



Der Vorsitzende des Promotionsausschusses

EINLADUNG

Hiermit lade ich ein zum öffentlichen Promotionskolloquium von

Herrn Dipl.-Ing. Bruno Alderete

Funktionswerkstoffe

(Prof. Dr.-Ing. Frank Mücklich)

am

Dienstag, 17. Juni 2025, 14:30 Uhr s.t.

per Videokonferenz: Link für MS Teams: <https://tinyurl.com/2waptjnx>

Raum für die Prüfung: Gebäude D3.3; Raum 2.15

Thema der Dissertation:

Design, Characterization, and Modeling of New Electrical Contact Material Systems Containing Carbon Nanoparticles

The increasing electrification of modern society calls for more reliable and durable electrical contacts, placing greater demands on material performance. This thesis investigates carbon nanostructures as a means to enhance the properties of silver- and copper-based contacts through two main strategies: nanocarbon coatings for static connectors and carbon nanotube (CNT)-reinforced metal matrix composites for switching electrodes. Carbon black and CNT had the lowest impact on conductivity, while offering excellent wear resistance, with CNT coatings minimizing the substrate's oxidation and generating superhydrophobic surfaces. CNT-reinforced composites improved contact elasticity and enhanced switching performance by minimizing arc instability and molten pool duration without degrading the reinforcement phase.

Saarbrücken, 3. Juni 2025

Prof. Dr. Uli Kazmaier