



**Summer School Program of the International  
Research Training Group  
GRK 2078**

**Integrated Engineering of Continuous-Discontinuous Long Fiber Reinforced  
Polymer Structures (CoDiCoFRP)**

**June 19 - 23, 2023**

**WissenschaftsForum Berlin  
Markgrafenstr. 37 (Gendarmenmarkt)  
10117 Berlin, Germany**



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## Week Program Overview

Time	Sun, 18/06	Mon, 19/06	Tue, 20/06	Wed, 21/06	Thu, 22/06	Fri, 23/06	
09:00			Presentations	Presentations	Thematic Session I	Self-organized meetings  Get to know Berlin**	
11:00			Coffee Break	Coffee Break	Coffee Break		
			Presentations	Highlights of GRK 2078 and ICRG	Thematic Session II		
13:00		Registration & Reception	Lunch	Lunch	Lunch		
14:00		Welcome & Introduction	Presentations	Highlights of GRK 2078 and ICRG	Thematic Session III		
16:00		Coffee Break	Coffee Break	Coffee Break	Coffee Break		
		Strategy Discussion IRTG/ICRG	Poster Session	Poster Session			
18:00		Welcome Reception*	Sightseeing Tour by Foot*				
19:00	Dinner*						Boat Trip on River Spree*
19:30					Conference Dinner*		
20:00					Dinner*		
21:00							
22:00							

\* Please see Event Schedule on page 10

\*\*Please see separate Berlin Booklet



## Program, Monday, June 19, 2023

**Location:** WissenschaftsForum | First Floor, Room 102

13:00 - 14:00 **Registration & Reception**

### Welcome

14:00 – 14:10 Opening

*Thomas Böhlke (KIT), Jeff Wood (UWO)*

14:10 - 14:30 **Status Quo: Research Training Group GRK 2078**

*Thomas Böhlke (KIT)*

14:30 - 14:50 **Status Quo: International Composite Research Group (ICRG)**

*Jeff Wood (UWO)*

14:50 - 15:10 **Status Quo: KIT/ICT Challenges and Perspectives**

*Frank Henning (KIT, ICT)*

15:10 - 15:30 **Status Quo: UWO/FPC Challenges and Perspectives**

*Frank Henning (KIT, ICT), Andrew Hrymak (UWO)*

15:30 - 15:50 **Announcement of SAMPE 2024**

*Frank Henning (KIT, ICT), Thomas Böhlke (KIT)*

### Coffee Break

16:30 - 18:00 **Strategy Discussion IRTG/ICRG & Definition of Work Tasks for Group Discussions in Thematic Session I – III on Thursday, June 22, 2023**

*Chairs: Thomas Böhlke (KIT), Loredana Kehrer (KIT)*

Identification of i) Current Status, ii) Open Questions and Issues, iii) Future Milestones for the Following Priority Topics in the Joint Research Activities IRTG/ICRG

- Thematic Session I: Research Visits, Publications, Beyond 2024, Doctoral Theses, Reporting Obligations (DFG, NSERC/CREATE)
- Thematic Session II: Demonstrator, Process Chain
- Thematic Session III: Modeling, Multiscale Models / Characterization, Research Data Management, Experiments, other topics

The aim of the strategy discussion is to define further work tasks. Moderators and minute keepers will be identified for the Thematic Sessions on Thursday.

