Symposium of the
International Research Training Group (IRTG)

Integrated Engineering of Continuous-Discontinuous Long Fiber Reinforced Polymer Structures

(GRK 2078)

May 14-17, 2018

Overview on the Schedule of the IRTG Symposium 2018

Scientific Program, Monday, May 14, 2018

Location: International Department (ID), **Hector Auditorium**, Schlossplatz 19 | 76131 Karlsruhe

08:30   **Registration, Poster Installation**

Introduction

09:00 - 09:05   **Address of Welcome**

Thomas Böhlke, Speaker GRK2078
Judith Elsner, Head of International Department

09:05 - 09:15   **Address of Welcome**

Thomas Hirth, KIT Vice President of Innovation and International Affairs

09:15 - 09:20   **Status Quo: Research Training Group GRK 2078**

Thomas Böhlke, Speaker GRK2078

09:20 - 09:30   **Status Quo: International Composite Research Center (ICRC)**

Jeff Wood, Speaker of the Canadian CREATE team

Highlights of GRK 2078 (Chair: Thomas Böhlke)

Please note that all presentation times given in the program include the discussion.

09:30 - 10:00   **Intrinsic CFRP-Metal Hybrids for Lightweight Structures**

Jürgen Fleischer (wbk), Principal Investigator of GRK 2078

10:00 - 10:30   **Damage Modeling and Characterization of Discontinuous Fiber-Reinforced Polymers**

Malte Schemmann (ITM), Doctoral Student of GRK 2078

10:30 - 11:00   **Computational Homogenization on Image Data**

Matti Schneider (ITM), Principal Investigator of GRK2078

Coffee Break (11:00 - 11:30)

Plenary Talks

11:30 - 12:00   **The Future of Carbon Fibre SMC in Automotive**

Peter Hilzendegen, Aliancys, Netherlands (Chair: Frank Henning)

12:00 - 12:30   **Simulation Models for Manufacturing Applicability in the Aerospace Industry**

Daniel Hartung, Premium Aerotec, Germany (Chair: Thomas Böhlke)

Lunch and Poster Session (12:30 - 13:30)

Plenary Lectures

13:30 - 14:00   **Carbon Fiber Sheet Moulding Compound**

Tobias Potyra, Zoltek Corporation, Germany (Chair: Kay André Weidenmann)

14:00 - 14:30   **On the Status of Simulating Fiber Reinforced Polymers in Crashworthiness Applications**

André Haufe, DYNAmore GmbH, Stuttgart, Germany (Chair: Tom-Alexander Langhoff)

14:30 - 15:00   **Industrial Research on Computational Material Science for Polymer Materials**

Kurt Hornberger, Robert Bosch GmbH, Germany (Chair: Luise Kärger)

15:00 - 15:30   **Process Simulation and CT Technology in Textile LightWeight Design**

Hermann Finckh, Deutsche Institute für Textil- und Faserforschung Denkendorf, Germany (Chair: Thomas Seelig)

Coffee Break and Poster Session (15:30 - 16:00)

16:00 - 18:00   **Overview Presentation to the GRK 2078 Research Areas (RA)**

- RA Characterization (*Pascal Pinter, Doctoral Student of GRK 2078*)
- RA Technology (*Marielouise Zaiß, Doctoral Student of GRK 2078*)
- RA Simulation (*Felix Schwab, Doctoral Student of GRK 2078*)
- RA Design (*Markus Spadinger, Doctoral Student of GRK 2078*)

18:00   **Poster Session and Discussion**

19:00   **Symposium Dinner**

Information about the KIT Business Club (*Dr. Barbara Schmuker*)

Scientific Program, Tuesday, May 15, 2018

Location: International Department (ID), **Hector Auditorium,** Schlossplatz 19 | 76131 Karlsruhe

Introduction

09:00 - 09:45   **Opening**

- GRK 2078: Status Quo (also by numbers) (Thomas Böhlke)

- Canadian research team: Status Quo, Outlook (Jeff Wood)

Discussion of the status quo and the research program of the 2nd generation: For each GRK2078 project, the young researchers of the first and the second generation should chair a discussion based on a 5 to 10 Minutes short presentation of the project. The main topics should be: a) Main research results (1st generation), b) Research objectives (2nd generation), c) Interaction with KIT projects within the 2nd funding period, d) Interaction of KIT and ICRC projects within the 2nd funding period. Additionally, the researchers of the second generation are welcome to present themselves.

