

Dr.-Ing. Sarah Fischer
Forum Produktion 2023 – 9.-10. Mai 2023

Funktionsintegration durch additive Fertigung: Herausforderungen für die Qualitätssicherung und Instandhaltung

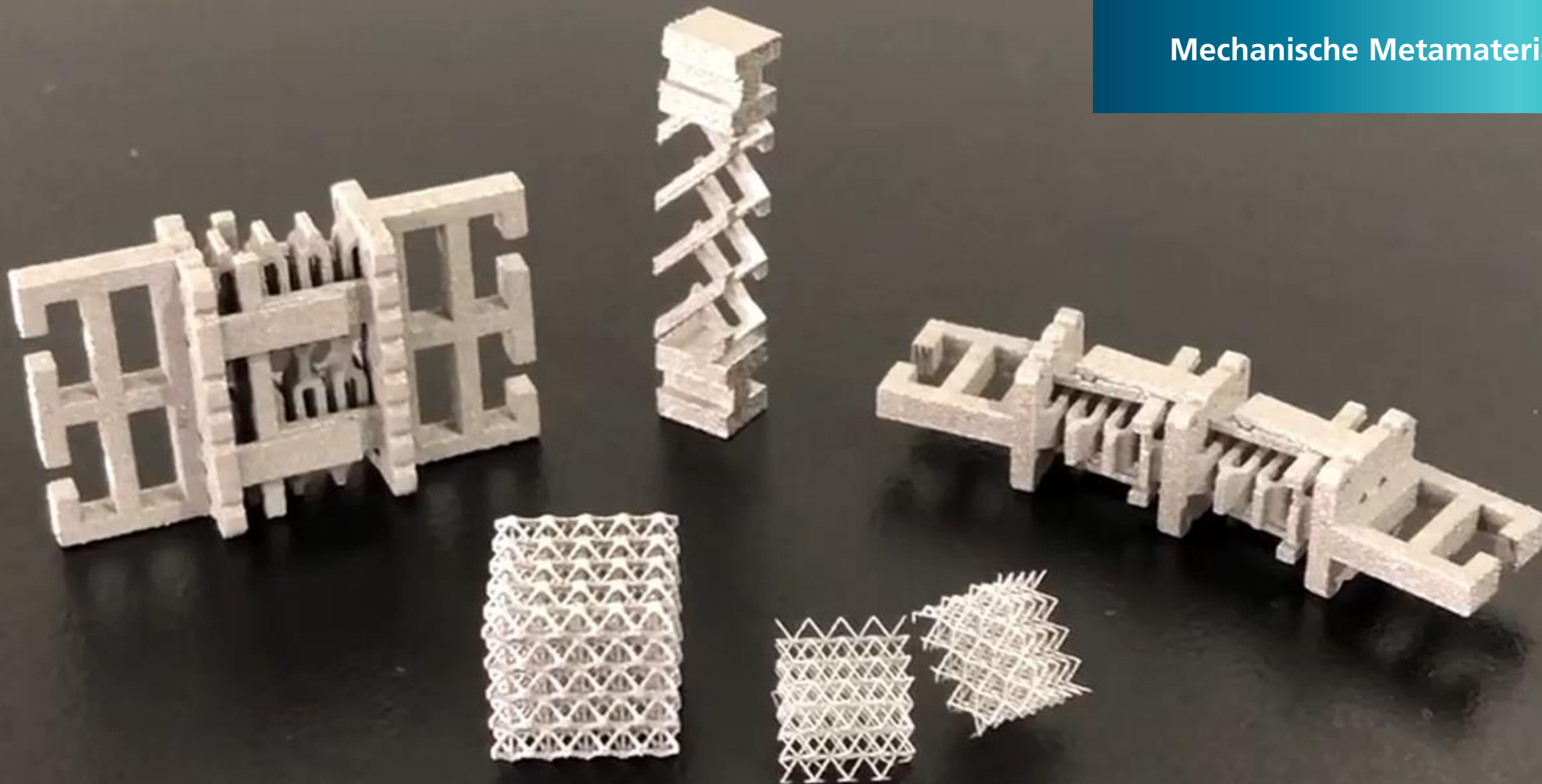
**Mechanische Funktionsintegration
durch additive Fertigung**



