

The 3rd ISA Global Annual LiFi Conference 2024

(18:00-22:00, Beijing Time, UTC+8, March 11-12, 2024)

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Information of the Speakers

Day 1 Speaker No. 1

Photo of Speaker



Name: Harald Haas FREng, FRSE, FIEEE, FIET

Organization/Company and title:
Distinguished Professor of Mobile Communications
Director of LiFi Research and Development Centre (LRDC)
The University of Strathclyde, UK
Van Eck Professor of Engineering, University of Cambridge (from 1 April 2024)
Chairman of ISA LiFi Committee
Member of ISA Board of Advisors

Short Bio:

Professor Harald Haas received his Ph.D. degree from The University of Edinburgh in 2001. He is a Distinguished Professor of Mobile Communications at the University of Strathclyde/Glasgow, Visiting Professor at the University of Edinburgh and the Director of the LiFi Research and Development Centre (LRDC). Prof Haas initiated and co-founded pureLiFi Ltd., where holds the position of Chief Scientific Officer (CSO). He has co-authored more than 650 conference and journal papers and holds more than 45 patents. He has been listed as highly cited researcher by Clarivate/Web of Science since 2017. Prof. Haas has delivered two TED talks which have been watched online more than 5.7 million times. In 2016, he was the recipient of the Outstanding Achievement Award from the International Solid State Lighting Alliance. In 2017 he was awarded a Royal Society Wolfson Research Merit Award. In 2019 he received the IEEE Vehicular Society James Evans Avant Garde Award. In 2021, he received the Enginuity The Connect Places Innovation Award. In 2022 he was the recipient of a Humboldt Research Award for his research achievements to date. He was shortlisted for the European

Patent Office (EPO) Inventor Award in the category ‘Research’ in 2023. He is a Fellow of the IEEE, a Fellow of the Royal Academy of Engineering (RAEng), a Fellow of the Royal Society of Edinburgh (RSE) and a Fellow of the Institution of Engineering and Technology (IET).

Subject: “How Crucial is the Receiver?”

Abstract:

LiFi is mobile multiuser networking with light. This approach necessitates that optical signals be received at sufficient power levels, irrespective of the orientation of a mobile device or its position. Often, the significance of the receiver in LiFi systems is underestimated; however, we argue that it is essential for optimal system performance. In this presentation, we will examine various receiver designs and technologies pertinent to LiFi networks, aiming for gigabits per second per square meter (Gbps/m²) data densities and the realisation of net-zero wireless networks.

Day 1 Speaker No. 2

Photo of Speaker



Name: Nan CHI

Organization/Company and title:
Professor, Director of the Department
Communications Science and Engineering, Fudan
University, China

Short Bio:

Professor Nan Chi is with School of Information Science and Engineering, Fudan University, China. She received the BS degree and PhD degree in electrical engineering from Beijing University of Posts and Telecommunications, China. She is the author or co-author of more than 300 papers and has been cited more than 12000 times. She has been awarded as The National Science Fund for Distinguished Young Scholars, the New Century Excellent Talents Awards from the Education Ministry of China, Shanghai Shu Guang scholarship. Her current research interests include optical packet/label switching, optical fiber communication and visible light communication. She is a fellow of the OSA.

Subject: “New spectra Communications for 6G”

Abstract:

The next generation of wireless communication technology requires the expansion of new

spectrum carrier resources (terahertz, visible light, ultraviolet, and infrared bands). This paper will present advancements in terahertz and visible light high-speed transmission, discuss recent research hotspots, including new materials and devices, system applications of satellite and underwater networks, as well as the exploration of AI applications in signal processing. Additionally, the paper will introduce the prospects and challenges of new spectrum communication in 6G.

