



# Marina Forum on Metantennas and Antennas+AI

4 – 7 March 2024, Singapore

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## *Technical Program*

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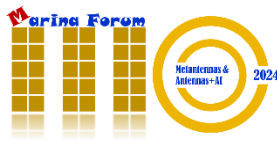
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# Marina Forum: Technical Program



Focus 2024: Metantennas & Antennas + AI

## Program:

- 13 invited speakers (Asia, Europe, and North America)
- 5 shortlisted paper presentations
- Panel Discussions, Student Paper Contest, and Student Interactive Forums



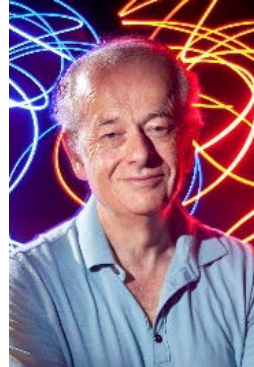
John Pendry  
(United Kingdom)



Andrea Massa  
(Italy)



Jianming Jin  
(USA)



Federico Capasso  
(USA)



Xudong Chen  
(Singapore)



Yijun Feng  
(China)



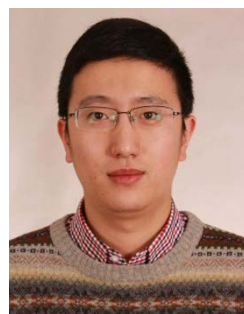
Weihong Xiao  
(China)



Hang Wong  
(HK SAR, China)



Chau Yuen  
(Singapore)



Shuai Zhang  
(Denmark)



Haiming Wang  
(China)



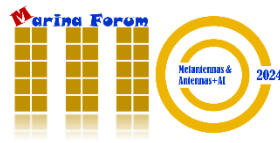
Peiqin Liu  
(Singapore)



Bo Liu  
(United Kingdom)

Marina Forum on Metantennas & Antennas + AI,  
4-7 March 2024, Singapore

# Marina Forum 2024: Committee



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Sergei Tretyakov (Finland)

Douglas Werner (USA)

# 4 March– Student Paper Contest

SN	Singapore Time [ GMT+8]	Presentations
SPC-1	2:00 PM - 2:15 PM	<b>Source Detection With Multi-Label Classification</b> <i>Jayakrishnan Vijayamohanam, The University of New Mexico, USA</i>
SPC-2	2:15 PM - 2:30 PM	<b>Modeling and Analysis of Wideband Multilayer Metasurface Antenna Array Using Characteristic-Mode Analysis</b> <i>Jia Fan Gao, ShanghaiTech University, China</i>
SPC-3	2:30 PM - 2:45 PM	<b>Achieving Functional Meta-Devices by Generalized Meta-Atom Model for Metasurfaces and Genetic Algorithm</b> <i>Wei Ding, Nanjing University, China</i>
SPC-4	2:45 PM - 3:00 PM	<b>A Programmable Diffractive Deep Neural Network Based on a Digital-Coding Metasurface Array</b> <i>Che Liu, Southeast University, China</i>
SPC-5	3:00 PM - 3:15 PM	<b>Light-Controlled Large-Scale Wirelessly Reconfigurable Microstrip Reflectarrays</b> <i>Si Yu Miao, ShanghaiTech University, China</i>
SPC-6	3:15 PM - 3:30 PM	<b>Complete Open-Stopband Suppression Using Sinusoidally Modulated Anisotropic Metasurfaces</b> <i>Federico Giusti, University of Siena, Italy</i>
SPC-7	3:30 PM - 3:45 PM	<b>Deep-Learning-Assisted Inverse Design of Dual-Spin/Frequency Metasurface for Quad-Channel Off-Axis Vortices Multiplexing</b> <i>Kai Qu, Nanjing University, China</i>

