



The chairman of the doctoral committee

INVITATION

I hereby invite you to the public doctoral colloquium of

M.Sc. Aisha Saddiqah 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