

The 2021 Westlake International Symposium in Engineering (WISE 2021)

Time: October 26th-27th, 2021

Venue: Wenlan Hotel Northern Hangzhou, Hangzhou, Zhejiang

The 2021 Westlake International Symposium in Engineering (WISE 2021) is an international conference held by the School of Engineering of Westlake University with the aim to provide an international collaboration and exchange platform for engineering scientists to share knowledge and research findings, discuss existing challenges, and explore exciting new ideas and cutting-edge technologies.

WISE 2021, with approximately 500 participants, will focus on five major fields:

- ◆ Artificial Intelligence
- ◆ Biomedical Engineering
- ◆ Electric Engineering
- ◆ Environment and Resources
- ◆ Materials Science and Engineering



WISE 2021 Conference Program

Monday, October 25

09:00-20:00	Registration	Hotel lobby
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Tuesday, October 26

09:00-09:15	Opening Ceremony					Wenlan B 文澜厅 B
09:15-10:00	Plenary	Xiaogang Peng 彭笑刚				Wenlan B 文澜厅 B
10:00-10:30	Coffee break/Group photos					
Sessions	Artificial Intelligence	Biomedical Engineering	Electric Engineering	Environment and Resources	Materials Science and Engineering	
	Wenxuan 文轩厅	Qinghefang 清河坊	Wenjin A 文锦厅 A	Qingzhiwu 青芝坞	Wenjin B 文锦厅 B	
10:30-11:00	Keynote	Xiansheng Hua 华先胜	Zhen Gu 顾 臻	Shouyi Yin 尹首一	Xin Yang 杨 新	Zhiyong Tang 唐智勇
11:00-11:30		Dongbo Bu 卜东波	Zhuang Liu 刘 庄	Weisheng Zhao 赵巍胜	Chunmiao Zheng 郑春苗	Dan Wang 王 丹
11:30-12:00		Min Zhang 章 敏	Guosong Chen 陈国颂	Yidong Huang 黄翊东	Gang Liu 刘 刚	Suhuai Wei 魏苏淮
12:00-12:30				Yixin Zhao 赵一新		
12:00-14:00	Lunch					
14:00-14:45	Plenary	Giovanni De Micheli				Wenlan B 文澜厅 B
14:45-15:15	Coffee break					
15:15-15:45	Keynote	Dinggang Shen 沈定刚	Xingyu Jiang 蒋兴宇	Lei Zhou 周 磊	Herbert Huppert	Yan Chen 陈 焱
15:45-16:15		Kang Li 李 康	Anna Wang Roe 王 菁	Jingbi You 游经碧	Itai Einav	Shaoxing Qu 曲绍兴
16:15-16:45		Fei Wu 吴 飞	Hua Lu 吕 华	Ziyi Ge 葛子义	Hailong Lu 卢海龙	Zhihong Nie 聂志鸿
17:00-18:00	Poster Session					
18:30-20:00	Banquet					

