



LEEDS BECKETT UNIVERSITY  
LEEDS SUSTAINABILITY  
INSTITUTE

# INTERNATIONAL SUSTAINABLE ECOLOGICAL ENGINEERING DESIGN FOR SOCIETY (SEEDS)

CONFERENCE 2021

CONFERENCE SPEAKERS

DELIVERED IN PARTNERSHIP WITH:





## SEEDS Conference Keynote Speakers



**Andy Shepherd** is Professor of Earth Observation at the University of Leeds, Director of the NERC Centre for Polar Observation and Modelling, Principal Scientific Advisor to the European Space Agency CryoSat satellite mission, and co-leader of the ESA-NASA Ice Sheet Mass Balance Inter-comparison Exercise. He uses satellites to study the physical processes of Earth's climate, and his main contributions to science have involved developing remote observations of the cryosphere, with particular emphasis on radar interferometry and radar altimetry. He has also led field campaigns in Europe, Africa, Greenland and Antarctica, to calibrate and validate satellite missions. Andrew was educated in the Department of Physics and Astronomy at the University of Leicester, and prior to working at

Leeds he has held academic posts at University College London, at the University of Cambridge, and at the University of Edinburgh. He has co-authored over journal 100 papers that are often reported in the media, and he regularly contributes to broadcast documentaries such as the BBC's Blue Planet 2 and Climate Change: the Facts. Andrew was awarded a Philip Leverhulme Prize in 2008 and a Royal Society Wolfson Research Merit Award in 2014.

**Mohamad Kassem** is Professor of Digital Construction, the Head of Subject for the Construction and Project Management division, and the Lead for the Digital Built Environment research group at Northumbria University. His research on two core strands: performance improvement of construction projects and processes through the development and application of digital innovation; and digital transformation of the built environment. He received the Scherer Award for outstanding service to the computing community in the context of European Council for Computing in Construction in 2021. He has published more than 110 outputs in international journals and conferences, and he has secured and delivered several research and enterprise grants (total value exceeding £5m) co-funded by UK and international research and innovation councils. He was appointed as a consultant on several studies of strategic digital transformation to a number of public sector bodies including the European Commission, the Foreign and Commonwealth Office, and various governments.



In his presentation, Prof. Kassem will discuss a digital twin-enabled approach to improve the productivity of earthwork equipment in large infrastructure projects, a collaborative project funded by Innovate UK under the grant agreement N 44584.



**Prof Enda Hayes** is a Professor of Air Quality and Carbon Management and the Director of the Air Quality Management Resource Centre at the University of the West of England, Bristol, United Kingdom. He has been working in the environmental field for over two decades with a primary focus on atmospheric emissions and their management including odour, bio aerosols, ammonia, traditional air quality pollutants (e.g. particulate matter, nitrogen dioxide, ozone) and greenhouse gases. Enda has worked with the local, national and international government on a range of air quality and carbon management projects and is the Scientific Director of various UK and EU research projects focused on citizen behaviour and air pollution.

**Dr Ruth Hartley** (C.Psychol) is Group Health and Wellbeing Manager at nmcn. She has worked as a researcher, academic and applied psychologist for over 20 years. As an academic she published in high-ranking journals, and presented at national and international conferences. She has wide ranging interests within the field of work psychology, but her primary areas of interest are: health, safety and wellbeing; organisational culture and climate; communication and behaviour change; and organisational effectiveness. As an award-winning practitioner she concentrates on developing initiatives that improve the health, safety and wellbeing of people working within the construction industry. She is an ardent advocate for improving primary interventions within the area of mental health.



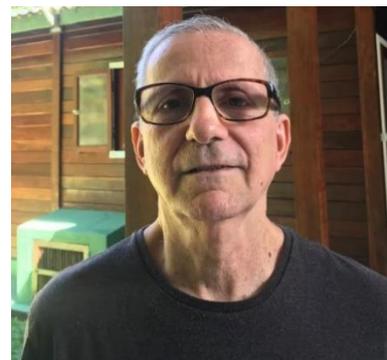


**Richard James MacCowan** is an award-winning multi-disciplinary designer and works worldwide on urbanism, manufacturing, and agricultural projects. He has a background in international real estate investment and development and sustainable design, combining this with behavioural science and bio-inspired design. Richard loves to explore fresh ideas and concepts and is ever curious about the environment around him. Richard's passion is developing new models of innovation to reduce costs, improve efficiency and resilience in the design and manufacturing process. He has taught at some of the top design schools in the world, such as The Royal

College of Art (UK), The Pratt Institute (USA), Vellore Institute of Technology (India), and the Budapest University of Technology and Economics (Hungary).

