



**CHINA  
HEAT  
TREATMENT  
ASSOCIATION**

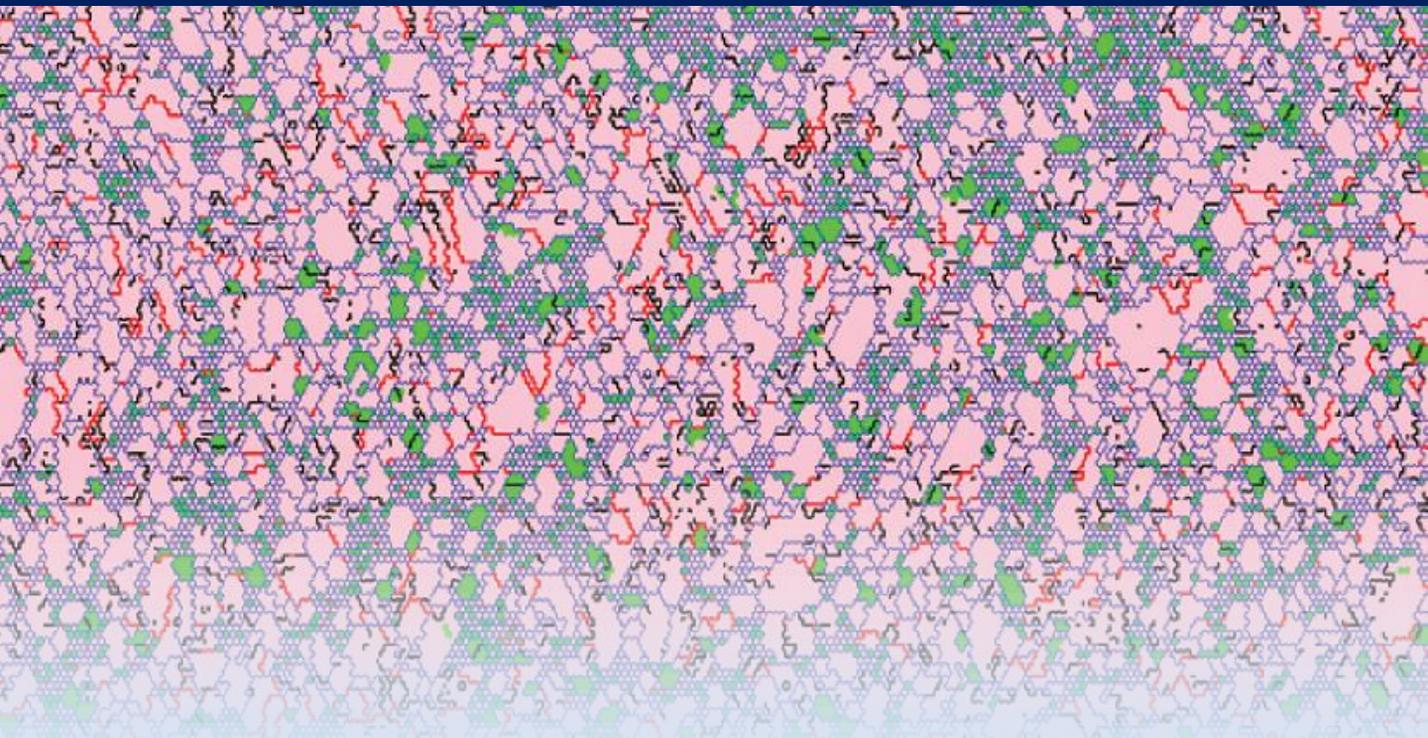


**INTERNATIONAL  
FEDERATION FOR  
HEAT TREATMENT  
AND SURFACE  
ENGINEERING**

# **5<sup>th</sup> Int'l Conf. on Heat Treatment and Surface Engineering of Tools and Dies**

Initiated by IFHTSE, Organized by CHTA  
Co-organized by Harbin Institute of Technology  
and Hangzhou Jinzhou Technology Co., Inc.

