Technical Program

The 4th International Metallurgical Processes Workshop for Young Scholars (IMPROWYS 2023)

October 13-15, 2023

Shenyang, China

Content

Organized by

The Chinese Society for Metals, China

Nonferrous Metals Society of China, China

Hosted by

Northeastern University, China

Royal Institute of Technology, Sweden

Sponsored by

Organization

Chairmen

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Overall Agenda

October 13th, 2023 (Friday)

Registration	14:00-18:00 1st Floor, International Hotel of Northeastern University

October 14th, 2023 (Saturday)

2nd Floor, Grand Banquet Hall

8:30-9:10 **Opening Ceremony**

Zoom: 81552234902 Password (Same for All Zooms): IMPROWYS

A (Room: 405)	B (Room: 406)	C (Room: 407)	D (Room: 408)
Zoom: 85841988205	Zoom: 88382222954	Zoom: 84435247878	Zoom: 87460768373
A1 09:30-12:25 **Additive Manufacturing & Solid State Phase Transformations (I)** Chairs: Shuo Yin, Pan Wang	B1 09:30-12:25 **Metal Forming and Joining & Solidification Process (I)** Chairs: Lei Shi, Yang Yang	C1 09:30-12:25 **Microstructure and Mechanical Performance (I)** Chairs: Lijia Zhao, Shuai Wang	D1 09:30-12:25 **Refining and Oxide Metallurgy & Sustainable Metallurgy (I)** Chairs: Ming Zhong, Yongqi Sun
A2 14:00-18:00 **Additive Manufacturing & Solid State Phase Transformations (II)** Chairs: Yuzeng Chen, Qinglong Zhao	B2 14:00-18:00 **New Energy Materials & Metal Forming and Joining & Solidification Process (II)** Chairs: Wei Xiao, Huayi Yin	C2 14:00-18:00 **Microstructure and Mechanical Performance (II)** Chairs: Junqiang Wang, Quan Jiao	D2 14:00-18:00 **Refining and Oxide Metallurgy & Sustainable Metallurgy (II)** Chairs: Somnath Basu, Hiroyuki Matsuura
Exhibition and Poster Session		2nd Floor, Lobby Area	
Tea Break		2nd Floor, Lobby Area	

October 15th, 2023 (Sunday)

A (Room: 405)	B (Room: 406)	C (Room: 407)	D (Room: 408)
Zoom: 85841988205	Zoom: 88382222954	Zoom: 84435247878	Zoom: 87460768373
A3 8:30-11:40 **Additive Manufacturing & Solid State Phase Transformations (III)** Chairs: Qingquan Lai, Jiayi Yan	B3 8:30-12:05 **Metal Forming and Joining & Solidification Process (III)** Chairs: Weizhong Han, Guohua Fan	C3 8:30-11:40 **Microstructure and Mechanical Performance (III)** Chairs: Ke Chen, Hao Wang	D3 8:30-12:05 **Refining and Oxide Metallurgy & Sustainable Metallurgy (III)** Chairs: Xiao Yang, Zhanjun Wang
Tea Break		4th Floor, Lobby Area	

October 14th, Saturday

Opening Ceremony
8:30-9:10 **Grand Banquet Hall**

8:30-8:35 **Opening Address**
Cong Wang, Professor, Northeastern University, China

8:35-8:40 **Welcoming Address**
Lixin Tang, Academician, Vice President, Northeastern University, China

8:40-8:45 **Welcoming Address**
Zhiling Tian, Executive Vice President, Chinese Society for Metals, China

8:45-8:50 **Congratulatory Speech**
Joakim Odqvist, Professor, Royal Institute of Technology, Sweden

8:50-8:55 **Congratulatory Speech**
Hongbiao Dong, Professor, FREng, University of Leicester, UK

8:55-9:10 **Group Photo**

October 14th, Saturday

Session A1: 9:30-12:25 Additive Manufacturing & Solid State Phase Transformations (I) (Room 405)

Chairs: Shuo Yin, Trinity College Dublin, Ireland
Pan Wang, Singapore Institute of Manufacturing Technology, Singapore

09:30-9:55 **Ultrastrong nanotwinned titanium alloys through additive manufacturing**
Aijun Huang*, Monash University, Australia

9:55-10:20 **CALPHAD-based ICME design for additive manufacturing of functionally graded alloys**
Wei Xiong*, University of Pittsburgh, USA

10:20-10:45 **Hot work tool steels for additive manufacture and additive manufacture of inserts containing conformal cooling channels for high pressure die casting**
Yuzeng Chen*, Northwestern Polytechnical University, China

10:45-11:10 **The formation of twinned dendrites in laser melted aluminum**
Qinglong Zhao*, Chunfeng Ma, Qichuan Jiang, Jilin University, China

11:10-11:35 **Mechanical behavior of 3D printed titanium lattice structures**
Laichang Zhang*, Edith Cowan University, Australia

11:35-12:00 **4D printing of green steel customized by machine learning**
Chaolin Tan*, Singapore Institute of Manufacturing Technology (SIMTech), Agency for Science, Technology and Research (A*STAR), Singapore

12:00-12:25 **Cost down and lean design of high-performance titanium via additive manufacturing**
Gang Chen*, Chang Liu, Wangwang Ding, Qiying Tao, Mingli Qin, Xuanhui Qu, University of Science and Technology Beijing, China

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October 14th, Saturday

Session B1: 9:30-12:25 Metal Forming and Joining & Solidification Process (I) (Room 406)

Chairs: Lei Shi, Shandong University, China
Yang Yang, East China Normal University, China

09:30-9:55 **Two key problems in friction stir welding (FSW): Thermomechanical responses and bonding window**
Yanfei Gao*, The University of Tennessee, Knoxville, USA

9:55-10:20 **Weldability of metals and failure mechanisms of weldments**
Zhenzhen Yu*, Colorado School of Mines, USA

10:20-10:45 **Corrosion resistant and high-strength dual-phase Mg-Li-Al-Zn alloy by friction stir processing**
Zhuoran Zeng*, Hunan University, China; Australian National University; Deakin University, Australia Tsinghua University, China
Mengran Zhou, Nick Birbilis, Australian National University; Deakin University, Australia

10:45-11:10 **A shrinkage-based criterion for evaluating resistance spot weldability of alloyed steels**
Haiwen Luo*, University of Science and Technology Beijing, China

11:10-11:35 **Metastable liquid properties and solidification at electrostatic levitation state**
Haipeng Wang*, Dingnan Liu, Hui Liao, Liang Hu, Bingbo Wei, Northwestern Polytechnical University, China

11:35-12:00 **Effect of liquid dynamics on crystal growth in NiAl and ZrTi melts**
Hailong Peng*, Central South University, China

12:00-12:25 **Superb metallurgical bonding formed in friction stir lap welding FeCoCrNiMn high entropy alloy to 6061 Al alloy**
Ke Chen*, Haining Yao, Min Wang, Xianping Dong, Aidang Shan, Xueming Hua, Shanghai Jiao Tong University, China

October 14th, Saturday

Session C1: 9:30-12:25 Microstructure and Mechanical Performance (I) (Room 407)

Chairs: Lijia Zhao, Northeastern University, China
Shuai Wang, Southern University of Science and Technology, China

09:30-9:55 **2D metal oxide nanostructures for electrochemical energy applications**
Ziqi Sun*, Queensland University of Technology, Australia

9:55-10:20 **A machine learning perspective on the inverse indentation problem: Learning elasto-plastic properties from pile-up**
Quan Jiao*, Harvard University, USA

10:20-10:45 **Neutron diffraction measurement and evaluation of gradient residual stress for induction hardened S38C axles**
Shengchuan Wu*, Tianyu Qin, Feifei Hu, Ni Ao, Southwest Jiaotong University, China
Pingguang Xu, Japan atomic energy agency, Japan

10:45-11:10 **Precisely modulating the energy state of metallic glasses and its influence on physical properties**
Junqiang Wang*, Ningbo Institute of Materials Technology and Engineering, CAS, China

11:10-11:35 **Micro-mechanics of multi-scale alloys under multi-physics**
Yilun Xu*, Agency for Science, Technology and Research (A*STAR), Singapore

11:35-12:00 **Towards reducing tension-compression yield and cyclic asymmetry in pure magnesium and magnesium-aluminum alloy with cerium addition**
Shubham Sisodia, Jananandhan S., Vamsi Krishna Pakki, Chethan Konkati, Ankur Chauhan*, Indian Institute of Science, Bengaluru, India

12:00-12:25 **Effects of Cr and V multiple precipitates on resistance to hydrogen embrittlement in high-strength steel**
Heng Dong, Rongjian Shi, Yiqun Li, University of Science and Technology Beijing, China
Xiaolu Pang*, University of Science and Technology Beijing; Institute for Materials Intelligent Technology, Liaoning Academy of Materials, China

October 14th, Saturday

Session D1: 9:30-12:25 Refining and Oxide Metallurgy & Sustainable Metallurgy (I) (Room 408)

Chairs: Ming Zhong, Northeastern University, China
Yongqi Sun, Central South University, China

09:30-9:55 **Modelling of reacting flows and industry applications: Hydrogen storage and utilization in ironmaking decarbonation**
Yansong Shen*, The University of New South Wales, Australia

9:55-10:20 **A new method for preparation of tungsten carbide powder by in-situ electrochemical reduction**
Xiaoli Xi*, Liwen Zhang, Beijing University of Technology, China

10:20-10:45 **Multi-scale characterization and first principle calculation of the atomic formation of $MgAl_2O_4$-MnS inclusions in steel**
Tao Li*, Wei Liu, Min Tan, Shaopeng Gu, Qian Meng, North China University of Science and Technology, China

10:45-11:10 **Elucidation of non-metallic inclusion evolution mechanism during solidification process**
Hiroyuki Matsuura*, The University of Tokyo, Japan

11:10-11:35 **ICME and machine learning-driven material design for advanced steels and alloys considering inclusion engineering**
Wangzhong Mu*, KTH Royal Institute of Technology, Sweden

11:35-12:00 **Development of CaO-MnO-SiO_2-Al_2O_3 flux as a CaF_2-free alternative for submerged arc welding of low carbon steel**
Sree Lakshmi Aditya Gowravaram, Somnath Basu*, Indian Institute of Technology Bombay, India

12:00-12:25 **Feasibility analysis of application of solid waste from lithium extraction in gel materials**
Shuai Zhang, Zhi Sun*, Yanling Zhang, Hongbin Cao, Yi Zhang, Institute of Process Engineering, Chinese Academy of Sciences, China

October 14th, Saturday

Session A2: 14:00-18:00 Additive Manufacturing & Solid State Phase Transformations (II) (Room 405)

Chairs: Yuzeng Chen, Northwestern Polytechnical University, China
Qinglong Zhao, Jilin University, China

14:00-14:25 **Preparation of high-strength bulk graphite based on nano-diamond phase transformation**
Shijia Gu*, Lianjun Wang, Wan Jiang, Donghua University, China

14:25-14:50 **Numerical modeling for oxide particles evolution in AISI316L during the additive manufacturing process**
Jung-Wook Cho*, Pohang University of Science and Technology, Korea

14:50-15:15 **Alloy design for co-optimization of additive manufacturability and creep resistance of Ni-based superalloy**
Yining He*, Alloyed Ltd, UK

15:15-15:40 **Carbides in an additively manufactured high-alloy steel**
Bo Chen*, Huayue Zhang, University of Leicester, UK

15:40-16:05 **Co-deposition mechanism of cold sprayed metal matrix composites: Numerical modeling and experiment**
Shuo Yin*, Trinity College Dublin, Ireland

16:05-16: 20 **Tea Break**

Chairs: Yuzeng Chen, Northwestern Polytechnical University, China
Qinglong Zhao, Jilin University, China

16:20-16:45 **Assessing and mitigating the distortion and stress during electron beam welding of a large steel shell-flange structure**
Yongle Sun*, Cranfield University, UK; Mike Smith, University of Manchester, UK, Thomas Dutilleul, Steve Jones, University of Sheffield, UK

16:45-17:10 **Additive manufacture and mechanics ultrahigh-strength ductile beta titanium alloys by electron beam powder bed fusion**
Pan Wang*, Singapore Institute of Manufacturing Technology, Singapore

17:10-17:35 **Evolution of nanostructure due to phase separation in stainless steels**
Xin Xu*, Ye Yuan, Sun Yat-sen University, China
Stephen King, Rutherford Appleton Laboratory, UK
Yubin Ke, China Spallation Neutron Source Science Center, China
Johan Westraadt, Nelson Mandela University, South Africa
Peter Hedstrom, KTH Royal Institute of Technology, Sweden

17:35-18:00 **Research status and development trend of intelligent metal additive manufacturing technology**
Fei Xing*, Nanjing Zhongke Raycham Laser Technology Co., Ltd, China

October 14th, Saturday

Session B2: 14:00-18:00 New Energy Materials & Metal Forming and Joining & Solidification Process (II) (Room 406)

Chairs: Wei Xiao, Wuhan University, China
Huayi Yin, Wuhan University, China

14:00-14:25 **Cation-doped $LiNi_{0.8}Co_{0.1}Mn_{0.1}O_2$ cathode with high rate performance**
Long Zhang, Xiaoming Zhang, Jiawei Wen, Guoyong Huang*, China University of Petroleum, China

14:25-14:50 **4D visualization technology and application of metallurgical electrochemistry**
Weili Song*, Beijing Institute of Technology, China

14:50-15:15 **Alkane oxidative dehydrogenation on carbon catalysts: Effect of heteroatom doping**
Wei Qi*, Institute of Metal Research, Chinese Academy of Sciences, China

15:15-15:40	**Recycling metal resource from used batteries** Yuxiang Hu*, Beijing University of Technology, China
15:40-16:05	**Low cost green hydrogen production technology for metallurgical industry** Li Li*, Northeastern University, China
16:05-16: 20	**Tea Break**
Chairs:	Wei Xiao, Wuhan University, China Huayi Yin, Wuhan University, China
16:20-16:45	**Modifying weld metal microstructure and inclusion distribution by electromagnetic fields** Imants Kaldre*, University of Latvia, Latvia Cong Wang, Northeastern University, China
16:45-17:10	**The mechanism of phase transformation of mold flux under electropulsing treatment** Lejun Zhou*, Xianzheng Si, Wanlin Wang, Xiaocan Zhong, Central South University, China
17:10-17:35	**The theoretical and atomistic simulation study of the solidification kinetic coefficient** Yang Yang*, East China Normal University, China
17:35-18:00	**Achieving high properties of medium-thick Ti/Al dissimilar joints by novel double-side friction stir Z shape butt-lap welding process** Lei Shi*, Yang Li, ChuanSong Wu, Shandong University, China

October 14th, Saturday

Session C2: 14:00-18:00 Microstructure and Mechanical Performance (II) (Room 407)

Chairs:	Junqiang Wang, Ningbo Institute of Materials Technology and Engineering, CAS, China Quan Jiao, Harvard University, USA
14:00-14:25	**Scale effect of surface asperities on stick-slip behavior of Zinc-coated steel** Lijia Zhao*, Hao Gao, Qiang Wang, Northeastern University, China
14:25-14:50	**Design and properties of graphene/Cu composites** Dingbang Xiong*, Shanghai Jiaotong University, China
14:50-15:15	**Structural and kinetic characteristic of twinning disconnections in hexagonal metals** Mingyu Gong*, Shanghai Jiao Tong University, China
15:15-15:40	**Machine learning-enabled tomographic imaging of chemical short-range atomic ordering** Yue Li*, Max Planck Institute for Iron Research, Germany
15:40-16:05	**The formation and strengthening mechanisms of lattice defects in ultrafine-grained CNT/2024Al composite** Jun Yan, Cunsheng Zhang*, Shandong University, China

16:05-16: 20	**Tea Break**
Chairs:	Junqiang Wang, Ningbo Institute of Materials Technology and Engineering, CAS, China Quan Jiao, Harvard University, USA
16:20-16:45	**Characterization of intermetallic and carbide nanoparticles in a novel dual precipitation strengthening martensitic steel** Alexander Dahlström*, Ze Sheng, Manon Bonvalet Rolland, Wangzhong Mu, Peter Hedström, KTH Royal Institute of Technology, Sweden
16:45-17:10	**Engineering the high-Mn TRIP steel via heavy ausforming** Qingquan Lai*, Nanjing Tech University, China
17:10-17:35	**On the orientation dependence of hydrogen-prompted dislocation structure evolution in Ni** Shuai Wang*, Southern University of Science and Technology, China
17:35-18:00	**Joining SiC_f/SiC composites to $Al_{0.3}CoCrFeNi$ high-entropy alloys with a Cu–Ti filler alloy: Interfacial reactions, high-entropy effects, and mechanical properties** Ce Wang*, Jia Yang, Panpan Lin, Tiesong Lin, Peng He, Harbin Institute of Technology, China

October 14th, Saturday

Session D2: 14:00-18:00	**Refining and Oxide Metallurgy & Sustainable Metallurgy (II) (Room 408)**
Chairs:	Somnath Basu, Indian Institute of Technology Bombay, India Hiroyuki Matsuura, The University of Tokyo, Japan
14:00-14:25	**Role of B_2O_3 in iron and steelmaking slags: A state-of-the-art review** Suguna Soumya Varanasi*, IIT-Hyderabad, India Venkata Rao M B, RINL-Visakhapatnam Steel Plant, India Ashok Kamaraj, Indian Institute of Technology Hyderabad, India
14:25-14:50	**Elemental migrations between spinel and liquid phases of vanadium-bearing slags** Yongqi Sun*, Central South University, China
14:50-15:15	**Limits on Ti element transfer in submerged arc welding: Thermochemical analysis** Theresa Coetsee*, Frederik De Bruin, University of Pretoria, South Africa
15:15-15:40	**Improving the cleanliness of a carbon steel by the optimization of refining slag and calcium treatment** Wen Yang*, University of Science and Technology Beijing, China Lifeng Zhang, North China University of Technology, China Sijun Li, Laiwu Company, Shangang Co., Ltd, China
15:40-16:05	**Modeling of the BOF tapping and LF refining process of steel** Dali You*, Primetals Technologies Austria, Austria Christian Bernhard, Montanuniversitaet Leoben, Austria
16:05-16: 20	**Tea Break**
Chairs:	Somnath Basu, Indian Institute of Technology Bombay, India Hiroyuki Matsuura, The University of Tokyo, Japan

16:20-16:45 **Effect of top blowing mixed Co_2-O_2 gas on metallurgical characteristics in converter**
Chenxi Ji*, Wenliang Dong, Haibo Li, Bin Chen, Research Institute of Technology, Shougang Group Co. Ltd, China

16:45-17:10 **Green ironmaking using ammonia**
Yan Ma*, Dierk Raabe, Max Planck Institute for Iron Research, Germany

17:10-17:35 **Life cycle analysis of waste PCB recycling through secondary Cu smelting process**
Dhvani Bankim Purohit, IIT Hyderabad, India
Ashok Kamaraj*, Indian Institute of Technology Hyderabad, India

17:35-18:00 **Influence of caustic compound (NaOH) on green and fired pellet properties**
Shaik Mahaboob Basha*, Srinivas Dwarapudi, Ramesh Munukutla, Vandana Gaddamidi, Rupesh Kumar Sinha, Indrajit Paul, Tata Steel Ltd., India

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October 15th, Sunday

Session A3: 8:30-11:40 **Additive Manufacturing & Solid State Phase Transformations (III) (Room 405)**

Chair: Qingquan Lai, Nanjing Tech University, China

8:30-8:55 **Phase transformation and novel functional properties in chemically complex shape memory alloys**
Daoyong Cong*, University of Science and Technology Beijing, China

