



ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026

Theme: Developing ASSETs for the Present and the Future Generations

Manchester, UK and Nairobi, Kenya; Wednesday, 29 – Friday, 31 July 2026; www.assetgrp.org; info@assetgrp.org



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Manchester, UK and Nairobi, Kenya

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Conference Abstract and Technical Programme

ASSET 5.0 Conference

29 – 31 July 2026

Manchester, UK and Nairobi, Kenya

Scope of the Conference includes:

Mobile and Satellite Communications

- ✓ RF / Microwave / Millimetrewave Devices and Systems
- ✓ Satellite Systems, Applications, Missions and Operations
- ✓ Antennas and Propagation Engineering
- ✓ Wireless Sensors and Mobile Communications Networks
- ✓ Metamaterials and Metasurfaces

Internet of Things, Artificial Intelligence and Big Data

- ✓ Smart IoT Sensors Design, Integration and Applications
- ✓ Cyber Security and Information Encryption
- ✓ Robotics and Human-Machine Systems
- ✓ Big Data Analytics
- ✓ AI/Machine Learning Algorithms and Applications

Complex Systems and Hybrid Advanced Manufacturing

- ✓ Adaptive Systems Development and Operation
- ✓ Complex Infrastructure Systems Management
- ✓ Green Systems Engineering Design and Modelling
- ✓ 3D / Nanoscale Printing and Additive Manufacturing

Renewable Energy Generation, Transmission & Utilisation

- ✓ Renewable Energy Harvesting Techniques
- ✓ Energy Grid Management and Sustainability
- ✓ On-demand Renewable Energy Networks
- ✓ Smart Power Line Communications

Future Living and Healthcare

- ✓ Bioengineering and Biomedical Technology Applications





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Sustainability, Environment, Climate Action and Agriculture

- ✓ Smart Cities and Sustainable Infrastructure Design
- ✓ Circular and Net Zero Economy and Environment
- ✓ Security, Safety and Surveillance
- ✓ Precision Agriculture / Smart Farming and Food Production
- ✓ Product Life Cycle Analysis
- ✓ Design for Sustainability
- ✓ Sustainability Readiness Level and Technology Readiness Level

Biosensors for Healthcare Applications

- ✓ Sustainable Digital Transformation in Healthcare
- ✓ Smart Healthcare and Sustainable Living and Working

General and Multidisciplinary Topics

- ✓ Entrepreneurship, Innovation, Commercialization
- ✓ Governance, Policy, Management, Finance, Education
- ✓ Sustainable Development Goals





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Organising Committee

Steering Committee

Prof Peter Aaen, Colorado School of Mines, Illinois, USA; **Prof. Quan Liu**, Wuhan University of Technology, China; **Prof. Zhipeng Wu**, The University of Manchester, UK; **Miracle Agholor**, VizionMinds Technology Ltd, UK; **Sunday Enahoro**, SmOp CleanTech, UK; **Daniel Nwandu**, DCLM, Inc., UK; **Prof. Isaac Oluwatayo**, University of Venda, South Africa; **Joseph Sanusi**, Josh Metro Ltd, UK; **Dr Itoero Esiet Udo**, University of Uyo, Nigeria; **Stanislaus Tochukwu Ukwuani**, Manchester Metropolitan Uni., UK; **Dr Zeyad Elsarraf**, Manchester Metropolitan University, UK; **Dr Mehdi Zeinali**, University of Hull, UK.

Organising Committee

General Chairs	Technical Programme Chairs	Short Courses Chairs	Exhibit Chairs	Local Organising Committee Chairs	Best Paper Award Chairs
Sunday Cookey Ekpo , ManMetUni., UK	Jamal Zaid , Huawei, Canada	Umar Raza , ManMetUni., UK	Kolawole Olasunkanmi , SmOp CleanTech, UK	Peter Munyao Kiilu , Uni. of Nairobi, Kenya	Muhammad Ijaz , ManMetUni., UK
Ochieng Duncan Elly , Uni. of Nairobi, Kenya	Noushin Karimian , ManMetUni., UK	Samik Chakraborty , Regent Edu. & Research Foundation, India	Michael Ejim , TISG, UK	MfonObong Uko , TISG, UK	Mercy Munjuri , Uni. of Nairobi, Kenya

Publicity Chairs: Fanuel Elias, Iresh Ubesiri Narayana, Leandra De Almeida, Chinonyerem Oreoluwa Nwankwo, ManMetUni., UK; **Sunday Enahoro**, SmOp CleanTech, UK





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Welcome Message

Welcome to the programme of the Fifth International Conference on Adaptive and Sustainable Science, Engineering and Technology (ASSET 2026).

We are all very glad to be able to meet onsite and online for this conference. This conference will enhance our collective global visibility for capacity-building and partnership.

Background: The ASSET Council facilitates interactions amongst experts and professionals from communities of interest on developing and deploying adaptive and sustainable science, engineering and technology and applications for national security and socio-economic development. The council embraces the disciplines of applied science, engineering and technology, focusing on the total integrated complex systems effectiveness of national and global significance. The applications base is sustained through knowledge transfer partnerships and multidisciplinary research and development collaborations.

Conference Objectives: This conference serves as an interactive forum for the advancement of the practice of adaptive and sustainable systems across the multiple disciplines and specialty areas involved with the science, engineering and technology of integrated entities, complex systems and networks. The conference will provide an avenue for ASSET practitioners, researchers, managers, developers, analysts, educators and users to exchange innovative ideas, concepts, applications and lessons learned in addressing domain-specific problems, applications-oriented topics, methodologies, standards and multidisciplinary research opportunities and findings relating to ASSET systems.

ASSET 5.0 conference will be held on Wednesday, 29 – Friday, 31 July 2026 in Manchester, UK and Nairobi, Kenya. **Hosts:** Manchester Met University, UK and University of Nairobi, Kenya.

ASSET 2026 conference programme includes **Introduction** (Engr Stephen Alabi, CEO/Founder, SmOp CleanTech Ltd, UK); **Welcome Address** (Prof Hans Degens, Manchester Metropolitan University, UK); **Conference Theme Exposition** (Prof Isaac Oluwatayo, University of Venda, South Africa); **15 Keynote Speakers; 2 Invited Speakers; 8 Short Courses; 2 poster sessions; 7 parallel and 13 plenary technical sessions.**

The ASSET 2015 (maiden), 2023, 2024 and 2025 conferences generated international collaborations that translated into at least 12 active trans-continental collaborations for mutual benefits. The success of the ASSET 5.0 conference is made possible by the collective efforts of many individuals. We appreciate our profound gratitude to the Conference Organising and the Technical Programme Committees. They worked hard and smart in planning the conference logistics and the programme. They ensured that the hybrid (i.e., onsite and the online) format of the ASSET 2026 provided a comfortable experience for all the participants. We extend our acknowledgement to the host institutions, Conference Track Chairs, Local Organising Committee, Programme Chairs, Publicity Committee and the external reviewers. Our heartfelt thanks go to the support and contributions of all the authors. We are eternally grateful to

5





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our Diamond Sponsor (SmOp CleanTech); and Platinum Sponsors (TISG Ltd, Anya Consultancy Services, VizionMinds Technology Ltd and Josh Metro Ltd); and profoundly thank all our industry and academic partners for their commendable technical sponsorships, assistance and noble support. We hope you have a rewarding, memorable and enriching experience as we bring the global north and the global south together with the ASSETs ecosystem. Finally, we look forward to hosting you again in our future ASSET events.

The ASSET 2026 presentations are essential for nurturing and challenging the broad levels of [Adaptive and Sustainable Science, Engineering and Technology](#) practitioners, researchers, managers, developers, analysts, educators and users in various disciplines to exchange innovative ideas, concepts, applications, and lessons learned in addressing domain-specific problems, applications-oriented topics, methodologies, standards and multidisciplinary research opportunities and findings relating to ASSET systems at the flagship refereed [International ASSET 2026 Conference](#). The ASSET conference will enable open multidisciplinary [Research, Innovation, Development and Education](#) (RIDE) and provide a [global multidisciplinary multi-stakeholder RIDE mechanism and community of practice](#) forum and platform for the sustainable realisation of the [United Nations' Sustainable Development Goals](#) for all.





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Attendees' Guideline

Time Zone: British Summer Time (BST) (GMT+1)

- The duration of oral presentation slot is 10 minutes (including 2-3 minutes Q&A time).
- We will appreciate your punctual arrival and active engagement in each session.
- Prepare and backup your presentation PPT and/or PDF files.
- The official oral presentation time schedule is for reference only. Where absence or some presentations finish in less than 10 minutes, kindly join your session earlier.
- A participation certificate will be awarded to each presenter.
- A best presentation certificate will be awarded to the best presentation selected from each session.

For Onsite Participants

- Location-specific instructions will be provided.

Attention

Please, take care of your belongings in public area. For your personal and property safety, delegates are suggested to wear representative card during conference and not to lend it to those unconcerned to enter event rooms. Conference does not assume any responsibility for loss of personal belongings of participants.

- Avoid staying too late in the city;
- Avoid being alone in the remote area;
- Be vigilant and careful with the strangers who offer you service, sign of charity and other appealing experiences at scenic spots; and
- You can search online for more Security and Tourist Information tips.

