

SP17 Conference Programme

TUESDAY 25TH JULY				
07:00 - 08:50	Registration			
08:50 - 09:00	Welcome and Introduction			
	Plenary Session I	Chairman: Professor Zhongyun Fan		
09:00 - 09:30	Fifty Years of Solidification Research <u>W. Kurz</u> (Ecole Polytechnique Fédérale de Lausanne, Switzerland)			
09:30 - 10:00	Fifty Years of Casting R&D <u>J. Campbell</u> (University of Birmingham, UK)			
10:00 - 10:30	Why Solidification? Why Phase-Field? <u>I. Steinbach</u> (Ruhr-University Bochum, Germany)			
10:30 - 11:00	Break			
	ROOM A	ROOM B	ROOM C	ROOM D
	A1 - Nucleation I: Kinetics and Prenucleation Chairman: Dr Mark Easton	B1 - Dendritic Growth I: Modelling Chairman: Professor Ingo Steinbach	C1 - Eutectic Solidification I Chairman: Dr Peter Schumacher	D1 - Liquid Metals and Their Treatment Chairman: Professor John Campbell
11:00 - 11:20	Invited Lecture: Quantitative Determination of Nucleation Rates <u>G. Wilde</u> (University of Münster, Germany)	Invited Lecture: Evolution of the Interfacial Area in Dendritic Solidification <u>C. Beckermann</u> (University of Iowa, USA)	Invited Lecture: Dynamics of Eutectic Growth Patterns <u>S. Akamatsu</u> (Sorbonne Universités, France)	Invited Lecture: Development of the Multi-purpose High Shear Mixing Technology for Continuous Processing of Al and Mg Alloys <u>J.B. Patel</u> (BCAST, Brunel University London, UK)
11:20 - 11:40	Invited Lecture: Developments in Undercooling and Nucleation Kinetics <u>J.H. Perepezko</u> (University of Wisconsin-Madison, USA)	Invited Lecture: Phase Field Modelling of Multiphase Alloy Solidification: A Review <u>A.M. Mullis</u> (University of Leeds, UK)	Periodically Changing Rod Distance in Al-Al ₃ Ni Eutectic Solidified by Magnetic Stirring Process <u>Z. Veres</u> (University of Miskolc, Hungary)	Premetz: Reliable Analysis of Prefil Tests <u>P.G. Enright</u> (N-Tec, UK)
11:40 - 12:00	Invited Lecture: Phase-Field Crystal Modelling of Crystal Nucleation Process <u>J.C. Wang</u> (Northwestern Polytechnical University, China)	Computational Study of Spacing Selection in Directionally Growing Dendritic Arrays <u>V. Indrizzi</u> (University of Birmingham, UK)	Effect of Crystal Orientation on Lamellar-eutectic Solidification Microstructures: An In Situ and X-ray Diffraction Analysis of Thin Al-Al ₂ Cu Thin Samples <u>S. Bottin-Rousseau</u> (Université Pierre et Marie Curie, France)	Melt Composition Characterization and Fluid Flow Simulation of ZE41 Low Pressure Casting <u>A. Sanitas</u> (MSMP Laboratory, France)
12:00 - 12:20	Periodical Correlation Dependence of Segregation Behaviour of Fourth Period Transitional Metals on Local Melt Structure in Liquid Al <u>J. Zhang</u> (Shanghai Jiao Tong University, China)	Invited Lecture: Large-scale Phase-field Simulations for Dendrite Solidification on a Supercomputer <u>T. Takaki</u> (Kyoto Institute of Technology, Japan)	Development of Aluminium Casting Alloys Based on Al-Cu-Si-Mg Quaternary Eutectic System <u>I. Chang</u> (BCAST, Brunel University London, UK)	Transition Metal Additions and Double Oxide Film Defects in an Al-Si-Mg Alloy <u>W.D. Griffiths</u> (University of Birmingham, UK)
12:20 - 12:40	Effects of Misfit on Pre-nucleation with Molecular Dynamics Simulations <u>H. Men</u> (BCAST, Brunel University London, UK)	Physical Model for Aluminium Dendrite Growth on the Substrate <u>H. Esaka</u> (National Defense Academy, Japan)	"Eutectic-glass" Transition in the Fragile Alloys Under Growth-controlled Conditions <u>N. Wang</u> (Northwestern Polytechnical University, China)	The Measurement and Estimation of Density for Selected Liquid Alloys <u>P. Queded</u> (National Physical Laboratory, UK)
12:40 - 13:00	Liquid/Substrate Interface in the Heterogeneous Nucleation of Aluminium Alloys <u>Y. Han</u> (Shanghai Jiao Tong University, China)	Modelling Solidification Microstructures on the Process Scale – The Problem of Nucleation <u>A. Jacot</u> (BCAST, Brunel University London, UK)	3D Characterisation of a Rosette in an Aluminium-Silicon Alloy <u>D. Ferdian</u> (Universitas Indonesia, Indonesia)	
13:00 - 14:00	Lunch			

