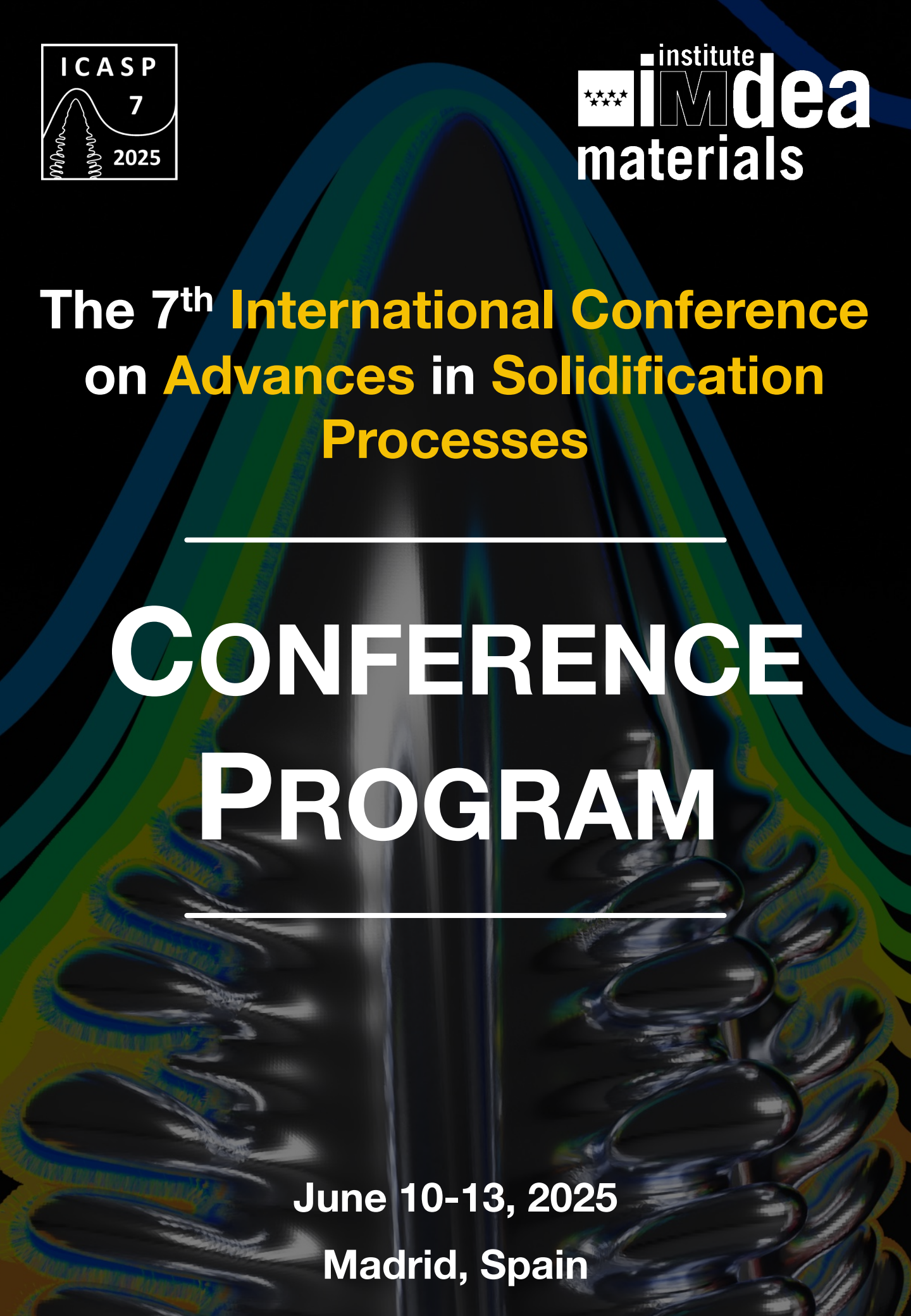


The 7th International Conference on Advances in Solidification Processes

CONFERENCE PROGRAM

June 10-13, 2025

Madrid, Spain

WELCOME TO MADRID!

We are delighted to welcome you to **ICASP-7**, the ***7th International Conference on Advances in Solidification Processes***, in **Madrid, Spain**, on **June 10-13, 2025**!

Following the great success of previous editions in Sweden (2005), Austria (2008), Germany (2011), the UK (2014), Austria again (2019), and France (2022), ICASP is coming to Spain for the first time. The main venue is the **Retiro building** of the **Civil Engineering School** of **Madrid Technical University** (*Universidad Politécnica de Madrid – ETSI Caminos, Canales y Puertos*).

The program features **178 presentations**: **6 plenaries lectures**, **140 talks** across **27 sessions** in **3 parallel tracks** (including **24 keynote lectures**), and **32 posters**. We are proud to welcome participants from **24 countries** across the World, and pleased to note that students make up over one third of the registered delegates.

In addition to coffee and lunch breaks, the **social program** offers several opportunities to connect outside the technical sessions, including a **welcome reception** on **Monday evening**, a **private visit** of the **Reina Sofía Museum** followed by the **poster session** on **Tuesday evening**, and a **banquet dinner** on **Thursday evening**.

We encourage you to make the most of the scientific and social opportunities at ICASP-7 — to reconnect with old friends, make new connections, and return home inspired to drive discoveries and innovation in our field.

Welcome to Madrid!