For Online Participants

Online Conference MS Teams Link:





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- [Join the ASSET 2026 using the Microsoft Teams Link:](#)
 - <https://teams.microsoft.com/meet/337612400023535?p=W0uXBBvULQI9U4A7HI>
- Meeting ID: 337 612 400 023 535
- Passcode: ff24np7G





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Conference Schedule

DAY 1: WEDNESDAY, 29 July 2026

8:45 – 09:00	Login via MS Teams Link sent and walk-in registration	
INAUGURAL CEREMONY		
Programme Director(s): Dr Qiuyu Wang and Dr Zeyad Elsaraf, <i>Manchester Met University, UK</i> and Dr Duncan Elly, <i>University of Nairobi, Kenya</i> Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37)] / MS Teams		
09:00 - 09:15	INTRODUCTION	Engr Stephen Alabi, <i>Founder / CEO, SmOp CleanTech, UK</i>
09:15 - 09:30	WELCOME ADDRESS	Dr Zeyad Elsaraf, <i>Manchester Metropolitan University, UK</i>
09:30 - 09:50	GUEST SPEAKER	“Do Any Oddities Exist in Global Warming?” – Prof Sang Choi, NASA Inventor/Scientist, NASA Langley Research Centre, Virginia, USA
09:50 – 10:20	KEYNOTE SPEAKER 1	“Wearable Technology for Monitoring Healthcare and Environment” – Dr Prabhuraj Venkatraman, Manchester Met University, UK
10:20 - 10:40	CONFERENCE THEME EXPOSITION	Dr Prabhuraj Venkatraman, <i>Manchester Met University, UK</i> Engr Miracle Agholor, <i>CEO/Founder, VizionMinds Technology Ltd, UK</i>

9





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10:40 – 11:10	KEYNOTE SPEAKER 2	ASSET_2026_paper_34: “Agentic Intelligence for a Sustainable Future: Building Multi Agent AI Systems That Solve Real World Problems” – Engr Miracle Agholor, CEO/Founder, VizionMinds Technology Ltd, UK
11:10 – 11:15	VOTE OF THANKS	Dr Zeyad Elsaraf, Steering Committee Chair, Manchester Met University, UK
11:15 – 11:30	TEA & COFFEE BREAK / TECHNICAL SESSION	
11:30 – 12:00	Track Chair(s): Dr Zeyad Elsaraf, Manchester Met University (MMU), UK & Engr Sunday Enahoro, SmOp CleanTech, UK	
	[MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams]	
11:30 – 12:00	KEYNOTE SPEAKER 3	ASSET_2026_paper_09: “A Deep Mathematical Framework for Hybrid CNN-LSTM-Transformer Anomaly Detection in IoT Networks” – Prof Samik Chakraborty, Regent Education and Research Foundation, Kolkata, India
	Track Chair(s): Dr Umar Raza, MMU, UK & Engr Miracle Agholor, VizionMinds Technology Ltd, UK	
	[MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams]	
12:00 – 12:30	KEYNOTE SPEAKER 4	“Global Semiconductor Foundries for Monolithic Microwave Integrated Circuits Manufacturing” – Dr. José V. Anguita, Advanced Technology Institute, Uni. of Surrey, UK
12:30 – 13:00	Track Chair(s): Dr. Nixon Omoro, University of Nairobi, Kenya UK and Engr MfonObong Uko, TISG, UK	
12:30 – 12:45	KEYNOTE SPEAKER 5	“AgroSolar Innovation: The Role of ASSET,” – Michael Ejim, CEO/Co-Founder, TISG, UK
12:45 – 13:00	KEYNOTE SPEAKER 6	“Operational Technology and IoT Integrated Solutions on Unmanned Aerial Vehicles Fleet Management” – Balaji Perumal, Founder / CEO, Anya Consultancy Services, Wycombe, UK
13:05 – 13:35	LUNCH BREAK and POSTER SESSION	





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	AFTERNOON SESSION	
13:40 – 14:40	Track Chair(s): Dr. Nixon Omoro, University of Nairobi, Kenya, UK and Engr MfonObong Uko, TISG, UK Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams]	
13:40 – 14:10	ASSET_2026_paper_08: “Multi-Band Circular Ring Slotted Modified Ground Antenna for 5G MIMO Applications”- Prof Samik Chakraborty, Regent Education and Research Foundation, Kolkata, India	
14:10 – 15:00	Track Chair(s): Dr. Zipporah Onsomu, University of Nairobi, Kenya; Dr Ito Esiet, University of Uyo, Nigeria; and Dr Emmanuel James, ManMet Uni, UK Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1 & 2]	
14:10 – 14:40	SCT 1E	“Engineering Functional Peripheral Neurons from Embryonic Stem Cells for Future Regenerative Healthcare” – Dr Qinyu Wang, Manchester Metropolitan University, UK
14:40 – 14:55	ASSET_2026_paper_10: “QR-Fortified Role-Stratified Campus Exit Governance with Adaptive ML Fusion: GateVault – A Serverless, Mobile-Responsive Gate Pass and Leave Authorisation Platform for Residential Institutions” – Samik Chakraborty	
15:00 -16:00	Track Chair: Dr. Onesmus Mutunga, University of Nairobi, Kenya and Engr Fanuel Elias, Manchester Met University, UK	
15:00 – 15:20	ASSET_2026_paper_54: Development of Sustainable Epoxy Based Brakepad Composites Reinforced with Coconut and Periwinkle Shells	
15:20 – 15:50	ASSET_2026_paper_56: Integrated Modelling and Energy Generation Optimization of a Wind Turbine System at Nsude Hill Using a Hybrid PSO-GA Algorithm	
15:40 – 16:10	EVENING SESSION	
15:40 – 16:10	Track Chair: Engr MfonObong Uko, TISG, UK	Track Chair: Dr. Nixon Omoro, University of Nairobi, Kenya
	[MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1]	Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya / DB 37 / MS Teams Rooms 2]





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15:40 – 15:55	ASSET_2026_paper_12: "AI-Controlled Reconfigurable Intelligent Surfaces for Rain-Fade-Resilient Ka-Band Satellite Links" – <i>MfonObong Uko</i>	ASSET_2026_paper_13: "On-Board TinyML RF Fingerprinting for Spoofing- and Jamming-Resilient Direct-to-Satellite IoT" – <i>MfonObong Uko</i>
15:55 – 16:15	Track Chair: Dr. Zipporah Onsomu, <i>University of Nairobi, Kenya</i> and Engr Sunday Enahoro, <i>SmOp, UK</i> Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1 & 2]	
15:55 – 16:15	ASSET_2026_paper_11: "Ephemeris-Aided Lightweight Learning for Predictive Beam Handover in LEO Satellite 5G Non-Terrestrial Networks" – <i>MfonObong Uko</i>	
16:00 – 18:00	Short Courses and POSTER SESSION	
16:00 – 18:00	Short Courses Chair: Dr Umar Raza and Dr Emmanuel James, <i>ManMet Uni, UK</i> and Stephen Nyamja, <i>TISG, UK</i> Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1]	
16:00 – 18:00	Short Course Talk (SCT) 1: Green Integrated Sensing & Communication / Artificial Intelligence / Big Data Analytics / Internet of Things Sensors / Digital Twins / Biological, Biomedical & Bioengineering Systems / Biosensing	16:00 – 16:30 [1] SCT-1A: ASSET_2026_paper_36: "Interoperability Barriers and an Open Multi-Agent Architecture for Autonomous Resilience Across Open RAN, Private 5G, and Cloud-Native Networks" – <i>Miracle Agholor, Mfonobong Charles Uko and Michael Ejim</i>
		16:30 – 17:00 [2] SCT-1B: "Multifunctional Reconfigurable Electromagnetic Systems Toward Integrated Sensing, Communications, and Intelligence for 6G and Beyond: Part 1" – <i>Prof Tarek Djeraji, Institut national de la recherche scientifique (INRS), Centre Énergie Matériaux Télécommunications (EMT), Montréal, Canada</i>
DAY 2: THURSDAY, 30 July 2026		
8:45 – 09:00	Login via MS Teams Link sent and walk-in registration	



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09:00 – 10:00	Programme Director(s): Dr. Ronald Chogii, University of Nairobi, Kenya; Engr MfonObong Charles Uko, TISG, UK; and Dr Noushin Karimian, ManMet Uni., UK;	
09:00 – 09:20	INTRODUCTION AND WELCOME ADDRESS	Prof Hans Degens, Manchester Met University, UK
09:25 – 09:45	KEYNOTE SPEAKER 7	“AgroSolar Cool Storage System in Nigeria: A Sustainable Food Security Solution for National Development.” – Dr Iloro Esiet Udo, Principal Investigator / Research Director, AgroSolar Technopreneurship and Innovation Centre (ASTIC), University of Uyo, Nigeria
09:50 – 10:05	ASSET_2026_paper_15: “Enhancing Performance of an Integrated Hybrid Fish Feed Processing Machine through Parametric Optimization” - John Edeh, Dr Daniel Nnadi, Stanislaus Tochukwu Ukwuani, Aniekani Offiong and Benson Ikuesan.	ASSET_2026_paper_14: “Sequence-Model Predictive Link Adaptation for LEO Satellite Non-Terrestrial Networks under Rapid Channel Variation” – MfonObong Uko
10:10 – 10:40	KEYNOTE SPEAKER 8	“Open Science and Access Publication” – Dr. Anette-Judit Balint, Deputy Managing Editor, Electronics (MDPI) Journal, Switzerland
10:40 – 10:00	TEA & COFFEE BREAK & TECHNICAL SESSION	
11:00 – 12:00	Track Chairs: Dr Zeyad Elsaraf ManMet Uni, UK; Engr Sunday Enahoro, ManMet / SmOp, UK; and Dr. Nixon Omoro, University of Nairobi, Kenya Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1]	
11:00 – 11:30	KEYNOTE SPEAKER 9	“Antenna Booster Technology Meets Nature: Empowering Forest Resilience through Green Connectivity” – Prof Jaume Anguera, FIEEE, Associate Professor and CTO/Founder, Ignion, Barcelona, Spain
11:30 – 12:00	ASSET_2026_paper_25: Wireless sensor and mobile communications networks: Topology-Aware Graph Neural Network with Particle Swarm Optimization for Reactive Power Dispatch in the IEEE 14-Bus System	ASSET_2026_paper_24: Wireless sensor and mobile communications network: Comparative Assessment of Clustering-Based LoRaWAN Gateway Placement under Foliage-Aware Radio-Energy Conditions
12:00 – 13:00	Track Chair(s): Engr Sunday Enahoro, SmOp CleanTech, UK and Dr. Nixon Omoro, University of Nairobi, Kenya; and Joseph Sanusi, Josh Metro Ltd, UK [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1]	





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12:00 – 12:30	ASSET_2026_paper_27: Internet of things, artificial intelligence and big data: Performance Analysis of Histogram-Based Gradient Boosting with Training-Only SMOTE and SHAP-Ranked Feature Reduction for X-IIoTID Intrusion Detection	ASSET_2026_paper_26: Wireless sensor and mobile communications network: A Systematic Assessment of Classical and Ensemble Classifiers for Early Software Defect Prediction: Effects of Feature Selection and Imbalanced Learning
12:30 – 13:00	KEYNOTE SPEAKER 10	“Wireless Sensing and IoT Technologies for Applications in Food Industry” – Prof Zhipeng Wu, The University of Manchester, UK
13:00 – 13:30	LUNCH BREAK and POSTER SESSION	
AFTERNOON SESSION		
13:35 – 14:20	Track Chair(s): Dr. Onesmus Mutunga, University of Nairobi, Kenya and Dr Kolawole Olasunkanmi, SmOp CleanTech, UK Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1]	
13:35 – 14:20	KEYNOTE SPEAKER 11	“Transforming the Future of Construction through Innovations in Low-carbon Concrete Technologies and Modular Building Systems” – Joseph Sanusi, Project Director and Head of Innovation, Josh Metro Ltd, UK
14:05 – 14:25	ASSET_2026_paper_28: Internet of thing, artificial intelligence and big data: Performance Evaluation of Ann, CNN and LSTM Models for Multiclass Intrusion Detection on a Processed X-IIoTID Dataset”	
14:25 – 15:25	Track Chairs: Dr Kolawole Olasunkanmi, SmOp CleanTech, UK	Track Chairs: Dr. Onesmus Mutunga, University of Nairobi, Kenya
	Venue: Dalton Building (DB 37) / MS Teams Room 1	Venue: Dalton Building (DB 37) / MS Teams Room 2
14:25 – 14:40	KEYNOTE SPEAKER 12	“AI Ethics: Past, Present and Future” – Prof Keeley Crockett, Manchester Met University, UK
14:40 – 14:55	ASSET_2026_paper_30: Design and Functional Verification of an IIoT-Enabled Protected Control Framework for a Laboratory Solar-Pumped Hydroelectric Energy Storage System	ASSET_2026_paper_31: Hybrid Machine Learning Framework for Foliage-Aware Energy Optimization and Gateway Planning in LoRaWAN Networks
14:55 – 15:25	Track Chair(s): Engr Fanuel Elias and Dr. Zipporah Onsomu, University of Nairobi, Kenya	





