25th anniversary

The MICRESS® group at ACCESS e.V. is proud to celebrate its 25th anniversary!

Starting from different activities at ACCESS aiming at modelling microstructure formation in multicristalline solar silicon and in high temperature superconductors, the “Physica D paper” which appeared in early 1996, Fig. 1., marks a milestone in the development of microstructure modelling not only at ACCESS but around the entire globe. This article meanwhile has been cited[1] more than 885 times and has provided the grounds for numerous contemporary phase-field approaches.

ELSEVIER

Physica D 94 (1996) 135–147

PHYSICA D

A phase field concept for multiphase systems

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The Physica D paper has laid the initial grounds for the development of MICRESS® and has been – and continuously still is - complemented by numerous likewise important publications during the last 25 years such as:

J. Eiken: A Phase-Field Model for Technical Alloy Solidification, PhD Thesis (2009) ISBN : 978-3-8322-9010-8

J. Eiken, B. Böttger, I. Steinbach: Multiphase-Field approach for multicomponent alloys with extrapolation scheme for numerical application Phys. Rev. E 73 (2006) 066122

J. Eiken: Numerical solution of the phase-field equation with minimized discretization error IOP Conf. Ser.: Mater. Sci. Eng. 33 012105, doi:10.1088/1757-899X/33/1/012105

B. Böttger, J. Eiken, M. Apel: Multi-ternary extrapolation scheme for efficient coupling of thermodynamic data to a multi-phase-field model, Comput. Mater. Sci., 108, 283 (2015)

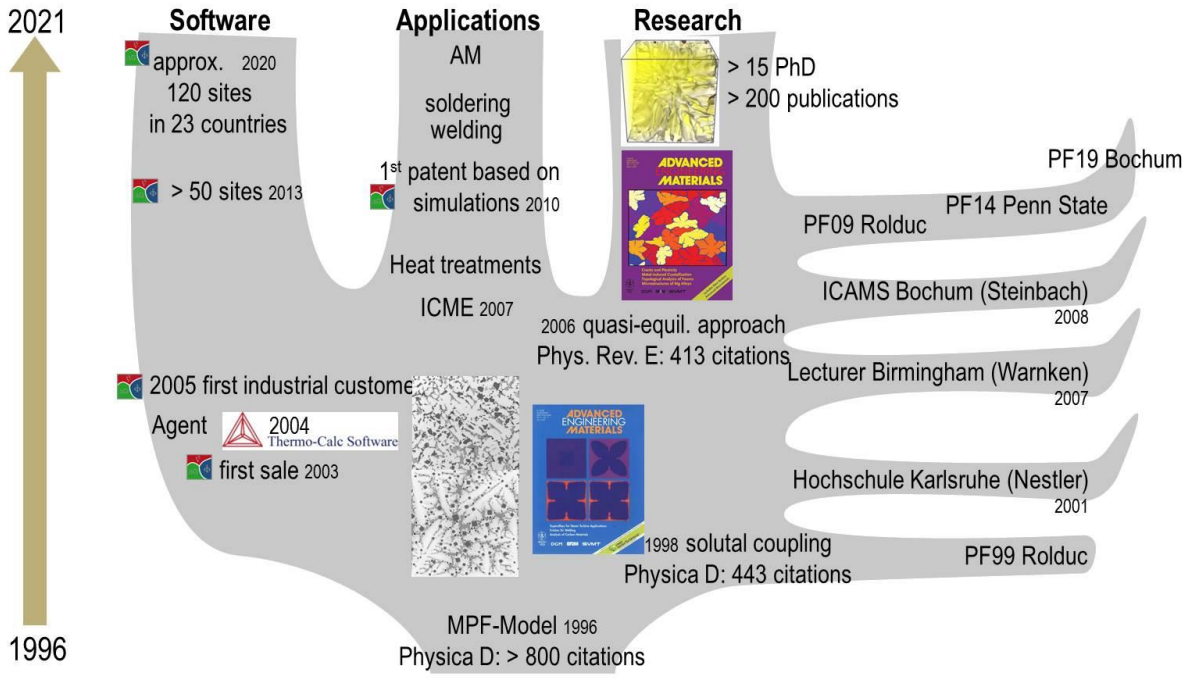
[1] According to google scholar on June 1st 2021

