

## 一、会议总日程安排/General Conference Schedule

时间		内容		会议号及直播地址
12月 03日	8:30-9:15	开幕式		腾讯会议 Tencent ID: 833-749-233
	9:15-11:45	大会特邀报告		密码 Passcode: 221203
	14:00-15:30	大会特邀报告		Zoom 会议 Zoom ID: 817 9024 9359 密码 Passcode: 221203
	15:40-17:50	分论坛 报告主题	爆炸安全与防护	腾讯会议 Tencent ID: 593-839-558 密码 Passcode: 221203
			矿山与地下工程安全	腾讯会议 Tencent ID: 713-491-176 密码 Passcode: 221203
			风险评估	Zoom 会议 Zoom ID: 899 6144 2055 密码 Passcode: 221203
12月 04日	08:30-10:00	大会特邀报告		Zoom 会议 Zoom ID: 811 0006 3824 密码 Passcode: 221204
	10:00-12:10	分论坛 报告主题	消防安全	Zoom 会议 Zoom ID: 862 9886 7775 密码 Passcode: 221204
			新能源/材料安全	腾讯会议 Tencent ID: 915-825-342 密码 Passcode: 221204
			危险化学品安全	腾讯会议 Tencent ID: 386-957-576 密码 Passcode: 221204
	14:00-15:40	分论坛 报告主题	人员安全与安全文化	腾讯会议 Tencent ID: 469-570-456 密码 Passcode: 221204
			消防安全	腾讯会议 Tencent ID: 418-466-899 密码 Passcode: 221204
			工业过程安全	腾讯会议 Tencent ID: 843-166-679 密码 Passcode: 221204
	15:40-16:00	闭幕式及优秀论文表彰		腾讯会议 Tencent ID: 701-896-125 密码 Passcode: 221204

## 二、会议详细日程安排/Detailed Conference Schedule

时间 /Time	12月3日上午 AM, 03 December (UTC+08) 腾讯会议 Tencent ID: 833-749-233 密码 Passcode: 221203
<p style="text-align: center;"><b>开幕式 Opening Ceremony</b> 主持人: 潘勇 教授 南京工业大学 <b>Host: Yong Pan, Prof. of Nanjing Tech University</b></p>	
08:30-08:35	<p>介绍与会嘉宾 <b>Introduction of Guests</b></p>
08:35-08:45	<p>主办单位领导蒋军成校长致辞 <b>Speech from Juncheng Jiang, President of Nanjing Tech University</b></p>
08:45-08:55	<p>大会主席范维澄院士致欢迎辞 <b>Speech from Weicheng Fan, Conference President of ISUIS 2022</b></p>
08:55-09:05	<p>教育部全国高等学校安全科学与工程类专业教学指导委员会张瑞新主任致辞 <b>Speech from Ruixin Zhang, Chairman of Ministry of Education National University Safety Science and Engineering Teaching Steering Committee</b></p>
09:05-09:15	<p>南京工业大学“探·智”国际青年学者论坛宣传 <b>Propaganda of Nanjing Tech University “Exploring and Wisdom” International Young Scholars Forum</b></p>
<p style="text-align: center;"><b>大会特邀报告 Plenary Speech</b> 主持人: 张和平 教授 (中国科学技术大学) /潘勇 教授 (南京工业大学) <b>Host: Prof. Heping Zhang, University of Science and Technology of China / Prof. Yong Pan, Nanjing Tech University</b></p>	
09:15-09:45	<p>城市韧性: 理念与进展 Urban resilience: concept and some progress 范维澄 院士 清华大学 <b>Weicheng Fan, Academician of Chinese Academy of Engineering, Tsinghua University</b></p>
09:45-10:15	<p>城市燃气管网安全保障技术 Safety Guarantee Technology of City Gas Pipeline Network 张来斌 院士 中国石油大学 (北京) <b>Zhang Laibin, Academician of Chinese Academy of Engineering, China University of Petroleum, Beijing</b></p>
10:15-10:45	<p>聚焦高层次人才培养, 助力高质量发展 Focusing on cultivation of high-level talents to help high-quality development 冯长根 国际欧亚科学院院士 北京理工大学 <b>Changgen Feng, Academician of International Eurasian Academy of Sciences, Beijing Institute of Technology</b></p>
10:45-11:15	<p>热分析技术在锂电池安全测试中的应用 Application of thermal analysis technology in safety test of lithium battery 徐启铭 教授 台湾云林科技大学 <b>Chi-min Shu, Prof. of National Yunlin University of Science and Technology</b></p>
11:15-11:45	<p>密闭空间 CO 产物的原位同步消纳方法研究 Study on in situ Synchronous Absorption of CO in Confined Space 周福宝 教授 中国安全生产科学研究院院长 <b>FubaoZhou, Prof. and Dean of China Academy Safety Science and Technology</b></p>

时间 /Time	12月3日下午 PM, 03 December (UTC+08)		
<p style="text-align: center;"><b>大会特邀报告 Plenary Speech</b>            主持人: 徐启铭 教授 (中国台湾云林科技大学)  <b>Host: Prof. Chi-min Shu, National Yunlin University of Science and Technology</b>            Zoom 会议 Zoom ID: 817 9024 9359 密码 Passcode: 221203</p>			
14:00-14:30	<p style="text-align: center;">有限空间环保无压温敏微胶囊灭火技术            Fire extinguishing technology of environmental friendly and non-pressure temperature sensitive microcapsules in limited space  <b>邓军 副校长 西安科技大学</b>  <b>Jun Deng, Vice President of Xi'an University Science and Technology</b></p>		
14:30-15:00	<p style="text-align: center;">工业和社区的未來安全挑战            The future safety challenges both for industry and communities  <b>Hans Pasman, Prof. of Texas A&amp;M University, USA</b></p>		
15:00-15:30	<p style="text-align: center;">杂化复合氧化物与碳纳米流体            Hybrid and composite oxide and carbon nanofluids  <b>Imre Miklós Szilágy, Prof. of University of Technology and Economics</b></p>		
<p style="text-align: center;"><b>分论坛报告</b>  <b>Sub-Forum Speech</b></p>			
15:40-17:50	<p style="text-align: center;"><b>爆炸安全与防护</b>  <b>Explosion Safety and Protection</b>            主持人: 邢志祥、汪志雷  <b>Host: Zhixiang Xing, Zhilei Wang</b>            腾讯会议 Tencent ID:            593-839-558            密码 Passcode: 221203</p>	<p style="text-align: center;"><b>矿山与地下工程安全</b>  <b>Mine and Underground Safety</b>            主持人: 程健维、董骏  <b>Host: Jianwei Cheng, Jun Dong</b>            腾讯会议 Tencent ID:            713-491-176            密码 Passcode: 221203</p>	<p style="text-align: center;"><b>风险评估</b>  <b>Risk assessment</b>            主持人: 杨克、倪磊  <b>Host: Ke Yang, Lei Ni</b>            Zoom 会议 Zoom ID:            899 6144 2055            密码 Passcode: 221203</p>
15:40-16:10	<p>邀请报告: Status and challenges of 3D CFD simulations of large-scale gaseous dispersions and explosions            报告人: <b>Jianjun Xiao</b>            单位: Karlsruhe Institute of Technology</p>	<p>邀请报告: A view on the fire escape code: A Hong Kong perspective            报告人: <b>Siuming Lo</b>            单位: City University of Hong Kong</p>	<p>邀请报告: Digital twins and risks - some applications in crowd evacuation            报告人: <b>Ahmed Mebarki</b>            单位: UNIVERSITÉ GUSTAVE EIFFEL (古斯塔夫·埃菲尔大学)</p>
16:10-16:30	<p>题目: Numerical analysis of the effect of ventilation door on the propagation characteristics of gas explosion shock waves            作者: <b>Jingzhang Ren, Xuebo Zhang, Jiajia Liu, Chunxian Wang</b>            单位: Henan Polytechnic University</p>	<p>题目: Study on dynamic response characteristics and structural optimization of sandwich sealed wall under the Impact of gas explosion wave            作者: Jianwei Cheng, Zui Wang, <b>Qiang Fu, Gao Ke, Leilin Zhang</b>            单位: China University of Mining and Technology</p>	<p>题目: Development and validation of a soft voting-based model for urban fire risk prediction            作者: <b>Zhijie Huang, Jingwei Ji</b>            单位: China University of Mining and Technology</p>
16:30-16:50	<p>题目: Suppression effects of</p>	<p>题目: Simulation study of heat</p>	<p>题目: Thermal risk assessment of</p>

