

Foreword

It is with great pleasure that we welcome you to the *Proceedings of the Cardiff University Engineering Research Conference 2023*. The conference was established for the first time in 2023 as part of a programme to sustain the research culture, environment, and dissemination activities of the School of Engineering at Cardiff University in the United Kingdom. The conference served as a platform to celebrate advancements in various engineering domains researched at our School, explore and discuss further advancements in the diverse fields that define contemporary engineering.

The structure of the conference programme reflected the multidimensional nature of our research and was built around the priority research areas for the School:

Engineering for Health forms a cornerstone of our discussions, recognizing the pivotal role technology plays in revolutionizing healthcare. We are applying the latest research in medical engineering to push the boundaries in areas where innovation has the potential to transform patient care.

Civil Infrastructure takes centre stage as we improve the sustainability and resilience of infrastructure across the UK and the globe. We work on developing sustainable and resilient total lifecycle solutions across a wide range of domains including construction, structures, energy, geo-environmental and water infrastructure systems. From creating new nano-scale smart materials to macro-scale urban interventions.

Advanced Manufacturing represents cutting-edge research into materials, systems and transformative technologies to transform engineering and economic performance in the transport, energy generation and manufacturing industries. Our research in this area focuses on developing smart materials and structures, and sustainable manufacturing processes that help create a sustainable and greener economy.

Sustainable Energy stands as a testament to our commitment to a greener, more efficient future. We aim to advance energy technology and play a key role in addressing the increasing demand for sustainable and low carbon technologies while reducing environmental impact and ensuring a sustainable environment. Our work helps to drive forward net-zero solutions for achieving the government carbon targets.

Compound Semiconductors and Applications represents the cutting edge of electronics, a critical driver of progress in the digital age. We explore the latest developments in compound semiconductor materials, advanced characterisation techniques, quantum optics and novel circuit design methodologies and their diverse applications. We anticipate breakthroughs that will power the next generation of computing, communication, and sensing technologies.

These proceedings are a testament to the shared vision of engineers and researchers from our School as they are working to address the challenges of today and set a course towards a brighter tomorrow. We extend our gratitude to all participants, presenters, and sponsors for their invaluable contributions to this endeavour and look forward to hosting this event again in 2024.

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The work presented in these proceedings has been peer reviewed and approved by the conference organisers and associated scientific committee to ensure high academic standards have been met.

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