	ROOM A	ROOM B	ROOM C	ROOM D
	A2 - Nucleation II: Atomistic Study Chairman: Professor László Gránásy	B2 - Dendritic Growth II: <i>In Situ</i> Study Chairman: Dr Ragnvald Mathiesen	C2 - Eutectic Solidification II Chairman: Dr Silvére Akamatsu	D2 - Solidification Under External Field I Chairman: Professor Koulis Pericleous
14:00 - 14:20	Invited Lecture: Integrating Atomistic Simulations and Phase-Field Crystal Modeling in Study of Solid-Liquid Interfaces and Solidification of Metals <u>M. Asle Zaeem</u> (Missouri University of Science and Technology, USA)	Invited Lecture: Solidification in 4D: Quantification of Microstructure <u>P.W. Voorhees</u> (Northwestern University, USA)	Invited Lecture: The Test of the IIT (Impurity Induced Twinning) Theory: A Review of Silicon Modification Mechanisms in Al-Si Alloys <u>S.Z. Lu</u> (BCAST, Brunel University, UK)	Invited Lecture: Fundamental Studies of Ultrasonic Melt Processing <u>D.G. Eskin</u> (BCAST, Brunel University London, UK)
14:20 - 14:40	Invited Lecture: Very Large Scale Molecular Dynamics Simulation of Solidification <u>Y. Shibuta</u> (The University of Tokyo, Japan)	Dendrite Growth Kinetics and Solutal Field Evolution Investigated by In-Situ X-ray Radiography of Thin Al-Ge Alloy Samples <u>M. Becker</u> (DLR, Germany)	Pattern Formation Dynamics in Three-phase Systems <u>M. Serefoglu</u> (Koc University, Turkey)	4D Observation of Directional Solidification under Magnetic Fields <u>B. Cai</u> (University of Manchester, UK)
14:40 - 15:00	Effect of Misfit on Heterogeneous Nucleation by Molecular Dynamics Simulation <u>H. Men</u> (BCAST, Brunel University London, UK)	Examining Columnar Dendritic Growth under Dynamic Solute Concentration Level Variations <u>W.U. Mirihanage</u> (University of Manchester, UK)	Anomalous Eutectic Formation in Undercooled Melts: Quantitative Analysis <u>A.M. Mullis</u> (University of Leeds, UK)	Thermoelectric Magneto-hydrodynamics in Solidification Processes <u>A. Kao</u> (University of Greenwich, UK)
15:00 - 15:20	First-principle Calculations on Interfaces Between Al and AlB ₂ -Type Transition Metal Diborides <u>J. Xu</u> (Shanghai Jiao Tong University, China)	Direct Observation of Interfacial Diffusion and Microstructural Evolution in Al/Cu Bimetal <u>T. Wang</u> (Dalian University of Technology, China)	Aluminium Casting Alloys on the Base of Ternary Eutectic Containing Calcium and Iron <u>N.A. Belov</u> (National Research and Technological University, Russia)	Effect of Ultrasonic Melt Treatment on Grain Refinement of Direct Chill Cast AA6082 Aluminium Alloy <u>G. Salloum-Abou-Jaoude</u> (BCAST, Brunel University London, UK)
15:20 - 15:40	Effect of Substrate Chemistry on Pre-nucleation by Ab Initio MD Simulation <u>C.M. Fang</u> (BCAST, Brunel University London, UK)	High-throughput In-Situ Characterization of Growth and Interaction of Dendritic Grains in an Al-Cu Alloy <u>Z. Chen</u> (Dalian University of Technology, China)	Effect of Growth Rates and Sample Diameters on Primary and Secondary Dendrite Arm Spacings in Directionally Solidified Sn-8wt.%Sb Peritectic Alloy <u>E. Yilmaz</u> (Erciyes University, Turkey)	The Uncertain Effect of Cavitating Bubbles on Dendrites <u>G.S.B. Lebon</u> (University of Greenwich, UK)
15:40 - 16:10	Break			
	ROOM A	ROOM B	ROOM C	ROOM D
	A3 - Nucleation III: Mechanisms Chairman: Professor John Perepezko	B3 - Dendritic Growth III: <i>In Situ</i> Study Chairman: Dr Peter Voorhees	C3 - Peritectic/Monotectic Solidification Chairman: Professor Mathis Plapp	D3 - Solidification Under External Field II Chairman: Professor Dmitry Eskin
16:10 - 16:30	Invited Lecture: Effect of Interfacial Segregation on Heterogeneous Nucleation <u>Y. Wang</u> (BCAST, Brunel University London, UK)	Synchrotron X-ray Imaging and Numerical Modelling of Dendritic Sidebranch Evolution During Coarsening <u>H. Neumann-Heyme</u> (Helmholtz-Zentrum Dresden-Rossendorf, Germany)	Invited Lecture: Massive-like Transformation in Fe-Cr-Ni Alloys: In-situ and Time-resolved Observation <u>H. Yasuda</u> (Kyoto University, Japan)	Invited Lecture: Cavitation in Liquid Metal Melts Using Contactless Electromagnetic Vibration <u>K.A. Pericleous</u> (University of Greenwich, UK)
16:30 - 16:50	Invited Lecture: Probing the Heterogeneous Nucleation Interface of TiB ₂ in Alloys by Advanced Electron Microscopy <u>P. Schumacher</u> (Montanuniversität Leoben, Austria)	Morphological Transition α -Mg Dendrites During Near-isothermal Solidification of a Mg-Nd-Gd-Zn-Zr Casting Alloy <u>R. Mathiesen</u> (NTNU, Norway)	Effect of Rotating and Travelling Magnetic Field on the Solidified Structure of Peritectic Sn-Cd Alloy <u>M. Svédá</u> (MTA-ME Materials Science Research Group, Hungary)	Overcooling in LFEC Casting <u>J. Cui</u> (Northeastern University, China)
16:50 - 17:10	Revealing the Deterministic Nature of the Heterogeneous Nucleation of Inoculated Aluminium Alloys <u>Y. Li</u> (Norwegian University of Science and Technology, Norway)	In Situ Analysis of the Grain Structure Formation During Horizontal Directional Solidification of Refined Al-20wt.%Cu Alloy <u>G. Reinhart</u> (Aix Marseille University, France)	Influence of Static Magnetic Fields on Liquid Phase Separation in Undercooled Cu-Co Alloys <u>J. Gao</u> (Northeastern University, China)	Understanding the Ultrasonic Influence on Solidification of Light Metals and Alloys <u>H.R. Kotadia</u> (University of Warwick, UK)
17:10 - 17:30	Grain Initiation: Progressive vs. Explosive <u>B. Jiang</u> (BCAST, Brunel University London, UK)	Synchrotron X-ray Micro Tomography Study of the 3D Structures of Metal Carbides in Cast IN713LC Ni Superalloys <u>J.C. Khong</u> (University of Hull, UK)	Coarsening Kinetics of Dispersed Droplets in Al-Bi Immiscible Alloy with Various Solidification Conditions <u>W.Q. Lu</u> (Shanghai Jiao Tong University, China)	The influence of Intermetallic Phases on the Permeability in Al-Si-Cu-Fe Alloys Processed Under Forced Fluid Flow Conditions <u>S. Steinbach</u> (German Aerospace Center, (DLR), Germany)
John Hunt Memorial Lecture and Dinner				

