



# International Conference on Modelling of Casting, Welding and Advanced Solidification Processes XVII

7<sup>th</sup> to 12<sup>th</sup> June 2026

Winchester, UK

## Conference Timetable

### 7th June 2026

14:00 to 18:00

Registration (Hotel check in from 15:00)

18:00 to 21:00

Welcome Reception and Buffet Dinner

### 8th June 2026

07:30 to 09:00

Breakfast

#### Industrial Challenges and Perspectives 1

Chair: Mark Jolly

09:00 to 09:20

Conference Opening Ceremony

*Andrew Kao and Catherine Tonry, University of Greenwich*

09:20 to 10:00

Advanced Research into Crystal Anisotropy and Nucleation Effects in single crystals (ARCANE) – industrial challenges to casting modelling for innovation

*Nick Green, The University of Birmingham*

10:00 to 10:20

Efficient Thermal–Mechanical Model of Steady and Dynamic Bulging

*Brian G. Thomas, Colorado School of Mines, Golden, CO*

10:20 to 10:50

Coffee Break

## **Industrial Challenges and Perspectives 2**

Chair: Brian G. Thomas

**10:50 to 11:10**

Simulation of solidification and remelting of accretion (mushroom) on AOD tuyere

*Hadi Barati, K1-MET GmbH*

**11:10 to 11:30**

In Search of Advanced Sedimentation Techniques for the Mitigation of Inclusions in Aerospace-Grade Structural Aluminium Alloy Casting: Ternary Baffle Configuration for Enhanced Sedimentation of Inclusions in Launder-Crucible Systems

*Mark Jolly, University of Greenwich*

**11:30 to 11:50**

A comparison of experimental and predicted results for vacuum arc remelting

*Caleb Schrad, Materials Engineering, Purdue University*

**11:50 to 12:10**

Control of hot cracking susceptibility by inter-layer heating strategies during L-PBF of IN738 parts

*Charles-André Gandin, MINES Paris - PSL - CNRS*

**12:10 to 12:30**

Effects of the slag band physical properties on the heat and mass transfer during initial solidification in continuous casting process

*Alexander Vakhrushev, Montanuniversität Leoben*

**12:30 to 14:00**

Lunch

## **Defects and Fluid Flow 1**

Chair: Miha Založnik

**14:00 to 14:20**

Prediction and control of the casting defects in the directional solidification of single-crystal nickel-based superalloys

*Jun Li, Shanghai Jiao Tong University*

**14:20 to 14:40**

Phase-Field–Crystal Plasticity Modeling of Solidification and Type-III Residual Stress in Nickel-Based Superalloy CM247LC

*Mostafa K. A. Salem, University of Sheffield*

**14:40 to 15:00**

Modeling of externally solidified crystal formation in aluminum high pressure die casting: physics-based and machine learning approaches

*Alan A. Luo, The Ohio State University*

**15:00 to 15:20**

Process parameter optimisation to prevent overdwelt defects in vertically upwards continuous casting of dilute Cu-Mg alloys

*Anna Katsiavria, University of Dundee*

**15:20 to 15:40**

Coffee Break

## **Defects and Fluid Flow 2**

Chair: Ivars Krastins

**15:40 to 16:00**

Characterization of Drag and Permeability of Equiaxed Dendritic Grains by Numerical Simulations

*Miha Založnik, Université de Lorraine, CNRS, IJL*

**16:00 to 16:20**

Modeling of Mushy-Zone Dynamics in Continuous Casting with Temperature Corrections at Phase Boundaries

*Anna Ivanova, Colorado School of Mines*

**16:20 to 16:40**

Thermal Boundary Conditions from Experiments: Classical and Adjoint Inverse Heat Conduction

*Jan Bohacek, Brno University of Technology*

**16:40 to 17:00**

Exploring Processing Space for Radiological Castings using Fluid Flow Modeling

*Spencer Hunt, Los Alamos National Laboratory*

**17:00 to 17:40**

Poster Preview Session

**17:40 to 18:00**

Free Time

**18:00 to 21:00**

Poster session and Barbeque

## **Additive Manufacturing and Welding**

**A1**

A Model Experiment of Magnetohydrodynamics in an Additive Manufacturing Melt Pool

*Valdemars Felcis, University of Greenwich / University of Latvia*

## **A2**

GPU-parallel AMR multi-phase-field simulation of competitive growth of dendritic grains in a melt pool during metal additive manufacturing

*Tomoya Okada, Kyoto Institute of Technology*

## **A3**

Highly efficient multi-phase-field framework for microstructure optimization via scan strategies in metal AM