Wednesday, October 27

Sessions		Artificial Intelligence	Biomedical Engineering	Electric Engineering	Environment and Resources	Materials Science and Engineering
		Wenxuan 文軒廳	Qinghefang 清河坊	Wenjin A 文錦廳 A	Qingzhiwu 青芝塢	Wenjin B 文錦廳 B
09:00-09:30	Keynote	Dong Yu 俞 棟	Tingrui Pan 潘挺睿	Xue Feng 馮 雪	Alan Jamieson	Minfang Han 韓敏芳
09:30-10:00		Xiaolin Li 李曉林	Guangjun Nie 聶廣軍	Shensheng Han 韓申生	Tiefeng Li 李鐵風	Xin Guo 郭 新
10:00-10:30	Coffee break					
10:30-11:00	Keynote	Badong Chen 陳霸東	Jianzhong Du 杜建忠	Limin Tong 童利民	Xi Lu 魯 玺	Yingying Zhang 張瑩瑩
11:00-11:30		Yiguang Hong 洪奕光	Ning Gu 顧 寧	Lei Liao 廖 蕾	Ningyi Zhou 周一一	Yanglong Hou 侯仰龍
11:30-12:00		Junbo Zhao 趙俊博	Xing Chen 陳 興	Yongsheng Zhao 趙永生	Jiayin Dai 戴家銀	Xinqiang Wang 王新強
12:00-13:30	Lunch					
13:30-14:00	Keynote	Jingyi Yu 虞晶怡	Meihua Sui 隋梅花	Tianyou Zhai 翟天佑	Zongping Shao 邵宗平	Hong Li 李 泓
14:00-14:30		Guangming Shi 石光明	Changyou Gao 高長有	Ce Zhu 朱 策	Dihua Wang 汪的華	Huisheng Peng 彭慧勝
14:30-15:00		Xiangyang Ji 季向陽	Jian Ji 計 劍	Guihua Zeng 曾貴華	Jidong Zhao 趙吉東	Jiangyu Li 李江宇
15:00-15:30	Coffee break					
15:30-16:00	Keynote	Xun Cao 曹 汛	Yucui Wang 王育才	Hongxing Qi 齊洪興	Guang Pan 潘 光	Qunfeng Cheng 程群峰
16:00-16:30		Han Wang 王 涵	Huabing Chen 陳華兵	Jia Huang 黃 佳	Thomas Cherico Wanger	Donglin Han 韓東麟
16:00-17:10	Invited	Yue Zhang 張 岳	Junling Guo 郭俊凌	Nanjia Zhou 周南嘉	Sergio Andres Galindo Torres	Lin Wang 王 琳
		Donglin Wang 王東林	Chengchen Guo 郭成辰	Bowen Zhu 朱博文	Yanyan Zhang 張岩岩	Yuxi Xu 徐宇曦
18:00-20:00	Dinner					

WISE 2021 Plenary Talks

Plenary, 09:15-10:00, October 26th, 2021

Colloidal Quantum Dots for Display

Speaker: Xiaogang Peng, Department of Chemistry, Zhejiang University

Abstract: Colloidal quantum dots (QDs) are optimal emitters for display because of their size-tunable emission peak and narrow peak width. 1 With ~20 years efforts, QDs can now be synthesized with monodisperse size/shape distribution, near unity emission quantum yield, and high chemical/optical stability, which promotes their applications in the back-lighting-units for liquid-crystal displays. In 2014, it was demonstrated that, through inexpensive solution processing, QD-based light-emitting-diodes (QLEDs) can be made with nearly ideal efficiency and good operational lifetime, 2 implying a new generation of display technologies. A substantial gap between photoluminescence in back-lighting-units and electroluminescence in QLEDs was identified in 2020. 3 This gap, in principle, can be closed by developing electrochemically-inert ligands to QDs with excellent luminescent properties, likely pushing QLED displays into market in the foreseeable future.

References

- [1] Yufei Shu, Xing Lin, Haiyan Qin, Zhuang Hu, Yizheng Jin, Xiaogang Peng*, Quantum Dots for Display, *Angewandte Chemie International Edition*, **2020**, 59, 22312-22323.
- [2] Xingliang Dai, Zhenxing Zhang, Yizheng Jin*, Yuan Niu, Hujia Cao, Xiaoyong Liang, Liwei Chen, Jianpu Wang, Xiaogang Peng*, Solution-processed, High-performance Light-emitting Diodes based on Quantum Dots, *Nature*, **2014**, 515 (7525), 96-99.
- [3] Chaodan Pu#, Xingliang Dai#, Yufei Shu#, Meiyi Zhu, Yunzhou Deng, Yizheng Jin* and Xiaogang Peng*, Electrochemically-stable ligands bridge the photoluminescence-electroluminescence gap of quantum dots, *Nature Communications*, **2020**, 11 (1), 937.