Day 1 Speaker No. 3

Photo of Speaker



Name: Mohamed-Slim Alouini

Organization/Company and title:
Professor, King Abdullah University of Science and Technology, KAUST

Short Bio:

Mohamed-Slim Alouini was born in Tunis, Tunisia. He received the Ph.D. degree in Electrical Engineering from the California Institute of Technology (Caltech) in 1998. He served as a faculty member at the University of Minnesota then in the Texas A&M University at Qatar before joining in 2009 the King Abdullah University of Science and Technology (KAUST) where he is now a Distinguished Professor of Electrical and Computer Engineering. Prof. Alouini is a Fellow of the IEEE and OPTICA (Formerly the Optical Society of America (OSA)). He is currently particularly interested in addressing the technical challenges associated with the uneven distribution, access to, and use of information and communication technologies in rural, low-income, disaster, and/or hard-to-reach areas.

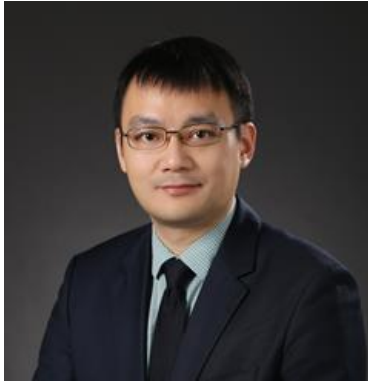
Subject: “On IRS-Aided Visible Light Communications”

Abstract:

Use of light-emitting diode (LED) -based lightings is increasing the interest in considering visible-light communication (VLC), as it offers efficient resource utilization while befitting from a huge unlicensed spectrum. On the other hand, as line-of-sight (LoS) components in have the largest contribution to the received signals in VLC, the performance of VLC systems is sensitive to link blockage and misalignment. Recently, intelligent reflecting surfaces (IRSs) were proposed to improve VLC system performance, with advantages that include relaxing the need for having LoS links between transmitters and receivers. In this talk, we present some of the state of the art developments in the area of IRS-aided VLC systems with respect to both indoor and outdoor applications.

Day 1 Speaker No. 4

Photo of Speaker



Name: Lai WANG

Organization/Company and title:

Department of Electronic Engineering,
Tsinghua University, Professor

Short Bio:

Wang Lai received his bachelor's degree and doctor's degree respectively, both in the Department of Electronic Engineering of Tsinghua University in 2003 and 2008, respectively. His research interests include optoelectronic materials and devices based on wide-gap semiconductors, Micro-LEDs for display and communication, blue and green laser diodes, and in-sensor computing devices. He has published more than 150 SCI papers. He serves as an oversea editorial board member of Applied Physics Express. In 2011, he won the second prize of National Science and Technology Progress Award. In 2022, he was supported by the National Science Fund for Distinguished Young Scholars.

Subject: "High-speed InGaN light-emitting devices for visible light communications"

Abstract:

New communication scenarios such as LIFI, in-vehicle plastic optic fiber communication, and inter-chip interconnection have put forward demands for high-speed blue and green light sources. This presentation will introduce the work of our team on achieving high-speed Micro-LEDs and laser diodes with a -3dB modulation bandwidth up to GHz level based on improved InGaN active region epitaxy.

Day 1 Speaker No. 5

Photo of Speaker

Name: Takaya Yamazato

Organization/Company and title:

Professor and Deputy Director at the Institute
of Liberal Arts and Sciences, Nagoya



University, Japan

Short Bio:

Dr. Takaya Yamazato is a professor and Deputy Director at the Institute of Liberal Arts and Sciences, Nagoya University, Japan. In 1998, he gave a half-day tutorial entitled "Introduction to CDMA ALOHA" at the IEEE GLOBECOM held in Sydney, Australia. In 2006, he received the IEEE Communication Society's Best Tutorial Paper Award. He served as the co-chair of the Wireless Communication Symposia of the IEEE ICC 2009 and is the co-chair of Selected Areas in Communication Symposia of the IEEE ICC 2011. From 2008 to 2010, he served as the chair of the Satellite and Space Communication Technical Committee of the IEEE Communication Society. In 2011, he gave a half-day tutorial entitled "Visible Light Communication" at the IEEE ICC 2011 held in Kyoto, Japan. In addition, he served as the editor-in-chief of the Japanese Section of IEICE Transactions on Communications from 2009 to 2011. From 2016 to 2017, he was the Director of the Asia/Pacific Board, the IEEE Communication Society. He co-chaired the 8th and 9th IEEE GLOBECOM Workshop on Optical Wireless Communications (OWC'18 and OWC'20). In addition, he was the Chair of the IEICE Communication Society Editorial Board from 2020 to 2021. Currently, he is the Chair of Japan Photonic Society Optical Wireless Subcommittee. His research interests include visible light communication, ITS, and stochastic resonance.