WEDNESDAY 26TH JULY

	Plenary Session II	Chairman: Professor Christoph Beckermann		
08:30 - 09:00	Microstructure Modelling Beyond Phase Field <u>M. Rappaz</u> (Ecole Polytechnique Fédérale de Lausanne, Switzerland)			
09:00 - 09:30	A New Framework for Understanding of Heterogeneous Nucleation and Grain Refinement <u>Z. Fan</u> (BCAST, Brunel University London)			
09:30 - 10:00	Twin-roll Casting of Mg Alloys <u>N.J. Kim</u> (Pohang University of Sciences and Technology (POSTECH), Korea)			
10:00 - 10:30	Increasing Quality Demands on Continuously Cast Steel - New Challenges for Solidification Research? <u>C. Bernhard</u> (Montanuniversitaet Leoben, Austria)			
10:30 - 11:00	Break			
	ROOM A	ROOM B	ROOM C	ROOM D
	A4 - Nucleation IV: Experimental Study Chairman: Professor Gerhard Wilde	B4 - Dendritic Growth IV: Facetted Growth Chairman: Professor Andrew Mullis	C4 - Solidification of Cast Iron Chairman: Professor Martin Glicksman	D4 - Process Modelling Chairman: Professor Alain Jacot
11:00 - 11:20	Invited Lecture: Heterogeneous Nucleation Mechanisms in Solder Joints <u>C.M. Gourlay</u> (Imperial College London, UK)	Faceting in Al-Si Using Phase field <u>P.C. Bollada</u> (University of Leeds, UK)	Invited Lecture: Macro and Microstructure Formation in Lamellar Graphite Iron <u>A. Diószegi</u> (Jönköping University, Sweden)	Invited Lecture: Multiphysics and Multiscale Modelling of Solidification in Casting Processes <u>M. Zaloznik</u> (Université de Lorraine, France)
11:20 - 11:40	Invited Lecture: Nucleation Pathway of Pure Al on Al ₂ O ₃ (10 $\bar{1}$ 0) Substrate <u>M. Xia</u> (Shanghai Jiao Tong University, China)	Faceted and Nonfaceted Growth of Cu ₆ Sn ₅ Crystals <u>J.W. Xian</u> (Imperial College, UK)	Thermal Analysis Control of the Magnesium Treatment of Ductile Iron Produced in a Georg Fischer Converter <u>M. Lueben</u> (George Fischer Automobilguss GmbH, Germany)	Invited Lecture: Grain Selection During Solidification of Single-Crystal Ni-base Alloys <u>H.B. Dong</u> (University of Leicester, UK)
11:40 - 12:00	Heterogeneous Nucleation in Peritectic Systems <u>J.H. Perepezko</u> (University of Wisconsin-Madison, USA)	Effect of Fe Addition on the Microstructure and Mechanical Property of Diecast Al-Mg ₂ Si-Mg Based Alloy <u>F. Yan</u> (North University of China, China)	Influence of Ti and Mo Additions in the Isothermal Coarsening Process of Primary Austenite in Lamellar Graphite Iron <u>J.C. Hernando</u> (Jönköping University, Sweden)	Modelling of Microstructure Evolution in Twin Roll Casting of Magnesium <u>H. Assadi</u> (BCAST, Brunel University London, UK)
12:00 - 12:20	Quasicrystal Nucleation in an Intermetallic Glass Former <u>R. Kobold</u> (German Aerospace Center, DLR, Germany)	Solidification of Al ₈ Mn ₅ in Mg-Al-Zn-Mn alloys <u>G. Zeng</u> (Imperial College London, UK)	The Role of Titanium and Nitrogen in Graphite Nucleation of Ductile Iron <u>G.A. Alonso</u> (IK4-Azterlan, Spain)	Multiscale Solidification Simulation of an Axisymmetric A356 Component in Die Casting <u>G. Laschet</u> (Access e.V, Germany)
12:20 - 12:40	Nucleation and Growth of Primary Si during Solidification of Hypereutectic Al-Si Alloys: A Combined In Situ X-radiography and Ex Situ TP-1 Type Test <u>Y.J. Xu</u> (Norwegian University of Science and Technology, Norway)	Solidification Interface Morphology Pattern in the Undercooled Co-Sn Alloy Melts <u>J.F. Li</u> (Shanghai Jiao Tong University, China)	Inferring the Development of Microsegregation and Microstructure in Spheroidal and Compacted Graphite Iron Using EPMA-WDS <u>B. Domej</u> (Jönköping University, Sweden)	In-situ Study and Simulation of Incipient Melting of Single Crystal Superalloy <u>N. Warnken</u> (University of Birmingham, UK)
12:40 - 13:00	Grain Refinement of Al- and Mg- alloys by Native Oxide Particles <u>Y. Wang</u> (BCAST, Brunel University London, UK)	Synchrotron X-ray Tomography Studies of Fe-rich Intermetallic Phases in Al Alloys <u>Y. Zhao</u> (University of Hull, UK)	Elucidating Graphite's Multitude of Growth Modes in a Cast Iron Alloy Captured Using In Situ 4D X-ray Synchrotron Tomography <u>M. Azeem</u> (The University of Manchester, UK)	Controls on Microstructural Features During Solidification of Colloidal Suspensions <u>J. You</u> (Northwestern Polytechnical University, China)
13:00 - 14:00	Lunch			

