The Henry Royce Institute is the UK national centre for research and innovation for advanced materials and was set up through an initial investment of £260m from the Department for Business, Energy, and Industrial Strategy (BEIS) via the Engineering and Physical Sciences Research Council (EPSRC). Royce was established to ensure that the UK remains at the forefront of materials research and exploitation through collaborations with industry and academia, and by providing access for the UK materials community to state-of-the-art equipment and facilities. Royce’s research tackles some of the most pressing challenges facing today’s society, from providing energy for future cities to decarbonisation and new recyclable materials. Our materials research facilities and expertise are available to academia and industry alike. We believe that collaboration between our researchers and industry will create real solutions to global grand challenges and provide significant societal and economic benefit to the UK.

Royce brings together world-leading expertise and technical capabilities and works closely with industry to ensure translation and commercialisation of fundamental research. With its hub at The University of Manchester, the Institute is a Partnership of eleven leading institutions – the universities of Cambridge, Liverpool, Leeds, Oxford, Sheffield, Imperial College London, the UK Atomic Energy Authority and National Nuclear Laboratory, and Associate Partners, the universities of Cranfield and Strathclyde, Royce coordinates over 700 academic, technical and research staff and over £200 million of facilities, providing a joined-up framework that can deliver beyond the current capabilities of individual partners or research teams. As the Institute transitions from a set-up to operational phase, it has established a clear vision around Advanced Materials for a Sustainable Society.
Enabling national materials research, collaboration, foresighting and strategy: Working to shape our materials research landscape by convening and connecting the UK materials community, engaging with government and policy-makers, and bridging industrial sectors to ensure maximum impact from the UK’s research endeavour.

Providing access to world-leading facilities and research expertise: Providing fast and flexible access for the UK research community to cutting-edge equipment and highly-skilled technical staff to enable high impact research and innovation.

Catalysing industrial collaboration and accelerating translation: Implementing programmes and interventions that meet the challenges of advanced materials translation throughout the value chain, from start-ups to SMEs and corporates.

Fostering materials science skills development, innovation training and outreach: Providing professional development to empower the next generation of materials researchers and leaders with technical and business skills through a comprehensive support and outreach programme.

Royce delivers its mission through four pillars of activity that support both industry and academia. These activity areas are underpinned by a culture and identity that is flexible, inclusive and collaborative, incorporating both industry and academia in the advanced materials community within and outside of the UK.
**INFRASTRUCTURE & FACILITIES**

Royce funding has supported a significant investment in new advanced materials research infrastructure and equipment across Royce Partner locations. These facilities provide an open and collaborative environment for cutting-edge materials research and innovation. New buildings and equipment in which EPSRC capital has been instrumental include:

**ROYCE HUB BUILDING, MANCHESTER**

Together the Royce Hub Building and new equipment represents an EPSRC investment of £150 million. Extending over 9 floors, it hosts a range of new lab spaces and equipment including for biomedical materials, metals processing, digital fabrication, and sustainable materials research.

**SIR MICHAEL UREN HUB, IMPERIAL**

Royce funding has been invested in Imperial’s recently completed Sir Michael Uren Hub building, in which Royce occupies the eighth floor. Royce facilities here focus on the production and characterisation of thin films and devices and include a 140 m² clean room.

**REX RICHARDS BUILDING, OXFORD**

The recently refurbished Rex Richards Building is set to be home to ~1000 m² facilities for air-sensitive energy storage materials. Battery materials and modelling research groups will be housed across four dedicated Royce floors. Once commissioned, the new equipment and facilities will significantly enhance the ability to synthesise, test and characterise air-sensitive materials for batteries.

**MAXWELL CENTRE, CAMBRIDGE**

Royce facilities at the Maxwell Centre address energy generation, storage, and use. Equipment is available for fabrication of new battery structures, X-ray photoelectron spectroscopy, X-ray tomography, and electrochemical characterisation. It houses the The Ambient Processing Cluster Tool, a series of twelve custom built gloveboxes allowing the design and fabrication of range of battery, PV, LED and other customised materials and devices.

