UK Atomic Energy Authority

FOSTERING FUSION'S FUTURE

Bridging the Skills Gap for the UK's Fusion Sector

EDITED BY LINETTE WALLACE

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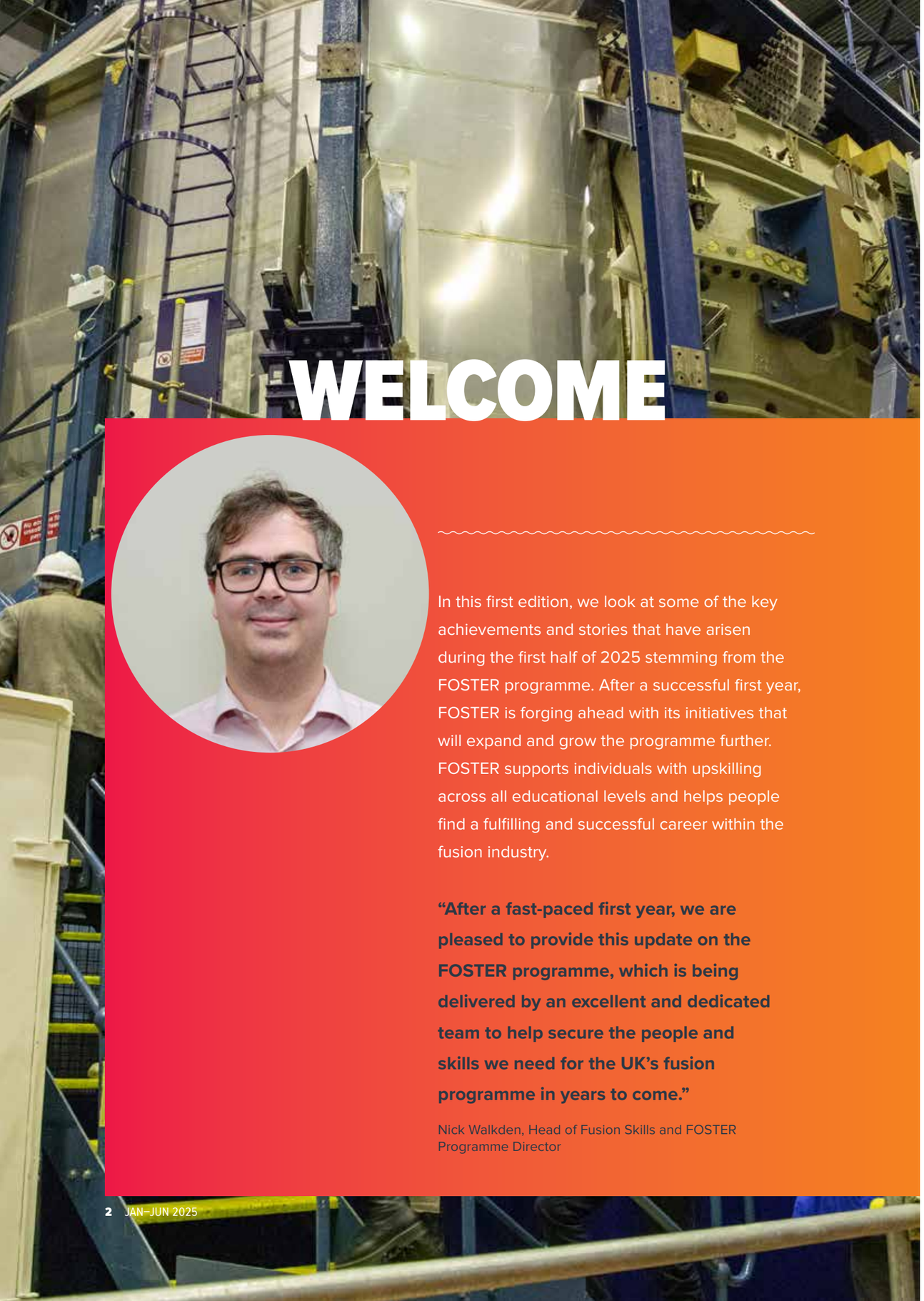
NEED FOR FOSTER

FOSTER addresses skills gaps, removes barriers, and inspires diverse individuals to explore fusion career and study pathways.