# 4 March– Student Interactive Forum

SN	Singapore Time [ GMT+8]	Presentations
SIF-1	4:00 PM - 4:10 PM	<b>Space-time Metasurface: Optimization and Applications</b> <i>Le Xi Ng, NUS High School, Singapore</i>
SIF-2	4:10 PM - 4:20 PM	<b>Design of Flat Lens Using Huygens' Metasurface</b> <i>Hui Yu Yeo, Carissa Ling, Raffles Institution, Singapore</i>
SIF-3	4:20 PM - 4:30 PM	<b>Pattern-Reconfigurable Archimedean Spiral Antenna Array for Long-Distance and Wide-Coverage RFID Inventorying</b> <i>Ren-Long Zhang, Chongqing University, China</i>
SIF-4	4:30 PM - 4:40 PM	<b>DNN-enabled Optimization for Broadband Decoupling of Metasurface Antenna</b> <i>Danyu Yang, National University of Singapore, Singapore</i>
SIF-5	4:40 PM - 4:50 PM	<b>Outlier Detection-Aided Supervised Learning for Modeling of Thinned Cylindrical Conformal Array</b> <i>Yang Hong, University of Electronic Science and Technology of China, China</i>
SIF-6	4:50 PM - 5:00 PM	<b>Meta-Radome for Radiation Pattern Improvement</b> <i>Bo Zhang, National University of Singapore, Singapore</i>

# Afternoon Session – 5 March

- **Session Chairs:** Prof. Feng Han Lin (Shanghai Tech University, China) / Dr. Theng Huat Gan (Temasek Labs @ NUS, Singapore)

SN	Singapore Time [GMT+8]	Presentations
PM-1	2:30 PM - 2:50 PM	<b>Metasurface Aided Signal Processing and Smart Antennas for Smart Electromagnetic Environments</b> <i>Prof. Filiberto Bilotti</i> , Roma Tre University, Italy
PM-2	2:50 PM - 3:10 PM	<b>Metantenna Integrated with In-Band Co-Polarized Radiation and Scattering Functions</b> <i>Dr. Yanhe Lyu</i> , National University of Singapore, Singapore
	3:10 PM - 3:40 PM	Session Break
PM-3	3:40 PM - 4:00 PM	<b>Gaussian Process Modeling of 3D-Printed Dielectrics Surrounding a Monopole Antenna</b> <i>Prof. Xin Hao</i> , The University of Arizona, USA
PM-4	4:00 PM - 4:20 PM	<b>Meander Embedding Sector Antenna for Series Superconducting Detectors</b> <i>Prof. Mei Yu</i> , Nantong University, China
PM-5	4:20 PM - 4:40 PM	<b>Recent Development in Machine-Learning-Aided-Design (MLAD) of Metasurfaces and Antennas</b> <i>Prof. Feng Han Lin</i> , ShanghaiTech University, China



# Morning Session – 6 March

- **Session Chair:** Prof. Shuai Zhang (Aalborg University, Denmark)

SN	Singapore Time [ GMT+8]	Presentations
AM-1	9:10 AM - 10:00AM	<b>[KEYNOTE] Extreme Time Modulation of Material Properties and Hawking Radiation</b> <i>Prof. John Pendry</i> , Imperial College London, United Kingdom
	10:00 AM - 10:30 AM	Session Break
AM-2	10:30 AM - 11:20 AM	<b>[KEYNOTE] On the Physical-Layer Implementation of the Metaverse - Physical-Driven AI-Based Synthesis and Planning of the Smart-EM-Environment (SEME) Entities</b> <i>Prof. Andrea Massa</i> , University of Trento, Italy
AM-3	11:20 AM - 12:00 PM	<b>[INVITED] Diversity of Functional Material-based Coding Metasurface in Terahertz Applications</b> <i>Prof. Hang Wong</i> , City University of Hong Kong, Hong Kong, China
	12:00 PM – 2:00 PM	Lunch Break