B. Böttger, J. Eiken, I. Steinbach: Phase field simulation of equiaxed solidification in technical alloys; Acta materialia. 2006, Vol. 54, pp. 2697-2704

B. Böttger, J. Eiken, M.Apel: Phase-field simulation of microstructure formation in technical castings – A self-consistent homoenthalpic approach to the micro–macro problem, J. Comput. Phys. 2009, pp. 6784-6795

B. Böttger, M. Apel, M. Budnitzki, J. Eiken, G. Laschet, B. Zhou: Calphad coupled phase-field model with mechano-chemical contributions and its application to rafting of γ' in CMSX-4; Computational Materials Science 184 (2020) 109909 https://doi.org/10.1016/j.commatsci.2020.109909

The milestones of the MICRESS® commercialization, Fig. 2, comprise the first installation at a third party site in 2001, the first commercial sale in 2003, the first sale to an industrial customer in 2005, the registration of MICRESS® and the MICRESS® logo as a trademark in 2006, a first patent being filed based on MICRESS® simulation results in 2010 as well as numerous PhD theses and more than 200 scientific publications being based on MICRESS® simulations.



Nowadays MICRESS® is installed in 23 countries and supported by our agents in the US/Canada, Brasil, Japan, Korea, China, India and Australia.

To celebrate our anniversary, the MICRESS® group and all our agents are happy to offer special

"25th MICRESS® anniversary" -conditions

for some of our products to all existing customers and future prospects.

Special activity to celebrate 25 years of MICRESS®:

To celebrate 25 years of MICRESS® together with our current and future customers we offer special conditions, which aim to promote the use of modules and functionalities not being part of the standard MICRESS® installation. In detail these modules are:

the MICRESS® flow module

The MICRESS® flow module allows investigating the effect of flow on phase formation and the effect of moving boundaries on evolving flow patterns. Typical applications of this module are the determination of the permeability of mushy zones or dendritic growth in a flowing liquid. It does not comprise features to tackle rigid body motion of particles in the melt.

the MICRESS® elastic module

The MICRESS® elastic module allows the calculation of elastic stresses originating form phase-transformations and also the influence of elastic stresses and strains on phase formation. Examples are the formation of cubic γ' and rafting in superalloys. Deformations are limited to small displacements only.

the HOMAT module

HOMAT draws on digital microstructure description resulting e.g. from MICRESS® simulations. It serves to determine effective material properties of heterogeneous materials. Thermal and thermoelastic properties as well as the Darcy permeability are determined by the asymptotic homogenization method while virtual tests are performed using e.g. Abaqus® to derive effective non-linear properties like elastoplastic flow curves, for which HOMAT provides suitable re-meshing tools.

The special conditions for "celebration purchases" ***apply to all orders received between June 1st and Dec. 31st 2021***. In detail following conditions are offered:

(i) for existing customers with expired maintenance and older versions

We will provide a permanent license for one of the above modules for free (including one year of free maintenance and support) upon placement of an up-date order for the existing old version, which automatically also includes one year of Maintenance & Support M&S.

(ii) for existing customers with active maintenance

We will provide a permanent license for one of the above modules for free (including one year of free maintenance and support) upon placement of an order for a one year extension of the M&S contract of the present installation. Alternatively we will extend the maintenance period of the base installation by one year in case of procurement of one of the modules.

(iii) for new customers :

We will provide a permanent license for one of the above modules for free (including one year of free maintenance and support) upon placement of an order for a new MICRESS academic TQ, MICRESS research TQ or MICRESS professional installation.

www.micress.de