

TAC – Report for Kick-Off Meeting (2nd month)

- Discuss the Ph.D. task, scope, impact, feasibility and associated risk of the project and set up the Ph.D. task definition
- The TAC members should be nominated and the TAC agreement should be signed.

Date: 24.03.2022

Name, Surname (Ph.D. candidate): Kun Ge

Host institution: Helmholtz - Zentrum Dresden - Rossendorf

Starting date at the chair: 15.11.2021

Task for Ph.D. thesis:

Ph.D. Topic: *Time dependence of martensitic transformation of magnetic shape memory epitaxial films*

Research objective:

- * to explore the speed limit of martensitic transformation and to do the evaluation of time-dependency transformation under different timescale of heating and cooling speeds.
- * to understand the influence of cooling rate on scale bridging martensitic microstructure.
- * use Joule-heating and laser to do the in-situ resistance measurement and the synchrotron x-ray diffraction during heating and cooling.
- * to make a comparison on prototype model NiTi, Ni-Mn-Ga and the reentrant martensitic transformation

Ph.D. thesis supervisor/Doktorvater:	<i>Prof. Dr. Gianaurelio Cuniberti</i>
Scientific Day-to-Day supervisor:	<i>PD. Dr. Sebastian Fähler</i>

TAC Statements

1. Gained experiences/learnings/establishments

What are the student's experiences with other scientific cultures and other countries?

What has the student learned during the stay abroad/at other universities?

Which collaborations established during these stays are still active today?

Please see the attached page. Thank you.

2. Scientific qualifications/skills

Which scientific qualifications/skills should be acquired?

(1) Matlab for EBSD and calculation. (2) Finite Element analysis of heating and cooling curves. (3) giving presentations and writing (4) (time-resolved) XRD and following analysis by matlab.

3. Examination for students without Engineering degree

Every student without an Engineering degree needs to absolve two additional courses within the Faculty of Mechanical Science and Engineering to proof the engineering knowledge (see Promotion-sordnung §9, between 10 and 20 credit points in total).

Additional course I: _____

Additional course II: _____

☐ TAC agreement filled and signed.

Next TAC Meeting (date): _____

Signature Ph.D. candidate: _____

Yun Ge

Signature Ph.D. thesis supervisor/Doktorvater: _____

Signature Day-to-Day supervisor: _____

S. Fackel

After signature, please hand in this report to the office of Prof. Cuniberti.

What are the student's experiences with other scientific cultures and other countries?

The student's study experiences in China are shown below:

Chinese Academy of Sciences, (XTPIC-CAS) Urumqi, China Jan. 2015 - Nov. 2016
Master thesis: Study on Nitroaromatic's SERS Activity and Its Steam Sensitive Detection.
Supervisors: Prof. Dr. Zhong Wei & Prof. Dr. Xincun Dou

Shihezi University Shihezi, China Sep. 2014 - Jun. 2017
Degree: M. Eng. in 'Chemical Engineering'

Henan Normal University (HNU) Xinxiang, China Sep. 2010 - Jun. 2014
Degree: B. Eng. in 'Chemical Engineering and Technology'

What has the student learned during the stay abroad/at other universities?

The student finished her second master's degree in TU Chemnitz, from where she learned the self-learning ability, the teamwork ability and strengthened her English. Also, she learned basic German and passed the CEFR B1 in 2019.

The student finished her master thesis under the guidance of Dr. Sebastian Fähler in IFW Dresden. From there she gained the knowledge of principles in the shape memory alloy area and skills of handling the equipments including DC magnetron sputtering, SEM, XRD (including Pole Figure measurement and RSM), AFM, PPMS (VSM) and RTA. She learned how to use the tools like Origin, CaRIne Crystallography, WSxM, Coredraw, JADE-ICDD, GIMP.

Which collaborations established during these stays are still active today?

The student already established the collaborations here in HZDR and in IFW for the involved equipments already. As shown in the following form:

Lab & equipment	Collaborator	Location
DC Magnetron sputtering	Yuru Ge / Satyakam kar	HZDR / IFW
SEM/EDX/EBS	Dr. L. Bischoff	HZDR
TEM	Dr. René Hübner	HZDR
XRD smart lab (Tilting angle, Pole figure, RSM)	Dr. F. Ganss	HZDR
PLA	Dr. S. Zhou	HZDR
FLA	Dr. L. Rebohle	HZDR
RTA-N ₂	Dr. C. Fowley	HZDR
RTA-vacuum	L. Fink	IFW
VSM	Dr. S. Zhou	HZDR
Resistance measurement	Dr. S. Zhou	HZDR
AFM	Prof. O. Hellwig	HZDR
Synchrotron	Prof. P Gaal	DESY
Wire bonding	--	HZDR-FWI clean room
Current pulser	--	HZDR
MOKE system		