

Forum Program

会议手册

**International Forum on Computational Optical
Measurement and its Education
COME 2022**

2022 计算光学测量及其教育国际研讨会

Northwestern Polytechnical University, Xi'an, China

24-25 June 2022

Welcome Message

The fourth international forum on Computational Optical Measurement and its Education (COME 2022) will be held at Northwestern Polytechnical University (NPU), Xi'an, China, on June 24-25 (Time in China). The forum is conducted online (Bilibili and Tencent conference). The forum focuses on the in-depth integration of cutting-edge research and postgraduate education, involving research fields including but not limited to optical measurement, optical testing, experimental mechanics, three-dimensional imaging, computational optics, optical instrumentation, artificial intelligence, etc. The forum has invited eight well-known experts in related fields to share their academic achievements and experiences. A student presentation competition is held to provide a platform for research students to exchange ideas and learn from each other, where ten Best Oral Presentations will be awarded.

This forum is free of charge for all participants. We would like to express our deepest gratitude to the great contributions from our volunteers. Our heartfelt thanks go to the invited speakers, student competition presenters, the forum participants, and the officers at NPU. Welcome you to this global forum to share your ideas and experiences and enjoy the company of new and old friends.

Forum Chairs



Jianlin Zhao

Northwestern Polytechnical
University



Jianglei Di

Guangdong University
of Technology



Kemao Qian

Nanyang Technological
University

Conference Organizer

Northwestern Polytechnical University



Conference Co-organizer

Guangdong Provincial Key Laboratory of Information Photonic Technology

Optics and Photonics Society of Singapore (OPSS)



Forum Sponsorship

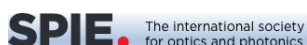
Society of Photo-Optical Instrumentation Engineers (SPIE)

Shanghai Ideaoptics Corp., Ltd.

Shanghai Jinlei Optoelectronic Technology Co., Ltd.

Nanjing Development Technology Co., Ltd.

Wuhan Yangtze Soton Laser Co., Ltd.



安扬激光

欢迎辞

第四届计算光学测量及其教育国际论坛（Computational Optical Measurement and its Education, COME 2022）将于6月24日至25日在中国西安西北工业大学举行。会议采用线上（哔哩哔哩和腾讯会议）模式来进行。会议聚焦于前沿研究与研究生教育的深度融合，涉及研究领域包括但不限于光学测量、光学测试、实验力学、三维成像、计算光学、光学仪器、人工智能等。会议邀请了8位相关领域的知名专家和学者分享他们的学术成果和经验。同时，会议将举办学生报告比赛，为青年学者提供一个交流学习的平台，并评选出10个最佳学生报告奖。

本次会议无需注册，对所有参会人员免费开放。我们对会议志愿者们的巨大贡献表示深深的谢意。我们衷心感谢被邀请的演讲者、学生报告比赛演讲者、会议参与者以及西北工业大学的主办人员。欢迎大家来到这个全球论坛分享你们的想法和经验，享受新老朋友的陪伴！

