

## 2022 International Symposium on Structural Integrity

### Third Announcement



#### 1. Aims and Scope of the Symposium

The 2022 International Symposium on Structural Integrity (ISSI2022) will be held at **Changsha, China**, by Changsha University of Science and Technology, during **October 14-17, 2022**. Due to COVID-19, ISSI2022 will be held on line and on site simultaneously. The predecessor of the annual symposium, Fracture Mechanics series, took place each year from 2003 to 2009, was renamed as Structural Integrity series after 2010, and organized by China Structural Integrity Consortium (CSIC).

Critical infrastructure encompasses a vast array of engineered systems and assets, including the facilities for gas and oil storage, electrical power systems, transportation systems, etc. They are so vital that their incapacity or destruction would have a debilitation impact on the safety of people's lives and property. Undoubtedly, there is a significant need to ensure the security and durability of these infrastructure systems. All this underpins the theme of ISSI2022, "**Structural Integrity of Critical Infrastructure**".

The stock of major energy and chemical infrastructure is huge, and a large part of it has entered or will enter the middle or large stage of service. It is facing severe damage and disaster risks, and the problem of service safety is becoming increasingly prominent. In addition, with the gradual and wide application of new energy such as hydrogen energy, its storage and transportation safety supervision and disaster prevention are also extremely urgent. Mastering the service safety status of massive major energy and chemical infrastructure and realizing efficient and accurate diagnosis are the keys to ensure its safe operation.

The aim of this symposium is hence to bring together people from both academic and industrial communities to exchange ideas and network friendship by discussing emerging structural integrity issues related to carbon neutrality, where papers toward are mostly welcome.

#### 2. Organizers

##### China Structural Integrity Consortium

including following members:

East China University of Science and Technology

Hefei General Machinery Research Institute

China Special Equipment Inspection and Research Institute

Zhejiang University  
Beihang University  
Nanjing Tech University  
Zhejiang University of Technology  
Zhengzhou University  
Southwest Jiaotong University  
Shandong University  
Changsha University of Science and Technology  
Tianjin University  
Jiangsu Province Special Equipment Supervision Institute  
Suzhou Nuclear Power Research Institute  
Centre of Excellence for Advanced Materials, Dongguan

### **3. Local organizers**

Changsha University of Science and Technology

### **4. Invited speakers**

- (1) Solids in nano-scales - extreme strength and elasticity  
*Prof. Wei Yang, Zhejiang University, China*
- (2) Engineer metals with internal interfaces for enhanced mechanical performance  
*Prof. Huajian Gao, Nanyang Technological University, Singapore*
- (3) Theory and method of fault diagnosis, risk assessment and early warning of oil and gas safe production system and equipment  
*Prof. Laibin Zhang, China University of Petroleum (Beijing), China*
- (4) RFID sensors-based inspection and monitoring structural integrity  
*Prof. Guiyun Tian, Newcastle University, U.K.*
- (5) Recent advances in ultrasonic array imaging and its implications for structural integrity assessment  
*Prof. Burce W Drinkwater, University of Bristol, U.K.*
- (6) New durable asphalt pavement design theory and method  
*Prof. Jianlong Zheng, Changsha University of Science and Technology, China*
- (7) Design and characterisation of mechanical meta-materials for impact mitigation  
*Prof. Lin Ye, Southern University of Science and Technology, China*
- (8) Strain-induced acceleration of the degradation of the crystallinity around grain boundaries in stainless steels under creep load at elevated temperature  
*Prof. Hideo Miura, Tohoku University, Japan*
- (9) Probing reversible noncovalent molecular interactions toward developing multifunctional soft materials and surfaces  
*Prof. Hongbo Zeng, University of Alberta, Canada*
- (10) Research and application of anti-icing technology for power grid  
*Prof. Jiazheng Lu, State Key Laboratory of Disaster Prevention and Mitigation for Power Transmission and Transformation Equipment, China*