	<p>confined space on the explosive boiling under rapid depressurization  作者: <b>Liming Wei</b>, Supan Wang, Kai Liu, Xuhai Pan, Juncheng Jiang  单位: Nanjing Tech University</p>	<p>transfer in I-shaped louvered fin of heat exchanger at the end of mining fan  作者: Yongliang Zhang, <b>Zhen Hu</b>, Min Qu, Wentao Fan  单位: Qingdao University of Technology</p>	<p>hydrogenation reaction in biorefinery process: Application to <math>\gamma</math>-valerolactone production  作者: <b>YanJun Wang</b>, Chaoqin Ren, Gan Wang, Yong Pan  单位: Nanjing Tech University</p>
16:50-17:10	<p>题目: Experimental study on suppression of methane-air explosion with different surface dispersants combined with modified attapulgite powder  作者: Ke Yang, <b>Guangyu Liu</b>, Hong Ji, Zhixiang Xing, Yongmei Hao, Juncheng Jiang  单位: Changzhou University</p>	<p>题目: Research and application of regional risk evaluation of coal mine based on grey clustering model and combined assignment method  作者: Yilong Wang, Ruixin Zhang, Yongming Wu, Yadong Fang, Hongqing Zhang, Yongfeng Qi, Qingquan Zhao, Yandong Song, <b>Weihong Guo</b>  单位: North China Institute of Science and Technology</p>	<p>题目: Risk assessment of urban crowded places based on combination weighting-SPA  作者: Lianhua Cheng, <b>Nan Li</b>, Shugang Li, Dongqiang Cao, Huimin Guo  单位: Xi'an University of Science and Technology</p>
17:10-17:30	<p>题目: Study on propagation characteristics of gas explosion disturbed by crushed rocks with different accumulation void fractions  作者: <b>Zhenqi Liu</b>, Xiaoxing Zhong, Qiu Zhong, Yansen Lu  单位: China University of Mining and Technology</p>	<p>题目: Experimental studies on the smoke temperature in bifurcated tunnel for fire located in branch tunnel under forced ventilation  作者: <b>Yueyang Luo</b>, Peiyao Zhang, Zhisheng Li, Yunji Gao, Tao Li, Yuchun Zhang  单位: Southwest Jiaotong University</p>	<p>题目: A safety evaluation system for urban metro and its applications  作者: Jianwei Cheng, <b>Yongzhen Ma</b>, Chang Qi, Shuping Sheng, Dezhi Ran  单位: China University of Mining and Technology</p>
17:30-17:50	<p>题目: Afterburning in two-dimensional detonations for aluminum-particle/<math>C_2H_2</math>/air system  作者: Jin Huang, <b>Qixiang Zhou</b>, Jianming Zhu, Wenhui Han  单位: Beijing Institute of Technology</p>	<p>题目: Investigation of filmwise condensation and flow characteristics on inner curved heat transfer surface  作者: Yongliang Zhang, <b>Min Qu</b>, Xilong Zhang  单位: Qingdao University of Technology</p>	<p>题目: A risk assessment model for classified supervision of hazardous chemicals transportation enterprises based on multi-source dynamic data  作者: <b>Mengchen Liu</b>, Mingguang Zhang, Zhen Xu  单位: Nanjing Tech University</p>

时间 /Time	12月4日上午 AM, 04 December (UTC+08)		
<p style="text-align: center;"><b>大会特邀报告 Plenary Speech</b>            主持人：潘旭海 教授（南京工业大学）  <b>Host: Xuhai Pan, Prof. Nanjing Tech University</b>            Zoom 会议 Zoom ID: 811 0006 3824 密码 Passcode: 221204</p>			
08:30-09:00	<p style="text-align: center;">数字化处理系统领域的安全            Safety in Digitalized Processing Systems  <b>Faisal Khan</b>, Prof. of Texas A&amp;M University, USA</p>		
09:00-09:30	<p style="text-align: center;">金属有机骨架化合物在塑料阻燃技术中的应用研究            Development of Flame Retardant Technology for Plastics using Metal-Organic Frameworks  <b>Qingsheng Wang</b>, Prof. of Texas A&amp;M University, USA</p>		
09:30-10:00	<p style="text-align: center;">低概率/高后果事件：预测和预防            Low Probability/High Consequence Incidents: Prediction and Prevention  <b>Paul Amyotte</b>, Prof. of Dalhousie University, Canada</p>		
<p style="text-align: center;"><b>分论坛报告</b>            Sub-Forum Speech</p>			
10:00-12:10	<p style="text-align: center;"><b>消防安全</b>  <b>Fire Safety</b>            主持人：吴西强、周汝  <b>Host: Xiqiang Wu, Ru Zhou</b>            Zoom 会议 Zoom ID:            862 9886 7775            密码 Passcode: 221204</p>	<p style="text-align: center;"><b>新能源/材料安全</b>  <b>New Energy/Material Safety</b>            主持人：鲁义、尤飞  <b>Host: Yi Lu, Fei You</b>            腾讯会议 Tencent ID:            915-825-342            密码 Passcode: 221204</p>	<p style="text-align: center;"><b>危险化学品安全</b>  <b>Hazardous Chemical Safety</b>            主持人：郭耸、赵坤  <b>Host: Song Guo, Kun Zhao</b>            腾讯会议 Tencent ID:            386-957-576            密码 Passcode: 221204</p>
10:00-10:30 (仅邀请报告 30 分钟, 其他报告 20 分钟)	<p>邀请报告: Are prevailing approaches for engineering structures to resist fire fit for purpose?            报告人: <b>Usmani Asif Sohail</b>            单位: Hong Kong Polytechnic University</p>	<p>题目: Numerical investigation of mitigating and suppressing thermal runaway propagation in a lithium-ion battery pack using thermal insulators            作者: Junhui Gong, Bo Liu, <b>Hui Fu</b>, Jingyi Liu, Jialong Liu            单位: Nanjing Tech University</p>	<p>题目: Research on the prediction model of hazardous chemical road transportation accidents            作者: <b>Jiangle Wu</b>, Yi Lu, Shiliang Shi, Rongyi Zhou, Yong Liu            单位: Hunan University of Science and Technology</p>
10:30-10:50	<p>题目: Heat transfer and spread characteristics of continuous ethanol spill fires on sand substrates            作者: <b>Haihang Li</b>, Zhenlin Li, Qiang Wang, Fei Tang            单位: China Jiliang University</p>	<p>题目: Experimental study on overpressure dynamics and flame behavior induced by the transformer oil explosion            作者: <b>Hongsheng Ma</b>, Zhiyu Liu, Changjian Wang, Jaqing Zhang, Yubiao Huang            单位: Hefei University of Technology</p>	<p>题目: Scenario construction and emergency decision of hazardous chemical disaster based on stochastic petri net and case based reasoning            作者: <b>Xunqing Wang</b>, YuJie Zhou, XiaoYu Sun            单位: Shandong Technology and Business University</p>
10:50-11:10	<p>题目: Simulation study of oil</p>	<p>题目: Flammability characteristics</p>	<p>题目: Numerical simulation of</p>