# 6 March (9:10 AM-10:00 AM): Keynote Talk

**WED-AM1: Extreme Time Modulation of Material Properties and Hawking Radiation**

**Speaker: Prof. John Pendry**, Imperial College London, United Kingdom



**John Pendry** is a condensed matter theorist working at Imperial College London. His early work addressed electronic and structural properties of surfaces developing the theory of low energy diffraction, EXAFS, and of electronic surface states later moving on to studies of transport in disordered systems. In the mid 1990's he turned his attention to metamaterials and proposed several structures which radically influenced the development of the field leading to the experimental discovery of negative refraction by the Smith group and later, also in collaboration with David Smith, the design of a cloak of invisibility. His investigation of negative refraction led to the discovery that it is theoretically possible to design a lens whose resolution is limited only by the perfection of manufacture, not by the well known Abbé law which limits resolution to the order of the wavelength. The technique of transformation optics which he pioneered has led to many applications in the field of plasmonics, particularly building on the perfect lens concept and showing how to concentrate light into sub nanoscale volumes. His most recent work is the topic of today's talk and moves the study of metamaterials on to structures that vary in time as well as in space.



# 6 March (10:30 AM-11:20 AM): Keynote Talk

## WED-AM2: On the Physical-Layer Implementation of the Metaverse - Physical-Driven AI-Based Synthesis and Planning of the Smart-EM-Environment (SEME) Entities

Speaker: **Prof. Andrea Massa**, University of Trento, Italy



**Andrea Massa** is the director of the network of federated laboratories "ELEDIA Research Center" located in Brunei, China, Czech, France, Greece, Italy, Japan, Perù, Tunisia with more than 150 researchers. Moreover, he is holder of a Chang-Jiang Chair Professorship @ UESTC (Chengdu – China), Visiting Research Professor @ University of Illinois at Chicago (Chicago – USA), Distinguished Visiting Professor @ Tsinghua (Beijing - China), Visiting Professor and IAS Distinguished Scholar @ Tel Aviv University (Tel Aviv – Israel), and Professor @ CentraleSupélec (Paris - France). He has been holder of a Senior DIGITEO Chair at L2S-CentraleSupélec and CEA LIST in Saclay (France), UC3M-Santander Chair of Excellence @ Universidad Carlos III de Madrid (Spain), Adjunct Professor at Penn State University (USA), Guest Professor @ UESTC (China), and Visiting Professor at the Missouri University of Science and Technology (USA), the Nagasaki University (Japan), the University of Paris Sud (France), the Kumamoto University (Japan), and the National University of Singapore (Singapore). He has been appointed IEEE AP-S Distinguished Lecturer (2016-2018) and served as Associate Editor of the "IEEE Transaction on Antennas and Propagation" (2011-2014). His research activities are mainly concerned with inverse problems, antenna analysis/synthesis, radar systems and signal processing, cross-layer optimization and planning of wireless/RF systems, system-by-design and material-by-design (metamaterials and reconfigurable-materials), and theory/applications of optimization techniques to engineering problems (coms, medicine, and biology). Prof. Massa published more than 900 scientific publications among which more than 350 on international journals (> 16.000 citations – h-index = 66 [Scopus] > 13.500 citations – h-index = 61 [ISI-WoS] > 25.500 citations – h-index = 90 [Google Scholar]) and more than 570 in international conferences where he presented more than 210 invited contributions (> 50 invited keynote speaker) ([www.eledia.org/publications](http://www.eledia.org/publications)). He has organized more than 100 scientific sessions in international conferences and has participated to several technological projects in the national and international framework with both national agencies and companies (18 international prj, > 5 M€ 8 national prj, > 5 M€ 10 local prj, > 2 M€ 63 industrial prj, > 10 M€ 6 university prj, > 300 K€).