Title: "Enhancing Mobile Vehicle Connectivity: Optimizing Visible Light Communication Signal Reception with Rolling Shutter Image Sensors"

Abstract:

We have effectively captured visible light communication signals within mobile vehicles by employing a camera equipped with a commonly utilized rolling shutter image sensor. Our ongoing efforts are focused on enhancing the performance of this approach. This presentation aims to provide an overview of our methodology.

Day 1 Speaker No. 6

Photo of Speaker

Name: Chen GONG



Organization/Company and title:
Professor, University of Science and
Technology of China

Short Bio:

Prof. Chen Gong is the associated director of CAS Key Lab of Wireless-Optical Communication. He joined University of Science and Technology of China in 2014. His research focuses on optical wireless communication and positioning, wireless communication and wireless big data. He received Hongkong Qiushi Award in 2016, best paper award of 2017 IEEE Globecom ONS Symposium, and excellent paper award in China Association for Science and Technology.

Title: “The Determinacy Consideration of Optical Wireless Communications”

Abstract:

Radio-frequency wireless communication suffers three challenges in the application in Industrial Internet of Things, including reliability, secrecy and customizability. The above three challenges increase time jitter, communication rate fluctuation, the uncertainty in terms of reliability and secrecy. To solve the above challenges, considering the controllable transmission range of signal and interference in the optical spectrum, optical wireless communication shows higher determinacy compared with radio-frequency communication. This report will present our recent research progress on the determinacy of optical wireless communication, including the preliminary investigation on the optical transmission and multi-user access.

Day 1 Speaker No. 7

Photo of Speaker

Name: Ali Khalighi

Organization/Company and title:
Associate Professor, Fresnel Institute,
Marseille, France


**Short Bio:**

Dr. Ali Khalighi is Associate Professor with Ecole Centrale Med, Marseille, France, and head of “Optical Communications for IoT” group at Fresnel Institute research lab. He is currently serving as Action Chair for the COST Action CA19111 NEWFOCUS (European Network on Future Generation Optical Wireless Communication Technologies, 2020-2024), and also served as Project Coordinator for the H2020 ITN MSCA VisIoN project (Visible-light-based Interoperability and Networking, 2017-2022). He has co-edited the book “Visible Light Communications: Theory and Applications” (CRC Press, 2017) and was the co-recipient of the 2019 Best Survey Paper Award of the IEEE Communications Society. He is also serving as Editor-at-Large for the IEEE Transactions on Communications. His main research interests include signal processing and system design for wireless communication systems with an emphasis on free-space, underwater, and indoor visible-light optical communications, as well as machine learning for wireless communications.

Title: “Optimizing Visible-Light Communication Network Performance with a Focus on Multiple Access and Mobility”**Abstract:**

In this talk, we consider the optimization of different parts of a VLC communication system in order to improve the overall network performance, while addressing the requirements in terms of multiple-access management and user mobility. In particular, for scenarios with relatively low number of users, and using zero-forcing pre-coding, we consider the optimization of transmitter and receiver parameters to improve the network performance by decreasing the correlation in the network channel matrix. We then consider scenarios with higher user density and introduce an efficient technique to manage multiuser interference, characterized by high efficiency and relatively low complexity. Lastly, we introduce soft handover techniques to accommodate user mobility, ensuring enhanced network throughput and reliability.