Damien Tourret
Chair, ICASP-7

#ICASP2025

www.icasp2025.org

Plenary lectures will take place in the **auditorium** (*Aulario*) (downstairs, main access from outside the main building)

Parallel sessions will take place in the main building, in

- **Room A** / *Salon de Actos* / Ground floor
- **Room B** / *Aula 13* / Ground floor
- **Room C** / *Aula 14* / First floor

Scan to download the full abstract booklet

Organized by

Hosted by

IMPORTANT INFORMATION

CONFERENCE VENUE

- The conference venue is the **Retiro Building** of the **Polytechnic University of Madrid**
  Main access via Calle de Alfonso XII, 5

POLITÉCNICA
UNIVERSIDAD POLITÉCNICA DE MADRID

REGISTRATION

- Monday June 9th / From 18:00 onwards
  Hotel OnlyYou / Paseo Infanta Isabel, 13, 28014, Madrid
- Tuesday June 10th to Friday June 13th / From 8:00 onwards
  UPM Retiro / C. de Alfonso XII, 3 y 5, Retiro, 28014 Madrid

LUNCH

- Tuesday to Thursday / 12:40 - 14:00
  Lunch will be served in the outdoor tent in front of the building
- Friday / From 11:30 onwards
  Bagged lunch to-go will be available for pick-up

COFFEE BREAKS

- Coffee break will take place in the outdoor tent in front of the building

WIFI

- Network: EventosUPM
  Password: eventosUPMwifi

Scan to connect to the wifi

PROGRAM AT A GLANCE

DAY 0 / JUNE 9 / MONDAY

18:00 – 19:00	**Registration**	OnlyYou Hotel, 7th Floor Rooftop Bar
19:00 – 20:30	**Welcome reception**	OnlyYou Hotel, 7th Floor Rooftop Bar

DAY 1 / JUNE 10 / TUESDAY

From 8:00	**Registration**	UPM Retiro Lobby
8:45 – 9:15	**Opening ceremony & address** Prof. José Miguel Atienza, Director, UPM School of Civil Engineering Prof. José Manuel Torralba, Director, IMDEA Materials Dr. Damien Tourret, Chair, ICASP-7	UPM Retiro Auditorium
9:15 – 10:00	**Plenary lecture** Alain Karma: *Phase-field modeling of far-from-equilibrium solidification processes: from additive manufacturing to ice templating*	UPM Retiro Auditorium
10:00 – 10:30	**Coffee break**	Outdoor tent
10:30 – 12:40	**Parallel sessions**	Main building
12:40 – 14:00	**Lunch break**	Outdoor tent
14:00 – 15:50	**Parallel sessions**	Main building
15:50 – 16:20	**Coffee break**	Outdoor tent
16:10 – 17:40	**Parallel sessions**	Main building
18:00 – 18:15	**Meet in front of the Museum Renia Sofía**	Ronda de Atocha, 2
18:30 – 19:30	**Private visit of the Museum**	Museum Renia Sofia
19:45 – 22:00	**Poster session & Cocktail**	Vestíbulo Jean Nouvel, Museum Renia Sofia

DAY 2 / JUNE 11 / WEDNESDAY

From 8:00	**Registration**	UPM Retiro Lobby
8:30 – 10:00	**Plenary lectures** Sabine Bottin-Rousseau: *In situ dynamics of directionally solidified irregular eutectic alloys* Suzana G. Fries: *CALPHAD and Phase-Field Modeling: a Successful Liaison, Reinforced by Reliable Interfacial Energies*	Auditorium
10:00 – 10:30	**Coffee break**	Outdoor tent
10:30 – 12:40	**Parallel sessions**	Main building
12:40 – 14:00	**Lunch break**	Outdoor tent
14:00 – 16:30	**Parallel sessions**	Main building
16:45 – 17:45	*Scientific Committee only: Scientific Committee Meeting*	*Room Bolonia*

PROGRAM AT A GLANCE

DAY 3 / JUNE 12 / THURSDAY

From 8:00	**Registration**	UPM Retiro Lobby
8:30 – 10:00	**Plenary lectures**	Auditorium
	Ulrike Hecht: *Fast directional solidification enabling the design of novel alloys for additive manufacturing*	
	María Teresa Pérez-Prado: *Additive manufacturing of fully amorphous Fe-based metallic glasses for soft magnetics*	
10:00 – 10:30	**Coffee break**	Outdoor tent
10:30 – 12:40	**Parallel sessions**	Main building
12:40 – 14:00	**Lunch break**	Outdoor tent
14:00 – 16:10	**Parallel sessions**	Main building
16:10 – 16:40	**Coffee break**	Outdoor tent
16:40 – 18:00	**Parallel sessions**	Main building
19:30 – 19:45	Meeting point for shuttle buses	Calle de Alfonso XII, 54
20:00 – 23:00	**Banquet dinner & Award ceremony** *Restaurant La Masia de Jose Luis*	Paseo de la Puerta del Ángel, 3
23:15 – 23:30	Shuttle buses return	

DAY 4 / JUNE 13 / FRIDAY

From 8:45	**Registration**	UPM Retiro Lobby
9:15 – 10:00	**Plenary lecture**	Auditorium
	Abhik Choudhury: *Modeling assisted workflows for single-crystal Ni-based superalloy processing: Adaptations from Directional solidification to Additive*	
10:00 – 10:30	**Coffee break**	Outdoor tent
10:30 – 12:20	**Parallel sessions**	Main building
12:20 – 12:30	**Closing address**	Auditorium
From 11:30	**To-go lunch bag pick-up**	

Social Program

Day 0 / June 9 / Monday

19:00 – 20:30 **Welcome reception** — Rooftop Bar, OnlyYou Hotel
Included in the registration fee

Day 1 / June 10 / Tuesday

18:30 – 19:30 **Private visit of the Museum** — Museum Renia Sofia, Ronda de Atocha, 2
Included in the registration fee

19:45 – 22:00 **Poster session & Cocktail** — Vestíbulo Jean Nouvel, Museum Renia Sofia
Included in the registration fee

The meeting point for the private visit of the museum is at Ronda de Atocha, 2 between 18:00 and 18:15.

