

MATERIALS CHARACTERIZATION AND TESTING

Thesis / Internship / Student assistant

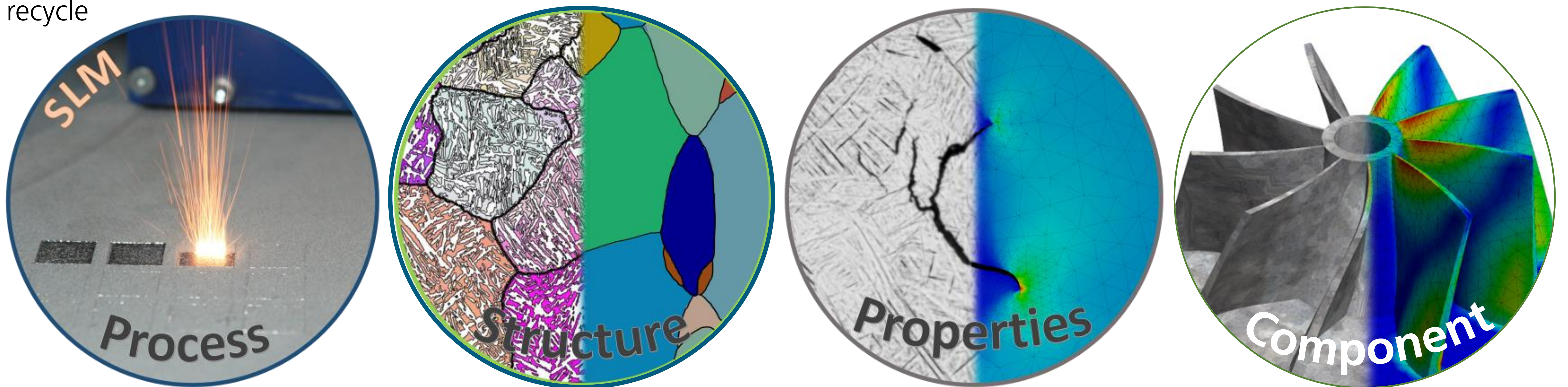
Prof. Dr.-Ing. Martina Zimmermann

Fraunhofer
IWS

TECHNISCHE
UNIVERSITÄT
DRESDEN

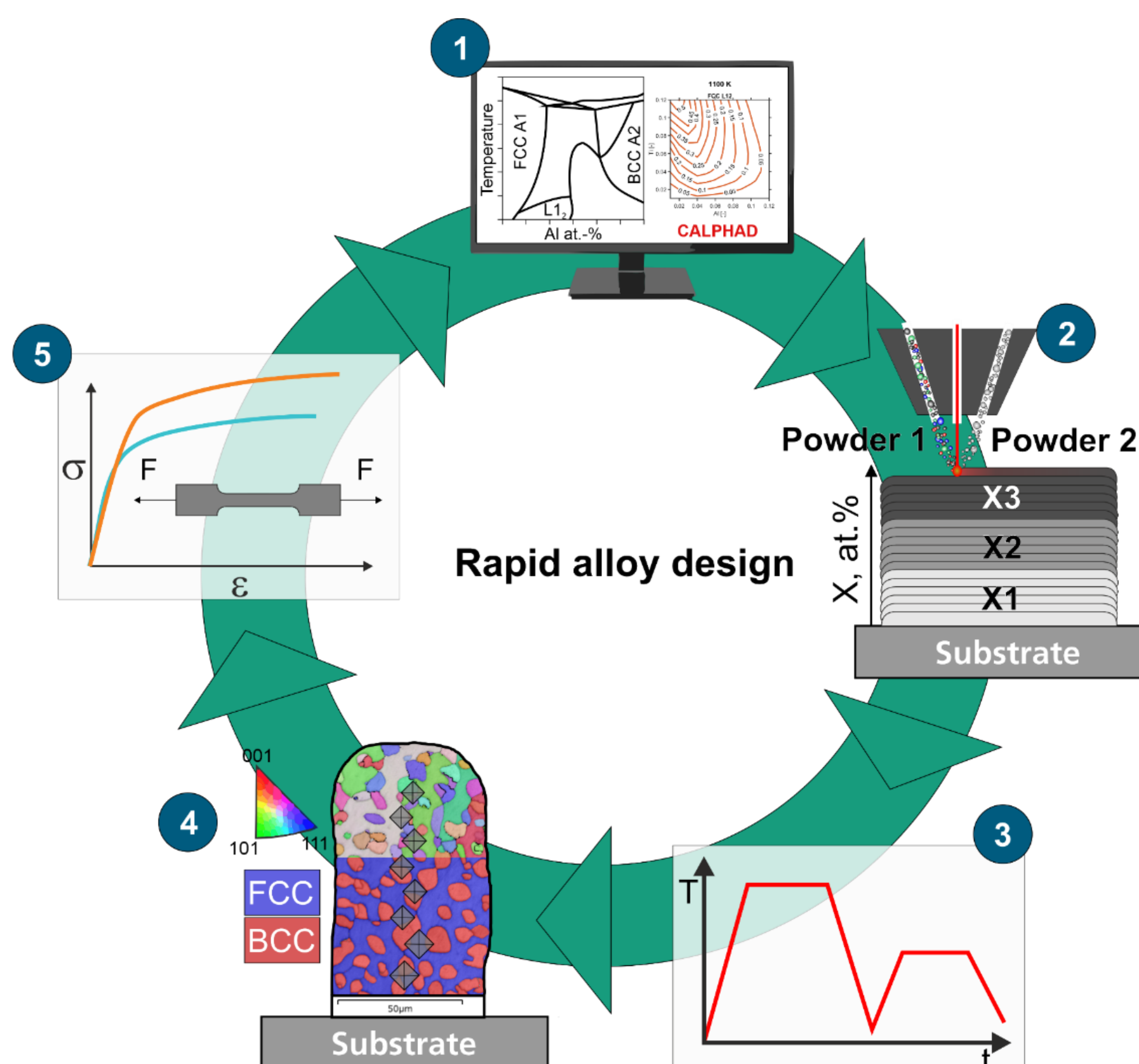
Subject areas:

The Competence Field of Materials Characterization and Testing deals with analyzing of mechanical properties, the structural composition of materials and coatings as well as their influence by modern manufacturing and processing procedures. A current major activity of our work is the development and design of novel materials, especially for additive manufacturing and coating technologies. We pursue the goal of increasing the durability of products, improving process efficiency, reducing energy and material consumption, and enabling the substitution of hazardous materials or materials that are difficult to recycle



Process - Structure - Properties - Functionality

- Laser cladding
- Laser powder bed fusion
- Laser welding
- Grain structure (Grain size)
- Texture (EBSD)
- Phase analysis (EBSD/EDS)
- Hardness
- Tensile, bending strength
- Fatigue strength
- Turbine components
- Dissimilar metals' joints
- Coatings for high temperature applications



Possible tasks:

- Thermodynamic simulations: prediction of phase formation and stability at different temperatures
- Planning and conducting of experiments for characterization of material's microstructure and properties
- Further development of characterization techniques for accelerated alloy development and screening

Facilities & techniques:

- ThermoCalc Software for thermodynamic calculations with MatLab-Toolbox for batch simulations
- Scanning electron microscopy with wide-ranging analytics: EBSD, EDS etc.
- Confocal laser scanning microscopy for surface characterization
- Diverse equipment for mechanical characterization: tensile and bending machines, hardness measurements
- And much more...

If you are interested in described topics, fill free to get in touch with us!