

Session Program

13-17 Sept 2021

**EUROPEAN CONGRESS AND EXHIBITION ON
ADVANCED MATERIALS AND PROCESSES -
EUROMAT 2021**

***D8_Multiscale and multiphysics modelling of
materials, processes and products***

Virtual

Thursday 16 September

16:40

D8_Multiscale and multiphysics modelling of materials, processes and products: D8_1_Multiscale material modelling - Uncertainty quantification and application of AI

Session | Location: Room 10

16:40-17:20

Uncertainty in the Definition and Calibration of Multiscale Material Models (Keynote)

Speaker

Prof. David L. McDowell

17:20-17:40

Uncertainty quantification of computational models of magnesium implant degradation

Speaker

Ms Tamadur Adnan Albaraghteh

17:40-18:00

Specialised deep neural networks for large scale rigid particle simulation

Speaker

Gusten Isfeldt

18:00-18:20

Simulating and Verifying the Phase and Stress Evolution of a 50CrMo4 Steel Rod during Inductive Heat Treatment

Speaker

Daniel Mevec

18:20

Friday 17 September

09:50

D8_Multiscale and multiphysics modelling of materials, processes and products: D8_2 Modelling of microstructure and property evolution during production I

Session | **Location:** Room 10

09:50–10:10

From electrons to atoms to phase diagrams, all with machine learning (Highlight)

Speaker

Alexander Shapeev

10:10–10:30

Numerical simulations of stress-diffusion coupling

Speaker

Mrs Lisa Germain

10:30–10:50

Description of bainitic phase transformation coupled with diffusion in dissipative solids

Speaker

Swaroop Nagaraja

10:50–11:10

S-PFM simulation of grain growth with non-uniform grain boundaries

Speaker

Mr Ahmed Dimokrati

11:10–11:30

Grain structure simulation in Gas Tungsten Arc Welding by coupled Cellular Automaton (CA)-Finite Element (FE) method and fluid flow modeling

Speaker

Mr Chengdan Xue

11:30

11:50

D8_Multiscale and multiphysics modelling of materials, processes and products: D8_3 Modelling of microstructure and property evolution during production II

Session | **Location:** Room 10

11:50–12:10

Predicting the transformation strain that controls ductility and toughness in advanced steels (Highlight)

Speaker

Francesco Maresca

12:10–12:30

A thermo-mechanical model to simulate dynamics of dislocations in transient heterogeneous temperature fields

Speaker

Prof. Manas Upadhyay

12:30–12:50

Hybrid modeling of induction hardening processes

Speaker

Dr Mohammad Zhian Asadzadeh

12:50–13:10

Finite-Element Modeling of the residual stresses in case-hardened gears**Speaker**

Mr Valérien Iss

13:10–13:30

Impact of the heat treatment on the surface integrity after grinding of a case-hardened steel: Simulation and Experiment**Speaker**

Mr Soheil Rooein

13:30

14:40

D8_Multiscale and multiphysics modelling of materials, processes and products: D8_4_Multiscale modelling of deformation, damage and fracture**Session** | **Location:** Room 10

14:40–15:00

Hydrogen enhanced grain boundary embrittlement in Ni: DFT vs in situ electrochemical micro cantilever bending tests (Highlight)**Speaker**

Dr Vsevolod Razumovskiy

15:00–15:20

Modelling of the propagation of a short crack in ductile materials coupling phase field and dislocation dynamics**Speaker**

Luis Eon

15:20–15:40

Phase-field model coupling vacancy diffusion, dislocation climb and pore evolution**Speaker**

Mr Benoît Dabas

15:40–16:00

The mechanical behaviour of tungsten under irradiation and heat loads**Speaker**

Dr Johannes Van Dommelen

16:00

16:40

D8_Multiscale and multiphysics modelling of materials, processes and products: D8_5_Fluid dynamics based multiscale and multiphysics modelling**Session** | **Location:** Room 10

16:40–17:00

Coupled CFD and surface chemistry modeling of a Si epitaxy process in a single wafer reactor (Highlight)**Speaker**

Linda Jäckel

17:00–17:20

A Multiscale Simulation Method for Deposition Processes: Micrometer-scale Off-Lattice Film Growth with Atomistic Precision**Speaker**

Mr Erik E. Lorenz

17:20–17:40

Coherent-ballistic-diffusive phonon transport: multiscale modelling and experiments**Speaker**

Dr René Hammer

17:40–18:00

Metal deposition with gas metal arc applied to Invar steel alloy: three-dimensional evaluation of electromagnetic models**Speaker**

Mr Pradip Aryal

18:00–18:20

Multiscale modeling and simulation of anisotropic injection molded magnet: prediction of magnetic alignment during the filling stage**Speaker**

Da Seul Shin

18:20