	<p>pressure problems caused by internal faults in oil-immersed transformers</p> <p>作者: Haowei Yao, <b>Kefeng Lv</b>, Mengyang Xing, YouXin Li, Zhongbin Lv, Dong Wang, Zhenyu Zhan, Zhenyu Wang, Wei Ren</p> <p>单位: Zhengzhou University of Light Industry</p>	<p>of wind turbine blades</p> <p>作者: <b>Ziyan Cheng</b>, Fei You, Yu Zhang, Zhenhua Wang, Chenhao Zhuang, Zhengmin Wang, Guilin Ling, Yu Pan, Junqi Wang, Jing Ma</p> <p>单位: Nanjing Tech University</p>	<p>heating temperature field of adiabatic acceleration calorimeter based on ANSYS Workbench</p> <p>作者: <b>Tianyi Yan</b>, Lei Ni, Liang Yin, Juncheng Jiang, Botao Tang, Miao Fei</p> <p>单位: Nanjing Tech University</p>
11:10-11:30	<p>题目: Pyrolysis behaviors of di-tert-butyl peroxide in gas and liquid phases: A ReaxFF molecular dynamics simulation</p> <p>作者: <b>Xianghui Shi</b>, Xin Zhang, Yong Pan</p> <p>单位: Nanjing Tech University</p>	<p>题目: Experimental study on the temperature distribution of cryogenic hydrogen jet flame on the barrier wall</p> <p>作者: Liang Gong, <b>Yifei Han</b>, Xianwen Zheng, Haoyu Wang, Yongzheng Yao, Yuchun Zhang</p> <p>单位: Southwest Jiaotong University</p>	<p>题目: Study on optimization of shelter locations and evacuation routes of gas leakage accidents in chemical industrial park</p> <p>作者: <b>Di Zhang</b>, Zhanli Mao, Meiling Gong, Jianxing Ren, Songtao Zuo</p> <p>单位: China People's Police University</p>
11:30-11:50	<p>题目: Research on flexible suppression method for explosion based on energy absorption and buffering</p> <p>作者: <b>Yajun Wang</b>, Huihuan Ma, Han Li, Xiuyan Xu</p> <p>单位: Heilongjiang University of Science and Technology</p>	<p>题目: Numerical simulation study on high-pressure hydrogen spontaneous ignition in the two types of corner structure</p> <p>作者: <b>Guanghu Wang</b>, Xiaodan Xu, Juncheng Jiang, Yuying Zhang, Lei Ni</p> <p>单位: Nanjing Tech University</p>	<p>题目: Experimental research on the effect of wire mesh on the flame propagation characteristics of syngas explosion</p> <p>作者: <b>Zhi Wang</b>, Xingyan Cao, Haoyue Wei, Yangqing Zhou, Shaochen Sun</p> <p>单位: Nanjing Tech University</p>
11:50-12:10	<p>题目: Risk assessment and control of urban industrial safety based on risk quantification</p> <p>作者: Zhang Yufu</p> <p>单位: Zhongan Guangyuan Testing and Evaluation Technology Service Co., Ltd. (中安广源检测评价技术服务股份有限公司)</p>	<p>南京安元科技有限公司</p> <p>题目: Practice and Case Studies of an Intelligent Chemical Safety Risk Control Platform Based on Industrial Internet</p> <p>作者: Wang Sanming</p> <p>单位: Anyuan Technology Co., Ltd. (安元科技股份有限公司)</p>	<p>题目: Discussion on the grading principle of Security Integrity Level (SIL)</p> <p>作者: Huang Jiulai, Xiamen Xibaoyuan Technology Group Co., LTD</p> <p>单位: Xiamen Xibaoyuan Technology Group Co., LTD. (厦门熙宝源科技集团有限公司)</p>

时间 /Time	12月4日上午 PM, 04 December (UTC+08)		
分论坛报告 Sub-Forum Speech			
14:00-15:40	<b>人员安全与安全文化</b> <b>Human Safety and Safety Culture</b> 主持人: 高云骥、龚俊辉 <b>Host: Yunji Gao, Junhui Gong</b> 腾讯会议 Tencent ID: 469-570-456 密码 Passcode: 221204	<b>消防安全</b> <b>Fire Safety</b> 主持人: 赵金龙、曹兴岩 <b>Host: Jinlong Zhao, Xingyan Cao</b> 腾讯会议 Tencent ID: 418-466-899 密码 Passcode: 221204	<b>工业过程安全</b> <b>Industrial Process Safety</b> 主持人: 王彦富、张明广 <b>Host: Yanfu Wang, Mingguang Zhang</b> 腾讯会议 Tencent ID: 843-166-679 密码 Passcode: 221204
14:00-14:20	题目: Multi-vessel collision risk analysis based on conflict detection algorithm 作者: Yanfu Wang, <b>Erhua Cui</b> , Miaomiao Wang, Kun Wang. 单位: China University of Petroleum	题目: Study of crack generation and expansion behavior of Frame-Supported float glass after heat exposure 作者: Yanni Zhang, <b>Luoxin Huang</b> , Jun Deng, Zhichao Feng, Xinyu Wen, Dan Yang, Shiyue Ling 单位: Xi'an University of Science and Technology	题目: Experimental study on the flame length and flame pulsation behaviors of continuous spill fires on a water surface 作者: Jinlong Zhao, <b>Guangheng Song</b> , Qingyuan Zhang, Xinjiang Li, Hong Huang, Jianping Zhang 单位: China University of Mining and Technology-Beijing
14:20-14:40	题目: Simulation of safety competency improvement strategy for construction workers based on system dynamics 作者: Lianhua Cheng, <b>Xudong Zhao</b> , Junsheng Shi, Dongqiang Cao 单位: Xi'an University of Science and Technology	题目: Study on Fire Simulation of Air-supported Membrane Structures Considering Pyrolysis of Lap Welded Seams 作者: <b>Yang Yu</b> , Ying Sun, Zhenggang Cao, Tengfei Wang 单位: North China Institute of Science and Technology	题目: Risk assessment of lithium-ion battery road transportation based on data-driven Bayesian networks —— considering battery self-heating 作者: <b>Jiapeng Li</b> , Jinghong Wang, Jun Xie, Juncheng Jiang 单位: Nanjing Tech University
14:40-15:00	题目: Safety management of schools in China from a macro perspective: Continuity, change and solutions 作者: Ruipeng Tong, <b>Ninghao Sun</b> , Shiji Gong, Jianting Yao, Dachen Lei, Ziqi Li 单位: China University of Mining and Technology-Beijing	题目: Experimental investigation of wind effects on heat transfer and fire spread across a pine needle fuel bed 作者: <b>Hanwen Guo</b> , Dong Xiang, Linyi Kong, Yunji Gao, Yuchun Zhang 单位: Southwest Jiaotong University	题目: Experimental research on merge characteristics and burning rate of annular pool fires under crosswinds 作者: <b>Yixiang Zhang</b> , Jianlu Zhu, Yuxing Li 单位: Xi'an Shiyou University
15:00-15:20	题目: A PLS-SEM-based study of emergency effectiveness behaviour in mines	题目: Influence of radiation mode and intensity on the protective performance of firefighting boots	题目: Study on the dynamic response characteristics of gas explosion on interlayer airtight

