

Kaleidoscope Academic Conference

Final Report

2026



“At this conference, we view innovation through a **kaleidoscope** to see its many dimensions. Breakthroughs for a better world start with research. We then bring them to life by connecting research, business, technology and policy. This understanding is central to ITU’s work with academia. As the UN agency for digital technologies, we want to help your research make an impact far and wide”

Seizo Onoe, Director, Telecommunication
Standardization Bureau, ITU

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1. ITU Kaleidoscope 2026 highlights

The [ITU Kaleidoscope academic conference 2026](#) (K-2026) on *AI and frontier technologies for good* took place in Geneva, Switzerland, from 7 to 9 July 2026.

The conference was held as part of the [AI for Good Global Summit 2026](#). In this regard, we wish to sincerely thank the whole AI for Good Team for their outstanding support that made Kaleidoscope 2026 an amazing edition.

A 10-month, substantial preparatory process was required for this 16th edition. This process involved the efforts and collaboration of the [ITU Kaleidoscope Secretariat](#), a [Scientific Committee](#) (SC) of 12 members, and a [Technical Programme Committee](#) (TPC) of 82 members, all internationally recognized digital technologies experts from academia, research institutes and the private sector.

The conference was technically co-sponsored by the Institute of Electrical and Electronics Engineers ([IEEE](#)) and the IEEE Communications Society ([IEEE ComSoc](#)).

113 original research papers, authored by 292 researchers from 48 countries from all regions of the world, were submitted to Kaleidoscope 2026. Of the 48 countries represented, 17 are classified as developed countries, 27 as developing countries, and 4 as least developed countries (LDCs), according to the United Nations classification.

A rigorous double-blind peer-review process was conducted by the [Technical Programme Committee](#), resulting in 264 completed expert reviews. As a result, 57 high-quality papers authored by 174 researchers from 32 countries across all world regions were selected for presentation at the conference. Please see the [Call for Papers](#) for the full list of tracks and topics.

The topics with the highest number of submissions are as follows:

- Track 3: AI regulations, governance and ethical considerations (55 papers)
- Track 3: Policy frameworks for safe and ethical AI development (48 papers)
- Track 3: Standards and regulations for sustainable development (35 papers)
- Track 3: Ethical frameworks for responsible quantum and AI development (17 papers)
- Track 1: The role of machine learning to artificial intelligence in network architecture, design, operation and maintenance (15 papers)
- Track 3: Sustainable smart cities and communities (12 papers)
- Track 2: Sustainable online education, rural access and the role of AI in learning (11 papers)
- Track 2: Embodied AI applications including healthcare (telemedicine, rehabilitation, assistive robotics, and assistance for the aging (11 papers)

The accepted papers have been submitted under the following tracks:

- 10 papers under track 1: Frontier technological bases in intelligent and resilient network infrastructures

- 15 papers under track 2: Applications and services for sustainable development
- 32 papers under track 3: Social, economic, environmental and policy dimensions of AI and frontier technologies

Six lecture papers and three poster papers were not presented at the conference as the authors could not attend in person.

The SC members and the ITU Kaleidoscope Secretariat developed a substantial 3-day programme featuring 48 research papers, 3 invited papers, 6 keynote talks (2 keynote papers, 4 keynote summaries) - and 5 special sessions, closely related to various ITU activities (please see the [ITU Relevance](#) chapter for details). Details can be found at the [Programme](#) webpage.

The programme featured 115 speakers in total. 38 of them are from developing countries.

All papers and keynotes are published in the [Conference Proceedings](#) and will be submitted for inclusion in the [IEEE Xplore Digital Library](#). Outstanding papers may also be submitted for review and potential publication in the [ITU Journal on Future and Evolving Technologies \(ITU J-FET\)](#).

The Award Committee, composed of four conference attendees (three Scientific Committee members, [Mostafa Hashem Sherif](#), [Eva Ibarrola](#), and [Christoph Dosch](#); and one ITU staff member, [Youlia Lozanova](#)), selected the winners of the awards for the best papers based on four criteria: clarity, relevance to the conference theme, significance to future standards and presentation at the conference.

At the [Closing](#) Ceremony, the winners of the best paper awards and the 19 recipients of the young author recognition (YAR) certificate were awarded with the ITU Certificate of appreciation by [Seizo Onoe](#), Director of the Telecommunication Standardization Bureau (TSB), ITU, Prof. Eva Ibarrola, Kaleidoscope 2026 General Chair, University of the Basque Country UPV/EHU, Spain, and Mostafa Hashem Sherif, Technical Programme Committee Chair.