Richard is also the founder of the non-profit Biomimicry UK and an equine technology startup, Smart Stable Limited. He combines this with extensive research development with international collaborators via the Design Society, ISO Standards in Biomimetics, Royal Society of the Arts, and the Bessemer Society. The current initiatives of Biomimicry Innovation Lab involve the development and delivery of investment into UK-based scientific research and development, with a focus on bio-inspired innovation and the circular economy. Working in tandem with the Nadathur family to deliver this initiative, the aim put the UK at the forefront of bio-inspired innovation. Internally, they have developed a model to understand the value of ecosystems and the environment across the manufacturing and production process across the value chain. Richard is an internationally renowned keynote speaker on biomimicry, innovation and sustainability from cosmetics through to superyacht design. Richard enjoys spending time with his family in his spare time, playing basketball (poorly) and tending to his houseplants.

**Prof Antonio José Teixeira Guerra** is Professor in Geography at the Federal University of Rio de Janeiro, Department of Geography. He coordinated the project titled LAGESOLOS - Laboratory of Environmental Geomorphology and Soils Degradation. He completed his PhD at King's College London and pursued a postdoc at the University of Oxford and University of Wolverhampton. He has authored more than 100 papers in national and international Journals. He is also an author, editor and co-author of more than 20 books. Currently Prof Antonio is a Senior Researcher with CNPq, Brazilian Research Council.





**Dr Maria do Carmo Oliveira Jorge** has a BSc in Geography from the Federal University of Paraná (1999), Master's in Geography from the São Paulo State University Julio de Mesquita Filho (2004) and PhD in Geography from the Federal University of Rio de Janeiro (2017), with post-PhD, between 2017 and 2018, with a CNPq (Brazilian Research Council) scholarship, carried out at the Postgraduate Program in Geography, under the supervision of Prof. Antonio José Teixeira Guerra, with research carried out on geotourism, geodiversity and geoconservation on trails in Ubatuba Municipality, São Paulo State. She is currently Postdoctoral Fellow - FAPERJ (Rio de Janeiro State Research Council), with the project:

"Geoconservation strategies in trails located in the south of Ubatuba Municipality - São Paulo State"; beginning in October 2019. She is an associate researcher at LAGESOLOS (Laboratory of Environmental Geomorphology and Soil Degradation) at the Federal University of Rio de Janeiro. She has experience in Geography, with emphasis on Geomorphology, acting on the following topics: geomorphology, soil degradation, geotourism, geodiversity and geoconservation.



## Expert Session Speakers – Building Performance Evaluation

### Session Description

Building physics has developed at a pace to meet the challenge of reliably monitoring and evaluating the performance of buildings. Against this progress, we ask our experts where the state of the art lies in commissioning new buildings, as well as accurately assessing aging buildings that need to be transformed into a net zero built environment and infrastructure.

As part of this year's International SEEDS Conference, we are pleased to host an Expert Seminar on Building Performance Evaluation with the kind support of the Chartered Institute of Building (CIOB) and the Building Performance Network (BPN). The focus of the event is to gather expert views of those leading research in the area, intending to capture a 'state of the art perspective' on the research and the challenges of conducting evaluations on how buildings perform regarding energy use, occupant comfort or the operational life. Join this event to learn from leading experts, which will cover some of the following topics:

- Building Performance Assessment
- In-use measurement and monitoring of buildings – the ability to accurately describe the energy efficiency of the fabric and services and energy behaviour of the occupant
- In-use commissioning, diagnostics, building compliance and fault detection
- Building performance tests, applications, reliability, accuracy and validity
- Smart meters and applied environmental technologies
- Energy Performance Directive, Energy Performance Certificates and Energy Display Certificates
- Assessing the building stock: common build typologies, large domestic buildings, multi-occupancy and multistorey buildings

Some experts will share their knowledge during the Keynote sessions throughout the Conference. On the last day, Friday, 3rd of September, we have designed a dedicated session for industry experts and academic researchers to come together and share their insights into the latest research in the field.

