

**2021 International Metallurgical Processes Workshop  
for Young Scholars (IMPROWYS 2021)**



*International Metallurgical Processes Workshop for Young Scholars*

**July 26-28, 2021**

**Shenyang, China**

## Organized by

**The Chinese Society for Metals**



## Hosted by

**Northeastern University**

**University of Leicester**

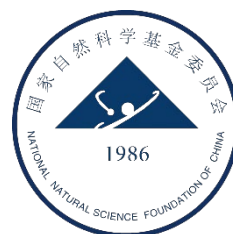


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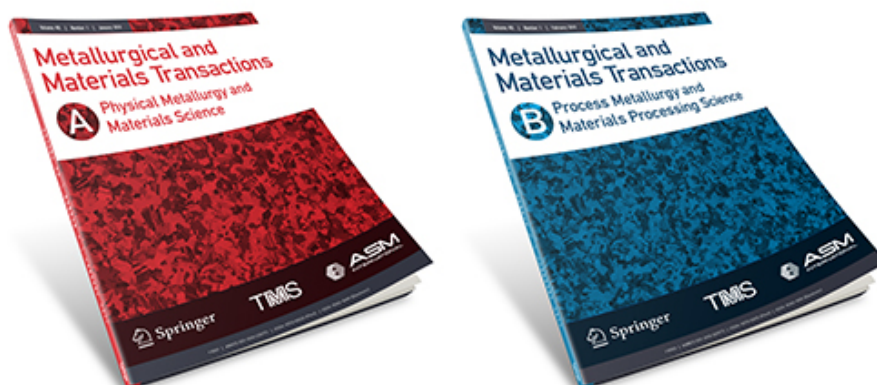
**National Natural Science Foundation of China (NSFC)**

**China Association for Science and Technology (CAST)**

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## Special Thanks



## Acknowledgement



## Organizing Committee

### Conference Chairmen:

**Cong Wang (Northeastern University)**

**Bo Chen (University of Leicester)**

### Secretaries:

**Ming Zhong (Northeastern University)**

**Zhanjun Wang (Northeastern University)**

## Contact Us

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## Conference Program

<b>Date</b>	<b>Time</b>	<b>Event</b>	<b>Location</b>
July 26, 2021	08:00-22:00	Registration	Hotel Lobby (1F)
	17:30-20:00	Buffet	Hotel Restaurant (1F)
July 27, 2021	09:00-12:00	Tour	Shenyang City
	12:00-13:00	Buffet	Hotel Restaurant (1F)
	16:00-16:35	Opening Ceremony	Juxian Hall (2F)
	16:35-16:50	Group Photo	Hotel Lobby (1F)
	16:50-20:00	Session A	Room 401 (4F)
	16:50-20:00	Session B	Room 402 (4F)
	16:50-20:00	Session C	Room 404 (4F)
	16:50-20:00	Session D	Room 407 (4F)
	20:00-21:00	Banquet	Juxian Hall (2F)
July 28, 2021	09:00-12:00	Tour	Shenyang City
	12:00-13:00	Buffet	Hotel Restaurant (1F)
	16:00-20:00	Session E	Room 401 (4F)
	16:00-20:00	Session F	Room 402 (4F)
	16:00-20:00	Session G	Room 404 (4F)
	16:00-20:00	Session H	Room 407 (4F)
	20:00-21:00	Buffet	Hotel Restaurant (1F)

<b>July 27, 2021      Opening Ceremony      Juxian Hall</b>			
	<b>Time</b>	<b>Event</b>	<b>Name</b>
1	16:00-16:05	Opening Remarks by the Chairmen of IMPROWYS 2021	Bo Chen, Cong Wang
2	16:05-16:15	Address by the Vice President of Northeastern University	Lixin Tang
3	16:15-16:25	Address by the Pro Vice Chancellor of University of Leicester	Philip Baker
4	16:25-16:35	Address by the Vice President & Secretary-General of The Chinese Society for Metals	Xinjiang Wang
5	16:35-16:40	Address by the Chief Scientist and Regius Professor of Materials, Henry Royce Institute and University of Manchester	Philip Withers
6	16:40-16:50	Group Photo	All members

