



The chairman of the doctoral committee

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## INVITATION

I hereby invite you to the public doctoral colloquium of

**M.Sc. Aisha Saddiqa Ahmed**

Funktionswerkstoffe  
(Prof. Dr.-Ing. Frank Mücklich)

am

**Thursday, February 19, 2026, 11 am (11:00)**

Via videoconference:

link for MS teams: <https://msteams.link/SN94>

Room: Building D3.3, Seminar Room R. 2.15

### **Thesis topic:**

### **Surface Modification of Copper-Based Alloys in Antibacterial Application**

Multidrug-resistant pathogens highlight the need for antibacterial materials beyond antibiotics. Copper alloys were structured using ultrashort pulsed direct laser interference patterning (USP-DLIP) to enhance antibacterial activity. Testing against *Escherichia coli* showed that composition, oxidation, and microscale topography ( $\sim 3\mu\text{m}$ ) jointly boost contact killing, with citric acid etching further increasing copper exposure. Line-like patterns outperformed honeycomb designs, providing a scalable strategy for durable antimicrobial surfaces in healthcare and public spaces.

Saarbrücken, February 4, 2026

Prof. Dr.-Ing. Georg Frey