



## MICRESS Basic Training Course 2015

ACCESS, Intzestr. 5, D-52072 Aachen, Germany

**Tuesday, March 3<sup>rd</sup> 2015 (9:00-17:30)**

9:00 -9:30	Welcome <ul style="list-style-type: none"> <li>getting acquainted</li> <li>Introduction to ACCESS</li> </ul>	GJS
9:30 – 10:30	1) MICRESS- phenomenology	GJS
10:30 - 11:00	2.) Overview of a MICRESS simulation <ul style="list-style-type: none"> <li>configuration of a simulation: the Dri-File, other files</li> <li>running the simulation</li> <li>evaluation of results: txt files, mcr files, vtk</li> </ul>	GJS
11:00 – 11:30	Coffee break	
11:30 – 12:15	3.) Creation of a dri file step by step <ul style="list-style-type: none"> <li>command-line input/switch command</li> <li>modification of existing .dri files/in-files</li> <li>Example Delta-Gamma.dri</li> </ul>	GJS
12:15 – 13:00	4.) Post-Processing using DP_MICRESS	GJS
13:00 - 14:00	Lunch break	
14:00 – 14:30	5.) Further useful information.... <ul style="list-style-type: none"> <li>The license system</li> <li>Creation of a .ges File using ThermoCalc</li> <li>ThermoCalc Scheil-calculation as basis for MICRESS simulations</li> </ul>	GJS
14:30 – 15:30	6.) Exercises: Post-Processing using DP_MICRESS <ul style="list-style-type: none"> <li>Visualisation of a result</li> <li>Virtual-EDX</li> <li>Simultaneous visualisation of several results</li> <li>Visualisation options</li> </ul>	Tutors/ GJS/BB
15:30 – 16:00	Coffee break	
16:00 – 17:30	7.) Exercises: Simple modifications of existing .dri –files using the example of solidification of Fe-C-Mn <ul style="list-style-type: none"> <li>modifying the initial conditions</li> <li>modifying the alloy composition</li> <li>modifying process conditions</li> <li>Modification of properties (e.g. diffusion)</li> <li>Modifications according to ideas of the participants</li> </ul>	Tutors/ GJS/BB



## Wednesday, March 4<sup>th</sup> 2015 (9:00- 17:00)

9:00-10:00	Evaluation of simulation results of first day <ul style="list-style-type: none"> <li>Questions/Answers</li> </ul>	GJS/ BB
10:00 – 10:30	8.) Simulation of grain growth <ul style="list-style-type: none"> <li>The Multi-Phase-Field Model</li> <li>Uncoupled Phase-Field: Grain Growth</li> <li>Special Models for Grain Growth</li> <li>Definition of Initial Grain Structures</li> <li>Evaluation of Results</li> </ul>	BB
10.30 – 11.15	9.) Exercise: Grain Growth in Steel <ul style="list-style-type: none"> <li>Normal Grain Growth</li> <li>Solute Drag, Particle Pinning</li> </ul>	Tutors/ BB/GJS
11:15- 11:30	Coffee break	
11:30 – 12:00	10.) Simulation of phase transitions <ul style="list-style-type: none"> <li>Coupling to Solute Diffusion</li> <li>Nucleation</li> <li>Categorization</li> <li>Example: <math>\gamma</math>-<math>\alpha</math> Transformation</li> </ul>	BB
12:00 – 13:00	11) Exercise: $\gamma$ - $\alpha$ transition in Fe-C-Mn <ul style="list-style-type: none"> <li>linearized phase diagram,</li> <li>nucleation</li> </ul>	Tutors/ BB/GJS
13:00 - 14:00	Lunch break	
14:00 – 14:30	12) Coupling to Thermodynamic Databases <ul style="list-style-type: none"> <li>General Considerations</li> <li>Coupling to Thermodynamic Databases: Theory</li> <li>Coupling to Thermodynamic Databases: Practice</li> <li>Coupling to Multicomponent Diffusion Data</li> <li>Simulation Example: <math>\gamma</math>-<math>\alpha</math> Transformation</li> </ul>	BB
14:30 – 16:00	13.) Exercise: $\gamma$ - $\alpha$ Transition in Fe-C-Mn <ul style="list-style-type: none"> <li>coupling to databases, diffusion data</li> </ul>	Tutors/ BB/GJS
16:00 -16:15	Coffee break	
16:15 – 17:00	14.) Exercises : <ul style="list-style-type: none"> <li>Discussion: Topics of interest of the individual participants</li> <li>setting up a simulation</li> </ul>	Tutors/ BB/GJS
evening	Informal meeting in the city of Aachen	



## Thursday, March 5<sup>th</sup> 2015 (9:00 - 17:30)

9:00 – 10:30	14.) Exercises (continued) <ul style="list-style-type: none"> <li>• Evaluation of results</li> <li>• tips and tricks</li> </ul>	Tutors/ BB/GJS
10:30 – 11:15	15.) Linking to the Process <ul style="list-style-type: none"> <li>• Thermal Boundary Conditions</li> <li>• Boundary Conditions for the Simulation Domain</li> <li>• Coupling to other Field Variables</li> </ul>	BB
11:15 -11:45	Coffee break	
11:30 – 12:30	16.) Examples of advanced MICRESS simulations <ul style="list-style-type: none"> <li>• Superalloys</li> <li>• Steels</li> <li>• Light metals</li> <li>• others</li> </ul>	GJS
12:30 - 13:30	Lunch break	
13:30 – 14:30	17.) Solidification of technical alloys	BB
14:30 – 16:00	18.) Exercises: Solidification of technical alloys	BB
16:00 – 17:30	Final remarks/ optional lab tour/farewell	BB/NN

### Tutors:

BB	-	Dr. Bernd Böttger
GJS	-	Dr. Georg J. Schmitz
JE	-	Dr. Janin Eiken
RB	-	Dr. Ralf Berger
GL	-	Dr. Gottfried Laschet
MA	-	Dr. Markus Apel



## MICRESS Basic Training Course

March 3<sup>rd</sup> to 5<sup>th</sup> 2015

# Registration Form

Please fill and fax to

Access e.V. , Intzestr. 5, D-52072 Aachen

Tel.: +49-241-8098014, Fax: +49-241-38578,  
info@micress.de

Please register me for above MICRESS® training course:

Name	
First Name	
Affiliation	
Adress	
E-mail	
Phone	

The participation fee (excl. VAT) is 750 € for participants from academia and 1000 € for participants from industry. It comprises all coffee breaks, lunch at all three days of the course, participation in the evening event and an electronic documentation of the course lectures. The participation is limited to a maximum of 10 participants. One computer will be provided for use by each participant.

Please select payment options: cash on site ☐ or invoice ☐

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place,date

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signature