EINLADUNG

Hiermit lade ich ein zum öffentlichen Promotionskolloquium von

Herrn M.Sc. Prateek Sharma
Technische Mechanik
(Prof. Dr.-Ing. Stefan Diebels)

am

Dienstag, 23. November 2021, 13:00 Uhr s.t.
in Gebäude A4.2, Raum 1.12.1 *)

und

per Videokonferenz in MS Teams: https://bit.ly/3bRo3fS

Thema der Dissertation:

Thermodynamically Consistent Material Model for Moisture Transport in Polymers

Polymers are omnipresent materials and their extensive use demands optimally designed components. The effect of moisture is generally ignored in such designing practices or is simplified as a reduction of stiffness with increasing moisture content. However, the interaction of moisture with the polymer chains leads to phase change, swelling, and altered moisture absorption rate among other effects. In this work, a material model is developed which can describe the effect of moisture on the mechanical behaviour of polyamide as well as the effect of mechanical loading on moisture transport. The theory of mixtures is utilised to develop the material model and derive its equations. The fully coupled model is checked for thermodynamic consistency and is concretised phenomenologically. A simulation tool is developed with the material model and is validated with stationary as well as transient experiments. Thus, a numerically stable model for polyamide that couples the mechanical deformation and moisture transport is presented.

*) Die Teilnahme in Präsenz ist nur möglich unter Einhaltung der geltenden 3 G-Regeln!

Saarbrücken, 8. November 2021

Prof. Dr. Christian Motz