会议主席



赵建林
西北工业大学



鄢江磊
广东工业大学



钱克矛
南洋理工大学

会议主办单位

西北工业大学



会议协办单位

广东省信息光子技术重点实验室
新加坡光学和光子学学会



会议赞助

国际光学工程学会，上海复享光学股份有限公司，上海津镭光电科技有限公司，南京拓展科技有限公司，武汉安扬激光技术股份有限公司

Program Overview

Student Presentation Competition June 24, Friday, Bilibili and WeChat live streams	
Time	Student Presentation
18:00-18:10	Defect Detection of Fresco Samples using Digital Holography Yuhang Liu, Shanghai University
18:10-18:20	Interferometry of Planar Optics Based on Wavelength-shifting Tingting He, Shanghai University
18:20-18:30	Microsphere-assisted label-free super-resolution microscopy Chu Xu, Nanjing Normal University
18:30-18:40	Coherence retrieval and multi-contrast microscopy imaging through transport of intensity Runnan Zhang, Nanjing University of Science and Technology
18:40-18:50	Adaptive optical quantitative phase imaging based on annular illumination Fourier ptychographic microscopy Yefeng Shu, Nanjing University of Science and Technology
18:50-19:00	3D fingerprint measurement based on fringe projection profilometry Shichang Yu, Zhejiang University of Technology
19:00-19:10	Pose calibration of LED array in Fourier ptychographic microscopy Chuanjian Zheng, Beijing Institute of Technology
19:10-19:20	DIC-assisted fringe projection profilometry for 3D shape and deformation measurement on complex structure parts Zhaosheng Chen, Sichuan University
19:20-19:30	Large-field structured illumination microscopy based on 2D grating and spatial light modulator Xiang Fang, Xidian University
19:30-19:40	Research on Polarized Multi-Spectral System and Fusion Algorithm for Remote Sensing of Vegetation Status at Night Siyuan Li, Shanghai University
19:40-19:50	Partially coherent illumination based point-diffraction digital holographic microscopy study dynamics of live cells Kequn Zhuo, Xidian University
19:50-20:00	Tea Break
20:00-20:10	High-accuracy fringe projection profilometry with a MEMS-based projector Yupei Miao, Shenzhen University
20:10-20:20	Anti-aliasing phase reconstruction via nonuniform phase-shifting technique Huijie Zhu, Shanghai University
20:20-20:30	Research on 3D measurement methods for complex scenes based on structured light fields Shangen Jia, Southeast University
20:30-20:40	Dynamic coherent diffractive imaging with a physics-driven untrained learning method Dongyu Yang, University of Chinese Academy of Sciences

20:40-20:50	Deep learning method for fringe filtering and phase unwrapping in ESPI technology Min Xu, Tianjin University
20:50-21:00	Fast digital refocusing and depth of field extended Fourier ptychography microscopy Guocheng Zhou, Beijing Institute of Technology
21:00-21:10	Applicability of image features in speckle pattern-based measurement of deformation and motion Yifei Zhou, South China University of Technology
21:10-21:20	Based on deep-learning image classification and detection technology under complex background Hao Zheng, Xi'an Technological University
21:20-21:30	Investigation on thickness measurement of coatings by active infrared thermography Zhen Huang, Jiangsu University
21:30-21:40	Unwrapped-Phase-free 3D reconstruction in structured light field system based on virtual imaging points Yanzheng Wang, Southeast University
21:40-21:50	High-speed three-dimensional shape measurement based on robust and efficient Gray-code coding strategy Haoran Wang, Sichuan University

Main Conference June 25, Saturday, Bilibili and WeChat live streams	
Session I (Chair: Jianlin Zhao)	
8:40-8:50	Opening Remarks
8:50-9:00	Forum Introduction Kemao Qian, Nanyang Technological University, Singapore
9:00-9:40	Smart materials and structures: from fundamental to application Jinsong Leng, Harbin Institute of Technology, China
9:40-10:00	Group Photo and Tea Break
Session II (Chair: Jianglei Di)	
10:00-10:40	Introduction to teaching and research systems and how to apply for Ph.D. and Post-Doctoral fellow positions in US universities Lianxiang Yang, Oakland University, America
10:40-11:20	Photomechanics methods, techniques and applications in room/high-temperature deformation measurement Wei He, Hunan University, China Huimin Xie, Tsinghua University, China
11:20-12:00	Three-dimensional shape measurement by using multiple parallel color fringe projection Zonghua Zhang, Hebei University of Technology, China
12:00-14:00	Lunch

Session III (Chair: Peng Gao)	
14:00-14:40	Challenging Optics in X-ray free-electron lasers facilities Sen Han, University of Shanghai for Science and Technology, Suzhou H&L Instruments, China
14:40-15:20	Physics enhanced deep neural networks for computational imaging Guohai Situ, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China
15:20-15:40	Tea Break
15:40-16:20	Single cell molecule imaging Liyun Zhong, Guangdong University of Technology, China
16:20-17:00	Computational terahertz imaging Erwin Hack, Empa – Swiss Federal Laboratories for Materials Science and Technology, Switzerland
17:00-17:30	Award Presentation, Closing of COME2022 and Announcement of COME2023

