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**Multi-component Phase Diagrams: Maps for
the Design of High Entropy Alloys**

Diskussionsleitung: Prof. Dr. H.J. Seifert

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Multi-component Phase Diagrams: Maps for the Design of High Entropy Alloys

Different from the traditional alloys, which are usually based on one or two key components, high entropy alloys (HEAs) require the use of multiple principal components. While this opens vast unexplored compositional space for alloy design, selection of the right alloy compositions with desired properties becomes even more challenging.

Phase diagrams, which provide an intuitive way of understanding the correlation among the microstructure and composition, temperature, and pressure, are usually referred to as road maps for materials design and development. While determination of a phase diagram solely by the experimental approach is feasible for a binary or simple ternary system, it becomes extremely difficult for a multi-component system.

CALPHAD method, which emerged as a method for calculating phase equilibria and thermodynamic properties of complex multi-component, multi-phase systems, has become an effective approach for modern materials design. In this presentation, I will first explain how to use phase diagrams to understand HEAs. I will then demonstrate how to use CALPHAD method and multi-component phase diagrams to guide the design of HEAs.