Mechanische Funktionsintegration durch additive Fertigung



Mechanische Metamaterialien



Design und additive Fertigung von komplexen Materialsystemen



Material



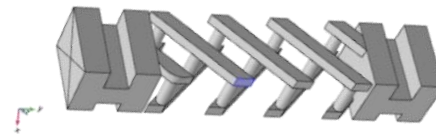
3D Modell



Bauteile

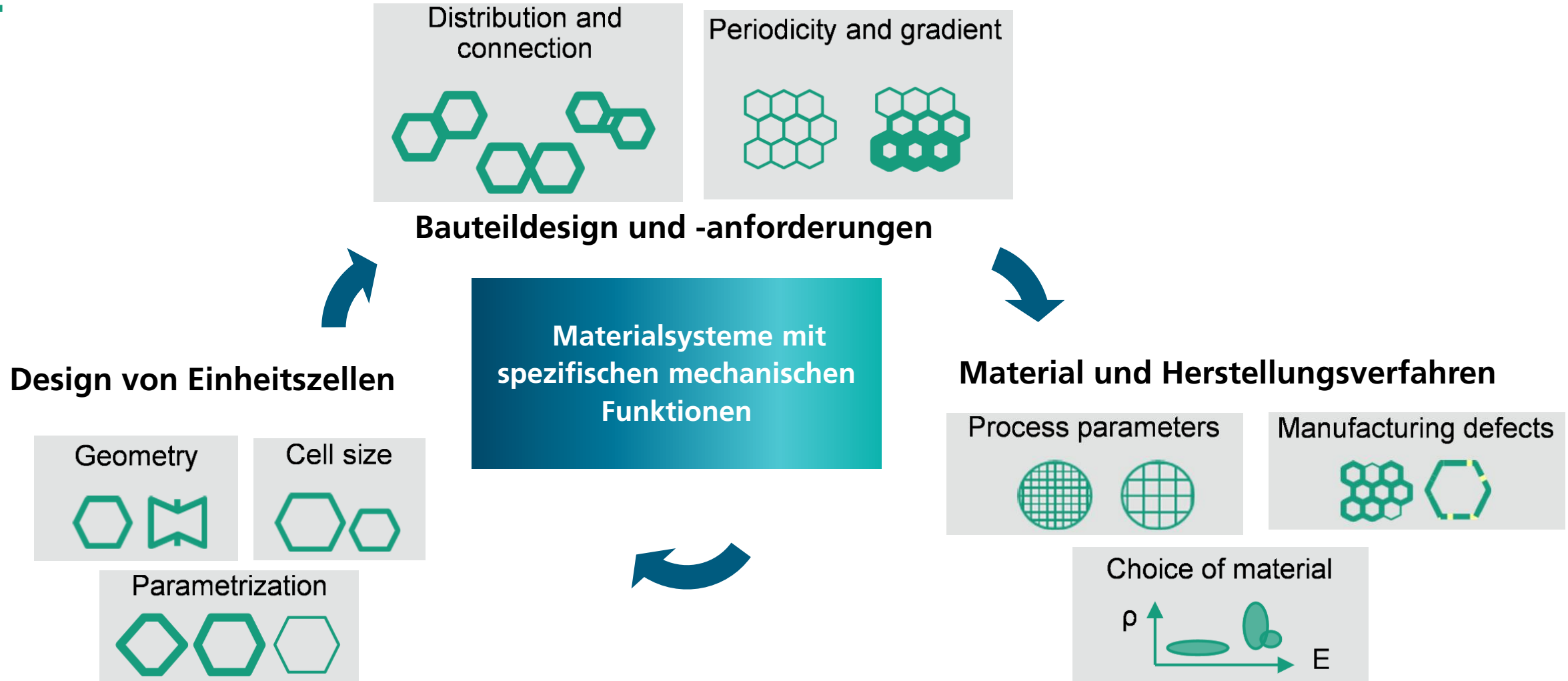
Metall

Ti-6Al-4V



Additive Fertigung von mechanischen Metamaterialien

Mehr als nur Design und Simulation von Einheitszellen



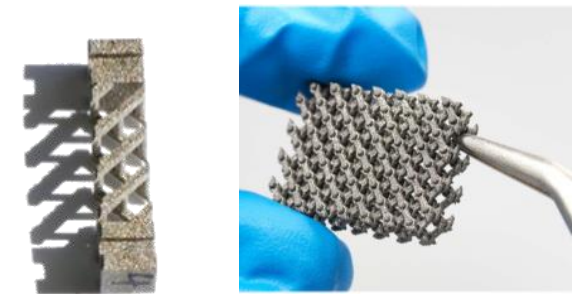
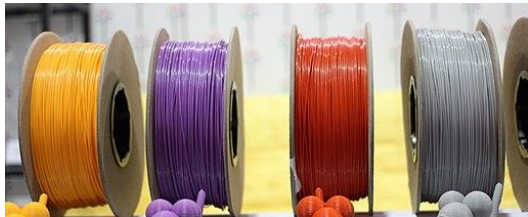