Bilibili live streams: <http://live.bilibili.com/25208146>

WeChat live streams



Forum Venue



Northwestern Polytechnical University (NPU), founded in 1938, is located in Xi'an, the ancient capital of thirteen dynasties of China. It is affiliated to the Ministry of Industry and Information Technology and is one of the key universities in the national “Double First-class”, “985 Project” and “211 Project”.

NPU has 21 post-doctoral stations, 25 doctoral programs in first-level disciplines and 38 master's programs in first-level disciplines. There are over 4300 faculty and staff members, 37 Academicians of Chinese Academy of Sciences or Chinese Academy of Engineering, and over 36,000 students. Since its establishment, the university has fully implemented the Party's educational policy, it adheres to the motto “Loyalty, Integrity, Courage and Perseverance” while carrying forward the spirit of “Strong Preparation, Diligent Effort, Practical Attitude, and Creative Innovation”.

NPU adheres to the “trinity” talent cultivation concept of value shaping, ability cultivation and knowledge imparting, and focuses on cultivating leading talents with national passion, pursuit of excellence and leading the future. A large number of NPU students become industry elites and pillars of the country, forming a unique “NPU phenomenon” in the field of talent training, known as the “Cradle of Chief Engineer”.

Forum Room

June 24: Bilibili and WeChat live streams (哔哩哔哩和微信视频号直播)

June 25: Bilibili and WeChat live streams (哔哩哔哩和微信视频号直播)



Transportation

From Xi'an Xianyang International Airport

从西安咸阳国际机场出发

- By metro: Take Line 14 at Xianyang International Airport to Xi'anbei Railway Station, transfer to Line 2 to Weiquan metro station. Take a taxi from Weiquan metro station to Nanshanyuan Hotel (about 27 km).

搭乘地铁：在咸阳国际机场搭乘 14 号线到达西安北站，换乘 2 号线至韦曲南地铁站，从韦曲南地铁站搭乘出租车至南山苑酒店（约 27 公里）。

- By taxi: It is about 60 kilometers from Xianyang International Airport to Nanshanyuan Hotel.

搭乘出租车：咸阳国际机场至南山苑酒店 60 公里左右。

From Xi'anbei Railway Station

从西安北站出发

- By metro: Take Line 2 at Xi'anbei Railway Station station to Weiquan metro station, then take a taxi from Weiquan metro station to Nanshanyuan Hotel (about 27 km).

搭乘地铁：在西安北站搭乘 2 号线至韦曲南地铁站，从韦曲南地铁站搭乘出租车至南山苑酒店（约 27 公里）。

- By taxi: It is about 50 kilometers from Xi'anbei Railway Station to Nanshanyuan Hotel.

搭乘出租车：西安北站至南山苑酒店 50 公里左右。

From Xi'an Railway Station

从西安站出发

- By metro: Take Line 1 at Wulukou metro station to Beidajie metro station, then transfer to Line 2 to Weiquan metro station, and take a taxi from Weiquan metro station to Nanshanyuan Hotel (about 27 km).

搭乘地铁：在五路口站搭乘 1 号线至北大街地铁站，换乘 2 号线至韦曲南地铁站，从韦曲南地铁站搭乘出租车至南山苑酒店（约 27 公里）。

- By taxi: It is about 40 kilometers from Xi'an Railway Station to Nanshanyuan Hotel.

搭乘出租车：西安站至南山苑酒店 40 公里左右。

From Huyi Railway Station

从鄠邑站出发

- By bus: Take Gaoxinchengxiang Line 8 at Huyi Railway Station to Changandongda station, and walk 790 meters to Nanshanyuan Hotel.

搭乘公交：在鄠邑站搭乘高新城乡 8 号线至长安东大站，然后步行 790 米至南山苑酒店。

- By taxi: It is about 17 kilometers from Huyi Railway Station to Nanshanyuan Hotel.

