

5TH EUROPEAN SYMPOSIUM ON SUPERALLOYS AND THEIR APPLICATIONS 2026

Program overview

SUNDAY 3RD MAY

18H30 – 18H30



18H30 – 20H30



GET TOGETHER
COCKTAIL & DINNER

20H30 – 21H30

Keynote Lecture
M. Hardy
Plenary room

MONDAY 4TH MAY

08H30 – 10H10

Blade Processing
Plenary room

COFFEE BREAK ☞

10H40 – 12H20

**Additive
Manufacturing**
Plenary room



14H – 15H40

Disk Processing
Plenary room

COFFEE BREAK ☞

16H10 – 17H50

**Repair,
Refurbishment,
Recycling**
Plenary room

18H – 20H

Poster Session
*Room 1
Room 2*



TUESDAY 5TH MAY

08H30 – 10H10

**Disk Alloys
Mechanical Behavior**
Plenary room

COFFEE BREAK ☞

10H40 – 12H20

**Environmental
Resistance**
Plenary room



14H30 – 18H30



19H–21H30



WEDNESDAY 6TH MAY

08H30 – 10H10

**Blade Alloys
Mechanical Behavior**
Plenary room

COFFEE BREAK ☞

10H40 – 12H20

**Superalloys for
Power Generation**
Plenary room



13H40–15H40

**Advanced
Characterizations**
Plenary room

COFFEE BREAK ☞

16H10–17H50

**New Grade
Superalloys**
Plenary room

18H– 20H

Poster Session
*Room 1
Room 2*



THURSDAY 7TH MAY

08H30 – 10H10

**ICME – Digital Twins
for Materials and
Processes**
Plenary room

COFFEE BREAK ☞

10H40 – 11H40

Keynote Lecture
T. Pollock
Plenary room

11H40 – 12H40

Plenary room
**AWARDS CEREMONY
& CLOSURE**



14H DEPARTURE



*Taking photos of slides
during presentations
or of posters is strictly
prohibited unless express
consent is given by the
presenter*

SUNDAY 3RD MAY

20H30 - 21H30

Keynote Lecture - Mark HARDY

Design & Manufacturing Challenges for Disc Rotors in Aircraft Engines

Plenary room,

Chairs : Nathalie BOZZOLO (SAFRAN), Jonathan CORMIER (Pprime Institute)

High bypass ratio turbofan aircraft engines and cycles are continuously evolving to provide improved efficiencies for reducing fuel consumption and emissions. However, whilst propulsive and aerodynamic optimisations of aircraft engines are possible, the increased demands upon nickel based superalloys, which are used in the hot section parts, limit the thermal efficiency improvements that can be achieved. The requirements for reduced engine core sizes and increased temperatures and stresses pose a complex set of seemingly conflicting property requirements for the materials considered for safety-critical disc rotor applications. The apparent conflict is in the design priority between strength and damage tolerance or crack growth resistance.

The former determines the size and weight of the disc, whereas the latter is critical for achieving shop visit intervals or probabilistic lives.

The lecture will begin with requirements, then review material and component manufacture, before discussing the effects of microstructure, manufacturing anomalies, surface modifications and operating environment on behaviour. In all these aspects, it is critical that material deformation and damage is understood from the extensive use of material models, process simulations, advanced material characterisation techniques, finite element methods and micromechanics, in addition to fundamental physical metallurgy and testing, whether on laboratory test pieces or on finished components.

Mark HARDY, Rolls-Royce plc, Derby, UK

with many authors from Rolls-Royce plc, ATI Materials, University of Arizona, University of Birmingham, University of Cambridge, Cranfield University, Imperial College London, University of Nottingham & Swansea University



Monday 4th may program

08H30 - 10H10

Blade Processing

Plenary room

.....
COFFEE BREAK 
.....

10H40 - 12H20

Additive Manufacturing

Plenary room

.....
 LUNCH
.....

14H - 15H40

Disk Processing

Plenary room

.....
COFFEE BREAK 
.....

16H10 - 17H50

Repair, Refurbishment, Recycling

Plenary room

18H - 20H

Poster Session

*Room 1
Room 2*

.....
 DINNER
.....



MONDAY 4TH MAY

Blade Processing

08H30 - 10H10

Chairs: Jonathan CORMIER (Pprime Institute), Charles (Qiang) FENG (USTB)

8H30 Dendritic Segregation and Homogenization of Elements in Re-containing Alloys with Wide Variation of Dendrite Arm Spacing

presented by **Akane SUZUKI**¹

Chen SHEN¹

David WARK²,

Scott OPPENHEIMER¹

Douglas KONITZER³

¹GE Aerospace Research, USA

²GE Research, USA

³GE Aerospace, USA

9H30 Toward a Better Understanding of Recrystallisation Mechanisms of Single Crystal Nickel Based Superalloys during Turbine Blades Processing

presented by **Louise GRAU**^{1,2}

Florent MAUGET¹

Patrick VILLECHAISE¹

Besnik SADRIJI²

Jonathan CORMIER¹

¹Pprime Institute, France

²Safran Aircraft Engines, France

8H50 Evolution of Dendritic Patterns during Direction Solidification of Ni-Base Alloys

presented by **Hongbiao DONG**

Univ of Leicester, UK

9H50 Uncovering the Mechanism of Recrystallisation in a Single Crystal Superalloy: the Role of Porosity and Localised Strain in Nucleation

presented by **Anh H. PHAM**¹

Mitsuaki TAKEMOTO¹, Kei KODERA¹,

Satoshi UTADA², Yuanbo T. TANG³,

Hideki WAKABAYASHI¹, Shigekazu

MORITO¹, D. Graham McCARTNEY⁴,

Catherine M. RAE⁵, Roger C. REED⁴

¹Shimane University, Japan

²National Institute for Materials Science, Japan

³Univ of Birmingham, UK

⁴Univ of Oxford, UK

⁵Univ of Cambridge, UK

9H10 A Permeability Based Model for Prediction of Freckling in Nickel Superalloy Single Crystal Castings

presented by **Nick GREEN**

Dmytro SHEVCHENKO

Univ of Birmingham, UK

10H40 - 12H20

MONDAY 4TH MAY

Additive Manufacturing

Chairs: Katerina CHRISTOFIDOU (Univ. Sheffield) Vitor VIERA RIELLI (UNSW)