8:55-9:20 **Development of 3-D printed Mg-based interpenetrating-phase composites with bioinspired architectures**
Zengqian Liu*, Zhefeng Zhang, Institute of Metal Research, Chinese Academy of Sciences, China

9:20-9:45 **Modeling of the kinetics of austenite decomposition in steels and its software implementation**
Jiayi Yan*, Tsinghua University, China
John Ågren, Johan Jeppsson, Thermo-Calc Software AB, Solna, Sweden

9:45-10:10 **Multi-scale numerical simulation of superalloy-based additive manufacturing**
Miao Liu, Zhongqiu Liu*, Baokuan Li, Northeastern University, China

10:10-10: 25 **Tea Break**

Chair: Jiayi Yan, Tsinghua University, China

10:25-10:50 **A comparative study of austenite reversion behavior from martensitic and bainitic initial structures**
Xianguang Zhang*, University of Science and Technology Beijing, China

10:50-11:15 **Formation and strengthening of triple-twinned alpha variants in additive manufactured titanium alloy**
Hao Wang*, University of Shanghai for Science and Technology, China
Zhichao Meng, Institute of Metal Research, Chinese Academy of Sciences, China

	Yuman Zhu, Aijun Huang, Monash University, Australia Rui Yang, Institute of Metal Research, Chinese Academy of Sciences; Shanghai Tech University, China
11:15-11:40	**Cold sprayed Ti6Al4V-CoCr composite coatings: Microstructure, mechanical and tribological properties** Adrian Tan*, University of Southampton (Malaysia Campus), Malaysia

October 15th, Sunday

Session B3: 8:30-12:05 New Energy Materials & Metal Forming and Joining (III) (Room 406)

Chair:	Weizhong Han, Xi'an Jiaotong University, China Guohua Fan, Nanjing Tech University, China
8:30-8:55	**Investigation of welding force in aluminum alloy friction stir welding** Lei Cui*, Tianjin University, China
8:55-9:20	**On the modelling of channel segregation: From benchmark to steel ingots** Jun Li*, Neng Ren, Mingxu Xia, Jianguo Li, Shanghai Jiao Tong University, China
9:20-9:45	**A novel strategy to fabricate thick ultra large-heat input butt weld joint by synergetic use of wire, arc and steel plate** Yu Zhang*, Na Wang, Fu Zhao, Nan Pan, Shasteel, China
9:45-10:10	**A special core-shell structured powders and their potential applications** Yafeng Yang*, Institute of Process Engineering, Chinese Academy of Sciences, China
10:10-10: 25	**Tea Break**
Chair:	Guohua Fan, Nanjing Tech University, China
10:25-10:50	**Is it possible to employ grain boundary engineering for welded metals?** Chao Han, Ming Zhong, Cong Wang, Northeastern University, China Ooraphan Chirayutthanasak, Sutatch Ratanaphan*, King Mongkut's University of Technology Thonburi, Thailand
10:50-11:15	**Microstructure and tribological properties of cold sprayed Ti-WC composite coating on Ti6Al4V titanium alloy** Yaxin Xu*, Jiejie Ge, Wenya Li, Northwestern Polytechnical University, China
11:15-11:40	**Mitigating CO_2 emission in the iron ore sintering process via dry particles embedding** Jian Xu*, Chengfeng Sun, Cong Leng, Rui Wang, Ruijing Feng, Yufei Huang, Chongqing University, China
11:40-12:05	**Preparation of carbon capture materials from steel slag** Qing Zhao*, Xiaohui Mei, Chengjun Liu, Maofa Jiang, Northeastern University, China

October 15th, Sunday

Session C3: 8:30-11:40 Microstructure and Mechanical Performance (III) (Room 407)

Chairs: Ke Chen, Shanghai Jiao Tong University, China

8:30-8:55 **Enhanced properties of brazed joint by using the in situ reaction of silver filler metal**
Weimin Long*, Zhengzhou Research Institute of Mechanical Engineering Co., Ltd., China

8:55-9:20 **Tailoring planar slip to achieve pure metal-like ductility in body-centred-cubic multi-principal element alloys**
Liang Wang*, Yunfei Xue, Benpeng Wang, Ke Jin, Beijing Institute of Technology, China

9:20-9:45 **In-situ visualization of morphological evolution of pores during spark plasma sintering of 7055 alloy by laboratory X-ray microscope**
Kesong Miao, Peng Chen, Rui Yao, Hao Wu, Nanjing Tech University, China
Guohua Fan*, Nanjing Tech University; Advanced Materials Research Institute, Yangtze Delta, China

9:45-10:10 **Achieving ultrahigh strength and ductility in nanostructured high-entropy alloys via dual precipitation**
Zengbao Jiao*, The Hong Kong Polytechnic University, China

10:10-10: 25 **Tea Break**

Chair: Hao Wang, University of Shanghai for Science and Technology, China

10:25-10:50 **Relative mobility of screw versus edge dislocations controls the ductile-to-brittle transition in metals**
Weizhong Han*, Xi'an Jiaotong University, China

10:50-11:15 **Applications of the Calphad approach in alloy design**
Songmao Liang*, CompuTherm LLC, China

11:15-11:40 **Origin of morphological variation of grain boundary precipitates in titanium alloys**
Rongpei Shi*, Harbin Institute of Technology, Shenzhen, China

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October 15th, Sunday

Session D3: 8:05-12:05 Refining and Oxide Metallurgy & Sustainable Metallurgy (III) (Room 408)

Chair: Xiao Yang, Westlake University, China

8:30-8:55 **Development of sustainable ironmaking technologies**
Shibo Kuang*, Aibing Yu, Monash University, Australia

8:55-9:20 **Tracking inclusion evolution for LCAK steel during secondary refining based on plant trial data**
Kezhuan Gu*, ArcelorMittal Dofasco, Canada

9:20-9:45	**In-situ observation of modification of alumina inclusions in steel by calcium treatment** Ying Ren*, Guojun Chen, University of Science and Technology Beijing, China Lifeng Zhang, North China University of Technology, China
9:45-10:10	**Zero-discharge vanadium extraction technique from vanadium slag** Hongyi Li*, Chongqing University, China
10:35-10: 50	**Tea Break**
Chair:	Zhanjun Wang, Northeastern University, China
10:10-10:35	**A model study on macroscopic transport, removal and collision–coalescence of non-metallic inclusions in a single-strand continuous casting tundish** Peiyuan Ni*, Northeastern University, China
10:50-11:15	**Metallurgical characteristics of reaction between QP steel and CaO-SiO_2-Al_2O_3-MgO slag** Hang Ding, Huixiang Yu*, University of Science and Technology Beijing, China Zhaoping Chen, Baoshan Iron & Steel Corporation Ltd., China Guosen Zhu, Beijing Shougang Steel Corporation Ltd., China
11:15-11:40	**Dynamic modelling of BOF steelmaking process using FactSage macro** Deepoo Kumar*, Vijay Kumar Chouhan, Nurni N Viswanathan, Indian Institute of Technology Bombay, India
11:40-12:05	**Electrometallurgy may reform the phosphorus chemical industry** Xiao Yang*, Westlake University, China

Poster Session
Time: October 14 2023
Room: 2nd Floor, Lobby Area

The effect of internal flow field variation on inclusion removal in elliptical ladle
Linbo Li, Chao Chen*, Xin Tao, Taiyuan University of Technology, China

Manufacturing a high-clean Fe-Cr-Ni-Mn-Co system alloy by slag treatment with ferroalloys feedstock
Shengchao Duan*, MinJoo Lee, Joohyun Park, Hanyang University, Korea
Jiyeon Kang, Hanyang University; Samsung Electro-Mechanics, Korea
Jinhyung Cho, Hanyang University; Research & Development Center, Hyundai Steel, Korea
Wangzhong Mu, KTH Royal Institute of Technology, Sweden

Interstitial-driven local chemical order enables ultrastrong face-centered cubic multicomponent alloys
Zhufeng He*, Lifang Sun, Nan Jia, Northeastern University, China

Thermodynamic assessment of utilizing captured CO_2 in blast furnace process and performance evaluation via modified RIST model
Venkatesan J*, Jayasankar K, Hareesh U S, Savithri S, CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) Trivandrum, India
Madan M, CSIR-National Metallurgical Laboratory (NML), Jamshedpur, India
Ashok Kamaraj, Indian Institute of Technology (IIT) Hyderabad, India

On the stability of vortex formation during the BOF tapping process
Sripushpa Kakara*, Syed Furqan Bukhari, Ashok Kamaraj, Indian Institute of Technology, Hyderabad
Usha Yenni, CSIR-National Metallurgical Laboratory, Jamshedpur, India

A novel approach for preparations of fused ZrC-SiC composites from Zircon via thermal plasma technique
Kumaresan L*, Christan Sam, Venkatesan J, Jayasankar K, CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram, India
SGK Manikandan, N Neethu, ISRO Propulsion Complex (IPRC), Tamil Nadu, India

Microstructure evolution of Fe-B-C-Cr-xGNS wt.% high-boron iron-based hardfacing alloy
Dashuang Liu*, Hefei University of Technology, China

Effect of SiO_2 on the structure of CaF_2-CaO-Al_2O_3 slag used in electroslag remelting
Midhun P.M.*, Somnath Basu, Indian Institute of Technology Bombay, India

Microstructural and mechanical properties of ZrO_2 reinforced muti-pass AZ91D alloy surface composite manufactured by friction stir processing
Surendra Kumar Patel*, Avinash Ravi Raja, Lei Shi, ChuanSong Wu, Shandong University, China

Analysis of intermetallic compounds of FSWed dissimilar Al/Steel by providing tool offset
Avinash Ravi Raja*, Shubham Verma, Shengli Li, Hao Su, Chuansong Wu, Shandong University, China

Stabilization of solid amine adsorbents by nano-Al_2O_3 crosslinking polyethyleneimine: Efficient CO_2 adsorption and superior anti-urea stability
Xuehua Shen*, Southern University of Science and Technology, China

Studies on microstructural characteristics, mechanical properties and corrosion behaviour of hybrid aluminium metal matrix composites
Vinothkumar Sivalingam*, Shandong University, China

Ultrasonic-assisted soldering W90 Tungsten heavy alloy to AZ31B Mg alloy using Sn-xAl alloy
Xiaoguo Song*, Wei Fu,Harbin Institute of Technology, Weihai, China

Particle wear mechanism transition due to increasing friction at heterogeneous interface
Xin Tang*, Aisheng Song, Kaili Feng, Tianbao Ma, Tianmin Shao, Jianbin Luo, Tsinghua University, China

Experimental investigation on friction stir welding of AA6082 under dry and MQL conditions
Shubham Verma*, ChuanSong Wu, Avinash Ravi Raja, Shengli Li, Shandong University, China.
Lalit Thakur, National Institute of Technology Kurukshetra, India

Prediction of flaw detection for continuous casting billet of pipeline steel based on the decision tree algorithm
Fuyue Wang*, Ren Yi, Tan Zhao, State Key Laboratory of Metal Material for Marine Equipment and Application, China

Laser powder bed fusion of Ti alloys with various Al contents
Zhe Song, Leyun Wang*, Xiaoqin Zeng, Shanghai Jiao Tong University, China
Xuan Zhang, Jun-Sang Park, Argonne National Laboratory, USA
Yanjun Li, Norwegian University of Science and Technology, Norway

The microstructure and mechanical properties of in-suit TiC reinforced Inconel 718 through addition of Ti2AlC by selective laser melting
Huihui Wang*, Yongchang Liu, Tianjin University, China

In-situ alloyed low density ultrahigh strength steels via additive manufacturing
Xiaopei Wang*, Chi Zhang, Zhigang Yang, Hao Chen, Tsinghua University, China

Crystallization behavior of the CaO-SiO_2-Al_2O_3-MgO system inclusions
Yong Wang*, Tohoku University, Japan; Wuhan University of Science and Technology, China
Sohei Sukenaga, Masanori Tashiro, Hiroyuki Shibata, Tohoku University, Japan
Hua Zhang, Hongwei Ni, Wuhan University of Science and Technology, China

Modulating Indium-based oxide nanoparticles recovered from ITO etching spent liquor enabling efficient electroreduction of CO_2 to HCOOH
Biao Hong; Wei Xiao*, Wuhan University, China

The influence of humidity on under-deposit corrosion of high strength medium Manganese steel
Xingshui Luo, Heng Liu, Menghao Liu, Qizhe Ye, Lijie Oiao, Yu Yan*, University of Science and Technology Beijing, China

Liquid metal electrochemistry
Huayi Yin*, Wuhan University, China

One-step preparation and solidification defect control of oxide eutectic ceramics by laser additive manufacturing based on melt growth
Minghui Yu*, Haijun Su, Northwestern Polytechnical University, China

Feasibility analysis of application of solid waste from lithium extraction in construction/road repair/filling materials
Shuai Zhang*, Zhi Sun, Hongbin Cao, Yi Zhang, Institute of Process Engineering, Chinese Academy of Sciences, China
Yanling Zhang, University of science and technology Beijing, China

Presenters' Resume

Somnath Basu *Professor* *Indian Institute of Technology, Indian*

B.E. (Metallurgy) from Jadavpur University (1998)
M.Tech. (Process Metallurgy) from IIT Bombay (2001)
PhD from KTH Royal Institute of Technology (2007)
Worked in Tata Motors (1998-1999) followed by Tata Steel (2001-2011); responsible for various functions related to steel making and continuous casting. Joined Metallurgical Engg. and Materials Science department at IIT Bombay in 2011. Currently a Professor, specializing in the area of process metallurgy. 40+ refereed papers in international journals and 30+ presentations in international conferences.

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Research Interests Metal refining, Thermodynamics, Slag-metal interactions, Continuous casting

Presentation Title *Development of CaO-MnO-SiO_2-Al_2O_3 flux as a CaF_2-free alternative for submerged arc welding of low carbon steel*

Ankur Chauhan *Assistant Professor* *Indian Institute of Science, Indian*

Dr. Ankur Chauhan is an Assistant Professor in the Department of Materials Engineering, Indian Institute of Science, Bengaluru, India. He obtained PhD from Karlsruhe Institute of Technology (KIT), Germany and Post-doc fellow at Johns Hopkins University, USA. Over the last nine years of his research and academic career (with 45 scientific publications published in reputed journals, including Acta Materialia, Scripta Materialia, Materials Research Letters etc.), he has contributed immensely to the development of novel materials for strategic sectors such as energy and space. Currently, he heads the Extreme Environment Materials Group (EEMG) at IISc. The research by his group involves designing novel materials and investigating their mechanical response under extreme conditions, such as high temperature, irradiation, and shock.

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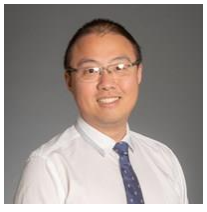
Research Interests Mechanical behavior of material, High-temperature materials, Irradiation effects on materials, Microstructure characterization

Presentation Title *Towards reducing tension-compression yield and cyclic asymmetry in pure magnesium and magnesium-aluminum alloy with cerium addition*

Bo Chen *Professor* *University of Leicester, UK*



Bo obtained a BSc degree from Beihang University between 2003 and 2007, specialising in Materials Engineering. He then carried out his PhD in Department of Engineering at University of Bristol, between 2007 and 2011, followed by two Post-doctoral Research Associate posts in Bristol's High Temperature Centre and Manchester's Materials Performance Centre. In 2015, Bo moved to a Lectureship at Coventry University, being promoted to Senior Lecturer in 2017. Bo became a Professor of Engineering Materials at University of Leicester in 2019. His research interests include advanced manufacturing, microstructural characterisation as well as creep and fatigue related lifetime prediction. He acts as the Head of the Mechanics of Materials (MoM) Group at the School of Engineering. He has published 50+ journal papers and has been the PI on EPSRC grants with cumulative value of over £4M.

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Research Interests Creep, fatigue, additive manufacturing, physical metallurgy

Presentation Title *Towards reducing tension-compression yield and cyclic asymmetry in pure magnesium and magnesium-aluminum alloy with cerium addition*

Gang Chen ***Professor*** *University of Science and Technology Beijing, China*

Prof. Gang Chen was graduated from The University of Auckland in New Zealand in 2014. Prof. Chen starts to work at University of Science and Technology Beijing in P.R. China since 2018. His research mainly focuses on the powder metallurgy including powder production, metal injection molding, and additive manufacturing. He has published over 60 academic journal papers including Acta Mater., Scripta Mater., Corros. Sci., Metall. Mater. Trans. A/B、J. Mater. Sci. Technol., Addit. Manuf., etc, and has been authorized 15 Chinese patents and 1 US patent. Prof. Chen also serves as the Editors of academic journals of "Advanced Powder Materials", as well as Key Reader of Metall. Mater. Trans. A/B.

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Research Interests Powder metallurgy

Presentation Title *Cost down and lean design of high-performance titanium via additive manufacturing*

Ke Chen ***Professor*** *Shanghai Jiao Tong University, China*

Ke Chen received his Ph.D. degree in Materials Science and Engineering from The Ohio State University in 2009. Since January 2010, he has been with Shanghai Jiao Tong University, where he is currently Professor of the School of Materials Science and Engineering (SMSE). From October 2019, he has been serving as Deputy Director of International Affairs Division, Shanghai Jiao Tong University. Prof. Ke Chen's current research interests related to two aspects. One is solid state joining of dissimilar metals and associated interfacial phase transformations; The other is the interfacial bonding mechanism between metal and polymer. For the purpose of improving both mechanical and functional properties of dissimilar joints, novel joining methods have been developed for the applications in emerging frontiers. He has published >60 journal/proceeding articles, filed 15 patent applications (11 granted), and delivered 20 Keynote/Invited academic conference presentations.

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Research Interests Welding and joining of dissimilar materials, Friction stir welding and processing; Phase transformations

Presentation Title *Superb metallurgical bonding formed in friction stir lap welding FeCoCrNiMn high entropy alloy to 6061 Al alloy*

Yuzeng Chen ***Professor*** *Northwestern Polytechnical University, China*

Yuzeng Chen serves as a full professor at Northwestern Polytechnical University. He received his doctoral degree in 2008 at the Northwestern Polytechnical University. In 2009, he worked as a postdoctoral research fellow at Georg-August-Universtät Göttingen. He joined the Nothwestern Polytechnical University as an associate professor in 2011. He published more than 90 articles in peer reviewed journals and delivered more than 30 invited presentations in academic conferences.

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Research Interests Advanced solidification technologies, Tool steels for additive manufacturing

Presentation Title *Hot work tool steels for additive manufacture and additive manufacture of inserts containing conformal cooling channels for high pressure die casting*

Jung-Wook Cho *Professor* *Pohang University of Science and Technology, Korea*

Controlling Solidification Process Lab., DANE (Division of Advanced Nuclear Engineering) / GIFT (Graduate Institute of Ferrous Technology)

EDUCATIONAL BACKGROUND

B.S., Metallurgical Engineering, Seoul National University, March 1989
M.S., Metallurgical Engineering, POSTECH, March 1991
Ph.D., Metallurgical Engineering, Tohoku University, October 1998

PROFESSIONAL EXPERIENCES

Nov. 1998 - Nov. 2012: Principal Researcher, Steelmaking Research Group, POSCO, Korea
Dec. 2012 – present: Professor, Controlling Solidification Process Lab., POSTECH, Korea
International Journals (SCI): more than 80 papers. Registered Domestic Patents: 25 domestic and 3 international patents

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Research Interests: Modeling and experimental analysis of mold heat transfer and lubrication, Controlling oxidation during metal additive manufacturing, Casting of advanced metallic alloys

Presentation Title: *Numerical modeling for oxide particles evolution in AISI316L during the additive manufacturing process*

Theresa Coetsee *Associate Professor* *University of Pretoria, South Africa*

Coetsee has 25 years of working experience in the metallurgy industry with mining and metals companies ISCOR, Kumba Resources and Exxaro Resources. At Exxaro Resources she worked as a principal process specialist on the process development of the AlloyStream furnace project for ferromanganese smelting. Since 2016 she is a full-time lecturer at the University of Pretoria in the Department of Materials Science and Metallurgical Engineering. Theresa served as PI for South Africa of the BRICS project on fluxes assisted inclusion engineering (2019-2021). Current research: Submerged Arc Welding (SAW) process development in the form of aluminium-assisted element transfer via unconstrained metal powders. Application of thermochemistry in Pyrometallurgical processes using FactSage in SAW process simulation and for manganese ore smelting investigations. Process mineralogy application in the phase chemistry studies of manganese slags and SAW fluxes.

