

Seminar Series of the Graduate School GRK 2078

Referee: **Dr. Laurent Orgéas**
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Grenoble / France

Date: Tuesday, 30/04/2024

Time: 14:30-15:30h

Location: Online / ZOOM

Title: **What can 3D multiscale imaging bring to the mechanics of textile reinforcements during their forming?**

Abstract

Abstract: Woven fabrics are multiscale textile reinforcements used in numerous structural polymer composites. During their forming, these fibrous materials undergo large and complex deformation which have drastic impacts on the physical and mechanical properties of the produced composite parts. If the woven textile mechanics has been studied for several decades purposely, there is still no constitutive model able to capture properly all the key features of this mechanics. Thanks to (i) the facilities offered by laboratory or synchrotron X-Ray microtomographs, combined with (ii) mechanical setups developed for in situ imaging and (iii) dedicated image analysis procedures to analyze the deformed fibrous structures and related kinematical fields, it is possible to better understand the deformation mechanisms arising at various scales during the deformation of a textile. In this lecture, this approach is illustrated using two typical examples, i.e., the bias extension of a woven fabric and the bending of a fiber bundle.

You are cordially invited to take part in the event!

Prof. Dr.-Ing. Thomas Böhlke
(Spokesperson of GRK 2078)