FUSION OPPORTUNITIES, IN SKILLS, TRAINING, EDUCATION & RESEARCH

INSIGHTS



WELCOME

In this first edition, we look at some of the key achievements and stories that have arisen during the first half of 2025 stemming from the FOSTER programme. After a successful first year, FOSTER is forging ahead with its initiatives that will expand and grow the programme further. FOSTER supports individuals with upskilling across all educational levels and helps people find a fulfilling and successful career within the fusion industry.

“After a fast-paced first year, we are pleased to provide this update on the FOSTER programme, which is being delivered by an excellent and dedicated team to help secure the people and skills we need for the UK’s fusion programme in years to come.”

Nick Walkden, Head of Fusion Skills and FOSTER Programme Director

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THE EDITOR

Meet Linette Wallace the Communications Lead for the FOSTER programme. She has worked at UKAEA since June 2024 on a variety of projects and now works for the FOSTER team across the various initiatives across the different workstreams. Passionate about upskilling and helping individuals further their study and career aspirations, her extensive background in business consultancy, marketing and academia assists and aligns with the various strands the programme delivers on. 2025 brings about new challenges and opportunities.

“It has been exciting to see so many inspirational projects start and grow during the first half of 2025 and be part of such a fantastic progressive team.”

Please do contact Linette directly with any Comm’s related queries for the FOSTER programme E: linette.wallace@UKAEA.UK

2025 CHALLENGES AND OPPORTUNITIES

The UK’s fusion sector is predicted to need more than 2000 more appropriately skilled individuals by 2030 to meet the exciting ambitions in the public and private sector.

Barriers in the form of limited training provision, fierce competition for sought after skills, and limited wider knowledge of fusion will make this target a challenge but also present an opportunity for the sector to come together with action and intervention to address these issues.

In year 1 of the FOSTER programme we have successfully secured commitment to train approximately 800 individuals across a range of levels and disciplines, from new apprentice training, through to increased engagement in schools and universities, the development of new and expanded masters training in universities, and the formation of the new Fusion Engineering Centre for Doctoral Training. As we now move forwards we will look to deliver these commitments, whilst forming new collaborations and partnerships focussed in areas such as widening access to fusion careers and strengthening cross-sector collaboration for training and career professional development.

FOSTER PROGRAMME


Fusion Skills Council

UKAEA's FOSTER (Fusion Opportunities, in Skills, Training, Education & Research) skills programme has been designed to grow and develop fusion's next generation.

Mission

FOSTER's mission is to train over 2200 people by 2030 by working with business to increase the number of apprentices and graduates, universities to increase the number of postgraduate and PhDs, and international partners to increase post-doctoral training opportunities within fusion.

Background

In 2022, the government commissioned UKAEA to develop an understanding of the future fusion skills gap. After the Fusion Skills Council was formed in 2023, a fusion sector skills strategy was developed to support the development of the necessary skills pathways required to deliver safe, sustainable, low-carbon energy to the grid.

In Feb 2024, the DESNZ funded national fusion skills programme 'FOSTER' was stood-up and headed by Nick Walkden, Head of Fusion Skills and FOSTER Programme Director.

Need for FOSTER

With the UK ramping up its focus on becoming a net zero economy the demand for engineers is predicted to outpace other occupations according to a recent report commissioned by Engineering UK. Employers in the sector will struggle to future-proof the stability of their workforce if the skills gaps identified with AI, machine learning, data analysis, electronic engineering and non-STEM disciplines are not addressed.

