

## Symposium C : Structural Materials for High Temperature

November 20 (Mon.), 2023

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Session Title : Structural Materials for High Temperature 1

Time : 10:50 - 12:25, Nov. 20

Room # : 201A, 2F

Session Chair

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10:50 – 11:20    **Keynote** K-C0584

**Mechanically-Driven Localized Phase Transformations at Stacking Faults and New Superalloy Design Strategy**

Yunzhi Wang, The Ohio State University, USA

11:20 – 11:40    **Invited** I-C1024

**High temperature oxidation behavior of 22wt% Cr containing Ferritic stainless steels for SOFC interconnects**

Dong Ik Kim, Korea Institute of Science and Technology, Korea

11:40 – 11:55 O-C0072

**Sensitivity of thickness debit effect on secondary orientation of a 3rd generation single crystal superalloy**

Li Wang, Institute of Metal Research, Chinese Academy of Sciences, China

11:55 – 12:10 O-C0378

**New composition standard based on cluster formula for superalloy Inconel 718**

Shuang ZHANG, Dalian Jiaotong University, China

12:10 – 12:25 O-C0423

**Formation of stacking fault MC carbides in Ni-Mo-Cr superalloy**

Li Jiang, Shanghai Institute of Applied Physics (SINAP), Chinese Academy of Sciences, China

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Session Title : Structural Materials for High Temperature 2

Time : 14:00 - 15:35, Nov. 20

Room # : 201A, 2F

Session Chair

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14:00 – 14:30    **Keynote** K-C0709

**Development of Environmental Resistant Ni Base Superalloys using Artificial Intelligence Approach**

Youngsoo Yoo, Korea Institute of Materials Science, Korea

- 14:30 – 14:50**    **Invited** **I-C0882**  
**Effect of Ru addition on the microstructural stability and creep properties in nickel-based single crystal superalloys**  
Jinguo Li, Institute of Metal Research, Chinese Academy of Sciences, China
- 14:50 – 15:05** **O-C0861**  
**Composition optimization of Inconel 718 via cluster formula and experimental verification**  
Yancheng Li, Dalian University Of Technology, China
- 15:05 – 15:20** **O-C0180**  
**Microstructure evolution of Ni-base single crystal superalloys at high temperature and resulting viscoplastic properties: Experiments and Modelling**  
Shamanth Shiva Kumar, Université Paris-Saclay, France
- 15:20 – 15:35** **O-C0453**  
**High-cycle fatigue behavior of a coated third-generation single crystal superalloy at 900°C**  
Dong Sun, University of Science and Technology Beijing, China

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Session Title : Structural Materials for High Temperature 3

Time : 16:00 - 17:40, Nov. 20

Room # : 201A, 2F

Session Chair

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- 16:00 – 16:20**    **Invited** **I-C0827**  
**Digital twin for control of dimensional accuracy of complex superalloy investment castings**  
Da SHU, Shanghai Jiao Tong University, China
- 16:20 – 16:40**    **Invited** **I-C**  
**Fatigue Crack Growth Life Assessment in Ni-Based Superalloy Alloy 247LC at Elevated Temperatures**  
Young Wha Ma, Doosan Enerbility Co., Ltd., Korea
- 16:40 – 16:55** **O-C0080**  
**Research on the Secondary  $\gamma'$  Phase Precipitation Behavior of Single Crystal Superalloys by Aging Heat Treatment**  
Xiaopeng Li, Harbin Engineering University, China
- 16:55 – 17:10** **O-C0571**  
**Effect of Boron on the creep deformation of Inconel 617 Ni-based superalloys at 1273K**  
DuHyun Kim, Korea Institute of Science and Technology, Korea
- 17:10 – 17:25** **O-C0057**

**Effect of secondary dendrite orientation on high temperature oxidation of a nickel-based single crystal superalloy**

Jiasheng Dong, Institute of Metal Research, Chinese Academy of Sciences, China

17:25 – 17:40

O-C0658

**Heat treatment design of Inconel 740H superalloy for microstructure stability and creep properties enhancement**

CheolHyeok Yang, Changwon National University, Korea

**November 21 (Tue.), 2023**

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Session Title : Structural Materials for High Temperature 4

Time : 10:50 - 12:25, Nov. 21

Room # : 201A, 2F

Session Chair

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10:50 – 11:20

Keynote

K-C0478

**Exploring the Insight into the Microstructure-Mechanical Property Relationship of Additive Manufactured Ni-Based Superalloys**

Hyun-Uk Hong, Changwon National University, Korea

11:20 – 11:40

Invited

I-C0422

**Development of  $\gamma'$ -strengthened CoNi-base powder superalloys suitable for additive manufacturing**

Longfei LI, University of Science and Technology Beijing, China

11:40 – 11:55

O-C0081

**Influence of solution treatment on the  $\gamma'$  phase precipitation behavior in K444 cast nickel-based superalloy**

Y.s. Xie, Harbin Engineering University, China

11:55 – 12:10

O-C0815

**Precipitation Mechanism of  $\eta$ -Ni<sub>3</sub>Ti Phase and Its Inhibition Method by Hf Microalloying in a Nickel-based Superalloy with High Ti/Al Ratio**

Meiqiong Ou, Institute Of Metal Research, Chinese Academy Of Sciences, China

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**14:00 – 14:30**    **Keynote** K-C0362

**R&D Trends in Mo-Based Ultra-High Temperature Alloys**

Kyosuke Yoshimi, Tohoku University, Japan

**14:30 – 14:50**    **Invited** I-C0368

**Synergetic Alloying Effects of Mo, V and Zr on the Microstructure and Properties of Multi-elemental Nb-Si Based Ultrahigh Temperature Alloys**