**BRAGG CENTRE FOR MATERIALS RESEARCH, LEEDS**

The Bragg Centre for Materials Research is home to an interdisciplinary laboratory space enabling the discovery, creation, characterisation, and exploitation of materials engineered at the atomic level. The Centre houses the Multi Deposition System; a multi-chamber, multi-technique thin film deposition tool, which allows a range of different materials and growth techniques to be combined.

**ROYCE DISCOVERY CENTRE & ROYCE TRANSLATIONAL CENTRE, SHEFFIELD**

The Royce Discovery Centre is home to the latest technologies in 3D additive manufacturing, digital manufacturing and nanocharacterisation. Researchers at the Royce Translational Centre are evolving novel materials and processing techniques, making them accessible for trial by industry collaborators. The facility features a broad range of Royce equipment to enable research into Advanced Metals Processing.

**MATERIALS RESEARCH FACILITY, UK ATOMIC ENERGY AUTHORITY**

UKAEA’s Materials Research Facility (MRF) at the Culham Science Centre hosts a range of Royce equipment for handling, preparing, processing and analysing radioactive samples, including microscopy and mechanical and thermo-physical testing equipment.

**MATERIALS INNOVATION FACTORY, LIVERPOOL**

Royce has invested £10m in Liverpool’s new Materials Innovation Factory (MIF) which is dedicated to materials chemistry and formulation. The site houses one of the highest concentrations of materials science robotics in the world, alongside a suite of advanced analytical equipment.

**NATIONAL NUCLEAR LABORATORY**

Capital funding from Royce has enabled NNL to extend its equipment portfolio for both academic and industrial research on active samples, including for glovebox micro-raman spectroscopy, plasma FIB with SIMS capability, hot cell optical microscopy and thermogravimetric analysis-mass spectrometry equipment for Pu science.
**RESEARCH**

Royce research work is arranged around eight key thematic areas, each championed by a Research Area Lead and supported by a steering group.

Royce is aligned to the UK government Innovation Strategy which sets out Advanced Materials & Manufacturing as a key technology. Our research has the potential to transform the digital, engineering, energy, and health sectors. Royce’s research areas are complementary, and our Partner institutions work collaboratively, sharing facilities and expertise.

**Chemical Materials Design** accelerates the formulation of matter with tailored properties (sustainable, electric, magnetic, catalytic, mechanical, etc.). Materials robotics systems focus on automatic synthesis and formulation of molecular, polymeric, composite and inorganic materials, often guided by data-driven or physical models. This theme also aims to rapidly engineer biological systems for the discovery and manufacture of new materials from biology, to design and evaluate sustainable materials, and to develop sustainable packaging solutions.

**Electrochemical Systems** focuses on fundamental electrochemistry research and device development to underpin scale delivery of batteries in transport and energy systems, and to drive economic supply of green hydrogen and sustainable chemical feedstocks. The research is supported by the continued development of advanced analytical techniques and simulation tools, from atoms to device level.

**Material Systems for Demanding Environments** delivers new understanding of performance and degradation of structural materials in application-relevant environments. This enables the development of more accurate life prediction and provides a pathway for new structural materials solutions to improve efficiencies and reduce CO\(_2\) emissions in the transport and power generation sectors. The theme also has a particular focus on developing coatings for extending the operation of structural materials to harsher environments.

**Nuclear Materials** aims to develop the more resilient structural materials needed to withstand the high heat loads and intense radiation environments for fission and fusion; to develop advanced fission fuels more tolerant of severe accidents, both improving safety and allowing simplification of reactor designs; and to develop the materials needed to enable plutonium reuse in fuel and/or disposal as waste.