Day 1 Speaker No. 8

Photo of Speaker 	Name: Chen CHEN
	Organization/Company and title: Professor, Chongqing University, China

Short Bio:
Prof. Chen Chen received both the B.S. and M.Eng. degrees from the University of Electronic Science and Technology of China and the Ph.D. degree from Nanyang Technological University, and he is currently a Professor in Chongqing University. His main research interest is 6G LiFi communication, focusing on physical-layer transmission techniques for LiFi communication systems.

Subject: “Multi-dimensional signal transmission in underwater LiFi (U-LiFi)”

Abstract:
LiFi has been widely shown to be a promising technology for efficient wireless connectivity in underwater environments. This speech will introduce underwater LiFi (U-LiFi) from the signal transmission perspective. More specifically, multi-dimensional signal transmission schemes by exploiting the frequency, polarization and wavelength domain resources in U-LiFi systems will be presented, and the use of pairwise coding (PWC) schemes for efficient multi-dimensional SNR imbalance compensation will also be discussed.

Day 2 Speaker No. 1	
Photo of Speaker 	Name: Eduward Tangdionga
	Organization/Company and title: Associate professor, Eindhoven Hendrik Casimir Institute

Short Bio:

Eduward Tangdiongga received the M.Sc. and Ph.D. degrees from the Eindhoven University of Technology, Eindhoven, The Netherlands, in 1994 and 2001, respectively. In 2001, he joined COBRA Research Institute, currently named Eindhoven Hendrik Casimir Institute, working on ultrafast optical signal processing using semiconductor devices. He is currently an associate professor of advanced optical access and local area networks with optical communication system group. His research interests include passive optical networks, radio over (single mode-, multimode-, and plastic) fiber, and optical wireless communication.

Title: “Individual narrow beams for high capacity and high user density wireless communication”**Abstract:**

Optical wireless communication (OWC) by means of narrow optical beams offers very high density with high capacity to individual users at low latency, while ensuring high privacy and security, and immunity for electro-magnetic interference. These pencil beams act as individual virtual fiber links. For short-reach OWC systems, the key functions are fast 2D steering, multiple links by multiple beams, user localization and tracking, and wide-aperture wide field-of-view detectors. This talk gives an overview of the design and implementation of these key functions.

Day 2 Speaker No. 2**Photo of Speaker****Name:** Shlomi Arnon**Organization/Company and title:**

Professor, Ben Gurion University, Beer Sheva, Israel

Short Bio:

Professor at Ben Gurion university, beer Sheva Israel. Fellow of SPIE and a former Fulbright Fellow at MIT USA. Professor Arnon is a renowned authority in his field, boasting prestigious visiting positions and editorial responsibilities for prominent organizations like OSA and IEEE. His contributions to scientific literature include influential authored and co-authored books on optical wireless communication and Visible light communication. Leading pioneering projects funded by the EU FET Open program, in medical technology,

demonstrates his commitment to advancing knowledge frontiers. Professor Arnon's research advances communication and optics and extends to medical applications and environmental sustainability, reflecting his dedication to global betterment. Some of his endeavors have even led to the establishment of spinoff companies from the university, showcasing the tangible impact of his work.

Title: “Beyond Traditional Methods: Orbital Angular Momentum Empowers Optical Wireless Communication”

Abstract:

Structured light, particularly beams endowed with orbital angular momentum (OAM), has captured widespread attention within the scientific community due to its remarkable properties, characterized by distinct amplitude and phase structures. This innovative approach to light manipulation has opened up new avenues, particularly within communication systems, where the utilization of multiple orthogonal OAM beams shows excellent promise for significantly enhancing link capacity across various contexts and environments. In our upcoming presentation, we will explore the fascinating realm of optical wireless communication systems and how OAM can be harnessed to revolutionize data transmission capabilities. By harnessing the unique properties of OAM beams, we aim to uncover the potential advantages and challenges associated with integrating this cutting-edge technology into communication networks. From improving data rates to enhancing signal robustness and spectral efficiency, the application of OAM in optical wireless communication holds immense potential for addressing the ever-growing demands of modern telecommunications.