*Yuki Takahashi, Kyoto Institute of Technology*

## **A4**

In Situ Synchrotron X-ray Investigation of Solidification Dynamics During Directed Energy Deposition of 316L Stainless Steel

*Xinyi Hao, Mechanical Engineering, University College London, London WC1E 7JE, UK; Research Complex at Harwell, Harwell Campus, Didcot OX11 0FA, UK*

## **A5**

Multiphase fluid mechanics and crystals plasticity approach to predicting surface roughness and localised deformations

*Hugh J. Banes, University of Sheffield*

## **A6**

Parallel GPU-AMR accelerated phase-field lattice Boltzmann simulations for melt pool dynamics in metal additive manufacturing

*Konosuke Ikeda, Kyoto Institute of Technology*

## **A7**

Revealing the Nature of Melt Pool Flow in Additive Manufacturing using Tungsten Tracer Particles in a Transient External Magnetic Field

*Ivars Krastins, University of Greenwich*

## **A8**

Coupling ultrasound and adjustable ring mode beam shaping during laser welding of AA6063 extrusions alloy.

*Philip Carr, Carrs Welding*

## **Casting and Other Process Models**

## **A9**

A Study of Uncertainty in Metal Casting Using a 1D Custom Python Finite Element Analysis Solver

*Christopher A Jones, AWE*

## **A10**

Direct modelling of mechanical deformation of mushy zone for Aluminium DC-casting simulation

*Sylvain Gouttebroze, SINTEF*

**A11**

Modeling and simulation of liquid in-fill process for sustainable manufacturing

*Mark Jolly, University of Greenwich*

**A12**

Optimisation of horizontal break ring continuous casting process using CFD Simulations.

*Badarudeen Kalappurakkal Mohiyudeen, University of Dundee*

**A13**

SHELL-CRACK: From Microstructure to Caster-Scale — Predicting and Preventing Cracks in Continuous Steel Casting

*Nils Å.I. Andersson, Swerim*

**A14**

Multifrequency Ultrasonic Treatment for Molten Metal Processing of Aluminum Alloys- Mechanisms and Inputs for Modeling

*Raquel F Jaime, University of California, Irvine*

**Multiphysics Modelling**

**A15**

Dendritic Fracture Mechanics: A Comparative Modelling Study

*Mathursan Vinayakamoorthy, University of Greenwich*

**A16**

EIGA and cold crucible combined melting technique

*Koulis A. Pericleous, University of Greenwich*

**A17**

Improving Benchmark Validation with Uncertainty Quantification

*Levi Dickson, Materials Engineering, Purdue University*

**A18**

Molecular dynamics study of deformation induced fragmentation in a semi-solid state

*Akihiro Niwa, Kyoto Institute of Technology*

**A19**

Numerical Simulation of Acoustic Bubble Dynamics: Analysis of Rayleigh-Plesset Solvers

*Nurul Islam, University of Greenwich*

**A20**

Phase-field multi-physics simulation of granular fragmentation due to contacts among solids

*Gensei Kobayashi, Kyoto Institute of Technology*

## **9th June 2026**

**07:30 to 09:00**

Breakfast

### **Microstructure Formation 1**

Chair: Damien Tourret

**09:00 to 09:40**

Solidification of Aluminum Wrought Alloys with Elevated Hydrogen Content

*Janin Eiken, Access e.V.*

**09:40 to 10:00**

3D mesoscopic modeling of equiaxed grain growth in a thin sample

*Ifzal Hussain, Université de Lorraine, CNRS, IJL*

**10:00 to 10:20**

Simulation of mechanical property evolution for die-cast Al7SiMg castings with subsequent heat treatments

*Fengxin Mao, MAGMA GmbH*

**10:20 to 10:50**

Coffee Break

### **Microstructure Formation 2**

Chair: Tomahiro Takaki

**10:50 to 11:10**

Coarse-Grained Molecular Dynamics Simulation of Solidification Dynamics in Al–Cu Alloys

*Yasushi Shibuta, The University of Tokyo*

**11:10 to 11:30**

Phase-field modelling of secondary dendrite arm fragmentation in a Fe–C alloy during solidification

*Ahmed Kaci Boukellal, Université de Lorraine, CNRS, IJL*

**11:30 to 11:50**

Cellular Automata Simulation coupled with CALPHAD Based Interface Response Functions for Dendritic Solidification