## **PROGRAMME**



**Hangzhou, China  
24-26 April 2023**



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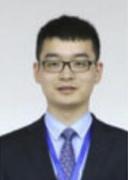
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**SCHEDULE (GMT+8)****日程**

Date 日期	Time 时间	Event 事项	Venue 地点
24 April 4月 24日	8:00 - 22:00	Registration 会议注册	InterContinental Hangzhou 良渚洲际酒店
	15:00 - 18:00	中国热协九届五次常务 理事大会	South Meeting Room, Building 4, North District, Dream Town 梦栖小镇北区4号楼南会议室
	18:30 - 20:00	Dinner 自助晚餐	InterContinental Hangzhou, Building B1 良渚洲际酒店B1楼会议区域
25 April 4月 25日	8:00 - 8:30	We gather at the Hotel entrance at 8:00 and take Bus to the Conference Venue	早8:00在酒店门口集体乘车去会场
	8:30 - 9:00	Opening Ceremony 开幕式	Meeting Room, Building 8, North District, Dream Town 梦栖小镇北区8号楼会议室
	9:00 - 12:30	Plenary Lectures 大会报告	Meeting Room, Building 8, North District, Dream Town 梦栖小镇北区8号楼会议室
	12:30 - 13:45	Lunch 午餐	Liangyulinjia Restaurant (Liangzhu) 良玉邻家(良渚店)
	13:45 - 18:00	Session I: Heat Treatment 分会场一：热处理	South Meeting Room, Building 4, North District, Dream Town 梦栖小镇北区4号楼南会议室
	13:45 - 18:00	Session II: Surface Engineering 分会场二：表面改性	Meeting Room, Building 8, North District, Dream Town 梦栖小镇北区8号楼会议室
	18:00 - 18:30	We gather at the entrance of the Building 8 at 18:10, and take Bus to the Hotel	下午18:10在8号楼会场门口集体乘车回酒店
	18:30 - 20:00	Banquet (The Best Paper Awards) 金舟之夜晚宴 优秀论文颁奖	InterContinental Hangzhou, Banquet Hall A 良渚洲际酒店平高宴会A厅
26 April 4月 26日	8:30 - 17:00	Visit (depart at 8:30, and return at 16:00) 参观 8:30出发, 16:00返回, 17:00到达酒店	We gather at the Hotel entrance, and visit SAMT Co., Ltd., and Lu Xun's Former Residence 在酒店门口集 体乘车至绍兴先越工厂,鲁迅故居



## 25 April 2023 (GMT+8) • Opening Ceremony • Plenary Lectures

Opening Ceremony		Chair: Prof. Mufu Yan, Harbin Institute of Technology	
8:30 — 9:00	 <b>Xinya Li</b> President of CHTA	 <b>Stefan Hock</b> Secretary General of IFHTSE	 <b>Wenhua Yao</b> Yuhang Vice Governor
Plenary Lectures		Chair: Dr. Fuyao Yan, Northwestern University	
9:00 — 9:30		<b>Prof. Zhenye Zhao [China]</b> Academician of CAE, Jimei University Beijing Institute of Aeronautical Materials <b>Focus on Heat Treatment Industrialization and Promote High-end Manufacturing</b>	
9:30 — 10:00		<b>Prof. Dr. Nader Asnafi [Sweden]</b> Luleå University of Technology Zhejiang Chuangge Technology Co. Ltd <b>Metal Additive Manufacturing of Production Tools / Dies / Moulds – Benefits and Constraints</b>	
10:00 — 10:30		<b>Dr. Scott MacKenzie [USA]</b> Quaker Houghton Past President of IFHTSE <b>Metallurgical Aspects of Distortion and Residual Stresses in Heat Treated Parts</b>	
10:30 — 11:00		<b>Xiaohui Tong [China]</b> Past President of CHTA <b>The Status and Trends of Heat Treatment in China</b>	
11:00 — 11:30		<b>Prof. Massimo Pellizzari [Italy]</b> University of Trento Vice President of IFHTSE <b>Heat Treatment of Additively Manufactured Tool steels: Microstructure and Properties</b>	
11:30 — 12:00		<b>Prof. Jianfeng Gu [China]</b> Shanghai Jiao Tong University Executive committee member of IFHTSE <b>Development of an additive manufactured high-strength Co-Fe-Ni alloy with high thermal conductivity for injection and die-casting mold</b>	
12:00 — 12:30		<b>Dr. Shaolou Wei [USA]</b> Massachusetts Institute of Technology <b>Overcoming the limits of strain-induced martensitic transformation in metastable face-centered cubic alloys</b>	