<b>July 27, 2021 Room 401 Session A: Steelmaking, Refining &amp; Casting      Session Chair: Wanlin Wang, Peiyuan Ni</b>						
	<b>Time</b>	<b>Name</b>	<b>Country</b>	<b>Presentation Title</b>	<b>Institution</b>	<b>Attendance</b>
1	16:50-17:15	Wanlin Wang	China	Key issues in the initial solidification of molten steel	Central South University	In person
2	17:15-17:40	Siddhartha Misra	India	Study of process parameters affecting steel cleanliness in ultra low carbon steel grades	Tatasteel	Online
3	17:40-18:05	Youn-Bae Kang	Korea	Analysis of soluble O content in ultra low C Al-killed steel using inert gas fusion infrared absorption analyzer	POSTECH	Online
	18:05-18:20	Tea Break				
4	18:20-18:45	Peiyuan Ni	China	Dynamic change of steel/slag interfacial tension induced by chemical reactions	Northeastern University	In person
5	18:45-19:10	Ashok Kamaraj	India	Influence of slag carryover on the evolution of non-metallic inclusion in 3.2wt% Si steel	CSIR National Metallurgical Laboratory Jamshedpur	Online
6	19:10-19:35	Chao Chen	China	On the motion-melting-mixing of scrap under stationery and gas-stirring conditions-A cold model study	Taiyuan University of Technology	In person
7	19:35-20:00	Kinnor Chattopadhyay	Canada	State of the art imaging techniques for physical modelling of metal casting and metal atomization processes	University of Toronto	Online

<b>July 27, 2021 Room 402 Session B: Recycling &amp; Steelmaking      Session Chair: Zuotai Zhang, Min Jiang</b>						
	<b>Time</b>	<b>Name</b>	<b>Country</b>	<b>Presentation Title</b>	<b>Institution</b>	<b>Attendance</b>
1	16:50-17:15	Zuotai Zhang	China	Preparation of hierarchically structured calcium silicate hydrate by chemical activation of steel-making slags	Southern University of Science and Technology	In person
2	17:15-17:40	Akbar Rhamdhani	Australia	Separation of Li and Co from cathode materials using aluminothermic reduction as an alternative route for lithium-ion batteries recycling	Swinburne University of Technology	Online
3	17:40-18:05	Ying Ren	China	The dissolution of SiO <sub>2</sub> particles in CaO-Al <sub>2</sub> O <sub>3</sub> -SiO <sub>2</sub> slags observed using confocal scanning laser microscope	University of Science and Technology Beijing	In person
	18:05-18:20	Tea Break				
4	18:20-18:45	Min Jiang	China	Control of non-metallic inclusions in high quality saw wires	University of Science and Technology Beijing	In person
5	18:45-19:10	Neslihan Dogan	Canada	Inclusion characteristics in medium and high manganese steels	McMaster University	Online
6	19:10-19:35	Xu Gao	China	Transformation of alumina inclusions by the reactions between molten steel and refractory/refining slag	Central South University	In person
7	19:35-20:00	Yan Ma	Germany	Influence of microstructure and atomic-scale chemistry on the direct reduction of iron ore with hydrogen	Max-Planck-Institut für Eisenforschung GmbH	Online

<b>July 27, 2021 Room 404 Session C: Additive Manufacturing      Session Chair: Bo Chen, Yafeng Yang</b>						
	<b>Time</b>	<b>Name</b>	<b>Country</b>	<b>Presentation Title</b>	<b>Institution</b>	<b>Attendance</b>
1	16:50-17:15	Bo Chen	UK	Recent progress in the gamma titanium aluminide processed by selective electron beam melting	University of Leicester	In person
2	17:15-17:40	Chu Lun Alex Leung	UK	Probing laser powder bed fusion additive manufacturing using x-ray imaging and process replicators	University College London	Online
3	17:40-18:05	Yingtao Tian	UK	Laser polishing of powder based additive manufactured components: surface smoothing and impact to subsurface material	Lancaster University	Online
	18:05-18:20	Tea Break				
4	18:20-18:45	Wei Xu	China	Computational design of novel Ni superalloys with low crack susceptibility for additive manufacturing	Northeastern University	In person
5	18:45-19:10	Minh-Son Pham	UK	Solidification microstructure and solidification cracking in metal additive manufacturing	Imperial College London	Online
6	19:10-19:35	Yafeng Yang	China	A general coating technology of powder to fabricate high-quality metal matrix composite powders for 3D printing	Institute of Process Engineering, Chinese Academy of Sciences	In person
7	19:35-20:00	Wei Xiong	USA	Additive manufacturing as a tool for materials design and process optimization	University of Pittsburgh	Online