TSB Director thanked the Scientific Committee members for their outstanding contribution to the development of the programme:

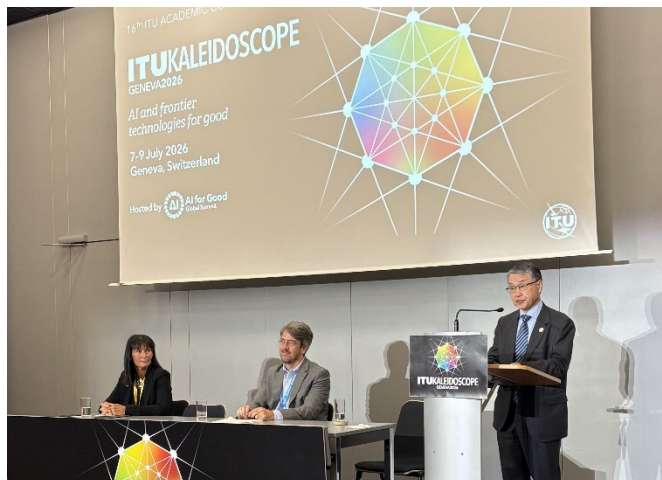
- Maria Antonia Brovelli, Politecnico di Milano, Italy
- Christoph Dosch, Former Chairman of ITU-R Study Group 6; ARD, Germany
- Emily Edwards, Duke University, United States
- Martin Gastal, CERN
- Eva Ibarrola, University of the Basque Country UPV/EHU, Spain
- Gyu Myoung Lee, Liverpool John Moores University, United Kingdom
- Tiziana Margaria, University of Limerick, Ireland
- Mitsuji Matsumoto, Waseda University Emeritus Professor, Japan
- Roberto Minerva, Télécom SudParis, France
- Vishnu Ram OV, Independent Consultant, India
- Mostafa Hashem Sherif, Consultant, United States
- Hao Qin, National University of Singapore, Singapore

the [Technical Programme Committee](#), and in particular its Chair, Mostafa Hashem Sherif, for ensuring transparency through the double-blind peer-review process; and all the partnering organizations which supported the promotion of the conference:

- [Waseda University](#)
- [Institute of Electronics, Information and Communication Engineers of Japan \(IEICE\)](#) of Japan
- [University of the Basque Country](#)
- [Liverpool John Moores University](#)
- [Korea Advanced Institute of Science and Technology \(KAIST\)](#)
- [Politecnico di Milano](#)
- [I-Form](#)
- [Research Ireland Centre's for Research Training in Artificial Intelligence](#).

[Alessia Magliarditi](#), ITU Kaleidoscope Coordinator, thanked the ITU Secretariat, Maria Eugenia Otero, [Erica Campilongo](#), [Thomas Basikolo](#), [Gillian Makamara](#), [Youlia Lozanova](#), and José Luis Cervera-Ferri, and all the people that contributed to the success of the conference.

2. Conference programme



[Seizo Onoe](#), Director, Telecommunication Standardization Bureau, ITU (in the photo, at the lectern), officially opened the 16th edition of the Kaleidoscope series saying that “At this conference, we view innovation through a kaleidoscope to see its many dimensions. Breakthroughs for a better world start with research. We then bring them to life by connecting research, business, technology and policy. This understanding is central to ITU’s work with

academia. As the UN agency for digital technologies, we want to help your research make an impact far and wide”. He also encouraged the audience to contribute to which offers comprehensive coverage of communications and networking. The Journal is currently inviting papers on digital twins, AI for 6G, AI-native networks, and quantum-safe communications. [ITU Journal on Future and Evolving Technologies](#) which offers comprehensive coverage of communications and networking. The Journal is currently inviting papers on digital twins, AI for 6G, AI-native networks, and quantum-safe communications.

Kaleidoscope programme explored new digital frontiers – from AI and robotics to quantum technologies and brain-machine interfaces – and how they can help us create the future we want.

The **Opening Ceremony** included welcome remarks from [Jorge Cancio](#), Co-Director of International Relations at the Federal Office of Communications (OFCOM), Switzerland, who highlighted the breadth of innovation emerging from Switzerland's academic and research ecosystem and its contribution to shaping a more inclusive, sustainable, and human-centred digital future.

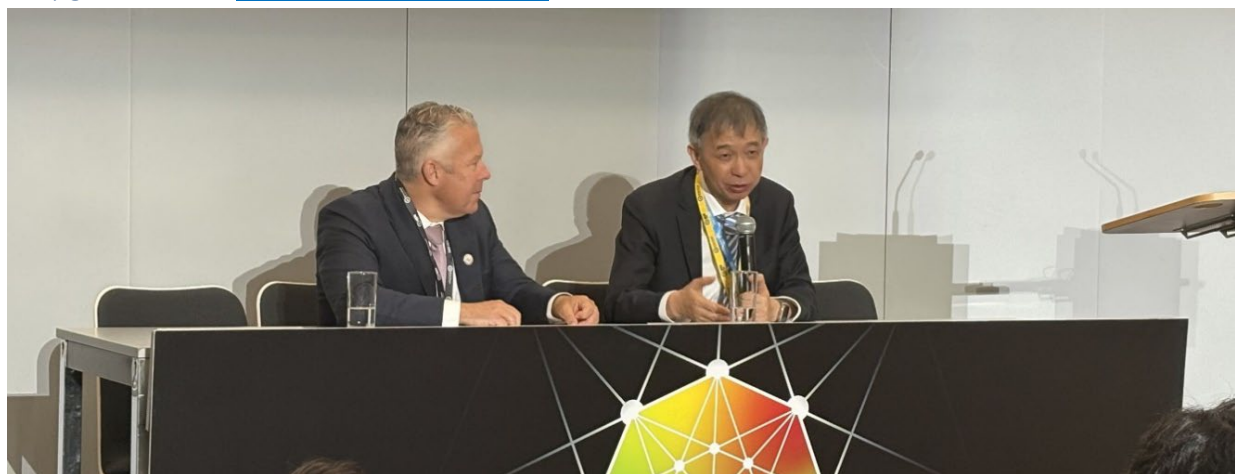
The Kaleidoscope 2026 General Chair, Prof. **Eva Ibarrola**, reflected on her own journey with Kaleidoscope, recalling that she first attended the conference in 2009 as a PhD student. She noted that the event had been the starting point of a long collaboration with ITU, leading to active participation in ITU standardization work and contributions to ITU-T Recommendations. She highlighted the value of bringing academia closer to international standardization and emphasized that this year's conference, held alongside the AI for Good Global Summit, offered a unique opportunity to strengthen dialogue on AI research, innovation and standards. She concluded by thanking the authors, reviewers, organizers and the ITU team for making the conference possible.