*Jyothirmai Bethanapalli, Indian Institute of Technology Bombay*

**11:50 to 12:10**

A data assimilation system for estimating interfacial anisotropy parameters and crystal orientation in polycrystalline zinc dendrites

*Ayano Yamamura, Kyoto Institute of Technology*

**12:10 to 12:30**

Casting and solidification of magnesium alloys

*Yuanding Huang, Helmholtz-Zentrum Hereon*

**12:30 to 14:00**

Lunch

**Multiphysics Modelling and Numerical Methods 1**

Chair: Peter Soar

**14:00 to 14:20**

On statistical evaluation and characterisation of local damage and material performance in megacastings

*Jakob Olofsson, Jönköping University*

**14:20 to 14:40**

Producing Green Hydrogen from Liquid Aluminium

*Koulis A. Pericleous, University of Greenwich*

**14:40 to 15:00**

Fully Coupled Cellular Automaton–Finite Volume Model for Grain Evolution

*Paolo Airoldi, Flow Science Mediterranea*

**15:00 to 15:20**

A new generation of finite difference methods for the phase-field modelling of dendritic solidification based on the strong-form local meshless methods

*Tadej Dobravec, University of Ljubljana, Faculty of Mechanical Engineering, Slovenia*

**15:20 to 15:40**

Coffee Break

**Multiphysics Modelling and Numerical Methods 2**

Chair: Jakob Olofsson

**15:40 to 16:00**

Three-dimensional point automata method for simulation of ECT and CET in continuous casting of steel

*Božidar Šarler, University of Ljubljana, Faculty of Mechanical Engineering*

**16:00 to 16:20**

Free Energy Surface of Nucleation via Metadynamics

*Takumu Yamamura, The University of Tokyo*

**16:20 to 16:40**

Accelerated defect prediction for part-scale powder bed fusion builds using semi-analytical modelling and machine learning techniques

*Shaun R. Cooke, The University of British Columbia*

**16:40 to 17:00**

Influence of rotating magnetic field on the precipitation of  $\alpha$ -Fe phase during unidirectional solidification of Al-6Si-4Cu-2Fe alloy

*Chenbo Xu, Montanuniversität Leoben*

**17:00 to 17:40**

Poster Preview Session

**17:40 to 18:00**

Conference Photograph

**18:00 to 21:00**

Poster Session and Hog Roast (Vegetarian and vegan alternatives available)

## **Defects and Fluid Flow**

**B1**

CFD modeling of calcium chloride solidification

*Shizhan Zhang, Montanuniversität Leoben*

**B2**

Simulation of macrosegregation and macrostructure in continuous casting of high-carbon steel billets

*Miha Založnik, Université de Lorraine, CNRS, IJL*

## **Numerical Methods**

**B3**

Macroscopic columnar front tracking with a phase-field interface capturing method

*Miha Založnik, Université de Lorraine, CNRS, IJL*

**B4**

A Lattice Boltzmann Approach to the One-Fluid Formulation of Multiphase Flow

*Snehil Srivastava, University of Greenwich*

**B5**

Flow-driven particle deposition and clog network formation on refractory walls

*Hadi Barati, K1-MET, Austria*

**B6**

The calculation of kinetic interface contact condition phase diagram for the melting of multi-component aluminium alloys

*Qiang Du, SINTEF Industry*

### **In situ Experiments**

#### **B7**

Heat transfer and solidification model of thermographic differential thermal analysis for the study of steel solidification

*Jose M. Flores Herrera, McMaster University*

#### **B8**

Investigating hot-tear nucleation, growth and merging behaviour during aluminium alloys solidification using high-speed synchrotron X-ray imaging

*Akash Aggarwal, University of Oxford*

#### **B9**

Heuristic Operando X-ray Microscopy: An Entropy-Based Sampling Framework for Large-Scale Facilities

*James Le Houx, University of Greenwich*

#### **B10**

Toward accurate reconstruction of dendritic morphology and material property identification from X-ray imaging data using phase-field-based data assimilation system

*Ayano Yamamura, Kyoto Institute of Technology*

#### **B11**

In Situ Synchrotron Imaging of Ga-In Alloy Solidification Under Pulsed Electromagnetic

*Natalia Shevchenko, Helmholtz-Zentrum Dresden-Rossendorf*

### **Microstructure and Macrostructure Formation**

#### **B12**

Effect of Alloying Elements on the Microstructure and Mechanical Behaviour in Recycled Al-Si Alloys

*Anish G P Nand, Cranfield University*

#### **B13**

Formation of bicontinuous structures through distributed internal melting

*Zhongyang Li, Institute of Materials Physics and Technology, Hamburg University of Technology*