## 25 April 2023 (GMT+8) • Session I — Heat Treatment

Time	Title <div style="text-align: right;">Session Chair: Prof. Ruiliang Liu [Harbin Engineering University] Jinsheng Lu [Zhengzhou Research Institute of Mech. Eng. Co., Ltd]</div>
13:45-14:05	<b>Experimental Study of Heat Treatment Process for GCr15 for High-end Bearings</b> Xiaohong Dong, <sup>a</sup> Hanqin Yin, <sup>a</sup> Zejian Lu, <sup>*a</sup> Xingfu Yu <sup>b</sup> a Guangdong Strong Metal Technology Co., Ltd., Foshan, Guangdong 528313, China; b School of Mechanical Engineering, Shenyang University of Technology, Shenyang, Liaoning 110870, China
14:05-14:35	<b>Processes of Vacuum Heat Treatment</b> Li Shen* Shanghai Advanced Metallurgical Technology Corporation, Shanghai 201612
14:35-14:55	<b>The low-temperature cooling rate control of polymer quenchants – way to replace quench oil with water</b> Yu Hansen,* Ding Lin, Zuo Yongping Nanjing KERUN Lubricants Co.,Ltd. 1, Jingfeng industrial park, No. 98 Chengxin Avenue, Jiangning, Nanjing, 211100, China
14:55-15:15	<b>Induction heating for the surface process of stamping die</b> Jixu Xu* Shanghai Minzhao Industry Trade Co., Ltd. 10F ledu Building No.251 Ledu Road, Songjiang District Shanghai
15:15-15:35	<b>Cryogenic Treatment of Steel and Its Application</b> Kaixuan Gu, <sup>*a</sup> Jia Guo, <sup>a, b</sup> Zeju Weng, <sup>a</sup> Junjie Wang, <sup>a, b</sup> a CAS Key Laboratory of Cryogenics, Technical Institute of Physics and Chemistry, Beijing 100190, China; b Beijing Fawip Cryogenic Technology Co., Ltd, Beijing 100190, China
15:35-15:50	<b>Mechanical and corrosion properties of bulk nanocrystalline 304 stainless steel plate</b> Shenggang Wang,* Miao Sun Shenyang National Laboratory for Material Sciences, Institute of Metal Research, Chinese Academy of Sciences,110016, Shenyang, China
15:50-16:05	<b>The Harm of Corrosion to Molds and the Importance of Surface Integrity Manufacturing</b> Jingxian Luo* Institute of Heat Treatment, DAXING, TAIZHOU
16:05-16:20	<b>Carbon emission calculation method for heat treatment industry</b> Kun Li, <sup>*a,b</sup> Weijiang Yu, <sup>a,b,c</sup> Yongwu Zhang, <sup>a,b</sup> Jiayang Yu, <sup>c</sup> Jia Yang <sup>a</sup> a Xi'an Electric Furnace Institute Co., Ltd, Xi'an 710061,China; b MCC Electric Furnace Engineering Technology Center, Xi'an 710061, China; c Xi'an Huijin Science and Technology Co., Ltd, Xi'an 710061, China

## 25 April 2023 (GMT+8) • Session I — Heat Treatment

Time	Title <div style="text-align: right;">Session Chair: <b>Prof. Jing Hu</b> [Changzhou University] <b>Prof. Hongtao Chen</b> [Harbin University of Science and Technology]</div>
16:20-16:35	<p><b>Heat Treatment for the Toughening of Tool and Die Steels</b> Zhizhong Yuan,<sup>*a</sup> Lu Chen,<sup>a</sup> Mengfei Wang,<sup>a</sup> Jiabo Wei,<sup>a,b</sup>, Haiming Liu<sup>a</sup>, Zongran Niu<sup>a</sup>, Zhiyuan Wang<sup>a</sup>, Yulin Ju<sup>a</sup>, Fuyang Cao<sup>a</sup>, Rui Luo<sup>a</sup> and Bocheng Zhang,<sup>a,c</sup> a School of Materials Science and Engineering, Jiangsu University, Zhenjiang Jiangsu 212013, China; b Bruker Nano Analytics GmbH, Shanghai 200000, China; c Jingkou Heat Treatment Service Station of Zhenjiang, Zhenjiang Jiangsu 212012, China</p>
16:35-16:55	<p><b>Integrated High Pressure Die Casting's challenge to Tool Steel and Heat Treatment</b> Jackson Sun* Schmiede werke Gröditz GmbH, Building A -206, Digital Mansion, Flower City, NO.1079 Nahai Ave. Shekou, Nanshan District, Shenzhen, China</p>
16:55-17:10	<p><b>Surface corrosion behavior of different aged 2A97 Al alloy after mechanical polishing</b> Yuxiao Qiu,<sup>a</sup> Junfeng Chen,<sup>*a</sup> Rongyi Liu,<sup>a</sup> Linchi Zou,<sup>b</sup> Haitao Chi<sup>c</sup> a School of Materials Science and Engineering, Fuzhou University, Fujian 350116, China; b School of Materials Science and Engineering, Fujian University of Technology, Fuzhou 350118, China; c Fujian Xiangxin Light alloys manufacture Co., Ltd., Fuzhou 350119, China</p>
17:10-17:30	<p><b>Heat treatment and surface strengthening of high-speed steel molds</b> Buqing Zhao* Jialong Knives Manufacturing Co., Ltd, Maanshan, An Hui, 243131</p>
17:30-17:45	<p><b>Status quo and selection of testing instruments and equipment using for heat treatment quality control</b> Alex Zhang* Standard-Trust Testing Technology Co., Ltd. , 11, No.2 Guigu Road, Guigu Science Park, Jiashan County, Zhejiang 314100, China</p>
17:45-18:00	<p><b>Application of Laser Phase Change Hardening Technology with High Heat Concentration</b> Luo Hong* Beijing Jingye Bearing Co., Ltd.</p>