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	Manchester, UK and Nairobi, Kenya; Wednesday, 25 Friday, 27 July 2024; www.asset-conference.com ; info@asset-conference.com	
14:55 – 15:05	ASSET_2026_paper_32: A Deep Learning Framework for Multi - Modal Breast Cancer Prediction and Classification	
	EVENING SESSION	
15:05 – 16:40	Track Chairs: Dr. Ronald Chogii, <i>University of Nairobi, Kenya</i> and Dr Kolawole Olasunkanmi, <i>SmOp CleanTech, UK</i>	
	Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and Dalton Building Lecture Theatre 1 (DB 37) / MS Teams Room 1	
15:05 – 15:35	KEYNOTE SPEEKER 13	“Multifunctional Reconfigurable Electromagnetic Systems Toward Integrated Sensing, Communications, and Intelligence for 6G and Beyond: Part 2” – Prof Tarek Djerafi, <i>Institut national de la recherche scientifique (INRS), Centre Énergie Matériaux Télécommunications (EMT), Montréal, Canada</i>
15:35 – 16:05	KEYNOTE SPEAKER 15	"Interference by Design: Rethinking Connectivity with NOMA" – Dr Zeyad Elsaraf, <i>Manchester Metropolitan University</i>
	SHORT COURSES and POSTER SESSION	
16:05 – 17:55	Short Courses Chair: Stephen Nyamja <i>TISG, UK</i> and Dr Umar Raza, <i>Manchester Met University, UK</i> Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1 & 2]	
16:05 – 17:35	Short Course 2: 5G/6G Radio Access Technologies / Satellite-Cellular Convergence / Metamaterials & Metasurfaces / Holographic Beamforming Technologies / Smart Manufacturing / Sustainable Energy Systems / Future Living	16:05 – 16:35 [1] SCT-2A: Panel Discussion: “AgroSolar Technopreneurship and Innovation Centre (ASTIC) – Past, Present and Progress” <i>University of Uyo, Nigeria: Dr Ito Esi Udo (Principal Investigator / Research Director ASTIC.);</i> <i>Benue State Polytechnic, Nigeria: Dr Godwin Oyiwona;</i> <i>TISG, UK: Michael Ejim and MfonObong Uko.</i>





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			16:35 – 17:05 [2] SCT-2B: “Obesity Diminishes Muscle-Tendon Health” – <i>Prof Hans Degens, Manchester Met University, UK</i> 17:05 – 17:35 [3] SCT-2C: “NOMA in 30 Minutes: Allocate, Decode and Decide” – <i>Dr Zeyad Elsaraf, Manchester Metropolitan University, UK</i>
			ASSET DINNER AND AWARDS CEREMONY
17:00 – 19:30			Programme Director(s): Dr Qiuyu Wang, <i>ManMet Uni, UK</i>; Michael Ejim, <i>TISG, UK</i> and Dr. Zipporah Onsomu, <i>University of Nairobi, Kenya</i> Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; [MMU Lecture Theatre, Dalton Building (DB 37) and Hyatt Regency Hotel (55 Booth Street West, Manchester, M15 6PQ) / MS Teams Room 1]
17:00 – 17:05	Opening Remarks	Dalton Building (DB 37)	Prof. Zhipeng Wu, <i>The University of Manchester, UK</i>
17:05 – 17:40	Dinner Talks	Dalton Building (DB 37)	[1] “Innovations in Low-carbon Concrete Technologies and Modular Building Systems: The Role of ASSETs” – <i>Joseph Samusi, Project Director and Head of Innovation, Josh Metro Ltd, UK</i> [2] “Agentic Intelligence for a Sustainable Future: The Role of ASSETs – <i>Engr MfonObong Uko, Co-Founder/CTO, TISG, UK</i>
17:40 – 17:45	Closing Remarks	Dalton Building (DB 37)	Lavanya Perumal, <i>Operations Director, Anya Consultancy Services, UK</i>
18:00 – 19:30	Dinner		Hyatt Regency Hotel, 55 Booth Street West, Manchester, M15 6PQ
			DAY 3: FRIDAY, 31 July 2026
8:45 – 09:00	Login via MS Teams Link sent and walk-in registration		





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026



Theme: Developing ASSETs for the Present and the Future Generations

Manchester, UK and Nairobi, Kenya; Wednesday, 29 – Friday, 31 July 2026; www.assetgrp.org; info@assetgrp.org

09:00 – 10:00	Programme Director(s): Dr. Zipporah Onsomu, <i>University of Nairobi, Kenya</i> ; Dr Zeyad Elsaraf, <i>ManMet Uni, UK</i> ; and Engr Sunday Enahoro, <i>SmOp CleanTech, UK</i> Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1 & 2]	
09:00 – 09:20	INTRODUCTION AND WELCOME ADDRESS	Dr Kolawole Olasunkanmi, <i>SmOp CleanTech, UK</i>
09:25 – 09:40	ASSET_2026_paper_40: “Ultrawideband Substrate Characterisation for Reconfigurable Holographic Metasurface Beamformer Development” - <i>Leandra De Almeida, Iresh Ubesiri Narayana, Fanuel Elias, Sunday Cookey Ekpo, Chinonyerem Nwankwo, Mfonobong Charles Uko, Sunday Enahoro and Stanislus Tochukwu Ukwuani.</i>	ASSET_2026_paper_41: Reconfigurable Holographic Metasurface Beamformer Design Considerations for 5G/6G Satellite-Cellular-Wi-Fi Communications ASSET_2026_paper_42 Prediction of RF, mmWave and THz smart substrates performance from molecular and electronic fingerprints: Substrates for smart communication systems
09:40 – 09:55	ASSET_2026_paper_43: Reconfigurable Metamaterial Elements Design for 5G/6G Satellite-Cellular-Wi-Fi Communications ASSET_2026_paper_44: Ultra-Massive Multiple Input Multiple Output Energy Harvester for 5G/6G CubeSat-Cellular-Wi-Fi Convergence Communications	ASSET_2026_paper_45: Reconfigurable Radio Frequency Integrated Sensing and Communication Transceiver Design Considerations for Health Metrics Monitoring ASSET_2026_paper_37: “A Comparative Analysis of RF Based UAV Networks for Defence, Agriculture, Disaster Response and Smart City Applications” - <i>Iresh Ubesiri Narayana, Leandra De Almeida, Fanuel Elias, Sunday Cookey Ekpo, Chinonyerem Nwankwo, Mfonobong Charles Uko, Sunday Enahoro and Stanislus Tochukwu Ukwuani</i>
10:00 – 11:40	TEA & COFFEE BREAK TECHNICAL SESSION	
10:00 – 11:40	Track Chair(s): Dr. Ronald Chogii, <i>University of Nairobi, Kenya</i> and Engr Sunday Enahoro, <i>SmOp, UK</i> Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1 & 2]	
10:05 – 10:35	ASSET_2026_paper_47: Split Chopped Spoon-shaped Circular Patch Antenna Design for Multi Band Application ASSET_2026_paper_48: Exploiting the Electrical Properties of Microfibres for Smart Sustainable Textiles Manufacturing	ASSET_2026_paper_49: Radio Frequency-Based Characterisation of Textiles Usage and Age for Full Fashion Economy Circularity ASSET_2026_paper_50: Smart Radio Frequency Microfibres Detection and Filtering Architecture for Energy-Efficient Next-Generation Washing Machines Manufacturing
10:40 – 11:10	ASSET_2026_paper_51: Smart Radio Frequency-based Real-time Microfibre Profiling Wearable Electronics Design	ASSET_2026_paper_53: Investigation of Environmental Effects on a Passive UHF RFID Antenna Sensors for Structural Health Monitoring

17





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026



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		ASSET_2026_paper_38: “A Comparative Analysis of RF Communication Technologies for UAV and Drone Applications,” - <i>Iresh Ubesiri Narayana, Leandra De Almeida, Fanuel Elias, Sunday Cookey Ekpo, Chinonyerem Nwankwo, Mfonobong Charles Uko, Sunday Enahoro and Stanislaus Tochukwu Ukwuani</i>
10:00 – 13:45	Track Chair(s): Dr Emmanuel James and Engr Fanuel Elias, ManMet Uni., and Dr. Ronald Chogii, University of Nairobi, Kenya, Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and [MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1 & 2]	
11:10 – 11:25	KEYNOTE SPEAKER 13	“Evaluating Entrepreneurial and Innovation Ecosystems Transformation at Universities in Kenya” – <i>Dr Duncan Elly Ochieng, University of Nairobi, Kenya</i>
11:25 – 11:45	ASSET_2026_paper_55: Optimization and Simulation of a combined solar PV-CHP-boiler-biomass energy system incorporating battery storage through Genetic algorithm Techniques	ASSET_2026_paper_59: Green Energy and Power Systems: Comparative ACO and PSO-Based Placement and Sizing of Solar PV Distributed Generation for Loss Reduction and Voltage Improvement in the Uyo Radial Distribution Network
11:45 – 11:55	ASSET_2026_paper_61: EM-HMVT: An Explainable Multi-Modal Hybrid CNN-ViT Framework with Cross-Modal Attention for Robust Obfuscated Android Malware Classification	
11:55 – 12:15	ASSET_2026_paper_63: A Modular Dual-Paradigm AI Framework for Adaptive Coding and Modulation in Ka-Band High-Throughput Satellites: LSTM Regression Meets XGBoost Classification ASSET_2026_paper_64: Integrated Multi-Objective Graph-Transformer and Deep Reinforcement Learning Framework for Joint Link State Prediction, Spectrum Allocation and Beamforming in Controller-Level URLLC-Oriented 6G Terahertz Systems	
12:15 – 12:35	KEYNOTE SPEAKER 14	“Digital Transformation in SSA- Enablers and Barriers” – <i>Etom Ofem, Regional Higher Education Insights Lead - Sub-Saharan Africa, British Council, Nigeria</i>
12:35 – 12:55	ASSET_2026_paper_65: Engineering Functional Peripheral Neurons from Embryonic Stem Cells for Future Regenerative Healthcare	ASSET_2026_paper_67: A Hybrid Graph Attention Network and Soft Actor-Critic Framework for Dynamic Spectrum Allocation in 6G THz Networks
12:55 – 13:05	ASSET_2026_paper_35: “DCC-LSTM for Proactive Power Scheduling in Bridge-Integrated Piezoelectric-Hydro Energy Harvesting for Autonomous IoT Sensors in Rural West Africa” – <i>Miracle Agholor and Mfonobong Uko</i>	
13:05 – 13:25	ASSET_2026_paper_69: Engineering the Future of Sustainable Construction: Decarbonising Concrete and Accelerating Net-Zero Housing Through Modular	ASSET_2026_paper_70: Green Synthesis of Reinforced Polytetrahydrofuran (PTHF) Nanocomposites: Characterization and Evaluation for Biomedical Implant Applications





