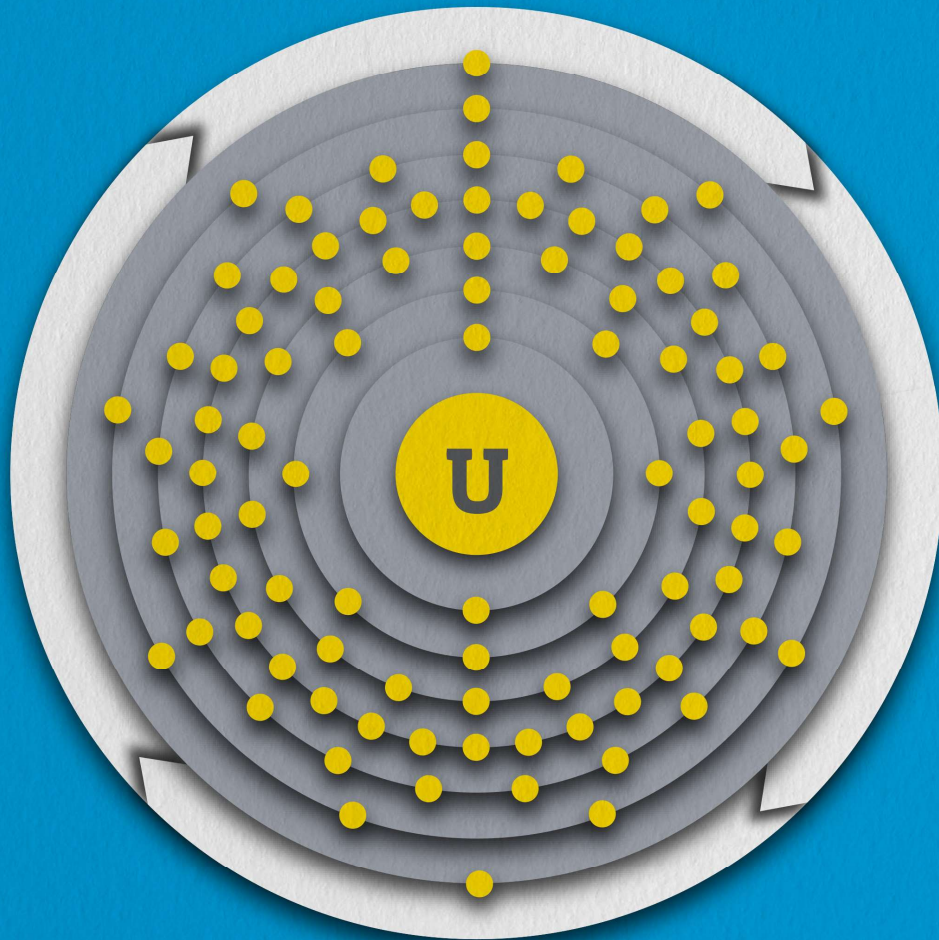


# 05 | Collaboration

Creating a global hub of expertise on advanced **fuel cycle science**.



A thriving nuclear power sector is an essential component of the UK's path to net zero. NNL has a long and proud history of collaborating and working in partnership with the International Atomic Energy Agency (IAEA), with our experts working together across many areas of nuclear science and technology.

**In September 2020, NNL and the IAEA jointly launched the UK's first IAEA Collaborating Centre. The first Centre of its kind anywhere in the world, it is creating a global hub of expertise on advanced fuel cycle science and is making an essential contribution to realising the vital role of advanced nuclear technologies in achieving net zero goals.**



David Hall, UK Permanent Representative to the IAEA at the signing ceremony to formalise the new Collaborating Centre in September 2020.

## Impact

**Building understanding of advanced fuels and fuel cycle development.**

Through the Centre, we seek to strengthen international understanding of a range of advanced fuels and fuel cycles.

**In partnership with the IAEA, the impact we have had:**

Organising and participating in national and international events, convening communities of experts in valuable forums for technical exchange. This included a meeting on Advances in Post-Irradiation Examination Techniques for Power Reactor Irradiated Fuels and Innovative Fuels and a roundtable exploring the fuel cycle opportunities and challenges associated with the deployment of advanced modular reactors. NNL experts also participated in the drafting of IAEA technical reports on fuel development and waste management;

Sharing our joint experience of modelling, comparing tools and applications. We have also combined our advanced reactor knowledge to

develop materials that will ultimately enhance understanding across the sector;

Receiving nominations for our scientists at NNL to represent the UK on important IAEA Technical Working Groups (TWGs), including Nuclear Fuel Cycle Options and Spent Fuel Management, and Fuel Performance and Technology. An essential mechanism for creating international consensus and vision across key research areas, these TWGs play a central role in informing the IAEA's future priorities.