Design und additive Fertigung von komplexen Materialsystemen



Material



Materialsystem



Design und additive Fertigung von komplexen Materialsystemen



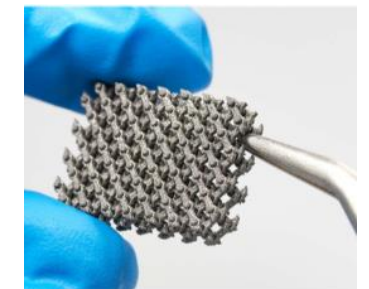
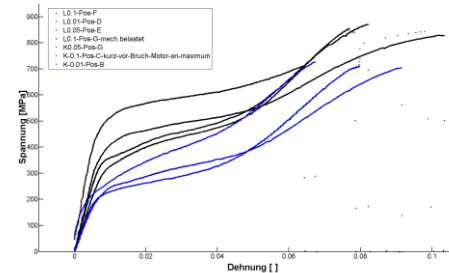
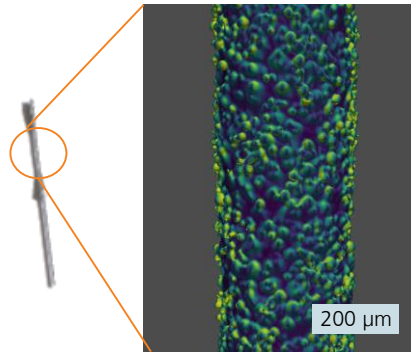
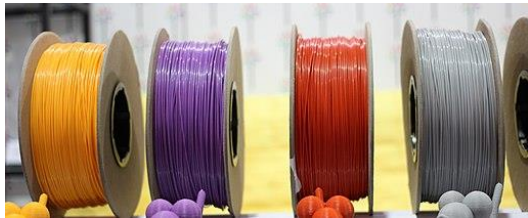
Material



Designelemente



Materialsystem



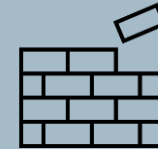
Design und additive Fertigung von komplexen Materialsystemen