ASSET 5.0 TECHNICAL PROGRAMME

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	Innovation	
13:25 – 13:45	ASSET_2026_paper_66: Innovation and Entrepreneurial Ecosystems in African Universities	ASSET_2026_paper_68: Prediction of the Spatial Extent of Adverse Noise Effects from an Aluminium Construction Workshop with a Maximum Noise Level of 109.5 dBA
13:45 – 14:05	ASSET_2026_paper_52: Design Considerations for Radio Frequency-based Characterisation of Microfibres for Smart Wearable Electronics Design	ASSET_2026_paper_62: Stacked Generalization Ensemble of Convolutional, Residual and Transformer Networks for Multilabel Classification of 12-Lead ECGs: A Comparative Study on the PTB-XL Dataset
14:05-14:35	NETWORKING AND LUNCH	
14:35 – 14:45	ASSET_2026_paper_60: Renewable Energy Generation, Transmission and Utilisation: Sensitivity-Informed Deep Neural Network with NSGA-II Optimization for Optimized Multiple Distributed Generation Placement and Sizing in IEEE 33-Bus Distribution Network	
14:45 – 15:05	ASSET_2026_paper_46: Green Channel-aware 6G Radio Frequency Power Amplifier Design Considerations	ASSET_2026_paper_29: AI/Machine Learning Algorithms and Applications: Hybrid Sensitivity Index-Guided Machine Learning and Metaheuristic Framework for Power Loss Minimization and Voltage Profile Improvement Via Multiple DG Integration in Radial Distribution Systems
15:05 – 15:15	CLOSING SESSION	
15:05 – 15:15	Session Chair: Engr Leandra De Almeida, <i>CaSSE Team, MMU, UK</i> and Dr. Zipporah Onsomu , <i>University of Nairobi, Kenya</i> [Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1 & 2]	
15:05 – 15:15	Closing Remarks	Dr Duncan Elly, <i>General Co-Chair, University of Nairobi, Kenya</i>
	Vote of Thanks	Dr Kolawole Olasunkanmi – <i>Conference Exhibition Chair, SmOp CleanTech, UK</i>
	Announcements	ASSET 2027: Michael Ejim, <i>CEO/Co-Founder, TISG, UK</i>
		ASSET 2026 Proceedings Book: Dr Sunday Cookey Ekpo – <i>General Chair & Conference Proceedings Editor-in-Chief, Manchester Metropolitan University, UK</i>





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026



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16:00 – 17:00	NETWORKING and ASSET Conference Organising Committee Meeting [Mahtma Gandhi Graduate Library Conference Room, University of Nairobi, Kenya; and MMU Lecture Theatre, Dalton Building (DB 37) / MS Teams Rooms 1 & 2]
ASSET 6.0 !!! [Tuesday, 06 – Thursday, 08 July 2027; Manchester, UK and Uyo, Nigeria]	





ASSET 5.0 TECHNICAL PROGRAMME

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Speakers' Introduction

Professor Zhipeng Wu, The University of Manchester, Manchester M13 9PL, UK



Zhipeng Wu (BSc, PhD, DEng) is a professor in the Department of Electrical and Electronic Engineering, The University of Manchester, Manchester, UK. His research interests include antennas and propagation, microwave sensors and imaging systems, RF/microwave circuits and measurement, Internet of Things (IoT) technologies, Machine-to-Machine (M2M) communication technologies, RFID based product traceability. He has published over 200 papers in these areas. Also, he has actively involved in a number of international conferences and was a conference chair of the IET-sponsored "International Workshop of IoT and Applications" in 2015. He received IET Innovation "Highly Commended" awards in "Electronics" and "Measurement in Action" in 2010, and in "Emerging Technologies" and "Measurement in Action" categories in 2011. He was awarded a Royal Society Industry Fellowship in 2012-2015 in bringing the microwave and antenna technologies to their uses in UK industries, and he has since been a member of the Royal Society Industry Fellow College.

Wireless Sensing and IoT Technologies for Applications in Food Industry

Prof. Zhipeng Wu, Department of Electrical and Electronic Engineering, University of Manchester, Manchester M13 9PL, UK

Abstract: The advances in wireless sensing and Internet of Things (IoT) and technologies in recent years have offered the food industry the abilities to improve manufacturing processes and product qualities with the provision of real time data. In this talk, wireless sensors and techniques suitable for food sensing will be reviewed. High speed data communication protocols and data handling techniques will be addressed. Implementation of wireless sensing, IoT and M2M-based high speed data communication technologies for food manufacturing will be demonstrated.





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026

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Prof. Sang H. Choi

Senior Lead Scientist / Innovator, NASA Langley Research Center, Hampton, Virginia 23681

Sang Choi is a Senior Lead Scientist who leads a research team in advanced electronic and energetic materials at NASA Langley Research Center. At NASA, he has developed satellite ERBE sensors, solar-pumped lasers, plasma switches, iodine lasers, microwave reflectometers & rectennas, solar thermal rocket, bionano battery, smart optics, nano-energetic propellants, micro-spectrometer, neural probe, rhombohedral hybrid bandgap engineering, single crystal SiGe growth, and nuclear thermionic avalanche cells. Also Dr. Choi has served for NASA's Quantum Technology Committee, NASA's Risk-Taking Success Strategy Committee, NASA LaRC Ideation-Innovation Blue Sky Team, and NASA LaRC Honor Awards panel. Dr. Choi received 72 various awards from NASA. Dr. Choi also received 3 of Nano50 Awards for his innovative bionano technology in 2006 and 2007, respectively, and a Nano50 Award cited as an "Innovator of the Year" in 2008. He won

R&D100 Award in 2009, the 2010 SOLAR Award in 2010, and 1st prize in the 2017 Create the Future Design Contest in Electronics. Dr. Choi published over 220 technical papers and reports. He received 59 U.S. patents and 6 patents pending out of his 169 inventions. He has over 40 invited, featured, plenary, or keynote talks on various technical areas. Dr. Choi has given 74 invited talks on general subject areas and has 43 news media captures. Dr. Choi served as the Editor-in-Chief of Recent Progress in Space Technology from 2009 to 2016. He is an editorial board member for 5 different journals. Dr. Choi has served as the conference chairs and session chairs for numerous professional events.

His honors are:

- a Fellow of National Academy of Inventors (NAI);
- a Fellow of SPIE;
- an Associate Fellow of AIAA;
- an Inductee of NASA Inventors Hall of Fame, 2020;
- NASA Exceptional Service Medal, 2021.

Talk Title: Do Any Oddities Exist in Global Warming?

The world has suffered from a sizzling hot weather that overspreads every corner of this globe. Current studies have pin-pointed the increased emission of carbon dioxide for global warming, since the emission of carbon dioxides has been estimated by measurements. On the other hand, the result of such measured element cannot justify scientifically to determine the overall aspect of global dynamics of warming, since the effect of carbon dioxide has, in general, a limited role for global warming. Great potentials that have agitated the equilibrium state of thermosphere may come from rather elsewhere than the emission of carbon dioxide with a low thermal mass. The author will present and discuss the potential but major thermal loading components that contribute to global warming.





ASSET 5.0 TECHNICAL PROGRAMME

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Note: Dr. Choi started his career developing NASA weather satellite (ERBS) sensors and data analysis code in the 1980s. His background with the Earth radiation budget has led him to explore other potential causes for global warming. His talk reflects only his own study and does not represent NASA.



Joseph Sanusi, Project Director and Head of Innovation, Josh Metro Ltd, United Kingdom

Joseph Sanusi is the **Project Director and Head of Innovation at Josh Metro Ltd**, a UK construction company committed to delivering innovative, sustainable, and future-focused construction solutions across the residential, commercial, industrial, and public sectors. With over 15 years of experience in the construction industry and more than a decade leading multidisciplinary projects throughout the United Kingdom, Joseph has established a reputation for combining practical construction expertise with strategic leadership and a passion for transforming the future of the built environment.

Throughout his career, Joseph has successfully led the delivery of complex construction projects from concept through to completion, with expertise spanning project delivery, construction management, stakeholder engagement, procurement, quality assurance, commercial management, regulatory compliance, and sustainable construction practices. His experience provides the practical foundation upon which he now drives innovation within the construction sector.

Recognising that construction must play a central role in addressing climate change while meeting increasing demands for housing and infrastructure, Joseph leads Josh Metro Ltd's innovation programme, focusing on the development of next-generation construction technologies that challenge conventional building methods. His work explores innovative approaches to **decarbonising concrete** and advancing **modular construction systems** capable of reducing embodied carbon, improving energy efficiency, accelerating housing delivery, enhancing build quality, and increasing the affordability of sustainable homes.

Joseph believes the future of construction lies at the intersection of **engineering excellence, scientific research, sustainability, digital innovation, and practical buildability**. Through Josh Metro Ltd's collaboration with **Manchester Metropolitan University** and other strategic industry partners, he is helping bridge the gap between academic research and commercial implementation, transforming emerging ideas into scalable construction solutions capable of delivering meaningful environmental, economic, and social impact.

A passionate advocate for collaboration between academia, industry, government, and technology innovators, Joseph is committed to building partnerships that accelerate the adoption of sustainable engineering practices and modern methods of construction. He believes that solving today's housing, infrastructure, and climate challenges requires multidisciplinary collaboration that combines scientific research with practical construction expertise to create solutions that are both commercially viable and environmentally responsible.

At the **5th International Adaptive and Sustainable Science, Engineering and Technology (ASSETS) Conference**, Joseph will present Josh Metro Ltd's vision for transforming the future of construction through innovations in **low-carbon concrete technologies** and **modular building systems**, demonstrating how research-led innovation can contribute to decarbonisation, increased productivity, improved affordability, and the delivery of more resilient and sustainable communities.