# 6 March (11:20 AM-12:00 PM): Invited Talk

## WED-AM3: Diversity of Functional Material-based Coding Metasurface in Terahertz Applications

Speaker: **Prof. Hang Wong**, City University of Hong Kong, Hong Kong, SAR, China



**Hang Wong** received the B.Eng., M.Phil., and Ph.D. degrees in electronic engineering from City University of Hong Kong in 1999, 2002 and 2006, respectively. He joined the Department of Electrical Engineering at City University of Hong Kong in 2012. He has been elected an IEEE Fellow in 2024. Dr. Wong is the director of Applied Electromagnetics Laboratory at CityU and the deputy director of the State Key Laboratory of Terahertz and Millimeter Waves (Hong Kong). His research interests are antenna technologies of 5G, 6G, millimeter-wave and terahertz applications. His achievements led to receiving numerous awards at local, national and international conferences. For example, he received the best paper award at the national conference 2017 Les Journées Nationales Microondes in France the best paper award at the 2017 IEEE International Workshop on Electromagnetics in the UK the best associate editor award 2016 of an IEEE Antennas and Wireless Propagation Letters in the US and an outstanding scientist award of 2016 in Shenzhen city presented by Shenzhen Science and Technology Bureau. He was awarded to lead a major project supported by the Ministry of Industry and Information Technology of PRC to develop new antenna elements for TD-LTE and 5G applications. He has over 250 publications, 2 co-authors of book chapters and 30 US and China patents. He is the chair of the IEEE Hong Kong Section of the Antennas and Propagation (AP)/Microwave Theory and Techniques (MTT) Chapter. He was the IEEE APS Region-10 Representative. He is an associate editor of IEEE Transactions on Antennas and Propagation and IEEE Antennas and Wireless Propagation Letters. Dr. Wong was the General Co-chair of the Asia Pacific Microwave Conference (AMPC) 2020, Hong Kong the General Chair of Cross-Strait Radio Science and Wireless Technology Conference 2021, Shenzhen, China the General Chair of 2025 IEEE International Workshop on Electromagnetics (iWEM), Hong Kong.

# Afternoon Session – 6 March

- **Session Chair:** Prof. Xudong Chen (National University of Singapore, Singapore)

SN	Singapore Time [ GMT+8]	Presentations
PM-1	2:00 PM - 2:50 PM	<p><b>[KEYNOTE] Hybrid Optimization of Electromagnetic Devices Enhanced with Physics-Informed Machine</b></p> <p><i>Prof. Jianming Jin</i>, University of Illinois at Urbana-Champaign, USA Zhejiang University-University of Illinois at Urbana-Champaign Institute, China</p>
PM-2	2:50 PM - 3:30 PM	<p><b>[INVITED] Stacked Intelligent Metasurfaces Enabled Joint Signal Processing and Communication in the Wave Domain</b></p> <p><i>Prof. Chau Yuen</i>, Nanyang Technological University, Singapore</p>
	3:30 PM - 4:00 PM	Session Break
PM-3	4:00 PM - 4:40 PM	<p><b>[INVITED] Performance Enhancement of Mechanically Beam-Steerable Transmitarrays with Low Profile</b></p> <p><i>Prof. Shuai Zhang</i>, Aalborg University, Denmark</p>
PM-4	4:40 PM - 5:20 PM	<b>Panel Discussion</b>

# 6 March (2:00 AM-2:50 PM): Keynote Talk

## WED-PM1: Hybrid Optimization of Electromagnetic Devices Enhanced with Physics-Informed Machine

**Speaker:** *Prof. Jianming Jin*, University of Illinois at Urbana-Champaign, USA / Zhejiang University-University of Illinois at Urbana-Champaign Institute, China



**Jianming Jin** is Y. T. Lo Chair Professor in Electrical and Computer Engineering and Director of the Electromagnetics Laboratory and Center for Computational Electromagnetics at the University of Illinois at Urbana-Champaign. He also serves as the Executive Dean of Zhejiang University-University of Illinois at Urbana-Champaign Institute. He has authored *The Finite Element Method in Electromagnetics*, *Electromagnetic Analysis and Design in Magnetic Resonance Imaging*, and *Theory and Computation of Electromagnetic Fields*, and co-authored *Computation of Special Functions*, *Finite Element Analysis of Antennas and Arrays*, and *Fast and Efficient Algorithms in Computational Electromagnetics*. He was elected by ISI among world's most cited authors in 2002. He is a Fellow of IEEE, OSA, ACES, and Electromagnetics Academy.