搭乘出租车：鄠邑站至南山苑酒店 17 公里左右。



Fig.1. The map of Xi'an

图1. 西安地图



Fig.2. The map of Chang 'an Campus of Northwestern Polytechnical University

图2. 西北工业大学长安校区地图



Keynote Speaker

Jinsong Leng 冷劲松

Harbin Institute of Technology

Title: Smart Materials and Structures: from fundamental to application

Abstract: Shape memory polymers (SMPs) and their composites as a class of smart materials, can remember various shapes and return to their original shapes in response to various external stimuli, including heat, light, water, pH, microwave, electric and magnetic fields. Owing to the advantages including fast response, long lifetime, high resilience, light weights, stretch ability, low cost and easy processing, SMPs are the promising materials for smart materials and structures in various areas. Potential applications of SMPs and their composites span all scale sizes from nano-scale devices through to macro-level products, such as aerospace, biomedical engineering, flexible electronic devices, information carriers, smart textiles, optical devices, etc. Some structures are capable of remote actuation with magnetic and electricity filed by incorporating of functional fillers in defined regions. Multistage, reversible, programmable structures are also 4D printed and systematically investigated. These materials offer significant promise for future smart products in many areas of science and technology.

Biography: Prof. Leng Jinsong, is a Member of the Chinese Academy of Sciences, a Cheung Kong Chair Professor and the Director of the Center for Smart Materials and Structures (CSMS) at School of Astronautics of Harbin Institute of Technology. His research fields include smart materials and structures, sensors and actuators, stimulus-responsive polymers (shape memory and electro-active polymers) and their composites, multifunctional nanocomposites, 4D printing, etc. He currently serves as Vice President of the International Committee on Composite Materials (ICCM), Vice President of the Chinese Society for Composite Materials (CSCM), Vice President of Chinese Society of Aeronautics and Astronautics (CSAA), and Editor-in-Chief of the International Journal of Smart and Nano Materials (IJSNM). He was elected as the Foreign Member of Academia Europaea, Member of the European Academy of Sciences and Arts, World Fellow of ICCM, Fellow of American Association for the Advancement of Science (AAAS), Fellow of the SPIE, Fellow of Institute of Physics (IOP), Fellow of Royal Aeronautical Society (RAeS), Fellow of Institute of Materials, Minerals, and Mining (IMMM) and Associate Fellow of AIAA. He has published over 350 peer-reviewed papers and holds over 140 issued patents.



Keynote Speaker

Lianxiang Yang 杨连祥

Oakland University

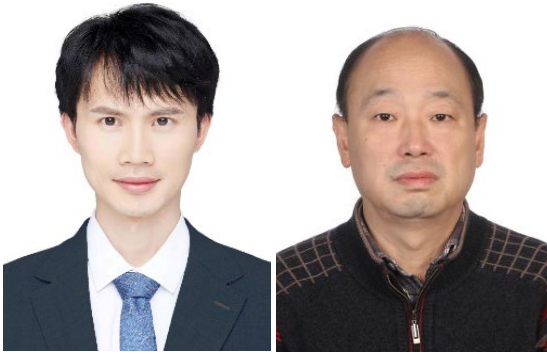
Title: Introduction to teaching and research systems and how to apply for Ph.D. and Post-Doctoral fellow positions in US universities

Abstract: This presentation will give an introduction to teaching and research systems and how to apply for Ph.D. and Post-Doctoral fellow positions in the US universities. It includes two parts.

Part I is an introduction to teaching and research systems in US universities. In order to better understand the systems, several aspects such as University classification, semester system, faculty positions, faculty salary system will be first briefly introduced before detailed explanations of the teaching and research systems.

Part II is an introduction to how to apply for Ph.D. and Post-Doctoral fellow positions which includes why Ph.D. and Postdoc in USA, the resources for these positions, and your qualification etc.

