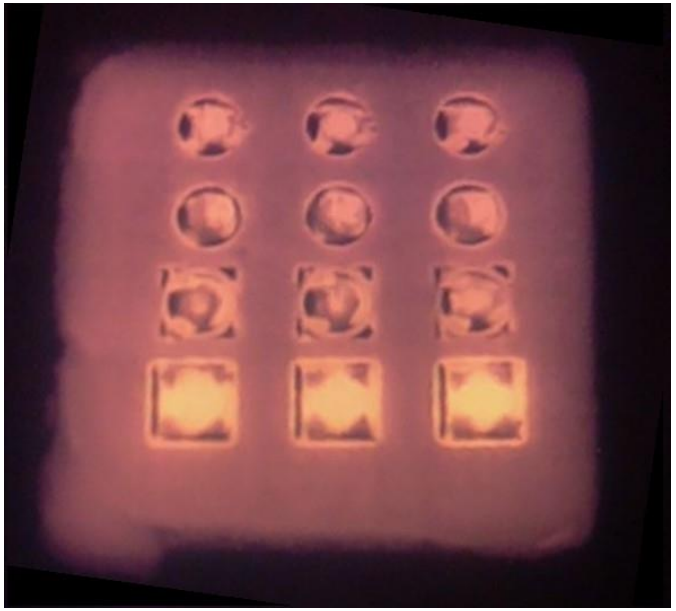
Bachelor-/Masterthesis

Topic: **Open-system SEBM with CMSX4 for advanced melt pool control and complex SX geometry**

Commencement: After consulting

Abstract: Additive manufacturing by selective melting of a powder bed using a focused electron beam (short SEBM) is a novel manufacturing technique with outstanding potential for material scientist. A powerful example is the successful creation of single crystalline samples (SX) using CMSX4 powder, an alloy which is usually considered non-weldable.

However, commercial SEBM systems have significant limitations for the development of new research strategies in the field of SEBM. In September 2022, ZMP will launch a new SEBM-system HADES which combines in-situ process monitoring with a freely programmable electron gun system. This machine will become the primary research environment for high temperature Ni-based materials for WTM and ZMP.



Examples of future research fields include:

- Scaling experiments for larger/ smaller SX structures
- Correlation between new scan-strategies and microstructure
- Validation of new melting strategies for enhanced melt pool control
- Validation of new melting strategies for complex SX geometries

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If you are interested, the supervisor can provide additional information on other topics in this field of research.