## 6 March (2:50 PM-3:30 PM): Invited Talk

WED-PM2: **Stacked Intelligent Metasurfaces Enabled Joint Signal Processing and Communication in the Wave Domain**

Speaker: **Prof. Chau Yuen**, Nanyang Technological University, Singapore



**Chau Yuen** received the B.Eng. and Ph.D. degrees from Nanyang Technological University, Singapore, in 2000 and 2004, respectively. He was a Post-Doctoral Fellow with Lucent Technologies Bell Labs, Murray Hill, in 2005. From 2006 to 2010, he was with the Institute for Infocomm Research, Singapore. Since 2023, he has been with the School of Electrical and Electronic Engineering, Nanyang Technological University. Dr. Yuen received IEEE Communications Society Fred W. Ellersick Prize (2023), IEEE Marconi Prize Paper Award in Wireless Communications (2021), IEEE APB Outstanding Paper Award (2023), IEEE ICC and ICCT Best Paper Award (2023), and EURASIP Best Paper Award for JOURNAL ON WIRELESS COMMUNICATIONS AND NETWORKING (2021). He is an IEEE Fellow and also a Highly Cited Researcher by Clarivate Web of Science.



# 6 March (4:00 PM-4:40 PM): Invited Talk

WED-PM3: **Performance Enhancement of Mechanically Beam-Steerable Transmitarrays with Low Profile**

Speaker: **Prof. Shuai Zhang**, Aalborg University, Denmark



**Shuai Zhang** received the B.E. degree from the University of Electronic Science and Technology of China, Chengdu, China, in 2007 and the Ph.D. degree in electromagnetic engineering from the Royal Institute of Technology (KTH), Stockholm, Sweden, in 2013. In 2014, he joined Aalborg University, Denmark, where he currently the Head of Antenna Research Group with over 13 staff. He has also been admitted to a promotion program to a Full Professor at Aalborg University since 2022. He has supervised/co-supervised 8 Postdocs and 17 PhD students since 2017. His current research interests include: antennas for handset and base station communications, bio-electromagnetics, metasurfaces, CubeSat antennas, Massive MIMO antennas, and antennas for wireless sensors. In these areas, he has coauthored over 120 articles in well-reputed international journals and 17 US or WO patents. His citations in Scopus are over 4600 with H index of 34. He is the Associate Editor for IEEE Antennas and Wireless Propagation Letters Sensors and IET Microwaves, Antennas and Propagation. He is also a reviewer for all the top IEEE and IET journals in antenna areas, where he got the prize of “Top Reviewers in IEEE Transactions on Antennas and Propagation 2019-2020, 2020-2021, and 2022-2023”. He is the General Co-Chair for iWAT2023 at Aalborg, Denmark, the Super TPC for IEEE APS 2020 and 2021, and the TPC for several top IEEE conferences. He is the recipient of “IEEE Antennas and Propagation Society Young Professional Ambassador” in 2022, where he gives presentation for different IEEE Chapters on Antennas for Cellular Communications. He has also been intensively invited to international conference and industry to give keynote/plenary speech and presentations.



# Morning Session – 7 March

- **Session Chair:** Prof. Jianming Jin (UIUC, USA / Zhejiang University-UIUC Institute, China)

SN	Singapore Time [GMT+8]	Presentations
AM-1	9:00 AM - 9:50 AM	<b>[KEYNOTE]</b> Flat Optics: From Structuring Light and Dark to Metalenses for High Volume Applications <i>Prof. Federico Capasso</i> , Harvard University, USA
	9:50 AM - 10:20 AM	Session Break
AM-2	10:20 AM - 11:10 AM	<b>[KEYNOTE]</b> Physics-Assisted Machine Learning for Solving Electromagnetic Inverse Problems <i>Prof. Xudong Chen</i> , National University of Singapore, Singapore
AM-3	11:10 AM - 11:50 AM	<b>[INVITED]</b> Intelligent Synthesis of Arrays Using Hybrid Knowledge-guided & Data-driven Technology <i>Prof. Haiming Wang</i> , Southeast University, China
AM-4	11:50 AM - 12:20 PM	<b>[INDUSTRY]</b> Intelligent Base Station Antenna System for 5.5G/6G Applications <i>Mr. Weihong Xiao</i> , Huawei Technologies Co. Ltd
	12:20 PM - 2:00 PM	Lunch Break

