

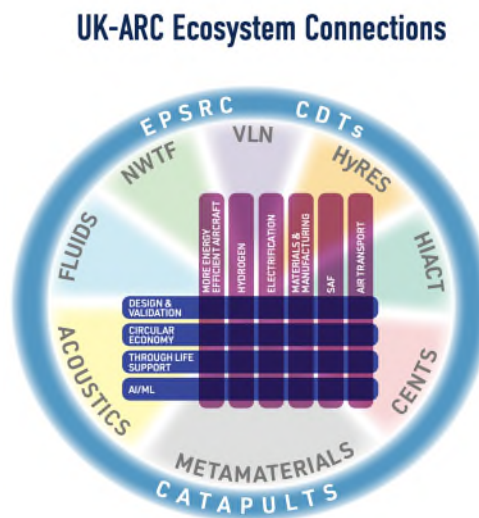


Farnborough July 2024

WELCOME! UK-ARC booth is in Hall 1, stand 1317- come and see us! As we strengthen and expand our community, we are delighted to be able to share our achievements and plans ahead. UK-ARC is established as a key part to the UK aerospace and aviation ecosystem, gathering academic knowledge and sharing it with industry and other stakeholders. We are working with the AGP on the Strategic Aerospace Research Forum, with the ATI on its non-CO2 roadmap and with the Hydrogen Capability Network (HCN) on exploiting university capabilities for the benefit of UK industry. UK-ARC theme narratives on research challenges and opportunities are being explored with industry to help guide value added research. Our challenges are the same as those being addressed by researchers in many countries so collaboration needs to be across borders as well as within the UK. Our next phase will deepen and grow these connections as we address the net zero and digitisation challenges. This newsletter shows some of the activities with UK-ARC universities and collaborations benefitting universities and industry alike. Be part of our journey – tell us about your research ambitions and let us see how we can assist you. Roger Gardner & Donna Lynch

SHOW NEWS & UK-ARC's FUTURE PLANS

As UK-ARC transitions to a second phase, our major ambitions are to grow our community - see our connections below – and help shape research to meets UK industry needs. Our six themes and academic network links are building a connected community within academia, with stakeholders and internationally. UK-ARC's first three years have been about building a community and setting the structures in place to enable project co-creation with stakeholders. As we move forward, we will broaden the technical topics to meet industry will pay greater attention to air transport and the aviation to and economic prosperity. Our planned timeline here to give a feel for the years ahead. Come you would like to the UK-ARC community do to



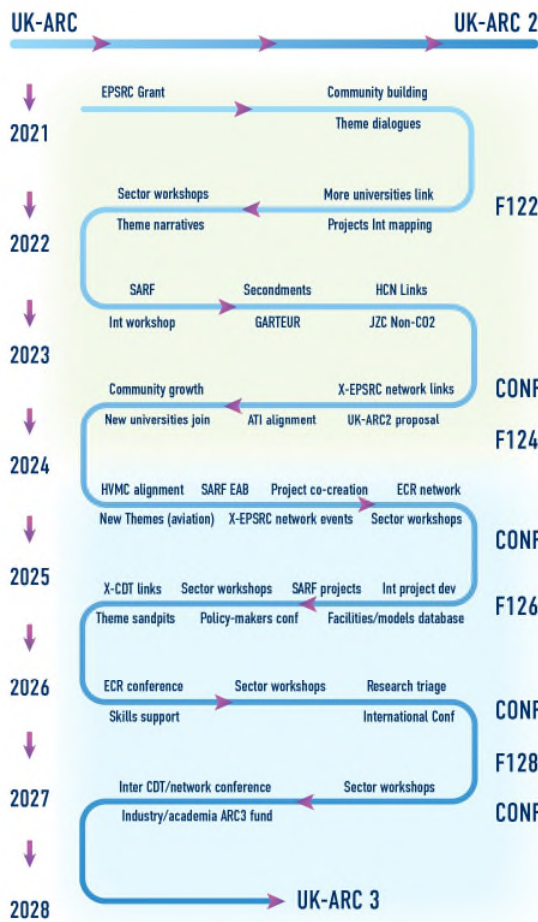
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Show clearly illustrates that aviation challenges challenges. UK-ARC is working with have arranged joint workshops with academics secondments internationally to achieve mutual UK-ARC and the ATI hosting the GARTEUR see photo.