#### **B14**

Liquid/Solid Interface energy and Its Anisotropy of Pure Metals

*Zhongyun Fan, BCAST, Brunel University London*

**B15**

Electromagnetic Control of Metal Solidification: From Fundamental Physics to Industrial Applications

*Qingwei Bai, University of Greenwich*

**B16**

Adaptation of a Spherical Neural Network Approach for Estimating the Solidification Time of Complex Geometries

*Maximilian Erber, Technical University of Munich*

**Machine Learning and Big Data**

**B17**

Data Acquisition for Data-Driven Mold Filling and Deviation Analysis in High Pressure Die Casting of AlSi10Mg

*Rohit Randhavan, University of Augsburg*

**B18**

Integration of rapid process modelling into a digital twin of a wire arc additive manufacturing cell

*Robin C. Laurence, University of Manchester*

**B19**

Machine learning surrogates for phase field modelling of rapid solidification

*Simon A. Savukoski, VTT Technical Research Centre of Finland*

**B20**

A strong form meshless method for through-process thermo-mechanical modelling of the steel production process

*Gašper Vuga, Faculty of Mechanical Engineering, University of Ljubljana*

## **10th June 2026**

**07:30 to 09:00**

Breakfast

### **Honoury Syposium for Christoph Beckermann 1**

Chair: Jon Dantzig and Michel Rappaz

**09:00 to 09:40**

Advancing Solidification Science: The Legacy and Impact of Christoph Beckermann

*Jon Dantzig, Charles-André Gandin, Michel Rappaz and Brian G. Thomas*

**09:40 to 10:00**

Volume average modeling of alloy solidification and applications

*Menghuai Wu, Montanuniversität Leoben*

**10:00 to 10:20**

Phase field as a front propagation method for modeling grain growth and texture evolution in additive manufacturing

*Murali Uddagiri, Ruhr University Bochum*

**10:20 to 10:50**

Coffee Break

### **Honoury Syposium for Christoph Beckermann 2**

Chair: Jon Dantzig and Michel Rappaz

**10:50 to 11:10**

Multi-Modal Investigation of Porosity in Aerospace In-vestment Casting: from Micrographs and CT-imaging via simulation to AI Models

*Jürgen Jakumeit, Access e.V.*

**11:10 to 11:30**

Probabilistic Prediction of Local Mechanical Properties applied to High-Pressure Die Castings

*Fengxin Mao, MAGMA Gießereitechnologie GmbH*

**11:30 to 11:50**

Dendrite Growth behaviour under coupled fluid flow and structural mechanics

*Peter Soar, University of Greenwich*

**11:50 to 12:10**

A Local Eutectic Growth (LEG) Map For Al-10Si-0.4Sc (Wt.%) Alloy"

*Akankshya Sahoo, University of Alberta*

**12:10 to 13:40**

Lunch

**13:00 to 17:00**

Stonehenge Trip

**13:40 to 16:00**

Bombay Sapphire Distillery, MRT Castings and Winchester Trip

**18:00 to 19:00**

Scientific Committee Meeting/Free Time

**19:00 to 21:00**

Dinner

# **11th June 2026**

**07:30 to 09:00**

Breakfast

## **In Situ Experiments and Machine Learning 1**

Chair: Natalia Shevchenko

**09:00 to 09:20**

Investigating the solidification of 'dirty' recycled aluminium alloys with X-ray imaging and artificial intelligence

*Enzo Liotti, University of Oxford*

**09:20 to 09:40**

Solidification and fluid flow model validation using in-situ proton radiography (pRad) imaging

*Nadira E. Surghani, Lawrence Livermore National Laboratory*

**09:40 to 10:00**

Multi-scale in situ experiment/simulation integration to predict rapid solidification microstructures in additively manufactured AlCu

*Tatu Pinomaa, VTT Technical Research Centre of Finland*

**10:00 to 10:20**

Directional melting dynamics of the irregular Al-Al<sub>3</sub>Ni eutectic

*Rajesh Kumari Rajendran, CNRS- SU-INSP*

**10:20 to 10:50**

Coffee Break

## **In Situ Experiments and Machine Learning 2**

Chair: Andre Phillion

**10:50 to 11:10**

Synchrotron-Based High-Resolution Imaging of the Ternary Ga–In–Bi Alloy

*Natalia Shevchenko, Helmholtz-Zentrum Dresden-Rossendorf*

**11:10 to 11:30**

In situ experiments for quantitative validation of core physics during external field assisted additive manufacturing processes