As Kaleidoscope 2006 MoC, Alessia introduced all sessions and session chairs of the conference.

2.1 Keynote sessions

The first keynote session, moderated by [Frederic Werner](#), Chief, Strategic Engagement Department & AI for Good, ITU, featured Dr [Jian Wang](#), Chinese Academy of Engineering &

Director of Zhejiang Lab, and Founder of Alibaba Cloud, who presented his keynote paper on *Space computing: Endless frontiers and exploration* [[presentation](#)]. His keynote paper is available on pg. xxix of the [Conference Proceedings](#).



The presentation explored how space computing—combining AI, computing, and space technology—can transform space exploration and address global challenges. Dr Wang introduced Zhejiang Lab's Three-Body Computing Constellation, which enables in-orbit computing, satellite networking, and AI deployment in space to process data more efficiently and support applications such as climate monitoring, disaster response, and deep-space exploration. The presentation concluded by highlighting the importance of global collaboration to develop an open and shared space computing infrastructure for the benefit of all humanity.

Prof. [Ian Akyildiz](#), Technology Innovation Institute, UAE, and Editor-in-Chief of the [ITU Journal on Future and Evolving Technologies \(ITU J-FET\)](#) delivered the second keynote speech on *From digital twins to cognitive twins: closing the metacognitive loop for 6G and beyond wireless systems* [[presentation](#)]. The keynote summary is available on pg. xvii of the [Conference Proceedings](#). Prof. Akyildiz proposes a new AI-native architecture for 6G networks called the Cognitive Goal-Oriented Stack (CGOS), which replaces traditional static network protocols with intelligent, self-learning systems. He described how AI agents can predict network conditions, understand communication intent, and optimize network operations in real time, enabling the evolution from the "Internet of Things" to a unified "Nervous System of Everything" spanning terrestrial, underwater, and space networks. Prof. Akyildiz's research work has been recently published in the ITU Journal: [Wireless communication research challenges for Extended Reality \(XR\)](#), authored by Ian F. Akyildiz and [Hongzhi Guo](#) - [Volume 3 \(2022\), Issue 2, Pages 273-287](#). This session was moderated by [Cristina Buetti](#), Counsellor of the [ITU-T SG20 - IoT, digital twins & smart cities](#), within the ITU Telecommunication Standardization Bureau.



On the same day, the 3rd keynote speech was delivered by Prof [Elham Kashefi](#), Sorbonne Université, LIP6, CNRS, Paris, France; Quantum Software Lab, School of Informatics, University of Edinburgh, UK and focused on *Hardware-aware photonic architectures for trusted and scalable quantum learning*. This session was moderated by Dr [Hao Qin](#), National University of Singapore, Singapore, and ITU Kaleidoscope 2026 Scientific Committee member. The keynote summary is available on pg. xix of the [Conference Proceedings](#) and presents a hardware-aware framework for scalable quantum machine



learning on photonic platforms that combines efficient photonic neural networks with verifiable and secure quantum computation, enabling trustworthy, energy-efficient AI applications on near-term quantum hardware.

On day 2, Prof [Hoda Alkhzaimi](#), New York University Abu Dhabi (NYUAD) and member of the ITU Academic Advisory Body on Emerging Technologies, presented her paper entitled *From frontier to public good: governing AI and frontier technologies for inclusive productivity, trust, and sustainable prosperity* [[presentation](#)]. The author argues that AI governance should be understood as a core complement to AI technology itself, not just as content moderation, since institutions, skills, and organizational design strongly shape how AI's benefits are distributed. The paper proposes a full-stack framework for AI governance across compute, models, and applications, with a focus on measurable, structured regulation—particularly at the compute layer—balancing innovation with compliance and enabling future empirical evaluation. The keynote paper is available on pg. xxxi of the [Conference Proceedings](#). The session was chaired by Prof [Michael Best](#), Executive Director of the Institute for People and Technology, Georgia Institute of Technology, USA, and member of the ITU Academic Advisory Body on Emerging Technologies.