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Research Interests: Pyrometallurgy: thermochemistry application, SAW process, phase chemistry of slags and fluxes, process mineralogy, manganese ore smelting

Presentation Title: *Limits on Ti element transfer in submerged arc welding: Thermochemical analysis*

Daoyong Cong *Professor* *University of Science and Technology Beijing, China*

Prof. Cong got dual PhD degrees from Université Paul Verlaine–Metz (France) and Northeastern University (China) in 2009, and then worked as a Humboldt Research Fellow at Leibniz Institute for Solid State and Materials Research Dresden (IFW Dresden), Germany. He joined USTB in 2013. He is the recipient of The National Science Fund for Distinguished Young Scholars. His main research interests are thermoelastic martensitic transformation and shape memory alloys. He has published about 100 SCI papers, most of which were published in prestigious journals such as Nature Materials, Physical Review Letters and Acta Materialia. He is a member of Board of Review (Key Reader) of Metallurgical and Materials Transactions A.

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Research Interests: Phase transformation and mechanical behaviors, Shape memory alloys, Solid-state caloric materials

Presentation Title: *Phase transformation and novel functional properties in chemically complex shape memory alloys*

Lei Cui ***Associate Professor*** *Tianjin University, China*

Lei Cui received his Ph.D. degree from Tianjin University in 2014. He is now working at the School of Materials Science and Engineering, Tianjin University as an associate professor. His current research interest includes 1) advanced friction welding technology and equipment, 2) ocean engineering welding key technology, 3) welding structure performance and reliability.

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Research Interests Advanced friction welding technology and equipment, Ocean engineering welding key technology, Welding structure performance and reliability

Presentation Title *Investigation of welding force in aluminum alloy friction stir welding*

Alexander Dahlström ***Doctor*** *KTH - Royal Institute of Technology, Sweden*

Dr. Alexander Dahlström is currently the senior resercher at KTH Royal Institute of Technology, Department of Materials Science and Engineering. Also, he is the expert and group leader of Atom Probe Tomography characterization. He obtained his Master Degree from KTH, and PhD from University of Rouen Normandy (France). After that he started to work in KTH till now. He has been served as deputy director of Excellent center Hero-M2i, and co-coordinator for the center of Mechanics and Materials Design (MMD). His research interest focus on alloy design, nanostructure characterization, microstructure and property correlation of steels, etc. He has served PI and co-PI for a few Swedish and international level projects from EU EIT RawMaterial, VINNOVA, Swedish Iron & Steel Research Association, etc..

Email adahlstr@kth.se

Research Interests Advanced friction welding technology and equipment, Ocean engineering welding key technology, Welding structure performance and reliability

Presentation Title *Characterization of intermetallic and carbide nanoparticles in a novel dual precipitation strengthening martensitic steel*

Guohua Fan ***Professor*** *Nanjing Tech University, China*

Prof. Guohua Fan is currently a full professor in the Key Laboratory for Light-weight Materials at Nanjing Tech University. He received his Ph.D. in Materials Science from Harbin Institute of Technology in 2009 and worked as a visiting scholar in Institute of Physical Metallurgy and Metal Physics at RWTH Aachen University and RisΦ National Laboratory in Denmark. His research interests include (1) developing novel heterogeneous materials with strength-ductility synergy, (2) understanding the material behavior from the perspective of local stress/strain evolution, and (3) exploiting a multi-field coupled set-up for in situ characterization and evaluation of engineering components under service conditions. He has published more than 80 SCI journal papers including papers in Progress in Materials Science, Acta Materialia, International Journal of Plasticity, and Metallurgical and Materials Transactions A.

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Research Interests High-performance light-weight materials, Advanced characterization technology, Multifunctional X-ray microscope

Presentation Title *In-situ visualization of morphological evolution of pores during spark plasma sintering of 7055 alloy by laboratory X-ray microscope*

Yanfei Gao *Professor* *The University of Tennessee, USA*

Prof. Yanfei Gao got his BS and PhD from Tsinghua University in 1999 and Princeton University in 2003, respectively. After a post-doc position at Brown University in 2003-2005, he started his own research group at University of Tennessee, focusing on mechanics of materials, deformation and failure mechanisms in metallic glasses, superalloys, high entropy alloys, and others. See: https://gao.utk.edu for more details.

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Research Interests Analytical and computational mechanics of materials, Small scale mechanical behavior, Failure of advanced structural materials, Thin film heterostructures, Contact and friction

Presentation Title *Two key problems in friction stir welding (FSW): thermomechanical responses and bonding window*

Mingyu Gong *Assistant Professor* *Shanghai Jiao Tong University, China*

Dr. Mingyu Gong is an assistant professor in School of Materials Science and Engineering, Shanghai Jiao Tong University, and was selected in the National Outstanding Youth Program (Overseas). He obtained the B.S. degree from Shanghai Jiao Tong University in 2015, majored in Materials Science and Engineering. In 2019, he received the Ph.D. degree from University of Nebraska-Lincoln in U.S., majored in Mechanical and Materials Engineering. Then, he worked as a Post-doctoral associate in University of Nebraska-Lincoln until joining Shanghai Jiao Tong University. His research focuses on the deformation behaviors of crystalline materials under extreme conditions. Mingyu has published more than 40 SCI papers, including 15 first- or corresponding-authored papers on PNAS, Acta Materialia, International Journal of Plasticity, etc.

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Research Interests Interface engineering of structural-functional metal matrix composites

Presentation Title *Structural and kinetic characteristic of twinning disconnections in hexagonal metals*

Shijia Gu *Associate Professor* *Donghua University, China*

Shijia Gu is an associate professor in Institute of Functional Materials at Donghua University. He received his PhD in 2016 at Donghua University. He is a Young editorial board of Journal of Ceramics. His active research covers the functionalization of ceramics and glass and low temperature sintering technology of ceramics. He published over 50 papers in the journals including Journal of Advanced Ceramics, Journal of the American Ceramic Society, Journal of the European Ceramic Society, Ceramics International and so on. He owns more than 10 invention patents.

Email gusj@dhu.edu.cn

Research Interests Functional ceramics, Carbon

Presentation Title *Preparation of high-strength bulk graphite based on nano-diamond phase transformation*

Weizhong Han ***Professor*** *Xi'an Jiaotong University, China*

Weizhong Han, Professor of Xi'an Jiaotong University. Mainly engaged in research on high-performance metallic materials, focusing on the irradiation effects and mechanical behavior of metals. He had published papers in journals such as Science Advances, Nature Communications, PNAS, PRL, Acta Materials, etc. He was selected into the Outstanding Youth Project of the National Natural Science Foundation of China, the National Overseas High level Youth Talent Plan and the Shaanxi Provincial Hundred Talents Plan, and won the Lin Mengliang Award for Teaching and Education.

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Research Interests Radiation effect in metals and alloys, Design of novel radiation tolerant materials, Mechanical behavior of metals in gaseous environment, Interface metallic materials, Dynamic loading of materials, Fatigue and fracture of materials

Presentation Title *Relative mobility of screw versus edge dislocations controls the ductile-to-brittle transition in metals*

Yining He ***Engineer*** *Alloyed Ltd, UK*

Yining He is an alloy development engineer from Alloyed Ltd, UK, mainly working on project management and technology development for Ni-superalloy, high entropy alloy, titanium and steel. Before joining Alloyed, Yining received her PhD degree in materials science from Carnegie Mellon University, working on computational alloy design for additive manufacturing alloy development.

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Research Interests Additive manufacturing, Ni-superalloy, green steel

Presentation Title *Alloy design for co-optimization of additive manufacturability and creep resistance of Ni-based superalloy*

Yuxiang Hu ***Professor*** *Beijing University of Technology, China*

Yuxiang Hu is currently Professor in Faculty of Materials and Manufacturing, Beijing University of Technology, China. He is also Deputy Director of Beijing International Science and Technology Cooperation Base of Carbon-based Nanomaterials, and Director of High safety battery innovation and entrepreneurship Center at BJUT. Previously, he worked as subgroup leader at Dow Center, and Postdoctoral Research Fellow in School of Chemical Engineering, the University of Queensland (UQ). In 2012, he received BSc degree in School of Chemistry & Chemical Engineering from Nanjing University, and then obtained the master's degree under the supervision of Prof. Jun Chen at Nankai University. He obtained Ph.D. degree at UQ under the supervision of Prof. Lianzhou Wang.

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Research Interests High-safety energy storage, Photocatalytic hydrogen production

Presentation Title *Recycling metal resource from used batteries*

Aijun Huang ***Professor*** *Monash University, Australia*

Professor Aijun Huang holds a PhD from the University of Birmingham, UK. He is a Fellow, Chartered Engineer and Chartered Scientist of the Institute of Materials, Minerals and Mining UK. He is currently the Director of Monash Centre for Additive Manufacturing and a full professor in the Department of Materials Science and Engineering and Department of Mechanical and Aerospace Engineering, Monash University Prior to his appointment at Monash University, Prof. Huang was an industry technical expert for a number of multinational corporations. Prof Huang held the position of the Executive Vice President of the High-Performance Materials Business Unit which exclusively manufacturing all aerospace metallic materials in Baosteel Group; a Fortune Global 500 company. From 2006 to 2012, Prof Huang was the Titanium Specialist of Rolls Royce Derby globally leading the titanium and titanium aluminides fundamental research within the company where he was elected to the Rolls Royce Engineering Leadership List in 2011

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Research Interests Metals and Alloys/Additive Manufacturing

Presentation Title *Ultrastrong nanotwinned titanium alloys through additive manufacturing*

Guoyong Huang ***Professor*** *China University of Petroleum, China*

Prof. Guoyong Huang graduated from Tsinghua University with a graduate degree and holds a Doctor of Engineering degree. From September 2015 to October 2018, he held the positions of Associate Researcher and Associate Professor at Central South University. Since November 2018, he has been serving as an Associate Professor and Professor at China University of Petroleum (Beijing), as well as the Deputy Dean of the School of New Energy and Materials. Huang Guoyong has led more than 10 research projects at the national, provincial, and enterprise levels. He has published over 50 academic papers and has been granted more than 10 Chinese invention patents. His contributions to research have earned him three first-class awards at the provincial and ministerial levels.

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Research Interests Energy storage technology, New energy materials

Presentation Title *Cation-doped $LiNi_{0.8}Co_{0.1}Mn_{0.1}O_2$ cathode with high rate performance*

Chenxi Ji ***Principal Researcher*** *Shougang Research Institute of Technology, China*

Dr. Chenxi JI, Professor level senior engineer, Principal Researcher of Shougang Research Institute of Technology, Member of the Continuous Casting Branch and Physicochemical Branch of the Chinese Society of Metals, engaged in research on low-carbon steelmaking technology and slab high-speed continuous casting technology. He has won 3 Metallurgical Science and Technology Awards, 1 Hebei Science and Technology Progress Award, and more than 20 Shougang Science and Technology Awards.

Email 13811410163@163.com

Research Interests Low-carbon steelmaking technology and slab high-speed continuous casting technology

Presentation Title *Effect of top blowing mixed CO_2-O_2 gas on metallurgical characteristics in converter*

Quan Jiao ***Postdoctoral Researcher*** *Harvard University, USA*

Quan Jiao is currently a postdoctoral researcher at the School of Engineering and Applied Sciences at Harvard University. His research focuses on developing novel in-situ mechanical testing methods and computational techniques to characterize and understand the mechanical behavior of alloys and electronic material systems.

Email qjiao@seas.harvard.edu

Research Interests Mechanical Properties, Mechanical Behavior of Materials, High Temperature Materials

Presentation Title *A machine learning perspective on the inverse indentation problem: Learning elasto-plastic properties from pile-up*

Zengbao Jiao ***Associate Professor*** *Hong Kong Polytechnic University, China*

Dr. Jiao is an associate professor in the Department of Mechanical Engineering at The Hong Kong Polytechnic University. He received his PhD from City University of Hong Kong in 2014 and worked as a postdoc at CityU in 2014–2015 and at MIT in 2016. His research interests focus on the development of advanced structural materials, including advanced ultrahigh-strength steels, high-entropy alloys, high-temperature superalloys & intermetallics, and nanostructured alloys. He has published 1 book, 4 book chapters, and >100 journal papers, including 3 papers in Nature Communications, 1 in Materials Today, and 18 in Acta Materialia. He serves as an Associate Editor for Materialia (Acta Materialia Inc.) and Advisory Board Member of MetalMat (Wiley). He also serves as a reviewer for Nature Materials, Nature Communications, Acta Materialia, etc.

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Research Interests *Advanced structural materials*

Presentation Title *Achieving ultrahigh strength and ductility in nanostructured high-entropy alloys via dual precipitation*

Imants Kaldre ***Senior Researcher*** *University of Latvia, Latvia*

Imants Kaldre research focus on magnetohydrodynamics, solidification of metallic alloys, metal matrix nano-composite production, electromagnetic processing of materials and applied physics related to process metallurgy. He finished his PhD from Grenoble University in France in 2014. Dissertation: Thermoelectric current and magnetic field interaction influence on the structure of binary metallic alloys. Recently work in projects related to electromagnetic production of particle strengthened Metal Matrix Composites. He work on the innovative production of Titanium from Ti-tetrachloride by electroslag process. Work is mainly related to technology application in industry, thus I have experience in contract research work realization. Imants Kaldre is deputy director of the Institute of Physics University of Latvia since 2017 and member of the scientific board of Institute of Physics University of Latvia since 2015. In 2021 he is elected in the senate of the University of Latvia. Member of the Latvian young scientists society.

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Research Interests Magnetohydrodynamics, Metal matrix composites

Presentation Title *Modifying weld metal microstructure and inclusion distribution by electromagnetic fields*

Ashok Kamaraj *Assistant Professor* *IIT Hyderabad, India*

Dr. Ashok Kamaraj is an Assistant Professor in the Dept. of Materials Science and Metallurgical Engineering at the Indian Institute of Technology Hyderabad. Before joining IITH, he was a Senior Scientist in the Ferrous Processing Group of Metal Extraction and Recycling (MER) Division at CSIR-National Metallurgical Laboratory (NML), Jamshedpur. He obtained a B.E., in Metallurgical Engineering from the Government College of Engineering, Salem, in March 2011. From Sep 2012 - Aug 2015, he held the Trainee Scientist fellowship while pursuing M.Tech., in Materials and Metallurgical Engineering. He continued his Doctoral Research in Process Metallurgy (Steelmaking) at CSIR-NML and obtained a doctoral degree from AcSIR in Feb 2020. The overarching theme of his research work is the physical simulation of steelmaking practices, the development of alloy steels, metal recycling, and the life cycle analysis of metallurgical processes. To his credit, he has published 27 research articles in a peer-reviewed journal and 12 publications in international conference proceedings.

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Research Interests: Process metallurgy: metal extraction, refining, recycling, casting & process modeling, Life cycle and sustainability assessment

Presentation Title: *Life cycle analysis of waste PCB recycling through secondary Cu smelting process*

Shibo Kuang *Doctor* *Monash University, Australia*

Dr Shibo Kuang is currently a senior research fellow in ARC Research Hub for Smart Design and Control at Monash University. His research interests centre around computational process engineering. It aims to achieve fundamental elucidation, theory and method establishment, new technology exploration, and process optimization for multiphase transportation and processes. Both mechanistic models and data-driven AI models are thus developed and applied. The research topics mainly cover particle transportation, particle separation, and multi-phase reacting flows. In this direction, he has published over 140 papers (>120 collected by ISI Web of Science). He has been invited to deliver over 30 invited lectures (including 15 keynote and plenary lectures) at international avenues.

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Research Interests: Non-Newtonian suspension flow, Particle transportation, Particle separation, Multi-phase reacting flows, Modelling and simulation, Flow characterisation, Process optimisation

Presentation Title: *Development of sustainable ironmaking technologies*

Deepoo Kumar *Assistant Professor* *Indian Institute of Technology Bombay, Indian*

Academic Qualifications: MS & Ph.D. (2018) in Materials Science and Engineering from Carnegie Mellon University, Pittsburgh, PA, United States; BTech & MTech (2013) in Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay, Mumbai, India

Professional Experience: June 2018 – June 2019, Development Specialist, Metals R&D, Praxair Inc., Tonawanda, NY, United States; August 2013 – July 2014, Post Graduate Management Trainee L&T Special Steels and Heavy Forgings, Hazira, Surat, India

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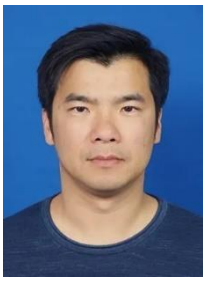
Research Interests: Steelmaking and casting, Refractory interaction with steel and slag, Additive Manufacturing, Metal recycling and recovery

Presentation Title: *Dynamic modelling of BOF steelmaking process using FactSage macro*

Qingquan Lai *Professor* *Nanjing Tech University, China*



Prof. Lai obtained the PhD degree from Universite de Grenoble-Alpes in France in 2014. Then he became a post-doc research fellow at UBC in Cananda. He worked in Herbert Gleiter Institute of Nanoscience from 2017-2022, and then joined Nanjing Tech Univeristy as a professor. He is also a joint researcher in Yangtze Delta Region Institute of Advanced Materials. Prof. Lai is dedicated to the fundamental research on the phase transformations and mechanical properties of steels, and has published more than 30 papers in the respected journals such as Nature Communications, Science Advances and Acta Materialia. He is deeply invovled in the R&D activities of the industry, and has closely collaborated with GM, Bao steel and ArcelorMittal on the topics of press-hardened steels, DP steels and thermomechanical processing.