The Farnborough Air are international international groups, we in Europe and supported research advancement. Council in March 2024 –

UK-ARC's future is benefits based upon our foundations of excellent researchers, deep connection with industry. Our timeline shown here plots our the future of aviation demands new skills and talented researchers research knowledge. We have exciting challenges ahead. Join us!

Development & Timing



increasingly about delivering community world-class facilities, and extensive and future. And it is not just about research – able to deliver innovations and core

UNIVERSITY NEWS

A new turbojet engine test rig, funded by a University of delivered to the Engineering Building, and successfully houses mini turbojet engines that produce up to 250 N of static identical instrumented engines that can be easily swapped to engines have been modified with instrumentation to provide at the key stations, as well as accurate rpm, airflow, and fuel flow have been modified to allow alternative fuels to be tested. Noise dedicated instrumentation. The facility is available for industry and available from A.Filippone@manchester.ac.uk



Imperial College London's Brahma Programme in Sustainable Aviation, which will that advance our understanding of the effects towards an equitable net-zero aviation sector, challenges that would need Imperial's unique www.imperial.ac.uk/brahma-institute/dpsa.

Manchester capital expenditure grant, was commissioned in June 2024. The rig thrust and comes initially with three cater to different specifications. The pressure and temperature measurements sensors. The fuel and lubricant system measurements are also possible with academic use and further information is

Institute has launched the Doctoral support ten students a year on projects of aviation on the environment, work and/or address industrially relevant strengths. For further details please go to

brand-new taught MSc programme The degree programme will be open to aerospace/aeronautical engineering, course, including details on how to apply, [soon!](#)

Swansea University will be launching a in Sustainable Aviation in September 2024. students with a background in physics or math and more information on the can be found at: <https://www.swansea.ac.uk/postgraduate/taught/coming->

The **UK-Metamaterials Network** kicked off its second phase with a 3-day research developments. The programme - found [here](#) - show the exciting university academics presented research and we engaged in panel discussions in and Manufacturing theme. The work of the Metamaterials network links well with manufacturing theme.



conference in May to set out plans and share potential of metamaterials. Several UK-ARC view of the connection with the UK-ARC Material ambitions of the UK-ARC materials and

University of Southampton surfaces. [More Information](#)

A new refractive index matched facility.

The University of Southampton has been awarded a new grant of £2M to construct a refractive index-matched facility that will help carry out flow measurements of complex aerodynamic flows. The facility allows access to near-surface and near-wall information that is crucial to understanding and predicting the drag and noise characteristics of flow over aerodynamic





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Cranfield University is testing the use of hydrogen as a Connected Places Catapult. A hydrogen-powered aircraft tow tug using HyQube and then used to push-back and tow the university [Project](#) aims to decarbonise aircraft turnarounds and ground Regional and City Airports Group and ULEMCo. The project Challenge Sandbox announced by the UK Civil Aviation Authority.



fuel for airside operations, supported by from [ULEMCo Ltd](#) was refueled with hydrogen SAAB 340B aircraft. The [Zero Carbon Turn](#) operations at airports, and involves TUI, recently won a place in the Hydrogen



UK-ARC member University of Manchester plus the University of Bath, Cardiff University, GKN Aerospace, Marshall, and Parker Meggitt are partners in the HyFIVE consortium supported by the ATI. The consortium, led by Marshall, is poised to achieve significant milestones, including the development, and testing of scalable liquid hydrogen fuel system technologies, culminating in a fully integrated hydrogen fuel system ground demonstration. Read the GKN press release [HERE](#). UK-ARC universities are closely involved in the developing aviation hydrogen challenge alongside the ATI and the Hydrogen Capability Network (HCN).



UK-ARC Member CDT's - funded by EPSRC.

Centres for Doctoral Training are a valuable means to nurture research and talent in key challenge areas for aerospace and aviation. Approved 2024 CDTs are in tune with several UK-ARC ambitions and we aim to build them to CDT connections to deliver maximum benefit or stakeholders.