Xiping GUO, Northwestern Polytechnical University, China

**14:50 – 15:05** O-C0717

**Elastic moduli and toughness of B1-type (Mo, Ti)<sub>x</sub> in Mo-Ti-C ternary system**

Shuntaro Ida, Tohoku University, Japan

**15:05 – 15:20** O-C0887

**Strong enthalpy interaction element modulated microstructure and properties of Cu-Ni-Al alloys**

Yinglin Hu, Dalian University Of Technology, China

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Session Title : Structural Materials for High Temperature 6

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**16:00 – 16:30**    **Keynote** K-E1139

**Mechanical behavior of titanium lattice structures fabricated by powder bed fusion**

Laichang Zhang, Edith Cowan University, Australia

**16:30 – 16:50**    **Invited** I-C0291

**Variations in the positive temperature dependence of yield stress for Co<sub>3</sub>(Al, W)–Co<sub>3</sub>Ti pseudo-binary intermetallic compounds**

Katsushi Tanaka, Kobe University, Japan

**16:50 – 17:05** O-C0509

**Study on the effect of infinitesimal potassium doping on the ductile-to-brittle transition temperature of tungsten as a plasma-facing material**

Jeongseok Kim, Seoul National University, Korea

17:05 – 17:20

O-C0447

**For the oxidation-resistant MoSiB-based ultrahigh-temperature materials**

Mi Zhao, Huazhong University of Science and Technology, China

17:20 – 17:35

O-C0227

**Effect of Nb on Phase Equilibria and Mechanical Properties of Mo-Ti-C Alloys**

Xinyu Yan, Tohoku University, Japan

**November 22 (Wed.), 2023**

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Session Title : Structural Materials for High Temperature 7

Time : 10:50 - 12:25, Nov. 22

Room # : 201A, 2F

Session Chair

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10:50 – 11:20

Keynote

K-C0883

**Recrystallization and phase transformations in metastable beta titanium alloys**

Elena Pereloma, University of Wollongong, Australia

11:20 – 11:40

Invited

I-C0271

**Microstructure and mechanical properties of TiAl alloys fabricated by electron beam powder bed fusion**

Hiroyuki Yasuda, Osaka University, Japan

11:40 – 11:55

O-C0142

**Thermal deformation mechanism and low-temperature superplasticity of  $\beta$ -stabilized Ti-43Al-9V-Y alloy sheet with bimodal  $\gamma$ -grain-size distribution**

Yu Zhang, Harbin Institute Of Technology, China

11:55 – 12:10

O-C0844

**Fracture Toughness of  $\gamma$ -TiAl from First-Principles Calculations**

Mahfooz Alam, Indian Institute of Technology Jodhpur, India

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Session Title : Structural Materials for High Temperature 8

Time : 14:00 - 15:35, Nov. 22

Room # : 201A, 2F

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14:00 – 14:30

Keynote

K-C0762

**Oxidative Influence on Tensile Properties of TiAl Intermetallic and Ni-based Alloys:  
Comparative Review**

Ji ZHANG, Central Iron & Steel Research Institute, China

14:30 – 14:50 **Invited**

I-C0757

**Investigation of the effect of cooling rate after heat treatment on creep properties of single  
crystal superalloy**

Jeonghyeon Do, Korea Institute of Materials Science, Korea

14:50 – 15:05

O-C0433

**$\gamma'$ -Strengthened Multicomponent CoNi-Based Wrought Superalloys With Improved  
Comprehensive Properties**

Song Lu, University of Science And Technology Beijing, China

15:05 – 15:20

O-C0490

**Development of Temperature Estimation Method for KA-SUS321J1HTB using  $\sigma$  -phase  
Particle Size**

Masahito Omiya, IHI Corporation, Japan

15:20 – 15:35

O-C0932

**Enhancement of strength-ductility trade-off in directionally solidified Al-rich Ni-27Al alloy via  
particle reinforced composite structure formation by static magnetic field**

Sansan Shuai, Shanghai University, China

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Session Title : Structural Materials for High Temperature 9

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16:00 – 16:30 **Keynote**

K-C

Guoqing ZHANG, AECC Beijing Institute of Aeronautical Materials, China

16:30 – 16:50 **Invited**

I-C0536

**Effect of Impurities on Creep Strength and Microstructure in Welded Joints of High-Cr  
Ferritic Heat Resistant Steel**

Masatoshi Mitsuhashi, Kyushu University, Japan

16:50 – 17:05

O-C0123

**Radiation-Induced Effects on Microstructure and IASCC Susceptibility of Austenitic 316  
Stainless Steel**

Yun Soo Lim, Korea Atomic Energy Research Institute, Korea

17:05 – 17:20

O-C0555

**Ex-situ observation of microstructure evolution during aging at 1013 K in 9Cr ferritic steel weld metal**

Katsuhiko Sato, IHI Corporation, Japan

17:20 – 17:35

O-C0631

**Microstructure Characteristics and Mechanical performance of Transformable 9Cr ODS Steels with Different Types of Minor Alloying Additions**

Xiaosheng Zhou, North University of China, China

17:35 – 17:50

O-C0454

**Unveiling the Re effect on microstructural stability, high-temperature strength of high-Cr CoNi-based superalloy**

Xiaorui Zhang, University of Science and Technology Beijing, China

17:50 – 18:05

O-C1134

**Revealing the Microstructural Evolution and Strengthening Mechanisms of Additively Manufactured Ni-based Hastelloy X Superalloy**

Seung-Chang Han, Incheon National University, Korea