[Eleni Diamanti](#), Senior Researcher/Directrice de Recherche, Paris Centre for Quantum Computing, France, and member of the ITU Academic Advisory Body on Emerging Technologies, presented her research work on *Resources and applications FOR advanced quantum networking* [[presentation](#)]. The work reviews the development of optical quantum communication networks and the key photonic technologies needed to scale them from experimental setups to large data-

centre and global infrastructures. It highlights applications such as ultra-secure communication and advanced cryptographic protocols, arguing that entanglement and efficient quantum memories are essential for enabling scalable, next-generation quantum connectivity. The keynote summary is available on pg. xxiii of the [Conference Proceedings](#)

Last keynote session (the 6th one), moderated by Mythili Menon, Telecommunication Standardization Bureau, ITU, featured Dr [Azamat Zhilokov](#), Director of the Institute of Artificial Intelligence (IAI) at the Moscow Institute of Physics and Technology (MIPT), Russian Federation. The speaker shared how the Moscow Institute of Physics and Technology has successfully translated AI research into commercially viable agricultural solutions through long-term industry partnerships. Drawing on a case study involving AI, computer vision, colorimetry, and hyperspectral analysis, he highlighted the key factors for transforming academic innovation into real-world products that address the needs of modern agriculture. The keynote summary is available on pg. xxv of the [Conference Proceedings](#)

2.2 Invited papers

In addition to the six keynote speakers, the programme included three invited papers.

The 1st invited paper session was held on day 1 and featured [John Ludden](#) and [Richard Chuchla](#), Co-Chairs of the GeoGPT Governance Committee, and was moderated by [Yitian Xiao](#), Chief Scientist of the Deep-Time Digital Earth (DDE), Zhejiang International Research Center, China. The paper presents the latest developments of GeoGPT, a domain-specific AI model for geoscience developed by Zhejiang Lab. It

highlights new capabilities in geospatial reasoning, AI-powered scientific agents, natural language interaction with geoscience data, and knowledge integration, while outlining the platform's future development and its role in advancing open, collaborative, and responsible AI for geoscience research. The full paper is available on pg. xlv of the [Conference Proceedings](#).

[Rafael Popper](#), Warsaw University of Technology (WUT), Poland; Technology Partners Foundation (TPF), Poland; University of Manchester (UoM), UK; Futures Diamond (FD), UK, presented his two invited papers in a dedicated session moderated by [Youlia Lozanova](#), Telecommunication Development Bureau, ITU.

The first paper on *Anticipatory AI governance for cybersecurity: foresight, road mapping and actionable policy pathways* [[presentation](#)] examines how AI is transforming cybersecurity by strengthening both defensive capabilities and emerging, more complex threats, and argues that governance must shift from reactive responses to anticipatory, adaptive approaches. Using foresight methods such as trend analysis and horizon scanning, it proposes a structured governance roadmap that helps policymakers identify risks early and translate insights into





practical, coordinated policy actions across different institutional contexts. The full paper is available on pg. li of the [Conference Proceedings](#).

The second paper entitled *From skills intelligence to transformation intelligence: A foresight-driven AI framework for curriculum modernization, workforce development and innovation ecosystems* [[presentation](#)] introduces a

transformation intelligence framework, developed within the SKILLBRIDGE project, that combines AI, foresight, and labor-market analytics to better understand and support evolving skill and capability needs across education, industry, and public systems. Using large-scale multi-source data and human-AI collaboration, it identifies emerging skills and challenges and proposes a structured model to guide education and policy interventions toward more adaptive and inclusive workforce development. The full paper is available on pg. lxi of the [Conference Proceedings](#).

2.3 Special sessions

Five special sessions have been designed and organized by the SC and ITU Secretariat and included in the programme.

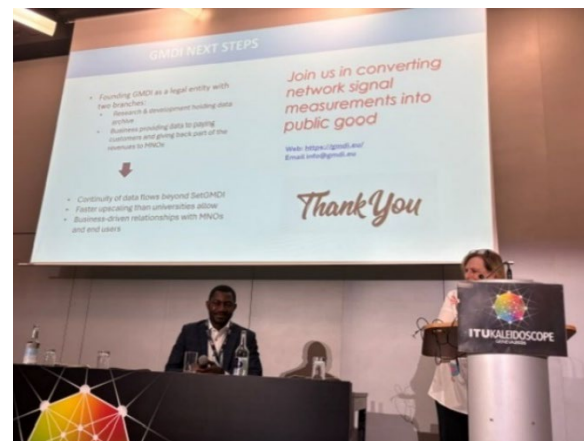
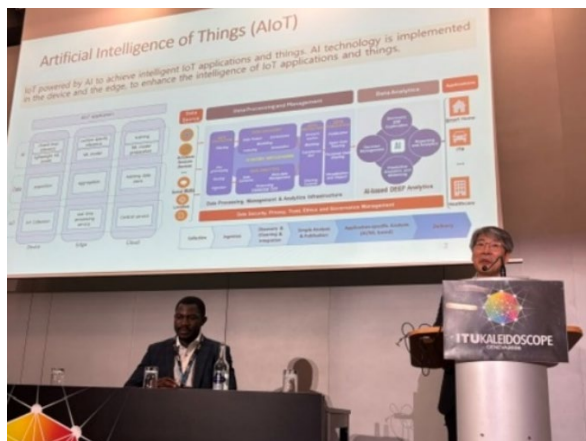
The first special session focused on *Anticipating the hot topics in tech*. The ITU recently established an Academic Advisory Body on Emerging Technologies with the aim of feeding timely research into the organization's work enabling global communications. Additionally, the 26-