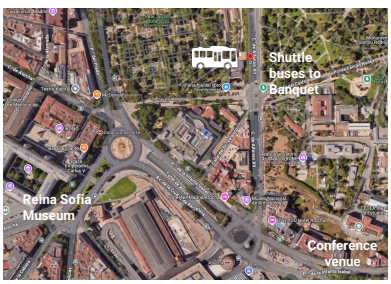
Day 2 / June 11 / Wednesday

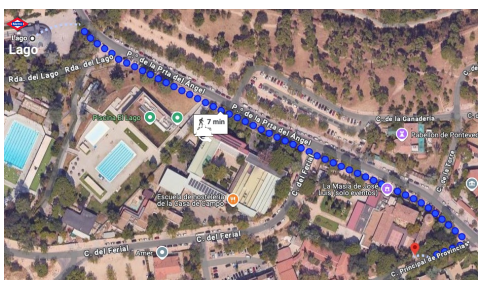
On Wednesday afternoon, sessions will conclude early (around 16:30), giving everyone a few free hours to explore Madrid. The conference venue is centrally located, within walking distance of many of the city's top attractions. Whether you're into art, sports, parks, city strolls, or culinary experiences, you will find something for you just steps away.

Rather than telling you what to do and prescribe a set itinerary, we compiled a list of our top recommendations that you can find on the About Madrid page of the conference website – or just scan the QR code on the right.

Day 3 / June 12 / Thursday

20:00 – 23:00 **Banquet dinner & Award ceremony** — Restaurant La Masia de Jose Luis, Paseo de la Puerta del Ángel, 3
Not included in the basic registration fee





Access the restaurant by Calle Principal de las Provincias

Shuttle buses to the banquet dinner will depart from Calle de Alfonso XII, 54 between 19:30 and 19:45.

The restaurant is also easy to reach by metro: closest station Lago (line 10).

SPECIAL SYMPOSIA

The conference will feature **two special symposia** dedicated to **honoring the memory and scientific legacy of our late colleagues and friends**, Professors **Dieter Herlach** (DLR & Ruhr-Universität Bochum, Germany) and **Markus Rettenmayr** (Friedrich-Schiller-Universität Jena, Germany). Each symposium will include presentations on the life and career of the commemorated scientist by longtime collaborators, as well as invited scientific keynotes from researchers who worked closely with them. Both symposia are open to submissions for contributed talks and/or posters.

The symposium in honor of Prof. **Rettenmayr** is organized by Andreas Ludwig and Peter Galenko. It will take place in the **Salon de Actos (Room A)** on **Tuesday afternoon**.

The symposium in honor of Prof. **Herlach** is organized by Dirk Holland-Moritz and Peter Galenko. It will take place in the **Salon de Actos (Room A)** on **Thursday afternoon**.

Prof. Dr. Dieter Herlach (1949-2022) was a prominent physicist whose work focused on the nucleation and growth of solids from undercooled liquids, specifically in metallic systems.

He earned his PhD at RWTH Aachen, exploring amorphous spin glasses. He later worked at the Low Temperature Physics Laboratory at Duisburg University before joining the German Aerospace Center (DLR) in Cologne, specifically the Institute of Space Simulation (later known as Institute of Materials Physics in Space), where he served as a group leader. In 1998, he became an adjunct professor and, in 2001, a full professor at Ruhr-Universität Bochum. He also held prestigious research positions at Imperial College, the University of Cambridge, and Harvard University. Prof. Herlach made significant contributions to materials science, particularly in the area of solidification from undercooled melts.

He pioneered techniques like Electro-Magnetic Levitation (EML) to study crystallization under microgravity and terrestrial conditions, contributing significantly to material science through space missions and experimental innovations. He received several prestigious awards, including the Bruce Chalmers Award by The Minerals, Metals & Materials Society (TMS), and the Honorary Membership of the German Society for Materials Science.

Prof. Dr. Markus Rettenmayr (1960-2022) was a distinguished scientist in the field of materials science, specifically focusing on metallic materials, solidification processes, phase transformations, alloy development, and oxidation phenomena.

He earned his degree in Physical Metallurgy from the University of Stuttgart in 1987 and later completed his PhD under Hans-Eckart Exner. His academic journey included postdoctoral research in the USA at Rensselaer Polytechnic Institute before returning to Germany, where he received his habilitation in 2000 from TU Darmstadt for his work on microstructure evolution during phase transitions. In 2004, he became a professor at the Friedrich Schiller University of Jena, where he played a pivotal role in founding the Otto Schott Institute for Materials Research in 2010, serving as its first director. Known for his exceptional teaching and leadership, he served in various academic administrative roles and was deeply involved in promoting good scientific practice.

Prof. Rettenmayr's contributions were widely recognized with numerous awards, including the Georg-Sachs-Preis from the DGM, the Roland Mitsche Prize, and an honorary doctorate from the University of Miskolc, Hungary. He was highly regarded for his mentorship and for fostering young scientists, leaving a lasting impact both in research and education.

esa

The special symposia are **supported by** the generous contribution of the **European Space Agency (ESA)**, in memory of Markus' and Dieter's instrumental contributions to ESA projects over several decades.

