August 19 (Mon)

1. Power Generation

Monday PM Room: 305 August 19, 2019

Session Chairs:

1:30 PM Keynote

A New Ni-base Superalloy GH750 for 700 Advanced Ultra-Supercritical Power Plant application: *X. Xie* [1];[1] University of Science and Technology Beijing

2:00 PM

Research on the Long-term Microstructural Stability and Mechanical Properties Changes of Nickel-base superalloys for 700℃ Advanced Ultra-supercritical Power Plants: *S.Zhao*[1]; *R. Fu*[1]; *Y.Wang*[1]; [1] Department Of Materials, Shanghai Power Equipment Research Institute

2:20 PM

Influence of lamellar structure on creep property of cellular precipitating Ni-38Cr-3.8Al alloy: *Y.Koyanagi* [1]; *H.Takabayashi* [1]; *H.Yasudai* [1]; [1] R&D center, Osaka University

2:40 PM

Tensile deformation mechanisms in a new Ni-Fe-base superalloy at750 °C: *P.Zhang*[1],*Y.Yuan*[1],*Y.Gu*[1], *J.Yan*[1],*Y.Dang*[1],*J.Lu*[1],*H.Yin*[1],*J.Wang*; [1]Xi'an Thermal Power Research Institute Co., Ltd.

3:00 PM

New generation of cast &wrought superalloy for A-USC boiler application beyond 700°C: *F.Sun*[1]; *F.Tadashi* [1]; [1] Institute for Materials Research, Tohoku University

3:30 PM-4:05PM Coffee Break

4:10 PM Keynote

Development of Ni Base Superalloys for Future Energy Plant Application: *Yoo, Youngsoo*[1]; *Jeong, Hiwon*[1]; *Seo,Seongmoon*[1]; *Yun,Daewon*[1]; [1] High Temperature Materials Center, Korea Institute of Materials Science

4:40 PM

Effects of Ti Addition on Mechanical properties of RAFM steel: Im,S.Y[1]; Moon, J.O.[1]; Lee, C.H.[1]; Hong, H.U[1]; [1]Changwon National University, Changwon, Korea; Korea Institute of Materials Science, Changwon, Korea

5:00 PM

August 19 (Mon) PM

7. Intermetallics

Monday PM Room: VIP August 19, 2019

Session Chairs:

1:30 PM Keynote

Design Approaches and Properties of Novel Wrought TiAl Alloys for Jet Engine Applications: *M. Takeyama*[1],[1]Tokyo Institute of Technology

2:00 PM

Mechanical properties of TiAl alloys with unique layered microstructure fabricated by electron beam melting: *C. Ken; S. Masahiro*; *O. Yeong*; *Y. HiroyukiY*; *T. Mitsuharu*; *I. Ayako; U. Minoru*; *T. Masao*; N. Takayoshi; Osaka University

2:20 PM

Effect of Zr on microstructure and mechanical properties of Nb-Si based multi-element alloys: *Y. Kang*[1]; *F. Guo*[1]; *M Li*[1]; [1]AECC Beijing Institute of Aeronautical Materials

2:40 PM

Microstructural evolution and hardness of rapidly solidified Nb-Si based alloys: *G, ling*; *J, Lina; P, Hui*; *Z, Hu*; Northwestern Polytechnica University

3:00 PM-4:10PM Coffee Break

4:10 PM Invited

Good Compatibility of Ultrahigh-Temperature Strength and Room-Temperature Fracture Toughness for MoSiBTiC Alloy: *Y, Kyosuke*; Tohoku University Japan

4:40 PM

Effect of Ti content on microstructure and oxidation resistance of MoSiBTi2C alloys: *H, Tomotaka*; *Y, Kyosuke*; Tohoku University Japan

5:00 PM

Microstructural evolution during ultrahigh-temperature tensile creep of MoSiBTiC alloy: *U, Sojiro*; *Y, Takateru*; *Y, Kyosuke*; *Y, Shiho*; *N, Shunichi*; *E, Gunther*; *M, Kouichi*; *T. mSadahiro*; Kumamoto University