## 25 April 2023 (GMT+8) • Session II — Surface Engineering

Time	<p style="text-align: right;"><b>Session Chair:</b>  <b>Prof. Nader Asnafi</b> [Luleå University of Technology]  <b>Prof. Yanxiang Zhang</b> [Harbin Institute of Technology]</p>
13:45-14:00	<p><b>Metastable structure transformation of diamond-like carbon films for tools and dies</b>  <b>Yefei Zhou<sup>*a</sup>, Zhihao Chen<sup>a</sup>, Zhengyu Qian<sup>b</sup>, Xiaolei Xing<sup>*a</sup></b>            a School of Mechanical Engineering, Yanshan University, Qinhuangdao 066004, China; b Star-Arc Coating New Material Technology Co., LTD, Suzhou 215000, China</p>
14:00-14:15	<p><b>Research on the application of New-QPQ in hot-working die steel</b>  <b>Defu Luo,<sup>*</sup> Liwei Long, Fangzhou Wang</b>            School of Materials Science and Engineering, Xihua University, Chengdu Sichuan 610039, China</p>
14:15-14:30	<p><b>Prediction of quenching crack by numerical simulation with an embeded ductile fracture criterion</b>  <b>Daming Tong, Miao Gong, Jianfeng Gu<sup>*</sup></b>            Institute of Materials Modification and Modelling, School of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai 200240, China</p>
14:30-14:45	<p><b>Low temperature plasma nitriding with high efficiency and excellent performance enhanced by titanium for 304 austenitic stainless steel</b>  <b>Runtao Li,<sup>a</sup> Jing Hu,<sup>*a</sup> Xiaobing Zhao<sup>a, b</sup></b>            a Jiangsu Key Laboratory of Materials Surface Science and Technology, Changzhou University, Changzhou 213164, China; b National Experimental Demonstration Center for Materials Science and Engineering, Changzhou University, Changzhou 213164, China</p>
14:45-15:00	<p><b>Study on Phase Control and Corrosion Mechanism of Nitridation Post-Oxidation</b>  <b>Jinquan Sun,<sup>*a</sup> Yanpeng Xue,<sup>b</sup> Zan Liu,<sup>a</sup> Fujie Li,<sup>a</sup> Chongyang Zhong,<sup>a</sup> Haotian li,<sup>a</sup> Yucha Gao<sup>a</sup></b>            a Shandong University of Science and Technology; b University of Science and Technology Beijing</p>
15:00-15:15	<p><b>Enhancement of Hardness and Sliding Wear Properties of Ti-6Al-4V Alloy by Cold Rolling/Low Temperature Nitriding Composite Process</b>  <b>Yudong Fu<sup>*</sup></b>            College of Materials Science and Chemical Engineering, Harbin Engineering University, Harbin 150001, China</p>
15:15-15:30	<p><b>Catalysis and strengthening mechanism of rare earth in plasma nitriding from first principles</b>  <b>Yuan You,<sup>*a</sup> Mufu Yan<sup>b</sup></b>            a School of Materials Science and Engineering, Heilongjiang Provincial Key Laboratory of Polymeric Composition materials, Qiqihar University, Qiqihar Heilongjiang 161006, China; b School of Materials Science and Engineering, National Key Laboratory for Precision Hot Processing of Metals, Harbin Institute of Technology, Harbin, Heilongjiang 150001, China</p>
15:30-15:45	<p><b>Catalytic nitriding of AISI H13 dies by ABO<sub>3</sub> perovskite oxides</b>  <b>Chengsong Zhang,<sup>*</sup> Shuai Li, Daodong Tang</b>            School of Materials Science and Engineering, Southwest Jiaotong University, Chengdu, 610036, P.R. China</p>
15:45-16:00	<p><b>Numerical simulation and properties of 42CrMo Steel surface modified layer with plasma nitriding and laser quenching</b>  <b>Yixue Wang<sup>*</sup></b>            School of Materials Science and Engineering, Shanghai University of Engineering Science, Shanghai 201620</p>