member group are boosting long-standing collaboration between ITU and the global academic community. As it nears the conclusion of its first year of work, this session featured the chairs of the four thematic groups of the academic advisory body on emerging tech— AI, quantum, space, and strategic foresight. The panellists presented the key findings and discussed what they

should be looking out for and what academia, governments and policy-makers can keep up with ever-accelerating technology. The session, moderated by [Christopher S. Yoo](#), Founding Director, Center for Technology, Innovation & Competition, University of Pennsylvania, was an opportunity for open exchange with a broader audience, enabling participants to ask questions and engage in discussion. Panellists included: **Hoda Al Khzaimi**, Director of Center of Cyber Security, New York University Abu Dhabi; [Jerry John Kponyo](#), Director, Office of Grants and Research Kwame Nkrumah University of Science and Technology, Ghana; **Michael Best**, Executive Director of the Institute for People and Technology, Georgia Institute of Technology, USA; [Nagla Rizk](#), Professor of Economics, Founding Director, Access to Knowledge of Development Center (A2K4D) Onsi Sawiris School of Business, The American University in Cairo; [Scott Pace](#), Director of the Space Policy Institute, the Institute for International Science and Technology Policy, and the MA International Science and Technology Policy program at the George Washington University's Elliott School of International Affairs.

The second special session on *[Emerging research and applications at the frontier](#)*, designed and moderated by [Thomas Basikolo](#), Telecommunication Standardization Bureau, ITU, showcased cutting-edge research on new and emerging areas in AI, with emphasis on how these technologies are being designed, adapted, and applied to advance telecommunications and the public good. Aligned with Kaleidoscope 2026's focus on AI and frontier technologies, the session brought together academic researchers to examine emerging AI methods, novel applications, and interdisciplinary work spanning intelligent networks, sustainable development, and innovation. Panellists included: [Gyu Myoung Lee](#), Liverpool John Moores University, United Kingdom, who presented the *Agentic Artificial Intelligence of Things* work carried out in ITU-T Study Group 20 [[presentation](#)]; [Hagit Messer](#), Prof. (Emerita), School of Electrical and Computer Engineering, Tel Aviv University, who spoke about *Wireless Communication for Good: A global initiative leveraging network signal measurements for rainfall monitoring* [[presentation](#)];



[Balaraman Ravindran](#), Head of the Robert Bosch Centre for Data Science and Artificial Intelligence (RBC-DSAI), Indian Institute of Technology Madras, and member of the ITU Academic Advisory Body on Emerging Technologies, who presented his research work on *Beyond benchmarks: Closing the deployment gap in High-stakes AI* [[presentation](#)]; Professor [Ammar Muthanna](#), National Research institute of telecommunications, Russian Federation, who presented the *Edge Sandbox: A Resource-Aware Intelligent Architecture for Autonomous*



Network [[presentation](#)]; and [Celina Lee](#), Zindi co-founder and CEO, who introduced Zindi's activities on *Building AI Research and Innovation Capacity Across Africa* [[presentation](#)].

The fourth special session focused on [AI for Geospatial Intelligence](#), and was moderated by Prof. [Ludovico Biagi](#), Dept. of Civil and Environmental Engineering, Geomatics and Geodesy Area, Politecnico di Milano, Italy. Panellists included: [Ali Mansourian](#), University of Lund, Sweden, presented *GeoLLMs and the future of spatial intelligence* [[presentation](#)]; [Julia Anna Leonardi](#), Politecnico di Milano, Italy, introduced *The young researcher's perspective on GeoAI*; [Gregory Giuliani](#), University of Geneva & UNEP/GRID-Geneva, Switzerland, responded to the question: *Are we really delivering the promises of GeoAI or is it just a hype?* [[presentation](#)]; finally, [Andrea Manara](#), Senior System Analyst, ITU, presented *Geospatial foundation models in practice* [[presentation](#)].



The fifth special session on **Quantum science for society: Collaborating on real-world applications and educational pathways**, was designed by [Gillian Makamara](#), ITU Telecommunication Standardization Bureau, and Prof [Emily Edwards](#), Duke University, United States, and ITU Kaleidoscope Scientific Committee member, who also moderated it.