5:20 PM

August 20 (Tues) AM

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2. Fundamentals of Superalloys

Tuesday AM Room: 305 August 20, 2019

Session Chairs:

8:30 AM Keynote

New Insights Into Rate Limiting Deformation Processes in Ni-Base Superalloys: *M. Mills*[1]; [1] The Ohio State University

9:00 AM Invited

The effect of segregation of solutes at crystal defects on the mechanical performance of superalloys: *P. Kontis*[1]; *L. Lilensten*[1]; *P. Kürnsteiner*[1]; *A. Cervellon*; *J. Cormier*; *D. Raabe*[1]; *B.Gault*[1]; [1]Max-Planck-Institut für Eisenforschung GmbH

9:25 AM

Interface structures in nickel-based single crystal superalloys during rafting at high temperatures: *Qi,Dongqing|Zhao,Peng|He,Suyun|Wang,Li|Wang,Dong|Lou,Langhong|Qi,Yang|Zhang,Jian|Ye,Hengqiang|Du,Kui; Institute of Metal Research , Chinese Academy of Sciences|School of Materials Science and Engineering , Northeastern University|School of Materials Science and Engineering , University of Science and Technology of China*

9:45 AM

The Tetrahedral-Octahedral Site Trajectories of Boron in L12 Ni3Al and Its (010) Antiphase Boundary: *Y. Wang*[1,2]; *K.A. Darling*; *H. Kim*[2]; *S.Shang*[2]; *Y.Wang*[1]; *L.J. Kecskes*; *Q. Feng*; *X .Hui*; J.Li[1]; Z.Liu[2]; [1]Northwestern Polytechnical University

10:00 AM-10:20 AM Coffee Break

10:20 AM Invited

Designing the microstructure of alloy 718: *S. Primig*[1]; *F. Theska*[1]; *V. Rielli*[1]; *S. P. Ringer*; [1]UNSW Sydney;

10:45 AM

Deformation behavior and strengthening-toughening of GH4169 alloy with multi-field coupling: *L. Wang*[1]; *J. An*[1,2]; *Y. Liu*[1]; *X. Song*[1]; [1] Northeastern University

11:05 AM

Influence of Heat Treatment on Microstructures and High-Temperature Mechanical Properties of Selective Laser Melted Inconel 625: *LEE, Jiwon*[1]; *KIM, Jinhyeok*[1]; *JUN,Sunyoung*[1]; *T.Mathieu*[1]; *C.Etienne*[1]; *L. Philippe*; *H. Hyunuk*; [1] Metal Material Science and Engineering, Changwon National University

11:25 AM

Morphological Characterization of Multimodal Microstructure for Ni-Based Superalloy Udimet 720Li: Yamaguchi, Yoshiya, Hisazawa, Hiromu, Terada, Yoshihiro, Tokyo Institute of Technology Graduate School of Technology , Industrial and Social Sciences , Tokushima University

August 20 (Tues) PM

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3. Creep, fatigue and deformation behavior

Tuesday PM Room: 305 August 20, 2019

Session Chairs:

1:30 PM Keynote

The Effects of thermal cycling on the creep performance of a single crystal alloy: *C. Rae*[1]; *C. Schwalbe*; *J. Cormier*; *N. Jones*; *E. GalindoNava*[1]; *X. Devaux*; *A.J acques*; [1]Cambridge University

2:00 PM Invited

Crack initiation mechanisms during VHCF of Ni-based single crystal superalloys: *J. Cormier*[1]; *A. Cervellon* [1]; *F. Mauget*[1]; *S. Hemery* [1]; [1]Physics and Mechanics of Materials Department, Institut pprime;

2:25 PM

Vibration Characteristics of High Speed Rotating Blades: *H. Wei* [1]; [1] Zhejiang University

2:45 PM

Effect of secondary dendrite orientation on the low cycle fatigue behaviors of a third generation Ni-base single crystal superalloy: *I. wang*[1]; *G. Sun*[1]; *Y. Li*[1];