	作者: <b>Yawen Liu</b> , Jingxu Chen, Yejiao Liu, Yuhui Ren, Yongdan Cao 单位: Inner Mongolia University of Science and Technology	作者: <b>Jiao Geng</b> , Song Guo, Ziwen Cao, Zi Wang, Weiqing Peng 单位: Nanjing University of Science and Technology	walls in complex roadway 作者: Jianwei Cheng, Zui Wang, <b>Zhiyuan Ma</b> , Gao Ke, Junhong Si, Yi Qin, Xincheng Hu 单位: China University of Mining and Technology
15:20-15:40	题目: Driving mechanism revelation and efficiency sustainability evaluation of workers' well-being promotion: A new insight based on DPSIR-DEA model 作者: <b>Xiaofeng Zhou</b> , Ninghao Sun, Leyao Wang, Qian Wang, Ruipeng Tong 单位: China University of Mining and Technology-Beijing	题目: Preparation of microencapsulated nitrogen-phosphorus-silicon synergistic flame retardant and its effect on high impact polystyrene flame retardancy 作者: <b>Xiaoyan Sun</b> , Wangxing Lu, Huimin Liu, Ru Zhou, Lian X. Liu, Juncheng Jiang 单位: Nanjing Tech University	题目: A Review of Progress in High Flash Point Liquid Spray Fire Explosion Research 作者: <b>Yuxing Tian</b> , Gang Tao, Lijing Zhang 单位: Nanjing Tech University
15:40-16:00	<b>闭幕式 Closing Ceremony</b> 主持人南京工业大学 潘勇 教授 <b>Host: Prof. Yong Pan, Nanjing Tech University</b> 腾讯会议 Tencent ID: 701-896-125 密码 Passcode: 221204		
15:40-15:50	优秀论文表彰 Excellent Paper Award		
15:50-16:00	大会闭幕		



### 三、特邀报告人简介

特邀报告：城市韧性：理念与进展

**Plenary Speech: Urban resilience: concept and some progress**



**范维澄**，清华大学公共安全研究院院长、教授，中国工程院院士，英国拉夫堡大学名誉博士。现任国家减灾委专家委委员、住建部城市建设防灾减灾专家委员会主任、国家自然科学基金委"非常规突发事件应急管理研究"重大研究计划指导专家组组长、国务院学位委员会"安全科学与工程"学科评议组召集人、"安全工程"专业学位教育协作组组长、（中国）公共安全科学技术学会理事长、中国安全生产协会副会长、亚太公共安全科学技术学会主席。主要研究领域：公共安全的风险评估、监测监控、预测预警、决策支持、应急管理的理论与技术及其综合集成；火灾动力学演化与防治技术。获国家科技进步一等奖 1 次，二等奖 2 次；国家级教学成果一、二等奖各 1 次；获授权发明专利 12 项，其中中国专利金奖 1 项；获国家重点实验室计划十周年与二十周年先进工作者金牛奖；全国五一劳动奖章；亚澳火灾科学技术学会首届终生成就奖。

Weicheng Fan, Professor and Director of Institute of Public Safety, Tsinghua University; Member of Chinese Academy of Engineering; Honorary Doctor in Loughborough University. He is currently a member of the expert committee of the National Committee on Disaster Reduction, director of the Urban Construction Disaster Prevention and Reduction Expert Committee of the Ministry of Housing and Urban Rural Development, the leader of the leading expert group for the major research plan of the National Natural Science Foundation of China on "unconventional emergency management research", the convener of the "safety science and engineering" discipline review group of the Academic Degrees Committee of the State Council, the leader of the "safety engineering" professional degree education collaboration group, the chairman of the (China) Society of Public Safety Science and Technology Vice President of China Association of Work Safety, President of Asia Pacific Society for Public Safety Science and Technology. Main research fields: risk assessment, monitoring, prediction and early warning, decision support, theory and technology of emergency management and their comprehensive integration of public security; Fire dynamics evolution and prevention technology. He won the first prize and second prize of the National Science and Technology Progress Award once and twice; respectively. One first prize and one second prize of national teaching achievement; 12 authorized invention patents, including 1 China Patent Gold Award; Won the Golden Bull Award for Advanced Worker of the 10th and 20th

Anniversaries of the National Key Laboratory Plan; National May Day Labor Medal; The First Lifelong Achievement Award of the Asia Australia Fire Science and Technology Society.

## 特邀报告：城市燃气管网安全保障技术

### Plenary Speech: Safety Guarantee Technology of City Gas Pipeline Network



**张来斌**，中国工程院院士，中国石油大学（北京）教授，应急管理部和油气生产安全与应急技术重点实验室主任，国务院第八届安全科学与工程学科评议组召集人，公共安全科学技术学会副理事长，曾任中国石油大学（北京）校长。

长期从事油气生产系统及装备安全科学与工程理论、方法和技术教学和研究工作，是我国油气安全科学与工程学科的主要创建者。主持 863、自然科学基金重点及企业重大项目多项。获国家科技奖励 4 项，其中以第一完成人或国家技术发明二等奖 2 项，省部级科技进步特等奖 1 项和一等奖多项，出版专著及教材多部，发表论文三百余篇。获国家教学成果二等奖 1 项，省部级教学成果一等奖 2 项。获国际石油工程师协会杰出会员、孙越崎能源大奖、IET-方正大学校长奖、北京市教学名师等荣誉称号。

第十一、十二、十三届全国政协常委，民盟中央常委。教育部安全工程专业教育指导委员会副主任，教育部高等学校专业设置与教学指导委员会委员。中国工程教育认证协会安全类专业认证委员会主任。

Laibin Zhang, Academician of Chinese Academy of Engineering, professor of China University of Petroleum (Beijing), director of Key Laboratory of Oil and Gas Production Safety and Emergency Technology of the Emergency Management Department, convener of the 8th Safety Science and Engineering Discipline Review Group of the State Council, vice chairman of the Public Safety Science and Technology Society, and former president of the China University of Petroleum (Beijing). He has been engaged in the teaching and research of the theory, method and technology of oil and gas production system and equipment safety science and engineering for a long time, and is the main founder of the discipline of oil and gas safety science and engineering in China. Presided over a number of 863, NSFC key and enterprise major projects. He has won 4 national science and technology awards, including 2 first prize winners or the second prize of national technology invention, 1 provincial and ministerial science and technology progress award and more than one first prize. He has published many monographs and textbooks, and more than 300 papers. It won one second prize of national teaching achievement and two first prizes of provincial and ministerial teaching achievement. He won the honorary titles of Outstanding Member of the International Association of Petroleum Engineers, Sun

Yueqi Energy Award, IET Founder University President Award, Beijing Famous Teacher, etc. He is a member of the Standing Committee of the 11th, 12th and 13th CPPCC National Committee, and member of the Standing Committee of the Central Committee of the NLD, deputy director of the Safety Engineering Education Steering Committee of the Ministry of Education, and member of the Professional Setting and Teaching Steering Committee of Colleges and Universities of the Ministry of Education. Director of Safety Professional Certification Committee of China Engineering Education Certification Association.