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026



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Through his leadership, Joseph continues to champion construction solutions that are not only technically robust and commercially viable but also contribute meaningfully to advancing sustainable engineering, supporting the transition to Net Zero, and shaping the future of the built environment.

Prof Keeley Crockett, Manchester Metropolitan University, UK



Keeley Crockett (SMIEEE, SFHEA) is a Professor in Computational Intelligence at Manchester Metropolitan University. She has over 27 years' experience of research and development in Ethical and responsible AI (for both SME's and an advocate for citizen voice), computational intelligence algorithms and applications, including adaptive psychological profiling, fuzzy systems, semantic similarity, and dialogue systems. Keeley has led work on Place based practical Artificial Intelligence, facilitating a parliamentary inquiry with Policy Connect and the All-Party Parliamentary Group on Data Analytics (APGDA), leading to the inquiry report "Our Place Our Data: Involving Local People in Data and AI-Based Recovery". She is one of the five EPSRC Public Engagement Champions and currently the PI on the EPSRC "PEAs in Pods: Co-production of community based public engagement for data and AI research." Keeley was one of the Founders of the People Panel for AI, funded originally by The Alan Turing Institute and in 2024 by Manchester City Council. She is currently working on several Innovate UK Knowledge Transfer Partnerships (e.g. GMCA) and a steering committee member for the UK Government Inquiry on Skills in the Age of AI. Keeley is working with the UK Government Digital Cabinet Office and was a collaborator on the AI Playbook for the UK Government released in 2025. She is also part of the International Agentic AI Safety Experts Focus Group which includes the development of the Guidelines for Agentic AI Safety Volume 1&2 (2024, 2025). Keeley is a member of UKRI's AI & Robotics Strategic Advisory Team and the EPSRC SAN on EDI, an elected member of the IEEE Computational intelligence Society ADCOM (2023-25), Founder and past (2022-2024) Chair of the IEEE Technical Committee SHIELD (Ethical, Legal, Social, Environmental and Human Dimensions of AI/CI) and chairs the IEEE AI Coalition Responsible AI subcommittee.

[Prof. Keeley A Crockett](#) SFHEA SMIEEE

Professor in Computational Intelligence

Lead Data and AI Ethics Group / Lead Machine Intelligence Group

[Past Chair \(2022-2024\) IEEE Technical Committee on Ethical, Legal, Social, Environmental and Human Dimensions of AI/CI \(SHIELD\)](#)

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ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026

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Keeley Crockett's Virtual Office Hours on Teams please email K.Crockett@mmu.ac.uk for an appointment



[EPSRC PEAs in Pods: Co-production of Community Based Public Engagement for Data and AI Research](#)

Talk Title: Participatory AI: Empowering AI with Human Insight

Abstract: Creating responsible and trustworthy AI requires more than technical excellence—it demands ethical awareness, legal foresight, and a deep understanding of societal impact. As new legislation and ethical frameworks emerge, developers and decision-makers face complex challenges in aligning AI systems with public values and expectations. This talk first explores Participatory AI, an inclusive approach that actively involves communities, users, and stakeholders throughout the AI lifecycle. By embedding transparency, collaboration, and shared ownership into design and deployment, participatory methods ensure AI reflects the needs and rights of the people it affects. Drawing on real-world research projects that unite academia, industry, and the public, the talk will showcase how ethical toolkits and co-production practices are being used to empower citizens, enrich academic inquiry, and guide businesses toward socially responsible innovation. These examples illustrate how inclusive design not only builds public trust, but also leads to more robust, meaningful, and ethically sound AI solutions.





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Dr. José V. Anguita, University of Surrey, UK

José V. Anguita received his B.Sc. degree in Chemical Physics and M.Sc. in the Physics of Advanced Electronic Materials from the University of Bristol in 1996 and 1997 respectively, and Ph.D. degree from the Electrical and Electronics Department of the University of Surrey in 2000. He was a process engineer at BAE Systems working on advanced infrared MEMS devices. After his Ph.D., he worked developing the then World's fastest production SMQW and DFB semiconductor lasers and fibre-coupling lasers at Hewlett Packard/Agilent Technologies. He then worked on advanced high-density plasma systems for thin-film deposition and surface modification at Plasma Quest Limited. In 2006 he joined the Advanced Technology Institute (ATI) within the Faculty of Engineering and Physical Sciences (FEPS), University of Surrey in Guildford U.K., where he developed nano-technological processes and equipment for the growth of a low-k dielectric material for fast transistors, promoting University spin-out company Surrey NanoSystems. In 2010 he developed new technologies and directed a 15-year international programme with EADS-Astrium/AIRBUS D&S for the design and development of ultra-high stability carbon-fibre composites for spacecraft. These are used in precision-optics for telescopes and spectrometers used for deep-space exploration and Earth observation missions from the Copernicus program, including Sentinel, Athena, Lisa, Ariel and Plato. In 2017, he became the Cleanroom and Laboratories Manager at both the ATI and the National Physical Laboratory (NPL) in Teddington, UK. He has co-authored 76 peer-reviewed publications in scientific, modelling and characterisation journals including book chapters, 1,500 citations 25,000 reads, inventor of five patents and Faculty researcher of the year. He has presented at several international conferences including invited and keynote. He lectures laser physics and fibre-optic communications, and advanced photolithographic and printing techniques for microchip fabrication.

Talk Title: Nanostructured Optical Super-absorbers for Energy Generation, Heat Management in Space and Energy Harvesting



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Etom Ofem, Regional Higher Education Insights Lead, British Council



Etom Ofem is a seasoned Research, Monitoring, Evaluation, and Learning (MEL) expert with over 14 years of experience driving data-informed development across Sub-Saharan Africa. Currently the Research, Evaluation, and Insights Lead at the British Council, he pioneers innovative MEL strategies, climate-focused initiatives, and enterprise support programmes. Etom blends statistical expertise with digital tools to shape impactful policies and programmes, championing inclusive, evidence-based development. He holds an MSc in Development Economics and is passionate about transforming data into actionable insights for sustainable change. Etom currently leads the SSA insights hub of the British Council where he leads the regional programme of generating insights that supports partnerships and collaborations between the UK and SSA.

Etom Ofem | Regional Higher Education Insights Lead SSA | Higher Education | Cultural Engagement | British Council, Nigeria | Plot 3645 IBB way Maitama district | Abuja | Nigeria

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Etom.Ofem@ng.britishcouncil.org, education-services.britishcouncil.org; www.britishcouncil.org.ng



Talk Title: Digital Transformation in SSA- Enablers and Barriers

Africa's youth population is projected to double by 2050, presenting both a demographic dividend and a developmental challenge. This study investigates the role of International Higher Education Partnerships (IHEPs) in addressing systemic gaps in higher education and employment across Sub-Saharan Africa, with a focus on Nigeria, Kenya, Ghana, and South Africa. The research aimed to Examine how IHEPs contribute to youth empowerment and employability; Explore youth participation in higher education policy-making; Identify success factors and barriers in IHEP implementation; and Provide actionable recommendations for stakeholders. A complexity-informed action research approach was employed, combining a systematic literature review with primary data collection through 48 key informant interviews and 53 survey responses. Youth comprised 75% of respondents, ensuring their perspectives were central. Data were analysed thematically and triangulated with secondary sources. The key findings include: Skills Mismatch: 85% of youth reported a disconnect between university curricula and labour market needs, citing outdated content and limited practical training; IHEP Impact: Participation in IHEPs significantly enhanced employability, with a 23% higher likelihood of securing employment within a year of graduation; Barriers: Financial constraints, limited awareness, and inequitable access hinder youth participation in IHEPs; Youth Voice:

27





ASSET 5.0 TECHNICAL PROGRAMME

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While formal structures for youth engagement exist, participation remains largely tokenistic, necessitating systemic reform; Success Factors: Effective IHEPs are characterised by mutual respect, alignment with local priorities, inclusive design, and robust monitoring and evaluation. The key recommendations span align curricula with labour market demands; institutionalise youth participation in policy-making; develop sustainable funding models for IHEPs; foster South-South collaborations and digital inclusion. IHEPs hold transformative potential for youth empowerment in Africa. However, realising this requires equitable partnerships, youth-centred design, and sustainable policy frameworks. The study calls for a shift from extractive to reciprocal models of collaboration that prioritise local agency and long-term impact.

Keywords: International Higher Education Partnerships, Youth Empowerment, Sub-Saharan Africa, Employability, Policy Participation, Sustainable Development

Acknowledgements: Researchers (Buhlebethu Magwaza, Chika Ehirim-Nmor, Morategi Kale, Sthandiwe Msomi, Fidelis Hove, Erica Gillard); and Editors (Etom Ofem, Geena Whiteman, Prince Chima, Meekness Lungu); Commissioned by the British Council Sub-Saharan Africa Insights Hub.





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Manchester, UK and Nairobi, Kenya; Wednesday, 29 – Friday, 31 July 2026; www.assetgrp.org; info@assetgrp.org

Prof. Jaume Anguera, IEEE Fellow, Founder / CTO, Ignion (Barcelona, Spain) and Ramon Llull University, Spain.



Jaume Anguera, IEEE Fellow, founder and CTO at the technology company Ignion (Barcelona, Spain). Professor at Ramon Llull University and a member of the Smart Society research group. He is an inventor of over 216 granted patents, most licensed to telecommunication companies, and +500 million devices have adopted his invented technology. Among his most outstanding contributions is that of the inventor of Antenna Booster Technology, a technology that fostered the creation of Ignion. The wireless industry has adopted +100M of these products worldwide to enable wireless connectivity to IoT devices through a miniature component called an antenna booster, which is 10 times smaller than conventional antennas. Author of more than 320 widely cited scientific papers and international conferences (+10000 citations, h-index 59, Google Scholar). Author of 8 books. He has participated in more than 28 competitive research projects, financed by the Spanish Ministry, CDTI, the Generalitat de Catalunya, and the European Commission, for an amount exceeding \$14M, as a principal researcher in most of them. He has taught over 100 antenna courses worldwide (USA, China, Korea, India, UK, France, Poland, Czech Republic, Tunisia, Perú, Brazil, Canada, Denmark, and Spain). With over 27 years of R&D experience, he has developed part of his career at Fractus in South Korea, designing miniature antennas for major Korean companies such as Samsung and LG. Since 2017, he has been with Ignion as CTO. He leads the company's R&D activity to create new products, envisage new technologies, and provide technology strategy to scale the company's business. He has received several national and international awards (e.g., the 2004 Best Ph.D Thesis, two prizes, one by Telefónica Mobile, the 2004 IEEE New Faces of Engineering, and the 2014 Finalist European Patent Award). He has directed the master/doctorate thesis to more than 200 students, many of whom have received awards for their thesis (COIT, COITT, Ministry of Education). His biography appears in Who's Who in the World and Who's Who in Science and Engineering. He is an associate editor of the IEEE Open Journal on Antennas and Propagation, and a reviewer in several IEEE and other scientific journals. He is an IEEE Antennas and Propagation Distinguished Lecturer and vice-chair of the working group "Software and Modelling" at EurAAP. He is a Life Fellow of the Wireless, Antenna & Microwave Symposium Society. More info at <https://users.salle.url.edu/~jaume.anguera/>

Prof Hans Degens, Emeritus Professor of Muscle Physiology at Manchester Metropolitan University (MMU) in the United Kingdom



Prof. Dr. Hans Degens is a highly prominent researcher in the field of exercise science, muscular health, and the biological mechanisms of human ageing.

