key Laboratory of Chemical Engineering & East China University of Science and Technology, Shanghai, China
10/2007-12/2011 Scientific Advisor & Lecturer, International Max Planck Research School for Analysis, Design & Optimization in Chemical and Biochemical Process Engineering, Max Planck Institute Magdeburg
10/2006-12/2011 Adjunct Lecturer, Department of Process Systems Engineering
Otto-von-Guericke University Magdeburg

Research Areas

- Model-Based Design of Optimal Chemical Reactors and Processes
- Tailor-Made Open Cellular Catalyst Supports Using Additive Manufacturing
- Reaction Kinetics: Analysis and Modeling

Research Statement

The focus of my research is on the rigorous, model-based design of optimal catalytic reactors for the development of energy and resource efficient chemical processes. For this purpose, we combine methods and tools of conceptual reactor and process design, analysis and optimization with detailed simulations for the computer-aided catalyst support design. This interdisciplinary, method- and model-based approach is complemented by key experiments for phenomenological elucidation, data retrieval and model validation. That way it is possible to identify novel tailor-made reactor concepts that can be realized by means of additive manufacturing techniques.

Selected Professional Activities

- Chair of the “Chemical Reaction Engineering” Division of Dechema/VDI
- Delegate of the Working Party “Process Intensification” of the European Federation of Chemical Engineering (EFCE)
- Chair of Process Development Division Area “Process Intensification” of the American Institute of Chemical Engineers (2009-2011 and 2013-2015)
- Project leader and research area coordinator in the Helmholtz Energy Alliance collaborative project “Energy efficient chemical multiphase processes” (2012-2015)
- Conference Chair of ICOSCAR-6 (6th International Conference on Structured Catalysts and Reactors, Sept. 11-13, 2019, Bad Herrenalb, Germany)
- Session Chair & Scientific Committee Member of various international conferences
- PhD Thesis Examiner at various Universities including RWTH Aachen, TU Berlin, Denmark Technical University, TU Delft, TU Dortmund, FAU Erlangen-Nürnberg, Karlsruhe Institute of Technology, Otto von Guericke University Magdeburg, Politecnico di Milano

Selected Awards

- Excellence in Engineering of Advanced Materials Award (750k€), 2011
- Hanns Hofmann Award of the ProcessNet Reaction Engineering Division, 2010
- Chemical Engineering Science (Elsevier) Most Cited Paper 2003-2006 Award, 2007

Projects

The spectrum of funded projects ranges from long-term fundamental research (e.g. funded by the German Research Foundation, DFG) to short- and middle-term application driven industry projects. The work is carried out in both larger research clusters (e.g. DFG Cluster of Excellence, DFG Priority Program, EU projects, Helmholtz-Energy-Alliance projects) as well as in bilateral projects (e.g. EU Marie Curie Initial Training Networks (ITN)) in cooperation with national as well as international partners from academia and industry.

Publications

> 400 Contributions to Journals, Conferences & Invited Talks at Universities and Companies (see separate List of Publications and Links to Databases for details).

Statistical Information (as of July 2024):

- Contributions to Journals/Books/Proceedings: 117 in total
- Journal Papers (peer reviewed): 90, h-index (Scopus): 31, Total citations: >2.800
- Conference Contributions: 216 (128 Oral, 88 Poster)
- Invited Talks: 67
- Patents: 3