- (11) TBD  
*Prof. Caijun Shi, Hunan University, China*
- (12) Structural integrity assessment of important components in nuclear power plants  
*Dr. Yinsheng Li, Japan Atomic Energy Agency, Japan*
- (13) Multi-source uncertainty quantification, propagation and optimization design for mechanical structures  
*Prof. Xu Han, Hebei University of Technology, China*
- (14) Multiscale mechanics and structural integrity of additive manufactured materials  
*Prof. Jian Lu, City University of Hongkong, Hongkong, China*
- (15) Predicting high temperature hydrogen attack and creep deformation in low alloy steels  
*Prof. Kamran Nikbin, Imperial College London, U.K.*
- (16) Corrosion reliability  
*Dr. Jay Zhou, JHZ Strategic QA, U.S.*
- (17) Progresses on the modelling of creep cavitation, deformation, and creep fracture  
*Prof. Qiang Xu, University of Huddersfield, U.K.*
- (18) From oil and gas to offshore wind turbine structures-fatigue design considerations  
*Dr. Yanhui Zhang, PipeChina Science and Technology Institute, China*
- (19) Artificial neural network and direct method-based probabilistic low cycle fatigue and creep-fatigue analyses for pressurized components  
*Prof. Haofeng Chen, University of Strathclyde, U.K.*
- (20) Critical issues of safety performance of advanced high-temperature materials in environments typical of energy and power engineering  
*Prof. Yan Niu, Changsha University of Science and Technology, China*
- (21) Treatment of residual stress in strain-based fracture assessment of pipeline girth welds  
*Prof. Guiyi Wu, Centre of Excellence for Advanced Materials (Dongguan), China*
- (22) On structural operational integrity of infrastructure  
*Prof. Yuting He, Air Force Engineering University, China*
- (23) Hydrogen embrittlement mechanisms and hydrogen-tolerant design of advanced complex metallic materials  
*Prof. Binhan Sun, East China University of Science and Technology, China*
- (24) Controlling factor on hydrogen induced cracking susceptibility of low alloy high strength steels  
*Prof. Guangfu Li, Shanghai Research Institute of Materials, China*
- (25) Fracture and failure analysis of additively manufacture titanium lattice structures  
*Prof. Yuer Ma, Northwestern Polytechnical University, China*
- (26) Calculation method of weight function in fracture mechanics  
*Prof. Xueren Wu, AECC Beijing Institute of Aeronautical Materials, China*
- (27) Structural integrity of critical infrastructure  
*Prof. Jinhao Qiu, Nanjing University of Aeronautics and Astronautics, China*
- (28) Fatigue and reliability for aero-engine's hot section components

- Prof. Dianyin Hu, Beihang University, China*
- (29)Electronic packaging reliability  
*Prof. Yunhui Mei, Tiangong University, China*
- (30)Some new viewpoints and thoughts on the mechanism of metal fatigue  
*Prof. Xiaogang Wang, Hunan University, China*
- (31)Mechanical strengthening based on bioinspired strategy  
*Assoc. Prof. Yunfei Jia, East China University of Science and Technology, China*
- (32)Determination of the critical defect and fatigue life of high-speed railway axles under variable amplitude loads  
*Prof. Shengchuan Wu, Southwest Jiaotong University, China*
- (33)Additive manufacturing of gamma-TiAl: opportunities and challenges for a technological breakthrough  
*Prof. Bo Chen, University of Leicester, U.K.*
- (34)In-situ study on the plastic deformation and fatigue properties of Al<sub>0.3</sub>CoCrFeNi high entropy alloy  
*Prof. Xianfeng Ma, Sun Yat-sen University, China*
- (35)Strain localization of zirconium alloys induced by  $\delta$ -hydride precipitation  
*Assoc. Prof. Xiang Guo, Tianjin University, China*
- (36)The correlation of fatigue/creep-fatigue crack propagation rate with unified constraint parameter  
*Assoc. Prof. Jie Yang, University of Shanghai for Science and Technology, China*
- (37)Effect of laser shock peening and aluminizing on the corrosion resistance of AISI 321 steel to molten Al-Si alloy  
*Prof. Wei Li, Changsha University of Science and Technology, China*
- (38)Research on low cycle fatigue properties of nickel based single crystal structure with shaped gas film holes processed by femtosecond laser  
*Prof. Zhixun Wen, Northwestern Polytechnical University, China*
- (39)Low cycle fatigue behavior and deformation mechanism of high-entropy alloy with heterogeneous structure  
*Assoc. Prof. Zhe Zhang, Tianjin University, China*
- (40)Damage assessment of high temperature materials under various creep fatigue loadings  
*Assoc. Prof. Xiaowei Wang, Nanjing Tech University, China*
- (41)Ultrasonic wave field imaging and inversion in non-destructive evaluation and structural health monitoring  
*Asst Prof. Jiaze He, The University Alabama, U.S.*
- (42)Key issues on future power battery's reliability and safety  
*Prof. Weiling Luan, East China University of Science and Technology, China*
- (43)Exploring and manipulating guided wave features for enhanced performance of structural health monitoring systems  
*Assoc. Prof. Yanfeng Shen, Shanghai Jiao Tong University, China*
- (44)Physics-based machine learning method for fatigue life prediction of AM materials