### Welcome Reception & Fingerfood

18:00 – 21:00 In front of Seminar Room 102



## Program, Tuesday, June 20, 2023

**Location:** WissenschaftsForum | First Floor, Room 102

09:00 - 09:05 **Opening**

*Thomas Böhlke (KIT), Jeff Wood (UWO)*

09:05 - 11:05 **Presentations (4 x 30 min.)**

*Chair: Frank Henning (KIT, ICT)*

**Superconvergence Phenomena in Computational Homogenization**

*Matti Schneider (KIT)*

**Interaction between Percolation and Shear Flow in Processing of Polymer Matrix Composites**

*Pascal Hubert (McGill University)*

**Accelerating Structural Optimization with Machine Learning**

*Nils Meyer (Augsburg University)*

**Combined Forming and Infiltration Simulation of CoFRP in Wet Compression Molding**

*Christian Poppe, Luise Kärger (KIT)*

**Coffee Break**

11:30 - 13:00 **Presentations (3 x 30 min.)**

*Chair: Jeff Wood (UWO)*

**What Molecular Scale Simulations Can Tell us About Fibre Reinforced Polymer Structures**

*Colin Denniston (UWO)*

**Statistical Properties of Short Fibre Reinforced Plastics and its Impact on Effective Composites Properties**

*Lars Bittrich (Dresden University)*

**Flow-Fiber Coupling of Mold-Filling Fiber Suspension Simulations Based on Anisotropic Viscosity and Mean-Field Modeling**

*Tobias Karl, Thomas Böhlke (KIT)*

**Lunch**

In Front of Seminar Room 102



14:00 - 15:30 **Presentations (3 x 30 min.)**

*Chair: Pascal Hubert (McGill University)*

**Capturing the Strain Rate-Dependant Behaviour of Fiber-Reinforced Composite Materials for Impact Performance Assessment**

*John Montesano (University of Waterloo)*

**Modeling the Effect of Moisture on Polyamide**

*Prateek Sharma, Stefan Diebels (University of Saarland)*

**Towards the Use of Probability Distribution Function to Describe the Flow of Fiber Suspensions**

*Gilles Ausias (University of Bretagne Sud)*

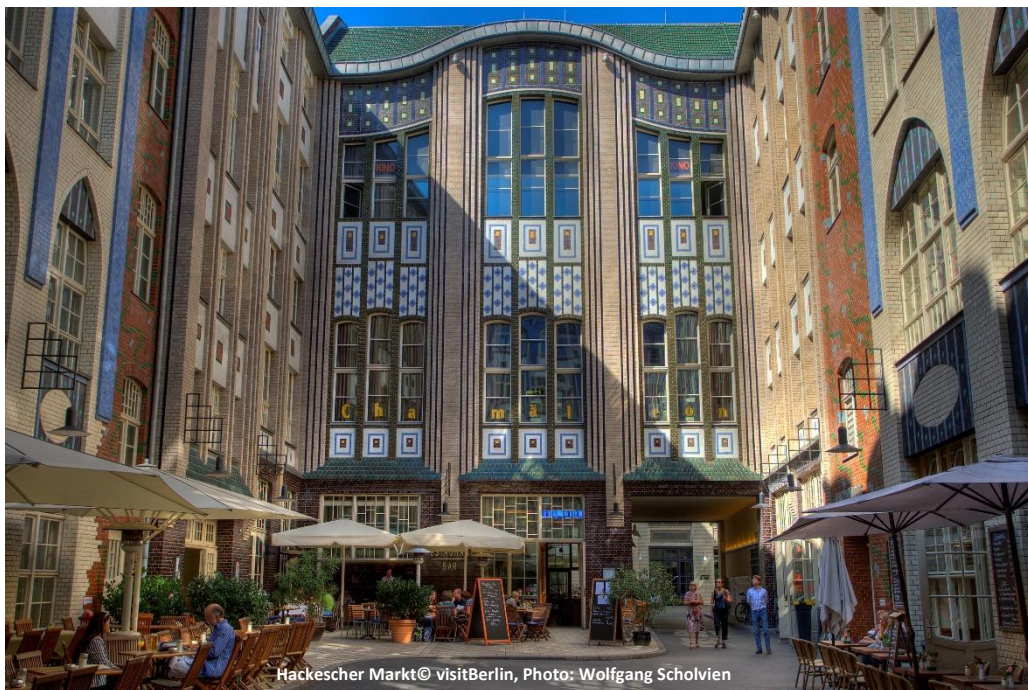
**Coffee Break**

16:00 - 17:00 **Poster Session – Research Areas Characterization & Technology**

**Evening Events**

18:00 - 20:00 **Sightseeing Tour by foot** (Please see Event Social Schedule on Page 10)