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	ROOM A	ROOM B	ROOM C	ROOM D
	A5 - Grain Refinement I: Solute Effect Chairman: Dr Yanjun Li	B5 - Dendritic Growth V: Melt Flow Chairman: Dr Nils Warnken	C5 - Defect Formation I: Hot Tearing & Other Defects Chairman: Professor Michel Rappaz	D5 - Melt-Conditioned Casting Processes Chairman: Professor David St John
14:00 - 14:20	Invited Lecture: Advances in Grain Refinement of Light Metals and Alloys: An Overview and Some Initial Investigations into Additive Manufacturing <u>M. Easton</u> (RMIT University, Australia)	Invited Lecture: Investigation of the Effect of Fluid Flow on Microstructure Evolution in Al-Si-Fe Alloys: The MICAST Project <u>S. Steinbach</u> (Deutsches Zentrum für Luft- und Raumfahrt, Germany)	Invited Lecture: 20 years of the RDG Criterion: Evolution of Hot Tearing Criteria in Aluminium Alloys <u>A. Phillion</u> (McMaster University, Canada)	Melt Conditioned Twin Roll Casting (MC-TRC) Process for Thin Gauge Mg Alloy Strip <u>C.L. Mendis</u> (BCAST, Brunel University London, UK)
14:20 - 14:40	A New Concept of Growth Restriction Coefficient <u>F. Gao</u> (BCAST, Brunel University London, UK)	Simulation of Convective Flow Around a Dendrite Particle Using Finite Element Multi-mesh Software <u>O. Budenkova</u> (CNRS, France)	Hot Tearing of Various Binary Magnesium Alloys <u>Y. Huang</u> (HZG, Germany)	Melt Conditioned Direct Chill (MC-DC) Casting of Al and Mg Alloys <u>H.T. Li</u> (BCAST, Brunel University London, UK)
14:40 - 15:00	A Phase-field Study of Grain Refinement: Role of Number Density of Inoculant Particles <u>H. Assadi</u> (BCAST, Brunel University London, UK)	The Effect of Solutal Convection on Dendritic Growth in Al-4wt.%Cu Alloy from Initial Transient to Steady State During Upward Directional Solidification: A Large-scale Quantitative Phase-field Study <u>Y. Chen</u> (Chinese Academy of Sciences, China)	Solidification Study of Steels by Differential Thermal Analysis and Impact of the Steel Chemistry on the Hot Tearing Sensitivity of Grades <u>F. Oudich</u> (ArcelorMittal Global, France)	Melt Conditioned High Pressure Die Casting of AZ91 Mg-alloy with Improved Variation of Mechanical Properties <u>Y. Zhang</u> (BCAST, Brunel University London, UK)
15:00 - 15:20	Grain Refinement and Solidification Texture Evolution in Aluminium Alloys <u>Z. Chen</u> (Northwestern Polytechnical University, China)	Effects of High Magnetic Field on the Growth of Zinc-rich Crystals During the Solidification Process of Binary Zinc Alloys <u>L. Li</u> (Northeastern University, China)	The Influences of Ingot Design on the Centreline Porosity in Large Scale Steel Ingot <u>T. Gu</u> (North University of China, China)	Efficient De-gassing of Aluminium Alloy Melt by High Shear Mixing Technology <u>J.B. Patel</u> (BCAST, Brunel University London, UK)
15:20 - 15:40	Inoculation of Ti-Al by Ti-Al-(RM) Powder and its Grain Refinement Efficiency <u>J.R. Kennedy</u> (Université de Lorraine, France)	Evolution of Permeability During Solidification in Simulated A356 Microstructures <u>R. Berger</u> (Access e.V, Germany)	A New Advanced Porosity Module <u>J. Guo</u> (ESI, USA)	De-ironing of Aluminium Scrap by High Shearing Processing <u>J. Lazaro Nebreda</u> (BCAST, Brunel University London, UK)
15:40 - 16:10	Break			
	ROOM A	ROOM B	ROOM C	ROOM D
	A6 - Grain Refinement II: <i>In Situ</i> Study Chairman: Dr Yun Wang	B6 - Dendritic Growth VI: Melt Flow Chairman: Professor Wilfried Kurz	C6 - Defect Formation II: Microsegregation Chairman: Dr André Phillion	D6 - Semi-solid Metal Processing Chairman: Dr Shouxun Ji
16:10 - 16:30	Invited Lecture: Measurement of Grain Formation Rate Using In-situ X-ray Synchrotron Radiography and Machine Learning <u>P.S. Grant</u> (University of Oxford, UK)	Invited Lecture: Recent Advances, Challenges and Future Trends on Four Dimensional Studies of the Solidification Processes <u>J. Mi</u> (University of Hull, UK)	Invited Lecture: Microsegregation Build-up During Solidification of Nodular Cast Iron - Phase-field Simulation Versus Experimental Information <u>J. Eiken</u> (Access, Germany)	Invited Lecture: Semisolid Processing of Metallic Alloys and Composites: Where are we now? <u>H. Atkinson</u> (Leicester University, UK)
16:30 - 16:50	The Effect of Ultrasonic Treatment on Macrosegregation in an Al-19Si-4Fe Alloy <u>C. Todaro</u> (RMIT University, Australia)	Effect of Microstructure During Dendritic Solidification on Melt Flow: A Phase-field-lattice-Boltzmann Study <u>A. Monas</u> (Ruhr-University Bochum, Germany)	Multicomponent Microsegregation Model with Diffusion Interaction Between Species - Application to Microstructure Evolution <u>G. Guillemot</u> (PSL Research University, France)	Production of Non-dendrite Semi-Solid Composite Microstructure with Modified SIMA (C-SIMA) Process <u>A. Turkeli</u> (University of Marmara, Turkey)
16:50 - 17:10	Fragmentation in Directionally Solidified Al-10wt%Cu Alloy at Low Pulling Speeds <u>G. Zimmermann</u> (Access e.V, Germany)	The Effect of Melt Flow on Dendritic Solidification in Ga-In Alloys <u>N. Shevchenko</u> (Helmholtz-Zentrum Dresden-Rossendorf, Germany)	Evolution of Cast Microstructures During Processing of Single Crystal Ni-base Superalloys Using a Bridgman Seed Technique <u>P. Hallensleben</u> (Ruhr-Universität Bochum, Germany)	3D Primary Grain Shapes Resulting from Semi-solid Metal Processing <u>U.A. Curle</u> (Council for Scientific and Industrial Research, South Africa)
17:10 - 17:30	Synchrotron Quantification of Dendritic Evolution in Mg-Zn Alloys <u>E. Guo</u> (The University of Manchester, UK)	Comparison of 2D and 3D Simulations of Solidification of Binary and Ternary Al-based Alloys under RMF <u>O. Budenkova</u> (CNRS, France)	The Effect of Dendrite Arm Coarsening on Back Diffusion and Microsegregation <u>A. Turkeli</u> (University of Marmara, Turkey)	Phase-field Study on Stress Induced Dendrite Fragmentation <u>N. Warnken</u> (University of Birmingham, UK)
	Farmers Street Market			