10H40 Characterisation of γ' Precipitation Kinetics in Additively Manufactured Ni-Based Superalloy ABD-900AM

presented by **Yuhan ZHUGE**¹

Yuanbo T. TANG², Sergio LOZANO-

PEREZ¹, Roger C. REED¹

¹Univ of Oxford, UK

²Univ of Birmingham

11H40 Improving the High-Temperature Mechanical Properties of L-PBF CM247LC through HIPing and Ageing Treatments

presented by **Suyalatu SUYALATU**¹

Kazuto ARAKAWA², Hideki

WAKABAYASHI², Shohei UEKI²,

Norio HIGUCHI¹, Hitoshi SAKAI¹,

Yugo HIGASHIDA³, D. Graham

McCARTNEY^{2,4}, Catherine RAE^{2,5},

Roger C. REED^{2,4}

¹NTT Data XAM Technologies

Corporation, Japan

²Shimane University, Japan

³Kiguchi Technics Inc., Japan

⁴Univ of Oxford, UK

⁵Univ of Cambridge, UK

11H Rapid Discovery of High-Performance Additive Manufactured Superalloys using High-Throughput and Artificial Intelligent Methods

presented by **Pei LIU**¹

Guangbao SUN¹, Teng AN¹, Hailong

QIN², Hongyao YU², Zhongnan BI¹

¹Research Institute of Advanced

Materials (Shenzhen) Co., China

²Beijing GAONA Materials &

Technology Co., China

12H Impact of Energy Input on Creep Performance and Strain Age Cracking of Additively Manufactured CM247LC Superalloy

presented by **Ahmed Fardan JABIR HUSSAIN**¹

Håkan BRODIN^{1,2}, Eduard HRYHA¹

¹Chalmers Univ of Technology, Sweden

²Siemens Energy AB, Sweden

11H20 Recrystallisation Behaviour during Post-Processing of an Additive Manufactured Nickel Based Superalloy

presented by **Kameshwaran**

SWAMINATHAN

Joel ANDERSSON

University West, Sweden

14H - 15H40 MONDAY 4TH MAY

Disk Processing

Chairs: Christian DUMONT (retired from Aubert&Duval), Sammy TIN (Univ Arizona)

14H An Innovative Experimental Thermomechanical Simulator of Ring Rolling Process on Screw Press

presented by **Yann JANSEN**¹
Florian BARATTO², Christian DUMONT³, Regis BIGOT⁴, Laurent LANGLOIS⁴

¹ *Aubert & Duval, France*
² *AM VALOR, France*
³ *Aubert & Duval, France*
⁴ *ENSAM de Metz, France*

14H20 On the Impact of Dwell Time on Recrystallization During Incremental Deformation

presented by **Théo HUYGHE**^{1,2}
Malik DURAND¹, Daniel PINO MUNOZ¹, Christian DUMONT³, Eric GEORGES³, Julien DE JAEGER², Marc BERNACKI¹, Nathalie BOZZOLO²

¹ *CEMEF, Mines Paris PSL, France*
² *SafranTech, France.*
³ *Aubert & Duval, France*

14H40 Effect of γ -Supersolvus Solutioning Heat Treatment Parameters on the Grain Structure Evolution of Powder Metallurgy Nickel Base γ - γ' Superalloys

Presented by **Corentin STRADY**¹

Alexis NICOLAY², Nathalie BOZZOLO³, Andrea AGNOLI¹, Julien DE JAEGER³, Marc BERNACKI²

¹ *Safran Aircraft Engines, France*
² *CEMEF, Mines Paris PSL, France*
³ *SafranTech, France*

15H Precipitation Sequence and Kinetics in the Inconel 706 Superalloy under Isothermal Conditions using in situ Electrical Resistivity

Presented by **Moukrane DEHMAS**²
Laurane FINET¹, Raphaël PERSEE^{1,2}, Ronan MAINGUY²

¹ *Aubert & Duval, France*
² *Univ of Toulouse, France*

15H20 Influence of Heat Treatment Variables on the Evolution of the Precipitate Population in VDM Alloy 780

Presented by **Fernando PASCUAL GOCE**¹, Masood HAFEZ HAGHIGHAT², Bodo GEHRMANN², Marc BERNACKI¹, Baptiste FLIPON¹, Madeleine BIGNON¹

¹ *CEMEF, Mines Paris PSL, France*
² *VDM Metals International GmbH, Germany*

16H10 - 17H50 MONDAY 4TH MAY

Repair, Refurbishment, Recycling

Chairs: Satoshi UTADA (NIMS), Lukasz RAKOCY (Univ of Krakow)

16H10 Exploring Oxides for Removing Impurity Si in Ni-base Superalloys During Vacuum Induction Melting Process

Presented by **Masaki DOBASHI**^{1,2}
Shizuna OYANO^{1,2}, Naoki OHNO^{1,2}, Chihiro TABATA^{1,2}, Yuji TAKATA², Satoshi UTADA², Toshio OSADA², Kyoko KAWAGISHI^{1,2}, Shinsuke SUZUKI¹

¹ *Waseda University, Japan*
² *National Institute for Materials Science, Japan*

16H30 Creep and Tensile Properties of Waspaloy Produced by Wire Arc Additive Manufacturing

Presented by **Marjolaine SAZERAT**¹
Alice CERVELLON², Sophie GILLET², Samuel HEMERY³, Azdine NAIT-ALI³, Patrick VILLECHAISE³, Roland FORTUNIER⁴, Jonathan CORMIER³

¹ *Safran Additive Manufacturing Campus, France*
² *Safran Aircraft Engines, France*
³ *Pprime Institute, France*
⁴ *LTDS, Centrale Lyon - ENTPE - ENISE, France*

16H50 Cyclic Recovery Heat Treatment to Control Recrystallization of a Single-Crystal Superalloy CMSX-4

Presented by **Guang XIE**² & **Jian ZHANG**²

Ningfeng HE^{1,2}, YuZhang Lu², Jian SHEN², YaWei LI²
¹ *Hefei Univ of Technology, China*
² *Institute of Metal Research, China*

17H10 Rejuvenation of a Crept Second-Generation Nickel-Based Single Crystal Superalloy with Emphasis on Heterogeneity of Dendritic Structures

Presented by **Jiaxi LIU**
Longfei LI, Weiwei ZHENG, Qiang FENG
Univ of Science and Technology, Beijing, China

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MONDAY 4TH MAY

Repair, Refurbishment, Recycling

16H10- 17H50

Chairs: Satoshi UTADA (NIMS), Lukasz RAKOCY (Univ of Krakow)

17H30 Exploring the Microstructure, Stability and Oxidation Resistance of Alloy 625+WC Nanocomposites for Repair Welding Applications of Cast Ni-Based Superalloys

Presented by **Łukasz RAKOCZY**¹, Małgorzata GRUDZIEN-RAKOCZY², Grzegorz CEMPURA¹, Tomasz KARGUL¹, Tomasz DUDZIAK², Ewa RZAŁD², Marcin MADEJ¹, Dawid KOZIEN¹, Rafał CYGAN³, Dušan GALUSEK⁴

¹ Univ of Kraków, Poland

² Kraków Institute of Technology, Poland

³ Consolidated Precision Products, Poland

⁴ Univ of Trencin, Slovakia



Poster Session

18H - 20H

Tuesday 5th may program

08H30 - 10H10

**Disk Alloys
Mechanical Behavior**

Plenary room

COFFEE BREAK 

10H40 - 12H20

**Environmental
Resistance**

Plenary room



LUNCH

14H - 18H30



FREE
AFTERNOON

19H-21H30



BANQUET

8H30 - 10H10

TUESDAY 5TH MAY

Disk Alloys Mechanical Behavior

Chairs: Howard J. STONE (Univ of Cambridge),
Patrick VILLECHAISE (Prime Institute)

8H30 Creep Strength Dependence of a γ/γ' Ni-based Superalloy to the Prior Thermomechanical Processing Route

Presented by **Matilde LECOURT**^{1,2}
Florence HAMON¹, Florent MAUGET¹,
Alexandre EL SABBAGH², Nicolas
CHANFREAU², Michel SABY², Anne
JOULAIN¹, Jonathan CORMIER¹
¹ Prime Institute, France
² Aubert et Duval, France