20:00 - 22:00 **Dinner at Aly by Hasir** (Please see Event Social Schedule on Page 10)



## Program, Wednesday, June 21, 2023

**Location:** WissenschaftsForum | First Floor, Room 102

09:00 - 09:05 **Opening**

*Thomas Böhlke (KIT), Jeff Wood (UWO)*

09:05 - 11:05 **Presentations (4 x 30 min)**

*Chair: John Montesano (University of Waterloo)*

**Modeling of Solid-Liquid Phase Transition in Polymer Solvent Systems Based on Statistical Thermodynamics**

*Josef Fischlschweiger (Technical University Clausthal)*

**Hybrid Composite Materials – Challenges and Perspectives**

*Kay Weidenmann (Augsburg University)*

**On the Usage of Dynamic Mechanical Analysis (DMA) for Reinforced Polymers**

*Wiebold Wurpts, Netzsch-Gerätebau GmbH, Ahlden*

**Hydrothermal Influences on the Mechanical Behavior of PA 6**

*Loredana Kehrer (KIT)*

**Coffee Break**

11:30 - 12:50 **Highlights of GRK 2078 and ICRG (4 x 20 min)**

*Chair: Kay Weidenmann (Augsburg University)*

**Overview Presentation GRK 2078 / Research Area Design**

*Christoph Kempf, Patrick Haberkern, Louis Schreyer - (KIT)*

**Residual Stresses During Liquid Moulding of Composites Using Highly Reactive Thermosets**

*Leonardo Barcenas Gomez (McGill University)*

**Overview Presentation GRK 2078 / Research Area Simulation**

*Celine Lauff, Johannes Keursten, Benedikt Sterr, Jit Sarkar - (KIT)*

**An Invariant-Based Strain Rate-Dependent Inelastic Deformation Model for Composites Materials: Shell-Element Formulation and FE Implementation**

*Khizar Rouf, Michael Worswick, John Montesano - (University of Waterloo)*

**Lunch**

In front of Seminar Room 102



**14:00 - 15:40 Highlights of GRK 2078 and ICRG (5 x 20 min)**

*Chair: Luise Kärger (KIT)*

**Overview Presentation GRK 2078 / Research Area Characterization**

*Benedikt Scheuring, Nicolas Christ, Juliane Blarr - (KIT)*

**The Influence of Moisture Content on the Anisotropic Mechanical Behaviour of Direct Compounded Compression Moulded Glass / PA6 LFTs**

*Pouya Mohammadkhani, Tarun Khapra, William Altenhof - (University of Windsor)*

**Overview Presentation GRK 2078 / Research Area Technology**

*Felicitas Böhlend, Katja Höger, Nikolas Matkovic, Christoph Schelleis - (KIT)*

**Effect of Supercritical CO<sub>2</sub> on the Graphene Exfoliation in Extruded Polystyrene Composite Foam**

*Apurv Gaidhani, Guoshan Min, Lauren Briens, Andrew Hrymak, Paul Charpentier - (UWO)*

**Thermal Effects and Demolding Characterization for Carbon Fibre Reinforced Polymers using Wet Compression Molding (WCM)**

*Jennifer Sears (University of Windsor)*

**Coffee Break**

**16:15 - 17:30 Poster Session – Research Areas Design & Simulation**

**Evening Event**

**19:30 - 22:00 Conference Dinner at Brasserie Ganymed (Please see Social Event Schedule Page 10)**





## Program, Thursday, June 22, 2023

**Location:** WissenschaftsForum | First Floor, Room 102

09:00 - 09:05 **Opening**

*Thomas Böhlke (KIT), Jeff Wood (UWO)*

09:05 - 11:00 **Thematic Session I**

*Chairs: Thomas Böhlke, Loredana Kehrler (KIT)*

- Research Visits
- Publications
- Beyond 2024
- Doctoral Thesis
- Reporting Obligations (DFG, NSERC/CREATE)