Material



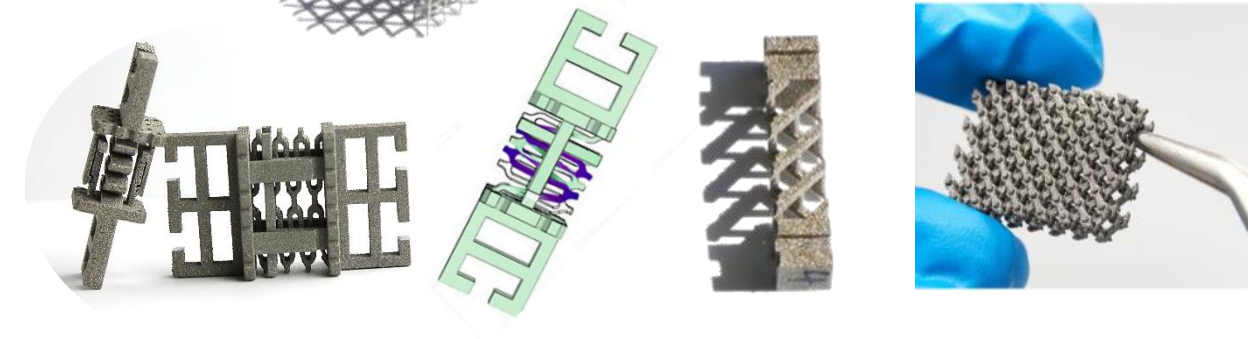
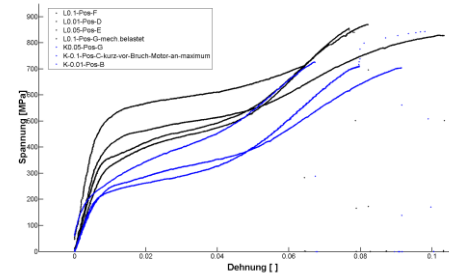
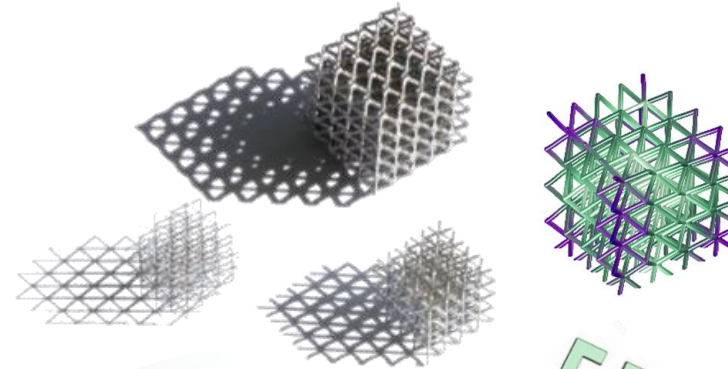
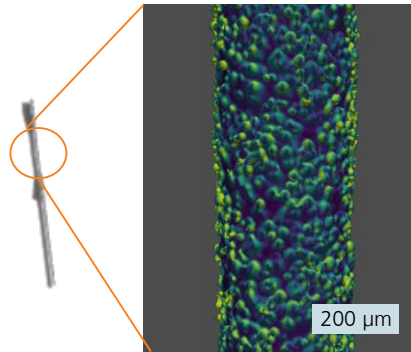
Designelemente



Einheitszellen



Materialsystem



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Photo https://commons.wikimedia.org/wiki/File:Powder_steel.jpg taken by Aney, 2006-03-12, GFDL

