

The Henry Royce Institute has been established to develop and exploit the UK's world-leading excellence in advanced materials research.

New materials and materials systems are fundamental to the new technologies that shape our everyday lives - from future cities and their energy supplies, to computing, manufacturing and medicine. As a national institute, the Royce is a catalyst for materials innovation; delivering science, facilitating relationships, engaging with business and influencing policy. We believe that collaboration between our world-leading researchers and industry will create real solutions to global grand challenges, and provide significant societal and economic benefit to the UK.

As a partnership of nine leading institutions, the Royce delivers a unique, integrated national capability for materials research, enabling design from the 'atom to the component' and allowing companies to accelerate innovation. Operating with a hub in Manchester and spokes across the UK, the Royce coordinates over 900 academics and over £300 million of facilities, providing a joined up framework that can deliver beyond the current capabilities of individual partners or research teams.

OUR MISSION

As an international flagship for the discovery and development of new materials systems, the Royce will:

SUPPORT AND GROW WORLD-RECOGNISED EXCELLENCE IN UK MATERIALS RESEARCH

ACCELERATE COMMERCIAL EXPLOITATION OF MATERIALS RESEARCH

DELIVER SIGNIFICANT ECONOMIC AND SOCIETAL IMPACT FOR THE UK

**OPEN,
ACCESSIBLE,
COLLABORATIVE.**

The Royce is the front door to the UK materials research and innovation community, open to academia, industry and the public.

The Royce is a different kind of research institute. Our facilities are accessible to all and we deliver research expertise in order to help translate science into impact.

We support the broad advanced materials community in the UK; connecting people and ideas, and providing a world-class environment for innovation.

SPEAK TO US ABOUT

- Facilities access
- Accelerating ideas into commercial opportunity
- Academic access and collaboration
- Funding for SMEs and start ups
- Training and workshops



UK Research and Innovation

GET IN TOUCH

W: Royce.ac.uk

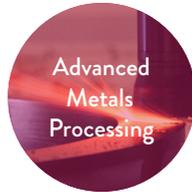
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Supporting excellence in materials research

The Royce has the expertise and facilities to contribute to a wide range of research and development. Our initial science program targets nine core themes, each led by a champion and coordinated through a stakeholder network of industrialists and academics enabling the focus to evolve and reflect changing national priorities. Each network will tackle critical questions of societal or economic benefit, and address global challenges and trends.



Research to deliver and better understand atomic thickness materials, including graphene, for a range of applications including membranes for filtration and coatings, energy storage and functional composites.



The creation of new alloys with higher performance, better manufacturability, greater flexibility, lower cost, and lower environmental impact. These will be used in materials systems across transport, healthcare, energy, and manufacturing.



Quantum scale engineering of new technologies, supported by many disciplines, that can translate into applications including photonics, imaging, semiconductors, sensors, energy storage and biomedical materials.



Accelerating a new generation of 'smart' biomaterials that improve health and wellbeing. This includes two grand challenges of; restoring biological function with minimal invasiveness, and new, low risk, cost efficient therapies.



The discovery and analysis of new chemical materials by combining high performance computing and materials science. Our research will impact a wide range of sectors, from nanofabrication to plastics and packaging.



Research focused on batteries, supercapacitors and thermoelectrics to solve the material challenges involved in the all-solid-state battery. This can transform the safety of lithium-ion batteries and energy density.



Research into performance and degradation to enable the design of new materials, systems and coatings for a range of applications including energy, marine, aerospace and automotive.



This research area focuses on innovation in energy generation, storage and use, to transform the devices we use. Applications include solar coatings, reduced power consumption, and battery energy density, longevity and cost.



Research into two key areas: nuclear fuels and waste streams in the nuclear fuel cycle; and structural materials for fission and fusion energy. This will drive productivity, lower cost and improve safety in future nuclear programmes.



Catalysing exploitation of materials research

The Royce will help UK industry convert new ideas and challenges into commercial opportunity, supported by materials research and capability. This will include a 'science push' approach, identifying real world potential in research and formulating routes to commercialisation, and an 'industry/academia pull' of bringing together our internal network of experts to resolve research and application challenges brought to the Royce.

Enabling access to world-class capability

The Royce has established a unique integrated UK capability to design from the 'atom to the component', through a fast fabricate, test, and analyse cycle. This capability is open to all, with clear routes of access, and allows for the iterative design of materials systems, cost-effectively and at speed.