**Coffee Break**

11:30 – 13:00 **Thematic Session II**

*Chair: tba / Format tba*

- Demonstrator
- Process Chain

**Lunch** In front of Seminar Room 102

14:00 - 16:00 **Thematic Session III**

*Chair: tba / Format tba*

- Modeling
- Multiscale Models / Characterization
- Research Data (NFDI-MatWerk)
- Experiments

**Coffee Break**

**Evening Event**

19:00 – 20:00 **Boat Trip on River Spree** (Please see Social Event Schedule on Page 10)

20:00 – 22:00 **Dinner at Ständige Vertretung** (Please see Social Event Schedule on Page 10)

## Program, Friday, June 23, 2023

**Location:** WissenschaftsForum | First Floor, Room 102

09:00 – 13:00 Self-Organized Meetings

13:00 – 16:00 Get to know Berlin (Please see separate Berlin Booklet)



## Social Event Schedule

Sunday, 18/06/2023 from 19:00-22:00

### Dinner at Augustiner

At one's own expense

Charlotten Str. 55

[www.augustiner-braeu-berlin.de](http://www.augustiner-braeu-berlin.de)

Monday, 19/06/2023 from 18:00-21:00

### Welcome Reception

Fingerfood & Drinks

WissenschaftsForum

[www.wissenschaftsforum-berlin.de](http://www.wissenschaftsforum-berlin.de)

Tuesday, 20/06/2023 from 18:00-20:00

### Berlin City tour by foot

Guide I: Dennis Behnke

Guide II: Jonny Whitlam

Meeting Point:

17:45 in front of WissenschaftsForum

[www.private-tour.berlin](http://www.private-tour.berlin)

Tuesday, 20/06/2023 from 20:00-22:00

### Dinner at Aly by Hasir

At one's own expense

Oranienburger Str. 4

[alaybyhasir.de](http://alaybyhasir.de)

Wednesday, 22/06/2023 from 19:30-22:00

### Conference Dinner at Brasserie Ganymed

Meeting Point: 19:30 at Brasserie

Schiffbauerdamm 5

[www.ganymed-brasserie.de](http://www.ganymed-brasserie.de)

Thursday, 22/06/2023 from 19:00-20:00

### Boat Trip on River Spree

At one's own expense (€ 20.00)

Meeting Point:

Schiffbauerdamm 12 at 18:45

[www.spree-havelschiffahrt.de](http://www.spree-havelschiffahrt.de)

Thursday, 22/06/2023 from 20:00-22:00

### Dinner at Ständige Vertretung

At one's own expense

Schiffbauerdamm 8

[www.staev.de/berlin-mitte](http://www.staev.de/berlin-mitte)



## Scientists and Institutions Cooperating within IRTG and ICRG

[www.grk2078.kit.edu](http://www.grk2078.kit.edu)