It was a lively and interactive discussion that brought together diverse perspectives from across the quantum ecosystem to explore how advances in quantum science can translate into tangible impact. Emphasis was placed on collaboration across disciplines and sectors, linking emerging technological capabilities with real-world applications and the educational pathways needed to equip the next generation to engage with these developments and contribute to the evolving global technology landscape. Panellists included: [Henry Ryder](#), Open Quantum Institute; [Araceli Venegas-Gomez](#), Founder, QURECA, Scotland; [Eleni Diamanti](#), Senior Researcher / Directrice de Recherche, Paris Centre for Quantum Computing, France; member of the Academic Advisory Body on Emerging Technologies, ITU; [Hao Qin](#), National University of Singapore, Singapore; ITU Kaleidoscope Scientific Committee member; and [Frederico Brito](#), Director, Quantum Computing Hardware, Quantum Research Center, TII , UAE.



The last special session of the conference showcased the [*AI for the Global Majority*](#) initiative, jointly led by the Geneva Graduate Institute and Microsoft in partnership with the ITU, convening four research teams working at the intersection of inclusive, responsible, and context-sensitive AI. Through a series of short presentations followed by a discussion moderated by Prof. [Jérôme Duberry](#), Director of the Tech Hub at the Geneva Graduate Institute, Switzerland, the session highlighted practical, field-based approaches across diverse sectors and regions. Topics included inclusive speech recognition for low-resource and multilingual contexts in Ghana, consumer protection and regulatory challenges in India's AI-driven fintech sector, governance frameworks for public health AI systems, and cooperative models of AI development in Argentina. Together, these contributions offered complementary perspectives on how AI can better reflect linguistic diversity, protect vulnerable users, strengthen local capacity, and promote equitable, community-oriented innovation, providing concrete insights for advancing more inclusive AI ecosystems globally. Panellists included: [Jerry John Kponyo](#), Director of the Office of Grants and Research of the Kwame Nkrumah University of Science and Technology (KNUST), Ghana; member of the Academic Advisory Body on Emerging Technologies, ITU; [Tanushree Kaushal](#), Researcher and Lecturer in Feminist Political Economy of Global Finance, University of Bern; [Jude Dzevela Kong](#), professor at the Dalla Lana School of Public Health, University of Toronto; and [Cecilia Muñoz Cancela](#), Professor, researcher, cooperativist, and Ph.D. student in Social and Human Sciences at the National University of Quilmes.

2.4 Paper sessions and winners

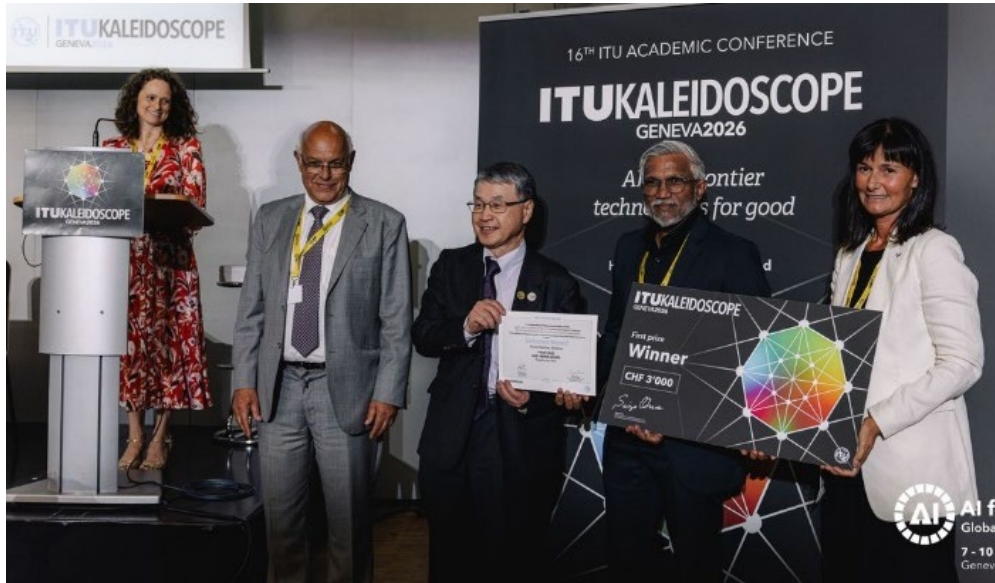
The academic papers submitted to this year's conference shared insight into ongoing projects and research on how frontier technologies, including artificial intelligence, brain-computer interface, embodied AI, autonomous driving, geospatial, space computing and quantum information technologies, interface with telecommunications.

36 research papers were presented in plenary in **7 lecture sessions** covering topics highly relevant to ITU's work, including: Global AI governance, sovereignty, and policy frameworks, ethics, responsibility, and trustworthy AI systems; AI in healthcare and well-being applications; AI for sustainable development: Education, inclusion, and society; Cybersecurity, privacy, and trust in AI systems; AI-Native networks, 5G/6G, and telecom architectures; infrastructure, sustainability, and emerging tech ecosystems.

The **12 poster papers** were introduced during the plenary **Fast-Forward Poster Preview session** moderated by [Eva Ibarrola](#), before being explored in greater detail during the dedicated Poster Exhibition. These papers collectively explore responsible AI governance, next-generation digital and telecommunications technologies, and AI-driven solutions for sustainability, accessibility, environmental monitoring, and socio-economic development.