Biography: Dr. Yang received his Ph.D. from University of Kassel, Germany. He joined Oakland University in Michigan USA in 2001. He is currently a tenured distinguished professor and the director of the optical measurement and quality inspection laboratories and the optical research group at Oakland University. He is a fellow of SPIE and SAE. His research expertise lies in the areas of advanced optically based techniques for metrology, nondestructive testing (NDT), and experimental mechanics. Prof. Yang is an Associate editor or on the editorial board for 5 SCI, 1 EI and 2 international journals. Before joining Oakland University in 2001, he was a R&D scientist of JDS Uniphase (Canada), a senior engineering of Dantec-Ettemeyer GmbH, currently called Dantec-Dynamics (Germany), a post-doctoral fellow at University of Kassel (Germany), and a Lecture and Associate Professor of Hefei University of Technology (China). Prof. Yang has so far advised 4 postdoctoral fellows and more than 30 visiting scholars, He has graduated 15 Ph.D. students, 33 Master students, and is currently advising 5 Ph.D. and 3 Master students.



Keynote Speaker

Wei He, Huimin Xie* 何巍, 谢惠民*

Hunan University, Tsinghua University

Title: Photomechanics methods, techniques and applications in room/high-temperature deformation measurement

Abstract: Photomechanics, which includes a variety of coherent/incoherent measurement techniques, is one of the important branches of experimental mechanics. It has the characteristics of full-field, non-contact, and online real-time measurement, and has been popularized in the 3D shape and deformation measurement of engineering components. With the development of cutting-edge science and high-tech, the extreme manufacturing process/service environment of engineering materials and structures has brought new problems and challenges to experimental mechanics, and it is urgent to develop new optical measurement methods and techniques to solve related problems.

Several novel optical techniques have been developed, such as digital image correlation (DIC), moiré, coherent gradient sensitive interferometry (CGS), and applied to studying the mechanical behavior of engineering materials and structures. The progress of related photomechanics methods in the measurement of mechanical properties of film-substrate structures, the characterization of fatigue fracture mechanical parameters of metal materials, and the detection and identification of defects is introduced. The results show that the optical measurement methods have a good potential in the monitoring of 3D printing process and the characterization of important mechanical parameters of engineering materials.

Biography:

Wei He: He is an associate professor in Hunan University, deputy secretary-general of Hunan Mechanics Society, senior member of Chinese Society of Micro-Nano Technology. His research areas are in the development of photomechanics methods and techniques, including digital image correlation, sampling moiré, infrared non-destructive testing, etc., and the applications in characterizing the static and dynamic mechanical properties of engineering materials, and experimentally studying the failure behavior of engineering structures in harsh environments. He has charge of the National Natural Science Foundation of China (Key Program-sub project, Youth), and China Postdoctoral Science Foundation, Natural Science Foundation of Hunan Province, etc. In the past five years, he has published 14 SCI papers as the first/corresponding author in academic journals, including Science China-Technological Science, Acta Mechanica Sinica, International Journal of Fatigue, Materials science & engineering A, etc., and applied for/authorized 5 patents. He has been invited to give more than 10 invited talks at academic conferences such as OPTICSMEET and the Young Scholars Forum of Experimental Mechanics.

Huimin Xie: Prof. Xie received Ph. D in Tsinghua university, China in 1992. He is a full professor and the deputy head of the key lab of Applied Mechanics of Ministry of Education of China in Tsinghua University. His research areas are in development of new techniques and applications in solving challenging fundamental and industrial problems in the fields of experimental solid mechanics, nondestructive testing techniques and applied optics. He is the steering committee member of the ACEM (Asian Society of Experimental Mechanics), and the Associate Technical Editor for Experimental Mechanics, editorial board member of the academic journals: Journal of Strain Analysis for Engineering Design, Strain, as well as Theoretical and Applied Mechanics Letters. He has published more than one hundred scientific papers in academic journals and proceedings of international conferences.