FOSTER seeks to address these gaps by reducing barriers to entry into the fusion industry. Through initiatives spanning various educational levels and engagement with diverse socio-economic groups, FOSTER aims to inspire individuals to explore the multitude of career pathways within fusion, alongside creating new training programmes offering a variety of upskilling opportunities.

HOW DOES FOSTER OPERATE?

The programme is a collection of over 30 projects, delivered across 4 interconnected workstreams which are individually managed accordingly.

Hayley Taylor

Workstream 1
Academia

Workstream 1: Hayley works on building relationships with academia both in the UK and internationally, to grow fusion energy opportunities from undergrad to postgrad level.

Steph Wood

Workstream 2
Industry

Workstream 2: Steph predominantly works on building links between the programme and industry to ensure gaps in skills are identified and upskilling opportunities are established.

Hannah Swales

Workstream 3
Outreach

Hannah Swales

Workstream 4
National Fusion Skills Hub

Workstreams 3 & 4: Hannah works on driving forwards outreach initiatives from primary school level through to adult training. She is also responsible for managing the development of the National Fusion Skills Hub.

Q1 & Q2
KEY ACHIEVEMENTS

> It's been a fantastic 2 week opportunity to learn and understand more about the fusion industry and the current engineering challenges. The lectures have covered a wide range of topics and been generally delivered in a way that accommodates a range of engineering backgrounds with limited assumed knowledge.

FUSION ENGINEERING ACADEMY A HUGE SUCCESS

Feedback from our first Fusion Engineering Academy at Culham Campus

The professional development training was specifically designed for engineers and scientists to advance their expertise and enhance their understanding of fusion engineering.

The Academy had a range of practical sessions over the two-week period alongside lectures and study sessions, giving trainees the opportunity to review and practice the materials they were learning.

Lectures covered topics as diverse as the Concept and Subsystems of a Tokamak Fusion Power Plant and Plasma Auxiliary Heating, through to Remote Handling and Tritium & Fuelling. Practical sessions included Applied Materials Technology, Infrared Thermography, Cobots and MAST-U Operations.

Delegates came from a range of countries including Singapore, USA, Netherlands, France and Slovakia and had varying levels of knowledge about the challenges within the fusion industry prior to attending.

Fusion Engineering Academy 2025

UKAEA Teachers Workshop – February 2025

TEACHERS WORKSHOP

We are delighted that our first teacher's one-day workshop, at Sherwood Observatory in collaboration with The Ogden Trust, was such a huge success. With approximately 30 physics teachers in attendance, all delivering KS3, KS4 and A-level, the informal day introduced fusion energy, STEPtoFusion (Spherical Tokamak for Energy Production), and gave an overview of the current global landscape for fusion energy research.

This fully funded event, clearly high in demand, selling out shortly after being promoted, was filled with expert-led talks and provided practical hints and tips for teachers tasked with inspiring and applying fusion concepts in the classroom.

Feedback from the event was positive with one of the delegates stating "Easily the best teacher training I have received, a marvellous day." UKAEA will be hosting a similar event next year and details of that will be provided in the near future.

If you are interested in equipping yourself with tools, knowledge and insights to make Science, Technology, Engineering, and Maths (STEM) subjects more engaging and accessible please email fusionskills@ukaea.uk to find out more about the next teachers workshop.

> Easily the best teacher training I have received, a marvellous day.

NEW COLLABORATION WITH CONNECTR

FOSTER are collaborating with Connectr over the next six months to map existing STEM provision across Oxfordshire. This county-wide research project will pool data and perspectives from local stakeholders to assess the current landscape, identify gaps and and explore opportunities for a collective approach to STEM outreach, ultimately fostering more equitable access to STEM careers for young people in the area.

