



Karlsruhe Institute of Technology

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76344 Eggenstein-Leopoldshafen, Germany

**Institute for Applied Materials  
Solid and Biomechanics (IAM-WBM)**

Head: Prof. Christoph Kirchlechner

Bachelor thesis work

**Micro-tensile deformation behavior of high entropy alloys**

Date: 11.08.2020

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**Motivation:**

Equiatomic alloys consisting of five or more principal elements, often termed as high-entropy alloys (HEAs), have attracted numerous scientific interests during the last 15 years due to their outstanding mechanical properties, such as high strength, ductility and fracture toughness. This new class of alloy provides a huge unexplored compositional space and promising potentials of achieving promising properties. For one newly developed material, it is extremely important to investigate its mechanical properties and corresponding microstructural response.

**Objectives:**

The candidate is expected to perform micro-tensile tests and corresponding microstructural investigations, to achieve the following objectives:

1. Characterize HEAs mechanical properties such as ultimate tensile strength, elongation and determine effects of different testing parameters such as temperature, strain rate on mechanical properties.
2. Analyze microstructural evolution by means of in-house electron microscopy facilities to understand deformation and damage mechanisms under monotonic loading.

Finally, the candidate is expected to document obtained results in the form of a bachelor thesis.

**Requirements:**

This bachelor thesis topic is aimed at mechanical or material science and engineering students with an interest in mechanical behaviour of materials and materials characterization. Prior knowledge in these fields would be an advantage.

**Contact:**

If you are interested, please do not hesitate to contact (email id: kaiju.lu@kit.edu).

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