**Two-Dimensional Materials** focuses on the smart design of functional materials using atomically thin layers as building blocks, exploiting complementary functionalities of different 2DM layers within a few-nanometre thick heterostructures for high performance electronics and novel devices and systems for low-power-consuming ICT systems. It also exploits 2DM in nanocomposites enhancing properties of materials for use in UK’s energy, automotive and aerospace sectors.
**RESEARCH DELIVERY FRAMEWORK**

Royce’s research delivery framework is composed of three major threads:

- **National Materials Challenges** - working with the wider UK research community, Royce is establishing roadmaps and landscapes to aid in the development of clear strategies for research endeavour and investment in materials science.

- **Royce Research Areas** - eight themes, each led by a nationally represented steering group who represent the collective research expertise of Royce. These Areas seek to build national and international collaborative research programmes, interfacing with other national networks and institutes.

- **Royce Technology Platforms** - Royce’s substantial research capabilities, in excess of over £200 million in capital value, are distributed across multiple locations within purpose build laboratories, grouped into interconnected Technology Platforms. Through our platforms we provide state-of-the-art facilities and expertise that enable innovative cross cutting research to be undertaken – they represent an integrated ecosystem for making, testing and characterising advanced materials linked to our Research Areas and accelerating the transition of those materials through the early stages of discovery.

By grouping the capabilities into the **Technology Platforms**, we are able to:

- Promote, diversify and extend the exploitation of our capabilities into a wide range of materials science applications beyond the Research Areas
- Engage directly with the user community to ensure their needs are met through implementation of simple access models
- Conduct user evaluation and respond appropriately
- Maintain, develop and enhance our technical expertise
- Ensure complementarity with other open access capabilities across the UK and identify gaps in provision

To complement our investment in research facilities, Royce is also investing in application scientists to run sprint/pathfinder projects with industry and is establishing a comprehensive training programme, overseen by a dedicated team led by our Training & Skills Manager.

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**LEADERSHIP AND OPERATIONAL STRUCTURE**

Royce’s structure for support and delivery of research impact encompasses roles at both the hub and spoke locations.

The Executive Team comprises the Chief Executive Officer, Chief Scientific Officer, Chief Technology Officer, Head of Operations and Head of Research and Business Engagement. The roles, responsibilities and membership for the Executive Team are determined by the CEO and approved by the Governing Board.

Key roles in the organisation structure include:

- **Chief Executive Officer (CEO):** To provide strategic leadership for Royce in delivering on its vision and mission
- **Chief Scientific Officer (CSO):** To provide strategic leadership for Royce’s science and research strategy
- **Chief Technology Officer (CTO):** To lead and oversee the strategic development, application and use of the Technology Platforms and related training & skills development
- **Head of Operations (HoO):** Strategic oversight of all operations within the Hub and coordination of operations across the Parties
- **Head of Research & Business Engagement (HRBE):** Coordination of engagement, research programme development, commercialisation support and impact reporting, within the Hub and coordination across the Partners
- **Partner Leads:** Role at each spoke to act as the operational and strategic lead at the Party organisation. Members of the Extended Leadership Team (ELT)

National Materials Challenges, are overseen by the CSO. Each individual challenge is led by a **Materials Challenge Lead** supported by the wider Royce engagement function, under the direction of the Head of Research and Business Engagement.

Research Areas are overseen by the CSO. Each area is led by one or more **Research Area Leads**, assisted by a steering group and supported by the Royce engagement function under the direction of the Head of Research and Business Engagement.

Technology Platforms across the Partners are overseen by the CTO. Each platform is led by a **Technology Platform Lead** located at the relevant Party where the platform is hosted.
We are seeking an experienced researcher, with a successful track record in industrial or academic collaboration, as a Chief Technology Officer (CTO) to provide strategic leadership for our substantial national investment in both equipment and people with a focus on three key aspects:

- **Capability** – ensuring the platforms evolve and continue to deliver world-class output for ‘making, testing and characterising’ advanced materials growing our industrial collaboration and developing world-class researchers
- **Coherence** – ensuring the platforms are integrated and serve the national need across the Hub and Spokes
- **Complementarity** – ensuring that the platforms interface with other major investments both nationally and internationally

CTO is one of the principal leadership roles within Royce. As part of the Royce Leadership Team, the appointee will work with the CEO, Chief Scientific Officer, Head of Operations and Head of Research and Business Engagement. They will be involved in determining and delivering the Institute’s strategic vision, in particular related to our Technology Platform capabilities. It is expected that they will develop particularly close working relationships with industry and public research organisations and will play a major role in supporting use of the platforms to accelerate technology translation through small to large industrial organisations.