Qualitätssicherung für Additive Fertigung

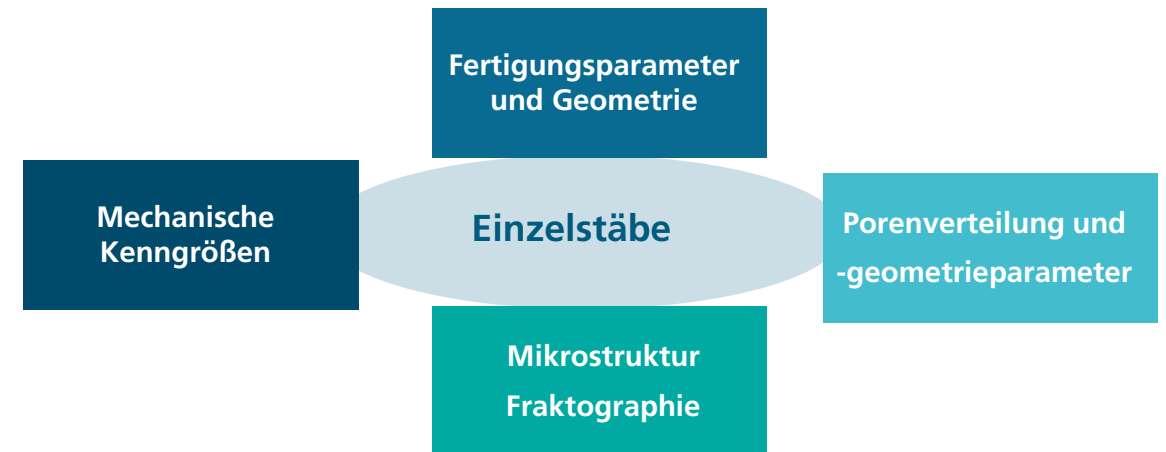
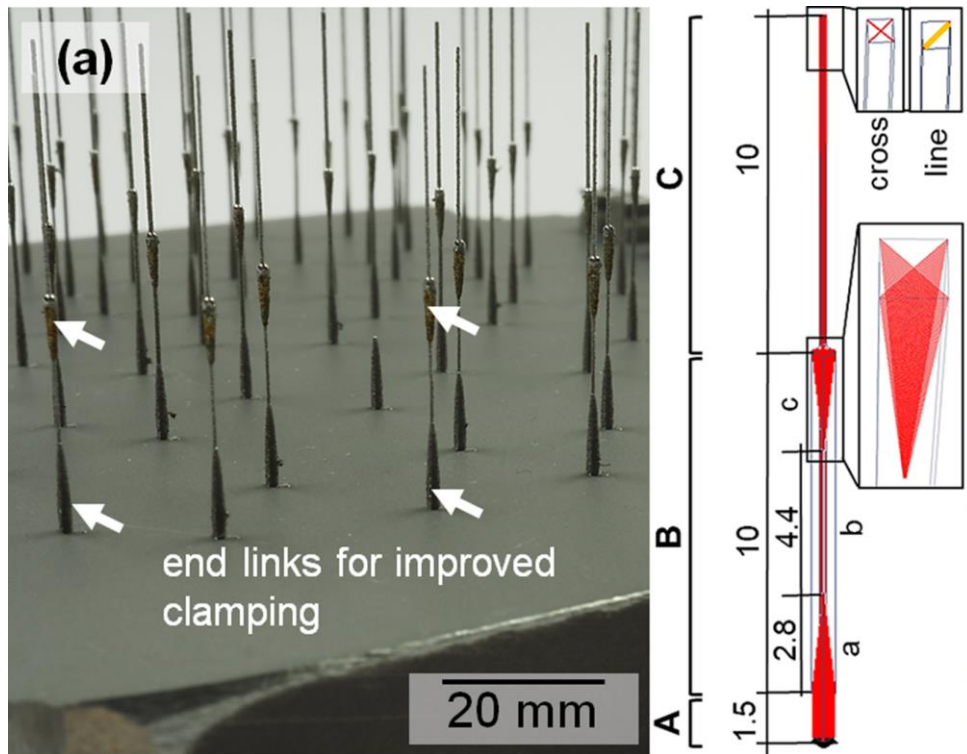


