

## Symposia - D02

### Advanced Structural Materials and Mechanical Properties of Materials

October 15 (Sunday), 2023

Conference Room: 7111B, #-1 floor

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8:30-10:30 Session I

Host: Yong Liu, Aiying Chen

8:30-9:00 (D02-01)

**Progress of additive manufacturing of structural materials: concept, processing, mechanical properties and applications (Keynote)**

Jian Lu, City University of Hong Kong, China

9:00-9:20 (D02-02)

**Break through the strength-ductility trade-off dilemma in aluminum matrix composites via precipitation-assisted interface tailoring (Invited)**

Gang Ji, University of Lille, France

9:20-9:40 (D02-03)

**Kink microstructures for strengthening LPSO-type Mg alloys (Invited)**

Elji Abe, Tokyo University, Japan

9:40-10:00 (D02-04)

**Quantitative Study on Orientation Dependence of Grain Boundary (GB) Strengthening in Mg alloys (Invited)**

Yunchang Xin, Nanjing Tech University, China

10:00-10:15 (D02-05)

**Design of bicontinuous metallic nanocomposites for high-strength and plasticity (Oral)**

Yuchi Cui, Shanghai Jiao Tong University, China

10:15-10:30 (D02-06)

**Microscopic phase separation in Ti-Zr-Nb-Ta-Mo refractory high entropy alloys processed by selective laser melting (Oral)**

Han Chen, Tokyo University, Japan

10:30-10:50 Coffee Break

10:50-12:00 Session II

Host: Zhenbo Wang, Qingwei Dai

10:50-11:10 (D02-07)

**Pulsing-induced electroplasticity and brittle-to-ductile transition in metallic materials (Invited)**

Jiangwei Wang, Zhejiang University, China

11:10-11:30 (D02-08)

**Tracking the plastic deformation of near-micrometer grain-size Al during tension in 2D and 3D (Invited)**

Andy Godfrey, Tsinghua University, China

11:30-11:45 (D02-09)

**3D grain orientation mapping in the TEM: a high-throughput technique for revealing five-parameter grain boundary character distribution at the nanoscale (Oral)**

Wanquan Zhu, Chongqing University, China

11:45-12:00 (D02-10)

**In situ TEM observations of microstructural evolution during recovery of heavily deformed Al alloys (Oral)**

Linfei Shuai, Suzhou Laboratory, China

12:00-14:00 Lunch

14:00-15:50 Session III

Host: Ge Wu, Yunchang Xin

14:00-14:25 (D02-11)

**Achieving ultrahigh fatigue resistance in AlSi10Mg alloy by additive manufacturing (Keynote)**

Zhe Chen, Shanghai Jiao Tong University, China

14:25-14:45 (D02-16)

**An excellent Al joint technology (Invited)**

Qingwei Dai, Chongqing University of Science and Technology, China

14:45-15:05 (D02-13)

**Three-dimensional characterization of dislocation structures in advanced aluminum alloys (Invited)**

Zongqiang Feng, Chongqing University, China

15:05-15:20 (D02-14)

**Insights for the strength and ductility of precipitation hardening Al-Li-Sc alloys (Oral)**

Jing Dai, Shanghai Jiao Tong University, China

15:20-15:35 (D02-15)

**Design and fabrication of high-performance TiB<sub>2</sub>/Al-Mg-Gd neutron shielding material with efficient shielding particles (Oral)**

Chen Yang, Shanghai Jiao Tong University, China

15:35-15:55 Coffee break

15:55-17:15 Session IV

Host: Gang Ji, Jiangwei Wang

15:55-16:15 (D02-16)

**Martensite transformation in gradient nanostructured austenitic stainless steel under cyclic loading (Invited)**

**Zhenbo Wang, Shenyang National Laboratory for Materials Science Institute of Metal Research, China**

**16:15-16:30 (D02-17)**

**Developing a high-strength and cracking-resistant Mg-Gd-Zn-Zr alloy for additive manufacturing (Oral)**

Qingchen Deng, Shanghai Jiao Tong University, China

**16:30-16:45 (D02-18)**

**Microstructure and mechanical properties of cold spray additive manufactured and post heat treated high-entropy alloys with mixed CoCrFeNi and Ti powders (Oral)**

Fanchao Meng, Yantai University, China

**16:45-17:00 (D02-19)**

**Design of concentration modulated materials (Oral)**

Tianlong Zhang, The Hong Kong University of Science and Technology, China

**17:00-17:15 (D02-20)**

**HR-DIC and crystal plasticity FEM simulation based studies on the correlation between microstructure and local inhomogeneous deformation of additive manufacturing AlSi10Mg (Oral)**