Based on the contributions from all experts, the end aim of this event is to publish a Guild on Building Performance Evaluation in 2022 together with CIOB.



**Professor Will Swan** is the Director of Energy House Laboratories (EHL) at the University of Salford, where he has led the energy and buildings research for more than 10 years. The labs include the award-winning Salford Energy House, a whole Victorian house in a climate-controlled chamber, the Smart Meters Smart Homes Lab and the forthcoming £16m Energy House 2.0. Will is a member of a number of groups concerning retrofit and energy efficiency of buildings; he was one of the founder members of the Building Performance Network, is Chair for the Low Carbon Buildings Challenge Group in Greater Manchester, and a member of the Retrofit Task Force.

**Cliff Elwell** is an Associate Professor at UCL Energy Institute, leading the Physical Characterisation of Buildings Group and co-leading the Buildings Theme. Cliff's core interest is in the measurement of energy use, and parameters related to it, to characterise the performance of buildings, building elements and systems. A physicist, his research includes understanding ventilation, the thermal performance of buildings and heating/cooling systems, combining physical principles with statistical analysis, including frequentist and probabilistic methods. He has published widely and received the CIBSE Napier Shaw Bronze medal 2020, for the highest rated research paper published in the BSERT journal in 2019, for research on airtightness and ventilation strategy.



Cliff has recently contributed to a number of projects focussed on in-use thermal characterisation of dwellings. These include leading the recently launched Green Homes Grant – Smart Meter Enabled Thermal Efficiency Ratings study with BEIS, leading a sub-theme of the UK Centre for Research in Energy Demand Solutions (CREDS), “Disrupting the system performance and deployment of low energy/power retrofit and new build – through digital, business and market innovation”; and leading the QA and participant support activities for the BEIS Smart Meter Enabled Thermal Efficiency Rating (SMETER) project.



**Dr John R Littlewood** graduated in Building Surveying, holds a Ph.D. in Building Performance



Assessment of Zero Heating Housing and is a Chartered Building Engineer, and Fellow of The Chartered Association of Building engineers. He is Head of the Sustainable and Resilient Built Environment Research group in Cardiff School of Art & Design and the Human Centred Design Global Academy, at Cardiff Metropolitan University (UK). He coordinates three Professional Doctorates in Art & Design, Engineering and Sustainable Built Environment, and has supervised and examined to completion 11 and 18 doctorates. John's research is industry focused, investigating methods to optimise the fire, production, and thermal performance for existing and new dwellings during the design, manufacture, construction, operation or during and after retrofit stages. John's current research includes

working with Wales' largest offsite manufacturer of timber frame construction systems, to increase the use of natural materials and recycling to embrace the circular economy. The outcomes of John's research enhance occupant quality of life and increase the environmental sustainability and resilience of the built environment. He has authored, co-authored and co-edited 155 academic peer-reviewed publications, and supported the Sustainability in Energy and Buildings International conference series since 2010, being General Chair since 2018.

**Dr David Allinson** is a Reader in Building Physics and leads the [Building Energy Research Group](#), in the School of Architecture, Building and Civil Engineering at Loughborough University. His research addresses the challenge of refurbishing our current building stock to meet the requirements of the future by combining measurement and modelling techniques to evaluate the energy, thermal, and moisture performance of homes. Of particular relevance, David leads the BEIS-funded Technical Evaluation of SMETER Technologies (TEST) Project, working in close collaboration with Halton Housing, Leeds Beckett University and UCL. SMETER technologies use algorithms to calculate the Heat Transfer Coefficient (HTC) of occupied homes from smart meter data.