The authors of the award-winning papers shared the prize fund of CHF 6 000.-.

FIRST best paper: "[The amplified sovereignty paradox: AI governance lessons from small island developing states](#)" presented by Mohamed Shareef, Nexia Maldives, Maldives [[presentation](#)].



SECOND best paper: "[A sequential model selection and optimization framework for security in zero touch network environments](#)" presented by [Alharith Tawfig Elghasri](#), The Libyan International Telecom Company, Libya; Abdulbaset Mustafa Hamed, University of Tripoli, Libya [[presentation](#)].

THIRD best paper: "[Reuniting the fragmented body of emAI: A global analysis of embodied AI research and development](#)" presented by [Leonhard Konstantin Cuzmin](#), Maastricht University, The Netherlands [[presentation](#)].

Alongside the winners of the best paper awards, 19 entrants (highlighted in bold below) received



Young Author Recognition Certificates that are delivered to young authors of accepted papers of up to 30 years of age:

- *S3.1 Clinically-grounded and human-centric machine learning system for personalized fertility diagnostics and early intervention using modular clinical, imaging and behavioural biomarkers*

Stuti Iyer and **Risha Paladugu**, Vellore Institute of Technology, India; **Eve Yee Leng Ang**, Saint Joseph's Institution, Singapore; **Yunjun Jiang**, Nanyang Technological University, Singapore; **Samanwita Mukherjee**, Birla Institute of Technology and Science, India

- *S3.2 Multi-modal health state monitoring system using wearable sensor and spatio-temporal graph attention*

Dhananjay Kumar and **Chandru Jayamurugan**, Anna University, India; Ved P. Kafle, National Institute of Information and Communications Technology, India

- *S4.4 Reuniting the fragmented body of emAI: A global analysis of embodied AI research and development*

Leonhard Konstantin Cuzmin, Maastricht University, The Netherlands

- *S4.5 From SCATS to mobility justice: An AI-driven traffic control standard for heterogeneous African cities*

Eunice Adewusi and Simeon Nsabiyumva, African Leadership University, Rwanda

- *S5.1 Resilience against adversarial concept drift in port scanning: Batch vs. incremental paradigms for green AI*

Piero Andres Aliaga Fernandez and **Jose Dario Menendez Acosta**, Universidad Nacional de Ingenieria, Peru

- *S5.4 A sequential model selection and optimization framework for security in zero touch network environments*

Alharith Tawfig Elghasri, The Libyan International Telecom Company, Libya; **Abdulbaset Mustafa Hamed**, University of Tripoli, Libya

- *S6.5 AI-native closed-loop self-healing for rural and edge telecom networks in NS-3: Randomised fault injection, explainable detection, and policy-grounded orchestration*

Anirudh Nishtala, Manipal Academy of Higher Education (MAHE), India; **Rishiraj Rakesh Kumar** and **Tarunika D**, Manipal Institute of Technology, India

- *S7.4 Deep learning-based monitoring and control of hydroponic leafy vegetables for urban farming*

Dhananjay Kumar and **Gowtham Rajasekaran**, Anna University, India

- *S7.6 Enforceable digital sovereignty in government cloud procurement*

Dickson Marfo Fosu, Juliet Arthur, Prince Dawson Tetteh, Ama Branoa Banful and Jerry John Kponyo, Kwame Nkrumah University of Science and Technology, Ghana (member of the Academic Advisory Body on Emerging Technologies, ITU)

- *P.4 CarbonLens-Senegal: A multi-source Machine Learning approach for forest biomass estimation in tropical West Africa*

Kone Kassoum, Salomon Kouassi and Gabriel Fonlladosa, Data354, Côte d'Ivoire

- *P.7 Reforming global AI governance: Institutional design for the next UN Secretary-General's mandate*

Ng Arian Man Lok, UN Major Group Children and Youth, Hong Kong SAR, China



Programme, presentations, and biographies are available [online](#) on the Kaleidoscope webpage, and also at the [Programme - AI for Good](#).

2.5 Relevance to the ITU work

The conference fostered stimulating discussions on topics of strategic importance to the ITU community and generated great interest and interaction among the audience, including many students who significantly contributed to the Q&A sessions.

The conference papers, keynotes and special sessions are related to various ITU activities, in particular to WTS-24 [Resolution 101](#) - *Standardization activities of the ITU Telecommunication*

Standardization Sector on artificial intelligence technologies in support of telecommunications /information and communication technologies and the following ITU's working groups and projects:

ITU-T (standardization Sector)