Academic Background:

- Education & Positions: With an MSc in Biology (Wageningen) and a PhD in Exercise Physiology (Nijmegen), Dr. Degens held roles at the University of Liverpool, Karolinska Institute, the University of South Florida, University of Maastricht and Radboud University Nijmegen.
- Affiliations: He is a Visiting Professor with an honorary doctorate from the Lithuanian Sports University

Primary Research Interests:





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026



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Professor Degens' work focuses on skeletal muscle adaptation and atrophy, specifically:

- Skeletal Muscle Ageing: Researching age-related loss of muscle power, atrophy, and structural degradation.
- Mechanisms: Investigating muscle fibre changes through single muscle fibre biopsies in human and rodent models.
- Hypoxia & Health: Studying the impact of low oxygen on muscle, with applications for COPD/heart failure patients and elite athletes.
- Countermeasures: Evaluating exercise interventions to combat muscle wasting.

Abstract:

Obesity Diminishes Muscle-Tendon Health

Leonardo Cesanelli,¹[0000-0003-2822-1836], Hans Degens^{1,2}[0000-0001-7399-4841]

¹Institute of Sport Science and Innovations, Lithuanian Sports University, Kaunas, Lithuania

²Department of Life Sciences, Manchester Metropolitan University, Manchester, UK

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Abstract. Obesity is a metabolic disorder that remodels the musculotendinous system through chronic low-grade inflammation, metabolic dysregulation and altered mechanical loading. These processes drive fibro-adipogenic infiltration and extracellular matrix disorganization that manifest as slower contraction and relaxation, diminished strength and movement efficiency, and elevated injury risk. These structural deficits are linked to the metabolic environment of obesity, and lifestyle interventions, particularly caloric restriction and exercise can partially reverse musculotendinous dysfunction. This perspective advocates an integrated approach to obesity treatment that targets not only body mass but also recognizes that restoring musculotendinous health may be one of the most effective levers for breaking the vicious cycle of physical inactivity, metabolic deterioration and progressive functional decline in obesity.

Keywords: Ageing, Cognitive Function, Exercise, Muscle, Masters Athletes.



ASSET 5.0 TECHNICAL PROGRAMME

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Engr Stephen Alabi (MIET)

Stephen Alabi is the Founder and Managing Director of SmOp CleanTech and has overall responsibility for its operational performance. Stephen is also the driving force behind SmOp's strategic plan. He holds a BSc in Engineering Physics and a MSc in Advanced Process Design for Energy from The University of Manchester, UK. His background is in the scientific aspects of the Company's project which has aided products delivery and knowledge transfer. Stephen's involvement in setting the strategic direction of the business and authority to commit resources to support Research and development projects make him the ideal candidate to act as Senior Business Employee. Mr Alabi was the Technical Programme Chair at the Second International Adaptive and Sustainable Science,

Engineering and Technology (ASSET) Conference 2023 held in Manchester, UK and gave a Keynote Speech on "Hybrid Wireless Power Transfer for Passive Electronic Appliances." SmOp CleanTech is the Diamond Sponsor of the ASSET Conference and Engr Alabi is an Executive Stakeholder of the ASSET Council. He has 10 peer-reviewed and refereed technical publications and 10+ peer-reviewed articles on "green energy development for future-generations telecoms infrastructure" in-preparation. Under Stephen's R&D engineering leadership, SmOp has developed intellectual properties and patentable green radio frequency communication and low-carbon hybrid RF-solar energy harvesting products for different horizontal and vertical use cases spanning civil and commercial applications for the major industries/sectors. He currently leads the R&D of passive, hybrid and active energy-efficient and ultra-low-carbon internet of things sensors electronics innovations using advanced nanoscale integrated manufacturing technology for the global net zero attainment.



Dr Prabhuraj Venkatraman (Prabhu)

Senior Lecturer in Technical Textiles and Sustainable Fashion, Manchester Fashion Institute [MFI], Manchester Metropolitan University, U.K.

Prabhu, a technical textile specialist and a Chartered Fellow of the Textile Institute, is a prolific researcher and a dedicated mentor. His research interests include using innovative sustainable materials, developing functional apparel, and technical textiles to improve health. He has made significant advancements in the development of bio-functional finishing of fabrics with antimicrobial properties using plant-based nano-emulsions. His other research areas include the development of socks for diabetic patients to monitor shear force or strain and prevent the formation of ulcers. His current projects include the development of smart face coverings with antimicrobial properties and the development of novel micro and nano-fibres using seaweed (alginate) for healthcare applications. He regularly disseminates his research at international and national events and is a journal peer reviewer. As a Doctoral college Department lead [DCDL] for Manchester Fashion Institute, he plays a crucial role in postgraduate admissions and progression. He imparts his knowledge of sustainable fashion and product innovation to PG and UG students, inspiring the next generation of researchers. He has





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supervised five PhD students and four Master by Research (primary supervisor). He supervises three PhD students and continues to nurture future scholars. He also serves as a personal tutor, offering pastoral guidance and support for UG students.

Talk Title: Wearable Technology for Monitoring Healthcare and Environment

The fashion industry is valued at 2.5 trillion USD and employs more than 75 million people globally. Recently, apparel and textiles consumption has increased significantly, and people use clothes for a shorter period, resulting in substantial waste generation. The fashion supply chain is complex and consumes much water, energy, and resources. The textile finishing industry dries up water resources, and nearly 60-70% of products are synthetic. Washing up these products releases enormous volumes of micro-fibres, which affect the aquatics in river streams. These synthetic textiles contribute to a significant impact on the environment and climate. Due to their impact, it has been a focus for many, including the industry, government, and academics, to study the impact areas methodologically and lower or minimise the environmental impact. The lifecycle assessment [LCA] is an essential tool to evaluate the environmental impact of textiles and apparel products in each life stage, including raw material extraction, fibre processing, yarn spinning, fabric formation, garment manufacturing, distribution, consumer use and end-of-life. In addition to determining the impact, it has been essential to monitor the textiles and clothing at the production level, including who made the product, where and how it has been made, tracing its environmental footprint and how it should be cared for and maintained by the consumer and identifying its re-use potential after it reaches the end-of-life. A digital product passport (DPP) has been proposed for implementation in the EU by 2030 for all fashion and textiles, offering comprehensive data about the product's environmental footprint. In this paper, the author identifies the challenges of implementing these initiatives within the supply chain with some examples and identifies a transition toward sustainable and circular fashion and textiles.



Dr. Duncan Elly Ochieng
University of Nairobi, Kenya

Duncan Elly Ochieng is a Senior Lecturer at the University of Nairobi, Faculty of Business and Management Sciences. Duncan has expertise in entrepreneurial and innovation ecosystems development, finance and investments. He leads global projects that blend academia, practical innovation and industry partnerships to drive sustainable development. He manages impactful initiatives including Entrepreneurship Educators Foundation of Eastern Africa, African Journal of Entrepreneurship and Innovation (AJEIN) and African Development Finance Journal (ADFJ). Duncan was a co- principal Investigator in both the Youth Entrepreneurship Accelerator Programme (YEAP) and the Global Entrepreneurial Talent Management (GETM4). He was also a principal investigator in the Triple H: Building Head, Heart and Hand set in young Entrepreneurs through Storytelling and Design Thinking.

Talk Title: Evaluating Entrepreneurial and Innovation Ecosystems Transformation in Universities in Kenya





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Abstract:

This study investigates the entrepreneurial and innovation ecosystems within Kenyan universities, recognizing their pivotal role in economic development through research commercialization and startup incubation. Despite their potential, universities face challenges such as limited infrastructure, funding constraints, and a nascent entrepreneurial culture. The research aims to fill gaps in empirical evidence by employing a Theory of Change framework to understand how universities contribute to these ecosystems and identifying factors influencing their effectiveness. Key objectives include assessing the impact of entrepreneurial initiatives and evaluating the applicability of performance metrics in measuring outcomes. Adopting a mixed-methods approach, the study integrates qualitative methods like interviews and case studies with quantitative analyses such as surveys and secondary data review. By exploring collaborative models like the Triple Helix, Quadruple Helix, and Quintuple Helix, the research seeks to enhance understanding and practices for sustainable innovation in Kenyan higher education, informing future policies and strategies.

Key Words: Entrepreneurial and Innovation Ecosystems, Transformation in Universities, Innovation Helices



Dr Zeyad Elsaraf, Lecturer in Electrical & Electronic Engineering, Manchester Metropolitan University

Dr. Zeyad Elsaraf is a Lecturer in the Department of Engineering at Manchester Metropolitan University. He specializes in wireless communication systems, with a particular focus on Non-Orthogonal Multiple Access (NOMA), visible light communication (VLC), LiFi, and integrated sensing technologies for next-generation (6G) networks. Dr. Elsaraf's research interests encompass advanced modulation techniques, optical wireless communication, and energy-efficient networking strategies. Prior to his current role, Dr. Elsaraf was affiliated with the University of Huddersfield, where he contributed to research on cooperative NOMA systems and their performance analysis using Extrinsic Information Transfer (EXIT) charts. His work has been instrumental in advancing the understanding of multi-user detection and interference management in wireless networks. Dr. Elsaraf has authored several peer-reviewed publications and actively collaborates on international research projects aimed at developing innovative solutions for future wireless communication systems. His expertise in integrating communication and sensing functionalities positions him at the forefront of research in 6G technologies.



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Manchester, UK and Nairobi, Kenya; Wednesday, 29 – Friday, 31 July 2026; www.assetgrp.org; info@assetgrp.org



Keynote Speech:

Interference by Design: Rethinking Connectivity with NOMA

Abstract: For decades, communication systems have followed one reassuring rule: keep users apart. Separate them by time, frequency, code or space, and interference becomes easier to control. NOMA breaks that rule. It allows users to occupy the same communication resource, deliberately creating interference and then attempting to manage it through power allocation, signal superposition and successive interference cancellation. This shift from rigid separation to intelligent sharing raises an intriguing question: could interference become a resource rather than simply an obstacle?

