



# EPSRC & SFI Centre for Doctoral Training in Advanced Metallic Systems

Study for a PhD or EngD in Advanced Metallic Systems to explore innovative materials and manufacturing routes to increase sustainability and performance.



# An Academic Partnership.

The University of Sheffield



The University of Manchester



Dublin City University



University College Dublin



# About the AMS CDT.

Established in January 2009, the AMS CDT received a £6.3m investment from the Engineering and Physical Sciences Research Council [EPSRC], to develop a national training centre for doctoral scientists and engineers in metallurgy and related disciplines.

A further £3.4m from EPSRC was awarded in 2014, and a further £5.4m in 2019. This phase of the Programme represents a significant expansion through our partnership with I-Form, the SFI Centre for Advanced Manufacturing, to deliver training and research in digital manufacturing processes.

It is recognised that the continuing shortage of metallic materials specialists is a threat to the competitiveness of both the UK and ROI's high value manufacturing. The supply of materials graduates and postgraduates trained through traditional routes unfortunately cannot meet the demand of the sector.

The AMS CDT is increasing the number of metallic materials specialists by recruiting talented students from STEM backgrounds. The four year PhD or EngD Programme includes a taught element in Year One to instil core metallurgical knowledge in preparation for the doctoral research project, which will be undertaken in collaboration with an industrial sponsor.

Our students, or as we like to call them - Cohorts -, also benefit from access to the world-leading facilities and equipment situated in all host institutions for the duration of their doctoral research, providing an outstanding research environment for their studies.

# Course Structure.

YEAR ONE	YEAR TWO	YEAR THREE	YEAR FOUR
Physical Metallurgy Foundations	UK Conference Presentation	International Conference Presentation	EDI Leadership
Modelling, Programming, & Data Analytics	Public Engagement Project	SME Consultancy Project	Thesis Preparation
Mini Research Project	Journal Club & Seminars	Standards, Codes, & Specifications	Industry Placement
Industry Training Programme	Equality, Diversity, & Inclusivity Project	Science & Engineering in the Media	
Responsible Research & Innovation			
Academic Writing Skills			
Project Management Skills			

## Programme Outcomes

PhD or EngD in Advanced Metallic Systems

&

Evidence of Personal & Professional Skills

# Our Programme.

The AMS CDT builds on the complementary strengths of all host institutions; providing the largest concentration of metals research and teaching activity across the UK and ROI; a combined current research portfolio of £100m; and access to state of the art facilities.

The Centre is hosted jointly by The University of Sheffield, The University of Manchester, Dublin City University, and University College Dublin, and builds on their leading international reputations in metallic materials science and engineering research.

Our Programme aims to:

- Provide a stimulating multidisciplinary training experience that encourages students to excel individually and as part of the AMS CDT Cohort.
- Teach topical courses that balance cutting edge technologies with fundamental principles and core concepts.
- Develop professional transferable skills in leadership, business, and research management.
- Foster innovative internationally competitive research.
- Work in partnership with industry to provide industrial experience and maintain relevance to real world problems.

In Year One, PhD and EngD students study core metallurgical topics to provide a foundation for their future research.

In Years Two - Four, EngD students are primarily based at their sponsoring organisation, whilst PhD students are based at their university, with the option of undertaking an industrial placement.

More information on Course Structure can be found on our website: [sheffield.ac.uk/metallicscdt](https://sheffield.ac.uk/metallicscdt)

# State of the Art Facilities Access.

Henry Royce Institute



Advanced Manufacturing Research Centre (AMRC)



1-Form Advanced Manufacturing Research Centre



Advanced Processing Technology Research Centre

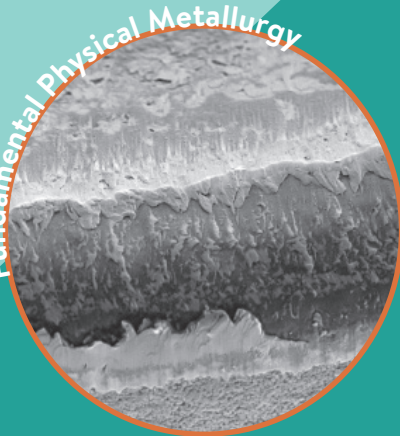


Scan here for Additional Facilities.