Untersuchungen an Einzelstäben



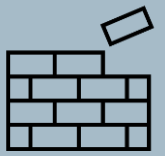
Designelemente

NiTi struts Ni50.9Ti49.1 (at%) – diameter 180 – 350 μm

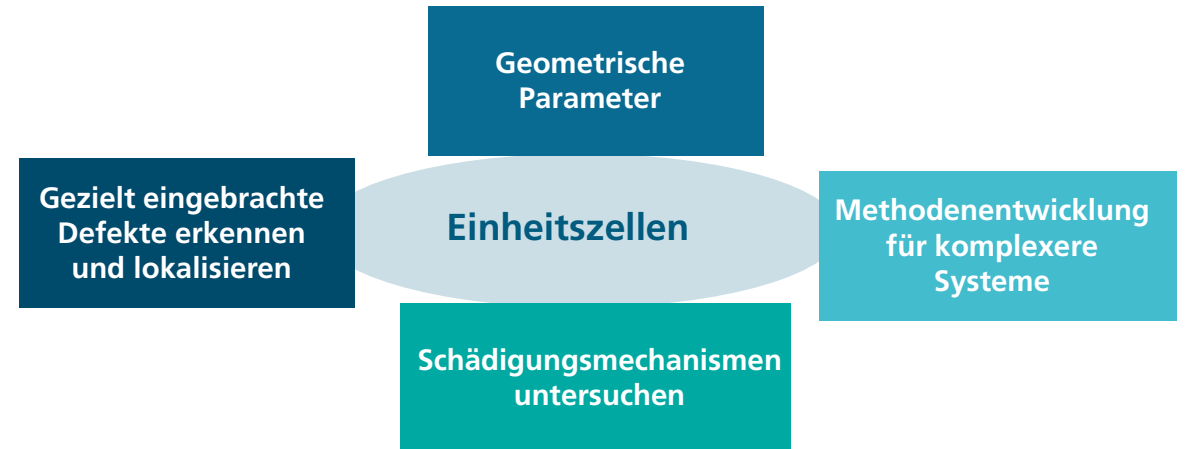
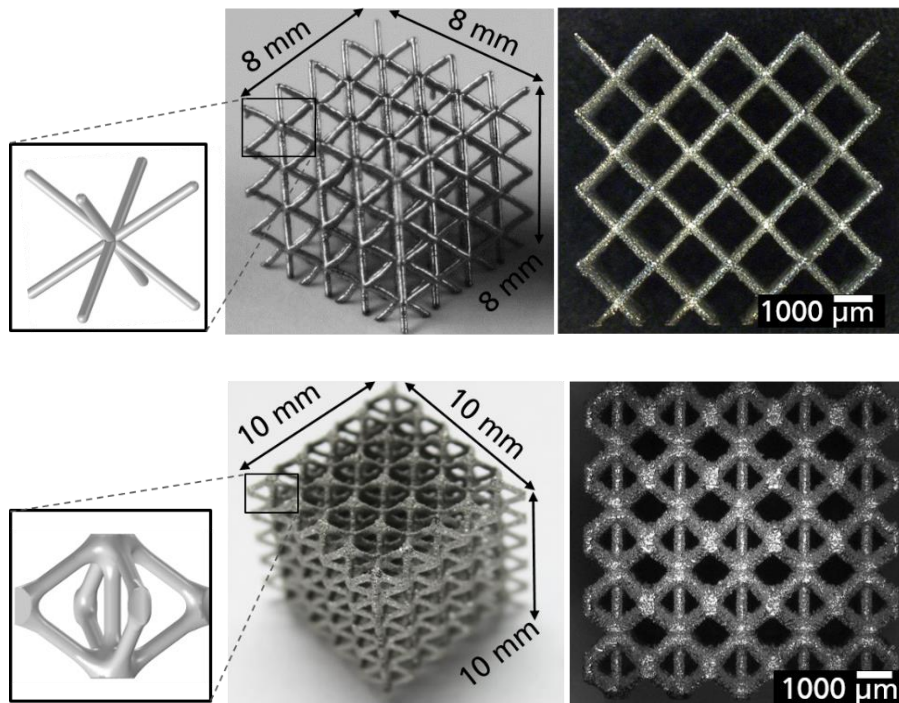