Keynote Speaker

Zonghua Zhang 张宗华

Hebei University of Technology

Title: Three-dimensional shape measurement by using multiple parallel color fringe projection

Abstract: Three-dimensional (3D) shape measurement has been widely applied in the fields of reverse engineering, biological recognition and digitalization of cultural relics, etc., because of the advantages of high speed, non-contact, fast data processing and high measurement precision. However, it is still a challenging problem to fast acquire 3D shape of complex objects. To solve this problem, this talk presents a multiple parallel color fringe projection method. A novel flexible calibration technique has proposed to build up the relationship between phase map and 3D shape data. To improve the measuring accuracy, chromatic aberration between color channels has been calibrated and eliminated by using full-field phase information. The proposed color fringe projection method has been demonstrated to measure 3D shape fast and effectively.

Biography: Zonghua Zhang is a full professor in the School of Mechanical Engineering, Hebei University of Technology, Tianjin, China. He received his Ph.D. degree from Tianjin University, Tianjin, China, in 2000. He worked in Ruhr University Bochum of Germany, Queen's University of Canada, Heriot-Watt University, University of Leeds, and University of Huddersfield of UK. His main research interests include 3D optical measurement, fringe projection profilometry, and phase measuring deflectometry. He has published more than 190 papers. From 2016 to 2018, he was an EU Marie Curie Individual Fellow in University of Huddersfield of UK. He is an Associate Editor for Optics Express now.



Keynote Speaker

Sen Han 韩森

University of Shanghai for Science and Technology, Suzhou H&L
Instruments

Title: Challenging Optics in X-ray Free-Electron Lasers Facilities

Abstract: X-ray Free-Electron Lasers (XFEL) has been focused in many areas of scientific research and industrial development, including physics, chemistry, material science, biology, medicine, biomedical applications, environmental science, and archeology and so on. There currently are several XFEL facilities across the world, including Linac Coherent Light Source (LCLS) in California, European XFEL in Hamburg, Shanghai High repetition rate XFEL & Extreme light facility (SHINE) in Shanghai and Super Photon ring-8 (SPRING-8) in Hyogo. All the XFEL facilities worldwide need super-high accurate optics for folding or collimating beam. The optics are either flat or curve. The requirements for the optics are so challenging existing measurement tools. In this talk, some challenging issues are listed. Then a quite useful solution is presented. Finally successful results are given out.

In addition, author will share some experience with creating a high-tech business.

Biography: Dr. Sen Han obtained his Ph.D. from University of Stuttgart, Germany. Dr. Han is a professor of University of Shanghai for Science and Technology and one of H&L Instruments co-founders. Dr. Han has been a SPIE Fellow and an adjunct professor of University of Arizona since 2008 and 2003, respectively. Dr. Han has published 115 papers, 15 SPIE Proceedings, 41 patents. He has hosted and joined 30+ research projects. Dr. Han has been involved in many academic activities as conference chairs, committee members, invited speakers for 100+ times across 10+ countries. Dr. Han won R&D 100 Award in United States twice, Gold Medal in Switzerland, Gold Medal, the First Prizes twice and the Third Prizes twice in China.



Keynote Speaker

Guohai Situ 司徒国海

Shanghai Institute of Optics and Fine Mechanics, Chinese Academy
of Sciences

Title: Physics enhanced deep neural networks for computational imaging

Abstract: Recently we have witnessed the impact of deep neural networks (DNN) to the field of computational imaging (CI). Usually, a DNN should be trained on a specific training dataset before it can be used to solve the corresponding CI problem. The DNN trained in this way is fundamentally a black box, lack of deep understanding of its applicability. Here we report our recent works on physics-driven untrained deep neural networks (PhysenNet) for computational imaging. The PhysenNet employs a strategy that incorporates a physical imaging model into a conventional DNN. PhysenNet has two apparent advantages. First, it does not need to be trained on any dataset. Instead, it just requires the data to be process as its input. The interplay between the physical model and the randomly initialized DNN provides a mechanism to optimize the DNN, and produce a good reconstruction. Second, the reconstructed image satisfies the constraint imposed by the physical model so that it is interpretable. We will take phase imaging and computational ghost imaging as examples to demonstrate the principle.