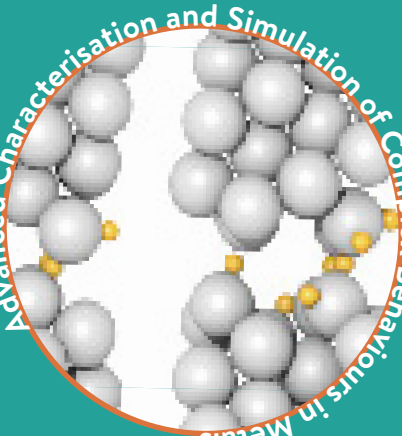


# Research & Applications.

Fundamental Physical Metallurgy



Advanced Characterisation and Simulation of Complex Behaviours in Metals

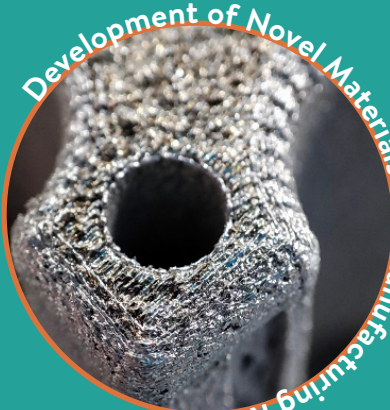


Our Cohorts are able to undertake research projects in a broad range of metallurgical topics thanks to the breadth of expertise provided by our pool of doctoral supervisors.

Research covers all aspects of metallic materials engineering including:

- Fundamental Physical Metallurgy,
- Advanced Characterisation and Simulation of Complex Behaviours in Metals, &
- The Development of Novel Materials and Manufacturing Routes.

Development of Novel Materials and Manufacturing Routes





# Industrial Collaboration.

A high level of industrial engagement is vital to the success of the AMS CDT, to ensure the Programme remains relevant whilst providing our Cohorts with real world problems, and relevant industrial experience.

We have collaborated with over 40 businesses so far - from SMEs through to multi-nationals - covering a range of sectors, including: aerospace, automotive, gas, manufacturing, and nuclear, to support doctoral research projects, with new companies getting involved year-on-year.

All AMS CDT Cohorts collaborate with industry on projects devised by our industrial partners, in conjunction with a doctoral supervisor. PhD study focusses on fundamental projects spanning across Technology Readiness Levels [TRLs] 1-4, whereas EngD study works on projects closer to implementation directly with their industrial supervisor across TRLs 4-7.



Explore the selection of Project Opportunities available, and join our fantastic community of researchers.



We recruit throughout the year, and applications will close once a suitable candidate is secured.



# Join the AMS CDT.

You could be part of our next Cohort, undertaking a world-leading combination of training activities and doctoral research, across highly-ranked universities in the UK and ROI.

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We welcome applications from highly motivated individuals working across an Engineering discipline or a STEM (science, technology, engineering, maths) subject. All UK projects are also open to international applicants.

## UK Projects (Universities of Sheffield and Manchester)

14 full (fees and stipend) scholarships are available each year for applicants. Our scholarships provide a stipend at the UKRI rate plus a top-up and tuition fees for 4-years.

Applications are for advertised projects **only**. Apply via the University PGR Application System, quoting 'CDT Advanced Metallics' and the advertised Project Title and Supervisors. We cannot accept general applications to the AMS CDT.

You may apply for more than one project, however, please make multiple, separate, applications to be considered. All projects are open-ended, but will close once a suitable candidate has been secured. All projects start in September, in line with the academic year.

## International Fee Scholarships:

Scholarships are available for international applicants, but due to the competitive nature of the scheme, applications close on 1st December for entry the following academic year. You're required to apply for your chosen project **before** 1st December, with a suitable English Language qualification, to be considered. Find more information on International Scholarships on the website: [sheffield.ac.uk/metallicscdt](https://sheffield.ac.uk/metallicscdt)

## ROI Projects (Dublin City University and University College Dublin)

The ROI Partnership in the AMS CDT is funded by Science Foundation Ireland (SFI) which covers full fees and stipend costs for four years. SFI also funds materials and project-related costs. 5 full (fees and stipend) scholarships are available each year.

**AMS CDT actively supports equality, diversity, and inclusion and encourages applications from all sections of society.**

# Impact Case Studies.

“The CDT in Advanced Metallic Systems is the perfect match between working closely with industry and actively solving demanding problems in an industrial environment, whilst also having the academic expertise and input. *Best of both worlds!*”

It was interesting that even though our Cohort were all working on projects related with metallic materials, our backgrounds are very different. This broadened our original point of view and improved our problem solving capabilities by widening our scope.”

Dr Daniel Suárez Fernández | 2016 AMS CDT Cohort | Sponsored by Rolls-Royce

## Additive Manufacturing of Novel Shape Memory Alloys for Clean Energy Applications

Josiah Cherian Chekotu, AMS CDT PhD Researcher, aims to reduce carbon emissions within the cooling and refrigeration industry through additively manufactured novel shape memory alloys for green energy solutions.



SCAN ME



## Designing Additively Manufactured High Entropy Alloys to Increase Efficiency and Sustainability of Aerospace Components

Lucy Farquhar, AMS CDT PhD Researcher, Partners with Boeing UK to establish a novel additive manufacturing solution to develop high entropy alloys able to operate under high temperatures for jet engine applications.



# Contact Us.



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## Republic of Ireland

If you would like to find out more about any aspect of the AMS CDT Programme, we'd like to hear from you.

Please direct all enquiries to our AMS CDT Programme Managers, via the email addresses provided.

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Visit the website



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