特邀报告：聚焦高层次人才培养，助力高质量发展

**Plenary Speech: Focusing on cultivation of high-level talents to help high-quality development**



**冯长根**（1953.2-），英国工程技术院院士，国际欧亚科学院院士，乌克兰国家科学院外籍院士，北京理工大学教授、博导，英国利兹大学化学学院博士。曾任北京理工大学副校长、首席教授。中国科协书记处原书记、党组成员、副主席，第十一、十二届全国人大常委会委员，第十、十一、十二届全国人大教科文卫委员会委员，国务院学位委员会七届学科评议组安全科学与工程组共同召集人。现任《安全与环境学报》主编。长期从事安全科学与工程、火工烟火技术和新材料应用研究，在国内外合作或单独发表学术论文 760 余篇，完成重要科研项目多项，包括 973 项目、国家自然科学基金项目、国家科技攻关项目等。学生中获博士学位 96 位、硕士学位 57 位。合作获奖 10 多项。获首届中国青年科技奖、中国青年十大杰出人物、全国“五一”劳动奖章、全国十大杰出职工、全国先进工作者、全国优秀留学回国人员、全国优秀科技工作者等多项荣誉称号。

科学科学与工程、火工烟火技术和新材料应用研究，在国内外合作或单独发表学术论文 760 余篇，完成重要科研项目多项，包括 973 项目、国家自然科学基金项目、国家科技攻关项目等。学生中获博士学位 96 位、硕士学位 57 位。合作获奖 10 多项。获首届中国青年科技奖、中国青年十大杰出人物、全国“五一”劳动奖章、全国十大杰出职工、全国先进工作者、全国优秀留学回国人员、全国优秀科技工作者等多项荣誉称号。

**Changgen Feng**, professor and doctoral advisor, doctor of the School of Chemistry, University of Leeds, UK, academician of the British Academy of Engineering and Technology, academician of the International Eurasian Academy of Sciences, and foreign academician of the National Academy of Sciences of Ukraine. He used to be the Vice President of Beijing University of Technology, the former Secretary of the Secretariat of the Chinese Association for Science and Technology, a member of the Party Leadership Group and Vice Chairman, a member of the Standing Committee of the Eleventh and Twelfth National People's Congress, a member of the Education, Science, Culture and Health Committees of the Tenth, Eleventh and Twelfth National People's Congress, and a co convener of the Safety, Science and Engineering Group of the Seventh Discipline Review Group of the Academic Degrees Committee of the State Council. He is currently the chief editor of the Journal of Safety and Environment and Defense Technology. He has been engaged in safety science and engineering, pyrotechnic technology and new material application research for a long time, and has published more than 600 academic papers in cooperation or independently at home and abroad. He has completed a number of important scientific research projects, including 973 projects, National Natural Science Foundation projects, national science and technology research projects, etc. He has won the first China

Youth Science and Technology Award, the top ten outstanding figures of Chinese youth, the National May Day Labor Medal, the top ten outstanding workers, the national advanced workers, the national outstanding returned overseas students, the national outstanding scientific and technological workers and other awards and honorary titles.

特邀报告：热分析技术在锂电池安全测试中的应用

**Plenary Speech: Application of thermal analysis technology in safety test of lithium battery**



**Chi-Min Shu**, Distinguished Chair Professor and Center Director, Department of Safety, Health, and Environmental Engineering, Yunlin University of Science and Technology. His main research fields include green material safety, intelligent monitoring, runaway reaction, quantitative risk assessment, prevention and mitigation on fire and explosion, storage and transportation safety, and lithium-ion battery safety. In 2012, he received the “Chemical

Technology Award” from Taiwan Institute of Chemical Engineers, the highest honor of the Taiwan chemical industry. In 2007 and 2010, he won the Academic Research Achievement Award of Yunlin University of Science and Technology. In 2014, he obtained the Industry-University Cooperation Achievement Award of Taiwan Yunlin University of Science and Technology. In 2017, he became the first scholar in Taiwan to receive the Mettler-Toledo Award, the first annual award in the field of thermal analysis in North America. In 2019, he was granted the Outstanding Research Award of Taiwan Ministry of Science and Technology. In 2021, he was the recipient of Trevor Kletz Merit Award (this award is the first prize for chemical safety internationally, and Professor Shu is also the second winner in Asia) and the National Award for Distinguished Contribution to Industry-Academic Cooperation. In 2022, he won the Outstanding Engineer Award of Chinese Institute of Engineers. He has published 524 international journals (SCI) including more than 90 TOP journals in different fields), and was honored as a fellow of NATAS, AIChE, RSC, IET, IChemE, and TwIChE in 2011, 2016, 2018, 2019, 2021, and 2022, respectively.

**报告摘要 Abstract:**

Lithium-ion batteries have opened a new chapter with their numerous advantages. However, concerted efforts are still underway on the battery’s development. Without a doubt, however, the safety issue is front and center for consideration. Inert gases are prevalently used to decrease substances’ activities and minimize the probability of an unexpected reaction. To determine the relationship between inert gases and lithium-ion battery runaway reaction, we used calorimetry, such as vent sizing package 2 (VSP2), as pseudo-adiabatic conditions with distinctive test cell which

allowed recording the voltage and the temperature variation with the time track.

Meanwhile, the system was imported with different gases, such as air, nitrogen, and argon, and multiple atmospheres were created for runaway reaction assessment. The output data, such as the curve of voltage versus temperature combined with a variety of thermal stability parameters, apparent exothermic onset temperature ( $T_0$ ), self-heating rate ( $dT/dt$ ), and pressure rise rate ( $dP/dt$ ), can exhibit the situation that inert gases mitigate the impact of a runaway reaction. The gases collected from a test cell with multiple temperatures can be future applied by analyzing with gas chromatography-mass spectrometry and the thermal runaway mechanisms could be elucidated comprehensively.



## 特邀报告：密闭空间 CO 产物的原位同步消纳方法研究

### Plenary Speech: Study on in situ Synchronous Absorption of CO in Confined Space



**周福宝**，男，1976年7月出生，工学博士，教授，中共党员。现任中国安全生产科学研究院党委副书记、院长。国家安全生产专家组专家。兼任国务院学位委员会第八届安全科学与工程学科评议组联合召集人，中国消防协会城市轨道交通消防安全专业委员会主任，中国煤炭工业技术委员会煤矿通风与安全专家委员会副主任等。曾获长江学者特聘教授、百千万人才工程国家级人选、国家有突出贡献的中青年专家、科学探索奖、何梁何利科学与技术奖、中国工程院光华工程科技青年奖、中国青年科技奖等人才奖项。

长期从事矿山灾害防治与资源化利用、公共安全与职业健康等方面的科学研究与人才培养工作。主持完成国家重点研发计划项目、国家杰出青年科学基金、国家自然科学基金重点项目、国家111学科创新引智基地、教育部创新团队发展计划等科研项目30余项，研究成果在国内外数百座矿山、隧道工程等领域直接转化应用。近年来获国家技术发明二等奖1项、国家科技进步二等奖3项及省部级科技进步一等奖5项，获授权国家发明专利80余件、软件著作权4件；出版学术专著2部，主编教材2部；曾任第十一届世界矿山通风大会组委会副主席、第三十五届国际匹兹堡煤炭会议燃烧分会主席等。在 *Journal of Hazardous Materials*、*煤炭学报* 等国内外重要学术刊物上发表论文100余篇，2017年后连续入选 Elsevier 在安全、风险、可靠性和质量学科领域的中国高被引学者。