¹ Univ of Cambridge, UK
² Univ of Birmingham, UK
³ Rolls-Royce plc, UK

8H50 Mechanical Properties of the Polycrystalline γ/γ' Nickel-Based Superalloy René 65 during Long- Term Aging

Presented by **Julien PROUTEAU**¹
Patrick VILLECHAISE¹, Anchal
GOYAL², Jonathan CORMIER¹
¹ Prime Institute, France
² Safran Aircraft Engines, France

9H30 Characterising the Effect of Environment and Salt Concentration on the Fatigue Life of a Nickel Disc Alloy

Presented by **Mark HARDY**¹
Yong LI², Simon GRAY³, Catherine
JACKSON¹, Hollie COCKINGS⁴, Mary
TAYLOR⁵, Benedict GRANT¹
¹ Rolls-Royce plc, UK
² Univ of Swansea, UK
³ Univ of Cranfield, UK
⁴ Fraser-Nash Consultancy, UK
⁵ Univ of Birmingham, UK

9H50 Ductility Dependence of a Ni-based Superalloy made by Spark Plasma Sintering to PPBs and Grain Size

Presented by **Rémi LEBOT**^{1,2}
Emmanuel SALY^{1,2,3}, Gautier
HUSER², Pierre SALLOT², Patrick
VILLECHAISE¹, Jonathan CORMIER¹
¹ Prime Institute, France
² SAFRAN Tech, France
³ SAFRAN Power Units, France

9H10 Development of a Grain Boundary γ' Forming Heat Treatment to Improve Dwell Fatigue

Presented by **Annie M. L. ANDERSSON**¹
George J. WISE¹, Hangyue LI²,
Mark C. HARDY³, Howard J. STONE¹

TUESDAY 5TH MAY

Environmental Resistance

10H40 - 12H20

Chairs: Fernando PEDRAZA (Univ of la Rochelle), Akane SUZUKI (GE Aerospace)

10H40 Effect of W and Mo on the Hot Corrosion Behaviour by Na_2SO_4 Deposits of Ni-Based Superalloys between 850 and 1000 °C in Air

presented by **Damien PIEL**¹
Mathieu MONDET², Sandrine
CHARLES², Vladislav KOLARIK³,
Fernando PEDRAZA¹
¹ Univ of La Rochelle, France
² Safran Aircraft Engines, France
³ Fraunhofer-Institut, Pfinztal,
Germany

11H20 Fracture Characteristics of a Hydrogen Charged Nickel- based Superalloy 718 at Cryogenic Temperatures

presented by **Marina LUKAS**¹
Nina DAMM¹, Jan PLATL², Andreas
DREXLER², Matthias EICHINGER³,
Magdalena ESKINJA³, Gregor MORI³,
Zoltan SIMON⁴, Michael SCHEERER⁴,
Stefan MARSONER¹, Vsevolod
RAZUMOVSKIY¹
¹ Materials Center Leoben Forschung
GmbH, Austria
² Voestalpine BÖHLER Edelstahl
GmbH & Co KG, Austria
³ Chair of General and Analytical
Chemistry, Austria
⁴ Aerospace & Advanced Composites
GmbH, Austria

11H Effect of Mn and Si on Corrosion of Ni-Based Superalloys for Turbine Disc Application

presented by **Cynthia RODENKIRCHEN**¹
Victoria MINNS², Adriana ENCINAS-
OROPESA², John NICHOLLS², Mark
HARDY³, Stella PEDRAZZINI¹
¹ Imperial College London, UK
² Univ of Cranfield, UK
³ Rolls-Royce plc., UK

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TUESDAY 5TH MAY

Environmental Resistance

10H40 - 12H20

Chairs: Fernando PEDRAZA (Univ. La Rochelle), Akane SUZUKI (GE Aerospace)

11H40 Hot Corrosion Behavior of a New Nickel-Based Superalloy TROPEA

presented by **Louis HUNAULT**¹
Fernando PEDRAZA¹, Stéphane MATHIEU², Lionel ARANDA², Jonathan CORMIER³, Joseph LAUTRU⁴, Renaud PODOR⁴

¹ Univ of La Rochelle, France

² Institut Jean Lamour, France

³ Pprime Institute, France

⁴ ICSM, France

12H Investigation of the Hydrogen Embrittlement Impact of the Intermetallic Precipitation Phases β and γ' in the CoNiCr-Based Superalloy CoWAlloy6

presented by **Oliver NAGEL**¹
Lucas STROBEL¹, Ralph GILLES², Steffen NEUMEIER¹

¹ Univ of Erlangen-Nürnberg, Germany

² Heinz Maier-Leibnitz Zentrum, Germany

Wednesday 6th may program

08H30 - 10H10

**Blade Alloys
Mechanical Behavior**
Plenary room

COFFEE BREAK 

10H40 - 12H20

**Superalloys for
Power Generation**
Plenary room

 LUNCH

13H40 - 15H40

**Advanced
Characterizations**
Plenary room

COFFEE BREAK 

16H10 - 17H50

**New Grade
Superalloys**
Plenary room

18H - 20H

Poster Session
*Room 1
Room 2*

 DINNER

WEDNESDAY 6TH MAY

Blade Alloys

Mechanical Behavior

08H30 - 10H10

Chairs: Florence PETTINARI-STURMEL (CEMES), Roger REED (Univ. Oxford)

8H30 Miniature Mechanical Testing to Infer Damage from Accidental and Complex Thermal-Mechanical Exposure for Single Crystal Superalloys

presented by **Yuanbo T. TANG**^{1,2}
Caspar SCHWALBE³, Julia BRUNTHALER³, Roger C. REED², Satoshi UTADA^{2,4}

¹ Univ of Birmingham, UK

² Univ of Oxford, UK

³ MTU Aero Engines AG, Germany

⁴ National Institute for Materials Science, Japan

8H50 Strain Rate and Temperature Dependent Deformation Mechanisms in the Single Crystal Superalloy CMSX-4: Insights from Full-Field Surface Mapping

presented by **Melvin Z. MIQUEL**¹
Satoshi UTADA^{1,2}, Yuanbo T. TANG^{1,3}, Roger C. REED^{1,4}

¹ Univ of Oxford, UK

² National Institute for Materials Science, Japan

³ Univ of Birmingham, UK

⁴ Univ of Oxford, UK

9H10 Challenging the Limit of Strengthening by γ/γ' Lattice Misfit on the High Temperature Creep Properties of Ni-Base Single Crystal Superalloy

presented by **Satoshi UTADA**
Tadaharu YOKOKAWA, Toshiharu KOBAYASHI, Kyoko KAWAGISHI, Michinari YUYAMA, Hiroshi HARADA, Toshio OSADA
National Institute for Materials Science, Japan

9H30 Segregation to Creep-induced Planar Faults in Ni-Base Single Crystal Superalloys

presented by **Zhongmin LONG**¹, **Yolita M. EGGELER**¹, **K. V. VAMSI**⁴, Christian DOLLE¹, Lukas GRÜNEWALD¹, David BÜRGER², Yuting DAI³, Christian KÜBEL³, Vamshi Krishna RAO⁴