DETAILED PROGRAM / DAY 1 / TUESDAY JUNE 10th

Auditorium / *Chair: Damien Tourret*

08:45 / Opening ceremony

9:15 / Alain Karma
Phase-field modeling of far-from-equilibrium solidification processes: from additive manufacturing to ice templating

10:00 / Coffee break

	Room A Salon de actos / Ground floor	Room B Aula 13 / Ground floor	Room C Aula 14 / First floor
	Micrograviy I	**Facetted interfaces & Intermetallics**	**Fluid flow I**
	Chair: Wim Sillekens	*Chair: Sabine Bottin-Rousseau*	*Chair: Andrew Kao*
10:30	**10:30 / Sonja Steinbach** *The effect of fluid flow on microstructure evolution in Al-alloys within the framework of the ESA project MICAST*	**10:30 / Mathis Plapp** *Phase-field modeling of dendritic growth in crystals with strongly anisotropic surface free energies*	**10:30 / Natalia Shevchenko** *Evolution of dendritic morphology in a solidifying Ga-In-Bi alloy studied by in-situ synchrotron radiography*
11:00	**11:00 / Dudu Geng** *Analysis of Microgravity and Hypergravity Observations of Equiaxed Solidification of Al-Cu Alloys in Parabolic Flight Campaigns*	**11:00 / Fatima Mota** *Facet growth and defect dynamics during the solidification of pure salol*	**11:00 / Utkarsh Godwal** *In situ X-ray imaging of defects and microstructural heterogeneity during semi-solid flow*
11:20	**11:20 / Golo Zimmermann** *Determination of the effect of convections & Fe-containing intermetallic phases on the permeability of technical Al alloys*	**11:20 / Kang Xiang** *Operando study of the nucleation and co-growth dynamics of multiple intermetallic phases in solidification of Al-Mn alloys by simultaneous synchrotron X-ray diffraction and tomography*	**11:20 / Abhinesh Kumar** *Numerical modelling of extrusion of granular particles against gravity through an opening*
11:40	**11:40 / Andrew Murphy** *Mesoscale Front Tracking Simulation of a µg-based Near-Isothermal Equiaxed Solidification Experiment of an Al-Cu Alloy performed onboard the MASER 13 Sounding Rocket*	**11:40 / Chris Gourlay** *Nucleation and growth of Al-Mn intermetallics in the solidification sequence of Mg-Al-Mn alloys*	**11:40 / Ankit Tamrakar** *Numerical modelling of flow through porous media to study shear bands*
12:00	**12:00 / Laszlo Sturz** *Structures in grain-refined directionally solidified hypoeutectic Al-Cu alloys: Benchmark experiments under microgravity on-board the ISS*	**12:00 / Eliane Farhi** *Nucleation and growth dynamics of intermetallics in model Al-Si-Fe-Mn alloys*	**12:00 / Andreas Ludwig** *Experimental Investigation on the Rheology of Suspensions Containing Dendritic-like Structures*
12:20	**12:20 / Mária Svéda** *Comparison of the grain structure of grain refined hypoeutectic Al-Cu alloys directionally solidified on ground (1g) and under microgravity onboard the ISS*	**12:20 / Ashwin J Shahani** *Capturing microstructure and its evolution in metal matrix nanocomposites*	**12:20 / Andreas Ludwig** *Volume-Averaged Two-Phase Simulations of the Rheology of Suspensions*
12:40	**12:40 / Lunch**		
	Markus Rettenmayr I	**Machine Learning**	**Fluid flow II**
	Chair: Andreas Ludwig	*Chair: Noël Jakse*	*Chair: Abdellah Kharicha*
14:00	**14:00 / Forewords**	**14:00 / Jürgen Jakumeit** *Porosity prediction in investment casting parts using simulation and machine learning*	**14:00 / Olga Budenkova** *Solidification process in electromagnetic levitation with a superposed horizontal DC magnetic field*
14:10	**14:10 / Peter Galenko & Stephanie Lippmann** *Stability of solidification fronts and formation of two-phase mushy zone*		
14:30		**14:30 / Alexandre Viardin** *Comparison of image analysis techniques based on deep learning for the solidification microstructure in different alloys*	**14:30 / Ivars Krastins** *Time-Dependent Magnetic Field Impact on Laser Additive Manufacturing*
14:40	**14:40 / Božidar Šarler** *Meshless methods for multiphase, multiphysics and multiscale problems*		
14:50		**14:50 / Chih-Kang Huang** *Neural Network Approximation of a Phase-Field Model for Dendritic Growth*	**14:50 / Keiji Shiga** *Electromagnetic Stirring-Induced Macrosegregation in Aluminum Alloys Containing Iron*
15:00	**15:00 / Julien Zollinger** *Solutal Melting*		
15:10		**15:10 / Yiming Chen** *Accurate identification of high relative density in laser-powder bed fusion across ML model with dimensionless parameters*	**15:10 / Zsolt Veres** *Comparison of the microstructure of Al12.6Si and Al18Si alloys solidified with and without rotating magnetic field*
15:30	**15:30 / Nagarjuna Remalli** *A X-ray view on solutal melting in Cu-Pd*	**15:30 / Xuyang Chen** *Machine learning for molten pool dynamic prediction in hybrid laser-MIG welding*	**15:30 / Catherine Tonry** *Challenges in Ultrasonic Cavitation for deagglomeration of Carbon Nanotubes*
15:50	**15:50 / Coffee break**		
	Markus Rettenmayr II		
	Chair: Julien Zollinger	**Glasses**	**Fluid flow III**
16:10		*Chair: Adrian Boccardo*	*Chair: Olga Budenkova*
16:20	**16:10 / Melis Şerefoğlu** *Real-time Investigation of Melting Dynamics in Two-Phase Eutectics*	**16:20 / Saichao Cao** *Structural origin of the glass-forming ability of Al-Cu-Zr liquid alloy: experimental and simulation studies*	**16:20 / Florian Kargl** *Hydrogen bubble formation and interaction in Al-alloys during melting and solidification*
16:40	**16:40 / Silvere Akamatsu** *In situ directional melting of eutectic microstructures in transparent alloys*	**16:40 / Yanuar Rohmat Aji Pradana** *Effects of experimental casting parameters on crystalline and amorphous phase balance during casting of Mg-Zn-Ca alloys*	**16:40 / Bastien Isabella** *Freezing of Gas Bubbles in a Liquid*
17:00	**17:00 / Rahul Nellissery Rajan** *Phase-field simulations of eutectic melting*	**17:00 / Paula Rodriguez Gonzalez** *Strain-Stress characterization of a bulk metallic glass by neutron scattering*	
17:20	**17:20 / Zhongyang Li** *Formation mechanism of bicontinuous structure during peritectic melting of TiAg*		
17:40			

