



**Institute of Thermomechanics, Czech Academy of Sciences**

invites you to a lecture within the lecture series **Institute of Thermomechanics Seminar**

## **Experimentally Validated Enhanced Constitutive Model of NiTi-based Shape Memory Polycrystals**

given by

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Shape memory alloys are metallic materials exhibiting unusual properties of being able to sustain and recover large strains and "remember" the initial configuration and return to it with temperature change. The peculiar mechanical response stems from rearrangements of the crystal lattice associated with a martensitic phase transformation induced by variation of temperature and/or variation of the applied mechanical load. The most common and practically utilized are polycrystals from nickel-titanium-based alloys, which exhibit many additional peculiarities of the mechanical response, e.g., the pronounced tension-compression asymmetry, the inclination towards strain localization, or appearance of an intermediate phase (R-phase). In the talk, the enhanced macroscopic constitutive model for NiTi SMA developed at the Institute of Thermomechanics will be introduced. It captures the mentioned phenomena via simple, albeit effective modifications of basic "building blocks" of a generic model formulated within the thermodynamics with internal variables. The enhancements of the model have been motivated by the state-of-the-art experimental research. The numerical implementation is based on the incremental energy approach. Simulations demonstrating the model's capabilities both at macro- and meso- scales will be presented and compared to experimental data..

**The lecture will be held on Thursday, December 10th, 2020, at 13:00**

**online via ZOOM meeting**

**<https://zoom.us/j/91077170690>**

**Meeting ID: 910 7717 0690**

**Passcode: 886284**