### Germany

- **Prof. Dr.-Ing. habil. Thomas Böhlke (Spokesperson), Jun.-Prof. Dr. rer. nat. Matti Schneider**  
*Institut für Technische Mechanik (ITM) / Institute of Engineering Mechanics (ITM)*
- **o. Prof. Dr.-Ing. Dr. h. c. Albert Albers**  
*Institut für Produktentwicklung (IPEK) / Institute of Product Engineering (IPEK)*
- **Prof. Dr.-Ing. habil. Kay André Weidenmann**  
*Lehrstuhl für Hybride Werkstoffe am Institut für Materials Resource Management, Augsburg Universität / Chair of Hybrid Composite Materials at the Institute for Materials Resource Management, Augsburg University*
- **Prof. Dr.-Ing. Jürgen Fleischer, Prof. Dr.-Ing. Gisela Lanza, Prof. Dr.-Ing. habil. Volker Schulze**  
*Institut für Produktionstechnik (wbk) / Institute of Production Science (wbk)*
- **Prof. Dr. rer. nat. Britta Nestler**  
*Institut für Angewandte Materialien - Mikrostruktur-Modellierung und Simulation (IAM-MMS) / Institute for Applied Materials - Microstructure Modelling and Simulation (IAM-MMS)*
- **Prof. Dr. rer. nat. Peter Gumbsch\*, PD Dr.-Ing. habil. Jörg Hohe**  
*Institut für Angewandte Materialien - Zuverlässigkeit und Mikrostruktur (IAM-ZM), IWM / Institute for Applied Materials - Reliability and Microstructure (IAM-ZM), \* Fraunhofer Institut für Werkstoffmechanik (IWM) / \* Fraunhofer Institute for Mechanics of Materials (IWM),*
- **Prof. Dr.-Ing. Frank Henning\*, Prof. Dr.-Ing. Luise Kärger**  
*Institut für Fahrzeugsystemtechnik (FAST), \* Fraunhofer Institut für Chemische Technologie (ICT), Universität Western Ontario (UWO) und Fraunhofer Projekt Center (FPC) / Institute of Vehicle System Technology (FAST), \* Fraunhofer Institute for Chemical Technology (ICT), University of Western Ontario (UWO), and Fraunhofer Project Center (FPC)*
- **Prof. Dr.-Ing. habil. Thomas Seelig**  
*Institut für Mechanik (IFM) / Institute of Mechanics (IFM)*

### Canada

- **Prof. Dr. Jeffrey T. Wood (Spokesperson), Prof. Dr. Colin Denniston, Prof. Dr. Andrew Hrymak, Prof. Dr. Darren Meister, Prof. Dr. Anthony Straatman, Prof. Dr. O. Remus Tutunea-Fatan**  
*University of Western Ontario*
- **Prof. Dr. William Altenhof, Prof. Dr. Jennifer Johrendt, Prof. Dr. Bruce Minaker, Prof. Dr. Jill Urbanic**  
*University of Windsor*
- **Prof. Dr. Michael Thompson**  
*McMaster Manufacturing Research Institute*
- **Prof. Dr. Kaan Inal, Prof. Dr. John Montesano**  
*University of Waterloo*
- **Prof. Dr. Pascal Hubert**  
*McGill University*
- **Prof. Dr. Kamran Behdinin**  
*Universtiy of Toronto*



## Summer School Organizers

International Research Training Group (DFG GRK 2078)

[www.grk2078.kit.edu](http://www.grk2078.kit.edu)

Integrated Engineering of Continuous-Discontinuous Long Fiber Reinforced Polymer Structures

Prof. Dr.-Ing. Thomas Böhlke, Speaker

Prof. Dr.-Ing. Frank Henning, Co-Speaker

Dr.-Ing. Loredana Kehrer, Post-Doc

## Contact Information

Karlsruhe Institute of Technology (KIT)

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[www.itm.kit.edu/cm](http://www.itm.kit.edu/cm)