¹ Karlsruhe Institute of Technology, Germany

² Ruhr-Universität Bochum, Germany

³ Karlsruhe Institute of Technology, Germany

⁴ Indian Institute of Technology Indore, India

9H50 Influence of the Chemical Composition and of the Misfit on the Tensile Behavior of Different Generation Ni-Based Single Crystal Superalloys

presented by **Florence PETTINARI-STURMEL**¹

Benoit MANSOZ^{1,4}, Jakob BANDORF², Steffen NEUMEIER², Pierre CARON³, Jonathan CORMIER⁴,

¹ CEMES, France

² Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

³ Retired from ONERA, France

⁴ Pprime Institute, France

WEDNESDAY 6TH MAY

Superalloys for Power Generation

10H40 - 12H20

Chairs: Jérémy RAME (NAAREA), Jian ZHANG (IMR Shenyang)

10H40 Long-Term Stability and Resulting Viscoplastic Behavior of Inconel 625 at 700 °C

presented by **Fabio MACHADO ALVES DA FONSECA**¹

Jérémy RAME¹, Camille ROUSSEAU¹, Guillaume BURLLOT², Jonathan CORMIER²

¹ NAAREA, France

² Pprime Institute, France

11H20 Microstructural Evolution and Strength of 3D Printed and Directly Aged ODS-Strengthened Inconel 718

presented by **Andreas BEZOLD**¹
Subham CHATTORAJ¹, Kojo BENEFO¹, Calvin M. STEWART¹, Timothy M. SMITH², Michael J. MILLS¹

¹ The Ohio State University, USA

² NASA Glenn Research Center, USA

11H On the Optimization of Wrought Superalloys by Small Variations in Ti and Al Content

presented by **Tim STORCH**¹

Julian HUNFELD¹, Yujiao LI¹, Jürgen KIESE², Hongcai WANG¹, Jean-Marc JOUBERT³, Marie MÜNCHHALFEN¹, Jürgen SCHREUER¹, Gunther EGGELER¹, Guillaume LAPLANCHE¹

¹ Univ of Bochum, Germany

² VDM Metals International GmbH, Germany

³ ICMPE, France

11H40 Deformation Twinning and Dislocation Motion During Creep Near the Solvus Temperature of the γ'' Phase

presented by **Victoria TUCKER**¹
Thomas MANN², Michael TITUS¹

¹ Purdue University, USA

² Haynes International, USA

12H Novel Al/Ti-Modified Ni-Mo-W-Cr Superalloys for High Temperature Structural Applications

presented by **Vijay K. VASUDEVAN**¹
N. Naveen KUMAR¹, Sonali RAVIKUMAR¹, Boateng T. DONKOR², Vishal SONI¹, Jie SONG³, Gopal B. VISWANATHAN⁴, Matthew A. STEINER², Steven J. ZINKLE⁵, V. A. RAVI⁶, G. MURALIDHARAN⁷

¹ Univ of North Texas, USA

² Univ of Cincinnati, USA

³ Virginia Polytechnic Institute and State Univ, USA

⁴ Ohio State Univ, USA

⁵ Univ of Tennessee, USA

⁶ California State Polytechnic Univ, USA

⁷ Oak Ridge National Laboratory, USA

13H40-15H40

WEDNESDAY 6TH MAY

Advanced Characterizations

Chairs: Steffen NEUMEIER (FAU Erlangen),
Michael MILLS (Ohio State University)

13H40 In Situ X-ray Characterization of Thermomechanical Deformation Behavior in Powder-Processed Polycrystalline High Co-Containing Ni-Based Superalloys

presented by **Frances E. SYNNOTT**¹
Lewis R. OWEN¹, Howard J.
STONE², Nicholas G. JONES², Paul
M. MIGNANELLI³, Mark C. HARDY³,
Katerina A. CHRISTOFIDOU¹
¹ Univ of Sheffield, UK
² Univ of Cambridge, UK
³ Rolls-Royce plc., UK

14H A New High-Resolution Analysis Method for Inclined Stacking Faults in the TEM

presented by **Erdmann SPIECKER**¹
Nicolas KARPSTEIN¹, Lukas
MÜLLER¹, Andreas BEZOLD²,
Steffen NEUMEIER²
¹ Friedrich-Alexander-Universität
Erlangen-Nürnberg, Germany
² Friedrich-Alexander-Universität
Erlangen-Nürnberg, Germany

14H20 In Situ High Energy XRD and Inverse Analysis of Thermal Barrier Coating Behavior

presented by **Mathias LAMARI**¹
Lara MAHFOUZ², Damien
TEXIER³, Loïc COURTOIS⁴, Sylvain
GAILLIEGUE¹, Andrew KING⁵, Henry
PROUDHON¹, Vincent MAUREL¹
¹ Centre des Matériaux, Mines Paris
PSL, France
² Safran Tech, France
³ ICA, Mines Albi, France
⁴ 3Dmagination, UK
⁵ Synchrotron SOLEIL, France

14H40 The Beneficial Impact of Ti and Ta Additions on the Creep Strength of Polycrystalline CoNi- Base Superalloys

presented by **Steffen NEUMEIER**¹
Nicolas KARPSTEIN¹, Ashton J.
EGAN¹, Mathias GÖKEN¹, Michael
J. MILLS², Erdmann SPIECKER¹,
Andreas BEZOLD^{1,2}
¹ Friedrich-Alexander-Universität
Erlangen-Nürnberg, Germany
² Ohio State Univ, USA

15H Cellular Solidification in Laser Powder Bed Manufacturing of Superalloys

presented by **James LAMB**
Tresa POLLOCK, Evan RAEKER
Univ of California Santa Barbara, USA

15H20 A Novel Experimental Approach for the Assessment of the Heterogeneous Nucleation in Investment Cast Superalloys

presented by **Richa GUPTA**¹
Dmytro SHEVCHENKO¹, Roger
REED², Joseph MOSES¹, Nils
WARNKEN¹, Nick GREEN¹
¹ Univ of Birmingham, UK
² Univ of Oxford, UK

WEDNESDAY 6TH MAY

New Grade Superalloys

16H10-17H50

Chairs: Mark HARDY (Rolls Royce), Didier LOCQ (ONERA)

16H10 Development and Characterization of new Ni-Based Superalloys for Turbine Casing Applications

presented by **Laurane FINET**¹
Antoine LACOUR-GOGNY-GOUBERT²,
Anne-Laure ROUFFIE³, Edern
MENOUE², Coraline CROZET¹, Jean-
Michel FRANCHET², Julien DE JAEGER²

¹ *Aubert & Duval, France*

² *Safran Tech, France*

³ *Safran Aircraft Engines, France*

16H50 Temperature and Strain-Dependent Tensile Deformation Mechanisms of a High-Cr CoNi-Based Single-Crystal Superalloys

presented by **Song LU**
Boxuan QU, Longfei LI, Qiang FENG
*Univ of Science and Technology,
Beijing, China*

17H10 Development of a New Low Thermal Expansion High-Strength Superalloy for Elevated Temperature Application

presented by **Ning ZHOU**
Wes T. ROTH, Tao WANG, Gian A.
COLOMBO, Stephane A.J. FORSIK,
Mario E. EPLER
*Carpenter Technology Corporation,
USA*