**Fubao Zhou**, male, born in July 1976, Doctor of Engineering, Professor, CPC member. He is now the Deputy Secretary of the Party Committee and President of the Chinese Academy of Work Safety Sciences. Experts of the National Work Safety Expert Group. He also served as the co convener of the 8th Safety Science and Engineering Discipline Review Group of the Academic Degrees Committee of the State Council, the director of the regional rail transit fire safety professional committee of the China Fire Protection Association, and the deputy director of the coal mine ventilation and safety expert committee of the China Coal Industry Technical Committee. He has won many talent awards, such as Changjiang Scholars Distinguished Award, National Candidate for the Hundred Thousand Talents Project, National Young and Middle aged Experts with Outstanding Contributions, Science Exploration Award, He Liang He Li Science and Technology Award, Guanghua Engineering Science and Technology Youth Award of the Chinese Academy of Engineering, and China Youth Science and

Technology Award. He has been engaged in scientific research and talent training in mine disaster prevention and resource utilization, public safety and occupational health for a long time. He has presided over and completed more than 30 scientific research projects, including national key research and development projects, National Science Fund for Distinguished Young Scholars, National Natural Science Fund key projects, National 111 Discipline Innovation and Talent Introduction Base, and the innovation team development plan of the Ministry of Education. The research achievements have been directly transformed and applied in hundreds of mines, tunnel projects and other fields at home and abroad.

特邀报告：有限空间环保无压温敏微胶囊灭火技术

**Plenary Speech: Fire extinguishing technology of environmental friendly and non-pressure temperature sensitive microcapsules in limited space**



邓军，教授，博士生导师。西安科技大学副校长。国务院学位委员会安全科学与工程学科评议组成员，“万人计划”科技创新领军人才、中国青年科技奖获得者，全国先进工作者，教育部创新团队带头人，兼任陕西煤火灾害防治重点实验室和西部煤矿安全教育部工程中心主任，国家安全生产专家。主要从事煤火科学与防治、城市安全与智慧消防和应急救援等科学问题等展开研究。承担国家科技研发计划重点专项课题、国家自然科学基金等国家级项目 20 余项。获国家、省部级科技进步奖 20 余项，国家发明专利 20 余项。

专利 20 余项。

**Jun Deng**, professor, doctoral supervisor. Vice President of Xi'an University of Science and Technology. Member of the Safety Science and Engineering Discipline Evaluation Group of the Academic Degrees Committee of the State Council, leader of scientific and technological innovation of the "Ten Thousand Talents Plan", winner of the China Youth Science and Technology Award, national advanced worker, leader of the innovation team of the Ministry of Education, and concurrently director of the Shaanxi Key Laboratory for Coal Fire Disaster Prevention and Control, the Engineering Center of the Western Coal Mine Safety Education Ministry, and national safety production expert. Mainly engaged in research on scientific issues such as coal fire science and prevention, urban safety and intelligent fire protection, and emergency rescue. It has undertaken more than 20 national level projects such as key special projects of the National Science and Technology Research and Development Plan and the National Natural Science Foundation of China. It has won more than 20 national, provincial and ministerial science and technology progress awards and more than 20 national invention patents.

## 特邀报告：工业和社区的未來安全挑战

### Plenary Speech: The future safety challenges both for industry and communities



**Dr. Hans Pasman** is TEES Research Professor at Mary Kay O'Connor Process Safety Center of the Artie McFerrin Department of Chemical Engineering of Texas A&M University, and he is Emeritus Professor Chemical Risk Management of the Delft University of Technology in the Netherlands. He graduated in chemical technology

at Delft University of Technology in 1961, with Ph.D. in 1964 while employed by Shell. He joined the Dutch organization for Applied Research, TNO, where he did or led many investigations into disastrous industrial accidents, he initiated and led research in reactive materials, explosions of all types, and risk analysis. Until 2003 he managed in various directing capacities Dutch defense research and coordinated process safety research at various discipline groups in TNO. He was chairman of the International Group on Unstable Substances for 10 years, the European Study Group on Risk Analysis (1980-1985), a NATO Group on Explosives, and the Working Party on Loss Prevention and Safety Promotion in the Process Industries (1986-2004) and in this latter capacity in 1992 co-founder of the European Process Safety Centre. From 1998 till 2008 he taught and researched process safety at the Delft University of Technology He has been member of the Dutch governmental Council of Hazardous Substances (2004-2012). He received various awards, presented numerous lectures and was author or co-author of many papers.

#### 报告摘要Abstract:

To save human life on planet earth, an energy transition from coal and fossil fuel to renewables will be imperative. The decarbonization requires use of energy from the sun converted to electrical power. Temporarily, electrical power from nuclear fission will also serve the goal until fusion becomes available. Because electrical energy storage is problematic and due to material cost problematic, part of the power generated will be converted to hydrogen, which is storable, albeit it has limitations as well. Hydrogen will be a crucial raw material for various chemical processes, e.g., nitrogen binding to ammonia for fertilizers and other, a fuel for heavy transport and machines, and a fuel for domestic use, perhaps temporarily mixed with natural gas. Many chemical processes will be driven by electrical power, while also cars will make large-scale use of this. It will all require

large investments. In addition, safety must be examined. Hydrogen has hazardous properties and high voltage and currents handling requires skill and competence. Undoubtedly, industry will train its workers for safe working, which still does not fully guarantee safety, but the largest risk is the “popularization” of the technology in urban areas. Ignorance and less competent people working with hydrogen and electrical power may cause small and larger accidents, repelling the use of new technologies.

The lecture will provide an overview of technologies and interdependencies, it will briefly review hydrogen properties, it will mention new devices that will be in use in large numbers, such as electrolyzers, fuel cells, and batteries and associated hazards, and will stress the weakness of hazard identification methods, which is already known to be present at traditional equipment and human factor, and which in case of fully new devices certainly will produce unpleasant surprises.

特邀报告：杂化复合氧化物与碳纳米流体

**Plenary Speech: Hybrid and composite oxide and carbon nanofluids**



**Dr. Imre Miklós Szilágyi** is an associate professor at the Budapest University of Technology and Economics (BME), Department of Inorganic and Analytical Chemistry. He is the head of the Materials Science Analysis Research Group, which is an international group of 15-20 PhD, MSc and BSc students, while postdocs, visiting scientists show up often as well. His research areas are materials science, nanotechnology, thermal science, spectroscopy and analytical chemistry with a strong emphasis on environmental and especially solar applications.

Besides academic work, he is doing industrial research frequently for various companies.

He has obtained various awards and recognitions, e.g. Young Scientist Award of the Hungarian Academy of Sciences (2010); and of the V4 Academies (2010); European Materials Research Society – Graduate Student Award (2009); Main prize of the Scopus Young Researcher Awards (2008, Hungary); Perkin-Elmer – ICTAC (International Confederation of Thermal Analysis and Calorimetry) Young Scientist Award (2008).

He is the Editor-in-Chief of the Journal of Thermal Analysis and Calorimetry (SpringerNature and Akadémiai Kiadó, IF 4.755, Q1 in Analytical Chemistry and Thermodynamics).

**报告摘要 Abstract:**

Heat exchangers are widely used in many energy related engineering applications, such as solar collectors, chemical industry, power production, waste heat recovery, air conditioning, automobile radiators and refrigeration. Although various techniques have been applied to enhance heat transfer, their performances are often limited by the low thermal conductivities of the heat transfer fluids. It has been proved that the dispersion of small amounts of nano-sized solid nanoparticles in base fluids enhance thermal conductivity. Nanofluids as a stable colloidal suspension are prepared by dispersing nanoparticles in base fluids to improve the thermal performance of heat transfer systems.