This keynote introduces the principles of NOMA in an accessible manner for a multidisciplinary engineering audience. It explores the potential of NOMA to support flexible resource sharing, user fairness, massive connectivity and heterogeneous services across wireless, optical, industrial and non-terrestrial communication environments. Particular attention is given to the engineering trade-offs among spectral efficiency, fairness, energy consumption, receiver complexity and decoding reliability. The presentation will also examine how artificial intelligence, sensing and localisation information could enable more context-aware resource allocation.

Drawing on recent research in optical wireless communication, the keynote will illustrate how NOMA can be combined with optical sensing and positioning to inform geometry-aware power allocation. It will also consider realistic challenges, including Poisson–Gaussian noise, imperfect interference cancellation, user mobility, receiver orientation and the need for experimental validation.

Rather than presenting NOMA as a universal replacement for orthogonal access, the keynote asks a more important question: under what conditions does intelligent sharing justify its additional complexity? Several practical questions will be intentionally left open for an interactive short course on the final day, where participants will allocate power, decode superimposed signals, investigate error propagation and decide when NOMA is—and is not—the appropriate engineering solution.

Short Course:

NOMA in 30 Minutes: Allocate, Decode and Decide

Abstract: What happens when two users transmit through the same communication resource—and you are responsible for making it work? In this fast-paced, interactive short course, participants will move beyond simply hearing about non-orthogonal multiple access (NOMA) and experience its key engineering decisions for themselves. Working through an accessible two-user scenario, participants will allocate transmission power, examine a superimposed signal and apply the basic principle of successive interference cancellation. They will then investigate what happens when decoding fails, observe how errors can propagate through the receiver and compare the outcome with a conventional orthogonal allocation. The session concludes with a practical challenge: given the users, channels and system requirements, should NOMA be used at all? Designed for a multidisciplinary audience, the course requires no previous knowledge of NOMA and uses intuitive examples, audience voting and collaborative problem-solving rather than lengthy mathematical derivations. Participants will gain a practical understanding of how power allocation, channel conditions, decoding order, fairness and receiver complexity affect NOMA performance. Building on questions introduced during the opening-day keynote, **Interference by Design: Rethinking Connectivity with NOMA**, this short course provides the practical payoff. By the end of the session, participants will not only understand how a basic NOMA system operates but will also be able to recognise when its potential benefits justify the additional complexity—and when keeping users apart may still be the better engineering decision.





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Prof Samik Chakraborty, Dipartimento di Ingegneria dell'Informazione, Università Degli Studi Di Firenze, Italy

Short Course Title: Cell-Free Massive MIMO based Beamforming for 5G NR and 6G Terrestrial and Non-Terrestrial Network (TN & NTN) Communication

Abstract: Cell-Free Massive MIMO (CF-mMIMO) is a decentralized wireless architecture where distributed Access Points (APs) jointly serve users, eliminating cell boundaries. Compared to traditional cellular networks, it offers uniform coverage (no cell-edge users), higher spectral efficiency via macro-diversity and interference mitigation through coherent transmission. This proposed methodology incorporates contemporary technological advancements with futuristic aspects of 5G and beyond (6G) for Cell-Free Massive Multiple-Input Multiple-Output (CF-mMIMO): Spectral efficiency bounds (Using massive MIMO based channel estimation); Performance vs. cellular systems; and reconfigurable intelligent surfaces (RIS) optimization methods (particularly useful in strategic locations like, subway, tunnel, multi curved corridor of big buildings, etc.) Cell-free massive MIMO can be beneficial for both Terrestrial Networks (TNs) and Non-Terrestrial Networks (NTNs), but the specific benefits differ. For TNs, it enhances capacity in dense urban areas and provides uniform coverage. For NTNs, it can improve connectivity in remote areas and enhance resilience.





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Dr Qiuyu Wang, Manchester Metropolitan University, UK

Qiuyu Wang is a Senior Lecturer in Biomedical Science at Manchester Metropolitan University. She has been a HUCBMS external examiner since 2016. Her main research areas are cancer research and stem cell research, which include developing and evaluating new approaches for the diagnosis and treatment of cancer. Her research interests include investigating communication between cancer cells and immune cells in the tumour microenvironment, as well as studying biological effects of exposure to radio frequency or plasm on cancer cells. Dr Wang is a fellow of the Institute of Biomedical Science (UK), and an editorial board member of the British Journal of Biomedical Science. She is a member of the European Association for Cancer Research and the Federation of European Biochemical Societies. She co-edited the textbook Biomedical Science Practice (OUP), and co-wrote Thrive in Cell Biology (OUP). She was a reviewer for Newton Prize application (2018), and she reviewed grant application (in the panel of molecular biology, biotechnology) for National Science Centre, Poland (2021).

Talk Title: Engineering Functional Peripheral Neurons from Embryonic Stem Cells for Future Regenerative Healthcare

Neural crest cells are a transient, multipotent cell population that give rise to a wide range of tissues, including much of the peripheral nervous system. Advances in stem cell technologies now enable the generation of neural crest-derived cell types in vitro, creating new opportunities for regenerative medicine, disease modelling, and the development of next-generation healthcare solutions. Understanding the molecular mechanisms that govern neural crest differentiation is essential for translating stem cell biology into future clinical applications. In this study, neural crest stem cells were differentiated from mouse embryonic stem cells under serum-free, feeder-free culture conditions using sequential FGF-2 and BMP-4 signalling. Differentiated cells expressed established neural crest markers including Sox10, Pax3, Sox9, and Musashi-1, and were subsequently directed to form peripherin-positive peripheral neurons. Functional assessment using microelectrode arrays demonstrated that these neurons generated action potentials and responded to key neurotransmitters, including GABA and NMDA, confirming the development of electrophysiologically active neural networks. By combining stem cell engineering, functional electrophysiology, and systems-level transcriptomics, this work establishes a platform for generating functional peripheral neurons with potential applications in regenerative medicine, patient-specific disease modelling, drug discovery, and future tissue replacement therapies. These advances support the development of innovative healthcare technologies aimed at improving the diagnosis and treatment of neurological disorders in the future living and healthcare landscape.



ASSET 5.0 TECHNICAL PROGRAMME

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Engr Miracle Agholor, CEO and Director of VizionMinds Ltd

Engr Miracle Agholor is a deep tech entrepreneur, CEO and Director of VizionMinds Ltd (www.viziontechnology.com) — a UK-incorporated AI and software company building intelligent systems that reason, adapt and deliver. Co-Founder of Vision Labs Ltd (Nigeria, 2025). A Professional Member of the British Computer Society (MBCS) and First Class BSc graduate in Applied Computing from the University of East London, Mr Agholor brings over five years of hands-on experience in AI-powered product engineering, blockchain architecture, and digital transformation across Africa and the UK. WP4 Lead (AI & Data) on the Horizon Europe RIA PEST-SHIELD consortium (6 million euros, 11 partners). IEEE-published researcher, author of two books on AI and responsible innovation available internationally, and recipient of the African Under-40 CEO Award (2025). His cross-border expertise spanning regulated UK public sector delivery, fintech SaaS engineering, and deep tech startup leadership positions him as a versatile technology executive equally effective in the boardroom, the lab, and the delivery programme.



Prof. Tarek Djerfafi, Institut national de la recherche scientifique, Centre Énergie Matériaux Télécommunications, Montréal, Canada

Prof. Tarek Djerfafi received the B.Eng. degree in Electrical Engineering from the University of Blida, Algeria, and the M.Sc. and Ph.D. degrees in Electrical Engineering from Polytechnique Montréal, Canada. He is currently a Professor at the Institut national de la recherche scientifique (INRS), Centre Énergie Matériaux Télécommunications (EMT), Montréal, Canada, where he leads research in advanced RF and microwave systems.

His research interests span radio-frequency (RF), microwave, millimeter-wave, and terahertz technologies, with a particular emphasis on multifunctional and reconfigurable electromagnetic systems for next-generation wireless applications. His work encompasses antennas and antenna arrays, substrate integrated waveguide (SIW) technologies, metasurfaces, integrated sensing and communications (ISAC), radar systems, microwave sensing, microwave photonics, electromagnetic material characterization, and intelligent RF systems for 6G and beyond.

Prof. Djerfafi has authored and co-authored more than 200 scientific publications in leading IEEE journals and international conferences and has led numerous research projects in collaboration with academia, government laboratories, and industry. His research has been supported by the Natural Sciences and Engineering Research Council of Canada (NSERC), the Canada Foundation for Innovation (CFI), the Fonds de recherche du Québec (FRQ), Mitacs, and several industrial partners.





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026



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He is actively involved in the IEEE community through technical committees, conference organization, editorial activities, and peer review for major IEEE journals. His current research aims to develop intelligent, adaptive, and multifunctional electromagnetic systems that seamlessly integrate communication, sensing, localization, and imaging capabilities, enabling future autonomous platforms, smart environments, aerospace systems, healthcare technologies, and 6G wireless networks.

The rapid convergence of wireless communications, sensing, localization, and artificial intelligence is fundamentally reshaping the design of future electromagnetic systems.

Multifunctional Reconfigurable Electromagnetic Systems Toward Integrated Sensing, Communications, and Intelligence for 6G and Beyond

Abstract: Beyond simply increasing data rates, sixth-generation (6G) networks are expected to provide a unified platform capable of simultaneously communicating, sensing, imaging, and interacting with the surrounding environment. Achieving this vision requires a paradigm shift from conventional single-function RF hardware to intelligent, multifunctional, and highly reconfigurable electromagnetic systems.

This keynote presents recent advances in multifunctional reconfigurable RF and electromagnetic technologies that enable the seamless integration of communication and sensing functionalities within a common hardware platform. The presentation will cover the evolution of reconfigurable antennas, beamforming networks, substrate integrated waveguide (SIW) technologies, programmable metasurfaces, and adaptive RF front-ends capable of dynamically modifying their electromagnetic response according to operational requirements and environmental conditions.

Particular emphasis will be placed on Integrated Sensing and Communications (ISAC), highlighting how reconfigurable electromagnetic structures can jointly support high-capacity wireless communications, high-resolution radar sensing, localization, imaging, and environmental awareness. Emerging concepts involving artificial intelligence, digital twins, and software-defined electromagnetic systems will also be discussed, illustrating how real-time optimization and autonomous reconfiguration can significantly enhance system performance while reducing hardware complexity, energy consumption, and deployment costs.

The keynote will conclude with an overview of current research challenges and future opportunities toward truly intelligent electromagnetic systems, including distributed ISAC architectures, cooperative sensing networks, autonomous aerial platforms, smart infrastructures, microwave photonics, and the integration of sub-THz technologies for 6G and future wireless ecosystems.