# 7 March (9:00 AM-9:50 AM): Keynote Talk

**THU-AM1: Flat Optics: From Structuring Light and Dark to Metalenses for High Volume Applications**

**Speaker: Prof. Federico Capasso**, Harvard University, USA



**Federico Capasso** holds a Doctor of Physics degree from the University of Roma, La Sapienza. He is the Robert Wallace Professor of Applied Physics at Harvard University, which he joined in 2003 after 27 years at Bell Labs where his career advanced from postdoctoral fellow to Vice President for Physical Research. He has made wider ranging contributions to optics and photonics, nanoscience, designer materials leading to his invention of the quantum cascade laser carried out fundamental studies of the Casimir effect, including the first measurement of the repulsive Casimir force. He pioneered metasurfaces, discovering their generalized laws of refraction and reflection, and metaoptics, such as high performance metalenses. He is a co-founder and board member of Metalenz Inc. (<https://www.metalenz.com/>), which is focused on commercializing metaoptics for high-volume markets. He is Clarivate citation laureate for physics in 2023 which recognizes an exceptional citation record within the Web of Science™. He is a member of the National Academy of Sciences, the National Academy of Engineering, the Academia Europaea, the Accademia dei Lincei, a fellow of the National Academy of Inventors, and a fellow of the American Academy of Arts and Sciences (AAAS). His awards include the Balzan Prize in Applied Photonics, the King Faisal Prize, the AAAS Rumford Prize, the IEEE Edison Medal, the IEEE Sarnoff Award, the American Physical Society Arthur Schawlow Prize, the Yves Medal of Optica, the Enrico Fermi Prize of the Italian Physical Society, the Matteucci Medal, the Wetherill Medal of the Franklin Institute, the Materials Research Society Medal and the Jan Czocharlski Award for lifetime achievements in Materials Science. He holds honorary doctorates from Lund University, Diderot University, the University of Bologna and University of Roma, Tor Vergata.

# 7 March (10:20 AM-11:10 AM): Keynote Talk

## THU-AM2: **Physics-Assisted Machine Learning for Solving Electromagnetic Inverse Problems**

Speaker: **Prof. Xudong Chen**, National University of Singapore, Singapore



**Xudong Chen** received the B.S. and M.S. degrees from Zhejiang University, China and the Ph.D. degree from the Massachusetts Institute of Technology, USA. Since 2005, he has been with the National University of Singapore, Singapore, where he is currently a Professor. He has published 170 journal papers on inverse scattering problems, material parameter retrieval, microscopy, optical encryption, and physics-assisted machine learning. He has authored the book *Computational Methods for Electromagnetic Inverse Scattering* (Wiley-IEEE, 2018). His research interests include mainly electromagnetic wave theories and applications, with a focus on inverse problems and computational imaging. Dr. Chen is a Fellow of IEEE and Fellow of the Electromagnetics Academy. He was a recipient of the Young Scientist Award by International Union of Radio Science in 2010 and a recipient of the Ulrich L. Rohde Innovative Conference Paper Award at ICCEM 2019 conference. He is currently a Deputy Editor-in-Chief (D-EiC) of IEEE Transactions on Geoscience and Remote Sensing. He was an Associate Editor (AE) of IEEE J-ERM, IEEE T-MTT, and IEEE T-GRS. He has been members of organizing committees of more than 10 conferences, serving as General Chair, Technical Program Committee (TPC) Chair, Award Committee Chair, etc. He was the Chair of IEEE Singapore Microwave Theory and Techniques (MTT)/Antennas and Propagation (AP) Joint Chapter in 2018.