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Research Interests Design and organization regulation of advanced steel materials, Fracture properties and toughening mechanism of ultra-high strength steels

Presentation Title *Engineering the high-Mn TRIP steel via heavy ausforming*

Hongyi Li *Professor* *Chongqing University, China*

Professor Hong-Yi Li received her Ph.D. degree in major of Chemistry from Peking University in 2010 and visited Université Pierre et Marie Curie, Paris, France from 2009-2010. She was sponsored by the National Science Fund for Excellent Young Scholars, Chongqing Science Fund for Distinguished Young Scholars and awarded the title of Chongqing Excellence-Top Young Talents. Her research interests focus on the value-added utilization of vanadium resource, including the sustainable vanadium extraction technologies and the development of vanadium-based energy storage materials. She has hosted 7 state-level projects including 5 NSFC projects and 4 provincial-level key projects. She has been authorized 16 Chinese invention patents, and has received 3 provincial-level science and technology progress awards. She is a member of the Metallurgical Physical Chemistry Sub-Committee of the Chinese Society of Metals, a member of the Vanadium Resource Clean Utilization Professional Committee of the Chinese Society of Non-ferrous Metals, a member of the Metallurgical Reaction Engineering professional committee of the Chinese Society of Non-ferrous Metals, and a member of the Materials Sub-committee of the Chinese Society of Mechanical Engineering. She is also an Editorial Board member of the SCI journal International Journal of Minerals, Metallurgy and Materials, a Youth Editorial Board member of the SCI journal Transactions of Nonferrous Metals Society of China

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Research Interests Vanadium-based energy storage materials and comprehensive utilization of vanadium resources

Presentation Title *Zero-discharge vanadium extraction technique from vanadium slag*

Jun Li *Associate Professor*, *Shanghai Jiao Tong University, China*

Dr. Jun Li received his Ph.D. from University of Leoben, Austria in 2013. He joined Shanghai Jiao Tong University in 2013 and is currently an associate professor at the School of Materials Science and Engineering at Shanghai Jiao Tong University. His main research directions are: 1) Numerical simulation of the solidification process; 2) Control of solidification (including quality control of traditional ingots and new functional materials). He has currently published more than 80 papers in well-known SCI journals such as Acta Materialia, Metall. Mater. Trans. A, J. Mater. Proc. Technol. et.

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Research Interests Numerical simulation of the solidification process, Control of solidification

Presentation Title *On the modelling of channel segregation: From benchmark to steel ingots*

Li Li ***Professor*** *Northeastern University, China*

Li Li is the Full Professor in the School of Metallurgy in Northeastern University, China. He is the Fellow of Royal Society of Chemistry (FRSC) and National Distinguished Young Scholars. He was awarded with the TMS Young Leader Development Award, RSC Emerging Investigator, the excellent Key Reader Award of MMTA and other more than 20 awards. As the corresponding author, he has published more than 100 papers in prestigious journals including Chem, Matter, PNAS, Energy & Environmental Science, MMTA, etc with a H index higher than 50. He serves as the director of review committee for MMTA and key reader/associate editor/editor/editorial board member for more than 10 prestigious journals including Metallurgical and Materials Transactions A, Metallurgical and Materials Transactions B, Nanoscale Horizons, ACS Sustainable Chemistry & Engineering、Materials Horizons, etc. His primary research is focused on the metallurgical physicochemistry, sustainable energy materials development and green hydrogen generation, etc.

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Research Interests Energy storage and battery electrochemistry, Physical chemistry of materials preparation and new materials for metallurgy

Presentation Title *Low cost green hydrogen production technology for metallurgical industry*

Tao Li ***Professor*** *North China University of Science and Technology, China*

Tao Li, born in May 1984, professor, Vice Dean of the College of Metallurgical Engineering at North China University of Science and Technology. He took the PhD degree at Tohoku University on 2013 and did a postdoc work at Norwegian University of Science and Technology during 2013-2015. In 2017, he came back to China and worked at Chongqing University and Technology for 3 years. In 2020, he started to work at North China University of Science and Technology where he took his bachelor degree. His research Interests includes, 1) Multiscale characterization of complex inclusions in steel, 2) First-Principle of the formation of complex inclusions, 3) Deep-learning driven Molecular dynamics of the molten slag with Raman spectrum characterization, 4) CFD simulation in the metallurgical process.

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Research interests Multi-scale characterization of complex inclusions in steel, First-principle of the formation of complex inclusions, Deep-learning driven molecular dynamics of the molten slag with Raman spectrum characterization

Presentation Title *Multi-scale characterization and first principle calculation of the atomic formation of $MgAl_2O_4$-MnS inclusions in steel*

Yue Li ***Doctor*** *Max Planck Institute for Iron Research, Germany*

Dr. Yue Li, Humboldt Fellow at the Max-Planck-Institut für Eisenforschung GmbH, Germany. He received PhD degree from University of Science and Technology Beijing at 2019. He mainly focuses on the atom probe tomography data analysis with the help of advanced machine learning algorithms. He has published 21 SCI papers including Progress in Materials Science, npj Computational Materials, Acta materialia, and Scripta Materialia, etc.

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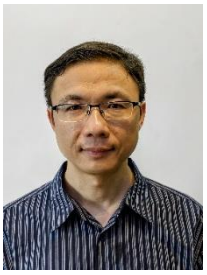
Research interests Atom Probe Tomography, Machine Learning, Aluminum Alloys, Steel, High-entropy Alloys

Presentation Title *Machine learning-enabled tomographic imaging of chemical short-range atomic ordering*

Songmao Liang ***Doctor*** *CompuTherm, China*



Songmao Liang, is currently a materials scientist at CompuTherm LLC. He received PhD degree at Institute Metal Research(IMR), Chinese Academy of Sciences in 2010, then worked as a research fellow in Clausthal University of Technology and assistant scientist in University of Wisconsin-Madison. He has published more than 40 peer reviewed scientific articles and serves as reviewer for more than 10 journals. His research interests mainly focus on Calphad modeling and Computational thermodynamics applications..

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Research interests Calphad Modeling and Applications

Presentation Title *Applications of the Calphad approach in alloy design*

Zengqian Liu ***Professor*** *Chinese Academy of Sciences, China*

Zengqian Liu is a Professor in the Institute of Metal Research, Chinese Academy of Sciences (IMR, CAS). He received his PhD degree from Beihang University in 2013. From 2013 to 2015, he worked with Prof. Zhefeng Zhang at IMR, CAS as a T. S. Ke postdoctoral research fellow. He joined IMR in 2015. From 2015 to 2017, he worked with Prof. Robert O. Ritchie at the University of California, Berkeley as a postdoctoral research associate. He works in the field of biological and bioinspired structures and materials with a special focus on their mechanical properties.

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Research interests Bioinspired Materials, Fracture Toughness, Toughening Mechanisms

Presentation Title *Development of 3-D printed Mg-based interpenetrating-phase composites with bioinspired architectures*

Zhongqiu Liu ***Professor*** *Northeastern University, China*

Prof. Liu conducts research in the Northeastern University, focusing on computational fluid dynamics (CFD) application in metallurgy. He is working on different projects concerning numerical modeling of metallurgical processes, such as continuous casting, electro-slag-remelting, additive manufacturing, etc. In addition, he is doing basic research on the CFD methods, such as large eddy simulation (LES), population balance approach (PBA), electromagnetic braking (EMBr), electromagnetic stirring (EMS) etc. Beside research activities he is giving courses for students on fundamentals of numerical modeling, application of simulation in steel production.

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Research interests Thermal physics of metal refining and solidification processes

Presentation Title *Numerical simulation on the effect of scan strategy in the directed energy deposition of GH3536 superalloy*

Weimin Long ***Research Fellow*** *Zhengzhou Research Institute of Mechanical Engineering Co., Ltd., China*

Weimin Long, research fellow, is honored the Distinguished Contribution Award of Science and Technology of Henan Province. He is chief scientist of China Academy of Machinery Science and Technology Group, and the chief engineer of Zhengzhou Research Institute of Mechanical Engineering Co., Ltd., also the director of State Key Laboratory of Advanced Brazing Filler Metals and Technology. He serves as vice director-general of China Association of Machinery Manufacturing Technology, and the director-general of China Welding Association Brazing Branch, also the chairman of the editorial committee of "Journal of Mechanical Strength". He was supported by the National Plan for the Special Support for Top-notch Talents, and obtained the National Award for Excellence in Innovation (2020) and the Outstanding Engineer Award of ISEFC (2020). He cultures 65 doctors and postdoctors.Weimin Long has long focused on researches of green welding, brazing of dissimilar materials, high performance brazing materials, high efficacy brazing technology and high reliability brazing system. He has undertaken national or provincial research projects more than 30, and transverse projects more than 100. He leads the innovation team to solve many welding problems of national mega-projects and brings more than 3 billion yuan according transformation of scientific and technological.

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Research interests: New brazing materials and their production technology, brazing process and equipment development and application

Presentation Title: *Enhanced properties of brazed joint by using the in situ reaction of silver filler metal*

Haiwen Luo ***Professor*** *University of Science and Technology Beijing, China*

Dr. Haiwen Luo is now a full professor in University of Science and Technology Beijing. He has been working in ferrous metallurgy for more than 20 years with the emphasis on understanding the relation of chemistries, processing routes, microstructures and the properties/performance of advanced steels. His recent effort is to develop new types of ultrahigh strength steels with good ductility/toughness, and touched some special steels including ultra-clean bearing steels for longer fatigue life and high strength electrical steels for the motor in electrical vehicles. He is among the earliest researchers developing medium Mn steels for outstanding mechanical properties and has published dozens of papers on this topic in highly ranked scientific journals.

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Research interests: The relation of chemistries, processing routes, microstructures and the properties/performance of advanced steels

Presentation Title: *A shrinkage-based criterion for evaluating resistance spot weldability of alloyed steels*

Yan Ma ***Doctor*** *Max Planck Institute for Iron Research, Germany*

Dr.-Ing. Yan Ma is group leader of Sustainable Synthesis of Materials at Max-Planck-Institut für Eisenforschung (MPIE). He received his doctoral (2020) and master's (2015) degrees in metallurgical engineering from RWTH Aachen University, and his bachelor's degree (2013) from the University of Science and Technology Beijing. His current research interests pertain to fundamental physical and chemical mechanisms in hydrogen-based metallurgical processes, the physical metallurgy of ferrous alloys and high-entropy alloys. Dr. Ma is a holder of the Walter Benjamin Position funded by the German Research Foundation (DFG) and he received the DGM Prize for Young Talent 2021 awarded by the German Materials Society (DGM).

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Research Interests: Green ironmaking

Presentation Title: *Green ironmaking using ammonia*

Shaik Mahaboob Basha *Principal Researcher* *Tata Steel Ltd, India*

Mr Shaik Mahaboob Basha, is principal researcher in agglomeration research group at Tata Steel Ltd. He has six years' experience in iron ore pellet and sinter area. He completed his Masters in Extractive Metallurgy from IIT BHU, Varanasi. He is presently pursuing PhD from IIT Hyderabad, India. The overarching theme of this research work in the advanced characterization of raw materials used for pellet making. He has expertise in fluxed pellets, hydrometallurgy, fuel reduction in agglomeration. To this credit he filed 5 patents and published 4 international papers in peer reviewed journals and 4 papers in international conferences.

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Research interests Fluxed pellets, Hydrometallurgy, Fuel reduction in agglomeration

Presentation Title *Influence of caustic compound (NaOH) on green and fired pellet properties*

Hiroyuki Matsuura *Associate Professor* *The University of Tokyo, Japan*

Awarded Ph.D. from the University of Tokyo in 2006. Working experience as Research Associate in the Center for Iron and Steelmaking Research, Carnegie Mellon University, USA, in 2006-2007. Working as Assistant Professor, Lecturer, and Associate Professor in the Department of Advanced Materials Science, Graduate School of Frontier Sciences, the University of Tokyo in 2007-2016, and currently Associate Professor in the Department of Materials Engineering, Graduate School of Engineering, the University of Tokyo since October 2016. Mainly working on pyrometallurgical processes, including ironmaking, steel refining, solidification, and thermomechanical treatment processes from thermochemical and kinetic viewpoints, such as equilibrium phase relationship, dephosphorization reaction, inclusion modification, solid steel heat treatment, and slag recycling. Also focusing on the development of a novel recycling process of zinc in EAF dust via selective chlorination, molten salt purification, and molten salt electrolysis.

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Research interests Pyrometallurgy, Steelmaking, Inclusion control, Recycling

Presentation Title *Influence of caustic compound (NaOH) on green and fired pellet properties*

Wangzhong Mu *Professor* *KTH Royal Institute of Technology, Sweden*

Dr. Wangzhong Mu is the formerly faculty member of KTH Royal Institute of technology and co-organizer of this year IMPROWYS conference. He got his PhD degree from KTH in 2015, and has continuously worked in McMaster University (Canada), Tohoku University (Japan), Ferritico AB (Sweden), and back to KTH since 2019. His research interest focuses on clean steel, intelligent metallurgy, material design and characterization, etc. He has published over 70 papers in the international peer-reviewed journals, and over 15 times as invited/keynote speakers in international conferences. He was PI of over 10 national and international level grants.

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Research interests Clean steel, Intelligent metallurgy, Material design and characterization

Presentation Title *ICME and machine learning-driven material design for advanced steels and alloys considering inclusion engineering*

Peiyuan Ni *Professor* *Northeastern University, China*

Peiyuan Ni, currently is a professor at Department of Metallurgical Engineering, Northeastern University, China. He obtained his Ph.D degree from KTH Royal Institute of Technology (Sweden) in 2015. Thereafter, he worked at KTH Royal Institute of Technology as a postdoctor and at Osaka University as a JSPS research fellow. His research interest includes High quality steel metallurgy, Numerical simulation on metallurgical process, High temperature metallurgical interface. In recent three years, he has hosted 6 research projects in metallurgy field. He has published over 50 academic papers. Also, he has been granted 6 patents, 2 international awards and 1 province award of science and technology progress.

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Research interests Metallurgy and Materials Manufacturing Simulation and machine learning, high quality steel and advanced manufacturing technology

Presentation Title *A model study on macroscopic transport, removal and collision–coalescence of non-metallic inclusions in a single-strand continuous casting tundish*

Xiaolu Pang *Professor* *University of Science and Technology Beijing, China*

Dr. Xiaolu Pang is a researcher specializing in materials surface damage and protection, the design and preparation of protective coatings, and the study of material surface and interface behavior, mechanism, and application completed a Ph.D. in Materials Science and Engineering from the University of Science and Technology Beijing between 2003 and 2008. With extensive academic and professional experience,he] has held various positions at the University of Science and Technology Beijing. They served as an Assistant Professor from 2008 to 2010, an Associate Professor from 2010 to 2017, and currently hold the position of Professor since July 2017.He has received several honors and awards for their outstanding contributions to their field of research. This includes the Outstanding Youth Science Foundation in 2019, the Beijing Nova Program in 2016, and the Fok Ying-Tong Education Foundation in 2012. Their research and expertise have made significant contributions to the understanding and development of materials surface protection and coatings.

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Research Interests Design and preparation of high-strength and tough coatings and thin films; Membrane induced matrix damage behavior and its mechanism

Presentation Title *Effects of Cr and V multiple precipitates on resistance to hydrogen embrittlement in high-strength steel*

Hailong Peng *Professor* *Central South University, China*

Hailong Peng got his PhD degree in Institute of Physics, Chinese Academy of Sciences, in May 2012. In 2013 he was awarded a research fellowship of the German Academic Exchange Serive (DAAD). After finishing his postdoctor career in Tohoku university, he was hired as an associate professor in School of Materials Science and Engineering, Central South University, since Jan. 2018. Up to 2023 he has published more than 30 peer-reviewed journals, including Phys. Rev. Lett., Phys. Rev. B, and J. Chem. Phys.

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Research Interests Deformation mechanism of amorphous solids, Glassy dynamics

Presentation Title *Effect of liquid dynamics on crystal growth in NiAl and ZrTi melts*

Wei Qi ***Professor*** *Institute of Metal Research, Chinese Academy of Sciences, China*

Prof. Dr. Wei Qi: Principal Investigator (PI) and Professor at Energy Catalysis and Material group, Shenyang National Laboratory for Material Science, Institute of Metal Research, Chinese Academy of Sciences. Dr. Qi was born in 1982 in Changchun, China. He received his B.S. and PhD degree from State Key Laboratory of Supramolecular Structure and Materials, Colloge of Chemistry, Jilin University in 2005 and 2009 (Supervisor: Prof. Lixin Wu). He worked as postdoc at Department of Chemical Engineering in UC Berkeley from 2009 to 2012 (Prof. Enrique Iglesia) before joining IMR. Dr. Qi has authored over 100 peer-reviewed papers with citations over 3600. His research explores reaction kinetics, in-situ spectroscopy, nano-catalyst design and synthesis, electro-catalysis, especially non-metallic nanocarbon catalysis

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Research Interests *Reaction kinetics, In-situ spectroscopy, Non-metallic nanocarbon catalysis*

Presentation Title *Alkane oxidative dehydrogenation on carbon catalysts: Effect of heteroatom doping*

Sutatch Ratanaphan ***Associate Professor*** *King Mongkut's University of Technology Thonburi, Thailand*

Sutatch Ratanaphan graduated from Carnegie Mellon University with a PhD in Materials Science and Engineering, supervised by Professor Gregory S. Rohrer. In 2014, He joined the Department of Tool and Materials Engineering, King Mongkut's University of Technology Thonburi (KMUTT), and also held courtesy appointments at Nanoscience & Nanotechnology Graduate Program and the Department of Computer Engineering at KMUTT. His research focused mainly on grain boundaries and their related properties in polycrystalline materials (i.e. orientation imaging microscopy, large scale scientific computing, and mathematical modelling).

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Research Interests Grain Boundary, Polycrystalline materials, Acicular ferrite, and welded metals, and Atomistic simulations

Presentation Title *Is it possible to employ grain boundary engineering for welded metals*

Ying Ren ***Professor*** *University of Science and Technology Beijing, China*

Ying Ren is currently a professor at University of Science and Technology Beijing, China. He obtained his Bachelor and Ph.D. degree from University of Science and Technology Beijing in China. He has overseas visiting research experiences at Carnegie Mellon University in USA and Tohoku University in Japan. His research has focused on cleansteel and non-metallic inclusions. He has published 1 book, 80 academic papers collected by SCI database. He received 6 first prizes of provincial-level science and technology awards.

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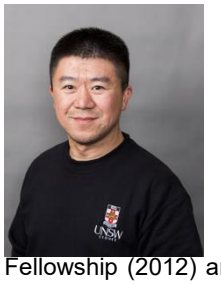
Research Interests Clean steel and inclusions

Presentation Title *In-situ observation of modification of alumina inclusions in steel by calcium treatment*

Yansong Shen *Professor* *The University of New South Wales, Australia*



Professor Yansong Shen is a full Professor in the School of Chemical Engineering at the University of New South Wales (Tenured), and is holding a prestigious Australian Research Council (ARC) Future Fellow. He obtained his BEng and MEng degrees from Northeastern University (China) and PhD degree from UNSW. He initiated and is leading a vibrant research lab - Process Modelling and Optimization of Reacting Flows "ProMO Lab" (www.promo.unsw.edu.au). He published over 200 peer-reviewed papers in top-tier multidisciplinary journals, secured 12 ARC and >20 highly competitive research grants from national and international funding agencies including ACARP/ARENA/BAJC, in total over AUD 27M, established industry engagements in Australia and overseas, and won several honours and highly-competitive national fellowships e.g. ARC APDI Fellowship (2012) and ARC Future Fellowship (2019). His group designed and scaled-up several new technologies including new low-carbon ironmaking technologies, iron ore and coal/biomass processing and upgrading, and reactors design including green hydrogen electrolysers and hydrogen storage tanks.

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Research Interests Ironmaking

Presentation Title *Modelling of reacting flows and industry applications: Hydrogen storage and utilization in ironmaking decarbonation*

Lei Shi *Professor* *Shandong University, China*

Professor Lei Shi obtained his PhD in Materials Science and Engineering at Shandong University in 2016. He joined University of Limerick, Ireland as a post-doc researcher. He also worked as a co-researcher at Ruhr-Bochum University and as a visiting researcher at BAM Federal Institute for Materials Research and Testing, Germany. In 2019, he joined Shandong University as a full Professor and was awarded Qilu Young Scholar. His research mainly focuses on welding theory, technology and application with expertise in numerical simulation and experimental sensing & controlling of welding process. He serves as a deputy director of the Advanced Joining and Processing Sub-committee of the Chinese Society of Non-ferrous Metals, a member of the China Welding Society and the Ultrasonic Materials Science and Technology Sub-committee of the Chinese Materials Research Society. He is a member of the Young Editor Board for several academic journals, including Transactions of Nonferrous Metals Society of China, Journal of Materials Engineering, Journal of Aeronautical Materials, etc.

