Hydrogen Material Challenges

16-20 March 2026, Cranfield University campus, AIRC Ideas room

Draft Agenda

Sponsors:

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Monday 16th March

AIRC Ideas room

09:00-9:45	Delegates arrival, refreshments	
09:45-10:15	Introduction to the course	Francesco Fanicchia (CU)
10:15-10:45	The importance of understanding hydrogen material challenges to decarbonise aviation	Louise Gale (RR)
10:45	Break	
11:00-12:00	Physics of Hydrogen and fundamentals of hydrogen transport	Francesco Fanicchia (CU)
12:00-13:00	Physics of Hydrogen and fundamentals of hydrogen transport	Francesco Fanicchia (CU)
13:00-13:45	Lunch	
13:45-15:45	Hydrogen embrittlement	Arijit Lodt (CU)
15:45-16:00	Break	
16:00-17:00	Design and validation of rigs for testing in Hydrogen	Darvick
17:00-18:00	Entry into Service of H2 Aircraft and Wider Decarbonising	Pericles Pilidis (CU)

Tuesday 17th March

AIRC Ideas room

09:00-11:00	High temperature oxidation and water vapour corrosion	John Nicholls (CU)
11:00-11.15	Break	
11:15-12.15	Hydrogen permeation barrier coatings	Vikesh Kumar (CU)
12:15-13:15	Tritium in Nuclear Fusion	Stuart Christie (UoM)
13:15-14.00	Lunch	
14:00-15:00	Hydrogen permeation barriers in Nuclear Fusion	Emily Curtis (NNL)
15:00-16:00	Measuring and modelling hydrogen-material interactions I	Emilio Martínez-Pañeda (UO)
16:00-16:15	Break	
16:15-17:15	Measuring and modelling hydrogen-material interactions II	Emilio Martínez-Pañeda (UO)
17:15-18:00	Lab visits (Hydrogen-material testing and Composites Centre)	FF/VK/ER/KK
18.00-21.00	Course dinner (location TBA)	

Wednesday 18th March

AIRC Ideas room

09:00-10:00	Chemical and Electrochemical Hydrogen challenges	Fabio Scenini (UoM)
10:00-11:00	Fundamentals of hydrogen permeation in composites	Stefanos Giannis (NPL)
11:00-11:15	Break	
11:15-12:15	Materials for Hydrogen Storage and Transport	Krzysztof Koziol (CU)
12:15-13:15	Standards for Hydrogen Storage and Transport	Charlie Hutchings (FN)
13:00-13:45	Lunch	
13:45-14:45	Standards for Hydrogen Storage and Transport	Charlie Hutchings (FN)
14:45-15:00	Break	
15.00-17:15	Lab activities (Hydrogen permeation)	FF/VK/ER
17:15-18:00	Lab visits (Energy Centre and HyPER)	Upul Kahagala Gamage Wijayantha (CU)

Thursday 19th March

AIRC Ideas room

09:00-10:00	Hydrogen safety	Edith Rogers (CU)
10:00-11:00	Hydrogen production methods	Upul Kahagala Gamage Wijayantha (CU)
11:00-11:15	Break	
11:15-12:15	Electrolysis and fuel cells	Indrat Aria (CU)
12:15-13:15	Material properties and testing at cryogenic temperatures	Huw Edwards (UoB)
13:15-14:00	Lunch	
14:00-15:00	Hydrogen internal combustion engines	Aaron Costall (CU)
15:00-16:00	Measurement methods for H2	TBA
16:00-16:15	Break	
16:15-16:30	Closing remarks	Francesco Fanicchia (CU)

List of Contributors:

Dr. Francesco Fanicchia (*course conveyor*) – Reader in High Temperature Surface Engineering, Cranfield University, UK.

Dr. Indrat Aria – Senior Lecturer in Functional Nanomaterials, Cranfield University, UK.

Dr. Stuart Christie – Senior Lecturer, The University of Manchester, UK.

Dr. Aaron Costall – Senior Lecturer in Electric and H_2 Automotive Propulsion Systems, Cranfield University, UK.

Dr Emily Curtis – UKAEA

Mr. Huw Edwards – Hydrogen Cryogenic Specialist, Aerospace Technology Institute (ATI), UK, University of Bristol, UK.

Dr. Louise Gale – Materials Specialist, Central Technology Team, Rolls Royce Plc., UK.

Prof. Upul Kahagala Gamage Wijayantha, Head, Hydrogen Integration Research Centre, Cranfield University, UK.

Dr. Stefanos Giannis – Science Lead, Advanced Materials, National Physical Laboratories (NPL), UK.

Mr. Charlie Hutchings – Materials Performance Engineer, Frazer-Nash Consultancy, UK.

Prof. Krzysztof Koziol – Professor of Composites Engineering, Cranfield University, UK.

Dr. Vikesh Kumar – Application Scientist in Materials and Coatings for Extreme Environments, Cranfield University, UK.

Dr Arijit Lodt – Research Fellow in Small Scale Mechanical Testing

Prof. Emilio Martínez-Pañeda – Associate Professor of Engineering Science, University of Oxford, UK.

Prof. John Nicholls – Professor of Coatings Technology, Cranfield University, UK.

Prof. Pericles Pilidis – Professor of Gas Turbine Performance, Cranfield University, UK.

Dr. Edith Rogers – Research Fellow in Radiation Detector Material Development, Cranfield University, UK.

Prof. Fabio Scenini – Professor in Materials Performance, University of Manchester, UK.

Vicki Wilkes – Darvick, UK