Building the UK materials supply chain

The Royce's investment in advanced materials capability across the UK provides access for SMEs and spinouts to research labs previously only available to major multi-nationals. The Royce will not just work with large corporates, but proactively engage with all levels of industry to drive research outcomes that meet their challenges. In addition, offerings to support training and career development will help long-term and sustainable knowledge transfer from academia to industry.

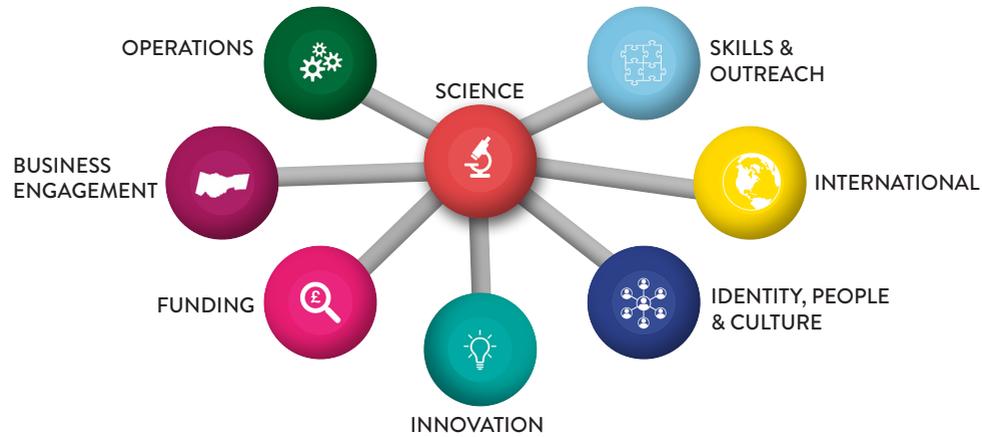
Strengthening the UK community of materials innovators

The Royce is open to academics and industry from across the UK and is focused on developing relationships and projects with other key players including universities, other institutes, RGOs, Catapults and Manufacturing Research Hubs. We will also form and contribute to networks for strategic landscaping of current capabilities, future opportunities, big ideas, challenges and needs.

Championing and facilitating collaboration

The Royce is committed to collaboration as a powerful route to solve challenges and create value. We will create an environment for collaboration, across disciplines, institutions and industries, providing financial and cultural incentives to collaborate. We will also aim to work with government and other policy makers, providing a source of advice and fore-sighting, and contributing to national priorities setting across sectors.

OUR STRATEGY



Inventing the future, tackling the problems of today

The Royce maintains a clear and purposeful agenda across its scientific themes, but can also quickly respond to materials challenges from industry and other stakeholders. The interconnectivity between themes supports work to address societal and economic challenges, providing a major national resource to inform policy and research in the UK.

Creating environments for innovation to flourish

The Royce will be proactive in encouraging innovation of new materials and materials systems. Innovation is not the preserve of large businesses and we will support and mentor spin-outs and start-ups with funding and guidance to develop their ideas. At the heart of the Royce is a supportive and creative community that will set the challenges, environment and processes that will enable innovation - and we will objectively measure how many innovations this has supported.

Engaged and informed by every level of UK industry

To ensure that our research outcomes are relevant to industry, the Royce will engage with a full range of sectors and businesses of all sizes. We will address key business challenges as well as translating research into new products. Our clear processes for engagement and competitive, accessible service will enable all levels of industry to benefit from the Royce's national capability and inform our work.

Inspiring the next generation of materials scientists

The Royce will work to ensure there is a highly skilled pipeline of trained individuals entering the field of advanced material science. We will help to upskill and train a number of diverse communities within PhD, early career researchers, academics and industry alike, using the Royce capability to pass on cutting edge knowledge and techniques. The Royce will also inspire the younger generation, making materials science an exciting and higher profile career prospect.

Democratic, collaborative and open to all

The Royce will facilitate an open, inclusive and collaborative network, incorporating industry, academia and other stakeholders in the advanced materials community. At the heart of this growing community is a culture that respects diversity, engenders trust, and supports the success of individuals and institutions. We recognise the power of connecting people and ideas, and aspire to be an international flagship for materials scientists globally.