<b>July 27, 2021 Room 407 Session D: Steels Session Chair: Mingyue Sun, Hongliang Yi</b>						
	<b>Time</b>	<b>Name</b>	<b>Country</b>	<b>Presentation Title</b>	<b>Institution</b>	<b>Attendance</b>
1	16:50-17:15	Mingyue Sun	China	Ultrafine-grained dual-phase maraging steel applied for heavy forgings of cryogenic engineering	Institute of Metal Research, Chinese Academy of Sciences	In person
2	17:15-17:40	Mingxin Huang	China	Strong, ductile, tough deformed partitioned steel	The University of Hong Kong	Online
3	17:40-18:05	Qian Yu	China	Effect of key alloy elements on the mechanical properties of alloyed metals	Zhejiang University	Online
	18:05-18:20	Tea Break				
4	18:20-18:45	Hongliang Yi	China	Al-Si coated press hardened steel with improved bendability	Northeastern University	In person
5	18:45-19:10	Yiqiang Wang	UK	The role of Mo on the interphase nano-precipitation in low carbon micro-alloyed steels	United Kingdom Atomic Energy Authority	Online
6	19:10-19:35	Xiangliang Wan	China	The significant impact of annealing temperature on phase reversion-microstructure-property relationship in phase reversion-induced Cr-Mn-N stainless steels	Wuhan University of Science and Technology	In person
7	19:35-20:00					

<b>July 28, 2021 Room 401 Session E: Light Alloys Session Chair: Hailiang Yu, Enyu Guo</b>						
	<b>Time</b>	<b>Name</b>	<b>Country</b>	<b>Presentation Title</b>	<b>Institution</b>	<b>Attendance</b>
1	16:00-16:25	Hailiang Yu	China	Metal matrix composites development of high performance metal matrix composites via cryorolling	Central South University	In person
2	16:25-16:50	Min Zha	China	Novel superplastic deformation mechanism in a high solid solution Al-7Mg alloy with multi-scale microstructural heterogeneities	Jilin University	Online
3	16:50-17:15	Weishu Liu	China	Thermoelectric interfacial materials in the thermoelectric power generator	Southern University of Science and Technology	In person
4	17:15-17:40	Yilun Xu	UK	Integrated discrete dislocation plasticity modelling, HR-EBSD and TEM characterisation of Titanium alloys dwell fatigue	Imperial College London	In person
5	17:40-18:05	Yingjie Ma	China	The research and development of high strength and toughness $\alpha+\beta$ titanium alloy based on microzone optimization	Institute of Metal Research, Chinese Academy of Sciences	In person
	18:05-18:20	Tea Break				
6	18:20-18:45	Enyu Guo	China	Microstructural evolution in Mg/Al alloys: a perspective learned from synchrotron studies	Dalian University of Technology	In person
7	18:45-19:10	Zengbao Jiao	China	Ultrahigh-strength and ductile high-entropy alloys with coherent nano-lamellar architectures	Hong Kong Polytechnic University	Online
8	19:10-19:35	Qinglong Zhao	China	The improved corrosion resistance and mechanical strength of Al-Mg-Si by the addition of TiC nanoparticles	Jilin University	In person
9	19:35-20:00	Dikai Guan	UK	The evolution of recrystallised grains and its effects on weakened basal texture during annealing of a cold-rolled magnesium AZ31B alloy	The University of Sheffield	Online

<b>July 28, 2021 Room 402 Session F: Welding &amp; Joining Session Chair: Cong Wang, Lei Shi</b>						
	<b>Time</b>	<b>Name</b>	<b>Country</b>	<b>Presentation Title</b>	<b>Institution</b>	<b>Attendance</b>
1	16:00-16:25	Cong Wang	China	Fine-tuning weld metal compositions via flux optimization in submerged arc welding: an overview	Northeastern University	In person
2	16:25-16:50	Yongle Sun	UK	Thermal-metallurgical-mechanical modelling of electron beam welding in low alloy steel	Cranfield University	Online
3	16:50-17:15	Sutatch Ratanaphan	Thailand	Grain boundary engineering of shipbuilding steels subjected to high heat input submerged arc welding	King Mongkut's University of Technology	Online
4	17:15-17:40	Wenya Li	China	Solid-state cold spraying: goes beyond a coating process	Northwestern Polytechnical University	In person
5	17:40-18:05	Yvonne Durandet	Australia	Laser assisted spot joining of magnesium with and without adhesive	Swinburne University of Technology	Online
	18:05-18:20	Tea Break				
6	18:20-18:45	Lei Shi	China	Experimental and numerical analysis of acoustoplastic effect on friction stir welding process	Shandong University	In person
7	18:45-19:10	Chun Li	China	Diffusion bonding of Ti and Zr at ultra-low temperature via surface nano-crystallization treatment	Harbin Institute of Technology	In person
8	19:10-19:35	Imants Kaldre	Latvia	Thermoelectric effect during welding under external magnetic field	University of Latvia	Online
9	19:35-20:00	Gang Chen	China	Research progress on powder sintering involving TiH <sub>2</sub>	University of Science and Technology Beijing	Online