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Research Interests Friction stir welding and additive manufacturing

Presentation Title *Achieving high properties of medium-thick Ti/Al dissimilar joints by novel double-side friction stir Z shape butt-lap welding process*

Rongpei Shi *Professor* *Harbin Institute of Technology, Shenzhen, China*

Rongpei Shi is a full professor in the College of Materials at Harbin Institute of Technology Shenzhen (HITsz). He received his PhD degree in Materials Science and Engineering from The Ohio State University (OSU) in 2014. Prior to joining HITsz, he was a research associate in the Department of Materials Science and Engineering at OSU from June 2014 to June 2017, and a staff scientist in the Materials Science Division at the Lawrence Livermore National Laboratory (LLNL) from July 2017 to August 2021. His research focuses on the intersection of multi-scale modeling and machine learning, and their applications in understanding composition-processing-microstructure-properties linkages in advanced metallic (Ti, Ni, Co, Cu-based) alloys for structural applications, metal additive manufacturing and energy storage materials. He has published about 60 papers (19 in Acta Materialia with 9 as a first author) in peer-reviewed journals as documented in Google Scholar Profile. He received best poster award in Gordon Research Conference-Physical Metallurgy 2013 and was named among five finalists of Aaronson Award in the International Conference on Solid-Solid Phase Transformation in Inorganic Materials for Materials for outstanding young researcher, at Whistler, Canada on 2015, publication award in physical life and science directorate at LLNL.

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Research interests Titanium alloys, Phase-Field Simulation, ICME, Nucleation

Presentation Title *Origin of morphological variation of grain boundary precipitates in titanium alloys*

Weili Song ***Professor*** *Beijing Institute of Technology, China*

Prof. Song was graduated from Beijing Institute of Technology in 2012. He is focused on the requirements of energy materials and electrochemical engineering technology, and aiming at the key issues such as electrochemical energy storage and electrochemical metallurgy, an analytical model of single-particle impedance was constructed to reveal the electrochemical intrinsic dynamic parameters and influencing mechanism of single-particle materials and crystal surface structures. The 4D visualization platform and quantitative analysis technology of electrode structure evolution during high-temperature molten salt electrolysis process were first established. The kinetic analysis model and kinetic research method of multi-scale electrochemical reaction of molten salt were developed. Published more than 100 papers included in SCI and 11 papers highly cited by ESIAs the first/corresponding author of Chem Rev, Sci Adv, Angew Chem Int Ed, Adv Mater, Energy Environ Sci and other journals.

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Research interests: Metallurgical electrochemistry and battery electrochemistry, Visualization and quantification of electrode processes, Reconfigurable structures and systems

Presentation Title: *4D visualization technology and application of metallurgical electrochemistry*

Suguna Soumya Varanasi ***Doctor*** *RINL-Visakhapatnam Steel Plant, IIT-Hyderabad, Indian*

Having B.Tech in Metallurgical Engineering and M.tech in Industrial Metallurgy from Andhra University. Currently working with RINL-Visakhapatnam Steel Plant as Senior manager (R&D).Pursuing Ph.D from IIT-Hyderabad in Material Science and metallurgical engineering. Worked in areas of steel making, steel desulphurization, modification of slag systems for molten steel refining, utilization of B_2O_3 as alternative fluxing material, solid waste utilization.Published 5 papers in renowned international journals and 11 papers in National and International conferences. Received "Green Award" twice from RINL for contribution towards environment.

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Research interests: Steel making, Steel desulphurization, Slags in steelmaking

Presentation Title: *Role of B_2O_3 in iron and steelmaking slags: A State-of-the-art review*

Yongle Sun ***Lecturer*** *Cranfield University, UK*

Dr Yongle Sun is a Lecturer in Additive Manufacture and the course director for Metal Additive Manufacturing MSc at Cranfield University. He has over 10 years research experience tackling the scientific and application challenges associated with engineering materials and manufacturing processes, broadly encompassing the mechanics and manufacturing techniques for metallic alloys and parts, lightweight protective cellular solids, and thermal barrier coatings. His research was funded by government (EPSRC, Innovate UK, etc.) and industry (Airbus, GE, EDF, Rolls-Royce, etc.) through high-profile projects with over £10M funding in total and contributed to revealing and utilizing the relationships between manufacturing processes, micro-/meso-scale features and mechanical properties of structural materials and components, and his research outputs have been applied to address technical challenges in aerospace and energy industries. His current research is focused on modelling and enhancing wire directed energy deposition additive manufacturing, welding, and the ancillary/allied processes, aimed to provide a sound scientific basis for advanced manufacturing technology development and applications. He has published over 45 peer-reviewed journal papers and has been acting as an editor/member of several academic journals and engineering professional organisations.

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Research interests: Modelling and enhancing wire directed energy deposition additive manufacturing, Welding, Ancillary / Allied processes

Presentation Title: *Assessing and mitigating the distortion and stress during electron beam welding of a large steel shell-flange structure*

Yongqi Sun ***Professor*** *Central South University, China*

Dr. Yongqi Sun is currently a professor at the School of Metallurgy and Environment, Central South University (CSU), China. He received his Bachelor's degree and Ph.D. degree from Peking University (PKU), China, in 2012 and 2017, respectively. Before joining CSU in 2022, he worked at Southern University of Science and Technology (SUSTech), China, and The University of Queensland (UQ), Australia, for 5 years. Dr. Sun's research focuses on the material recycling/heat recovery in metallurgy, low-carbon metallurgy and material synthesis and characterization based on metallurgical methods.

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Research interests Material recycling/heat recovery in metallurgy, Low-carbon metallurgy and material synthesis and characterization based on metallurgical methods.

Presentation Title *Elemental migrations between spinel and liquid phases of vanadium-bearing slags*

Zhi Sun ***Professor*** *Institute of Process Engineering, Chinese Academy of Sciences, China*

Dr. Sun graduated with a bachelor's degree from Beijing University of Science and Technology in 2004, obtained a master's degree from the Institute of Process Engineering, Chinese Academy of Sciences in 2007, and completed his Ph.D. at the University of Leuven in Belgium in 2011. From 2011 to 2013, he held postdoctoral positions at the University of Leuven in Belgium and the University of Queensland in Australia. From 2013 to 2016, he served as a senior researcher at Delft University of Technology. Since 2016, he has been a project researcher and researcher at the Institute of Process Engineering, Chinese Academy of Sciences, focusing on research related to resource recycling and environmental engineering. He has received various honors, including the National High-level Talents Program (Youth Program) and the Young Scientist Award from the Chinese Society for Environmental Sciences. His work has been recognized with two First Prizes in the China Nonferrous Metal Industry Science and Technology Awards, one First Prize in Zhejiang Provincial Science and Technology Progress Awards, and one First Prize in the China Environmental Protection Science and Technology Awards.

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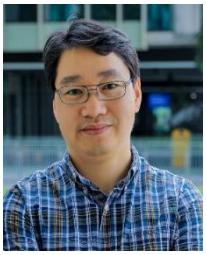
Research interests Metal resource cycle

Presentation Title *Feasibility analysis of application of solid waste from lithium extraction in gel materials*

Ziqi Sun ***Professor*** *Queensland University of Technology, Australia*



Dr. Sun Ziqi (PhD, FHEA, FRSC) is a tenured professor at Queensland University of Technology, Australia, holding the position of Full Professor. He is a recipient of the Australian Research Council Discovery Early Career Researcher Award (ARC DECRA) and Future Fellow grants. In 2010, Dr. Sun joined the University of Wollongong, Australia, where he conducted research on metal oxide nanomaterials, supported by grants from the Australian Research Council, Australian Innovation Projects, the Vice-Chancellor's Research Fellowship at the University of Wollongong, and the Australian Research Council Future Fellowships. In 2015, he attained a tenured professorship at Queensland University of Technology. Currently, Professor Sun Ziqi has published over 180 papers in prestigious international journals, including Nature Nanotechnology, Nature Communications, Journal of the American Chemical Society, and Advanced Materials, with more than 12,000 citations.

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Research interests Metal oxide nanomaterials

Presentation Title *2D metal oxide nanostructures for electrochemical energy applications*

Adrian Wei-Yee Tan ***Assistant Professor*** *University of Southampton (Malaysia Campus), Malaysia*

Dr. Adrian Wei-Yee Tan is an Assistant Professor in the Mechanical Engineering department at the University of Southampton (Malaysia Campus). He received his BEng (Mechanical Engineering), MSc (Precision Engineering) and PhD from Nanyang Technological University (NTU), Singapore in 2012, 2014 and 2019, respectively. Prior joining USoM, Dr. Tan worked as a Research Associate (2014 to 2019) and Research Scientist (2019 to 2020) for the Cold Spray project (coating/additive manufacturing technology) at Rolls-Royce@NTU Corporate Lab, Singapore. As the project lead and pioneer member, he managed the project and led the technology development of the cold spray process with the aim to produce dense coatings or deposits for surface repair or protection of aerospace components. He has researched different kinds of deposited materials (via cold spray) such as titanium, Inconel, cobalt-chromium, copper, aluminium and various types of metallic composites. Dr Tan's current research interests are in metal additive manufacturing, thermal spray, metallic and composite coatings, and microstructure/mechanical analysis of materials. He is currently working on hybrid arc welding and cold spray projects.

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Research interests Cold spray, Welding, thermal spray, Metal additive manufacturing

Presentation Title *Cold sprayed Ti6Al4V-CoCr composite coatings: Microstructure, mechanical and tribological properties*

Chaolin Tan ***Senior Scientist*** *Singapore Institute of Manufacturing Technology, Singapore*

Dr Tan is a Senior Scientist, Principal Investigator and Doctoral Supervisor at the Singapore Institute of Manufacturing Technology (SIMTech), A*STAR. He is an Honorary Research Fellow of University of Birmingham, Fellow of International Association of Advanced Materials (IAAM Fellow), and was listed in World's Top 2% Scientist Ranking in 2022. He supervises 4 PhD students and leads a few national competitive grants in Singapore as the PI. His research experience in Additive Manufacturing (3D printing), has been 10 years and contributed more than 60 SCI papers (H-index 25) and 2 books, including 26 SCI papers as First Author and 8 papers as Correspondent (15 papers with IF >10), with few ESI highly cited and hot papers. He is on Editorial Board of the flagship journal Int. J. Mach. Tools Manuf. (IF 14) and Youth Editor of Int. J. Extreme Manuf. (IF 14.7), J. Mater. Sci. Technol. (IF 10.9), Mater. Res. Lett. (IF 8.3), Rare Metals (IF 8.8) and Trans. Nonferrous Met. Soc. China (IF 4.5).

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Research interests Additive Manufacturing (3D printing)

Presentation Title *4D printing of green steel customised by machine learning*

Ce Wang ***Assistant Professor*** *Harbin Institute of Technology, China*

Wang Ce, an assistant professor of State Key Laboratory of Advanced Welding and Joining, Harbin Institute of Technology, majoring in brazing and diffusion bonding of advanced and dissimilar materials, design of new solders and research on interface behavior of all solid state lithium batteries. Based on the research foundation and achievements in glass brazing of ceramics, she gains the approval of the National Natural Science Foundation of China Youth Found. As the technical leader, she participates in the National Key Research and Development Plan, leading the evolution of the activators specially for steel surface activation and the development of the special equipment for high-strength connection with thin-walled heterogeneous composite components. Additionally, she participated more than 10 national and provincial, or school level scientific research projects and enterprise research projects. 15 academic papers have been published, including 10 SCI papers in Zone 1 of the Chinese Academy of Sciences. The impact factor reaches 90.1. Over 10 national invention patents have been applied and 2 of them have been authorized.

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Research interests Brazing and diffusion bonding of advanced, Dissimilar materials, Design of new solders and research on interface behavior of all solid state lithium batteries

Presentation Title *Joining SiCf/SiC composites to $Al_{0.3}$CoCrFeNi high-entropy alloys with a Cu-Ti filler alloy: Interfacial reactions, high-entropy effects, and mechanical properties*

Haipeng Wang *Professor* *Northwestern Polytechnical University, China*

Professor Wang Haipeng, an esteemed scholar, holds numerous prestigious titles, including being recognized as a New Century Excellent Scholar by the Ministry of Education, a National Young Top-notch Talent, and a Young and Middle-aged Leading Scientist in the field of science and technology by the Ministry of Science and Technology. He has also served as a visiting scholar at the University of Toronto. Professor Wang has received notable awards such as the China Youth Science and Technology Award and the Ho Leung Ho Lee Foundation Young Teachers Award. He is acknowledged as a rising star in the field of science and technology in Shaanxi Province and a soaring young scholar at Xi'an University of Technology. His academic expertise lies in the fields of material physics and chemistry, as well as condensed matter physics. Professor Wang has made significant contributions to his field, publishing over 100 SCI academic papers in esteemed journals such as Applied Physics Letters, Physical Review E, and the Journal of Applied Physics.

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Research Interests Rapid solidification and preparation of new superalloys, Study on physical and chemical properties of liquid superalloys

Presentation Title *Metastable liquid properties and solidification at electrostatic levitation state*

Hao Wang *Professor* *University of Shanghai for Science and Technology, China*

Professor Hao Wang received his PhD from the Institute of Metal Research, Chinese Academy of Sciences in 2009. He was a postdoctoral research fellow in the Grenoble Institute of Technology during 2010-2011. He was awarded an Outstanding Young Research Fellowship by the Shenyang Branch of Chinese Academy of Sciences in 2014, and the Thousand Talents by the Liaoning Provincial Department of Human Resources and Social Security in 2018. His research interests include modelling and simulation of metals and alloys, materials genome engineering and additive manufacturing. He is a member of the Computational Materials Science Branch of the Chinese Materials Society, a member of Shanghai Association of Standardization, and an Editorial Board Member of Scientific Reports. He has published 100+ journal and conference articles, including Nat Mater (1), Science (1), Nat Commun (2), Acta Mater (13), JMST (15), Scripta Mater (5).

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Research Interests Modelling and simulation of metals and alloys, materials genome engineering and additive manufacturing

Presentation Title *Formation and strengthening of triple-twinned alpha variants in additive manufactured titanium alloy*

Junqiang Wang *Professor* *Chinese Academy of Science, China*

Junqiang Wang is a Professor in Ningbo Institute of Materials Technology and Engineering CAS, since 2014. He got PhD in Institute of Physics, Chinese Academy of Science (CAS) in 2010, has been worked as a postdoc in Tohoku University in Japan and University of Wisconsin-Madison in UAS from 2010-2014.His research interests focus on exploring new metallic glasses with advanced mechanical and functional properties, and studying the evolution of metastable non-equilibrium characteristics and their influence on properties.He authored more than 100 papers in academic journals, such as PNAS, Phys. Rev. Lett./B/Mater., Nature Comm., Advanced Functional Materials, Acta Mater and so on. These papers have been cited by more than 3000 times.

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Research Interests Controling the metastable characteristics of amorphous alloys and its influence on the functional properties

Presentation Title *Precisely modulating the energy state of metallic glasses and its influence on physical properties*

Leyun Wang ***Professor*** *Shanghai Jiao Tong University, China*

Prof. Wang's research focuses on the following aspects: (1) Lightweight metallic materials for structural applications (e.g. Mg, Ti alloys); (2) Metal 3D printing; (3) Materials characterization by synchrotron X-ray techniques; (4) Machine Learning in materials science. Prof. Wang has published over 50 peer-reviewed papers in well-known journals including Acta Materialia, Inter J Plasticity, Additive Manufacturing, etc. These publications have been cited for over 1600 times with an h-index of 22. Prof. Wang is teaching an undergraduate course on Materials Characterization. Prof. Wang is active in international research collaboration with scientists from different institutes, such as MIT, University of Michigan, Northwestern University, University of New Hampshire, Argonne National Laboratory, Deutsches Elektronen-Synchrotron, Helmholtz Zentrum Geesthacht, etc..

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Research Interests: Mg alloys development and mechanical properties, 3D printing of Ti alloys, Materials characterization by synchrotron X-rays and data analysis software development, Machine Learning in materials science

Presentation Title: *Laser powder bed fusion of Ti alloys with various Al contents*

Liang Wang ***Postdoctor*** *Beijing Institute of Technology, China*

Liang Wang is a Post-Doctor at the Institute of Advanced Structure Technology, Beijing, Institute of Technology, Beijing, China. Dr. Wang graduated from Beijing Institute of Technology and obtained the Doctor's Degree in June 2019. His interest is high entropy alloy design and characterization. He has published 36 research articles in SCI journals, including Nature Materials, Acta Materialia, Materials Today Physics, and Scripta Materialia.

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Research Interests: High entropy alloy design and characterization

Presentation Title: *Tailoring planar slip to achieve pure metal-like ductility in body-centred-cubic multi-principal element alloys*

Pan Wang ***Doctor*** *Singapore Institute of Manufacturing Technology, Singapore*

Dr. Wang Pan is a Senior Scientist II in the Additive Manufacturing Division at Singapore Institute of Manufacturing Technology (SIMTech), A*STAR, where he spearheads the development of the electron beam powder bed fusion (EB-PBF) technique, covering the entire spectrum from fundamental research to industrial applications. With a Ph.D. degree in Materials and Manufacturing Science from Osaka University, Japan, Pan explores the interplay of advanced manufacturing technologies and materials science. His research interests encompass metal additive manufacturing (EB-PBF, Laser-PBF, and Binder Jetting) and metallic powder, artificial intelligence, novel structure design, high-throughput screening and microstructure analysis, phase transformation and deformation, and grain boundary engineering. Pan was recognized as one of the World's Top 2% Scientists for both 2020 and 2021 by Stanford University. In addition, he also serves as editorial board member for reputed journals, such as Virtual and Physical Prototyping, Additive Manufacturing Letters, and Journal of Materials Science & Technology, and International Journal of Lightweight Materials and Manufacture.

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Research Interests: Metal additive manufacturing, Artificial intelligence, Phase transformation and deformation, Metallic powder, High-throughput microstructure analysis, Novel structure design and optimization, Grain boundary engineering

Presentation Title: *Additive manufacture and mechanics ultrahigh-strength ductile beta titanium alloys by electron beam powder bed fusion*

Shuai Wang *Associate Professor* *Southern University of Science and Technology, China*

Dr. Shuai Wang joined the Department of Mechanical and Energy Engineering at SUStech as an Assistant Professor in 2018. He received his Doctor degree in Hokkaido University, Japan, in 2013. He attended key projects related to the research of defects behavior and mechanical properties of new energy structural materials that sponsored by the Japanese Ministry of Education, National Science Foundation in the USA, and Department of Energy in the USA. By using electron transmission microscopy and atomistic simulation as main approaches, his research interest focuses on the mechanical behavior and the evolution of microstructure in additive manufactured materials, to enhance the understanding of the underlying mechanisms for the mechanical behaviors, and take advantage of additive manufacturing to design and develop new materials with functions of self-healing of cracks, negative Poisson ratio, high elasticity, thermal stability, high resistance of environmental failure.