**Professor Fionn Stevenson** holds a Chair in Sustainable Design at the University of Sheffield School of Architecture where she is also the Green Impact Lead, a member of the 'Design, Engagement and Practice' research group and the Energy Institute. She is also Campaigns Director for the Building Performance Network UK. She has previously held academic positions in five other UK Universities and was in practice for eight years as a qualified architect prior to this. Her research and consultancy work focuses on developing innovative building performance evaluation and occupancy feedback in order to improve sustainable building design and develop new policy and



practice. She has held a visiting professorship at the University of British Columbia in Canada, and has worked on BPE projects in the UK, Poland, Mexico and Brazil. She is particularly interested in designing housing for people from a holistic perspective that ensures sustainable resource use and ecosystems. As a principal and co-applicant, she has obtained and managed over £1.5 million in research funding to date, derived primarily from government agencies and the EU. She has over 120 publications to date including her seminal book: Stevenson, F. (2019) *Housing Fit For Purpose: performance, feedback and learning*. RIBA Publishing, London pp.1-225.

**George Martin** pursues his passion for sustainable development and the 'performance of buildings in use' through his position as Executive Chair of the UK's Building Performance Network a programme of the Sustainable Development Foundation which he also Chairs. Most recently he was Professor of Low Impact and Sustainable Buildings at Coventry University and prior to this was Head of Sustainable Development and a Director with Willmott Dixon Group. Before that appointment, he was Director of Sustainability at BRE. George plays an active role as Chair of the Sustainable Development Foundation. He is also a Forum Affiliate of the UK's leading sustainable development charity Forum for the Future; an alumni of the Cambridge Programme for Sustainability Leadership; and formerly a UK Green Building Council Ambassador. He has been a member of a number of Government task forces, the most recent of which was the Green Construction Board's Knowledge & Skills Working Group, which he chaired.



**Johnston David Johnston BEng (Hons), MSC, PhD** is a Professor of Building Performance Evaluation within Leeds Sustainability Institute. He has over twenty five years' experience of applied and theoretical research and consultancy in low carbon housing and is a leading expert in coheating testing and building performance evaluation. He has led and managed numerous field trial projects in both new and existing dwellings, involving detailed in-use monitoring of energy consumption, the analysis of occupant behaviour and detailed evaluations of the fabric and services performance of domestic buildings. He is also the co-author of numerous peer reviewed publications.

In recent years, his research has concentrated on the building fabric thermal '*performance gap*'. Professor Johnston's work in this area has involved developing methodological approaches to assessing the fabric performance of dwellings (for instance, development of the Coheating Test Method), exploring the techniques that can be used to quantify the size of the '*performance gap*', identifying the reasons why this '*gap*' is important and examining the various factors that contribute to the '*gap*'.



**Dr Johann Meulemans** is Deputy Director of the joint laboratory Saint-Gobain/CNRS/University of Lorraine "Canopée", Research Scientist at Saint-Gobain Research Paris. He leads research projects related to building performance evaluation (BPE) and is involved in national (France, Sweden and UK) and international collaborative projects (IEA EBC Annexes, EU). Johann's BPE research activity is primarily involved with developing in situ test methodologies for the energy performance evaluation of buildings (e.g., the QUB method). His work has included building performance evaluation on new, existing and retrofitted dwellings in different countries in Europe. Johann is an established author with publications in thermal sciences, radiative transfer, inverse techniques, building physics and building performance evaluation.



**Dr Abdullahi Ahmed** is a Chartered Building Services Engineer (CIBSE) with over 15 years academic and professional practice in Building Services Engineering and Sustainability Design. Dr Ahmed hold a PhD in low-energy systems modelling from the University of Brighton. He is an academic with Coventry University and an active member of CIBSE as a member of the course accreditation panel, CIBSE membership reviewer and planning/scientific committee of CIBSE Technical Symposium. He is principal investigator and project manager for several multi-disciplinary and multi-partner research projects at Coventry University. He received and managed research funding from local and international funding agencies relating to projects in circular economy, micro-grid, district scale low-energy renovation and building performance evaluation. He was Keynote and invited speaker for several national and international events and workshops across Europe, Middle East, and Africa. Dr Ahmed Supervised and examined innovative PhD research projects in areas of Energy, climate change and built environment sustainability and resilience. He designed and managed courses and modules in the field of building services engineering and sustainable design. He developed internal and external networks, building relations with external stakeholders for research, teaching and business engagement purposes, supporting organisational mission, policies, and procedures.