[EPSRC Centre for Doctoral Training in Sound Futures](#)

This is a collaboration between the Universities of, **Sheffield, Bristol, Salford**, working alongside over fifty project partners from industry to expertise and facilities that is unprecedented for Acoustics PhD training.



Southampton, (UK-ARC members) and government. This creates a scale and depth of

[EPSRC Centre for Doctoral Training in Robotics and AI for Net Zero](#): Under the guidance of Dr. Simon Watson, this University of Manchester led CDT trains multi-disciplinary engineers to revolutionize lifecycle asset management in support of the UK's Net Zero Strategy. As lifecycle assessment becomes a crucial part of the net zero quest, numerous aspects of aerospace and aviation can be helped by learnings in this research area.

[The EPSRC Centre for Doctoral Training in Net Zero Aviation](#): is a collaboration between Cranfield, Cardiff and Strathclyde Universities and the National Centre for Atmospheric Science, and will be delivered in partnership with industry, driving research into novel, disruptive solutions that will decarbonise aviation. The work of this centre will help deliver the UK's [Jet Zero](#) and the ATI's [Destination Zero](#) strategies and help establish the UK as an international hub for technology, innovation, and education for net zero aviation. This collaboration aligns well with [UK-ARC themes](#) which are all underpinned by the aim to deliver net zero aviation.

[EPSRC Centre for Doctoral Training in Innovation for Sustainable Composites Engineering Led by the University of Bristol with the University of Nottingham](#)



will provide a means of achieving environmental neutrality for composite products through production, service, and reuse. With strong sector support, the CDT's research topics include the pursuit of more sustainable composite materials, which create inherently sustainable composite solutions, able to perform in diverse environments, and made using new scientific advances, with new energy efficient, waste-free manufacturing procedures. The CDT will explore the design freedoms and weight savings offered by reinforced polymer, metal, and ceramic-based composite materials in a mission to make them key enablers for the UK's journey to Net-Zero.



Professor Mark Price from the School of Mechanical and Aerospace Engineering at Queen's University Belfast has been awarded a prestigious 5-year Fellowship by EPSRC. The Open Plus Fellowship is called ["DECIDE for Net Zero"](#) Supported by Rolls-Royce and Spirit Aerosystems its core focus is Engineering Design and aims to put theoretical underpinning to how constraints can be managed and evolved in complex engineered systems like aircraft, and the challenge of developing net zero flight solutions that can be manufactured sustainably. In the Plus part of the Fellowship Professor Price will work with the Advanced Manufacturing Innovation Centre ([AMIC](#)) and the National Composites Centre ([NCC](#)) in support of the High Value Manufacturing Catapult's drive to speed the UK transition to faster digital design. This exciting project begins 1st October 2024. If you would like further information or to engage with the project, please contact m.price@qub.ac.uk directly.

[AMIC - Advanced Manufacturing Innovation Centre](#)



Queen University Belfast is a key player in the new Advanced Manufacturing Innovation Centre being established in Northern Ireland. This exciting project is seeing a direct investment of almost £100M in a state-of-the-art Factory of the Future facility being constructed just outside Belfast. AMIC is the foundation for a new generation of engineers and innovators in the region playing their part in helping to keep the UK as a global leader in aerospace manufacturing. AMIC offers opportunity to academia to work closely with industry. If you would like further information or to have a conversation with the AMIC team please contact the CEO Professor Sam Turner at: s.turner@qub.ac.uk

Imperial's Department of Aeronautics biannual research showcase will take to attend. For further details, <https://www.imperial.ac.uk/events/178346/aeronautics->

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place on 4 September 2024. The event is free [research-showcase-2024/](https://www.imperial.ac.uk/events/178346/aeronautics-research-showcase-2024/)

UK-ARC produces a hydrogen research challenges report. This is available on a restricted basis to UK researchers. The first phase of the UK-ARC H2 work has been focused upon the 'H2 in the aircraft' sub-theme as this is closest to the core aerospace constituency and the aim of government and industry to advance UK aerospace technology for national gain. Working with the ATI Hydrogen Capability Network ([HCN](#)), we have produced a report on identified H2 research gaps, 2030 targets, ambitions and the UK-ARC university research track record picking up on numerical and experimental capabilities of UK academia. If you would like to apply to receive a copy of the report, please email Donna Lynch with your affiliation and contact details.