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Research Interests Mechanical behavior and microstructure evolution of materials in nano- and micro-scale

Presentation Title *On the orientation dependence of hydrogen-prompted dislocation structure evolution in Ni*

Shengchuan Wu *Professor* *Southwest Jiaotong University, China*

Wu Shengchuan, male, Shandong, born in 1979, postdoctoral fellow, researcher of Southwest Jiaotong University, Yanghua Scholar, the 13th batch of Academic and Technological Leaders of Sichuan Province, and Honorary Professor of National Institute for Advanced Materials, University of Manchester.He received his PhD degree from the School of Mechanical Engineering of Huazhong University of Science and Technology (HUST) in 2009, and presided over the Second Prize for Scientific and Technological Advancement of Sichuan Province in 2019 (Rank 1). He has long been engaged in the research of service behaviour assessment of high-speed rail vehicle structures

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Research Interests Service behaviour assessment of high-speed rail vehicle structures

Presentation Title *Neutron diffraction measurement and evaluation of gradient residual stress for induction hardened S38C axles*

Xiaoli Xi *Professor* *Beijing University of Technology, China*

Xi Xiaoli, Professor/Doctoral Supervisor, Director of the Materials and Manufacturing Department at Beijing University of Technology. Winner of the National Science Fund for Distinguished Young Scholars and the National Natural Science Fund for Distinguished Young Scholars. He also serves as the Deputy Director of the Rare Metals Metallurgy Academic Committee of the China Nonferrous Metals Society, the Deputy Director of the Solid Waste Resource Utilization Professional Committee of the China Nonferrous Metals Society, and the Deputy Director of the Molten Salt Chemistry Committee Branch of the China Metals Society. I have been engaged in scientific research on efficient recycling and reconstruction of scarce metal materials, simulation of metallurgical processes, and electrochemistry of materials and environment for a long time.

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Research Interests Recycling of waste resources, Preparation of ultrafine powder by low temperature metallurgy

Presentation Title *A new method for preparation of tungsten carbide powder by in-situ electrochemical reduction*

Fei Xing ***Professor*** *Nanjing Zhongke Raycham Laser Technology Co., Ltd., China*

Fei Xing, Male, Member of the Communist Party of China. Received the PhD degree in Mechanical and Electronic Engineering from the Shenyang Institute of Automation Chinese Academy of Sciences, Shenyang, China, in 2009. Professor of Northeastern University, Second-class Professor of Shenyang University of Technology, doctoral supervisor. Founder, chairman and general manager of Nanjing Zhongke Raycham Laser Technology Co. Ltd. The second batch of "Ten Thousand Talents Program" selected by the Organization Department of the Central Committee of the Communist Party of China. The selected "Leading Innovation and Entrepreneurship Talent Program" by the Ministry of Science and Technology. The winner of the "Youth May Fourth Medal" of Jiangsu Province, the outstanding scientific and technological workers of Jiangsu Province, the "333 Category B Talents" of Jiangsu Province, the leading talent of Jiangsu Provincial Innovation and Entrepreneurship Team, and the Liaoning Provincial climbing scholar. Successively presided over and participated in more than 30 national, provincial, and ministerial-level science and technology program projects, applied for over 100 patents, and published more than 40 academic papers.

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Research interests Development and industrial application of laser additive manufacturing, laser welding, laser remanufacturing, laser, robot and other technologies

Presentation Title *Research Status and Development Trend of Intelligent Metal Additive Manufacturing Technology*

Dingbang Xiong ***Professor*** *Shanghai Jiao Tong University, China*

Ding-Bang Xiong is a professor in the State Key Lab of Metal Matrix Composites, in Shanghai Jiao Tong University, China since 2012. He received Ph.D degreee in materials physics and chemistry from Shanghai Institute of Ceramics, CAS, in 2007. Between 2007-2010, he carried out his postdoctoral research as Alexander von Humboldt (AvH) fellow in Marburg University, Germany and between 2010-2012, he did collaboration research in Kyoto University supported by the Japan Society for the Promotion of Science (JSPS). His current researches foucs on fabrication and properties of metal matrix composites materials.

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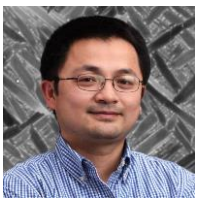
Research Interests Metal matrix composites are strengthened and toughened

Presentation Title *Design and properties of graphene/Cu composites*

Wei Xiong ***Associate Professor*** *University of Pittsburgh, USA*



Dr. Wei Xiong is the director of the Physical Metallurgy and Materials Design Laboratory at the University of Pittsburgh. Using the CALPHAD-based ICME methods, Dr. Xiong works in materials design and process optimization, which covers a wide range of inorganic materials, and focuses on phase equilibria and phase transformations. He has more than 70 publications related to physical metallurgy, including 7 invited book chapters. Dr. Wei Xiong serves on the ASM International Alloy Phase Diagrams Committee, TMS Alloy Phases Committee (Chair), TMS High-Temperature Alloys Committee, TMS Additive Manufacturing Committee. He was the TMS ICME education sub-committee chair. He has received several academic awards, which include: Best Paper Awards of the CALPHAD journal in 2012 and 2013, Outstanding Reviewer Award 2020 of Acta Materialia, the CALPHAD Young Leader Award 2020, the TMS Early Career Faculty Fellow Award 2021.

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Research Interests CALPHAD, ICME, Additive Manufacturing

Presentation Title *CALPHAD-based ICME design for additive manufacturing of functionally graded alloys*

Jian Xu ***Professor*** *Chongqing University, China*

Dr. Jian Xu is a professor in the Department of Metallurgical Engineering at Chongqing University. He received his bachelor's degree and PhD from the University of Science and Technology Beijing in 2007 and 2012, respectively. Dr. Xu's research is dedicated to advancing low-carbon ironmaking processes by addressing multi-scale challenges in in gas-solid interfacial reactions and granular segregation systems.

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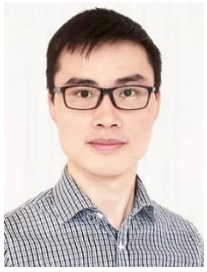
Research Interests *Gas-solid interfacial reaction, Granular segregation and characterization*

Presentation Title *Mitigating CO_2 emission in the iron ore sintering process via dry particles embedding*

Xin Xu ***Associate Professor*** *Sun Yat-sen University, China*



Xin Xu got his PhD degree from Royal Institute of Technology (KTH), Sweden, in December 2017. Then he worked as a postdoctoral researcher at KTH and Imperial College London until December 2020 before joining the School of Materials, Sun Yat-sen University (SYSU) as an associate professor under the "Hundred Talents Program" at SYSU. His research mainly focuses on the development of high-performance stainless steels, titanium alloys and metallic composites and the application of large scientific facilities including Synchrotron X-rays and neutron sources in materials characterization. He is chairing 5 grants including Young Scientists Fund of the National Natural Science Foundation of China and the sub-project of National Key R&D Program and working as a key researcher on other projects, and have published more than 20 peer-reviewed papers.

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Research Interests Phase transformation, processing methods of titanium alloys and stainless steels

Presentation Title *Evolution of nanostructure due to phase separation in stainless steels*

Yaxin Xu ***Professor*** *Northwestern Polytechnical University, China*

Research field: Reliability of solid-state welding joints, high-temperature corrosion and long-term protection of metals, involving the design of high-performance alloy components, evaluation of joint performance, corrosion behavior and mechanism, and preparation and evaluation of high-temperature protective coatings.Served as a member of the Surface Engineering Branch of the Chinese Society of Mechanical Engineering, a member of the Council of the Surface Engineering Branch of the Shaanxi Provincial Society of Mechanical Engineering, and a young editorial board member of journals such as China Journal of Corrosion and Protection, Materials Engineering, and Aerospace Materials Journal. Led 2 National Natural Science Foundation projects and 3 provincial and ministerial level fund projects, and participated in multiple National Natural Science Foundation and National Key R&D Plan projects. Published more than 30 papers as the first author or corresponding author in important journals such as Corrosion Science, Ceramics International, Surface and Coating Technology, Journal of Thermal Spray Technology, and authorized 5 invention patents.

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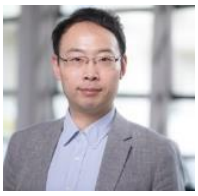
Research Interests Reliability of solid-state welding joints, High-temperature corrosion and long-term protection of metals

Presentation Title *Microstructure and tribological properties of cold sprayed Ti-WC composite coating on Ti6Al4V titanium alloy*

Yilun Xu ***Research Fellow*** *Agency for Science, Technology and Research (A*STAR), Singapore*



Dr Yilun Xu worked as a Research Fellow and Teaching Lecturer at Imperial College London prior to joining Agency for Science, Technology and Research (A*STAR) as a Senior Scientist. His research has been focusing on the multi-scale micromechanics of advanced alloys subject to multi-physics using crystal plasticity and discrete dislocation plasticity. His researches were sponsored by EPSRC (UK), Marie-Curie (EU), NRF (SG) and Rolls-Royce (UK) etc. He has published 23 peer-reviewed papers on top journals, including Nature Communications, JMPS, IJP, ACS Appl Mater Interfaces etc.

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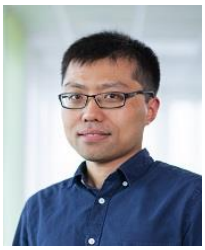
Research Interests Micromechanics of alloys
Presentation Title *Micro-mechanics of multi-scale alloys under multi-physics*

Jiayi Yan ***Research Assistant Professor*** *Tsinghua University, China*



Jiayi Yan is currently Research Assistant Professor at School of Materials Science and Engineering, Tsinghua University. He obtained his B. Eng. degree from Tsinghua and PhD from Northwestern University (US). He was Postdoctoral Researcher at KTH and later Product Developer at Thermo-Calc Software AB and Materials Design Engineer at QuesTek Europe, in Sweden. His expertise and research interest include Materials Design supported by Materials Genome, computational thermodynamics and kinetics of phase transformations in metallic materials, and their impact on mechanical properties.

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Research Interests Phase transformations; Thermodynamics; Kinetics; CALPHAD
Presentation Title *Modeling of the kinetics of austenite decomposition in steels and its software implementation*

Wen Yang ***Professor*** *University of Science and Technology Beijing, China*

Wen Yang is a professor at the University of Science and Technology Beijing, selected for the National Youth Talent Program, and also serves as a youth editorial board member for the journals “Iron and Steel” and “Continuous Casting”. He has worked as a visiting scholar at the Argonne National Laboratory and the Colorado School of Mines in the United States. He mainly conducts theoretical and technical research related to the clean production of high-quality steels. He has led and participated in more than 20 projects, including National Key R&D Programs, published 1 academic monograph, over 60 academic papers as the first/corresponding author, authorized more than 10 patents, and won 5 first prizes at the provincial and ministerial levels.

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Research Interests Research on clean steel production technology, Control of non-metallic inclusions in steel, Surface quality control of continuous casting billet
Presentation Title *Improving the cleanliness of a carbon steel by the optimization of refining slag and calcium treatment*

Xiao Yang *Researcher* *Westlake University, China*

Xiao Yang is an experienced extractive metallurgist with 15+ years of research experience in the field. He received his B.S. from Beihang University in 2003, M. S. from Institute of Process Engineering-CAS in 2006, and Ph.D. in Metallurgical Engineering from The University of Tokyo in 2009. He has served as a research associate at National Institute of Advanced Industrial Science and Technology in Japan, a researcher at Shasteel Group, a research assistant professor at Kyoto University, a research fellow at The University of Texas at Austin, a visiting professor at Yonsei University, and an assistant professor at The University of Tokyo. Xiao joined Westlake University in 2020. His research is focused on developing smart extraction technologies for pure chemical elements through the utilization of molten salts.

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Research Interests Physical chemistry of high-temperature molten salt system, preparation of high-purity semiconductor elements, recycling of solid waste
Presentation Title *Electrometallurgy may reform the phosphorus chemical industry*

Yafeng Yang *Professor* *Chinese Academy of Sciences, China*

Prof. Yang is currently professor of Institute of Process Engineering, Chinese Academy of Sciences. He has been awarded Thousands Plan Youth Talent, Australian Postdoctoral Researcher Fellowship (ARC-APD), Australian Research Council Discovery Early Career Researcher Award, (ARC DECRA), Queensland International Fellowship, UQ ECR, and Humboldt Fellowship. His research focused on the advanced net-shape manufacturing of metals and ceramics from powders, specifically on the powder manipulation, conventional consolidation and 3D printing.

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Research Interests Powder Materials, Sintering, Additive Manufacturing
Presentation Title *A special core-shell structured powders and their potential applications*

Yang Yang *Professor* *East China Normal University, China*

Dr. Yang received his Ph.D. from the East China Normal University in 2010. He subsequently joined Prof. Xingao Gong's research group at Fudan University, as a research assistant. From 2011 to 2013, he worked with Prof. Brian Laird at the University of Kansas as a postdoc. From 2013 to 2014, he worked with Prof. Mark Asta as a postdoc at the University of California, Berkeley. He joined the School of Physics and Material Science at East China Normal University as a Zijiang youth scholar faculty. Since March 2016, he has been serving as director of the institute of condensed matter physics at the School of Physics and Electronic Science. Dr. Yang's research focuses on employing state-of-the-art theoretical and simulation techniques to develop the modern theory for the liquid phase interface thermodynamics and kinetics. Dr. Yang was awarded the Excellent Doctoral Dissertation Award of Shanghai City, and the 2018 recipient of the East China Normal University Natural Science Youth Award.

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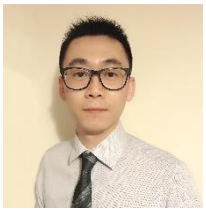
Research Interests Liquid phase interface thermodynamics and kinetics
Presentation Title *The theoretical and atomistic simulation study of the solidification kinetic coefficient*

Shuo Yin ***Assistant Professor*** *Trinity College Dublin,The University of Dublin, Ireland*



Dr. Shuo Yin was appointed Assistant Professor and Principal Investigator within the Department of Mechanical, Manufacturing and Biomedical Engineering in January 2019. His expertise is mainly on additive manufacturing processes including cold spraying, selective laser melting, digital light processing, direct-ink writing, plasma spraying, and digital holography. His research mainly focuses on equipment design and manufacturing, microstructure characterization and analysis, process in-situ visualization, numerical modeling (CFD and FEA), and mechanical and biomedical properties. Dr. Yin has secured over 5-million-euro research funding as PI or Co-PI from European Innovation Council (EIC), Marie Skłodowska-Curie Actions (MSCA), Science Foundation Ireland (SFI), Irish Research Council (IRC), Enterprise Ireland (EI), IntertradeIreland, and industrial partners. He is the awardee of IRC Government of Ireland Postdoctoral Research Fellowship, SFI Frontiers for the future project, Trinity Accelerated Advancement Award, and Trinity Research Boost Award. He has authored over 160 peer-reviewed papers including ESI hot paper, ESI highly cited paper, JTST Best paper, JMST Best paper. Dr. Yin has served as the international referee of research proposals from the US, Canada, Singapore, the Netherlands, and Switzerland. He is the editorial board member of several key journals.

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Research Interests Additive Manufacturing, Advanced Manufacturing

Presentation Title *Co-deposition mechanism of cold sprayed metal matrix composites: numerical modeling and experiment*

Dali You ***Doctor*** *Primetals Technologies Austria, Austria*

Dali You obtained his PhD degree in 2017 at Montanuniversitaet Leoben, Austria. He worked as assistant, junior, and senior researcher at Montanuniversitaet Leoben from 2013 to 2022. Then he worked as metallurgist and model development engineer at Primetals Technologies Austria. His main research domains are microsegreagtion, inclusion formation, refining and process modeling of steel.

Email dali.you@primmetals.com

Research Interests Process model and metallurgy of steelmaking, inclusion formation, mircrosegregation

Presentation Title *Modeling of the BOF tapping and LF refining process of steel*

Huixiang Yu ***Professor*** *University of Science and Technology Beijing, China*

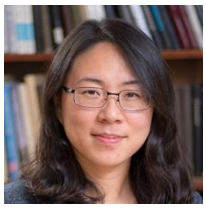
Huixiang Yu is professor of Ferrous metallurgy at University of Science and Technology Beijing (USTB). She got the first academic position at USTB in 2002 after getting her Master's degree. Ten years later, she got her PhD from USTB in 2013 and became associate professor in 2016. In 2023, she was promoted to professor. She had academic visiting in La Trobe University(Australia), Tokyo University(Japan) and Imperial College London(UK) in 2009, 2016 and 2022, respectively. Her researches include cleanliness improvement of high grade steel, fundamental research on medium / high Mn steel, and numerical simulation of metallurgical process. She has published over 40 research papers, been rewarded 8 Provincial/Ministerial level Science and Technology awards, and granted 10 patents for invention.

Email yuhuixiang@ustb.edu.cn

Research Interests Cleanliness improvement of high grade steel

Presentation Title *Metallurgical characteristics of reaction between QP steel and CaO-SiO_2-Al_2O_3-MgO slag*

Zhenzhen Yu *Associate Professor* *Colorado School of Mines, USA*



Prof. Zhenzhen Yu is an Associate professor in the department of Metallurgical and Materials Engineering (MME) at Colorado School of Mines, the Director of the Center for Joining, Welding and Coatings Research (CWJCR), and site director of NSF Industry and University Cooperative Research Center (I/UCRC) Manufacturing & Materials Joining Innovation center (Ma2JIC). She is also a joint Faculty at National Renewable Energy Laboratory. She received MS and PhD degrees from the Department of Materials Science and Engineering at the University of Tennessee, Knoxville and B.S. degree from Mechanical Engineering at East China University of Science and Technology. Before joining CSM, she worked as a postdoctoral research associate at Oak Ridge National Laboratory.

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Research Interests Joining of similar and dissimilar materials, weld consumables design, weld metallurgy

Presentation Title *Weldability of metals and failure mechanisms of weldments*

Zhuoran Zeng *Professor* *Hunan University, China*

Zhuoran Zeng obtained his bachelor's degree in 2011 from Monash University in Australia. After completing his Ph.D. in 2016, he continued his postdoctoral research at Monash University. In 2020, he was appointed as a researcher and PhD supervisor at the Australian National University. Facing the challenges of low plasticity and poor corrosion resistance in magnesium alloys, he proposed a new approach based on grain boundary engineering to enhance the plasticity and corrosion resistance of magnesium alloys. He has developed a series of high-strength and corrosion-resistant magnesium alloys. In recent years, he has published a total of 36 SCI papers, including publications in journals such as Nature Communications and Acta Materialia, with over 2200 citations.

Email zeng.zhuoran@hnu.edu.cn

Research Interests Magnesium alloy; Mechanical Properties; Characterization

Presentation Title *Corrosion resistant and high-strength dual-phase Mg-Li-Al-Zn alloy by friction stir processing*

Cunsheng Zhang *Professor* *Shandong University, China*

Prof. Zhang works at the School of Materials Science and Engineering at Shandong University. His primary research focus is on the theory and technology of plastic deformation of high-performance complex aluminum (lithium) alloy components. He has led more than 20 research and talent projects, including the National Natural Science Foundation, sub-projects of the National Key Research and Development Program, the Shandong Provincial Natural Science Foundation's Outstanding Young Scholar Fund, Shandong Provincial Major Innovation Engineering Projects, and Shandong Provincial Key Research and Development Programs.