18:00 ~ 18:15 / Meeting point by the Museum Reina Sofia / Ronda de Atocha, 2

18:30 – 19:30 / Private visit Museum Reina Sofia

19:45 – 22:00 / Poster session & cocktail (standing dinner)
Vestibulo Jean Nouvel – Museum Reina Sofia

DETAILED PROGRAM / DAY 2 / WEDNESDAY JUNE 11th

Auditorium / *Chair: U Hecht*

8:30 / Sabine Bottin-Rousseau
In situ dynamics of directionally solidified irregular eutectic alloys

9:15 / Suzana G Fries
CALPHAD and Phase-Field Modeling: a Successful Liaison, Reinforced by Reliable Interfacial Energies

10:00 / Coffee break

	Room A Salon de actos / Ground floor	Room B Aula 13 / Ground floor	Room C Aula 14 / First floor
	In-situ imaging & Dendritic growth	**Modeling & Simulations I**	**Aluminum Alloys I**
	Chair: Guillaume Reinhart	*Chair: Mathis Plapp*	*Chair: Georges Salloum-Abou-Jaoude*
10:30	**10:30 / Hideyuki Yasuda** *Direct observation of dendrite arm development in hexagonal Mg-Zn alloys*	**10:30 / Noel Jakse & Philippe Jarry** *Recent advances in atomistic modelling of alloy melt structures as input for solidification modelling*	**10:30 / Jiehua Li** *Atomic DFT simulation and experimental TEM APT observations on the distribution of modifying solutes within eutectic Si in Al-Si based alloys*
11:00	**11:00 / Nlis Bellenbaum** *Comparison of the surface morphology of dendrites of different growth orientation in Al-Ge*	**11:00 / Yasushi Shibuta** *Direct Observation of Dendritic Growth from Atomistic Simulation*	**11:00 / Shikang Feng** *Revealing and controlling the formation dynamics of Fe-rich intermetallic compounds for impurity-tolerant alloy recirculation*
11:20	**11:20 / Taka Narumi** *Characterization of austenite grain structure evolution via metastable ferrite nucleation & ferrite-austenite transformation in Fe-Mn-C austenitic steel using X-ray imaging techniques*	**11:20 / Qing-Xi Chen** *Unusual Temperature Dependence of the Solid-Liquid Interfacial Energy in the Binary Lennard-Jones System*	**11:20 / Yueyuan Wang** *In situ STEM studies of the atomic structure transition across phase boundaries of a recycled Al alloy in melting and solidification*
11:40	**11:40 / Tomohiro Nishimura** *Time-resolved and in-situ observation of dendrite fragmentation during undercooled solidification in Cu-Fe-P alloys*	**11:40 / Tadej Dobravec** *Assessment of the meshless RBF-FD method for the 3-D phase-field modelling of dendrite growth*	**11:40 / Suwaree Chankitmunkong** *The effects of scrap addition on the structure and mechanical properties of hypereutectic Al-Fe alloys*
12:00	**12:00 / Sonja Steinbach** *Effect of hypergravity on microstructural development in Al-10wt.%Cu alloy during controlled directional solidification*	**12:00 / Tatu Pinomaa** *Bridging length scales in additive manufacturing conditions with in-situ rapid solidification experiments and simulation*	**12:00 / Janin Eiken** *Calphad-based multi-phase-field simulations of intermetallic compounds in secondary aluminum alloys with high impurity levels*
12:20	**12:20 / Andreas Ludwig** *Segregation Channels and Crystal Multiplication During the Solidification of an Aqueous Ammonium Chloride Solution*	**12:20 / Ahmed Elmoghazy** *Modelling of microstructure evolution during polymer solidification using the phase-field method*	**12:20 / Qiang Du** *An autonomous high throughput microstructure-property modelling approach toward design of recycling friendly Al-Si foundry alloys*
12:40	**12:40 / Lunch**		
	Eutectics & Peritectics	**Modeling & Simulations II**	**Aluminum Alloys II**
	Chair: Melis Şerefoğlu	*Chair: Ahmed Kaci Boukellal*	*Chair: Jiehua Li*
14:00	**14:00 / Silvere Akamatsu** *Lamellar eutectic grains with a crystallographic mosaicity*	**14:00 / Tomohiro Takaki** *High-performance phase-field lattice Boltzmann simulations for semi-solid deformation*	**14:00 / Dmitry Eskin** *Design of crack-resistant and high-temperature aluminium alloys for a range of casting technologies*
14:30	**14:30 / Ashwin J Shahani** *Capturing solidification in real-time at the nanoscale via full-field x-ray imaging*	**14:30 / Andrew Kao** *Large scale simulations of bi-crystal competition with buoyancy driven fluid flow*	**14:30 / Nicolas Coniglio** *Investigating solidification path of Al-Mg alloy for welding and casting conditions*
14:50	**14:50 / Soumyadeep Dasgupta** *Synchrotron x-ray nanotomography uncovers microstructure of a three-phase eutectic solidified in microgravity*	**14:50 / Miha Založnik** *Multiscale modeling of diffusive grain interactions during equiaxed dendritic solidification*	**14:50 / Thomas Schenk** *Influence of composition on microstructure formation in undercooled directionally solidified aluminium alloys*
15:10	**15:10 / Racha Hammoud** *Numerical Modeling of Eutectic Growth in Multicomponent Alloys*	**15:10 / Muhammad Umar** *Phase-Field Investigation of Solidification Cracking Probability During Laser Beam Welding*	**15:10 Kangcai Yu** *Evaluation of the cooling rate during solidification process of DC casting aluminum alloy industrial ingots*
15:30	**15:30 / Yutaka Urakawa** *Time-resolved and in-situ observation of solidification in Cu-Sn alloys*	**15:30 / Ali Fahem** *Finite Element Modelling of Multi-Pass Welding in 304L Stainless Steel Cladded with Low Alloy Low Carbon Steel*	**15:30 / Maximilian Erber** *Simulation of Fluid Flow for a Dual-Alloy Injector Casting Process*
15:50	**15:50 / Mathis Plapp** *Phase-field simulations and theoretical description of peritectic coupled growth*	**15:50 / Radhika Sarawagi** *Stress generation in the container during solidification of water*	
16:10	**16:10 / Andreas Ludwig** *Peritectic Layered Structures during Initial Transient*		
16:30			