<b>July 28, 2021 Room 404 Session G: Structure &amp; Integrity Session Chair: Shengchuan Wu, Xianfeng Ma</b>						
	<b>Time</b>	<b>Name</b>	<b>Country</b>	<b>Presentation Title</b>	<b>Institution</b>	<b>Attendance</b>
1	16:00-16:25	Xianfeng Ma	China	On the mechanical property and failure mechanism of Cr-coated Zr4 alloy for accident tolerant fuel claddings	Sun Yat-sen University	In person
2	16:25-16:50	Thorsten Becker	South Africa	Anisotropy in near-threshold fatigue crack growth characteristics of laser-based powder bed fusion produced Ti-6Al-4V	Stellenbosch University	Online
3	16:50-17:15	Shuai Wang	China	On the orientation dependence of dislocation evolution in hydrogen-containing environment	Southern University of Science and Technology	In person
4	17:15-17:40	Yabin Yan	China	In situ SEM investigation on fatigue behaviors of microscale single-crystal fcc metals	East China University of Science and Technology	In person
5	17:40-18:05	Xian Chen	China	Mesomechanics experimental mechanics: dual beam-shear differential interference contrast microscopy	The Hong Kong University of Science and Technology	Online
	18:05-18:20	Tea Break				
6	18:20-18:45	Shengchuan Wu	China	The effect of defect population on the anisotropic fatigue resistance of AlSi10Mg alloy fabricated by laser powder bed fusion	Southwest Jiaotong University	In person
7	18:45-19:10	Mahmoud Mostafavi	UK	Application of crystal plasticity in high temperature structural integrity	University of Bristol	Online
8	19:10-19:35	Yadong Xu	China	Solution-processed metal halide perovskites for nuclear radiation detection	Northwestern Polytechnical University	In person
9	19:35-20:00	Ankur Chauhan	Germany	Superior low-cycle fatigue properties of CoCrNi compared to CoCrFeMnNi	Karlsruhe Institute of Technology	Online

<b>July 28, 2021 Room 407 Session H: Phase Transformation      Session Chair: Qiaodan Hu, Lijia Zhao</b>						
	<b>Time</b>	<b>Name</b>	<b>Country</b>	<b>Presentation Title</b>	<b>Institution</b>	<b>Attendance</b>
1	16:00-16:25	Haijun Yu	China	Structure evolution and design for high energy cathode of lithium-ions battery	Beijing University of Technology	In person
2	16:25-16:50	Qiaodan Hu	China	Structural mechanism of homogenous polycrystalline selection and glass transition in titanate melts	Shanghai Jiaotong University	In person
3	16:50-17:15	Tarek Hatem	Egypt	Microstructural numerical framework to model martensitic alloys: application to high-strength steels	British University in Egypt	Online
4	17:15-17:40	Daoyong Cong	China	Employing solid-state phase transition in shape memory alloys for elastocaloric refrigeration	University of Science and Technology Beijing	In person
5	17:40-18:05	Xiaowei Wang	China	Experimentally and analytically quantify the influence of cyclic loadings on the subsequent tensile and creep behaviors	Nanjing Tech Univerisity	Online
	18:05-18:20	Tea Break				
6	18:20-18:45	Lijia Zhao	China	Dynamic transformation behavior in low-carbon steel	Northeastern University	In person
7	18:45-19:10	Wangzhong Mu	Sweden	A machine learning model to predict deformation induced martensite transformation in austenitic stainless steels	KTH Institute of Technology	Online
8	19:10-19:35	Haiwen Luo	China	Microstructure, cooling history and its quantitative modelling of wuxilike iron meteorite	University of Science and Technology Beijing	In person
9	19:35-20:00	Chinnapat Panwisawas	UK	Digital manufacturing of solidification in investment cast single crystal superalloys	University of Leicester	Online