Transition to the next doctoral generation

09:45 - 10:30   **RA Design,** *Chair: Luise Kärger*

- Doctoral Project D1: Production oriented dimensioning of local patches under consideration of distortion and manufacturing constraints (*Benedikt Fengler, Nils Meyer, Doctoral Students of GRK 2078*)

- Doctoral Project D2: Advanced anisotropic topology and shape optimization methods for CoDiCoFRP with a focus on variations and robust behavior (*Markus Spadinger, Sven Revfi, Doctoral Students of GRK 2078*)

- Doctoral Project D3: Identification, conditioning and validation of design relevant material, simulation and production specific knowledge for efficient design of advanced lightweight (*Viktoriia Butenko, Thilo Richter, Doctoral Students of GRK 2078*)

Coffee Break (10:30 - 10:45)

10:45 - 11:30   **RA Simulation,** *Chair: Thomas Seelig*

- Doctoral Project S2: Mean field models for DiCoFRP and CoDiCoFRP (*Malte Schemmann, Johannes Görthofer, Doctoral Students of GRK 2078*)

- Doctoral Project S3: Micromechanical finite element simulations of CoFRP, DiCoFRP and CoDiCoFRP (*Loredana Kehrer, Juliane Lang, Doctoral Students of GRK 2078*)

- Doctoral Project S4: Phase-field modeling of thermo-mechanical properties in multiphase solidification microstructures (*Felix Schwab, Lukas Schöller, Doctoral Students of GRK 2078*)

11:30 - 12:30   **RA Technology,** *Chair: Kay André Weidenmann*

- Doctoral Project T1: Local continuous fiber reinforcements and their interaction with DiCoFRP in compression molding (*David Bücheler, Sergej Ilinzeer, Doctoral Students of GRK 2078*)

- Doctoral Project T2: Automated integrated handling and preforming (*Fabian Ballier, Daniel Kupzik, Doctoral Students of GRK 2078*)

- Doctoral Project T3: Implementation of an inline quality assurance system for the improved production of CoDiCoFRP components (*Marielouise Zaiß, Doctoral Student of GRK 2078*)

- Doctoral Project T4: Preparation of 3D SMC and LFT composites for joining operations (*Anton Gabsch, Research Associate*)

Lunch (12:30 - 13:30)

13:30 - 14:15   **RA Characterization,** *Chair: Kay André Weidenmann*

- Doctoral Project C1: Characterization and modeling of the interface properties of fiber reinforced polymeric materials (*Michael Schober, Benedikt Rohrmüller, Doctoral Students of GRK 2078*)

- Doctoral Project C2: Quantitative description of the inner structure and interfacial properties of CoDiCoFRP (*Pascal Pinter, Ludwig Schöttl, Doctoral Students of GRK 2078*)

- Doctoral Project C3: Mechanical properties for SMC and LFT composites and locally reinforced CoDiCoFRP (*Anna Trauth, Miriam Bartkowiak, Doctoral Students of GRK 2078*)

14:15 - 14:30   **PostDoc Project**: Physical modeling of curing phenomena in composite materials (*Tarkes D. Pallicity*)

14:30 - 14:45   **Summary** *(Luise Kärger, Thomas Seelig, Kay André Weidenmann)*

Coffee Break (14:45 - 15:15)