Scientific committee only
16:45 – 17:45 / Scientific committee meeting / Bolonia Room

DETAILED PROGRAM / DAY 3 / THURSDAY JUNE 12th

Auditorium / *Chair: M Easton*

8:30 / Ulrike Hecht
Fast directional solidification enabling the design of novel alloys for additive manufacturing

9:15 / María Teresa Pérez-Prado
Additive manufacturing of fully amorphous Fe-based metallic glasses for soft magnetics

10:00 / Coffee break

	Room A Salon de actos / Ground floor	Room B Aula 13 / Ground floor	Room C Aula 14 / First floor
	Microgravity II	**Additive manufacturing I**	**Aluminum alloys III**
	Chair: Sonja Steinbach	*Chair: Tatu Pinomaa*	*Chair: Philippe Jarry*
10:30	**10:30 / Nathalie Bergeon** *Dendritic Array Stability in a 3D Diffusion Controlled Directionally Solidified Alloy System: Benchmark Experiments and Computation*	**10:30 / Charles-Andre Gandin** *Metallurgy-driven thermomechanical analysis of solidification grain structures by coupling cellular automaton with crystal plasticity*	**10:30 / Jiawei Mi** *Solidification dynamics across different spatiotemporal scale revealed in operando by the extremely brilliant synchrotron and X-ray free electron laser sources*
11:00	**11:00 / Wim Sillekens** *The X-Ray Facility (XRF): A new research capability for the International Space Station*	**11:00 / Duyao Zhang** *On the Compositional Criteria to Predict Columnar to Equiaxed Transitions in Metal Additive Manufacturing*	**11:00 / Antonio Vazquez Prudencio** *Laser-induced breakdown spectroscopy for studying solidification processes*
11:20	**11:20 / Guillaume Reinhart** *Analysis of preparatory directional solidification experiments using XRF (X-Ray Facility) for ISS*	**11:20 / Jürgen Jakumeit** *Thermal and Microstructure Simulations for LPBF processes with Different Laser Beam Profiles*	**11:20 / Dmitry Eskin** *Precipitation hardening potential in cast Al-Fe alloys*
11:40	**11:40 / Fan Wu** *Examining equiaxed solidification under microgravity through multi-scale characterization*	**11:40 / Imants Kaldre** *Magnetohydrodynamics effects in metal additive manufacturing*	**11:40 / Ahmed Ktari** *Impact of mold constraints on casting shrinkage during the cooling phase in rapid low-pressure sand-casting process*
12:00	**12:00 / Jonathan Mullen** *Accelerating Analysis of In-Situ X-Ray Videos of Alloy Solidification using Machine Learning*	**12:00 / Guillaume Boussinot** *Columnar dendritic growth in additive manufacturing*	**12:00 / Jaime Lazaro-Nebreda** *Low-Pressure Die Casting of Aluminum Alloy Components for EV Battery Enclosures*
12:20	**12:20 / Gwendolyn P Bracker** *Atmospheric suppression of dynamic nucleation during electromagnetic levitation experiments*	**12:20 / Yashan Zhang** *Solidification cracking suppression in additively manufactured Hastelloy X by controlling carbon content: Insight from phase-field simulations*	
12:40		**12:40 / Lunch**	
	Dieter Herlach I	**Additive manufacturing II**	**Steels**
	Chair: Damien Tourret	*Chair: Chris Gourlay*	*Chair: Miha Založnik*
14:00	**14:00 / Forewords**	**14:00 / Mark Easton** *The impact of high cooling rates the solidified microstructure: considering the Al-Si system in casting and additive manufacturing*	**14:00 / Menghuai Wu** *Modeling and experimental evaluation of as-cast structure and macrosegregation in steel ingot from a rotating mold*
14:10	**14:10 / Charles-Andre Gandin** *From theory of dendrite tip kinetics to additive manufacturing of multicomponent alloys*		
14:30		**14:30 / María Teresa Pérez-Prado** *An Al-Zn alloy with outstanding processability by laser powder bed fusion*	**14:30 / Gašper Vuga** *2.5D thermo-mechanical strong-form meshless travelling slice model of continuous casting of steel billets*
14:40			
14:50	**14:40 / Alain Karma** *Grain texture development during rapid solidification of thin metallic films*	**14:50 / Julie Gheysen** *Direct Liquid Metal Deposition of Aluminium Alloys*	**14:50 / Anna Ivanova** *Numerical issues in interface determination at continuously cast slab solidification using effective heat capacity & enthalpy methods*
15:10	**15:10 / Peter Galenko** *Non-equilibrium effects in rapid solidification*	**15:10 / Gizem Ersavas Isitman** *Improving the processability of additively manufactured tungsten by laser beam shaping experiments and melt pool flow simulations*	**15:10 / Ahmed Kaci Boukellal** *Influence of the fragmentation on the microstructure and segregation in a 110t steel ingot*
15:30	**15:30 / Dirk Holland-Moritz** *Phase selection during non-equilibrium solidification of undercooled Zr-Co melts studied by in situ X-ray diffraction*	**15:30 / Shishira Bhagavath** *Sustainable printing of copper using Laser Powder Bed Fusion*	**15:30 / Jacob R Kennedy** *Characterisation of centimetric scale segregation in large steel ingots*