Untersuchung von Modellstrukturen

Basis für die Methodenentwicklung an komplexeren Strukturen

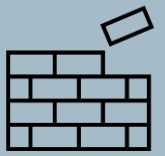


Einheitszellen

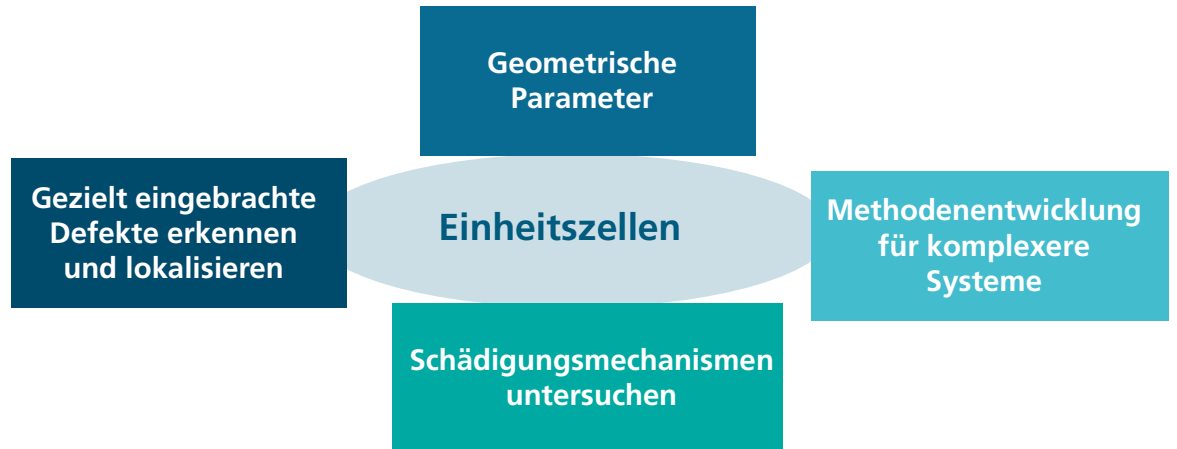
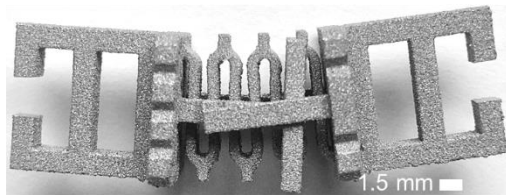
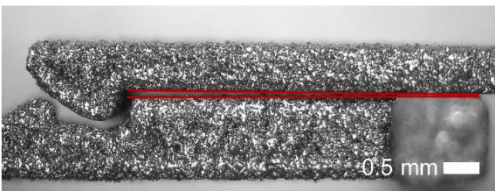
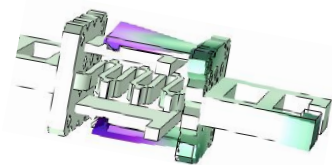
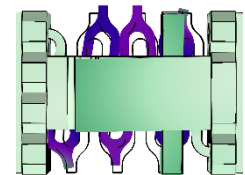
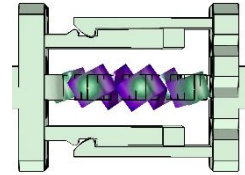
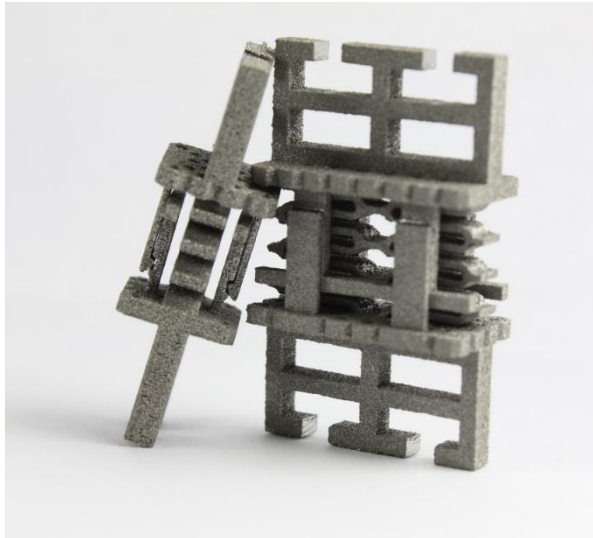