Xiaogang Peng is currently a Professor at Zhejiang University in China. He was a chair professor at the University of Arkansas before moving back to China in 2009. He received his B.S. (1987) and Ph.D. (1992) from Jilin University, China. His Postdoctoral experience followed by a position as Staff Scientist at UC Berkeley between 1994 and 1999 brought him into the field of colloidal nanocrystals. Shortly after starting his tenure at the University of Arkansas in 1999, he founded NN-Labs LLC in USA to explore industrial applications of quantum dots. In 2009, he founded Najing Tech Corporation in Hangzhou, currently focusing on quantum-dot display technologies.

Plenary, 14:00-14:45, October 26th, 2021

Enabling Technologies and Design Methods for Electronic Systems

Speaker: Giovanni De Micheli, EPFL, Switzerland

Abstract: As we approach the sunset of CMOS downscaling, new materials and emerging technologies are expected to play a major role in large scale processing chips. Still their success depends on the availability of tools and methods for their design. In this perspective, I will first present the landscape of emerging technologies, ranging from nanowires/nanotubes to flatronics and to quantum electronics. Then, I will focus on new methods for synthesis of integrated circuits, their effectiveness on established and emerging technologies and results from experimental design tools.

Next, I will address the issue of designing heterogeneous integrated circuits and the co-design of sensors and electronics. These technologies find applications in health management and environmental monitoring, and thus are of high interest to a broad audience. I will describe some advances in circuits for ion sensing and their applications, and then I will summarize results and impact of a broad research program, called Nano-Tera.ch, that I manage during the last decade.



Giovanni De Micheli is a research scientist in electronics and computer science. He is credited for the invention of the Network on Chip design automation paradigm and for the creation of algorithms and design tools for Electronic Design Automation (EDA). He is Professor and Director of the Integrated Systems Laboratory at EPFL Lausanne, Switzerland. Previously, he was Professor of Electrical Engineering at Stanford University. Prof. De Micheli is a Fellow of ACM and IEEE, a member of the Academia Europaea and an International Honorary member of the American Academy of Arts and Sciences. He received several awards including the 2020 IEEE/CEDA Richard Newton Technical Impact Award, the 2019 ACM/SIGDA Pioneering Achievement Award, and the 2016 EDAA Lifetime Achievement Award.

WISE 2021 Keynote & Invited Talks

Session 1 Artificial Intelligence	
October 26th	
Venue: Wenxuan 文軒廳	
Chair: Stan Z. Li, Lin Yang	
10:30-11:00	Visual Intelligence Scale Realization - From Algorithm to Platform to System Xian-Sheng Hua (Alibaba Group)
11:00-11:30	ProFOLD: Predicting Protein Structure Through Directly Learning Residue Co-evolution Directly from Multiple Sequence Alignment Dongbo Bu (Chinese Academy of Sciences)
11:30-12:00	Optimal Mass Transportation and its Applications on Medical Imaging Min Zhang (Zhejiang University)
15:15-15:45	Applications of AI in Full-stack Medical Imaging, Diagnosis, and Therapy Dinggang Shen (ShanghaiTech University)
15:45-16:15	Artificial Intelligence in Orthopaedics: From Diagnostics, Treatment to Rehabilitation Kang Li (Sichuan University)
16:15-16:45	Big Data Intelligence: From Correlation Discovery to Casual Reasoning Fei Wu (Zhejiang University)
October 27th	
Venue: Wenxuan 文軒廳	
Chair: Xiaofei Li, Shiyu Zhao, Xin Yuan	
09:00-09:30	Progresses Toward All Neural Network Speech Processing Dong Yu (Tencent AI Lab)
09:30-10:00	AI Empowers Drug Discovery Xiaolin Andy Li (Tongdun Technology)
10:30-11:00	Recent Advances in Information Theoretic Learning Badong Chen (Xi'an Jiaotong University)
11:00-11:30	Distributed Optimization Analysis and Design of Multi-agent Systems Yiguang Hong (Tongji University)
11:30-12:00	The Data-Centric Research Junbo Zhao (Zhejiang University)
13:30-14:00	Neural Modeling and Rendering for MetaHuman Creation and Beyond Jingyi Yu (ShanghaiTech University)
14:00-14:30	Semantic Communications with Low-latency for Transmission and Understanding Guangming Shi (Xidian University)
14:30-15:00	Vision-based Object Pose Estimation Xiangyang Ji (Tsinghua University)
15:30-16:00	Computational Spectral Video Imaging Xun Cao (Nanjing University)
16:00-16:30	Deep Learning for Multiscale Molecular Modelling Han Wang (Institute of Applied Physics and Computational Mathematics)
16:30-16:50	Challenges in Machine Learning for NLP Yue Zhang (Westlake University)
16:50-17:10	Meta-Learning: From Few-Shot Adaptation to Real-World Generalization Donglin Wang (Westlake University)