15:50	**15:50 / Thomas Volkmann** *Formation & transformation of the metastable bcc phase in undercooled Fe-Co & Fe-Ni alloy melts*	**15:50 / Alan Vaissières** *Influence of laser speed on microstructure of copper enriched steels processed by additive manufacturing*	**15:50 / Sama Safarloo** *Development of Maraging Steels from Mixes of Commodity Alloys*
16:10	**16:10 / Coffee break**		
	Dieter Herlach II	**Additive manufacturing III**	**Nickel alloys**
	Chair: Dirk Holland-Moritz	*Chair: Jacob R Kennedy*	*Chair: Menghuai Wu*
16:40	**16:40 / Douglas Matson** *The influence of convection on phase transformation kinetics on ground and in microgravity*	**16:40 / Guillermo Santos** *Microstructure development during laser melting and resolidification; integrated experimental and simulation study*	**16:40 / Haijie Zhang** *Gravity effect on the freckle formation during directional solidification of Ni-based superalloys*
17:00	**17:00 / Andreas Meyer** *Additive Manufacturing of Metallic Glass from Powder in Space and at Synchrotron Radiation Facilities*	**17:00 / Chithra Menon** *Predicting Columnar to Equiaxed transition during laser-based additive manufacturing of SS316L reinforced by TiN particles*	**17:00 / Ibrahim Sari** *Freckle Formation in directional solidification of IN718 alloy*
17:20	**17:20 / Jonas Valloton** *Non-equilibrium solidification of hypereutectic Al-20wt%Ce atomized particles*	**17:20 / Ana Santana** *Effect of LPBF laser parameters & layer thickness on the solidification microstructure, texture & variant selection of a maraging steel*	**17:20 / Jun Li** *Prediction and control of the casting defects in the directional solidification of single-crystal nickel-based superalloys*
17:40	**17:40 / Asuncion Garcia-Escorial** *Solidification and Crystallization of FeNiP microwires*	**17:40 / Erick E Alvarado** *Laser Powder Bed Fusion of G91: Powder Properties and Microstructural Development*	**17:40 / Murali Uddagiri** *Phase-Field Modelling of Microstructure Evolution and Heat Treatment Optimization in Multi-Component Ni-Based Superalloy*
18:00			

19:30 ~ 19:45 / Shuttle buses meeting point / Calle de Alfonso XII, 52-54

20:00 / Banquet dinner & Award ceremony (ticketed event)
Restaurant La Masia de Jose Luis / Paseo de la Puerta del Ángel, 3

23:15 ~ 23:30 / Shuttle buses return

DETAILED PROGRAM / DAY 4 / FRIDAY JUNE 13th

09:15	***Auditorium*** */ Chair: D Tourret*		
	9:15 / Abhik Choudhury *Modeling assisted workflows for single-crystal Ni-based superalloy processing: Adaptations from Directional solidification to Additive*		
10:00	**10:00 / Coffee break**		
	Room A *Salon de actos / Ground floor*	***Room B*** *Aula 13 / Ground floor*	***Room C*** *Aula 14 / First floor*
	Rapid solidification	**Additive manufacturing IV**	**Complex alloys & Alloy design**
	Chair: Charles-André Gandin	*Chair: AAbhik Choudhury*	*Chair: Paula Alvaredo Olmos*
10:30	**10:30 / Peter Galenko** *Crystallization waves and explosive crystallization of liquid helium*	**10:30 / Wajira Mirihanage** *Multi-mode imaging and analysis of solidification behaviour in metal additive manufacturing*	**10:30 / Bojing Guo** *Segregation-dislocation self-organized structures ductilize a work-hardened medium entropy alloy*
11:00	**11:00 / Yue Li** *A phase-field model bridging near-equilibrium and far-from-equilibrium alloy solidification*	**11:00 / Sourav Goswami** *On the origins of fine equiaxed microstructure in additively manufactured 316L stainless steel – Inconel 718 bimetals*	**11:00 / A Nicholas Grundy** *Generating alloy thermodynamic and thermophysical data using CALPHAD*
11:20	**11:20 / Lei Wang** *Quantitative phase-field modeling of solute trapping and solute drag in rapid solidification*	**11:20 / Swapnil Bhure** *A Multi-Scale Framework for Achieving Single-Crystal Growth in Ni-based Superalloy Using Laser-Directed Energy Deposition*	**11:20 / Alexandre Viardin** *Phase field simulation study of solidification morphologies and microsegregation in high entropy alloy thin films*
11:40	**11:40 / Damien Tourret** *Emergence of Banded Microstructures in Rapid Solidification of Biomedical Mg Alloys*	**11:40 / Divya Nalajala** *CMSX-4 Superalloy Builds: A Comparative Study of Directional Solidification and Additive Manufacturing with Optimized Heat Treatment Strategies*	**11:40 / Daniel Guerrero Sánchez** *Microstructural control in eutectic high-entropy alloys: solidification pathways for hydrogen storage applications*
12:00	**12:00 / José Mancias** *A phase-field study of the effect of kinetic undercooling on the occurrence of banding in rapid solidification of alloys*	**12:00 / Neng Ren** *Multiple physical fields of laser powder bed fusion of nickel-based superalloys*	
12:20	**12:20 / Closing address / *Auditorium***		