**Dr Aitor Erkoreka** is a doctor in Thermal Engineering by the University of the Basque Country (UPV/EHU). He has worked in 'SENER Ingeniería y Sistemas' and 'IDOM Ingeniería y Consultoría', where he has participated in two combined cycle projects as a mechanical engineer. In 2006, he joined the UPV/EHU as an associate professor in the Department of Thermal Machines and Motors (now Energy Engineering Department) where he has taught 'Heat Transfer', 'Thermodynamics', 'Thermal Engineering' and 'Thermoelectric Power Plants'. Since 2008, he has been part of the research group ENEDI (Energy in Buildings - ENergética en la EDificación) of the UPV/EHU. He has directed two national research projects for the RETOS call and has actively participated in another 20 projects on energy efficiency in buildings and in three projects on energy efficiency in industry. In the same way, he has participated in various contracts with companies related to the development of construction elements that minimize the energy demand of buildings and has carried out several audits and technical reports on energy efficiency in the industry. These works have been the basis of 29 publications in indexed international journals, 6 international book chapters and 30 presentations in various national and international conferences.



**David Adams** is Development Director for the Building Performance Network part time and engages with initiatives that drive progress within the zero-carbon home retrofit and new build arenas.

Previously he established a start-up company Melius Homes to deliver ultra-low energy new build homes and 'Energiesprong' domestic retrofits, 'putting a new home over the old one' with zero carbon energy systems and smart controls using offsite manufacturing. He was central in the creation of Willmott Dixon Energy Services which focused on domestic low energy retrofit set up the Zero Carbon Hub and chaired various multi-stakeholder task groups reporting to the several Housing Ministers on the 2016 zero carbon new build homes policy development. He is a board member of Good Homes Alliance, a founder of the Building Performance Network and formerly: a Director of EnergiesprongUK, Member of the Each Home Matters Review Implementation board, Director of Sustainable Homes and, chair of the Advisory Board for the London-Loughborough Centre for Doctoral Research in Energy Demand. David spent 20 years in manufacturing within the automotive and construction materials sectors before moving into construction & retrofit.



**Richard Fitton** holds a PhD in Building Physics and is also a chartered building surveyor. He leads a task group for the development of international standards around energy performance. He is also active in the International Energy Agency studying the use of smart meter data to provide energy efficiency data for dwellings. He holds a place on the SAP Scientific Integrity Group at the Building Research Establishment (BRE) which oversees the domestic energy model used in the UK. Richard is also the technical lead for the new Energy House 2 project, a building physics test lab.



**Dr Richard Jack** is a building physicist with a background in testing and research in both industry and academia. Formerly a Design Manager and Energy Solutions Engineer with Willmott Dixon, Richard recognises the industry need for accurate, affordable and accessible means of measuring building performance in the interest of process improvement, delivering quality products and informing building design. His core skills include designing and managing testing programs and research projects, and effective communication and dissemination of project outputs. Richard's PhD with Loughborough University concerned the development of easy and low cost ways the measure the thermal characteristics of houses which included work in measuring elemental u-values, whole house heat loss (HTC), airtightness and undertaking thermal imaging surveys.

**Luke Smith** is an Architectural Technologist whose career has been dedicated to reducing the energy use and environmental impact of both new and existing buildings. In his role at BTS, he oversees the direction setting of the organisation as well as business development activity concerning the discovery, development and launch of new building performance measurement products into a range of different built environment market sectors.





**Steven Heath**, Technical Director for Knauf Insulation, Northern Europe.

Steven has over a decade of experience in energy efficiency strategy and project management. He previously worked for the Energy Saving Trust and the Welsh Government managing the region's area based retrofit programme. At Knauf Insulation, Steven's team cover new product development, customer technical service support and large scale R&D project delivery.

Most recently, Steven supported Knauf Energy Solutions' development of technology to measure individual home energy efficiency. This innovation, which tells occupants how successful a low energy retrofit has been, has underpinned large-scale demonstrator projects in the UK and a commercial offer selling measured efficiency improvement in Belgium.