Email zhangcs@sdu.edu.cn

Research Interests Theory and technique of plastic deformation of high performance complex aluminum (lithium) alloy members

Presentation Title *The formation and strengthening mechanisms of lattice defects in ultrafine-grained CNT/2024Al composite*

Laichang Zhang ***Professor*** *Edith Cowan University, Australia*

Lai-Chang Zhang is a Professor of Materials Engineering, Head of Centre for Advanced Materials and Manufacturing, and the Program Leader–Mechanical Engineering in the School of Engineering at Edith Cowan University (Perth, Australia). After awarded his PhD in Materials Science and Engineering at the Institute of Metal Research, Chinese Academy of Sciences, Prof. Zhang held several positions at The University of Western Australian, University of Wollongong, IFW Dresden and Technische Universität Darmstadt. His research interests include metal additive manufacturing, metallic biomaterials, light-weight materials and structures, and high-strength materials. He has published about 360 referred journal papers with an H-index of 79 and 21,900+ citations and 29 ESI Highly Cited Papers. He also serves as Editors or Editorial Board Members for more than 10 journals, e.g. International Journal of Extreme Manufacturing, Advanced Engineering Materials, Materials Science and Technology, Acta Metallurgica Sinica (English Letters), etc.

Email l.zhang@ecu.edu.au

Research Interests: 3D printing/Additive manufacturing; Metallic biomaterials; Lightweight alloys & structures; High-strength alloys

Presentation Title: *Mechanical behavior of 3D printed titanium lattice structures*

Xianguang Zhang ***Associate Professor*** *University of Science and Technology Beijing, China*

Dr. Zhang is currently an associate professor at University of Science and Technology Beijing (USTB), China. He received his Doctor degree in 2014 at Hokkaido University, Japan. After that, he worked as a Research Associate at Tohoku University, and he Joined USTB at 2018. His research interests include various aspects of fundamentals of microstructure evolution and its control in structural metallic materials, especially steels; transformation kinetics associated with element partitioning, crystallography, and strengthening by nano-clustering/precipitation. He has authored/co-authored over 80 refereed papers, including Acta Mater., Metall. Mater. Trans. A et al.

Email xgzhang@ustb.edu.cn

Research Interests: Control of microstructure and properties of advanced iron and steel materials

Presentation Title: *A comparative study of austenite reversion behavior from martensitic and bainitic initial structures*

Yu Zhang ***Senior Researcher*** *Institute of Research of Iron and Steel, Shasteel, China*

Dr Zhang Yu received his PhD degree from Tohoku university at 2008, and then joined the Institute of Research of Iron and steel (IRIS) , Shasteel, as researcher, senior researcher, and research group manager until now. Cureently, he is manager of research group of Rod and Wire, IRIS, Shasteel. His research interests covers steel metallurgy, steel microstructure amd property, welding metallurgy, and welding process physics.

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Research Interests: Steel metallurgy, Steel microstructure and property, Welding metallurgy, Welding process physics.

Presentation Title: *A novel strategy to fabricate thick ultra large-heat input butt weld joint by synergetic use of wire, arc and steel plate*

Lijia Zhao *Professor* *Northeastern University, China*

Lijia Zhao received his Ph.D. degree from the Department of Materials Science and Engineering, Kyoto University, Japan in 2015. From 2015 to 2018, he worked as a postdoctoral fellow at Kyoto University and Advanced Steel Technology and Product Research Center of Colorado School Mines. From 2018 to 2020, he served as a senior researcher at ArcelorMittal Global R&D Center. Since 2020, he has been a professor at Northeastern University, China. By 2023, he had presided over more than 10 joint fund projects of NSFC and industry-university-research cooperation projects. He has published more than 60 high-level papers, international proceedings and technical reports and two invited review papers in journals like Acta Materialia, Materials Research Letters, Scripta Materialia, etc.

Email zhaolijia@mail.neu.edu.cn

Research Interests Solid state phase transition and defect control of high-performance steel materials

Presentation Title *Scale effect of surface asperities on stick-slip behavior of zinc-coated steel*

Qing Zhao *Associate Professor* *Northeastern University, China*

In 2015, Qing Zhao graduated from the Iron and Steel Metallurgy program at Northeastern University, where he obtained a Ph.D. in Engineering. During his studies, he received a joint training scholarship from the China Scholarship Council and studied at Aalto University in Finland. From 2016 to 2018, he conducted postdoctoral research in the field of Power Engineering and Engineering Thermophysics at Northeastern University. Since completing his postdoctoral research, he has been teaching at the Institute of Iron and Steel Metallurgy and Resource Recycling. His main research interests include the comprehensive utilization of complex associated resources, carbon capture, utilization, and storage (CCUS), and advanced functional materials and their preparation. He has published over 60 academic papers as the first or corresponding author, with more than 30 of them in SCI-indexed journals. Additionally, he has served as the chief editor for one monograph.

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Research Interests Comprehensive utilization of complex co-associated resources

Presentation Title *Preparation of carbon capture materials from steel slag*

Qinglong Zhao *Professor* *Jilin University, China*

Dr. Zhao graduated from the Norwegian University of Science and Technology (NTNU). In June 2015, they joined Jilin University as an associate professor, and in October 2020, they were promoted to the position of professor.Zhao's research covers the grain refinement of cast alloys by nanoparticles and its effect on microstructure evolution during thermo-mechanical processing and mechanical properties. Zhao has published more than 30 journal articles.

Email zhaoqinglong@jlu.edu.cn

Research Interests Microstructure control of solidification and processing of metal materials

Presentation Title *The formation of twinned dendrites in laser melted aluminum*

Lejun Zhou ***Professor*** *Central South University, China*

Lejun Zhou is a full professor in School of Metallurgy and Environment, Central South University. He also works as a key member in National Center for International Research of Clean Metallurgy. He gets his B.E., M.S. and Ph.D. degree also from Central South University. Professor Zhou's research is in the field of continuous casting of steel, especially in designing and optimizing of mold flux, controlling of initial solidification of steel, and exploring the interaction between molten slag and steel.

Email l.j.zhou@hotmail.com

Research Interests Designing and optimizing of mold flux, Controlling of initial solidification of steel, Interaction between molten slag and steel

Presentation Title *The mechanism of phase transformation of mold flux under electropulsing treatment*

Kezhuan Gu ***Researcher*** *ArcelorMittal Dofasco, Canada*

After graduating from McMaster University in 2017, Rer.Gu continued to work as a research fellow with the focus on BOF process modeling based on steel research center at McMaster. From 2019 to 2021, he joined Stelco as a part time researcher with main focus on characterization of inclusion evolution at secondary refining process. Started from 2022 May, he joined ArcelorMittal Dofasco initially as a process engineer at EAF steelmaking facility and then moved to primary research group at R&D.

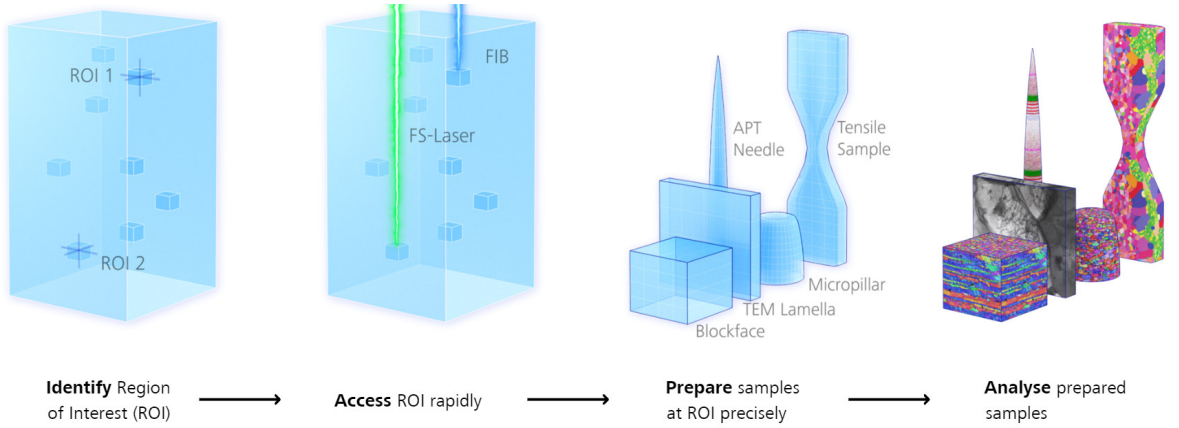
Email kezhuan.gu@arcelormittal.com

Research Interests Primary/Secondary steelmaking process

Presentation Title *Tracking inclusion evolution for LCAK Steel during secondary refining based on plant trial data*

Identify, Access, Prepare, Analyze Your Sample with Precise Navigational Guidance

ZEISS Sample-in-Volume Analysis Workflow



Introducing the multi-scale challenges in microscopy

Advanced materials research is challenging. The challenge is based on our requirement as material scientists to understand structures, properties and processes across different length scales within a material. This requires a range of imaging and analysis technologies that enable us to understand our materials from macro-to-sub-nanometer scales. As we move from the macro-scale to sub-nanometer, we require a workflow that enables us to make the best decisions possible for the best experimental outcomes.

Introducing the Sample-in-Volume Analysis Workflow

The ZEISS Sample-in-Volume Analysis workflow comprises four major elements which include, Identify the Regions-of-Interest (ROI), Access the ROI rapidly, Prepare samples at ROI precisely and Analyze the prepared samples.

The workflow aims to provide navigational guidance to characterize samples within a large volume in order to present multi-scale and multi-modality experimental findings.

This workflow is enabled by ZEISS X-ray Microscopy, ZEISS Crossbeam laser FIB-SEM and correlative software solutions for 2D/3D imaging and analysis.

Workflow Highlights

- **Identify:** Your initial sample volume with ZEISS Xradia Versa family, a 3D X-ray Microscope (XRM) that perform high resolution, non-destructive 3D imaging of large sample volumes.
- **Access:** Your sample with the LaserFIB, a femtosecond (fs) laser, integrated on ZEISS Crossbeam FIB-SEM. The LaserFIB enables massive material removal to access deeply buried samples rapidly.
- **Prepare:** High quality surfaces and delicate structures for further analysis with the Ion-sculptor Gallium FIB column integrated on the ZEISS Crossbeam.
- **Analyze:** Your prepared samples and connect to other scales and modalities with ZEISS correlative software such as ZEISS Atlas 5 or ORS Dragonfly Pro.

ZEISS

Seeing beyond

ZEISS Sample-in-Volume Analysis Workflow

The Correlative Enablers

Identify regions-of-interest with the ZEISS Xradia Versa X-ray Microscope:

- Resolution at a Distance (RaaD) architecture that enables high-resolution 3D imaging of large sample volumes
- High flux X-ray source to acquire tomography scans faster without sacrificing resolution and contrast
- Laboratory-based Diffraction Contrast Tomography (LabDCT) to unlock 3D crystallographic information, acquire non-destructive mapping of grain orientation and investigate microstructures in 3D

Precisely access and prepare surfaces and structures with the Focused Ion Beam SEM (FIB-SEM) of the ZEISS Crossbeam family:

LaserFIB:

- 515 nm green laser with burst pulsing that enable massive material removal with ablation rates up to 15 mio. $\mu m^3/s$ (for Si) and resolution <2 µm on local areas
- Avoid contamination of your FIB-SEM main chamber by performing laser work in a dedicated integrated chamber to maintain column cleanliness

Ion-sculptor (Ga^+ FIB column):

- Perform fine polishing and sample preparation with Ion-sculptor
- 100 nA probe current enable fast and precise preparation of sample without compromising on FIB resolution
- Low voltage Ion-sculptor capabilities enable ultra-thin samples like TEM lamellae while keeping amorphization damage to a minimum

Correlate 3D XRM data with the ZEISS Crossbeam for site-specific access, sample preparation and analysis with ZEISS Atlas 5:

- Combine multi-scale and multi-modal data from EM, XRM and 3D Diffraction Contrast Tomography for correlative workflow with ORS Dragonfly Pro software
- Perform 3D image processing and segmentation for multi-scale and multi-modal 3D visualization and analysis with ORS Dragonfly Pro software
- Correlating images from multiple sources to build the seamless multi-modal, multi-scale dataset with ZEISS Atlas 5 software
- Use the integrated 3D analysis for EDS and EBSD on ZEISS Atlas 5 and take advantage of the “True Z” slice thickness control
- Switch to other modalities such as such as ToF-SIMS for advanced chemical analysis workflows in the ZEISS Crossbeam

Contact your ZEISS Application Specialist to learn how the Sample-in-Volume Analysis Workflow can be used for your multi-scale material challenges.

microscopy@zeiss.com
zeiss.com.sg/sample-in-volume

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Complete research equipment for metal materials

Cutting and Dicing Saw


SYJ-150
Low Speed Diamond Saw


SYJ-50
Heavy Duty Cut-off Saw

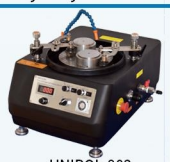

SYJ-200
Automatic Diamond Saw


STX-202A
Compact Diamond Wire Saw


STX-100QX
Diamond Curve Cutting Machine

Grinding and Polishing Machine


UNIPOL-820
Metallographic Grinding and Polishing Machine


UNIPOL-802
Automatic Precision Grinding and Polishing Machine


UNIPOL-1200Z
Vibration Polishing Machine


EP-530 Electrolytic Polishing Machine


UNIPOL-1200M
Automatic Pressure Grinding and Polishing Machine

Lab Mill and Mixer


SFM-11 Laboratory Compact V-Shaped Mixer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High-Throughput V-Shaped Mixer


SFM-1 Bench-Top Planetary Automatic Ball Mills


MSK-SFM-13S
Bench-top Horizontal Planetary Ball Mill


MSK-SFM-15
Hi-Energy Planetary Ball Mill

Lab Press


YLJ Series Press


Manual Cold Isostatic Press Series


Ultra-high Pressure Cold Isostatic Press


MSK-5070-R2R
Roll to Roll Rolling Press


MSK-HRP-MG1
Automation Hot / Cold Rolling Machine for High Throughput Research

Furnace


Tube Furnace Series (200°C-1800°C)


Box Furnace Series (200°C-1800°C)

Melting System


SP-MSM130 Micro Arc Melting Furnace


MSM20-7
(Non-Consumable) Compact Metal Melting Furnace


SP-MSM360 32-Cavity High-Throughput Arc Melting System


Induction Melting Furnace


VTC-200S Bench-top Vacuum Melt Spinning System

Film Coating Machine


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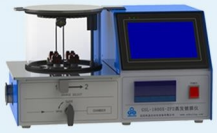
Plasma Sputtering Coater


VTC-600-3HD
Threel-Head Magnetron Sputtering Coater


GSL-1800X-ZF2 Evaporation Coater


GSL-1800X-ZF4 Evaporation Coater

Detection and analysis


Automatic 32-Sample XRF Scanning System


Automatic 32-Sample Rockwell Hardness Testing System


OTF-1500X-S-CR
Compact High Temperature Creeping Tester


Microscope

Tel:024-23826163
Phone:18624331856
E-mail:kejing@sykejing.com
Official Website:www.sykejing.com
Add:No. 35-27, Middle Hunnan Road, Hunnan District, Shenyang, Liaoning

沈阳元杰光学技术有限公司

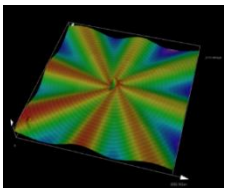
Shenyang Yuanjie Optics Technology Co., Ltd

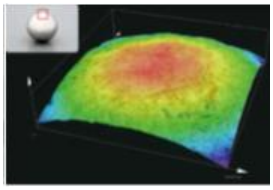
Contact person: Hao Shuai

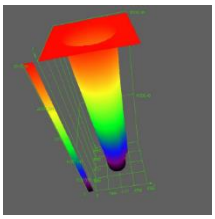
Contact number: 15640202692

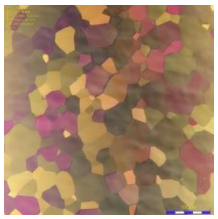
Email: olympus_shuai@126.com

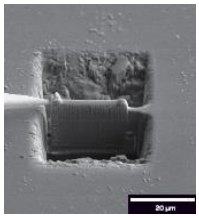
Address: No. 2113, Building F, Changxin Building, No. 322 Qingnian Street, Heping District, Shenyang City, Liaoning Province











EVIDENT | OLYMPUS

Laser confocal microscope OLS5100

3D imaging, 3Dmeasurement,roughness measurement,high-resolution multi field automatic stitching, etc

It is a sharp tool for material research such as metallographic analysis, additive manufacturing, 3D printing, and three-dimensional morphology analysis of material surfaces

EVIDENT | OLYMPUS

3D digital depth of field microscope DSX1000

From low magnification to high magnification (20-7000 times), 6 observation methods, 3D imaging, 3D measurement, roughness measurement, multi field automatic stitching, etc

It can meet the requirements of fracture analysis, bionic scientific research, foam metal analysis, large size workpiece imaging, metallographic analysis, etc

TESCAN

PERFORMANCE IN NANOSPACE

FIB Focused Ion Beam System

FIB dual beam system for gallium ion and xenon ion sources

Microscopically cutting out areas of interest for samples

SEM resolution: 0.6 nm (15KV)

FIB resolution:<2.5 nm (30KV)

ZHONGKE RAYCHAM LASER TECHNOLOGY CO., LTD

ABOUT US

Nanjing Zhongke Raycham Laser Technology Co., Ltd. was founded in 2013, Raycham is a national high-tech enterprise. Our primary focus in the research, development, and manufacturing of cutting-edge laser additive manufacturing equipment, encompassing 3D printers and laser cladding systems， Additionally, we excel in the production of intelligent laser welding system, automated production lines, and essential core components.

Leveraging independent innovation as a guiding principle, our company is dedicated to establishing a comprehensive laser industry ecosystem. we are progressively setting up research and development centers, application demonstration hubs, marketing centers, and processing and manufacturing service facilities across the Northeast, East, Central, and Southwest regions.

We actively engage in collaborative partnerships with various universities and research institutions on multiple fronts. Currently, through joint scientific research initiatives with these academic institutions, we have collectively applied for 28 patents and software copyrights. Additionally, our collaborative efforts have yielded more than 70 publications in both Chinese and English, effectively fostering the in-depth advancement of industry-university-research collaborations.

10+	300+	5+	50%+
Experience in laser additive manufacturing industry	national patent	National Major Special Projects	R&D technical personnel

T TRAINING CENTER AND TALENT DEVELOPMENT

Through the utilization of established postdoctoral workstations, joint laboratories, and other collaborative platforms, and by implementing specific talent development mechanisms, project partnerships, and academic exchange platforms in the context of school-enterprise cooperation, our goal is to expand the horizons of talent development between educational institutions and businesses. In doing so, we aim to foster the practical application skills of students and facilitate a more seamless integration of academic knowledge with real-world industry practices.

ESTABLISHING A COLLABORATIVE RESEARCH AND DEVELOPMENT LABORATORY

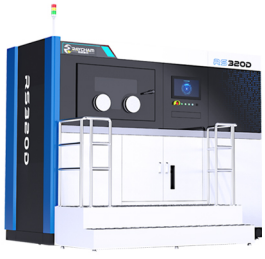
Cooperate with higher education institutions to build joint laboratories, establish a good mechanism of combining production, learning, research, and application, and provide specialized office and laboratory conditions for teachers and students who cooperate in scientific and technological projects.

CONSTRUCTION OF TRAINING BASE AND COMPETITION COOPERATION

Provide complete solutions for the construction of additive manufacturing training bases, skill competition training and competitions, technical training and communication to meet the needs of school education, scientific research, and competitions.