We have kick-started the project this morning with Theory of Change and Stakeholder Mapping workshops. Research work will soon be undertaken to investigate the quality and breadth of STEM engagement across Oxfordshire, with findings and recommendations available later in summer 2025.

uncover duplication and any gaps, with a particular focus on promoting social mobility and nurturing diverse talent. This data-led approach will allow employers across the county to consider how to harness more impact and effectiveness in schools/colleague outreach and engagement with the aim to encourage more young people to consider STEM pathways and fuel local growth in the STEM sector.

Dr Caroline Wood, Apprenticeships Project Manager

> We're excited to launch this much needed project with Connectr Early Engagement. This benchmarking research will map STEM programs running in schools and colleges across Oxfordshire, to understand their impact,

To express your interest in contributing to this exciting project, complete the brief form here. It should take no more than 3 minutes. A member of the team will be in touch by 23rd May.

To express your interest in contributing to this exciting project, please email oxfordstem@connectr.com, and a member of the team will get back to you.

Project Team: Hannah Swales (UKAEA), Caroline Wood (UKAEA), Charlotte Dudley (Connectr), Linette Wallace (UKAEA), Rebecca Jarvis (Connectr), Isabella Gray (Connectr), Will Akerman (Connectr), Nia John (UKAEA)

PRIMARY ENGINEER PARTNERSHIP

Inspiring the Next Generation of Engineers! Thank you to staff at UKAEA (60 registrations to the programme) who have been volunteering through our partnership with the Primary Engineer initiative. We couldn't be more excited to share some of the amazing work being done!

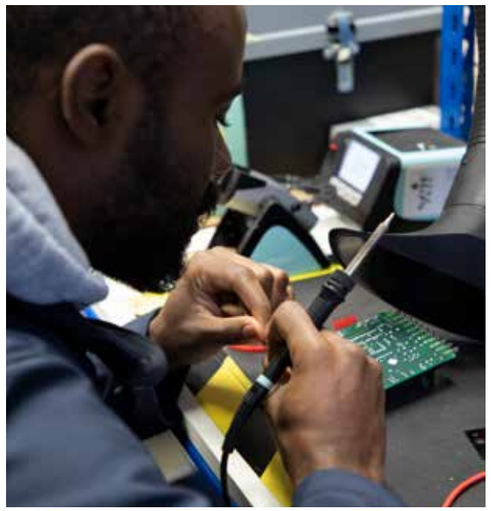
Recently, Martin Herrero Castelo, Tom Preston, Alexander Eichhorn, Douglas Auld, Aathira Hegde, Emily Curtis, and Freddie Good have been engaging with students across the UK to ignite their passion for engineering and STEM careers.

Martin, Tom, and Alex visited schools to share their engineering journeys and introduced students to the innovative work happening at UKAEA. The highlight? The children interacting with a plasma ball and sparking curiosity about science and technology.

Dougie Auld will be interviewed by a primary school in Fife, inspiring students with insights into his career and the exciting world of engineering.

Aathira visited Wexham School in Slough to give a talk to 90 Year-7 students about "My Life as an Engineer." She also looks forward to inspiring Year-9/10 students this summer to pursue careers in STEM!

Emily recently participated in a grading day at the National Grid in Warwick, where she reviewed over 250 ideas from Year-9 students in Yorkshire and 50 from children aged 5-7 in Scotland.



Freddie Good is lined up for a grading day on 2nd April in Bristol, where he'll be helping assess more innovative ideas from young engineers. We're excited to see the creativity and passion he'll help shape!

These hands-on experiences are helping students develop critical thinking skills, creativity, and a passion for solving real-world problems. A huge thank you to all our volunteers for inspiring the engineers of tomorrow!

SUMMER INTERNSHIP PROGRAMME

UKAEA's FOSTER (Fusion Opportunities in Skills, Training Education & Research) skills programme has been designed to grow and develop fusion's next generation.

We are delighted that this year, not only have a range of host organisations have offered 8-week summer internship placements to UK-based undergraduates but for the first time, the following 13 universities have also provided 29 projects supporting 46 students.

These internships will give students an invaluable opportunity to gain work experience within the growing UK fusion industry and a variety of disciplines such as STEM, Professional Services and Project Management.