# 7 March (11:10 AM-11:50 AM): Invited Talk

THU-AM3: **Intelligent Synthesis of Arrays Using Hybrid Knowledge-guided & Data-driven Technology**

Speaker: **Prof. Haiming Wang**, Southeast University, China



**Haiming Wang** received the B.S., M.S., and Ph.D. degrees in Electrical Engineering from Southeast University, Nanjing, China, in 1999, 2002, and 2009, respectively. He joined the School of Information Science and Engineering, Southeast University, Nanjing, China, in 2002, and is currently a distinguished professor. His current research interests include AI-powered antenna and radiofrequency technologies (iART), AI-powered channel measurement and modeling technologies (iCHAMM), and integrated communications, sensing, and positioning (iCSAP).

# 7 March (11:50 AM-12:20 PM): Industry Talk

## THU-AM4: Intelligent Base Station Antenna System for 5.5G/6G Applications

**Speaker: Mr. Weihong Xiao**, Huawei Technologies Co., Ltd., China (presented on behalf by Dr. Wei Liu, Huawei International Pte. Ltd., Singapore)



**Weihong Xiao** received the Bachelor and Master degrees from the University of Electronic Science and Technology of China (UESTC), Chengdu, China, both in Electronic Engineering, in 2003 and 2006 respectively. Mr. Xiao has been with Huawei Technologies since 2006, where he is currently the CTO for Base Station Antenna. Under his leadership, Huawei Antenna has ranked No. 1 in competitiveness for the past nine consecutive years. Meanwhile, Huawei has developed a series of cutting-edge technologies of FreSIP, SDIF and Metalens for the comprehensive improvement of RF efficiency, coverage efficiency and beamforming efficiency, leading the base station antenna industry into a new era of continuously improving its generalized efficiency. For example, Huawei BladeAAU Pro packaged the iF Design Award, Red Dot Design Award, and Best Mobile Network Infrastructure Award. His research interests include the theory and design of antennas and arrays for base stations, and the integration of antenna, filter and algorithm for wireless communications. He holds over 140 granted and pending US/WO/PCT/CN patents.



**Wei Liu** received the Ph.D. degree from the Department of Electronic Engineering and Information Science, University of Science and Technology of China (USTC), Hefei, China. Since 2021, Dr. Liu has been with Huawei, where he is currently the Director of Singapore Antenna Technology Lab. Prior to joining Huawei, he has worked with National University of Singapore and the Institute for Infocomm Research, A\*STAR, Singapore. His main research interests include the theory, modelling, and design of metamaterial/metasurface antennas and arrays. Dr. Liu was the recipient of Institution of Engineers Singapore (IES) Prestigious Engineering Achievement Award 2014. He has authored and co-authored one Book Chapter and more than 50 peer-reviewed journal and conference papers. He has served as the TPC Member, Session Chair and Award Jury Member for a number of academic conferences.

# Afternoon Session – 7 March

- **Session Chair:** Prof. Chau Yuen (Nanyang Technological University, Singapore)

SN	Singapore Time [ GMT+8]	Presentations
PM-1	2:00 PM - 2:50 PM	<b>[KEYNOTE] Deep-learning-aided Metasurface Design and Manipulation: Meta-atom Optimization, On-demand Scattering Control and Self-adaptive Retroreflection</b> <i>Prof. Yijun Feng</i> , Nanjing University, China
PM-2	2:50 PM - 3:30 PM	<b>[INVITED] Prior Knowledge-Guided Deep Learning-Enabled Synthesis Method for Metantennas</b> <i>Dr. Peiqin Liu</i> , National University of Singapore, Singapore
	3:30 PM - 4:00 PM	Session Break
PM-3	4:00 PM – 4:40 PM	<b>[INVITED] Automated Design of Microwave Antennas: An AI-empowered Approach</b> <i>Prof. Bo Liu</i> , University of Glasgow, United Kingdom
PM-4	4:40 PM – 5:20 PM	<b>Panel Discussion</b>
	5:20 PM - 5:30 PM	Closing Remarks