Day 2 Speaker No. 3

Photo of Speaker



Name: Alistair Banham

Organization/Company and title: \ CEO, pureLiFi, England

Short Bio:

Alistair Banham is a global semiconductor industry veteran, with more than 30 years' experience leading international business units. Prior to taking up the role as CEO at pureLiFi Alistair was Senior Vice President & GM of Customer Solutions Business Unit at Wolfson

Microelectronics. At Wolfson Alistair was responsible for chip development, mobile systems strategy and driving strong engagement with tier 1 global accounts Previously he held roles as SVP & General Manager EMEA (Europe Middle East & Africa) at Philips Semiconductors. Alistair was a founding member and President & GM EMEA of ON Semiconductor and played a leading role in the spin out from Motorola semiconductor and subsequent IPO. During his time in the semiconductor industries, Alistair has been based out of key technology hubs from silicon valley (California) through to ASIA. Alistair brings an element of skill to pureLiFi that will lead innovation and release new products to drive increased adoption with our global customers and key growth markets.

Title: “Breaking the Boundaries of Connectivity with LiFi”

Abstract:

The transformative potential of LiFi technology can reshape the way we connect and communicate.

LiFi has proven its ability to provide reliable, highspeed and secure communications through the light spectrum, dramatically improving quality of experience and privacy. LiFi is now transitioning from specialised applications to everyday life. The global standard 802.11bb has emerged as a pivotal milestone and paving the way for widespread adoption.

LiFi components are now ready for integration into billions of consumer devices to break the boundaries of connectivity for everything and everyone.

Day 2 Speaker No. 4

Photo of Speaker



Name: Junping Zhang

Organization/Company and title:
Researcher, Huawei Technologies Co., Ltd., China

Short Bio:

Junping Zhang is a researcher at Huawei Technologies Co., LTD., mainly engaged in wireless optical communication technology research, studying the application of optical spectrum in the next generation wireless communication. Research areas include light sources, detectors, and new space physics technologies. He has more than 15 years of experience in wireless communication technology research and more than 20 patents granted.

Title: “Technology and development of perception integration in wireless

optical communication”

Abstract:

This paper mainly discusses the development trend of wireless optical communication technology, as well as the advantages and disadvantages compared with other communication technologies, and discusses the key path and difficulties of the future development of wireless optical communication technology.

Day 2 Speaker No. 5

Photo of Speaker



Name: Fathi Abdeldayem

Organization/Company and title:

Senior Manager, Access Architecture & Standardization
Infra Technology Planning, Emirates Integrated Telecommunications Company, United Arab Emirates

Short Bio:

Mr. Abdeldayem, started his career at Siemens Germany as an R&D MSC, student for Chipset and terminal development. Moved to automotive industry working for BMW and Audi (Germany). Shifted back to Telecommunication branch as consultant expert with o2 Germany. Managing cross functional accounts, building the strategy demand for Technology and Business divisions. Mr. Abdeldayem, has a wide expertise in creating strategy and roadmap for the company terminal portfolio. His next career section was Telefonica Germany developing and managing E2E terminal portfolio for Telefonica Germany end user including software engineering, Requirements engineering, managing Tier 1 key Terminal vendors. Mr. Abdeldayem has an expert level know-how in Telecommunication technologies, such as LTE, VoLTE, VoWiFi, 5G NSA -SA, e-SIM, LiFi, Smart City deployments, Internet of Things, AI, ML, LiFi standardization, and MetaVerse Standardization.

