



Der Vorsitzende des Promotionsausschusses

EINLADUNG

Hiermit lade ich ein zum öffentlichen Promotionskolloquium von

Frau M.Eng. Lucía Paula Campo Schneider

Funktionswerkstoffe

(Prof. Dr.-Ing. Frank Mücklich)

am

Freitag, 4. September 2026, 10:00 Uhr s.t.

per Videokonferenz: Link für MS Teams: <https://shorturl.at/860JG>

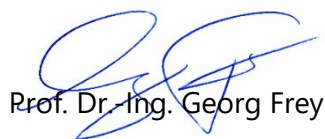
Raum für die Prüfung: Gebäude D3.3, Raum 2.15

Thema der Dissertation:

**Nickel effects in low-alloy tempered martensitic steels:
From microstructure evolution to mechanical response**

This thesis investigates how nickel influences the microstructural evolution and cryogenic performance of medium-carbon low-alloy tempered steels. Integrating thermo-kinetic simulations, atom probe tomography, and constitutive modelling, the research reveals how nickel drives phase stability and austenite reversion. Crucially, while nickel additions below 2 wt. % optimize the strength - toughness balance, higher amounts (2 - 5 wt. %) can form unstable reverted austenite that easily transforms into brittle "fresh" martensite, severely impairing fracture toughness. By clarifying these nanoscale mechanisms and dynamic recovery behaviors, this work establishes a predictive framework for designing resilient, high-strength steels tailored for extreme, low-temperature applications like liquefied gas storage.

Saarbrücken, 21. August 2026



Prof. Dr.-Ing. Georg Frey