

CU Innovation Day „Tailored Structures“

am **05. April 2022** bei **Leibniz-Institut für Polymerforschung Dresden e. V. (IPF)**

Online

Moderation: Prof. Dr.-Ing. Axel Spickenheuer, IPF

The CU Innovation Day „Tailored Structures“ focuses on lightweight structural applications made of fiber-reinforced plastic composites that are based on the minimum possible use of materials. In addition to established lightweight construction principles, the focus will be on a materials approach that specifically addresses the anisotropic properties of unidirectional composites for extreme lightweight construction. On the theoretical side, this is intended to take account of current developments for generative, continuous fiber-reinforced composite manufacturing processes, with which variable-axial fiber architectures can already be implemented today. In the sense of sustainable and resource-saving product development, methods for future lightweight FRP design are to be made available to the next generation of engineers.

Agenda

08:00 **Get together, warm up, networking**

08:30 **Welcome note and introduction**

Thomas Heber, CU

Axel Spickenheuer, Leibniz-Institut für Polymerforschung Dresden e.V.

08:50 **Tailored design of lightweight drones**

Aviv Levy, Aviv Innovations, Israel

09:10 **Design aid method for TFP parts using anisotropic topology optimization and turing pattern dehomogenization**

Tsuyoshi Nomura, Toyota Central R&D Labs, Japan

09:30 **Simultaneous optimization of structural shapes and fiber directions targeting long fiber composites**

Shinji Nishiwaki, Kyoto University, Japan

09:50 **Coffee break, networking**

11:00 **Tailor Fiber Placement for lightweight sustainable architecture and building construction**

Hannaa Dahy, Institut für Tragkonstruktionen und Konstruktives Entwerfen, Universität Stuttgart, Germany

11:20 **Advances in simulation and optimization of variable-axial composites**

Lars Bittrich, Leibniz-Institut für Polymerforschung Dresden e. V., Germany

11:40 **Hybrid material load introduction elements and reinforcing structures for FRP using tailored fiber placement technology**

Alexander Marx, Faserinstitut Bremen, Germany

12:00 **An extended anisotropic topology optimization approach for TFP structural design**

Johannes Schwingel, Institut für Flugzeugbau, Universität Stuttgart, Germany

12:20 **Lunch, networking**

14:00	Highly loaded tailored composites application Tales de Vargas Lisbôa, Leibniz-Institut für Polymerforschung Dresden e. V., Germany
14:20	Function-aware slicing using principal stress line for toolpath planning in additive manufacturing Eder Sales, Concordia University, Canada
14:40	Optimization and fabrication of steered fiber composite structures Ryan Seifert, University of Dayton, United States of America
15:00	Optimal design and manufacture of architected fiber reinforced composites Narashima Boddeti, Washington State University, United States of America
15:20	Closing note
15:35	Networking
16:30	End