- Prof. Shunpeng Zhu, University of Electronic Science and Technology of China, China*  
 (45) An international benchmark on residual stress assessment for welding repair in nuclear power plant  
*Prof. Qingrong Xiong, Shandong University, China*  
 (46) Structural integrity of nanomaterials based mechanical systems: concept, processing, simulation and applications  
*Prof. Jian Wang, University of Nebraska-Lincoln, U.S.*  
 (47) Basic models for primary creep  
*Prof. Rolf Sandström, KTH, Sweden*  
 (48) Viscoplastic constitutive modelling of the ratchetting behavior of 35CrMo steel subjected to cyclic loading considering the stress amplitude effect  
*Prof. Xiaotao Zheng, Wuhan Institute of Technology, China*  
 (49) Analysis of fundamental research in structural strength  
*Prof. Mingliang Zhu, East China University of Science and Technology, China*  
 (50) Void swelling in additively manufactured 316L stainless steel  
*Assoc. Prof. Miao Song, Shanghai Jiao Tong University, China*  
 (51) Excitation of odd harmonics of torsional guided waves in pipelines using magnetostrictive sensor  
*Prof. Xiucheng Liu, Beijing University of Technology, China*

## 5. Schedule of ISSI2022

Day	Time	Event	Place
Oct 14	10:00—22:00	<b>Registration</b>	Hotel lobby
	19:30—22:00	Panel discussion : Funding Policy	Furong Hall
Oct 15	08:30—08:45	<b>Conference opening</b>	Hunan Hall
	08:45—10:15	Series session 1	Hunan Hall
	10:15—10:45	<b>Group photos &amp; coffee break</b>	
	10:45—12:00	Series session 2	Hunan Hall
	12:00—	<b>Lunch</b>	
	14:00—15:40	Series session 3	Hunan Hall
	15:40—16:00	<b>Coffee break</b>	
	16:00—18:30	Series session 4	Hunan Hall
	18:30—	<b>Conference dinner</b>	Hunan Hall
	Oct 16	08:30—10:10	Parallel sessions 1-8
10:10—10:30		<b>Coffee break</b>	
10:30—12:10		Parallel sessions 1-8 & Student paper competition 1	
12:10—		<b>Lunch</b>	
13:30—15:40		Parallel sessions 1-8 & Student paper competition 2	

	15:40—16:00	<b>Coffee break</b>	
	16:00—17:50	Parallel sessions 1-8 & Student paper competition 3	
	16:10—18:30	Poster Q&A session	Yuelu Hall
	18:30—	<b>Buffet for dinner</b>	
	08:30—10:00	Parallel sessions & Series session 5	
Oct 17	10:30—11:30	<b>Closing ceremony</b>	Hunan Hall
	14:00—18:00	Technical visiting (some participants only )	
<b>End</b>			

**Note:** In case of a covid-19 travel ban, the speakers who intend to give an online presentation please send the abstract's ID, abstract's title, and a request to [issi2022@china-sic.net](mailto:issi2022@china-sic.net) before September 30, 2022.

## 6. Registration and accommodation

The ISSI2022 will be held at **Hunan Huatian Hotel**, located at 300 jiefangdonglu Road, Changsha, 410114, China. Registration fee will be 360 USD and 270 USD for on-site official participants and students, respectively. The registration fee covers admission to all technical sessions; two refreshment breaks each day of the conference, lunches, dinners, conference banquet, and a copy of the conference proceedings, but not accommodation. Accommodation at the conference venue needs to be pre-booked. The **online participants** will be **free** of registration fee.

## 7. ISSI2022 Awards

The China Structural Integrity Consortium is delighted to sponsor **Best Student Paper Awards** and **Best Poster Awards** at ISSI2022. The details of awards can be found at <https://issi2022.china-sic.net/page.asp?call=Awards>.

## 8. Contact Information

### Symposium Secretariat

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More information can be found at ISSI2022 website (<https://issi2022.china-sic.net>).

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Chinese Pressure Vessel Institution  
Chinese Failure Analysis Institution  
International Institute of Welding (IIW) - Pressure Vessels, Boilers & Pipelines  
Changsha Science and Technology Association

**China Structural Integrity Consortium**  
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