16H30 Improvement of Mechanical Properties in a CoNi-Based Superalloy Fabricated by Selective Laser Melting through Optimized Heat Treatment

presented by **Chen Li YAN**
Song LU, Lengfei LI, Qiang FENG
*Univ of Science and Technology,
Beijing, China*

17H30 Comparing Creep Behavior of Novel CoNi-based Superalloys and Conventional Ni-Based Superalloys Exhibiting Local Phase Transformation

presented by **Ashton EGAN**¹
Andreas BEZOLD², Longsheng
FENG³, Christopher ZENK¹, Julian
VÖLKL¹, Yunzhi WANG², Michael
MILLS², Steffen NEUMEIER¹,
Erdmann SPIECKER¹, Mathias
GÖKEN¹

¹ *FAU Erlangen-Nürnberg, Germany*

² *Ohio State Univ, USA*

³ *Lawrence Livermore National
Laboratory, USA*



Poster Session

18H10 - 20H

Thursday 7th may program

08H30 - 10H10

ICME - Digital Twins for Materials and Processes

Plenary room

COFFEE BREAK ☕

10H40 - 11H40

Keynote Lecture T. Pollock

Plenary room

11H40 - 12H40

Awards Ceremony & Closure

Plenary room



LUNCH

14H

Departure



8H30 - 10H10

THURSDAY 7TH MAY

ICME - Digital Twins for Materials and Processes

Chairs: Arjen ROOS (Safran), Caspar SCHWALBE (MTU)

8H30 Influence of Instantaneous Strain Rate Changes on the Microstructural Evolution of Inconel 718 through Full Field Simulations

presented by Nadine **ELEKYABI**
Holger BRÜGGEMANN, Emad SCHARIFI
IBF, RWTH Aachen University, Germany

8H50 Novel Multi-Class Grain Size Model and Yield Stress Prediction for UDIMET720LI

presented by Drazen **BRESCAKOVIC**¹
Thomas HÖNIGMANN¹, Johannes NEUMÜLLER¹, Christian GRUBER², Peter RANINGER¹, Philipp RETZL^{3,4}, Vitor RIELLI⁵, Konstantin PRABITZ⁶, Sophie PRIMIG⁵, Martin STOCKINGER⁶, Gerald RESSEL¹
¹ Materials Center Leoben Forschung GmbH, Austria
² Voestalpine BÖHLER Aerospace GmbH & Co KG, Austria
³ MatCalc Engineering GmbH, Austria
⁴ Technische Universität Wien, Austria
⁵ Univ of New South Wales, Australia
⁶ Univ of Leoben, Austria

9H10 High-Throughput Automated Evaluation of Composition-Aging Temperature-Precipitate Geometry Relations in a Ni-Base Superalloy

presented by Thomas **HOEFLER**
¹ Ayako IKEDA¹, Makoto OSAWA¹, Kyoko KAWAGISHI¹, Toru HARA¹, Takahito OHMURA¹, Daichi AKAMA², Masaki TANEIKE², Toshio OSADA¹
¹ National Institute for Materials Science, Japan
² Mitsubishi Heavy Industries, Japan

9H30 Process-Structure Modeling of Polycrystalline Ni-Based Superalloys using Microstructure Informatics and Deep Learning Neural Networks

presented by Pascal **THOME**
Luis ARCINIAGA, Sammy TIN
Univ of Arizona, USA

9H50 Creep Modeling in Porous Superalloy Crystal Displaying Tension-Compression Asymmetry

presented by Oana **CAZACU**
Benoit REVIL-BAUDARD
Univ of Arizona, USA

THURSDAY 7TH MAY

10H40 - 11H40

Keynote Lecture Tresa POLLOCK

3D Insights on 3D Printed Superalloys

Plenary room,

Chairs : Nathalie BOZZOLO (SAFRAN), Jonathan CORMIER (Pprime Institute)

Additive manufacturing promises a major transformation of the production of high economic value metallic materials, enabling innovative, geometrically complex designs with minimal material waste. While 3D printed superalloys are likely to replace cast components in many applications, there is not a detailed understanding of the differences in cast vs. additive structure. TriBeam tomography, which integrates electron, ion and femtosecond laser beams to acquire high resolution chemical, structural and crystallographic information has

been employed to study Ni- and CoNi-base printed materials. New insights on 3D aspect of printed structure, including cell/dendrite and grain morphology evolution, misorientation accumulation, defect formation and melt pool dynamics will be reviewed. Differences in single crystal vs. additive structure will be highlighted, along with implications for properties. Future directions for the design of "printable" alloys will also be discussed.

Tresa M. POLLOCK, Alcoa Distinguished Professor of Materials, University of California, Santa Barbara
with James LAMB & Evan RAEKER.



Poster Session Room I

Additive Manufacturing

15 Tensile Behavior of a PBF-LB/M VDM780 Alloy Studied as a Function of γ' Precipitation State and Temperature

Louis HÉBRARD, Jan HAUBRICH, Joachim GUSSONE, Sina PETSCHER, Juri MUNK, Mauro MADIA, Itziar SERRANO-MUNOZ

17 Anisotropic Combustion Properties of IN718 Alloy Processed by Selective Laser Melting

Jiaxuan ZHOU, Shaohua ZHANG, Jian ZHANG

31 Material Characterization of L-DED-w HAYNES 233 Alloy

Matilda MOBERG LARSSON, Niklas JOHANSSON, Prajina BHATTACHARYA, Fang LIU

58 In625 Fabricated by Metal Binder Jetting and Cold Metal Fusion: High temperature Mechanical Properties and Microstructure Characterization

Gautier HUSER, Aliénor ROYER, Frédéric ADAMSKI, Karine NGUYEN, Pierre SALLOT

97 Microstructure-dependent Mechanical Properties and Optimization of Post-Weld Heat Treatment in an Electron Beam Welded Ni Based Superalloy

Haijing ZHOU, Hongyao YU, Hailong QIN, Jinli XIE

101 Effect of Microstructural Control on Creep Performance in ATI 718Plus Manufactured by PBF-LB

Dominik BIELAK, Yuanbo TANG, Jürgen OLBRICHT, Birgit SKROTZKI, Moataz ATTALLAH

121 Multiscale Microstructural Understanding of an Additively Manufactured MCrAlY Coating for High-Temperature Applications

Ingrid BERGHEIM, Katerina CHRISTOFIDOU, Felicity FREEMAN, Jack BATTY, Paraskevas KONTIS

124 Effect of Nano-Oxide Incorporation Method on Microstructure and Mechanical Properties of Additive Manufactured ODS Ni-Based Alloys

Pierre-Louis ARDIZZONE, Yann DE CARLAN, Louise TOUALBI, Didier LOCQ, Thibaut FROELIGER, Cécile BLANC, Pascal AUBRY

125 Influence of Environment for Fatigue Crack Growth Rate in Inconel 718 Processed by L-PBF

Benoît MANSOZ, Hugo SISTACH, Lionel MARCIN, Emmanuel FESSLER, Henry PROUDHON, Vincent MAUREL