Long-term, sustainable funding for access to capability

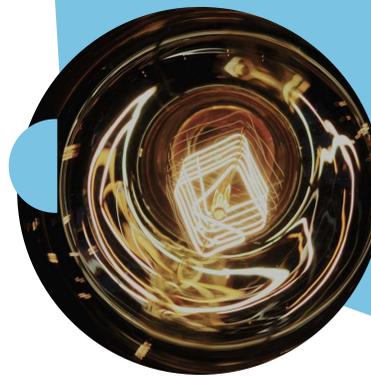
The Royce is committed to providing a level of 'reduced or free' at the point of access capability for those organisations that require funding to seed the development of new innovations. In addition to this commitment, the Royce's range of training, community building, outreach, and student support will be secured by a sustainable funding model, drawing on commercial income as well as core funding and grants.

World class operational delivery to support world class science

Our operational strategy establishes seamless, resilient and transparent structures and processes so that working with or within the Royce is simple and can remain focused on creating value for the UK. By ensuring our facilities and expertise are easy to access for all, we will facilitate world-class science and enable the delivery of our mission. Finally, a clear set of KPIs will ensure the Royce is held to account for its performance and can continue to increase facilities access and research and innovation outputs.

An international leader and beacon for materials capability

The Royce will be recognised within the international materials community as a world leading organisation in terms of equipment, academics and network. We will facilitate international collaboration, with academics and industry, in order to meet the UK Industrial Strategy challenges and to encourage foreign direct investment into the UK.



Horizon scanning for the next big materials ideas

We will identify new opportunities for scientific growth and development by establishing a materials horizon scanning team at the Royce Hub. This will deliver our ability for foresighting future big ideas and ensure we are ready to inform and direct industrial funding opportunities arising from new challenges.



Measurable impact through research excellence

They Royce has invested in materials science capability to match areas of expertise and potential for the UK. We will measure our impact across the range of research themes by tracking scientific outputs that have been made possible by Royce facilities, and utilising the Research Excellence Framework as a tool to ensure quality. We will report regularly on the Royce's influence on new materials science in the UK.

Simple collaboration agreements and contracting

Our ambition is to deliver simple, easy-to-understand collaboration agreements for parties working on materials innovation, whether with multiple collaborators or in partnership. This is a common barrier to collaboration which the Royce is committed to evolving and setting the standard for industry and academia interaction in a way that benefits all parties involved in materials innovation.

Regular 'Accelerator' events to share knowledge and innovate

The Royce ensures that materials capability and innovation opportunities remain open and accessible to industry by running regular 'Accelerator Forums'. These free events help businesses to gain support, provide information on funding and developments in the materials science landscape, and share success stories and inspiration with the wider community.

A virtual innovation space, open to all

The Royce will deliver a unique online innovation network that provides a forum and a process for questions to be posed, challenges to be set and potential solutions to be offered within the UK materials community. This can enable industry to get answers quickly with no barriers to accessing expertise, and it also provides a forum for students and academics to share knowledge and crowdsource new approaches to research challenges.

De-risking innovation through industry sandpits

We will provide individual companies with the opportunity to triage materials challenges and de-risk innovation through Royce sandpit events. These workshops bring diverse expertise from across Royce and the materials community to solve practical issues and facilitate their solution through the use of Royce research capability and facilities. This puts industry at the heart of the science community.

Nationwide support for doctoral students

The Royce is working with Centres for Doctoral Training (CDT) to form a nationwide community of advanced materials doctoral students. As well as making Royce facilities available to CDT students to do science, we will enhance their scholarship experience through a national programme of activities, including a student conference, keynote lectures, workshops, training, networking and careers support. This work will develop an extended network of future advanced materials practitioners and leaders for the UK.

Diverse training and lecture programme

We are committed to utilising our wide range of advanced materials facilities and expertise to transfer knowledge to industry, within academia, and externally through a programme of courses and workshops led by the Royce. We will establish this open programme for the latest techniques and to enable users to run their own research on Royce kit.

Inspiring young audiences and connecting with teachers

The Royce will engage with the public, schools and future STEM students by staging unique interactive learning experiences as national outreach events and festivals. We will provide a sustainable link to teachers and schools via a full time outreach post and publish materials for teachers to channel Royce research and learning into classrooms.