Renewal Proposal, Book Project, Discussion of Doctoral Projects

15:15 - 15:45   **DFG Renewal Proposal and On-site review of DFG**: Time Schedule, ToDos, Research Strategy, Interaction with Canadian Partners (*Thomas Böhlke*)

15:45 - 16:15   **IRTG Book project:** Status Quo, Time Schedule, ToDos (*Tarkes D. Pallicity*, *Andrew Hrymak, Thomas Böhlke*)

16:15 - 18:00   **Time for individually arranged meetings**:

Discussion of Doctoral Projects between Canadian PIs and KIT Doctoral Students
For presentations, Room SE 202 at the International Department (ID) will be available. For group discussions, the Hector Auditorium (ID) and an additional meeting room at the ID could be used. For additional presentations, the ITM Seminar Room 308.1 , Bldg. 10.23, 3rd Floor will, as well, be available.

19:30   **Come Together** (to be organized individually)

Program, Wednesday, May 16, 2018

Location: KIT Campus South (KIT institutes)

Meetings

09:00 - 11:30   **Informal Meetings at KIT** (to be organized individually)

Special Meetings (ITM Seminar Room, Building 10.23, 3rd Floor, Room: 308.1)

08:30 - 09:15   **Collaboration KIT UWO**

(*T. Böhlke, A. Hrymak, T.-A. Langhoff, T. D. Pallicity, J. Wood; Representatives of KIT for International Affairs*)

09:15 - 10.00   **Planning of the Interaction of the GRK2078 and the International Department**

(*T. Böhlke, A. Hrymak, T.-A. Langhoff, T. D. Pallicity, J. Wood, Representatives of International Department*)

10:00 - 11:30   **Discussion of the Renewal Proposal**

(*T. Böhlke, A. Hrymak, L. Kärger, T.-A. Langhoff, T. D. Pallicity, T. Seelig, K. A. Weidenmann, J. Wood*)

Lunch (Mensa) (11:30 - 12:30) (*Person in Charge: L. Kehrer*)

Meeting Point: Institute of Engineering Mechanics (Building 10.23), 3rd floor

Doctoral Examination within GRK 2078

13:00 - 13:30   **Doctoral Examination** (*M.Sc. Malte Schemmann*)

Dekanatssaal, Building 10.91, 1st floor, Room 130

(please see the map)

City Tour Karlsruhe (for the Canadian Guests, only)

Meeting Point: At 15:10 in the Foyer of Building 10.23

15:30 - 16:00   **Visit of the Palace-Tower** (*Persons in Charge: J. Lang, T. D. Pallicity*)

16:00 - 17:00   **City Tour** (*Persons in Charge: J. Lang, T. D. Pallicity*)

Highlights: Palace Surroundings, Market Place, Town Hall, Pyramid, Protestant City Church, Art Hall, Botanic Garden (*if the weather allows for it*)

Social Program, Thursday, May 17, 2018

09:00 - 18:00   **Trip to Strasbourg, Alsace** (Sightseeing, Lunch, etc.)
(*Person in Charge: J. Görthofer*)

Meeting Point: At 09:00 at the corner Engesser / Rudolf-Plank-Straße (please see the map)

International Research Training Group (DFG GRK 2078)

Integrated Engineering of Continuous-Discontinuous Long Fiber Reinforced Polymer Structures

Locations: Symposium of the International Research Training Group (IRTG)

(1) **Scientific Program,** Monday, May 14, 2018, 09:00-18:00h and Tuesday, May 15, 2018, 09:00-18:00h
International Department (ID), Hector Auditorium, Schlossplatz 19, 76131 Karlsruhe, Germany
(2) **Special Meetings**, Wednesday, May 16, 2018, 08:30-11:30h
ITM Seminar Room, Building 10.23, 3rd Floor, Room: 308.1
(3) **Doctoral Examination** within GRK 2078, Wednesday, May 16, 13:00h
Dekanatssaal, Building 10.91, 1st floor