The university projects will be promoted and recruited for by each individual institution internally.

Thanks to Durham University, The University of Sheffield, Lancaster University, Imperial College London, University of Birmingham, University of East Anglia, University of Leicester, University of Oxford, University of Surrey, University of Lincoln, University of Liverpool, The University of Edinburgh and University of York.

QUESTFUSED

An overview of QuEST-FuSED with UKAEA Chief Operating Officer Justin Kingsford, Engineering Installation Group Leader Stuart Gore and STFC Associate Director Steve Blake.

UKAEA and the Science and Technology Facilities Council (STFC) have established a collaborative approach to accelerating the two organisations' training of Engineering Apprentices.

> We're here to celebrate a superb collaboration between STFC and UKAEA. We are all very much about trying to build a fusion generation, which is going to be absolutely critical as we head towards the prototype for 2040.
>
> Justin Kingsford, Chief Operating Officer, UKAEA

QuEST: Quantum Enabling Skills Training
FuSED: Fusion. Skills. Education. Development.

The QuEST-FuSED programme underpins a broader focus on creating a talent pipeline for the Quantum and Fusion enabled workforce of the future. It builds on foundational engineering training with specialist Quantum and Fusion knowledge and application, enabling apprentices to maximise their hands-on learning, and build the Quantum and Fusion expertise and skill required to flourish in their careers at STFC and UKAEA.

Based in OAS's Workhall 2 and classrooms, QuEST-FuSED is a supplementary development programme covering Quantum and Fusion relevant content, running concurrently with the engineering apprenticeship standard and being delivered part-time throughout the first 12 months of the apprenticeship scheme.

This is the first year of the QuEST-FuSED collaboration and the learning programme was stood up in a matter of weeks. A new workshop was established to include mechanical work benches, band saw, lathes, mills, electrical testing facilities, installation equipment and PCB diagnostic stations. The learning programme has been enabled by a dedicated tutoring and mentoring team, designing and delivering a multi-disciplinary programme based on their combined 'hundreds of years' experience to the next generation of Quantum and Fusion engineers.

QuEST-FuSED was the first stop on the tour route of DESNZ Secretary of State, Rt Hon Ed Miliband, during his recent visit to Culham Campus. This was followed by a visit of senior Whitehall officials during National Apprenticeship Week.

All parties expressed their gratitude to the tutors for their invaluable contribution and positive approach to the training, and to the apprentices for sharing their enthusiasm when embracing this innovative learning model. The parties recognise the opportunity for further development of the QuEST-FuSED approach to support Early Career development but also upskilling from adjacent industries both internally and for other businesses in Oxfordshire.

With Skills England having set out their support for 'the creation of a set of new, specialised Technical Excellence Colleges to deliver the highly trained workforces that local economies need', it is hoped that QuEST-FuSED can become an exemplar for organisations across the high technology sectors to collaborate, and thereby broadening opportunities for learning and supporting the kickstart of economic growth.

UPCOMING ACTIVITIES AND EVENTS

ANNUAL TEACHER'S CONFERENCE 2025

Inspiring the Next Generation of Scientists

22nd – 25th July 2025
Voco Oxford Thames Hotel, Oxfordshire, OX4 4GX

Following the sell-out success of our 2024 event, we are excited to invite you to our highly anticipated second Annual Teacher's Conference tailored for state school Physics teachers at KS3, KS4, and A-Level. With only **60 spaces available**, this fully funded event is a fantastic opportunity to dive into the latest breakthroughs in fusion energy research and network with fellow educators.

Why Attend the Main Conference?

This exclusive event will kick off with a welcome BBQ and drinks reception on Tuesday evening. Wednesday will feature an introduction to fusion with guided tours of Culham Campus, as well as visits to nearby private fusion companies Tokamak Energy and First Light Fusion.