# 7 March (2:00 PM-2:50 PM): Keynote Talk

**THU-PM1: Deep-learning-aided Metasurface Design and Manipulation: Meta-atom Optimization, On-demand Scattering Control and Self-adaptive Retroreflection**

**Speaker: Prof. Yijun Feng**, Nanjing University, China



**Yijun Feng** received the Ph.D. degrees from the Department of Electronic Science and Engineering, Nanjing University, Nanjing, China, in 1992. Since then, he has been a faculty member and is currently a Full Professor and the Deputy Dean of the School of Electronic Science and Engineering, Nanjing University. From September 1995 to July 1996, he was a Visiting Scientist with the Department of Physics, Technical University of Denmark. From August 2001 to August 2002, he was a Visiting Researcher with the University of California at Berkeley, USA. He has authored or coauthored over 200 peer-reviewed journal articles and over 180 referred international conference papers. His research interests include the electromagnetic metamaterials and their applications to microwave and photonic devices, electromagnetic wave theory, and novel microwave functional materials. He has conducted more than 20 scientific research projects including National 973, 863 Projects, the National Natural Science Foundation projects and the National Key Research and Development Program in China. Dr. Feng has received the 2010 Science and Technology Award (first grade) from Jiangsu Province, the 2021 Science and Technology Award (first grade) from Shanxi Province, China, and the 2022 Science and Technology Award (first grade) from China Institute of Communications. He has served as the General Co-Chair or Technical Program Co-Chair of several international conferences, including General Co-Chair for the 2018 IEEE International Workshop on Antenna Technology, 2024 IEEE Asia-Pacific Conference on Antennas and Propagation, and Technical Program Co-Chair for the 2013 International Symposium on Antennas and Propagation.

## 7 March (2:50 PM-3:30 PM): Invited Talk

THU-PM2: **Prior Knowledge-Guided Deep Learning-Enabled Synthesis Method for Metantennas**

Speaker: **Dr. Peiqin Liu**, National University of Singapore, Singapore



**Peiqin Liu** received the B.E. degrees from the University of Electronic Science and Technology of China, in 2014, and the Ph.D. degree in Electronic Engineering from Tsinghua University, Beijing, China, in 2019. Since September 2019, he has been with National University of Singapore, where he is a Research Fellow. His current research interests include metamaterial and antenna theory, particularly in novel metasurface with machine-learning methods. Dr. Liu has authored and co-authored more than 30 technical papers published in international journals and conferences and holds 5 granted Chinese patents. He is the recipient of Young Antenna Scientist Award of 2023 Singapore Workshop on Antennas (SWA) the Outstanding Student Paper Award of 2018 Cross Strait Quad-Regional Radio Science and Wireless Technology Conference (CSQRWC) the Best Student Paper Award of 2017 Asia-Pacific Conference on Antennas and Propagation (APCAP) the Best Student Paper Award of 2017 National Conference on Antennas (NCANT).

## 7 March (4:00 PM-4:40 PM): Invited Talk

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THU-PM3: **Automated Design of Microwave Antennas: An AI-empowered Approach**

Speaker: **Prof. Bo Liu**, University of Glasgow, United Kingdom



**Bo Liu** received the B.Eng. degree from Tsinghua University, China, in 2008 and the Ph.D. degree from University of Leuven (KU Leuven), Belgium, in 2012. Currently, he is a Professor of Electronic Design Automation at University of Glasgow. He is a Fellow of IET and a Senior Member of IEEE. His research focuses on novel data-driven optimization and machine learning algorithms for electronic design and their real-world applications, including antenna, filter, analog and RF ICs. In terms of AI-driven antenna design, he is the inventor of the SADEA series. The SADEA series is the first to address the bottleneck of computationally expensive electromagnetic simulations together with poor or no initial design in antenna design exploration – this makes the AI-driven antenna design approach suitable for industrial requirements. More information can be found via <https://www.gla.ac.uk/schools/engineering/staff/boliu/>.