Lubin Song, Huazhong University of Science and Technology, China

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**October 16 (Monday), 2023**

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**8:30-10:25 Session V**

**Host: Zhe Chen, Wenzhen Xia**

**8:30-8:55 (D02-21)**

**Microstructure regulation and mechanical properties of Mg alloy (Keynote)**

Yong Liu, Nanchang University, China

**8:55-9:15 (D02-22)**

**Massive interstitial solid solution alloys achieve near-theoretical strength and large deformability (Invited)**

Chang Liu, Xi'an Jiaotong University, China

**9:15-9:35 (D02-23)**

**Defeating hydrogen-induced grain-boundary embrittlement via triggering unusual interfacial segregation in FeCrCoNi-type high-entropy alloys (Invited)**

Tao Yang, City University of Hong Kong, China

**9:35-9:50 (D02-24)**

**Creep Behavior Characterization of Nickel-Based Single-Crystal Superalloy Thin-Walled Specimens (Oral)**

Yue Zhang, AECC Beijing Institute of Aeronautical Materials, China

**9:50-10:05 (D02-25)**

**Influence of Al<sub>3</sub>(Sc,Zr) Precipitates on Strain Hardening Behavior and Tensile Ductility of Al-Mg-Sc-Zr Alloy Processed by Laser Powder Bed Fusion (Oral)**

Yanchi Chen, Shanghai Jiao Tong University, China

**10:05-10:25 Coffee Break**

**10:25-11:35 Session VI**

**Host: Lihua Wang, Guo Liu**

**10:25-10:45 (D02-26)**

**Atomic-scale analysis of hydrogen embrittlement in high-strength Al alloys (Invited)**

Huan Zhao, Xi'an Jiaotong University, China

**10:45-11:05 (D02-27)**

**Nanotwin-induced nano-precipitation strengthening in CoCrNi alloy (Invited)**

Aiyong Chen, University of Shanghai for Science and Technology, China

Qiong Xu, Anhui Jianzhu University, China

**11:05-11:20 (D02-28)**

**Investigations on microstructure and mechanical properties of a heterostructured AZ91 alloy prepared by ECAP and single-pass high-reduction rolling (Oral)**

**11:20-11:35 (D02-29)**

**Exploring Local Lattice Distortion in Face-Centered Cubic High-Entropy Alloys (Oral)**

Dawei Zhou, Yantai University, China

**12:00-14:00 Lunch**

Afternoon, Oct 16 (Monday), 2023

**14:00-15:50 Session VII**

**Host: Chang Liu, Tao Yang**

**14:00-14:25 (D02-30)**

**Substantially enhanced homogeneous plastic flow in hierarchically nanodomained amorphous alloys (Keynote)**

Ge Wu, Xi'an Jiaotong University, China

**14:25-14:45 (D02-31)**

**Shear response of  $\Sigma 3$  twin boundary in FCC metals (Invited)**

Wenzhen Xia, Anhui University of Technology, China

**14:45-15:05 (D02-32)**

**The development of high-performance in-situ X-ray  $\mu$ -CT and its application in material science (Invited)**

Yi Ma, Nanjing Tech University, China

**15:05-15:20 (D02-33)**

**Large volume dispersion of reinforcing particles in metal composites via controlled track scan in laser powder-bed-fusion (Oral)**

Ge Wang, Shanghai Jiao Tong University, China

**15:20-15:35 (D02-34)**

**A well-performed amorphous-crystalline interface in metallic matrix composite (Oral)**

Yuyang Liu, Shanghai Jiao Tong University, China

**15:35-15:50 (D02-35)**

**Mechanical response of 3D printed titanium alloy honeycomb structures (Oral)**

Jing Xie, Beijing Institute of Technology, China

**15:50-16:10 Coffee break**

**16:10-17:05 Session VIII**

**Host: Huan Zhao**

**16:10-16:30 (D02-36)**

**In situ atomic-scale deformation mechanism of metallic materials (Invited)**

Lihua Wang, Beijing University of Technology, China

**16:30-16:50 (D02-37)**

**3D/4D additive-subtractive manufacturing of ceramics (Invited)**

Guo Liu, City University of Hong Kong, China

**16:50-17:05 (D02-38)**

**Programmable mechanical metamaterials through bio-inspired hierarchical structures based on a data-driven approach (Oral)**

Zhenyang Gao, Shanghai Jiao Tong University, China