C. Li[1]; *W. Zheng*[1]; *D. Wang*[1]; *L. Lou*[1]; *J.Z hang*[1]; [1] Institute of Metal Research，Chinese Academy of Sciences

3:05 PM

Re segregation at dislocations in the γ' phase of Ni-based single crystal superalloys: X. Wu[1]; M. Surendra[1]; G. Baptiste[1]; E. Gunther[1]; [1] Max Planck Institute für Eisenforschung; Ruhr-Universität Bochum

3:25PM-Coffee Break

4:10PM-6:00PM Poster

August 21 (Wed) AM

4. Processing and alloy design

Wednesday AM Room: 305 August 21, 2019

Session Chairs:

8:30 PM Keynote

Microstructural evolutions of Ni-based superalloys during high temperature straining: *Y.Liu[1];H. Long; S .Mao; X .Han*; [1]The University of Western Australia

9:00 AM Invited

Hot Isostatic Pressing of Dual Ni-base Superalloys: *H. Fraser*[1]; *B. Georgin*[1]; *B.Welk*[1]; *G. B.Viswanathan*[1]; [1]The Ohio State University

9:25 AM Invited

Residual stress in precipitation hardening superalloys forgings: *Z. Bi*[1]; *H. Qin*[1]; *R. Zhang*; *T.L. Lee*; *X. Liu*; *V. Luzin*; *Jinhui Du*[1]; *H. Dong*; *J. Zhang*[1]; [1]Central Iron and Steel Research Institute

9:50 AM

Hot Mechanical Behaviors for Alloy 800H Base and Weld Metals : *Kim, Woo-Gon; Kusuma, INC; Sah, Injin; Kim, Eung-Seon; Kim, Seon-Jin; Kim, Min-Hwan*; Korea Atomic Energy Research Institute (KAERI); Pukyong National University

10:10 AM

Dependency of deformation behavior on γ′ precipitates formed by various heat treatments in Haynes 282 superalloy: *KIM, JIN HYEOK; Shin, Kyeong Yong; Terner, Mathieu; Kong, Byeong Ook; Hong, Hyun Uk Changwon National University*

10:30 AM-10:45 AM Coffee Break

10:45 AM Invited

Materials Genome Initiative: Accelerated Ni-based single crystal superalloy design: *C. Xiao[1]; J. Chen[1]; X. Hui; Z .Du; X. Shen;* [1]Science and Technology on Advanced High Temperature Structural Materials Laboratory，Beijing Institute of Aeronautical Materials

11:10 AM Invited

Precipitate-Mediated Dislocation Transformation in Superalloys: *Yunzhi Wang[1]*; *Longsheng Feng[1]*; *Mike Mills[1]*; [1]The Ohio State University

11:35 AM

High-Speed High-Throughput Thermodynamic Phase Equilibrium Calculation and Its Application in Phase Field Simulation: *S. Chen*[1];*D.Sun*;*W.Cao*[1]; *D.Lv*[1]; *F.Zhang*[1]; *Y. Wang*; [1]CompuTherm LLC

11:55 AM

Machine learning accelerates component design of 2nd generation long life Nickel-based single Crystal superalloys: *Q. Huo; J. Chen; X. Hui; J. Chen;* State Key Laboratory for Advanced Metals and Materials，University of Science and Technology Beijing，China

August 21 (Wed) PM

4. Novel concepts

Wednesday PM Room: 305 August 21, 2019

Session Chairs:

1:30 PM Invited

Gamma–Gamma Prime based Precipitation Strengthenable High Entropy Alloys: *R. Banerjee[1]; B. Gwalani[1]; S. Dasari[1]; A. Jagetia[1]; R. Mishra[1]; [1]University of north texas*

1:55 PM Invited

Design of γ′-strengthened Co-base alloys based on multi-scale characterization: *Choi[1]; Pyuck-Pa|Im; Hyeji, Yoo; Boryung; [1]Korea Advanced Institute of Science and Technology*