## 25 April 2023 (GMT+8) • Session II — Surface Engineering

Time	Title Prof. Jinquan Sun [Shandong University of Science and Technology] Prof. Yuan You [Qiqihar University]	Session Chair:
16:00-16:15	<b>A kinetic model for vacuum carburizing</b> Yanxiang Zhang, <sup>*a</sup> Mufu Yan, <sup>a</sup> Leyu Zhou, <sup>b</sup> Yueming Xu <sup>b</sup> a School of Materials Science and Engineering, National Key Laboratory for Precision Hot Processing of Metals, Harbin Institute of Technology, Harbin, Heilongjiang 150001, China; b Beijing Research Institute of Mechanical & Electrical Technology, Beijing 100083, China	
16:15-16:30	<b>Rare earth accelerated plasma nitriding on CoCrCuFeNi high entropy alloys</b> Yifan Wang, <sup>a</sup> Yuan You <sup>*a</sup> , Mufu Yan <sup>b</sup> a School of Materials Science and Engineering, Heilongjiang Provincial Key Laboratory of Polymeric Composition materials, Qiqihar University, Qiqihar Heilongjiang 161006, China; b School of Materials Science and Engineering, National Key Laboratory for Precision Hot Processing of Metals, Harbin Institute of Technology, Harbin, Heilongjiang 150001, China	
16:30-16:45	<b>Thermal stability of low-temperature plasma nitrided layer on 17-4PH stainless steel under simulated service environment</b> Lingze Li, Ruiliang Liu, <sup>*</sup> Quanli Liu Key Laboratory of Superlight Material and Surface Technology of Ministry of Education, College of Materials Science and Chemical Engineering, Harbin Engineering University, Harbin 150001, China	
16:45-17:00	<b>Microstructure evolution of gradient-structured Cu-2Ti alloys produced by surface mechanical attrition treatment</b> Huan Wei <sup>a</sup> , Lifeng Hou <sup>b</sup> , Huayun Du <sup>b</sup> , Yinghui Wei <sup>b,*</sup> a College of Aeronautics and Astronautics, Taiyuan University of Technology; b College of Materials Science and Engineering, Taiyuan University of Technology, 030024, Shanxi, China	
17:00-17:15	<b>Microstructure and Hardness Distribution of 20Cr2Ni4 Steel after Carburizing and Quenching: Prediction and Experiment</b> Bangzhan Long, Lei Zhu, Ying Yang, Yanxiang Zhang, Mufu Yan <sup>*</sup> School of Materials Science and Engineering, Harbin Institute of Technology, Harbin 150001, China	
17:15-17:30	<b>Improved high temperature oxidation resistance of AISI304 steel by PVA modified Al sol coating</b> Hao Wu, Hongtao Chen, <sup>*</sup> Jichao Lu, Yicheng Feng, Sicong Zhao, Erjun Guo School of Materials Science and Chemical Engineering, Harbin University of Science and Technology. Harbin 150080, P R China	
17:30-17:45	<b>Effect of Cu on microstructure and wear properties of TiAl/Cu composite coatings</b> Qin Wang, Bin Han, <sup>*</sup> Qi Zhang, Meiyang Li, Fuhao Qi, Lihu Guo School of Materials Science and Engineering, China University of Petroleum (East China), 66 Chang Jiang West Road, Qingdao, 266580, China	
17:45-18:00	<b>Investigation on Microstructure and Properties of CoCrFeNiMo High Entropy Alloy Coating Prepared by High-speed Laser Cladding</b> Qi Zhang, Bin Han, <sup>*</sup> Qin Wang, Fuhao Qi, Meiyang Li, Chunyang Hu School of Materials Science and Engineering, China University of Petroleum (East China), 66 Chang Jiang West Road, Qingdao, 266580, China	