Session 2 Biomedical Engineering

October 26th

Venue: Qinghefang 清河坊

Chair: Huaimin Wang, Yi Sun

10:30-11:00	Bioresponsive Drug Delivery Zhen Gu (Zhejiang University)
11:00-11:30	Biomaterials to Boost Cancer Immunotherapy Zhuang Liu (Soochow University)
11:30-12:00	Controlling Macromolecular Self-Assembly by Reactions and Structures of Saccharides Guosong Chen (Fudan University)
15:15-15:45	Liquid Metal/Polymer-Based Flexible Devices for Biomedical Applications Xingyu Jiang (Southern University of Science and Technology)
15:45-16:15	Identifying Fundamental Features of Efficient Processing Architecture in Human and Nonhuman Primate Brains Anna Wang Roe (Zhejiang University)
16:15-16:45	Development of Synthetic Polypeptides for Protein Conjugation Hua Lu (Peking University)
<p>October 27th</p> <p>Venue: Qinghefang 清河坊</p> <p>Chair: Chengchen Guo, Bowen Zhu, Huaimin Wang</p>	
09:00-09:30	Beginning of Artificial Iontronic Senses Tingrui Pan (Suzhou Institute for Advanced Research, University of Science and Technology of China)
09:30-10:00	Nanorobots for Tumor Microenvironment Targeting and Regulation Guangjun Nie (National Center for Nanoscience and Technology, China)
10:30-11:00	Polymer Vesicles for Delivery of Protein and Nucleic Acids Jianzhong Du (Tongji University)
11:00-11:30	Fe-Based Magnetic Nanomaterials for Biomedical Applications Ning Gu (Southeast University)
11:30-12:00	Click Expansion Microscopy: Making Super-Resolution Bioimaging Easier Xing Chen (Peking University)
13:30-14:00	Cancer Therapeutic Resistance: An Ancient and Still Challenging Topic, and Our Experience on Nano-Sized Strategies for Reversing Drug Resistance Meihua Sui (Zhejiang University)
14:00-14:30	ROS-Responsive Polymers for Tissue Repair and Regeneration via Modulating Inflammation Microenvironment Changyou Gao (Zhejiang University)
14:30-15:00	Supramolecular Nitric Oxide Nanosystems for Synergistic Cancer Therapies Jian Ji (Zhejiang University)
15:30-16:00	Biointerfaces between Polymeric Nanoparticles and Vessels Yucui Wang (University of Science and Technology of China)
16:00-16:30	Self-Assembled Nanomedicine for Cancer Phototherapy Huabing Chen (Soochow University)
16:30-16:50	Natural Polyphenols - Emerging Bio-Building Blocks for Advanced Materials Junling Guo (Sichuan University)
16:50-17:10	Translating Silk from Textiles to Functional Biomaterials Chengchen Guo (Westlake University)

Session 3 Electric Engineering

October 26th

Venue: Wenjin A 文錦 A 厅

Chair: Mohamad Sawan, Dianyi Liu

10:30-11:00	Reconfigurable Neural Network Processor for Embedding AI in Everything Shouyi Yin (Tsinghua University)
11:00-11:30	From Spin Transfer Torque (STT) to Toggle Spin Torque (TST) for the next generation of MRAM Weisheng Zhao (Beihang University)
11:30-12:00	Next-Generation Optoelectronic Chips with Nanostructure Yidong Huang (Tsinghua University)
12:00-12:30	High Efficiency and Stable Cs based Perovskite Solar Cells Yinxin Zhao (Shanghai Jiao Tong University)
15:15-15:45	Metasurfaces for Controlling Light Lei Zhou (Fudan University)
15:45-16:15	Status and Prospects of Perovskite Solar Cells Jingbi You (Chinese Academy of Sciences)
16:15-16:45	Highly Efficient Organic Solar Cells Ziyi Ge (Chinese Academy of Sciences)

