

## Prof. Dr.-Ing. Hannsjörg Freund

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### Education and Scientific Career

Since 01/2012 Professor, Head of Group “Catalytic Reactors and Process Technology”  
Department of Chemical & Biological Engineering  
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 12/2018 Editorial Board Member  
“Journal of Advanced Manufacturing and Processing” (Wiley)

Since 01/2018 Executive Board Member  
EUROPIC (European Process Intensification Centre), a platform of 20+  
European companies connecting science and business

Since 08/2016 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 & Otto-von-Guericke University 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
- Additive Manufacturing of Cellular Structures as Novel Catalyst Supports
- Reaction Kinetics: Analysis and Modeling

### Research Statement

The focus of my research is on the development of energy and resource efficient chemical processes with a special focus on the model-based design of optimal catalytic reactors. In a comprehensive approach innovative process-, reactor- and material concepts are considered, which includes the evaluation of different process intensification options. For this, an interdisciplinary, method- and model-based approach is essential, which is complemented by experiments at different scales for phenomenological elucidation, data retrieval and model validation. The combination of powerful simulation tools at different scales and at different times during the design process allows for linking the process-, reactor- and material design. That way it is possible to identify tailor-made solutions based on rigorous model-based optimization. Finally, additive manufacturing techniques allow for the technical demonstration of the identified novel reactor and process concepts.

## **Institutional Responsibilities at FAU Erlangen-Nürnberg**

- Executive Board Member of the Interdisciplinary Center for Nanostructured Films
- Executive Board Member of the Department of Chemical and Biological Engineering
- Executive Board Member of the Erlangen Cluster of Excellence “Engineering of Advanced Materials” funded by the German Excellence Initiative
- Speaker of the Graduate School “Advanced Materials and Processes”
- Chair of the Admissions Committee for the Master Programs “Chemical Engineering”, “Chemical and Biological Engineering” and “Life Science Engineering”
- Scientific Member of the Technology Transfer Center “VerTec – Novel materials and production processes of components applied in process engineering”

## **Selected Professional Activities**

- Vice Chair of the “Reaction Engineering” Division of ProcessNet
- Chairman of ICOSCAR-6 (6th International Conference on Structured Catalysts and Reactors, Sept. 11-13, 2019, Bad Herrenalb, Germany)
- 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)
- Session Chair & Scientific Committee Member of various international conferences
- External PhD Thesis Examiner at various Universities including RWTH Aachen, Denmark Technical University, Technical University Delft, Technical University Dortmund, 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. Cluster of Excellence “Engineering of Advanced Materials” (EAM), Helmholtz-Energy-Alliance “Energy efficient chemical multiphase processes”) 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**

> 300 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 April 2020):

- Contributions to Journals/Books/Proceedings: 94 in total
- Journal Papers (peer reviewed): 71, h-index (Scopus): 22, Total citations: >1.500
- Conference Contributions: 174 (106 Oral, 68 Poster)
- Invited Talks: 55
- Patents: 3