Untersuchung von Modellstrukturen

Basis für die Methodenentwicklung an komplexeren Strukturen



Einheitszellen

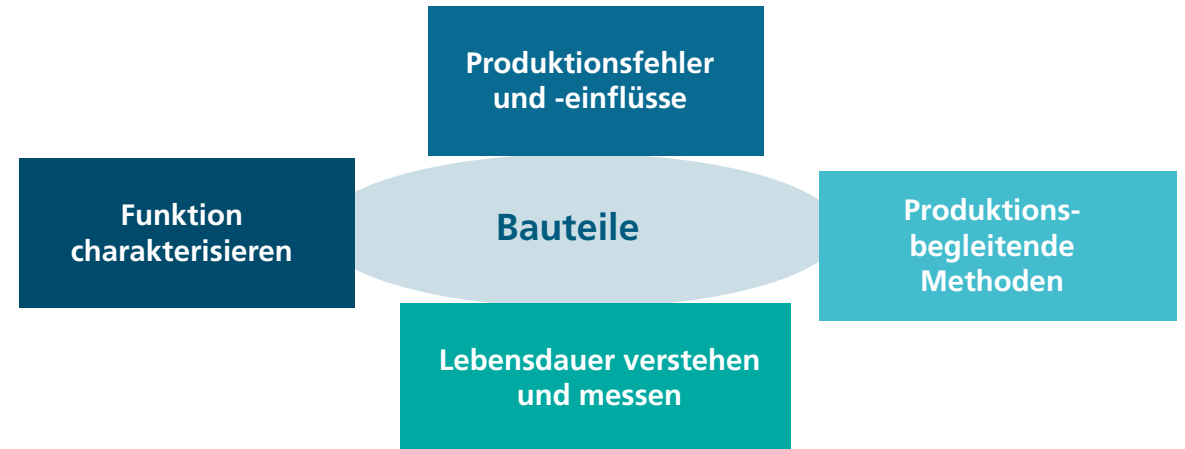
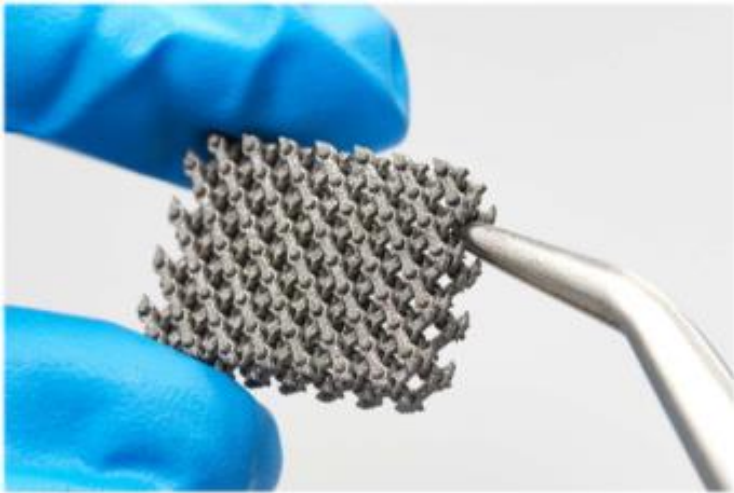
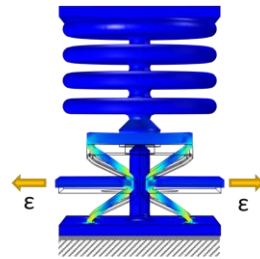


Untersuchung von Bauteilen

Praxisnahe und anwendungsspezifische Methoden



Bauteile



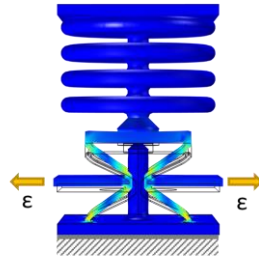
Mechanische Funktionsmaterialien charakterisieren



Bauteile

Programmierbare Materialien

Fraunhofer Cluster ProgMat



Kaal, W.; et al. Programmable Materials 2023, 1, E1.
doi:10.1017/pma.2022.1



Wenz, F. et al. Adv. Eng. Mat. 2022, 25(3), 2201022
doi: 10.1002/adem.202201022

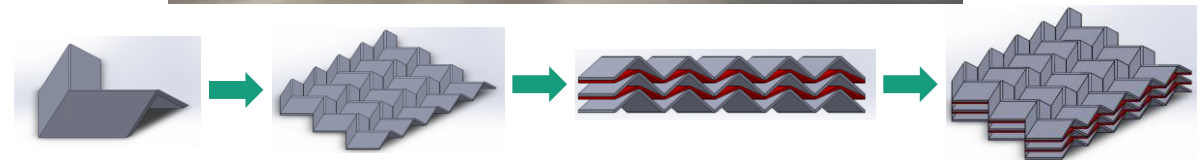
Hybride Schäume

Kooperation Prof. A. Jung (HSU-HH)



Publications in preparation

Miura-Ori Strukturen und akustische Metamaterialien



Schwarz, A. et al. Adv. Eng. Mater. 2022, 24, 2200386 doi: 10.1002/adem.202200386



Förderung:  **Fraunhofer**



Bundesministerium
für Bildung
und Forschung



Bundesministerium
für Ernährung
und Landwirtschaft



Fraunhofer
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Vielen Dank für Ihre Aufmerksamkeit

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