SP17 Conference Programme

THURSDAY 27TH JULY

Plenary Session III		Chairman: Professor Alain Karma	
08:30 - 09:00	Formation and Properties of Metallic Glasses <u>A.L. Greer</u> (University of Cambridge, UK)		
09:00 - 09:30	Nucleation and Polycrystalline Growth in a Hydrodynamic Theory of Freezing <u>L. Gránásy</u> (Hungarian Academy of Sciences, Hungary)		
09:30 - 10:00	Solidification Processing of Superalloys <u>R.F. Singer</u> (University of Erlangen-Nuernberg Lehrstuhl WTM, Germany)		
10:00 - 10:30	Solidification Structure Selection as a Guideline to the Optimization of Al-alloys DC Casting <u>P. Jarry</u> (Constellium Technology Center, France)		
10:30 - 11:00	Break		
ROOM A		ROOM B	
	A7 - Grain Refinement III: Effect of External Field Chairman: Dr Jiawei Mi	B7 - Dendritic Growth VII: Micro-Gravity Chairman: Professor Lorenz Ratke	C7 - Defect Formation III: Macrosegregation Chairman: Professor Christian Bernhard
11:00 - 11:20	Nucleation and Dendrite Growth Under the Action of Pulsed Magnetic Field <u>Y.S. Yang</u> (Institute of Metal research, China)	Invited Lecture: Columnar and Equiaxed Solidification in Microgravity Environment - The CETSOL Project <u>G. Zimmermann</u> (Access e.V., Germany)	Invited Lecture: Numerical Study of Crystal Sedimentation Induced Segregation Band in Steel Ingots <u>M. Wu</u> (Montanuniversitaet Leoben, Austria)
11:20 - 11:40	Investigation of Dendrite Settlement in Commercial Purity Al During Solidification with a Forced Fluid Flow <u>J.C. Jie</u> (Dalian University of Technology, China)	Invited Lecture: Overview of In Situ X-ray Studies of Metal Alloy Solidification in Microgravity Conditions - The XRMON Project <u>H. Nguyen-Thi</u> (Aix-Marseille University, France)	Assessment of the Effect of Solutal Boundary Layer Thickness on Macrosegregation Formation During VAR Process in Zirconium Ingots <u>K. Mramor</u> (Institut Jean Lamour, France)
11:40 - 12:00	Control of Structure and Segregation of Large-sized Aluminium Alloy Billet by Uniform Direct Chill Casting <u>Z.F. Zhang</u> (General Research Institute for Non-Ferrous Metals, China)	Three-dimensional Grain Boundry Instability and Solitary Cell Dynamics in Directional Solidification of Binary Alloys <u>A. Karma</u> (Northeastern University, USA)	Effect of Solutal, Thermal and Shrinkage Induced Flow on the Solidification Grain Structure and Segregation <u>S. Mosbah</u> (Universal Think Solidification, USA)
12:00 - 12:20	Solidification Mechanisms During Melt Conditioned Direct Chill (MC-DC) Casting <u>H.T. Li</u> (BCAST, Brunel University London, UK)	Quantification of Equiaxed Dendrite Motion during Spatially Isothermal Solidification of an Al-Cu Alloy in Microgravity <u>S. Velayutham</u> (University College Dublin, Ireland)	The Evolution of RE-based Inclusion and its Effect on Macrosegregation in Bearing Steels <u>Y.F. Cao</u> (Chinese Academy of Sciences, China)
12:20 - 12:40	Equiaxed Structure in DC-casting Al-10Si Billets via Engineered Nucleation <u>H.B. Nadendla</u> (BCAST, Brunel University London, UK)	In-situ Observation of Equiaxed Dendritic Growth and Interaction in Microgravity <u>L. Sturz</u> (Access e.V., Germany)	Nucleation and Propagation of Extended Defects During Seeded Directional Silicon Growth <u>G. Regula</u> (Aix - Marseille Université, France)
12:40 - 13:00	Effect of Ultrasonic Field on Undercooling and Nucleation Rate During Solidification of 7085 Aluminium Alloy <u>Q. Li Rui</u> (Central South University, China)	Evolution of Primary Spacing During Directional Solidification of Transparent Bulk Samples Conducted on DECLIC-DSI <u>N. Bergeon</u> (Aix - Marseille Université, France)	Exploring Semi-solid Deformation with the Discrete Element Method and Synchrotron Radiography <u>T.C. Su</u> (Imperial College London, UK)
13:00 - 14:00	Lunch		
			D7 - Solidification Processing of Metal Matrix Composites Chairman: Dr André Roósz
			Improving Particle Distribution in Metal Matrix Composites (MMCs) by Intensive Melt Shearing <u>X.L. Yang</u> (BCAST, Brunel University London, UK)
			Pressureless Reactive Infiltration of Liquid Al into Porous Fe Preform <u>S. Milenkovic</u> (IMDEA Materials Institute, Spain)
			Characterisation of Al/SiC MMCs Fabricated Using Siliconised Carbon Fibres <u>S.C. Hogg</u> (Loughborough University, UK)
			Solidification Processing of Super Metals Containing Self-dispersed Nanoparticles <u>A. Javadi</u> (University of California, USA)
			The Impact of High Shear Treatment on the HA Particle Distribution and Microstructure of Mg-HA Nanocomposite Castings <u>Y. Huang</u> (BCAST, Brunel University London, UK)
			Development and Validation of a Numerical Model for Intermetallic Layer Growth During Composite Casting of Cu-Al-Compounds <u>O. Starykov</u> (Clausthal University of Technology, Germany)