*Harry E. Chapman, University College London*

**11:30 to 11:50**

Interface Energy Anisotropy in Hexagonal Alloys Revealed by Time-Resolved In-Situ Tomography

*Hideyuki Yasuda, Kyoto University*

**11:50 to 12:10**

Development of 4D tomographic observation of grain motion and microstructure evolution during semisolid deformation using synchrotron radiation X-rays

*Taka Narumi, The University of Tokyo*

**12:10 to 12:30**

Exploring the Forest – Computer Vision and Image Processing Applied to In-situ Competitive Dendritic Growth Video Sequences

*Shaun McFadden, Ulster University*

**12:30 to 14:00**

Lunch

**Casting and other process models**

Chair: Catherine Tonry

**14:00 to 14:40**

The History of Bell Casting and the Whitechapel Bell Foundry

*Alan Hughes, Whitechapel Bell Foundry*

**14:40 to 15:00**

Microstructure evolution of peritectic Cu-24%Sn alloy during stationary melting under a thermal gradient: insights from experiments and phase-field simulations

*Mehdi Medjkoune, Université de Lorraine, CNRS, IJL*

**15:00 to 15:20**

Modelling the Effect of Bulging Driven Fluid Flow on Centerline Segregation in Steel Continuous Casting

*Araf Al Rafi, McMaster University*

**15:20 to 15:40**

Coffee Break

**Casting and other process models**

Chair: Koulis Pericleous

**15:40 to 16:00**

Industrial-Scale Validation of a CFD Model for Ingot Casting Using the Rotating Casting Mold Technique

*Christian Gomes Rodrigues, Montanuniversität Leoben*

**16:00 to 16:20**

The integration of multi-scale process modelling with virtual commissioning of Aluminium billet DC-casting equipment

*Qiang Du, SINTEF Industry*

**16:20 to 16:40**

Towards an Intelligent Continuous Caster Mould: Unifying Full-Scale Water Modelling and CFD

*Ali Asgarian, University of Toronto*

**16:40 to 17:00**

Melt-flow-induced loading on multilayer sand cores in high-pressure die casting

*Erwin Reberger, Technical University of Munich*

**17:00 to 17:40**

Exploring Plasma Transferred Arc Processing for Metallic Glass Claddings

*Paschal A. Ubi, Cranfield University*

**18:00 to 18:30**

Bus to Conference Dinner Venue

**18:30 to 22:00**

Conference Dinner

**22:00 to 22:30**

Bus to hotel

## **12th June 2026**

**07:30 to 09:00**

Breakfast

### **Additive Manufacturing and Welding 1**

Chair: Peter Lee

**09:00 to 09:40**

Toward full-scale melt pool dynamics simulation and scan-strategy-based microstructure prediction in laser powder bed fusion

*Tomahiro Takaki, Kyoto Institute of Technology*

**09:40 to 10:00**

Multiscale modelling of additive manufacturing microstructures

*Tatu Pinomaa, VTT Technical Research Centre of Finland*

**10:00 to 10:20**

On the micromechanics of nanoscale solidification void formation during 3D printing of a nickel-based superalloy

*Hector C. Basoalto, University of Sheffield*

**10:20 to 10:50**

Coffee Break

### **Additive Manufacturing and Welding 2**

Chair: Hector C. Basoalto

**10:50 to 11:10**

Correlation between Solidification Microstructure and Thermal Flow of the Molten Pool in Laser Additive Manufacturing

*Qiang Zhu, Southern University of Science and Technology*

**11:10 to 11:30**

Exploiting Electromagnetic Forces for Improved Control of Melt Flow in Metal Additive Manufacturing

*Imants Kaldre, University of Latvia*

**11:30 to 11:50**

Cellular Automaton Simulation of Grain Refinement in LPBF of Al-10Si: Influence of Laser Rescanning Parameters and Scanning Strategies

*Kai Kang, McMaster University*

**11:50 to 12:10**

Multiple physical fields of laser powder bed fusion of nickel-based superalloys.

*Neng Ren, Shanghai Jiao Tong University*

**12:10 to 12:30**

Coupling ultrasound and adjustable ring mode beam shaping during laser welding of AA6063 extrusions alloy.

*Philip Carr, Carrs Welding*

**12:30 to 12:40**

Conference Closing Ceremony

*Andrew Kao and Catherine Tonry, University of Greenwich*

**12:40 to 14:00**

Lunch (Packed Lunch available for those who need to leave early)

**14:00**

Last Shuttle Bus Departs