128 Additive Manufacturing of High-Strength and Ductile Co-Based Superalloy with Ultrahigh γ' Volume Fraction

Shuai FENG, Shuai GUAN, Zhongnan BI, Wen CHEN

132 Development of a High Temperature Version of Powder 780 for Additive Manufacturing Applications

Katrin BRUNNERT, Bodo GEHRMANN, Christina SOMSEN

139 From Alloy Design to Printing: AI Accelerates the Development of Nickel-Based Superalloys

Jian YAO, Junkang WU, Jie SU, Liming TAN, Lan HUANG, Feng LIU

144 Research on Tensile Fracture Failure Mechanism of Spray-Formed Superalloy

Xiaopeng XU, Mingqing WANG, Jinhui DU, Nan JIANG, Sifan YU

147 Metal Fused Filament Fabrication of VDM Alloy 780

Svetoslava TSANKOVA, Annalena MEERMEIER, Sevgi SENGÜL, Katrin BRUNNERT, Christina SOMSEN, Bodo GEHRMANN, Stephan SCHUSCHNIGG, Christian KUKLA, Peter FELFER, Steffen NEUMEIER

169 Thermomechanical Fatigue Crack Propagation under Multiaxial Very Low Cycle Fatigue Loading for Laser Power Bed Fusion Ni Base Superalloy

Camille LE GOFF, Pierre ARNAUD, Alban MONSAVOIR, Alban DU TERTRE, Zeineb MESKINE, Ida RAOULT, Jacques BESSON, Vincent MAUREL

180 Development and Validation of New Nickel-Based Superalloy 718 for the Application of Wire DED AM by Varestment Test

Nithin THERAMBATH AMBUJAKSHAN, Pierre-Louis REYDET, Hervé FRAISSE

Advanced Characterizations

14 Evaluation of a New Method for Grain Size Control Based on Backscattered Electron Imaging Series

Oussama DABOU, Xavier BAUDEQUIN, Nathalie BOZZOLO, Olena DANYLOVA, Anne DELOBBE, Gautier DOUMENC, Christian DUMONT, Daniel FOOLCHAND, Daniel GALY, Jamel ITRI, Falko KNABE, Cyril LANGLOIS, Nathalie LOPEZ, Justine RENAUD, Amélie TAIEB, Thomas WITULSKI

56 In Situ Synchrotron Investigation of the Microstructural Heterogeneity Induced on Alloy 718 by Laser Melting

Guilherme MAZIERO VOLPATO, Márcio CELSO FREDEL, Adriano DE SOUZA PINTO PEREIRA, Mathias GÖKEN, Steffen NEUMEIER, Ulrich TETZLAFF

69 Dependence of Local Phase Transformation on Ta Content and Temperature in Superalloys

Xiaokun LI, Haopeng ZHANG, Jian JIA, Jiantao LIU, Yiwen ZHANG

80 Investigation of the σ Phase with a Stable Orientation Relationship in a Ni-Based Single Crystal Superalloy

Tianyu ZHANG, Wenqi GUO, Haigen ZHAO, Yanling PEI, Shusuo LI, Shengkai GONG

90 High-Throughput Exploration for Alloying Effect on the Microstructural Stability and Mechanical Properties of CoNi-Base Superalloys

Wendao LI, Jeffrey M. WHEELER, Longfei LI, Qiang FENG

93 Asymmetry Growth of γ' with Coherent/Incoherent Interface and its Effect on the Formation of Serrated Grain Boundaries in Ni-Based Superalloys

Hao WU, Hui GUO, Changshuai WANG, Zhenhuan GAO, Liping NIE, Xiufang GONG

95 Assessment of Oxide-Substrate Interfacial Strength for Ni-Base Single Crystal Superalloy TMS-238 Using Nanoindentation

Chihiro TABATA, Toshio OSADA, Takahito OHMURA, Kyoko KAWAGISHI, Shinsuke SUZUKI

98 Investigation on the Long-Term Aging Microstructure Evolution of Cobalt-Based Superalloy ECY768

Zhicheng WANG, Lijie QIAO, Haijing ZHOU, Xiaofei YUAN, Hailong QIN, Jinli XIE

113 Investigation of Internal Residual Stress Evolution in Additive Manufacturing High-Performance Superalloys During Heat Treatment Processes via Neutron Diffraction & Contour Method

Renren ZHENG, Songyi SHI, Mingzhao XIE, Yixin CHEN, Zhimin SUN, Jinli XIE, Hailong QIN

122 Casting of Single-Crystal, Single-Phase Nickel-Based Superalloys with Varying Re-Content

Julia KNAPP, Rainer VÖLKL, Florence PETTINARI-STURMEL, Uwe GLATZEL

145 The LASAT and LASDAM Methods to Evaluate the Interface Strength of TBCs in Air and Water Vapor Environments

Eliott DEGOUILLES, Vincent GUIPONT, Vincent MAUREL, Filofteia-Laura TOMA, Radosław SWADŹBA, Ravisankar NARAPARAJU, Boguslaw MENDALA

148 Artificial Defects Processed by Laser Shock to Mimic Thermal Barrier Coating Damage Mechanisms

Paul COLOMBEL, Vincent GUIPONT, Florent COUDON, Aurélien JOULIA, Lara MAHFOUZ, Vincent MAUREL

185 In Situ Synchrotron X-ray Radiography of Directional Solidification in a Single-Crystal Ni-Based Superalloy

Alessandro DE NARDI, Akash AGGARWAL, Andrew LUI, Patrick S. GRANT, Roger C. REED, Enzo LIOTTI

Blade Alloys - Mechanical Behavior

12 Effect of Strain Amplitude on the Thermomechanical Fatigue Damage Behavior of a Thermal Barrier-Coated Fourth-Generation Nickel-Based Single Crystal Superalloy

Shichao HAN, Guang XIE, Dong WANG, Wei ZHENG, Shaohua ZHANG, Jianchao PANG, Shumeng JIANG, Jian ZHANG

37 On the Evolution of the Microstructure of Single Crystal Superalloy (SX) Airfoils under Dynamic Loads

Takuma SAITO, Christoph SOMSEN, Antonín DLOUHÝ, Thomas GÖHLER, Markus FRIED, Gunther EGGER

42 Influence of Dendritic Segregation on local γ' Precipitate Structure and Creep Properties of Ni-Based Superalloys

Sean BÖHM, Andre BORSATTO BALDISSERA, Rainer VÖLKL, Uwe GLATZEL

54 Microstructure Evolution and Tensile Property Degradation of DZ409 Alloy under Long-Term Thermal Exposure in a Temperature Range of 750°C to 980°C

Lei WANG, Yang LIU, Xiu SONG, Huaijin CHEN, Yuehan FENG, Baoping WU, Jiantao WU

60 Creep Properties of a First Generation Ni-Based SX Superalloy as a Function of its Original Microstructure

Mathilde MÉLET, Jérémy RAME, Luciana Maria BORTOLUCI ORMASTRONI, Jonathan CORMIER

62 Effect of MCrAlY Coating on the Creep Properties of a Directionally Solidified Superalloy

Xin ZHAN, Dong WANG, Jian ZHANG

71 Rotating Bending Fatigue Properties of Single Crystal Superalloys Prepared by Different Directional Solidification Processes