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	ROOM A	ROOM B	ROOM C	ROOM D
	A8 - Grain Refinement - Intermetallic Compounds (IMCs) Chairman: Dr Chris Gourlay	B8 – Microstructure Formation I Chairman: Dr Yves Fautrelle	C8 - Solidification of Other Systems Chairman: Professor Hamid Assadi	D8 - Additive Manufacturing Chairman: Professor Patrick Grant
14:00 - 14:20	Compositional Templating for Heterogeneous Nucleation of Intermetallic Compounds (IMCs) <u>Z. Que</u> (BCAST, Brunel University London, UK)	Invited Lecture: Effect of Low Rotating Magnetic Field (RMF) Induced Melt Flow on the Microstructure of Unidirectionally Solidified Al-7wt%Si-1wt%Fe Alloy <u>A. Roósz</u> (Materials Science Research Group, Hungary)	Invited Lecture: Bubble Growth and Three Phase Flow During the Solidification of Magma <u>P. Lee</u> (University of Manchester, UK)	Static Magnetic Field has Impact on Solidification Structure of Metallic Samples Fabricated via Additive Manufacturing <u>J. Wang</u> (Shanghai University, China)
14:20 - 14:40	Comparison of the Effects of Al-5B and Al-5Ti-1B Grain Refiners on the Formation of Fe-rich Phases in Secondary Al-7Si-3Cu-0.3Mg Alloys <u>J. Rakhmonov</u> (University of Padova, Italy)	Volume Average Modelling of Equiaxed-to-Columnar Transition in a Vertically Solidified Pb-18 wt.%Sn Cavity <u>Y. Zheng</u> (University of Leoben, Austria)	Directional Solidification and Microstructure Control of Al ₂ O ₃ /GdAlO ₃ Eutectic In-situ Composite by Laser Floating Zone Melting with High Temperature Gradient <u>H. Su</u> (Northwestern Polytechnical University, China)	Controlling the Columnar to Equiaxed Transition in Metal Additive Manufacturing <u>M. Patel</u> (RMIT University, Australia)
14:40 - 15:00	Refinement of Primary Al ₃ Ti Intermetallic Particles in an Al-0.4 wt% Ti alloy by Ultrasonic Melt Processing <u>F. Wang</u> (BCAST, Brunel University London, UK)	Critical Parameters Concerning the Columnar - to - Equiaxed Transition in Solidification Processing <u>Y.Z. Li</u> (Aix Marseille University, France)	Interaction between Double Diffusive Convection and Solidification in Ammoniumchloride Solutions <u>S. Anders</u> (HZDR, Germany)	Analysis of the Solidification Behaviour of Nb-Si-Ti Alloys Produced by Laser Additive Manufacturing <u>L.M. Feitosa</u> (University of Leicester, UK)
15:00 - 15:20	Intermetallic Phase Selection in AAGXXX Aluminium Alloys: Role of Grain Refiner and Trace Elements <u>K. Sundaram</u> (University of Oxford, UK)	Columnar Grain Competition in Low Density Steels <u>N. Hollyhoke</u> (University of Warwick, UK)	The Evolution of Solidification Microstructures in Ice Cream During Thermal Cycling <u>E. Guo</u> (University of Manchester, UK)	Impact of Forced Flow on the Solidification Structure of Wrought Aluminium Alloys by Means of AC Magnetic Fields <u>D. Rábiger</u> (Helmholtz-Zentrum Dresden-Rossendorf, Germany)
15:20 - 15:40	The Critical Assessment of Data for Al-Fe Based Intermetallic Phases Formed During Solidification of Aluminium Alloys <u>A.T. Dinsdale</u> (BCAST, Brunel University London, UK)	Constitutive Relations for Macroscopic Modeling of Equiaxed Solidification <u>C. Beckermann</u> (University of Iowa, USA)	On the Structure Evolution of TiAl-based Alloy Directionally Solidified in the BaZrO ₃ -based Mould <u>L. Kai</u> (Shanghai Univeristy, China)	Additive Alloy Melting: A Novel High-throughput Method for Accelerated Alloy Fabrication <u>S. Milenkovic</u> (IMDEA Materials Institute, Spain)
15:40 - 18:00	Poster Session (with light refreshments) (All Posters will be displayed in a dedicated room from the beginning of the conference)			
	Conference Gala Dinner			

SP17 Conference Programme

FRIDAY 28TH JULY				
	Plenary Session IV	Chairman: Professor Lindsay Greer		
08:30 - 09:00	Design of Metastable Materials: Experimental Results and Modelling of Non-equilibrium Solidification <u>D.M. Herlach</u> (DLR, Germany)			
09:00 - 09:30	Phase-field Simulations of Coupled Eutectic Growth <u>M. Plapp</u> (Université Paris-Saclay, France)			
09:30 - 10:00	Numerical Simulation of Macroseggregation of Large Steel Ingots with a Multicomponent Multiphase Model <u>B. Liu</u> (Tsinghua University, China)			
10:00 - 10:30	Capillary Perturbations: Interface Fields Affecting Solidification <u>M. Glicksman</u> (Florida Institute of Technology, USA)			
10:30 - 11:00	Break			
	ROOM A	ROOM B	ROOM C	ROOM D
	A9 - New Techniques for Solidification Study Chairman: Dr Peter Lee	B9 - Microstructure Formation II Chairman: Professor Hongbiao Dong	C9 - Non-equilibrium Solidification Chairman: Professor Dieter Herlach	D9 - Solidification Processing Chairman: Professor Bill Griffiths
11:00 - 11:20	A combination of In Situ Synchrotron Diffraction and In Situ Synchrotron Tomography Techniques to Study the Solidification Behaviour of Mg-%Nd-5Zn Alloy <u>T. Subroto</u> (HZG, Germany)	Invited Lecture: Statistical Analysis of the Solidification of Tin-Lead Alloy: What is Really Reproducible? <u>Y. Fautrelle</u> (CNRS-Grenoble Institute of Technology, France)	Dendrite Growth Kinetics and Growth Morphology of fcc and bcc Structured Phases in Undercooled Melts <u>T. Volkmann</u> (German Aerospace Center (DLR), Germany)	Mechanical Properties of a Nanostructured Al-Fe-Cr-Ti Alloy Produced in Bulk Form by Spray-casting <u>E. Liotti</u> (University of Oxford, UK)
11:20 - 11:40	Recent Advances in 4D Micro- and Nanotomography provide Experimental Insights for the Processing of Metal-based Nanocomposites <u>L. Salvo</u> (CNRS University, France)	Invited Lecture: Solidification of Al-Si Alloys: The Formation and Morphology of Primary and Eutectic Structures <u>D.H. StJohn</u> (University of Queensland, Australia)	Effects of Solute Trapping on Solidification Path of Ta-Al-Fe and Nb-Al-Fe Ternary Alloys Under Rapid Freezing <u>L. Feitosa</u> (University of Leicester, UK)	A Shop Floor Approach to Improving Quality in Investment Cast CF8M Components For Biomedical Applications <u>R. Lumley</u> (La Trobe University, Australia)
11:40 - 12:00	Solidification Studies at the Australian Centre for Neutron Scattering <u>M. Reid</u> (Australian Nuclear Science and Technology Organisation, Australia)	The Effect of Cr and Zr Additions on the Structure and Phase Composition of TNM Gamma Titanium Aluminide Alloys after Solidification and Hot Isostatic Pressing <u>T.K. Akopyan</u> (National University of Science and Technology MISiS)	Transformation Kinetics of Metastable bcc Phase in Undercooled Fe-Co Alloy Melts <u>C. Kreischer</u> (German Aerospace Center (DLR), Germany)	Optimization of Melting and Casting Techniques and Parameters for Ultra-light Weight Mg-Li Based Alloys <u>S. Kumar</u> (Indian Institute of Science, India)
12:00 - 12:20	Revealing the Modification of Eutectic Si in Al Alloy by Advanced Electron Microscopy <u>P. Schumacher</u> (Montanuniversität Leoben, Austria)	2D Axisymmetric Front Tracking Model for Bridgman Solidification of γ -TiAl Alloys <u>S. Battaglioli</u> (Trinity College Dublin, Ireland)	Microstructure of Tetragonal Ni ₂ B Compound Solidified from the Undercooled Melt <u>M. Kolbe</u> (German Aerospace Center (DLR), Germany)	Prediction of Air Entrainment in High Pressure Die Casting Applications <u>J. Jakumeit</u> (Access e.V, Germany)
12:20 - 12:40	The Development of HTCM - DTA for the Study of Solidification <u>D. Phelan</u> (University of Wollongong, Australia)	Phase-field Study of Microstructure Evolution in Directionally Solidified NiAl-34Cr During Dynamic Velocity Changes <u>M. Kellner</u> (Karlsruher Institute of Technology, Germany)	Transient Metastable Phases in Peritectic Systems: Terrestrial vs. Microgravity Experiments <u>O. Shuleshova</u> (Leibniz Institute for Solid State and Materials Research Dresden, Germany)	Castability, Mechanical Properties and Microstructure of A201 Alloys with Additions of Si, Ti and B <u>S. Abd El Majid</u> (Israel Institute of Technology, Israel)
12:40 - 13:00	Skeletonisation to Find the Centre of Dendrites Traced from a 2D Microstructural Image <u>J.E. Miller</u> (University of Birmingham, UK)	The Phase Formation of Mg-Zn-Gd Alloy in the Mg-rich Corner <u>Y. Liu</u> (Nanchang University, China)		Light Weight Opportunities and Challenges for the Future in the Context with Solidification and Design <u>B. Kendhapadi Mothila</u> (The University of Warwick, UK)
13:00 - 14:00	Lunch			
14:00 - 15:40	Round Table Discussion — The Future of Solidification and Casting Research			
	Conference End			