2:20 PM

Thermal stability and strenghening effects of nano-precipitated Ni3Al phase in CrCoNi alloys: N. An[1]; J. Tian[1]; Y. Niu[1]; [1]Beijing Beiye Functional Materials Corporation

2:40 PM

Studies of discontinuous precipitation in Ni-Co-Al ternary alloy system: *Y. Zhou[1]; J. Wang[1]; Z. Fei[1]; P. Nash;* [1]*Shanghai Jiaotong University*

3:00 PM

Effect of L21-Co2Al(Ti,V) precipitates on deformation behavior of Fe-Al-Co-Ti-V single crystals: *Yasuda[1]; Hiroyuki, Yasunishi; Yuki|Kobayashi[1]; Ryota Cho; Ken;* [1]*Osaka University*

3:30 PM-4:10PM Coffee Break

4:10 PM Invited

β-NiAl based protective coatings for advanced single crystal superalloys: *H. GUO[1]; J. HE[1]; L. Wei[1]; H. PENG[1]; S. GONG[1];* [1]*Beihang University*

4:35 PM Invited

Application of Pt-Ir Paste Coating for Ni-based superalloys: *Hideyuki[1]; Murakami;* [1]*National Institute for Materials Science*

5:00 PM

Research on the Interface Reactions and Wettability between a Y-containing Superalloy Melt and Ceramic Materials: *Y. Zi[1,2]; J. Meng[1]; Y. Zhou[1];* [1]*Institute of Metal Research , Chinese Academy of Sciences;* [2]*University of Science and Technology of China*

5:20 PM

Experimental and numerical investigation of compressive creep in 3D-woven Ni-based superalloys: *Hoon-Hwe Cho[1]; Dinc Erdeniz; Keith W. Sharp; David C. Dunand;* [1]*Hanbat National University*

5:40 PM

August 22 (Thur) AM

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6. Casting and manufacturing

Thursday AM Room:305 August 22, 2019

Session Chairs:

8:30 AM Invited

Research statues and progress of solidification structure and grain defects in nickel-based single crystal supealloys: *L. Liu[1]; J. Zhang[1]; H Fu[1];* [1]Northwestern Polytechnical University

8:55 AM Invited

A Phenomenological Analyses of Freckling in Directional solidification of Ni-base Alloys: *H. Dong[1];F. Wang; Z.. Dong[1]; D. Ma;*[1]University of Leicester

9:20 AM Invited

Formation and evolution of casting defects in single crystal nickel based superalloys: *J.Zhang[1];* [1]Institute of Metal Research , Chinese Academy of Sciences

9:45 AM

High temperature mechanical behavior of ceramic core for directional solidification of turbine blades: *J. Zhong[1]; Z. Xu[1]; Q. Xu[1]; B. Liu[1];* [1]Tsinghua University

10:05 AM

Application of combined HIP and high pressure heat treatment for superalloy post processing: *C.Hao[1];E.Anders[1];S.James[1];* [1]Quintus Technology

10:25 AM-10:45 AM Coffee Break

10:45 AM Invited

Microstructural evolution of Ni-based K403 alloy during thermal exposure: *J. Li[1];* [1]Montanuniversität Leoben

11:10 AM

Microstructure-Mechanical Property Relationship of Additive Layer Manufactured Ni-Based Superalloys: *H.U. Hong[1]; J.W. Lee[1]; S.Y. Im[1]; S.Y. Jun[1];M. Terner[1];B.S. Lee; E. Copin; P. Lours;G. Marchese;S. Biamino;* [1]Changwon National university

11:30 AM

Contributed Design of Ni-Base Superalloys for Additive Manufacturing *Sammy Tin1; 1.Illinois Institute of Technology*

11:50 AM

Characterization of high-entropy-TLP joints of a single crystal superalloy: *L. Chai[1]; J. Hou[1];* [1]AVIC Manufacturing Technology Institute

12:10 AM