

Zlín, July 20, 2025

A report on Julian Niklas Rech, the author of thesis

"Reinforcing mechanisms of polymer matrix composites: evaluation and modeling of matrix/dispersed phase interrelationship"

Julian's dissertation represents a thorough and original contribution to the field of polymer composite mechanics. His work successfully combines theoretical modeling, experimental techniques, and advanced characterization to develop a novel understanding of interfacial adhesion effects in polymer composites.

One of the most impressive aspects of Julian's research is the development and validation of a modified modeling framework that integrates the effects of imperfect filler-matrix adhesion using the elementary volume concept. His ability to refine classical models and correlate them quantitatively with experimental data is a testament to both his scientific maturity and methodological rigor.

Julian also developed a viscoelastic model capable of predicting long-term creep behavior by incorporating filler content, orientation, and time-dependent adhesion. His approach is not only scientifically sound but also practical for the design of advanced composite materials in engineering applications. The results have a high degree of relevance for materials design in the automotive, aerospace, civil engineering and electronics industries.

Beyond the technical excellence of his work, Julian has consistently demonstrated exceptional motivation, independence, critical thinking, and collaborative skills. He has actively contributed to scientific publications and presented his work at international conferences with clarity and confidence.

I am convinced that Julian Rech has all the qualities necessary for a successful career in academia or industry R&D. He is a remarkable researcher, an excellent team member, and a person of great integrity. I recommend him without reservation for a doctoral degree.

Sincerely,

Prof. Ing. Berenika Hausnerová, Ph.D.

Supervisor of the doctoral thesis

Tomas Bata University in Zlín