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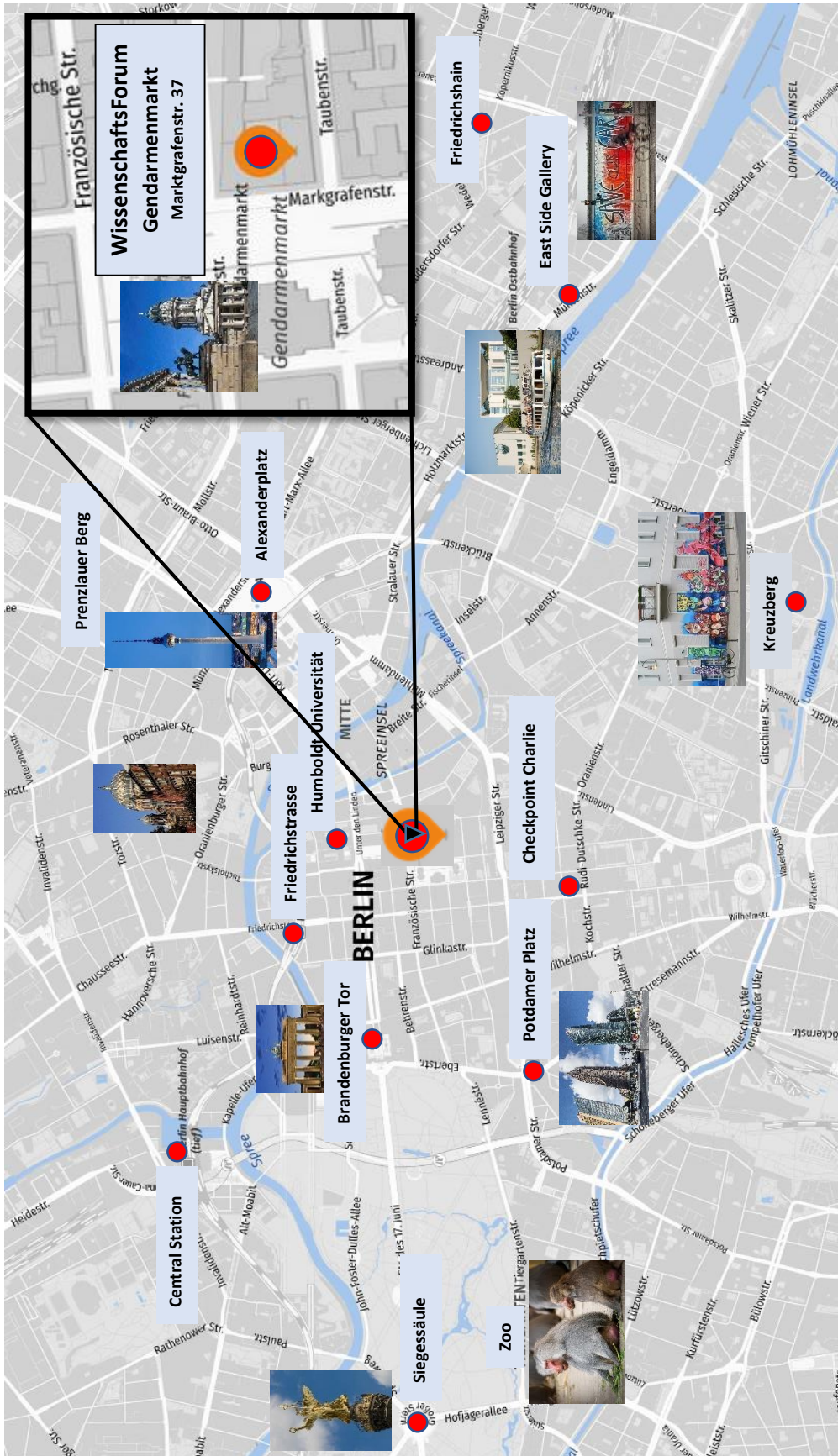
Ute Schlumberger-Maas +49 (0)721 608-43796 \*