Tours of Culham Campus will include:

- JET – come and see the largest and most advanced Tokamak
- Oxfordshire Advanced Skills (OAS) which houses our industry-leading apprentices
- Materials Research Facility (MRF) which enables industrial and academic researchers to analyse the effects of irradiation on materials inside the Tokamak.
- RACE our centre which designs, builds and operates robotics for extreme industrial environments.

Thursday and Friday will focus on the diverse range of fusion careers available. Teachers will explore different ways to apply their new knowledge and integrate fusion practically into their teaching practices. All taking place in a stunning venue on the River Thames, the event will offer supports from our outreach and early career teams, private fusion companies, networks, charities, and universities.

New for 2025: Open Morning Opportunity

Due to the success of last year's Industry and Careers focused panel session, this year, we're excited to introduce an Open Morning event, allowing a wider audience to experience the conference including local teachers, UKAEA networks, early career's teams, and universities.

This Open Morning, being held on Friday 25th July, 9am – 11am will have an additional 30 spaces open to local physics teachers based in Oxfordshire (this will already form part of the event for conference delegates). If you would like to attend just the Open Morning, please choose the relevant ticket when you register.

What to Expect:

- Valuable resources, insights and information will be available for educators from a range of stakeholders hosting stalls.

A chance to connect with diverse organisations and other practitioners involved with enhancing STEM initiatives.

Registration Information

This is not a first-come, first-served process. To ensure a breadth of participation, delegates will be carefully selected to represent a wide range of schools, backgrounds, and locations across the UK.

Important Notes:

- If you've attended a previous Fusion Teacher Workshop or Conference, you'll be added to a waitlist to prioritise new participants.
- Your confirmation email secures your place at the conference or open morning.

Fully Funded Opportunity

The conference, hosted as part of UKAEA's FOSTER (Fusion Opportunities in Skills, Training, Education and Research) programme, is a completely funded event, covering:

- Transport
- Accommodation
- Meals

Our ultimate objective is to help the fusion sector build a dynamic and skilled workforce capable of advancing fusion technology, creating 2,200 new roles over the next five years.

Initiatives like our Annual Fusion Teachers Conference are critical in growing and diversifying the talent in the fusion industry. Our continued support and collaboration with teachers is essential to ensure that the educational system is equipped to nurture the next generation of fusion experts.

NOW SOLD OUT

2025 YEAR AHEAD

As FOSTER moves into 2025, the programme continues to build momentum, expanding its reach and deepening its impact across academia, industry, and outreach. This year presents new challenges and opportunities as we strengthen partnerships, launch new initiatives, and refine our strategy. Some of those new initiatives include:

- Partnering with another 2-4 UK universities to further L7 education in fusion
- Start and expand international fellowships with partner universities abroad
- Commencement of UKAEA industrial visiting academic scheme
- Create an action plan to increase access into fusion and support living-costs bursaries to widen participation on fusion master's courses
- Scoping and business planning completed for the development of the digital National Fusion Skills Hub in the future
- Opening of the Visitor's Centre on the Culham Campus
- Partnering with local training providers within the Cumbria region, to support new robotics pathways for RAICo

Year 2 of FOSTER looks set to be as exciting and forward moving as year 1 was, in no small part thanks to the fantastic team who continue to drive us forwards. I'm excited at the prospect of initiatives such as the introduction of nuclear curricula into our apprentice training provisions in line with sector demand, and the continued growth of our summer industrial internships programme. Fusion cannot be delivered without an active effort to bring in the people needed to deliver it, and we look forward to keeping you up to date on our efforts to do this through this newsletter.

Nick Walkden, Head of Fusion Skills and FOSTER Programme Director

THANK YOU

The UK Atomic Energy Authority's mission is to lead the delivery of sustainable fusion energy and maximise scientific and economic benefit

UK Atomic Energy Authority

Find out more
www.gov.uk/ukaea

scan the QR code to learn more about the FOSTER programme

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