Biography: Prof. Guohai Situ is a professor with the Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (CAS) since 2012, leading a CAS Interdisciplinary Innovation Group of Computational Optical Imaging. His research interests include a wide range of computational optical imaging in particular based on deep learning, with current focus on imaging through optically thick scattering media, computational ghost imaging, and phase imaging. So far, he has published 80 papers in leading journals including Nature Photonics, and Light, receiving more than 5300 citations according to Google Scholar. He has delivered more than 30 Plenary, Keynote, Tutorial, and Invited conference talks, and served as chair, program chair, and program committee member in many conferences around the world. He is currently a committee member of the SPIE Dennis Gabor Award.



Keynote Speaker

Liyun Zhong 钟丽云

Guangdong University of Technology

Title: Single cell molecule imaging

Abstract: Single cell molecule detection, which emerges as a multidisciplinary tool to advance life science and involves nanoscale to submillimeter scale imaging technique, remains challenging. In this presentation, various cell molecule imaging techniques, including scanning probe microscopy (scanning tunneling microscopy, atomic force microscopy, near-field optical microscopy), non-scanning optical imaging methods (digital holography, incoherent digital holography, quantitative phase imaging), super-resolution fluorescence imaging and Raman spectral imaging, are compared and analyzed in detail.

Biography: Prof. Liyun Zhong is currently the leader of optical micro-nano imaging research group at Guangdong University of Technology. Her research interests involve the interdisciplinary of optics and biomedicine, including cell and molecule imaging based on near field optical microscopy, Raman spectral imaging, digital holography, quantitative phase imaging. Before joining Guangdong University of Technology in 2020, she was a leader of optical micro-nano imaging research group in , a director of laser institute in Kunming University of Science and Technology in 1998. To date, she has published more than 100 papers in core journals of Optics and Biophotonics field including Optics Letter, Talanta, Biomedical Optics Express, Optics Express. She was a young academic and technical leader of Yunnan province in 2003 and won the first Daheng award 1991.



Keynote Speaker

Erwin Hack

Empa – Swiss Federal Laboratories for Materials Science and
Technology

Title: Computational terahertz imaging

Abstract: While the same theoretical foundations describe the entire electromagnetic spectrum, the generation, detection and material interaction of the different wavelength ranges are diverse. This presentation will introduce computational THz imaging using techniques borrowed from other wavelength ranges, such as digital holography, ptychography and Talbot imaging. Starting from Huygens principle and diffraction, we will explain the theoretical foundation with a special focus on the phase problem, and will introduce THz lasers and bolometer cameras allowing efficient experiments. We will illustrate the application of the techniques to different materials. Finally, we will touch on the generation of non-classical THz radiation containing orbital angular momentum.

Biography: Erwin Hack holds a diploma in theoretical physics and a PhD in physical chemistry, both from the University of Zurich, Switzerland. At present, he is senior scientist and member of the Research Commission of Empa. His research interest is in full-field optical measurement techniques, including THz imaging, speckle pattern interferometry and thermography and their use in model validation. His expertise in measurement technology includes ellipsometry and measurement uncertainty. Erwin was coordinator and partner in many European and national research projects. He authored or co-authored more than 150 papers in peer-reviewed journals and conferences and co-edited two books. He lectures at ETH Zurich and is Editor in Chief of “Optics and Lasers in Engineering”. Erwin is member of Optica and elected honorary member of the “Swiss Society for Non-destructive Testing”.

Volunteers List

COME 2022 Conference Volunteers: Ju Tang, Ji Wu, Wenxuan Han, Xingxing Xu, Jiawei Zhang, Jiale Zuo

Total Responsibility: Ju Tang

Conference Publicity: Wenxuan Han, Xingxing Xu, Jiale Zuo

Student Presentation Competition: Ju Tang, Ji Wu

Live Streaming: Ji Wu, Jiawei Zhang