

**MATERIALS ENGINEERING**

**SEMINAR**

**“Effect of aging and precipitation on the martensitic transformation behavior in shape memory alloys”**

**By**

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**Purdue MSE Preliminary Exam**

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**ABSTRACT**

Martensitic transformation temperatures are important characteristics for shape memory alloys (SMAs) since they define the operating condition for specific SMA. Recently, there is a rapidly growing interest in using precipitates to tune the transformation properties, since precipitates can not only tune the transformation temperatures (TTs) but also make SMAs have better mechanical properties, such as high hardness, small functional fatigue, and good shape stability. The way that precipitates tune the TTs can be categorized into chemical effect and mechanical effect. In contrast to the chemical effect, which is simply the chemical partitioning to different phases, the mechanical effect is more complicated and still not well-studied. Therefore, the purpose of this document is to provide a comprehensive review of the mechanical effect of precipitates. The phenomenological theory of martensitic transformation and thermodynamics of martensitic transformation will be reviewed, followed by case studies of NiTi and NiTiHf two SMA systems.

**Date: Thursday, July 14, 2022**

**Time: 10:00pm**

**Place: ARMS 1021 or WebEx via <https://purdue.webex.com/meet/strachan>**



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