Vote of Thanks – ASSET 2026

Delivered by: Dr Kolawole Olanikanmi

Friday, 31 July 2026





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026

Theme: Developing ASSETs for the Present and the Future Generations

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Good afternoon, distinguished guests, colleagues, and friends.

As we come to the close of the Fifth International Conference on Adaptive and Sustainable Science, Engineering and Technology – ASSET 2026, it is my honour and privilege to deliver this Vote of Thanks.

First and foremost, we express our deepest gratitude to all our keynote and invited speakers for sharing their invaluable insights and research. Your thought-provoking contributions have inspired us, challenged us, and set a clear direction for future collaboration and innovation.

To our session chairs, presenters, panellists, and poster contributors, thank you for enriching the programme with your diverse perspectives, rigorous work, and engaging discussions.

A heartfelt appreciation goes to our host institutions—Manchester Metropolitan University, UK, and the University of Nairobi, Kenya—for their unwavering support and excellent coordination across continents. Your efforts have made this hybrid conference not only possible, but exceptional.

We also thank all our industry and academic partners, technical sponsors, and collaborators whose support has been instrumental.

To the Conference Organising Committee, Technical Programme Committee, Track Chairs, Publicity Team, and our local and virtual support teams—your dedication and hard work behind the scenes have ensured a seamless, impactful event. We commend you.

To all our participants, both in-person and online—from across disciplines, countries, and time zones—thank you for your presence, engagement, and shared commitment to building adaptive, sustainable futures.

Let us carry forward the connections we've made here, the ideas we've exchanged, and the collaborations we've begun. Let ASSET continue to grow—not just as a conference, but as a global community of practice.

Once again, thank you all for making ASSET 2026 a resounding success.

We wish you safe travels, continued innovation, and we look forward to seeing you at our future events.

Thank you.

Dr Kolawole, R&D Director, SmOp CleanTech, UK





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026

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ASSET 5.0 TECHNICAL PROGRAMME

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Manchester, UK and Nairobi, Kenya; Wednesday, 29 – Friday, 31 July 2026; www.assetgrp.org; info@assetgrp.org



Technical Papers

ID: Paper Title

- [8] Multi-Band Circular Ring Slotted Modified Ground Antenna for 5G MIMO Applications
- [9] A Deep Mathematical Framework for Hybrid CNN-LSTM-Transformer Anomaly Detection in IoT Networks
- [10] QR-Fortified Role-Stratified Campus Exit Governance with Adaptive ML Fusion: GateVault – A Serverless, Mobile-Responsive Gate Pass and Leave Authorisation Platform for Residential Institutions
- [11] Ephemeris-Aided Lightweight Learning for Predictive Beam Handover in LEO Satellite 5G Non-Terrestrial Networks
- [12] AI-Controlled Reconfigurable Intelligent Surfaces for Rain-Fade-Resilient Ka-Band Satellite Links
- [13] On-Board TinyML RF Fingerprinting for Spoofing- and Jamming-Resilient Direct-to-Satellite IoT
- [14] Sequence-Model Predictive Link Adaptation for LEO Satellite Non-Terrestrial Networks under Rapid Channel Variation
- [15] Enhancing Performance of an Integrated Hybrid Fish Feed Processing Machine through Parametric Optimization
- [16] Obesity Diminishes Muscle-Tendon Health
- [24] Wireless sensor and mobile communications network: Comparative Assessment of Clustering-Based LoRaWAN Gateway Placement under Foliage-Aware Radio-Energy Conditions
- [25] Wireless sensor and mobile communications networks: Topology-Aware Graph Neural Network with Particle Swarm Optimization for Reactive Power Dispatch in the IEEE 14-Bus System
- [26] Wireless sensor and mobile communications network: A Systematic Assessment of Classical and Ensemble Classifiers for Early Software Defect Prediction: Effects of Feature Selection and Imbalanced Learning
- [27] Performance Analysis of Histogram-Based Gradient Boosting with Training-Only SMOTE and SHAP-Ranked Feature Reduction for X-IIoTID Intrusion Detection
- [28] Performance Evaluation of Ann, CNN And LSTM Models for multiclass Intrusion Detection on a Processed X-IIoTID Dataset
- [29] Hybrid Sensitivity Index-Guided Machine Learning and Metaheuristic Framework for Power Loss Minimization and Voltage Profile Improvement Via Multiple DG Integration in Radial Distribution Systems
- [30] Design and Functional Verification of an IIoT-Enabled Protected Control Framework for a Laboratory Solar-Pumped Hydroelectric Energy Storage System
- [31] Hybrid Machine Learning Framework: Hybrid Machine Learning Framework for Foliage-Aware Energy Optimization and Gateway Planning in LoRaWAN Networks
- [32] A Deep Learning Framework for Multi - Modal Breast Cancer Prediction and Classification
- [34] Agentic Intelligence for a Sustainable Future: Building Multi Agent AI Systems That Solve Real World Problems
- [35] DCC-LSTM for Proactive Power Scheduling in Bridge-Integrated Piezoelectric-Hydro Energy Harvesting for Autonomous IoT Sensors in Rural West Africa
- [36] Interoperability Barriers and an Open Multi-Agent Architecture for Autonomous Resilience Across Open RAN, Private 5G, and Cloud-Native Networks
- [37] A Comparative Analysis of RF Based UAV Networks for Defence, Agriculture, Disaster Response and Smart City Applications
- [38] A Comparative Analysis of RF Communication Technologies for UAV and Drone Applications
- [40] Ultrawideband Substrate Characterisation for Reconfigurable Holographic Metasurface Beamformer Development
- [41] Reconfigurable Holographic Metasurface Beamformer Design Considerations for 5G/6G Satellite-Cellular-Wi-Fi Communications
- [42] Prediction of RF, mmWave and THz smart substrates performance from molecular and electronic fingerprints: Substrates for smart communication systems
- [43] Reconfigurable Metamaterial Elements Design for 5G/6G Satellite-Cellular-Wi-Fi Communications
- [44] Ultra-Massive Multiple Input Multiple Output Energy Harvester for 5G/6G CubeSat-Cellular-Wi-Fi Convergence Communications
- [45] Reconfigurable Radio Frequency Integrated Sensing and Communication Transceiver Design Considerations for Health Metrics Monitoring

41





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026

Theme: Developing ASSETs for the Present and the Future Generations

Manchester, UK and Nairobi, Kenya; Wednesday, 29 – Friday, 31 July 2026; www.assetgrp.org; info@assetgrp.org



- [46] Green Channel-aware 6G Radio Frequency Power Amplifier Design Considerations
- [47] Split Chopped Spoon-shaped Circular Patch Antenna Design for Multi Band Application
- [48] Exploiting the Electrical Properties of Microfibres for Smart Sustainable Textiles Manufacturing
- [49] Radio Frequency-Based Characterisation of Textiles Usage and Age for Full Fashion Economy Circularity
- [50] Smart Radio Frequency Microfibres Detection and Filtering Architecture for Energy-Efficient Next-Generation Washing Machines Manufacturing
- [51] Smart Radio Frequency-based Real-time Microfibre Profiling Wearable Electronics Design
- [52] Design Considerations for Radio Frequency-based Characterisation of Microfibres for Smart Wearable Electronics Design
- [53] Investigation of Environmental Effects on a Passive UHF RFID Antenna Sensors for Structural Health Monitoring
- [54] Development of Sustainable Epoxy Based Brakepad Composites Reinforced with Coconut and Periwinkle Shells
- [55] Optimization and Simulation of a combined solar PV-CHP-boiler-biomass energy system incorporating battery storage through Genetic algorithm Techniques
- [56] Integrated Modelling and Energy Generation Optimization of a Wind Turbine System at Nsude Hill Using a Hybrid PSO-GA Algorithm
- [59] Green Energy and Power Systems: Comparative ACO and PSO-Based Placement and Sizing of Solar PV Distributed Generation for Loss Reduction and Voltage Improvement in the Uyo Radial Distribution Network
- [60] Sensitivity-Informed Deep Neural Network with NSGA-II Optimization for Optimized Multiple Distributed Generation Placement and Sizing in IEEE 33-Bus Distribution Network
- [61] EM-HMVT: An Explainable Multi-Modal Hybrid CNN-ViT Framework with Cross-Modal Attention for Robust Obfuscated Android Malware Classification
- [62] Stacked Generalization Ensemble of Convolutional, Residual and Transformer Networks for Multilabel Classification of 12-Lead ECGs: A Comparative Study on the PTB-XL Dataset
- [63] A Modular Dual-Paradigm AI Framework for Adaptive Coding and Modulation in Ka-Band High-Throughput Satellites: LSTM Regression Meets XGBoost Classification
- [64] Integrated Multi-Objective Graph-Transformer and Deep Reinforcement Learning Framework for Joint Link State Prediction, Spectrum Allocation and Beamforming in Controller-Level URLLC-Oriented 6G Terahertz Systems
- [65] Engineering Functional Peripheral Neurons from Embryonic Stem Cells for Future Regenerative Healthcare
- [66] Innovation and Entrepreneurial Ecosystems in African Universities
- [67] A Hybrid Graph Attention Network and Soft Actor-Critic Framework for Dynamic Spectrum Allocation in 6G THz Networks
- [68] Prediction of the Spatial Extent of Adverse Noise Effects from an Aluminium Construction Workshop with a Maximum Noise Level Of 109.5 dBA
- [69] Engineering the Future of Sustainable Construction: Decarbonising Concrete and Accelerating Net-Zero Housing Through Modular Innovation
- [70] Green Synthesis of Reinforced Polytetrahydrofuran (PTHF) Nanocomposites: Characterization and Evaluation for Biomedical Implant Applications

Greater Manchester, UK





ASSET 5.0 TECHNICAL PROGRAMME

The Fifth International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2026

Theme: Developing ASSETs for the Present and the Future Generations

Manchester, UK and Nairobi, Kenya; Wednesday, 29 – Friday, 31 July 2026; www.assetgrp.org; info@assetgrp.org

Greater Manchester's contributions to the UK's innovation and education span over the last 200 years and the Manchester city-region is a globally recognised centre of cultural, industrial and technological excellence. Manchester is a student-focused city with enriching sporting and buzzing social scenes. It is one of the world's top 3 student cities (QS Best Student Cities 2023) that showcase dynamic real international cuisine and cultural events.



Nairobi, Kenya

Nairobi is the capital city of Kenya. Besides its urban core, Nairobi National Park (a large game reserve that is famous for breeding endangered black rhinos and home to giraffes, zebras and lions) locates in the city. Neighbouring it is a well-regarded elephant orphanage. Nairobi serves as the take-off point for safari trips pan-Kenya. Nairobi is home to one of the most diverse landscapes worldwide – this makes this breathtaking small city such an amazing place to visit. It houses a wide variety of rare wildlife species that can only be found in the rain forests, wooded savannas and grassy plains of Kenya.