POSTER PRESENTATIONS

Posters 19:45 – 22:00 / Tuesday / Vestibulo Jean Nouvel – Museum Reina Sofia
13 / Christian M G Rodrigues / *Validation of a Freeze-Lining Solidification Model Using Laboratory Experiments Under Static and Dynamic Conditions*
14 / Chenbo Xu / *Role of buoyancy flows in the remelting and solidification process of VAR*
15 / Eduardo Reverte Palomino / *Combinatorial development of Al-based alloys using DED technology*
40 / Lisa Philipp / *Freckle Formation and Freckle Criterion of Directionally Solidified Alloys Under Various Solidification Conditions*
55 / Maria Svéda / *Physical simulation of the practical solidification process by chill-plate experiments*
60 / Takumu Yamamura / *Metadynamics of solid-liquid interface for alloy*
63 / Gensei Kobayashi / *Phase-field multi-physics modeling & simulation of granular & dendritic fragmentation induced by solid deformation during solidification*
65 / Aoi Watanabe / *Large-Scale Data Assimilation for Estimating Interfacial Properties Using Quantitative Phase-Field Model*
71 / Haruki Yano / *Estimation of interface properties from dendrite images using systematic phase-field simulations and convolutional neural network*
72 / Tomoki Uchiyama / *Multi-phase-field lattice Boltzmann simulations for semi-solid compressive deformation*
73 / Konosuke Ikeda / *High-performance phase-field lattice Boltzmann simulations for accurate thermal fluid flow in metal additive manufacturing*
86 / Zsolt Veres / *Complex characterising of primer Si and eutectic in Al-Si alloys*
89 / Geetanjali Srivastava / *Casting of magnesium alloys for microgravity space experiments*
91 / Ayano Yamamura / *AMR-accelerated phase-field data assimilation for dendrite solidification*
95 / Natalia Shevchenko / *Combining in-situ synchrotron X-ray techniques to study the dendritic growth in Ga–In alloys*
100 / Taka Narumi / *Observation of equiaxed dendrite growth and motion in Al-Cu alloy using 4D-CT*
101 / Victoria Kaban / *Phase-field modelling of dendrite growth in undercooled Ti-6Al-4V*
110 / Aya Maruhashi / *Particle filter-based phase-field data assimilation for estimating material parameters in solidification*
123 / Amber Schneeweis / *Characterization of Additively Manufactured Stainless Steel with In-Situ Heat Treatment*
129 / Jonathan Chapignac / *Icosahedral order in an AlZr alloy: insights from first principle calculations*
134 / Peter Galenko / *Crystallization of Zr-Cu-Ni-Ti melts under terrestrial and reduced gravity conditions*
135 / Yuki Takahashi / *Multi-phase-field microstructure prediction for multiple layers and tracks in metal additive manufacturing*
154 / Noel Jakse / *Machine-Learned molecular dynamics study of crystal nucleation in eutectic Al-Si alloys*
159 / Aarne Pohjonen / *On the effect of solidification induced segregation on austenite formation and grain growth during re-heating of a forged steel part*
176 / Mehdi Medjkoune / *Insights into melting dynamics and microstructural evolution in multiphase peritectic alloys*
186 / Josh Cartwright / *Computational Modelling of Initial Temperatures within a Vacuum Induction Melting (VIM) Furnace*
189 / Rémi Hebrard / *Study of the mechanisms of the non-equilibrium solidification in the alumina-zirconia binary system*
190 / Elise Tuncay / *Non-equilibrium solidification of Al2O3 – MgO – ZrO2 system*
191 / Peter Galenko / *Modelling and Simulation of Atomic-Scale Solid/Liquid Interface under an External Magnetic Field Using Phase Field Crystal Method*
192 / Rajesh Kumari Rajendran / *Unraveling the Dynamics of Eutectic Melting: An In Situ Study of CBr_4-C_2Cl_6 Microstructures*
194 / Shishira Bhagavath / *Mechanisms of Defect Formation in High Pressure Die Casting*
195 / Utkarsh Godwal / *A component-scale Machine Learning framework for prediction of porosity in High Pressure Die Casting*

Special Thanks to our Sponsors

PHYSICSWORKS

Thermo-Calc Software

micress®

OpenPhase Solutions GmbH

aleastur group

CENIM
Centro Nacional de Investigaciones Metalúrgicas
Gobierno de España · Ministerio de Ciencia, Innovación y Universidades
CSIC Consejo Superior de Investigaciones Científicas

esa

Universidad Politécnica de Madrid
Politécnica

uc3m | Universidad Carlos III de Madrid