



Der Vorsitzende des Promotionsausschusses

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## EINLADUNG

Hiermit lade ich ein zum öffentlichen Promotionskolloquium von

**Herrn M.Sc. Daniel Wyn Frank Müller**

Funktionswerkstoffe

(Prof. Dr.-Ing. Frank Mücklich)

am

**Montag, 7. Juli 2025, 14:00 Uhr s.t.**

per Videokonferenz: Link für MS Teams: <https://msteams.link/QY37>

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

### **Thema der Dissertation:**

### **Modifying the Antimicrobial Properties of Copper Surfaces by Ultrashort Pulsed Direct Laser Interference Patterning (USP-DLIP)**

Bacterial biofilm formation on technical surfaces can result in material erosion and the dissemination of infectious diseases. The antiseptic effect of copper, already known in the advanced civilizations of antiquity, can be applied in countering decontamination measures. This work investigates how the active antimicrobial properties of copper surfaces can be further optimized by targeted functionalization via ultrashort pulsed direct laser interference patterning. This encompassed the adjustment of bacterial surface contact conditions on a topographical level by periodic structures on the scale of individual bacteria cells. Parallely induced process-related modifications of the surface chemistry and the microstructure are furthermore monitored with regard to their influence on the integrated mechanisms involved in the expression of antimicrobial copper surface efficacy. The knowledge gained facilitates a more profound comprehension of bacteria/surface interaction on copper surfaces supporting in a more targeted use in decontamination strategies.

Saarbrücken, 23. Juni 2025

Prof. Dr. Uli Kazmaier