A necessary aspect of operating a successful set of national facilities is an associated training programme and the CTO will therefore oversee Royce’s training and skills strategy. Within the leadership team they will be accountable for the relevant facility, training and impact KPIs for the Institute.
Major areas of responsibility include, but are not limited to:

- The Institute’s strategic vision for our major infrastructure and capabilities
- The research delivery strategy for Royce Technology Platforms including, but not limited to
  - Industrial/RTO engagement and provision
  - Major research programme engagement
  - Student/Early Career Researcher (ECR) access and training
- Managing the imaging and chemical characterisation Research Area steering group(s) across the Institute
- Acting as a principal lead in the Institute’s strategy for engagement and collaboration with industry to support technology development and translation
- The Institute’s strategy for engagement and collaboration with national and international major facilities/capabilities
- The coordination of Technology Platform leaders and Application Scientists, providing a particular focus on technology translation
- The evolution and ownership of appropriate measures of impact across Royce’s facilities
- The Institute’s training and skills strategy
- Deputise for the CEO or Chief Scientific Officer as required
- Perform other duties that may reasonably be associated with a post of this nature and/or as may be requested by the CEO.

KEY RELATIONSHIPS

External
- National and international research groups/facilities
- CTOs spanning RTOs and industry
- National Research Facility (NRF) PIs and Science and Technology Facilities Council (STFC) technology leads
- Funding bodies – key infrastructure leads

Internal
- Royce Extended Leadership Team
- Technology Platform Leads
- Training & Skills Manager
- Research Area Leads

PERSON SPECIFICATION

ESSENTIAL KNOWLEDGE, SKILLS & EXPERIENCE

- A first degree or higher in an Engineering or Science subject
- Over 5 years experience in strategic oversight and development of a substantial research laboratory/capability/organisation engaged with industrial and academic users
- Knowledge of infrastructure funding landscape and a track record of strategic business case development to support investments enabling/accelerating technology translation
- Demonstrated excellence in leadership and management of diverse research staff working with multiple stakeholders in an organisation to deliver high impact output
- Track record in delivering major experimental programmes across multiple platforms working across academia and industry
- An established research track record in a materials science related discipline

DESIRABLE KNOWLEDGE, SKILLS & EXPERIENCE

- Established links to wider research facilities and networks nationally and internationally
- Experience in development of training for technical researchers
- Experience in the oversight and delivery of a geographically distributed research capability
- Experience in digital information management, processing and interrogation
- Track record of international research collaboration
HOW TO APPLY

Our organisation is positive about flexible working – you can find out more here. Blended working arrangements will be considered.

Please note that we are unable to respond to enquiries, accept CVs or applications from recruitment agencies.

Only applications submitted via the online system and completed in full will be accepted. You will be required to provide a CV and supporting statement detailing how you meet the person specification.

General enquiries should be directed to hrservices@manchester.ac.uk, and technical support via https://jobseekersupport.jobtrain.co.uk/support/home.

To request an informal discussion about the role with the CEO, Professor David Knowles, please contact Emily Lui (Project Officer) on emily.lui@manchester.ac.uk

We actively encourage applicants from diverse career paths and backgrounds and from all sections of the community regardless of age, disability, ethnicity, faith, sexual orientation, gender or gender expression. We are currently operating positive action in recruitment, aiming in this case for at least one in three of the candidates that meet the essential shortlisting criteria and are to be interviewed (after shortlist) to be female, Black, Asian and Minority Ethnic, LGBTQ+ or to have a declared disability. Equal opportunities data completed by applicants will not be accessible by the panel.