Wenjing YI, Yaqi HUANG, Yuzhang LU, Jian SHEN, Dong WANG, Jian ZHANG

89 Effect of Heat Treatment Conditions on Microstructural Evolution and High-Temperature Creep Performance of Nickel-Based Single Crystal Superalloys

Zijin LIU, Wenqi GUO, Haigen ZHAO, Yanling PEI, Shusuo LI, Shengkai GONG

96 Topologically Closed Packed Phase and its Interaction with Dislocation Movement in Ni-based Superalloy during High-Temperature Creep

Wenqi GUO, Haigen ZHAO, Yi RU, Yanling PEI, Shengkai GONG, Shusuo LI

108 Creep Behavior and Mechanism of a Notched γ' -Rich Ni-Based Single Crystal Superalloy at High Temperature

Haigen ZHAO, Wenqi GUO, Peiyun BAO, Junwu WANG, Shusuo LI

112 Effect of Coatings on Creep Property of a Directionally Solidified Superalloy

Zhongkai SUN, Xin ZHAN, Dong WANG, Jian ZHANG

114 Microstructural Evolution during Heat Treatment and High Temperature/ Low Stress Creep of Re-free Single Crystal Superalloy ERBO/15

Jonathan STREITBERGER, Oliver MARTIN HORST, Gunther EGGELER

116 Stress Sensitivity Analysis of Ultrahigh-Temperature Creep in Nickel-Based Superalloy

Jie ZHANG, Jiapeng HUANG, Geng LI, Hang SU, Heng ZHANG, Wenqi GUO, Haigeng ZHAO, Yanling PEI, Shusuo LI, Shengkai GONG

118 Influence of Stress States on Rafting Kinetics during Creep of Nickel-Based Single Crystal Superalloys

David BÜRGER, Gunther EGGELER

119 Dual Effects of γ' Phase Volume Fraction and Interface Mismatch Optimization on 1200°C Ultrahigh-Temperature Creep Resistance in Ni₃Al-Based Single Alloy

Geng LI, Haodong DUAN, Jie ZHANG, Hang SU, Wenqi GUO, Haigeng ZHAO, Heng ZHANG, Yanling PENG, Shusuo LI, Shengkai GONG

131 On the Influence of Trace Elements on Microstructures and High Temperature Properties of Single Crystal Ni-Base Superalloys

Nico PAUFLER, Thomas GÖHLER, Jan FRENZEL

154 Thermo-Mechanical Fatigue Crack Growth of a Coated Superalloy

Louise MARIOTON, Matthieu RAMBAUDON, Jean-Michel SCHERER, Brice LE PANNERER, Nicolas LEOST, Vincent MAUREL

Blade Processing

41 Effect of Solidification Rate on the Microstructure of LEKv - 94 Nickel-Based Superalloy

André BALDISSERA

81 Numerical Optimization of Directional Solidification Process Parameters for Nickel-Based Superalloys

YiLin LI, Enhui WANG, Xinmei HOU

88 The Effect of Carbon Content on the Solidification Behavior in a Mo-Rich Single Crystal Superalloy

Xiaoyu SONG, Tianyu ZHANG, Wenqi GUO, Haigen ZHAO, Yanling PEI, Shusuo LI, Shengkai GONG

141 A [111]-Oriented Nickel-Based Single Crystal Superalloy against 1150°C with Low Density And Low Cost

Zhuoyang LI, Yi RU, Yuanhang GAO, Wenyue ZHAO, Yanling PEI, Shusuo LI, Shengkai GONG, Huibin XU

Poster Session Room 2

Disk Alloys - Mechanical Behavior

8 Microstructure-Based Modeling of Temperature-Dependent Yield Strength in Polycrystalline Ni-Based Superalloys

Uwe GLATZEL, Enrique GALINDO-NAVA, Howard J. STONE, Moritz MÜLLER

84 Tensile Properties Degradation of N18 during Overaging

Guillaume BURLLOT, Benjamin FLAGEOLET, Christian DUMONT, Clément LE GALL, Jonathan CORMIER

91 Dependence of Yield Strength Anomaly on Strain Rate in a Novel Powder Metallurgy Ni-based Superalloy

Haopeng ZHANG, Tian TIAN, Ting YAN, Yingnan SHI, Jian JIA, Yiwen ZHANG

92 Time and Strain Dependence of the Long-Term Creep Behaviors of High-Cr Re-free Ni-Based Single-Crystal Superalloys for Industrial Gas Turbines: A Comparative Study with Re-Containing Alloys

Muchun HOU, Fan LU, Longfei LI, Song LU, Dong WANG, Jian ZHANG, Qiang FENG

138 Effect of Cooling Rate on the Microstructure and Mechanical Properties of Waspaloy

Anchal GOYAL

140 Revealing the Influence of Temperature, Stress and Strain Rate on Deformation Mechanisms of the Ni-based Superalloy Udimet 720Li

Julian VÖLKL, Florian FISCHER, Benedikt DIEPOLD, Lisa P. FREUND, Mathias GÖKEN, Steffen NEUMEIER

143 Dwell-Fatigue Crack Propagation in a Wrought Ni-Base Superalloy: Effects of Tensile Dwell and Oxygen

Shiyu SUZUKI, Zhiqi CHEN, Yuya UEMURA, Satoshi UTADA, Hideaki NISHIKAWA, Toshio OSADA, Yu KUROKAWA, Motoki SAKAGUCHI

149 Cooling Rate Sensitivity and its Effect on the Microstructure and Mechanical Properties of Forged Ni-Base Superalloys

Svetoslava TSANKOVA, Andreas HAUSMANN, Masood Hafez HAGHIGHAT, Bodo GEHRMANN, Angela QUADFASEL, Thomas WITULSKI, Steffen NEUMEIER

183 Full Field Determination of Surface Strains during High Temperature Deformation of Nickel Based Superalloys

Tom LANCASTER, Michael GOODE, Hiroki SUGAWARA, Roger REED

Disk Processing

106 Optimization of Mechanical Properties in a Novel Nickel-Based Superalloy GH4251 via Pre-Engineered Substructures

Hongyao YU, Jinxin DONG, Caiyu GUO, Zhongqiu LIU, Hailong QIN, Jinli XIE, Zhongnan BI

111 Role of Degassing Pre-treatment on the Microstructure and Mechanical Properties of a PM Ni-base Superalloy

Qiang ZHANG, Yixing WANG, Minxi WANG, Tian TIAN, Mingdong LIU, Jiantao LIU

134 Evaluation of Machining Deformation in RR1000

Jonah SHRIVE, Henry BOYLE, Matthew BROWN, Lewis OWEN, Susanne NORGRÉN, Alex GRAVES, Rachid M'SOUBI, Mark HARDY, Jamie MGGOURLAY, Katerina CHRISTOFIDOU

157 Metadynamic Recrystallization and Grain Growth during Ingot-to-Billet Conversion of a Ni-Based Superalloy: JMAK Modeling and Experimental Validation