To successfully develop, and ultimately deploy, advanced nuclear clean energy systems, countries around the world must have a holistic understanding of the full fuel cycle, including how to manage future legacy.

Together with IAEA, we will be jointly conducting training courses and seminars on the modelling of advanced nuclear fuel and fuel cycle performances, using our own ORION fuel cycle analysis software and IAEA's Nuclear Fuel Cycle Simulation System. Importantly, we are also partnering to drive forward research into waste management issues, helping to evolve recycling concepts and support sustainability efforts.

## Talent

### Developing the next generation of nuclear experts

People are the currency of the nuclear industry; it is only by investing in our national talent pipeline that we will retain the critical skills and knowledge base the UK needs to develop new nuclear capabilities.

By encouraging the participation of early career research scientists, the Centre is providing an opportunity for them to work closely with those who have decades of experience in the field whilst giving them unparalleled insight into the international nuclear sector.

NNL is also engaging in specific activities to develop the next generation of nuclear scientists, both in the UK and globally, as part of the Centre's e-Learning workstream. Leveraging our national nuclear expertise, we have helped to create a suite of online materials, hosted on the IAEA's e-Learning platform, designed for early careers individuals at NNL and the IAEA. So far, content has been produced for a module focused on fast reactor fuel cycles and potential challenges to deployment, with further materials set to be developed in the future.

Additionally, in 2020 NNL joined UK Government in supporting the IAEA's Marie Skłodowska-Curie Fellowship Programme (MSCFP). This aims to increase the number of women in the nuclear field, helping to foster an inclusive workforce which contributes to and drives global scientific and technological innovation. The Centre will explore opportunities to host participants of the MSCFP, offering internship placements for up to 12 months.

"I am delighted that NNL and IAEA have continued to progress their cooperation since the launch of the NNL-IAEA Collaboration Centre in 2020 the first of its kind in the world on the Advanced Fuel Cycle. In the context of COP26, this kind of collaboration is essential to support the clean energy transition and the contribution of nuclear to this effort. I also welcome NNL's support of the Marie Skłodowska-Curie Fellowship Programme, which is an important initiative to build an inclusive nuclear workforce and drive scientific innovation."



**Corinne Kitsell**  
Ambassador, UK Mission  
Vienna

## Quality

### Delivering leading pioneering advancements on a global stage

As the UK's national laboratory for nuclear fission, we are working to secure the country's place as a global leader in the clean energies of the future.

The IAEA Collaborating Centre has created a platform for NNL to

be internationally recognised as a convener of advanced fuel cycle expertise, made possible through our investment in AFCP. As the Centre continues to grow and expand, NNL will further cement its position in this strategically important field, taking a leading role at international events, presentations and conferences and creating joint publications with the IAEA to share information and learning.

## Partnerships

### What's next: future Collaborating Centres

Over the coming years, we will create more Collaborating Centres. These will allow us to explore partnership opportunities with other like-minded organisations, advancing globally significant research across our four Focus Areas and ensuring we're delivering on our purpose of *nuclear science to benefit society*.

The first of these will be a UK Collaborating Centre on Integrated Energy Systems, which we recognised as a fundamental area of work through our Science and Technology Agenda. Following our commitment made at the Global National Laboratories Summit 2022, the Centre, which is set to be established in Spring 2022, will bring together UK industry, national laboratories and academia across energy sectors to advance our knowledge in this area. [🔗](#)

"The opportunity to work in the Collaborating Centre has allowed me to develop my skills in presenting and communication and given me the opportunity to interact with international experts across all areas of advanced fuel science. My ambition for the future is to become a technical expert in reprocessing, so gaining this insight into how we, as nuclear scientists, can collaborate across borders is invaluable. One day, I hope to be a key contributor to the Centre's work."



**Billy Keyword**  
Technical Graduate at NNL  
who acts as Secretary for the  
IAEA Collaborating Centre