Poster Presentations

Grain Refinement

- P01 A Theoretical Model for Semi-quantitatively Calculating Cavitation Induced Nuclei in an Ultrasonicated AlCu Melt
D. Shu (Shanghai Jiao Tong University, China)
- P02 The Primary Phase Refinement in Al-7%Si and Al-17%Si Alloys Solidified by the Electromagnetic Stirring Technique
M. Li (National Institute of Advanced Industrial Science and Technology, Japan)
- P03 Grain Refinement of Pure Copper
J.B. Patel (BCAST, Brunel University London, UK)
- P04 Microstructure and Mechanical Properties of Cast Al-Si-Mg-Cu Alloys Refined by Al₅Ti₁B and Al₃Ti₃B
X. Dong (BCAST, Brunel University London, UK)
- P05 Comparison of the Effect of Two Different Types of TMF Induced Melt Flow on the Microstructure of Unidirectionally Solidified Al-7wt.%Si-1wt.%Fe Alloy
A. Rónaföldi (MTA-ME, Materials Science Research Group, Hungary)
- P06 Influence of High Rotating Magnetic Field (RMF) on the Solidified Structure of Al-7wt.%Si-1wt.%Fe Alloy
J. Kovács (MTA-ME, Materials Science Research Group, Hungary)

Dendrite Growth

- P07 In-situ Equiaxed Dendrite Growth Experiments in Comparison with DNN-modelling
M. Becker (DLR, Germany)
- P08 Synchrotron Quantification of Dendritic Evolution in Mg-Zn Alloys
E. Guo (The University of Manchester, UK)
- P09 Combining In-situ Synchrotron X-ray Techniques to Study the Dendrite Morphology in Solidifying Ga-In Alloys
N. Shevchenko (Helmholtz-Zentrum Dresden-Rossendorf, Germany)
- P10 Modeling and Synchrotron Validation of Dendritic Solidification in a Co Based Alloy
M. Azeem (The University of Manchester, UK)
- P11 Free Dendritic Growth Under the Influence of Thermoelectric Magneto hydrodynamics
J. Gao (Northeastern University, China)
- P12 Morphological Transitions: In-situ Observation of Equiaxed Growth in Al-Zn Alloys
F. Kargl (DLR, Germany)

Microstructure Formation

- P13 Real-time Synchrotron X-ray Studies of the Solidification Microstructures of Al Alloys Under Pulse Electromagnetic Fields
W. Du (University of Hull, UK)
- P14 Microstructural Evolution and Mechanical Property of Directionally Solidified Al-Mn-Be Alloy
H. Kang (Dalian University of Technology, China)
- P15 Rapid Solidification of Aluminium-Nickel Melts in Earth and Space Environment
M. Reinartz (DLR, Germany)

- P16 Parallel GPU Lattice Boltzmann Method for Fluid Dynamics in Microstructure Modelling
I. Krastins (University of Greenwich, UK)
- P17 Observed Solidification Path Using Aluminium – 0.1 wt. % Titanium as a Surrogate for Plutonium Alloys
G. Cleary (AWE, UK)
- P18 Microstructural Characterisation of As-cast and Isothermally Homogenised Ce-5.04 at. % La
J. Lennard (AWE, UK)
- P19 The Microstructure Response to Fluid Flow in Al-Si6-Cu4-FeX (X = 0, 0.5, 1, 2wt.%) Alloys and the Role of Fe-rich Intermetallics
N. Zhang (DLR, Germany)
- P20 Thermodynamic Modeling and Scheil Solidification of the Mg-Nd-Y-Zr Systems
K.M. Cheng (Shandong Academy of Sciences, China)
- P21 Microstructure Formation, Interface Instability and Coarsening of Al-Cu Alloy in Rheocasting
H.M. Guo (Nanchang University, China)
- P22 Equilibrium Phase Compositions via Non-equilibrium Solidification
O. Shuleshova (Institute for Complex Materials, Germany)

Eutectic/Peritectic

- P23 Microstructural Investigation of $(\text{Ti}_{65}\text{Fe}_{35})_{100-x}(\text{Bi}_{53}\text{In}_{47})_x$ Hypereutectic Alloys with β -Ti Primary Phase
K.B. Kim (Sejong University, Korea)
- P24 Microstructure of Undercooled and Solidified Eutectic and Near Eutectic Ni-Sn Alloys
M. Wegener (DLR, Germany)
- P25 Anomalous Eutectic Solidification Studied by Phase Field Crystal Simulations
C. Guo (Northwestern Polytechnical University, China)
- P26 Combined Techniques to Assess the Solidification Behaviour of Peritectic Steels
K. Hechu (University of Warwick, UK)
- P27 Phase-field Simulations for Eutectic Solidification of Cast Iron
J.C. Wang (Northwestern Polytechnical University, China)