Telecommunication Standardization subject matter expert with +25 years of experience. Leading cross-functional projects coordinating with global key partners, vendors, and customers. Interfacing the cooperation from standardization point of view with global Tier 1 telecommunication industry players and global Standardization bodies GSMA, GCF, ITU, ETSI, 3GPP, LCA and MetaVerse Standardization Forum. An expert level in Project management and product management, besides International Business management. Leading the Technology standardization involvement as a technology standards expert interfacing with GSMA, GCF, ITU, ETIS, 3GPP, LCA, MetaVesre Standardization Forum.

Winner of the 1st place Innovation Prize from du in H H Sheikh Mohammed bin Rashid Al Maktoum Innovation Week, Founder of the BE-AT-The Top work process, initiator of the

UAE/GCC Profile Initiative and the Initiator of the 5G MENA Conference in cooperation with the Global Certification Forum (GCF).

Title: “Building 6G Frame Work in MENA”

Abstract:

In the past, ITU has done pioneering work in the field of AI/ML in networks. This includes the initiatives on ML Sandbox [ITU-T Y.3181] from ITU FG ML5G and Sandbox for Autonomous Networks from ITU FG AN. However, during the ITU workshop on ML Communications in Geneva, it is evident that 6G requires the limitless Capacity Provided by the Cloudifications 5G and beyond connectivity, combined with AI ML, to be enabled for the right use case. During our workshop the important developments in the Dubai MetaVerse Assembly & the Dubai Future Foundation, TII and the industry development in MENA were brought to front, where the need of a technology that can cater for this demand such as LiFi is not any more optional.

Day 2 Speaker No. 6

Photo of Speaker



Name: Liang XIA

Organization/Company and title:
Technical manager, China Mobile, China

Short Bio:

Liang Xia received the M.S. degree in Information and Communication Engineering in 2008 from Tsinghua University, Beijing, China. He is a technical manager in the Future Research Laboratory, China Mobile Research Institute. He is in charge of research and verification of 6G wireless technologies including millimetre-wave, THz, visible light communication and networking.

Subject: “Prospects for VLC Applications in 6G”

Abstract:

VLC is expected as a potential supplement technology for 6G communications, but VLC also faces challenges of application. This presentation will show China Mobile’s effort on solve these challenges and discuss VLC applications in 6G.

Day 2 Speaker No. 7

Photo of Speaker



Name: Yong AI

Organization/Company and title :

Chairman, Wuhan Liubo Optoelectronics Technology Co., LTD.
Professor of Electronic Information School, Wuhan University, China

Short Bio:

Professor Yong Ai is with Electronic Information School, Wuhan University. He received the PhD degree in Space Physics Wuhan University, China. He is Chairman of Wuhan Liubo Optoelectronics Technology Co., LTD., member of a council of the Chinese Society of Engineering Optics, director of the Special Committee of Wireless Optical Communication of Hubei Communication Society, academic member of the Key Laboratory of Space Laser Information Transmission and Control of the Chinese Academy of Sciences, Chief designer of Tiangong II laser communication payload. Professor Ai has been specializing in space optical communication technology research for more than 20 years, published hundreds of academic papers, and won the second prize of the Military Science and Technology Progress Award. Research interests: Space laser communication technology, underwater optical communication technology, space optical detection technology.

Title: “Blue/green LED/LD communication device testing for ROV”

Abstract:

Underwater robots or Remotely Operated Vehicle (ROV) have been widely used in the fields of ocean exploration, submarine operation and Marine scientific research. Underwater communication with low delay, high efficiency and safety is the key to realize the data transmission system of applied underwater vehicle (ROV). We developed an underwater blue/green light communication device, and carried out high-speed video and image data transmission experiments between ROV. The communication equipment adopts blue and green LED/LD dual light source design, LED light source emission Angle is 120° , LD light source emission Angle is 0.5° . Using the large field of view PMT detecting technology, the communication distance of LED and LD light source is 30 meters and 100 meters, respectively, and the communication rate can reach more than 100 Mbps, including the information transmission content including network data transmission, real-time video, pictures and other data types. The device provides a solution for uncabled ROV data transmission, which greatly improves the application field of ROV.