Ariane van Elst +49 (0)721 608-46107 \*

\* Landline numbers are redirected to cell phones



## Location: Berlin Center



## List of Participants

### ***German Doctoral / Post-Doctoral Researchers***

- Juliane Blarr, Institute for Applied Materials - Materials Science and Engineering (IAM-WK), KIT
- Felicitas Böhland, Institute of Production Science (wbk), KIT
- Nicolas Christ, Institute for Applied Materials - Reliability and Microstructure (IAM-ZM), KIT
- Patrick Haberkern, Institute of Product Engineering (IPEK), KIT
- Dr.-Ing. Loredana Kehrer, Institute of Engineering Mechanics (ITM), KIT
- Christoph Kempf, Institute of Product Engineering (IPEK), KIT
- Johannes Keursten, Institute of Engineering Mechanics (ITM), KIT
- Celine Lauff, Institute of Engineering Mechanics (ITM), KIT
- Nikolas Matkovic, Institute of Production Science (wbk), KIT
- Dr.-Ing. Andreas Prahs, Inst. for Appl. Materials - Microstructure Modell. and Sim. (IAM-MMS), KIT
- Christoph Schelleis, Institute of Vehicle System Technology (FAST), KIT
- Benedikt Scheuring, Inst. for Appl. Materials - Materials Science and Engineering (IAM-WK), KIT
- Louis Schreyer, Institute of Vehicle System Technology (FAST), KIT
- Benedikt Sterr, Institute of Engineering Mechanics (ITM), KIT

### ***Canadian Doctoral Researchers***

- Navid Afrasiabian, University of Western Ontario (UWO)
- Valerie Ajayi, University of Waterloo
- Austin Bedrosian, McMaster Manufacturing Research Institute
- Apurv Gaidhani, University of Western Ontario (UWO)
- Leonardo Barcenas Gomez, McGill University
- Joe Iskander, University of Windsor
- Jierui Jian, McMaster Manufacturing Research Institute
- Tarun Khapra, University of Windsor
- Khizar Rouf, University of Waterloo
- Pouya Mohammadkhani, University of Windsor
- Sidharth Sarojini Narayana, McGill University
- Renan Miranda Portela, University of Waterloo
- Jennifer Sears, University of Windsor
- Erli Shi, University of Waterloo
- Yuheng Zhou, McGill University
- Milos Zivkovic, University of Waterloo



**German Principal Investigators**

- Prof. Dr.-Ing. Thomas Böhlke, Institute of Engineering Mechanics (ITM), KIT
- Prof. Dr.-Ing. Frank Henning, Institute of Vehicle System Technology (FAST), KIT
- PD Dr.-Ing. Jörg Hohe, Fraunhofer Institute for Mechanics of Materials (IWM)
- Prof. Dr.-Ing. Luise Kärger, Institute of Vehicle System Technology (FAST), KIT
- Jun.-Prof. Dr. rer. nat. Matti Schneider, Institute of Engineering Mechanics (ITM), KIT
- Prof. Dr.-Ing. Kay A. Weidenmann, Institute for Materials Resource Management, Augsburg Univ.

**Canadian Principal Investigators**

- Prof. Dr. Colin Denniston, University of Western Ontario (UWO)
- Prof. Dr. Pascal Hubert, McGill University
- Prof. Dr. Jennifer Johrendt, University of Windsor
- Prof. Dr. John Montesano, University of Waterloo
- Prof. Dr. Jill Urbanic, University of Windsor
- Prof. Dr. Jeffrey Wood, University of Western Ontario (UWO)

**Guests**

- Prof. Gilles Ausias, Laboratoire de Génie Mécanique et Matériaux, Université de Bretagne Sud
- Dr. Lars Bittrich, Leibniz-Institut für Polymerforschung, Dresden
- Prof. Dr. mont. Dr. rer. nat Michael Josef Fischlschweiger, Institute of Energy Process Engineering and Fuel Technology, TU Clausthal
- Hon.-Prof. Dr.-Ing. André Haufe, DYNAmore GmbH
- Jun.-Prof. Dr.-Ing. Nils Meyer, Institute for Materials Resource Management, Augsburg Universität
- Dr.-Ing. Prateek Sharma, FR Materialwissenschaft und Werkstofftechnik, Univ. des Saarlandes
- Dr. Wiebold Wurpts, Technology and Product Management, Netzsch-Gerätebau GmbH, Ahlden

**Organizational Staff**

- Ute Schlumberger-Maas, Institute of Engineering Mechanics (ITM), KIT
- Ariane van Elst, Institute of Engineering Mechanics (ITM), KIT



## Funding



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## Participating Institutes