Defect Formation

- P28 Effect of Solidification Rate on Macro-segregation and Morphologies of Silicon Phases in Solidification of Al-15Si Alloy
K.W. Al-Helal (BCAST, Brunel University London, UK)
- P29 X-Ray Computed Tomography Versus Metallography for Porosity Analysis in Aluminium RPT Castings
J.L. Malisano (University of Oxford, UK)
- P30 Halo Formation in Nb-Al-Fe and Nb-Al-Co Ternary Alloys
L.M. Feitosa (University of Leicester, UK)
- P31 Formation of Surface Defects During Investment Casting of Ni-base Alloys
Z.H. Dong (University of Leicester, UK)
- P32 Inoculation Experiments in Lab Scale Castings of Low Alloyed Steel
M. Gennesson (Université de Lorraine, France)

Formation of Intermetallic Compounds

- P33 Role of Zinc Content on Solidification and Interfacial Nucleation of Sn-Cu Solder Alloy by Experiments and Phase-field Simulation
H.R. Kotadia (The University of Warwick, UK)
- P34 Initial Morphologies of the Al₃Zr Phase on the Interface During Molten Salt Reaction Process
Q. Zhu (Northeastern University, China)
- P35 Kinetic Model on Manganese Sulfide Formation During Solidification of Steel
D. You (Montanuniversität Leoben, Austria)
- P36 Effect of Solidification Velocity by Forced Convection on Microstructure and Mn-rich Intermetallics in AlSi Alloys
P. Mikołajczak (Poznan University of Technology, Poland)
- P37 Solidification Studies of 3003 Alloys with Different Mn and Ti Contents
G. Razaz (Mid Sweden University, Sweden)
- P38 Interfacial Reaction Between the CaO Doped BaZrO₃ Refractory and TiAl Melt
G.Y. Chen (Shanghai University, China)
- P39 Solidification and Microstructure of Al-5Fe Binary Alloys Modified with Ce-rich Rare Earths
Z.M. Shi (Inner Mongolia University of Technology, China)
- P40 Influence of Alloying Elements on Intermetallic Formation in Al-Mg Compound Castings
K. Schneider (BCAST, Brunel University London, UK)
- P41 Lamellar Microstructure Alignment in Directionally Solidified Ti-46Al-8Nb Alloy
H. Zhang (Shanghai University, China)

Melt Treatment

- P42 High-throughput Screening of Chemical Reaction for the Removal of Deleterious Impurities from Aluminium Melt
Y. Dai (Shanghai Jiao Tong University, China)
- P43 Effect of A-EMS Melt Treatment on Microstructure and Mechanical Properties of Al-11.8Zn-2.9Mg-1.1Cu Alloy
Z.F. Zhang (General Research Institute for Non-Ferrous Metals, China)
- P44 Evolution of Mosaicity During Solidification of Single Crystal Ni-base Superalloys
F. Scholz (Ruhr-Universität Bochum, Germany)
- P45 Viscosity of Liquid metals - Some Experiments with Concentric Cylinder Viscometers
R. Ritwik (Brunel University London, UK)
- P46 Surface Layer of Austenitic Stainless Steel Formed by Alloying with REE Using High Intense Pulsed Plasma Beams (HIPPB)
B. Sartowska (Institute of Nuclear Chemistry and Technology, Poland)
- P47 Creep Behaviour of a 4% Re-containing Third-generation Nickel-based Single Crystal Superalloy Produced by Directional Solidification Technology
W. Yang (Northwestern Polytechnical University, China)

Solidification Processing

- P48 Study of As-cast Structure Formation in Titanium Alloy
E. Balestra (University of Birmingham, UK)

- P49 Thermal Evolution Effects on Solidification Process During Casting
S. Jäger (Austrian Institute of Technology, Austria)
- P50 Characterization of Microstructure and Mechanical Properties of Thixoformed Magnesium Matrix Composite Reinforced with Graphene Nanoplatelets
L. Rogal (Polish Academy of Sciences)
- P51 Bonding of Aluminium to Low Carbon Steel Using an Overcasting process
A. Valizadeh (BCAST, Brunel University London, UK)
- P52 The Multiple Ultrasound-assisted Casting of Large-scale Al Alloy Components
Z.L. Liu (Central South University, China)
- P53 Design and Development of Continuous Melt-conditioned Twin Roll Casting Process for Aluminium Alloys
K.W. Al-Helal (BCAST, Brunel University London, UK)
- P54 Semi-solid Casting of High Purity Aluminium and the Al-Si Binary Eutectic Alloy
U.A. Curle (Council for Scientific and Industrial Research, South Africa)
- P55 Effect of Casting Parameters on the Microstructure of Semi-solid ZL101 Aluminum Alloy
Y.C. Jin (North University of China, China)
- P56 Study on High Speed DC Casting Process of A390 Alloy
D.T. Wang (Northeastern University, China)
- P57 Preparation AA4045/3003 Cladding Billet via Direct-chill Casting Process
H.T. Zhang (Northeastern University, China)
- P58 Characteristics of AA4045/AA3003 Clad Hollow Billet Prepared by Direct-Chill Process
X. Han (Northeastern University, China)
- P59 Microstructure Characteristics and Tensile Properties of a Powder-bed Laser Additive Manufactured Ti-6Al-4V Alloy
S. Q. Wu (Chinese Academy of Sciences, China)
- P60 High Modulus Al-based Alloy Prepared by Low Pressure Die Casting
S. Amirkhanlou (BCAST, Brunel University London, UK)

Alloy Development

- P61 The Effect of Transition Alloying Elements on the Microstructure of Al-Si Alloys
M. Rahimian (BCAST, Brunel University London, UK)
- P62 Effect of Silicon on Microstructure and Mechanical Properties of Cu-Fe alloys
K.B. Kim (Sejong University, Korea)
- P63 Study on the Damping Capacity of an Mg-Zn-Y Based Alloy
R.P. Lu (North University of China, China)
- P64 Microstructure and Mechanical Properties of ZL101 Reinforced by $Al_{63}Cu_{25}Fe_{12}$ Particles
H. Hou (North University of China, China)
- P65 In-situ Studies on the Solidification of Low Carbon Iron
M. Reid (Australian Nuclear Science and Technology Organisation, Australia)