October 27th

Venue: Wenjin A 文錦 A 厅

Chair: Xiaorui Zheng, Lan Li, Liaoyong Wen, Botao Ji

09:00-09:30	Flexible Ultrasound Technology and Biomedical Applications Xue Feng (Tsinghua University)
09:30-10:00	Ghost Imaging Research in SIOM Shensheng Han (Chinese Academy of Sciences)
10:30-11:00	Elastic Ice Optical Microfibers Limin Tong (Zhejiang University)
11:00-11:30	Two Dimensional Materials Transistors Lei Liao (Hunan University)
11:30-12:00	Organic Microlaser Materials and Devices Yongsheng Zhao (Chinese Academy of Sciences)
13:30-14:00	Two-dimensional Inorganic Molecular Crystals Tianyou Zhai (Huazhong University of Science and Technology)
14:00-14:30	Towards Global Rate Distortion Optimization in Video Coding: Challenges & Recent Developments Ce Zhu (University of Electronic Science and Technology of China)
14:30-15:00	Quantum Secure Communication Technology and Applications Guihua Zeng (Shanghai Jiao Tong University)
15:30-16:00	Research Progress of LIBS (Laser-Induced Breakdown Spectroscopy) in the Application of China's Deep Space Exploration Hongxing Qi (Hangzhou Institute for Advanced Study, University of Chinese Academy of Sciences)
16:00-16:30	Sensors and Synaptic Devices Based on Conjugated Molecules Jia Huang (Tongji University)
16:30-16:50	How 3D Printing is Transforming the Electronic Industry Nanjia Zhou (Westlake University)
16:50-17:10	Solution-Processed Thin-Film Transistors for Skin-Like Flexible Electronics Bowen Zhu (Westlake University)

Session 4 Environment and Resources

October 26th

Venue: Qingzhiwu 青芝坞

Chair: Kai Liu, Thomas Cherico Wanger

10:30-11:00	Characterization of the Physicochemical Properties of Atmospheric Aerosols at the Single Particle Level Xin Yang (Southern University of Science and Technology)
11:00-11:30	The Future of Environmental Water Science: A View from China Chunmiao Zheng (Southern University of Science and Technology)
11:30-12:00	Sociometabolic Analytics for Circular Economy and Carbon Neutrality Gang Liu (University of Southern Denmark)
15:15-15:45	Ocean Surface Waves over Coral Reefs, Suggesting How to Defend against Tsunamis Herbert Huppert (University of Cambridge)
15:45-16:15	Heterarchical Modelling of Comminution in Landslides and Mineral Processing Itai Einav (The University of Sydney)
16:15-16:45	Natural Gas Hydrate and its Exploitation Hailong Lu (Peking University)