LDM4030E POWDER DED 3D PRINTING PLATFORM

LDM16RD BLADE REPAIR MACHINE



RS320 SLM 3D PRINTING PLATFORM

ZHONGKE RAYCHAM LASER TECHNOLOGY CO., LTD

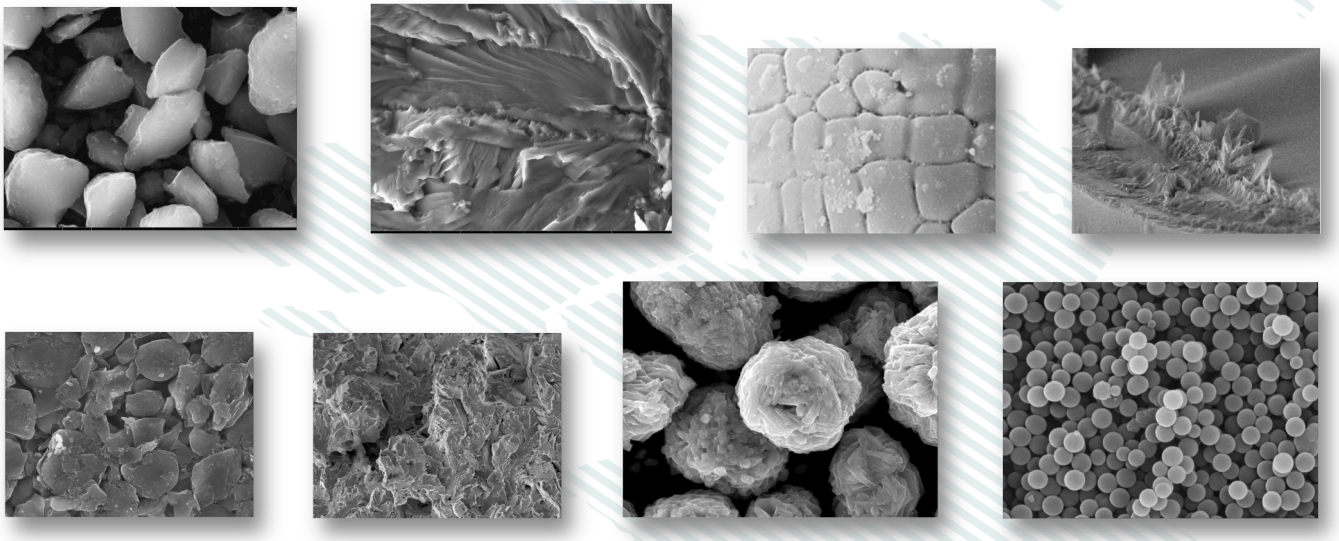
Address: No. 68 Qixia Avenue, Qixia District, Nanjing, Jiangsu Province
phone: 4001070008 mailbox: info@raycham.com

沈阳华仪
科学仪器

CUBE SERIES SEM

Tabletop scanning electron microscope can provide microscopic observation of the microstructure and surface morphology of sample surfaces for research. Breaking through the limitations of site area and the bulky body of traditional scanning electron microscopes, the CUBE series occupies a small area, does not require a special installation environment, and is more convenient to operate. It can be operated with only simple training, greatly saving early maintenance costs and time costs.

-High-Resolution Imaging
-Anywhere you need SEM
-X200,000 magnification
-5-axis stage system
-Convenient automatic function
-Maximum sample size
-High performance of X 10 ~ X 200,000 magnification



SPECTROMETER

Hitachi Analytical Instruments direct reading spectrometer series and handheld X-ray fluorescence spectrometer series, to meet the needs of different operating environments, can be accurate analysis of metal composition, wide spectral range, covering almost all elements of concern.

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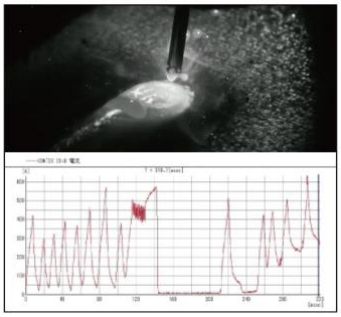
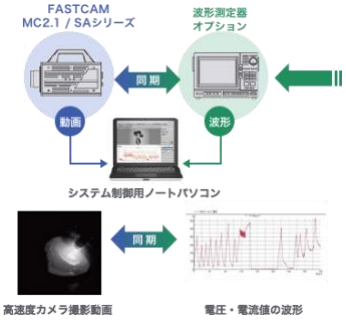
「捷昕科技」成立于 2013 年，公司主营： Photron 高速相机、高速相机高亮度光源系统、高速焊接过程测试系统、三维度非接触式 DIC 测试系统、TEMA 高速图像分析软件。Bruker 白光干涉三维轮廓仪、AMF 原子力显微镜、纳米微米压痕仪、摩擦磨损试验机。X 射线焊接残余应力测试仪、增材制造原位测量仪等。

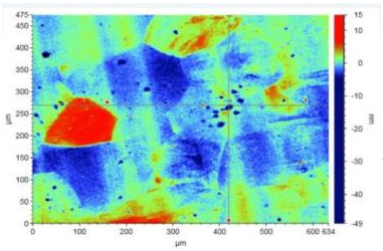
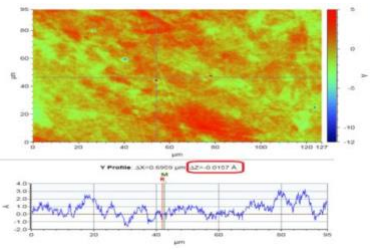
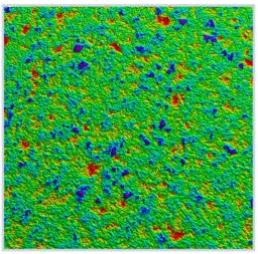
捷昕科技秉承「以光学为核心」，依托光测领域测试产品为客户提供解决方案”的经营方针，成功为众多企业、高校、中科院、国家重点实验室等提供各种个性化光学解决方案，在汽车、电子、能源、光通讯、金属材料、机械制造、化学化工、微加工等领域积累了丰富的光学应用经验。

我们的经营理念：诚信、创新、专业、精致、卓越。

我们的责任：让先进的测试技术与服务推动“中国科技事业”的发展。

我们的发展目标：以务实的经营理念和执着的专业素质，将公司发展成为“科技创新领域”类的领航标，致力于提供世界最为先进的测试技术——见·所未见。

联系方式：
华北地区：李先生 13821526512 电子邮件：bin_li@jiexintech.com
西北地区：姚先生 15129054649 电子邮件：jiming_yao@jiexintech.com
华东地区：黄先生 18802233887 电子邮件：pin_huang@jiexintech.com
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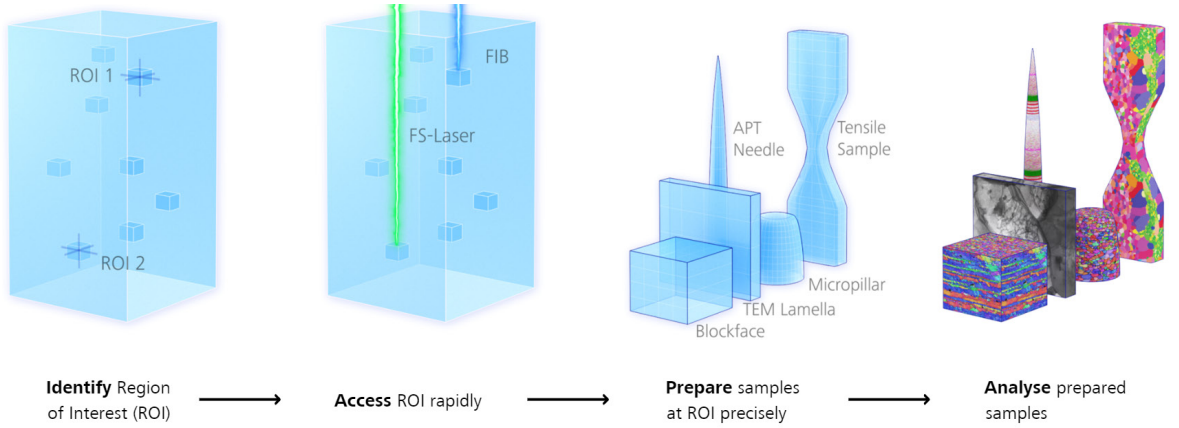
ZEISS Sample-in-Volume Analysis Workflow



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ZEISS

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Complete research equipment for metal materials

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Compact Diamond Wire Saw


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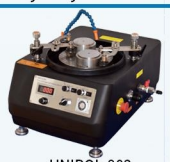
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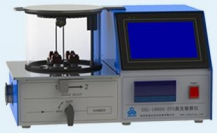
VTC-600-3HD
Threel-Head Magnetron Sputtering Coater


GSL-1800X-ZF2 Evaporation Coater


GSL-1800X-ZF4 Evaporation Coater

Detection and analysis


Automatic 32-Sample XRF Scanning System


Automatic 32-Sample Rockwell Hardness Testing System


OTF-1500X-S-CR
Compact High Temperature Creeping Tester


Microscope

Tel:024-23826163
Phone:18624331856
E-mail:kejing@sykejing.com
Official Website:www.sykejing.com
Add:No. 35-27, Middle Hunnan Road, Hunnan District, Shenyang, Liaoning

沈阳元杰光学技术有限公司

Shenyang Yuanjie Optics Technology Co., Ltd

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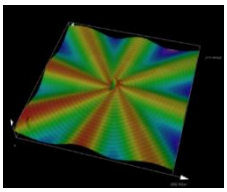
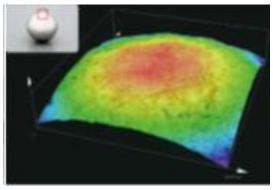
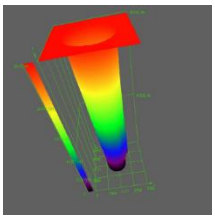
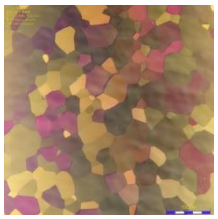
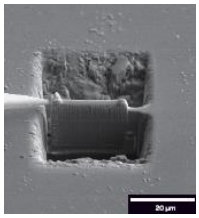
Address: No. 2113, Building F, Changxin Building, No. 322 Qingnian Street, Heping District, Shenyang City, Liaoning Province











EVIDENT | OLYMPUS

Laser confocal microscope OLS5100

3D imaging, 3Dmeasurement,roughness measurement,high-resolution multi field automatic stitching, etc

It is a sharp tool for material research such as metallographic analysis, additive manufacturing, 3D printing, and three-dimensional morphology analysis of material surfaces

EVIDENT | OLYMPUS

3D digital depth of field microscope DSX1000

From low magnification to high magnification (20-7000 times), 6 observation methods, 3D imaging, 3D measurement, roughness measurement, multi field automatic stitching, etc

It can meet the requirements of fracture analysis, bionic scientific research, foam metal analysis, large size workpiece imaging, metallographic analysis, etc

TESCAN

PERFORMANCE IN NANOSPACE

FIB Focused Ion Beam System

FIB dual beam system for gallium ion and xenon ion sources

Microscopically cutting out areas of interest for samples

SEM resolution: 0.6 nm (15KV)

FIB resolution:<2.5 nm (30KV)

ZHONGKE RAYCHAM LASER TECHNOLOGY CO., LTD

ABOUT US

Nanjing Zhongke Raycham Laser Technology Co., Ltd. was founded in 2013, Raycham is a national high-tech enterprise. Our primary focus in the research, development, and manufacturing of cutting-edge laser additive manufacturing equipment, encompassing 3D printers and laser cladding systems， Additionally, we excel in the production of intelligent laser welding system, automated production lines, and essential core components.

Leveraging independent innovation as a guiding principle, our company is dedicated to establishing a comprehensive laser industry ecosystem. we are progressively setting up research and development centers, application demonstration hubs, marketing centers, and processing and manufacturing service facilities across the Northeast, East, Central, and Southwest regions.

We actively engage in collaborative partnerships with various universities and research institutions on multiple fronts. Currently, through joint scientific research initiatives with these academic institutions, we have collectively applied for 28 patents and software copyrights. Additionally, our collaborative efforts have yielded more than 70 publications in both Chinese and English, effectively fostering the in-depth advancement of industry-university-research collaborations.

10+	300+	5+	50%+
Experience in laser additive manufacturing industry	national patent	National Major Special Projects	R&D technical personnel

T TRAINING CENTER AND TALENT DEVELOPMENT

Through the utilization of established postdoctoral workstations, joint laboratories, and other collaborative platforms, and by implementing specific talent development mechanisms, project partnerships, and academic exchange platforms in the context of school-enterprise cooperation, our goal is to expand the horizons of talent development between educational institutions and businesses. In doing so, we aim to foster the practical application skills of students and facilitate a more seamless integration of academic knowledge with real-world industry practices.

ESTABLISHING A COLLABORATIVE RESEARCH AND DEVELOPMENT LABORATORY

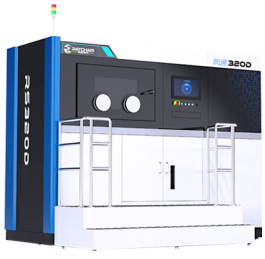
Cooperate with higher education institutions to build joint laboratories, establish a good mechanism of combining production, learning, research, and application, and provide specialized office and laboratory conditions for teachers and students who cooperate in scientific and technological projects.

CONSTRUCTION OF TRAINING BASE AND COMPETITION COOPERATION

Provide complete solutions for the construction of additive manufacturing training bases, skill competition training and competitions, technical training and communication to meet the needs of school education, scientific research, and competitions.

LDM4030E POWDER DED 3D PRINTING PLATFORM

LDM16RD BLADE REPAIR MACHINE



RS320 SLM 3D PRINTING PLATFORM

ZHONGKE RAYCHAM LASER TECHNOLOGY CO., LTD

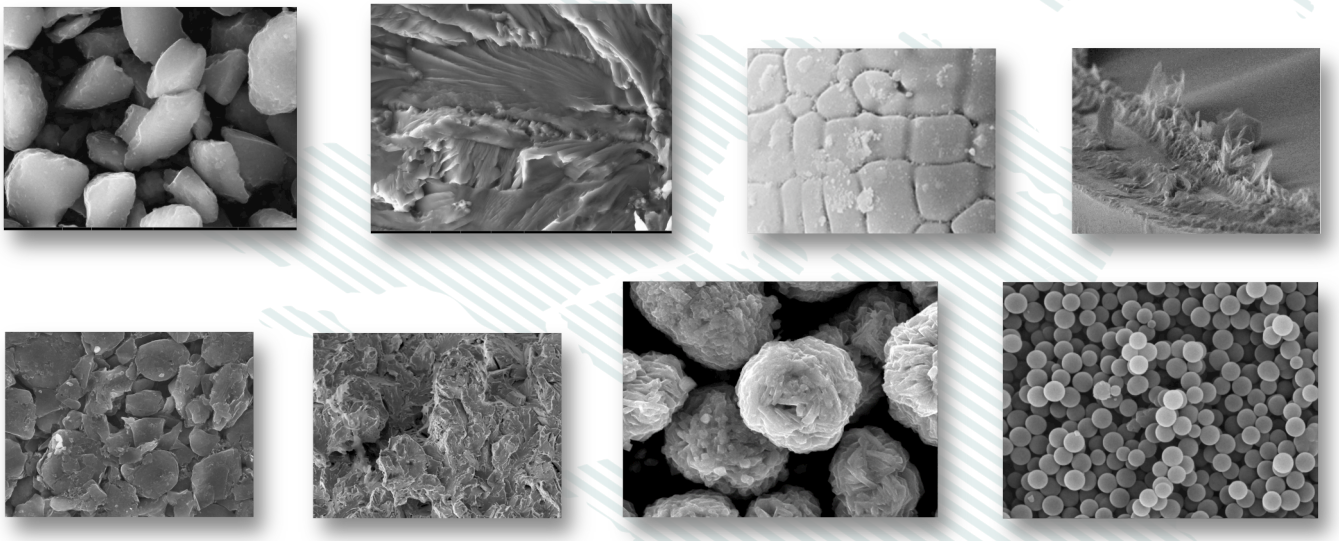
Address: No. 68 Qixia Avenue, Qixia District, Nanjing, Jiangsu Province
phone: 4001070008 mailbox: info@raycham.com

沈阳华仪
科学仪器

CUBE SERIES SEM

Tabletop scanning electron microscope can provide microscopic observation of the microstructure and surface morphology of sample surfaces for research. Breaking through the limitations of site area and the bulky body of traditional scanning electron microscopes, the CUBE series occupies a small area, does not require a special installation environment, and is more convenient to operate. It can be operated with only simple training, greatly saving early maintenance costs and time costs.

-High-Resolution Imaging
-Anywhere you need SEM
-X200,000 magnification
-5-axis stage system
-Convenient automatic function
-Maximum sample size
-High performance of X 10 ~ X 200,000 magnification



SPECTROMETER

Hitachi Analytical Instruments direct reading spectrometer series and handheld X-ray fluorescence spectrometer series, to meet the needs of different operating environments, can be accurate analysis of metal composition, wide spectral range, covering almost all elements of concern.

SHENYANG HUAYI TIMES TECHNOLOGY CO., LTD

TEL: 024-23789806 SERVICE TEL: 024-23786650
WEB: www.hytesters.com
ADD: E01-7, Hunnan International Software Park, Shenyang, Liaoning

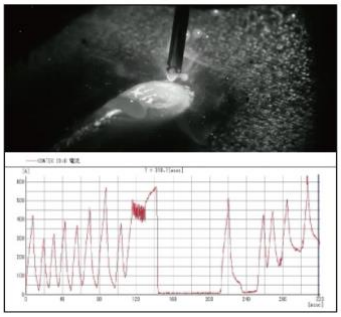
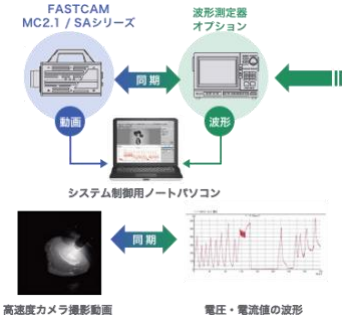

「捷昕科技」成立于 2013 年，公司主营： Photron 高速相机、高速相机高亮度光源系统、高速焊接过程测试系统、三维度非接触式 DIC 测试系统、TEMA 高速图像分析软件。Bruker 白光干涉三维轮廓仪、AMF 原子力显微镜、纳米微米压痕仪、摩擦磨损试验机。X 射线焊接残余应力测试仪、增材制造原位测量仪等。

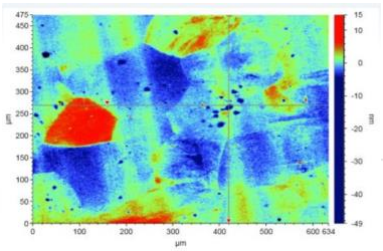
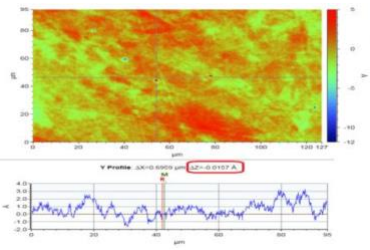
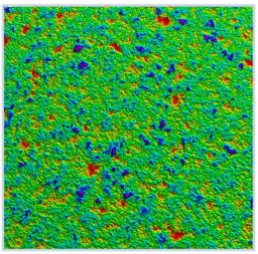
捷昕科技秉承「以光学为核心」，依托光测领域测试产品为客户提供解决方案”的经营方针，成功为众多企业、高校、中科院、国家重点实验室等提供各种个性化光学解决方案，在汽车、电子、能源、光通讯、金属材料、机械制造、化学化工、微加工等领域积累了丰富的光学应用经验。

我们的经营理念：诚信、创新、专业、精致、卓越。

我们的责任：让先进的测试技术与服务推动“中国科技事业”的发展。

我们的发展目标：以务实的经营理念和执着的专业素质，将公司发展成为“科技创新领域”类的领航标，致力于提供世界最为先进的测试技术——见·所未见。

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