In this lecture, the thermal conductivity and viscosity of various single phase, hybrid and composite oxide and carbon nanofluids are presented. As solid nanomaterials for single phase nanofluids, halloysite nanotubes, SiO<sub>2</sub> and TiO<sub>2</sub> nanoparticles, carbon nanospheres and carbon

nanopowders were used. For hybrid nanofluids, SiO<sub>2</sub>-TiO<sub>2</sub> were applied. For the first time, core/shell nanomaterials obtained by atomic layer deposition (ALD) were also tried to increase the thermal conductivity of nanofluids. The hybrid nanofluids were better in performance compared to the single phase ones. However, the ALD prepared core/shell ones were even more beneficial, which opens up a new way to obtain novel, beyond the state-of-the-art nanofluids.

## 特邀报告：数字化处理系统领域的安全

### Plenary Speech: Safety in Digitalized Processing Systems



**Dr. Faisal Khan** is Mike O'Connor II Chair Professor and Director of Mary Kay O'Connor Process Safety Center, Texas A&M University, College Station, Texas. He is also Director (Technical) of Ocean Energy Safety Institute (OESI), a US Department of Energy and US Department of Interior funded applied R&D initiative.

Dr. Khan is a former Professor and Canada Research Chair (Tier I) of Offshore Safety and Risk Engineering at the Memorial University of Newfoundland, Canada. He is the founder of the Centre for Risk Integrity and Safety and Engineering, which was home of 100+ research members during his time at Memorial University. His research interests include offshore safety, drilling safety, extreme event modeling, asset integrity, and risk engineering. He is the recipient of many National and International Awards. He is actively involved with multinational energy and processing industries on the issue of safety, risk, and asset integrity. He is a Fellow of the Canadian Academy of Engineers. He has authored over 500 research articles in peer-reviewed journals and mentored 75 PhDs and 85 master students. He is Editor-in-Chief of the Journal of Process Safety & Environmental Protection and Journal of Safety in Harsh Environments.

#### 报告摘要 **Abstract:**

While efforts to use digital solutions in process operations are gaining wider acceptance, there are serious safety concerns that need to be addressed when adopting digitalization. Safety issues have also evolved with digitalization, from simple equipment failure to failure of process systems (equipment with electronic systems), monitoring and control systems, data encryption systems, and most recently, software systems. How these evolving process safety issues are understood and addressed will govern the overall safety of process facilities. Therefore, proactively converting this challenge to opportunity and developing digital process safety solutions more holistically. Dynamic risk management is one approach to address this challenge. The concept of creating a dynamic risk profile for a processing system encompasses the likelihood and consequences of a given abnormal event. Dynamic risk estimation uses Bayesian theory to update the probability of an event occurrence and a generalized consequence algorithm to obtain the given event's relative



consequences. This approach results in a risk function with predictive capabilities and the ability to be updated with time. This talk also touches on system advances from a digitalization perspective and the dynamic risk management approach's details.

特邀报告：金属有机骨架化合物在塑料阻燃技术中的应用研究

**Plenary Speech: Development of Flame Retardant Technology for Plastics using Metal-Organic Frameworks**



**Dr. Qingsheng Wang** is a tenured professor and George Armistead '23 Faculty Fellow in the Artie McFerrin Department of Chemical Engineering at Texas A&M University. He was Dale F. Janes Endowed Professor and Department Head at Oklahoma State University before returning to TAMU in 2019. Dr. Wang received his BS and MS in Chemistry at Zhejiang University and PhD in Chemical Engineering at TAMU under supervision of late Sam Mannan. He has nearly 20 years of work and research experience in process safety, chemical engineering, and chemistry. Dr. Wang has published over 165 journal papers, 9 book chapters, 1 book, and 2 patents. Dr. Wang is currently leading TAMU Multiscale Process Safety Lab, pioneered in the areas of flame-retardant polymers, fire & explosion dynamics, machine learning, and composites manufacturing.

**报告摘要 Abstract:**

Polymeric materials present wide applications in daily life and promising perspectives in the future market because of their unique properties of lightweight and chemical resistance. However, one significant drawback is the high flammability of many synthetic polymers due to their energy-dense hydrocarbon-based chemical structures. Therefore, improving the flame retardancy of polymeric materials is an increasingly important strategy to limit exposure to fire hazards. Since halogen-based retardants are under strictly environmental scrutiny, intumescent flame retardant (IFR) is halogen-free with low costs, thus resulting in increased demand from industry. In this talk, I will discuss our recent successes in investigating MOFs as a competitive candidate on synergistically improving the flame retardancy behaviors of conventional IFR-based polymer composites, including vertical burning rating, LOI value, heat and toxicity release. Considering the limited manufacture efficiency and large volumes of required solvent in the MOF synthesis, we further proposed a sustainable and efficient manufacturing of MOFs-based polymer nanocomposites by reactive extrusion. Our approach also informs machine-learning strategies for building up flame

retardancy database from available literatures and predicting the corresponding flammability. We hope that these advances will pave the way for rational design and manufacturing of novel sustainable flame retardant nanocomposites.

特邀报告：低概率/高后果事件：预测和预防

**Plenary Speech: Low Probability/High Consequence Incidents: Prediction and Prevention**



**Dr. Paul Amyotte, P.Eng.** is a Distinguished Research Professor and Professor of Chemical Engineering at Dalhousie University (Halifax, Canada), where he held the C.D. Howe Chair in Process Safety from 2011-2020. He is a chemical engineering graduate of the Royal Military College of Canada (Bachelor's), Queen's University (Master's), and the Technical University of Nova Scotia (PhD). He is a registered professional engineer in Nova Scotia.

Dr. Amyotte has an extensive record of authorship, with six books, nine book chapters, and over 350 papers published in peer-reviewed journals or presented at national and international conferences. He has presented invited plenary lectures at symposia in Canada, France, Italy, Malaysia, Netherlands, Norway, Poland, Qatar, Taiwan, and the United States. He is the current editor of the Journal of Loss Prevention in the Process Industries, and a past-president of the Canadian Society for Chemical Engineering, Engineers Nova Scotia, and Engineers Canada. In 2019, he was presented with the Sovereign's Medal for Volunteers by the Governor General of Canada.

Dr. Amyotte has consulted on numerous industrial projects involving hazard analysis, incident investigation, and material explosibility. He has also served as an expert witness in the proceedings related to two coal mine disasters: Westray in Nova Scotia and Upper Big Branch in West Virginia. In June 2014, he received the Cybulski Medal from the Polish Academy of Sciences for significant and sustained contributions to the field of dust explosion research. In October 2014, Dr. Amyotte received the Trevor Kletz Merit Award from the Mary Kay O'Connor Process Safety Center, Texas A&M University, for significant contributions to the advancement of education, research, and service activities related to process safety. He was presented with the 2017 Process Safety Management Award by the Canadian Society for Chemical Engineering for outstanding contributions in Canada to process safety and loss management.

**报告摘要 Abstract:**

A low probability/high consequence (LPHC) event can be defined in many ways, whether by

fatalities, property loss, production loss, environmental harm, or financial loss (or some combination thereof). This presentation examines LPHC incidents, their associated warning signs, and how these warning signs can be detected. The Center for Chemical Process Safety provides guidance that warning signs can occur in any of the following areas of an organization: leadership and culture, training and competency, process safety information, procedures, asset integrity, risk analysis and management of change, audits, and learning from experience. There are currently many tools available for process safety assurance, including: process hazard analysis (PHA), Quantitative Risk Assessment (QRA), layer of protection analysis (LOPA) and Bayesian networks. While these methodologies can help detect process incident warning signs, it is imperative that warning sign detection and incident prevention methods be fully integrated into the process safety management (PSM) system. Key in this endeavor is effective knowledge management to facilitate heightened risk awareness leading to the prevention of LPHC occurrences. By beginning at the individual level, the result will be improvements in the PSM system itself, the promotion of a culture of safety, the creation of inherently safer designs, and the implementation of an effective communication/training system. The underlying thesis of the presentation is that if a collection of small warnings in the workplace are not properly heeded, the low probability of a high consequence event occurring may become a severe reality.