Liam HUSTON, Jose GONZALEZ-MENDEZ, Austin DICUS, Mario EPLER, Stephane FORSIK

158 Development, Design and Prototype Forging of an UDIMET720LI Turbine Disk for Next Generations Aero Engines

Christian GRUBER, Flora GODOR, Aleksandar STANOJEVIC

182 Advanced Prediction of Remelting-Related Defects in the VAR Process

Abdellah KHARICHA, Ebrahim KARIMI-SIBAKI, Mehran ABDI, Chenbo XU, Menghuai WU

Environmental Resistance

7 Novel Analysis of High Temperature Corrosion Products and Porosity on Uncoated Single Crystal René5 Superalloy

Roger MADDALENA, Alice SCARPELLINI, Marc LIU, Stoichko ANTONOV, Jonathan CORMIER, Nicolas RIVAS

28 Effect of Pt-Al coating on High-Temperature Creep Performance in a Ni-based Single Crystal Superalloy

Yawei LI, Li WANG, Jian ZHANG

32 Cyclic Oxidation Behaviour of Al9Co25Cr8Fe15Ni36Ti6X1 with Minor Alloying Additions at 750 °C

Anke Silvia ULRICH, Sebastian HAAS, Anna Maria MANZONI, Uwe GLATZEL

53 Negative Creep and Isothermal Oxidation Behavior of Inconel 783

Konstantin MÜLLER, Benedikt ALBERT, Rainer VÖLKL, Uwe GLATZEL

68 Cognition on the Oxidation Behavior of Ni-Based Superalloy GH4742 when Exposed to Water Vapor

Hui XU, Enhui WANG, Xinmei HOU

133 Corrosion Behavior of Ni-Based Alloy Inconel 625 in Molten NaCl-MgCl Eutectic Salt at High Temperature

Hanae EL AOUDI, Fernando PEDRAZA, Benjamin GREGOIRE, Jonathan CORMIER, Jérémy RAME, Camille ROUSSEAU, Charly CARRIERE

137 Towards Understanding Deformation Mechanisms of H Embrittlement in Ni-Based Alloys

Yutaro OKI, Tomohiro ANDO, Yoshihiko KOYANAGI, Hiroto KITAGUCHI, Yu-Lung CHIU

155 Thermal Barrier Capacity of the Coating on Single Crystal Superalloy: a Destructive Burner Rig Test with Structural Simulation Component

Xinyu ZHANG, Yi RU, Bin HU, Huidong WU, Shusuo LI, Yanling PEI, Shengkai GONG

171 Influence of Hot Corrosion Pits on Short Fatigue Crack Growth

Elise PERUSE, Justine BONNAL, Stephane KNITTEL, Cécilie DUHAMEL, Stéphane MATHIEU, Matthieu RAMBAUDON, Benoit MANSOZ, Vincent MAUREL

ICME - Digital twins for materials and processes

23 Machine Learning for Microstructural Prediction on IN718 industrial Parts

Antoine GOMOND, Yann JANSEN, Eric GEORGES

30 Prediction of Plastic Deformation Behavior in Complex Multi-Component L1² Precipitates

Yingchun TANG, Wei Li, Levente VITOS, Florian PYCZAK

33 Knowledge-Informed Graph Attention Networks Enable Defect-Free Alloy Design for Laser Additive Manufacturing

Hao YU, Wei XU

35 Building a Quantitative Relationship among Microstructure-Defects-Property of Superalloys Based on Multimodal Convolutional Neural Network

Huipeng YU, Maodong KANG, Jun WANG, Baode SUN

51 **Microstructural Prediction of Inconel 718 during High Strain Rate Process Conditions using DIGIMU®**

Franco JAIME, Pascal De MICHELI, Jonathan DARION, Olena DANYLOVA, Baptiste FLIPON, Marc BERNACKI

70 **Unveiling the Effect of Stress on Vacancy Diffusion Isotropy at High Temperature in Ni-Re Systems: Insights from Atomic Simulations**

Shichao DU, Siyuan LIN, Wenyue ZHAO, Yi RU, Yanling PEI, Shusuo LI, Shengkai GONG

153 **Machine Learning for the Computational Design of Single-Crystal Nickel-Base Superalloys**

Matthieu DEGEITER, Edern MENOUE, Patricia KLOTZ, Armand BARBOT, Didier LOCO, Sami BEN ELHAJ SALAH, Thibaut FROELIGER, Yohan COSQUER, Mikael PERRUT

184 **An Ab Initio Investigation into Dislocation Core Structures and Yield Strength Anomalies in L12 Intermetallics**

Benjamin ZELIN, Yilun GONG, Jonathan R. YATES, Roger C. REED

New Grade Superalloys

2 **Evaluation of the Development of Microstructural and Chemical Gradients in γ/γ' Superalloys Prepared by spark Plasma Sintering**

Thibaut FROELIGER, Louis METAYER, Etienne RIMPOT, Didier LOCO, Mathilde LAURENT-BROCO

9 **Novel Wrought Polycrystalline Co/Ni-Base Superalloys**

Cameron CRABB, Geri TOPORE, James O. DOUGLAS, Mark HARDY, Shelly CONROY, David DYE

34 **Osmium Effect in Single Crystal Nickel Base Superalloys**

Zaiwang HUANG

49 **The influence of Zr content on the grain boundary segregation and inter-phase distribution behavior in a novel nickel-based PM superalloy [49]**

Jian Jia, Ying Nan Shi, Ting Yan, Hao Peng Zhang, Yi Wen Zhang

142 **A Nickel-Based Powder Metallurgy Superalloy with High-Temperature Capability: Strengthening Effect of High (W, Ta) Content**

Ting YAN, Xiaokun LI, Jiaming BAI, Haopeng ZHANG, Jian JIA, Jiantao LIU, Yiwen ZHANG

181 **In Situ Study on the Effect of W on Precipitation in High-Ta-Containing Nickel Superalloys**

Romain BOURDAIS, Thomas VAUBOIS, Edern MENOUE, Vladimir A. ESIN

Repair, Refurbishment, Recycling

18 **Recycling and Purification of Superalloy Scrap via Hydrogen Plasma Arc Melting**

Peng ZHAO, Shufeng YANG

45 **The Effect of Ca Additions on the Mechanical Properties of an Advanced Polycrystalline Ni-Base Superalloy**

George WISE, Mark HARDY, Nicholas JONES, Howard STONE

117 **Nondestructive Inspection of Recrystallization in Single Crystal Ni-Based Superalloys by X-ray Laue Method**

Ayumi NAKAYAMA, Shinya IWASAKI, Daisuke KOBAYASHI, Toshikatsu TATEISHI

130 **Joining Ni-Based Superalloys with Compositionally Complex Filler Alloys**

Jonas VOGLER, Benjamin SCHNEIDERMAN, Zhenzhen YU, Rainer VÖLKL, Uwe GLATZEL

Superalloys for Power Generation

11 On the Control of γ' Nanoprecipitation in the NiMolloy Superalloy Designed for Molten Salt Reactors

Adrien DELAGNES, Romane BUISSON, Nicolas MARI, Jacques PERRIN TOININ, Sylvie DOROT, Michel PÉREZ, Brigitte BACROIX, Yann DE CARLAN

63 Enhancing the Creep-Rupture Strength of a Novel Ni-Fe-Cr-Based Superalloy GH4070T through Tailoring Heat Treatments

Peng ZHANG

103 Microstructural and Mechanical Assessment of an Ex-Service Blade from a Land-Based Gas Turbine

Clara POHL, Jonathan STREITBERGER, Antonín DLOUHY, Gunther EGGELER