- [Telecommunication Standardization Advisory Group \(TSAG\)](#)
- ITU-T Study Groups:
 - [SG3 - Economic & policy issues](#)
 - [SG5 - Environment, EMF, climate action & circular economy](#)
 - [SG11 - Protocols, testing & combating counterfeiting](#)
 - [SG12 - Performance, QoS & QoE](#)
 - [SG13 - Future networks](#)
 - [SG15 - Transport, access & home](#)
 - [SG17 - Security](#)
 - [SG20 - IoT, digital twins & smart cities](#)
 - [SG21 - Multimedia, content delivery & cable TV](#)
- Focus Groups:
 - [Focus Group on AI for Smart Sustainable Cities and Communities \(FG-AI4SSC\)](#)
 - [Focus Group on Embodied Artificial Intelligence for Multimedia Technologies \(FG-EAI\)](#)
 - [Focus Group on Artificial Intelligence Native for Telecommunication Networks \(FG-AINN\)](#)
- [TSB Director's IPR Ad hoc Group](#)
- Coordination initiatives
 - [Joint Coordination Activity on Child Online Protection \(JCA-COP\)](#)
 - [Joint Coordination Activity on Internet of Things, digital twins and smart sustainable cities and communities \(JCA-IoT, DT and SSC&C\)](#)
 - [Joint Coordination Activity on Accessibility and Human Factors \(JCA-AHF\)](#)
- Global initiatives under AI for Good Global Summit
 - [Global Initiative on AI for Health \(GI-AI4H\)](#) led by ITU, WHO and WIPO
 - [AI for Resilience to Natural Hazards](#)
 - [Global Initiative on AI and Virtual Worlds – Discovering the Citiverse](#)
- [AI for Good Global Summit](#)
 - [AI for Good Impact Initiative](#)
 - [AI Readiness](#)
 - [AI Governance](#)
 - [AI Skills Coalition](#)

- [AI for Road Safety](#)
- [AI for Accessibility](#)
- [GeoAI Challenge - AI for Good – ITU](#)
- ITU Journal special issue on [Space computing and space AI](#)

ITU-D (Development Sector)

- [SG1 – Enabling environment for meaningful connectivity](#)
- [Network of Women](#) (NoW)
- [ITU Academy](#)
- [Capacity and Digital Skills Development](#) (CSD)
- [Policy and Regulation](#)
- [Evidence-informed Digital Policy-making](#)
- [Collaborative Digital Governance](#)
- [AI Governance and Preparedness](#) (including Collaborative AI Frameworks and Preparedness Diagnostics)
- [Digital Innovation Ecosystems](#)
- [Cybersecurity](#)
- [Digital Inclusion](#)
- [Environment – Circular Electronics and Green Digital Transformation](#)
- [Small Island Developing States](#) (SIDS)
- [Giga](#) – Connecting Every School to the Internet

ITU-R (Radiocommunication Sector)

- [Working Party 5D \(WP 5D\) – IMT Systems](#)
- [SG4 – Satellite Services](#)
- [Study Group 7 – Science Services](#)

A mapping of papers and keynote summaries and ITU activities (i.e. Study Groups, Focus Groups, etc.), also highlighting relevant standardization work and ITU Recommendations, will be presented at the meeting of the ITU Telecommunication Standardization Advisory Group (TSAG) that will take place from 11 to 15 January 2027, and will be submitted also to the next ITU Radiocommunication Advisory Group (RAG) and the ITU Telecommunication Development Advisory Group (TDAG). Temporary documents providing information on selected papers will be also submitted to the various ITU Study Groups for consideration in their activities.

3. Exhibition - Swiss Academic and Research Projects

Kaleidoscope 2026 conference featured a Swiss Academic and Research Projects Exhibition showcasing AI innovations for social good.

The exhibition highlighted diverse applications ranging from medical AI and global surveillance to AI ethics tools and the mitigation of misinformation. Featured exhibitors included the University of Fribourg (Project Harbour), EPFL and partners (DISCO, MOOVE, ULTR-AI), UNIGE (Using satellite data to measure the impact of connectivity), Idiap/EPFL (Mitigating migration misinformation: A human-in-the-loop AI framework for policy and media transparency), ETH Zurich (Operationalizing AI ethics: Mapping the AI governance tool landscape), Geneva Graduate Institute (AI for the Global Majority), UNIGE/WHO (Automate incident triage for WHO's Global Surveillance and Monitoring System using agentic AI), and UNIGE/Duke-NUS Medical School (Toward global large language models in medicine). For details on the exhibition and its participants, visit the [ITU dedicated webpage](#).

We welcomed submissions from Swiss:

- University research labs, innovation hubs, and centres
- Undergraduate and graduate student teams
- Individual students

A Fast-Forward Exhibition Preview Session, moderated by [Erica Campilongo](#), was organized on the first day of Kaleidoscope to offer exhibitors the opportunity to pitch their project in Plenary and invite the audience to continue the conversation at their exhibition booths in parallel to the conference. Exhibitors got access to the conference and [AI for Good Global Summit 2026 \(AI4G\)](#) networking areas and had the opportunity to interact directly with ITU delegates, Kaleidoscope and AI4G participants, including experts in AI, geospatial, space computing and quantum information technologies, industry leaders, international researchers, standardization practitioners, policy makers and innovators.



4. Next Kaleidoscope

The next Kaleidoscope edition will be hosted again by the AI for Good Global Summit, in the week of the 21 June 2027.

The Call for Papers will be launched in fall.

Please stay tuned for news on the 17th edition of the ITU Kaleidoscope academic conferences [here](#).