## **Keynote Speech: Status and Challenges of 3D CFD Simulations of Large-scale Gaseous Dispersions and Explosions**



**Jianjun Xiao** obtained his Ph.D. at Tsinghua University in 2006.

He joined Karlsruhe Institute of Technology (KIT) in Germany as a scientific fellow in 2006, and obtained his tenure track position at KIT in 2012. He is the principle scientist of numerical safety analysis in the Hydrogen Group at KIT. His research interests include Computational Fluid Dynamics, combustion, heat and mass transfer, and two-phase flow. He is a recognized expert in numerical modeling, CFD simulation,

safety of explosive gases, and quantitative risk assessment. He is leading the development of 3D high-performance scientific computing software GASFLOW (<https://www.gasflow-mpi.com>), and promoting its' applications to the real-world industrial-scale problems.

### **报告摘要 Abstract:**

Computational Fluid Dynamics (CFD) methods have been widely used in the safety analysis of flammable gas release, dispersion, mixing and explosion. However, most of the studies focused on single or relatively simple physical phenomena in small-scale geometries. CFD simulations of gas mixing, dispersion and explosion in industrial-scale applications are often considered to be “colorful” and “fake”. In my opinion, It is mainly because the involved complicated physics in large-scale complex geometries are far beyond the capabilities and validity domains of the models and solution algorithms in the applied CFD codes. The limited computing power also makes the physics under-resolved due to the very coarse mesh used in the simulation.

In this talk, I will discuss the simulation capability requirements for industrial-scale gas dispersion, mixing and explosion including unified numerical solver for flows at broad Mach number, turbulence modeling, combustion modeling, conjugate heat and mass modeling, unique engineering models for industrial applications and high-performance computing. I will give an overview about the status of research on large-scale gas dispersion and explosion at Karlsruhe Institute of Technology. The gaps, challenges and our plan for the future work will be also discussed.

Although from the academic point of view many issues cannot be solved in the near future, scientific-based, well-validated and reliable CFD code can be still very valuable in the industrial-scale applications due to the following reasons: 1) it tackles physical phenomena and parameters that are difficult to observe and measure in the experiments of large-scale gas distribution and explosion; 2) it gives in-depth understanding of the physics involved in the explosive gas safety analysis; and 3) it provides an economical and efficient way to explore and optimize the design of the risk mitigation system in industries involving flammable gases.

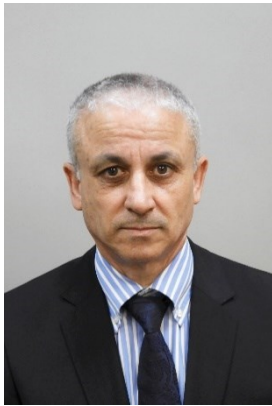
## 主题报告： A View on the Fire Escape Code: A Hong Kong Perspective



**Dr. Siuming Lo** is a professor at the Department of Architecture and Civil Engineering. He received his PhD in architecture from the University of Hong Kong. He is an Authorized Person registered in the Hong Kong Buildings Ordinance. His research interests are mainly in urban planning, construction project management, fire safety engineering, fire risk analysis, etc. He has published more than 190 SCI/SSCI journal articles, and been awarded more than 15 Hong Kong Research Grant Council grants. He is a panel member of the Engineering Panel, Hong Kong Research Grant Council.



**主题报告: Digital twins and risks - some applications in crowd evacuation Ahmed Mebarki**



**Dr. Ahmed MEBARKI** is the full Professor of Université Gustave Eiffel, high-level talent flexible introduction professor of Nanjing Tech University, and the Director of IUT of Université Gustave Eiffel. His main research works are devoted to Natural and Technological Risks: industrial hazards (explosions, impacts) & natural hazards (earthquakes, tsunamis, floods); vulnerability and fragility (buildings, and industrial tanks); optimal risks and layouts; cascading and domino effects; Digital twins and Guided crowd evacuation; risk and resilience. He has coordinated several academic and scientific projects in coordination with industrial and academic partners, mainly in: Asia (China, Japan), Europe (France, Germany, Greece), Africa (Algeria), America (USA, Venezuela). In recent years, he has also been developing new theories about risk and resilience in complex systems.

## 主题报告：Are Prevailing Approaches for Engineering Structures to Resist Fire Fit for Purpose?



**Usmani Asif Sohail** (BE, MS, PhD, CEng, FIStructE)

Chair Professor of Building Science and Fire Safety Engineering

Head of the Department of Buildings Environment and Energy

Engineering

Faculty of Construction and Environment

Hong Kong Polytechnic University

Professor Usmani joined Hong Kong Polytechnic University in August 2016. He Professor of Structural Engineering and Computational Mechanics at the University of Edinburgh (until Sept 2015). His research in fire safety engineering has focussed on understanding the thermo-mechanical behaviour of structures in real fires using computational methods validated with experiments. Key achievements include: providing fresh insights to understand non-intuitive structural behaviour observed in full-scale fire tests on a steel-frame composite building at Cardington (UK) during the mid-1990s; explaining the collapse of WTC Twin Towers; proposing and leading research on a distributed real-time emergency response system, FireGrid, demonstrated successfully in London in 2010 (subject of a BBC Horizon documentary); His current research interests include: Development of computational tools for integrated simulation of structures subjected to fire based on open-source software framework OpenSees; Characterisation of fire loading in large open-plan compartments and accidental bridge fires in the context of performance based engineering for structural fire resistance; progressive collapse simulation of tall building under multiple-floor fires; and developing AI-based tools for smart firefighting building on the work of the FireGrid project in UK. This is currently Professor Usmani's primary research focus, as he is leading an RGC TRS funded 33.333 Million HK\$ project "SureFire: Smart Urban Resilience and Firefighting" (2020-2024).

### 报告摘要 Abstract:

Structural performance under loading is closely associated with the material used in its construction. The choice of material for a project depends on many factors, such as cost, climate, durability, availability, sustainability, maintenance, aesthetics and indeed performance under

loading and other environmental influences and extreme events such as fire. Structural steel and concrete are the two most common construction materials for most large building projects. Ever since the high profile collapses of three steel framed tall buildings in the September 11, 2001 terrorist attack in New York a perception has developed that steel structures may suffer from a greater vulnerability to fire. This presentation will systematically examine the comparative merits and demerits of these two materials in the context of their behaviour when exposed to high temperatures and how does that behaviour influence the performance of structural members and structural systems built using these materials. It will be shown that while material behaviour in fire is important, it is misleading to consider it the only significant factor that determines overall structural performance and response to fire or in some cases even most significant factor. Furthermore, temperature dependent strength and stiffness properties of materials dominate most studies of material and structural behaviour in fire, which is also somewhat misleading. The deformation of materials upon heating (usually thermal expansion but sometimes contraction, such as in the case of concrete under high compressive stress) may also play a major role in the determining overall structural response and should not be ignored. A number of cases studies will be presented to illustrate the key aspects of steel and concrete behaviour in fire in the context of maintaining overall structural stability.

