

# Major international collaboration – HERA and ACM CRC to revolutionise circular design in composites manufacturing and metals

**HERA is thrilled to announce an exciting collaboration with Australian Composites Manufacturing CRC (ACM CRC) to lead the way in digital transformation for Circular Design 4.0. ACM CRC (formerly The Sovereign Manufacturing Automation for Composites CRC, SoMAC CRC) has united 33 partners in a groundbreaking \$250 million program under Australia's Cooperative Research Centres initiative, spanning a decade.**

HERA recognises the critical role that engineering excellence, intelligent automation, and advanced technology implementation can play when working in conjunction with top Australian universities as part of the ACM CRC. This collaboration offers a unique opportunity to harness the world's leading research teams in the development of composite steel applications with a strong focus on sustainability and circular design principles.

In the inaugural project with the University of Sydney (SYDU) and the Australian Nuclear Science and Technology Organisation (ANSTO), HERA aims to establish an AI-based monitoring system for assessing the quality of manufactured composite products, including steelwork. This system will optimise inspection requirements and manage compliance risks through extensive big data analysis. The project also encompasses the collection and analysis of productivity data, in-service health monitoring, and the development of novel 3D printing techniques capable of reusing or recycling materials based on their remaining properties, all aligned with Circular Design 4.0 principles.



Project signing ceremony at University of Sydney. From left: ACNS - ANSTO, Dr. Jamie Schulz; HERA General Manager Fab 4.0, Dr. Michail Karpenko; USYD Pro Vice-Chancellor (Research - Enterprise and Engagement), Prof. Julie Cairney; and ACM CRC CEO, Dr Steve Gower

HERA's CEO, Dr. Troy Coyle, said: "HERA anticipates that this project will yield remarkable benefits for our members. Our primary focus is on achieving a high level of sustainability, efficiency, and compliance within our industry. Moreover, the project offers significant collaborative opportunities and synergy with other HERA initiatives, such as the \$10.3 million MBIE Endeavour funded project titled "Construction 4.0- an industry 4.0 transformation of the Aotearoa New Zealand construction sector" and our material passport research.

HERA acknowledges the immense significance of this project. Leveraging AI in Circular Design 4.0 empowers designers, manufacturers, and policymakers to make more informed decisions, optimise resource utilisation, reduce waste, and create products that align with the principles of the circular economy. Composite metals-based manufacturing holds great importance within HERA's membership, the vital contributors to the fabrication of structures, bridges, plants, tanks, pipelines, equipment, and defence assets.

**Australian Composites Manufacturing CRC (ACM CRC)**  
Level 1, Ainsworth Building  
Engineering Road  
UNSW Sydney NSW 2052

info@acmcrc.com.au



Dr. Michail Karpenko, HERA's Fab 4.0 GM, said: "Most of the products fabricated by HERA members are safety-critical, necessitating compliance with underlying fabrication and quality management standards. AI-optimised inspection has the potential to significantly reduce compliance risks and minimise inspection efforts by reducing human involvement. Further opportunities exist by adopting a holistic approach to the entire manufacturing cycle and extending AI tools to design optimisation."

The University of Sydney (SYDU) is excited to be part of this transformative project. Prof. Anna Paradowska, Chief Investigator at SYDU and ANSTO, said: "SYDU and ANSTO are excited to commence their first ACM CRC project with HERA. As founding research partners, SYDU and ANSTO are delighted to contribute to the ACM CRC's vision to introduce new paradigms to composites manufacturing."



With new AI-based technologies, we can develop strategies to create a unique value proposition for HERA in the rapidly evolving field of Circular Design 4.0."

This project marks the beginning of a long-term collaboration between HERA, ACM CRC, and project partners such as SYDU, ANSTO, and others, aiming to revolutionise the entire industry, making it more competitive, efficient, and sustainable.

**Australian Composites Manufacturing CRC (ACM CRC)**  
Level 1, Ainsworth Building  
Engineering Road  
UNSW Sydney NSW 2052

[info@acmcrc.com.au](mailto:info@acmcrc.com.au)



## **FURTHER INFORMATION**

### **Please contact:**

Professor Gangadhara Prusty

Director of Research

ACM CRC

**Phone:** 1 3 3

**Email:** g.prusty@somac-crc.com

### **About the Australian Composites Manufacturing (ACM CRC)**

ACM CRC commenced operations in January 2023. Australia is entering a decade of transformation with the arrival of intelligent manufacturing automation and the emergence of new high-value industries. Bringing together 33 partners under a \$100 million program, ACM CRC will address these opportunities and strengthen current industry with digital-export-ready, cost-competitive, high-quality platform capability. Its vision is to transform Australia's established composite technologies capability into sovereign leadership, creating a world-class, highly automated, digitally enabled, network of designers, manufacturers, and service providers. In doing so, the CRC will underpin a next generation of manufacturing industry, supporting a forward-looking Australia, including the hydrogen economy, EV cars and buses, space and low-earth-orbit vehicles, onshore and offshore infrastructure, aircraft and the future defence industry, consumer goods including sporting and solar, and the recycling industry.

<https://somaccrc.com/>

### **About HERA**

As an independent research association based in Aotearoa New Zealand, we are a national (and in some cases global) centre of excellence for low carbon design, Industry 4.0, circular design, productivity, FEA and seismic and structural fire engineering related to heavy engineering applications across the manufacturing and construction sectors. We are home to the national centre of excellence in fabrication, the Fab4.0Lab and lead the \$10.3 million Endeavour funded research project titled "Construction 4.0 – an industry 4.0 transformation of the Aotearoa New Zealand construction sector". We also provide a range of advanced training, certification, and consulting services related to heavy engineering.

<https://www.hera.org.nz/>

### **About The University of Sydney - School of Aerospace, Mechanical and Mechatronic Engineering**

Pioneering the next generation of robotics, machinery and materials, the University of Sydney conducts teaching and research excellence across the areas of aerospace engineering, mechanical engineering and mechatronic engineering. They focus on the research, development and application of autonomous and intelligent robots, working closely with industry to maximise the benefit of robotics and intelligent systems. Their research centre provides access to high-end equipment and technical expertise for advanced microscopy research. They also possess outstanding expertise in the fields of materials characterisation and processing, computer simulation, nanotechnology, advanced manufacturing, solid mechanics and biotechnology, and conduct applied research in autonomous systems, orebody modelling and systems optimisation in partnership with Rio Tinto's operations towards realisation of fully-autonomous integrated mining operations. They're delivering cutting-edge expertise in additive manufacturing and materials processing to serve both fundamental and applied research.

<https://www.sydney.edu.au/engineering/schools/school-of-aerospace-mechanical-and-mechatronic-engineering.html>

### **About the CRC Program**

The Cooperative Research Centres (CRC) Program is an Australian Government initiative that was established in 2001 and funds industry-led collaborations between industry, researchers, and end users. The Program links researchers with industry and government with a focus towards research application. Innovation and Science Australia and its CRC Advisory Committee provide strategic oversight of the CRC Program.

<https://cooperativeresearch.org.au/cooperative-research/crc-program-australian-government/>

### **Australian Composites Manufacturing CRC (ACM CRC)**

Level 1, Ainsworth Building

Engineering Road

UNSW Sydney NSW 2052

[info@acmcrc.com.au](mailto:info@acmcrc.com.au)