October 27th

Venue: Qingzhiwu 青芝坞

Chair: Yuzhong Zhang, Yanyan Zhang, Xiao Yang, Liang Lei

09:00-09:30	Exploration of the Deepest Places in the Oceans: The Five Deeps and Ring of Fire Expeditions Alan Jamieson (The University of Western Australia)
09:30-10:00	Soft Robot in the Mariana Trench: Mechanics and System Design Tiefeng Li (Zhejiang University)
10:30-11:00	Rethink the Development of Renewable Energy in the Carbon Neutrality Scheme Xi Lu (Tsinghua University)
11:00-11:30	Microbial Degradation of Polycarbonate and Polyvinyl Alcohol Ningyi Zhou (Shanghai Jiao Tong University)
11:30-12:00	Novel Perfluoroalkyl Ether Carboxylic Acids (PFECAs) and Sulfonic Acids (PFESAs): Occurrence in Human Matrix and Association with Serum Biochemical Parameters in Residents Jiayin Dai (Shanghai Jiao Tong University)
13:30-14:00	Superstructures with Atom-Level Arranged Perovskite and Oxide Layers for Advanced Oxidation with Enhanced Non-Free Radical Pathway Zongping Shao (Nanjing Tech University)
14:00-14:30	Innovated Molten Salt Electrochemical Technologies for Carbon Neutrality Dihua Wang (Wuhan University)
14:30-15:00	Paradigm Shift in Computational Modeling of Granular Media for Geomechanics Jidong Zhao (The Hong Kong University of Science and Technology)
15:30-16:00	Key Technologies for The Development of Manta Ray-like Flexible Submersible Guang Pan (Northwestern Polytechnical University)
16:00-16:30	Sustainable Agriculture in the 21st Century Thomas Cherico Wanger (Westlake University)
16:30-16:50	Multi-scale Multi-physics Modelling (M3) of Complex Problems in Civil, Mining and Environmental Engineering Sergio Andres Galindo Torres (Westlake University)
16:50-17:10	Dechlorination and Defluorination of Organic Contaminants Yanyan Zhang (Westlake University)

Session 5 Materials Science and Engineering

October 26th

Venue : Wenjin B 文錦 B 厅

Chair: Jiaxing Huang, Hanqing Jiang

10:30-11:00	Self-Assembled Supraparticles for Electrocatalysis Zhiyong Tang (National Center for Nanoscience and Technology, China)
11:00-11:30	Hollow Multi-shelled Structure: A Promising Novel Materials Dan Wang (Chinese Academy of Sciences)
11:30-12:00	First Principles Investigation of Defect Control in Thin Film Solar Cell Materials Su-Huai Wei (Beijing Computational Science Research Center)
15:15-15:45	Origami Kinematics and Metamaterials Yan Chen (Tianjin University)
15:45-16:15	Soft Multifunctional Hydrogel Devices Shaoxing Qu (Zhejiang University)
16:15-16:45	Functional Nano-Molecules and Nano-Polymers Zhihong Nie (Fudan University)
<p>October 27th</p> <p>Venue: Wenjin B 文錦 B 厅</p> <p>Chair: Qiyang Lu, Enzheng Shi, Yuxi Xu, Yizhou Zhu</p>	
09:00-09:30	Performance and Stability of Reversible High Temperature Fuel Cells Minfang Han (Tsinghua University)
09:30-10:00	Lattice Defects in Ionic Crystals: Theory & Emerging Applications Xin Guo (Huazhong University of Science and Technology)
10:30-11:00	Engineering of Carbon and Silk Materials toward Flexible Electronics Yingying Zhang (Tsinghua University)
11:00-11:30	Controllable Synthesis of 2D Magnetic Nanomaterials and its Magnetic Structure Yanglong Hou (Peking University)
11:30-12:00	Lattice Polarity Manipulation of Quasi-vdW Epitaxial GaN Films on Graphene through Interfacial Atomic Configuration Xinqiang Wang (Peking University)
13:30-14:00	Analysis on Next Generation Batteries Hong Li (Chinese Academy of Sciences)
14:00-14:30	Lighting Fibers and Display Textiles Huisheng Peng (Fudan University)
14:30-15:00	Materials under the Tip: Quantitative Imaging of Localized Functionalities at the Nanoscale Jiangyu Li (Southern University of Science and Technology)
15:30-16:00	Bioinspired Polymer Nanocomposites Qunfeng Cheng (Beihang University)
16:00-16:20	Proton Conduction in Solid Oxides Promoted by Different Mechanisms: The Role of Oxide Ion Vacancies and Interstitial Oxide Ions Donglin Han (Soochow University)
16:20-16:40	Synthesis and Opto-Electronic Properties of Two-Dimensional Ultrahin Perovskite Materials Lin Wang (Nanjing Tech University)
16:40-17:00	Two-Dimensional Triazine Polymers for Efficient Energy Storage and Conversion Yuxi Xu (Westlake University)