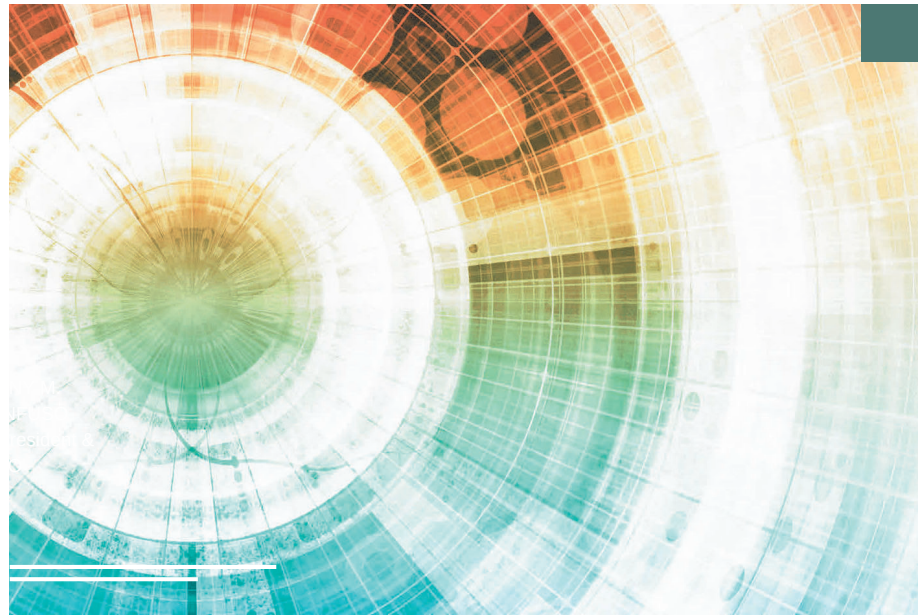


UIDP London Forum



Exploring the role national laboratories can play in the
research and innovation landscape

<https://www.npl.co.uk/>

<https://uidp.org/>

Event Summary



Anthony Boccanfuso
President & CEO

The UIDP London Forum 2023 convened research and partnership professionals from academia, industry, and government to explore the future potential impact of partnerships with national laboratories in the research and innovation landscape. Sessions included those with specific emphasis on university and industry perspectives, needs, and goals for collaboration with national research laboratories (NRLs) and public sector research establishments (PSREs) and case studies of success stories and models for successful collaborations. This event was hosted and received a warm welcome from Dr Peter Thompson, the National Physical Laboratory's (NPL) Chief Executive Officer.

Graeme Reid, Professor of Science and Research Policy at UCL and Chair of the National Physical Laboratory (NPL) Management Board, set the stage for the day's activities by discussing the multifaceted contribution of NRLs to the global R&D landscape through technology transfer and commercialisation, collaborative partnerships, policy influence, and talent development. The current landscape was further illuminated during a data-rich presentation by Lesley Thomson and Paola Barr from Elsevier on the trends in collaboration between NRLs and industry.

Laurie Locascio, Director and Under Secretary of Commerce for Standards and Technology at the U.S. National Institute of Standards and Technology (NIST), brought an international perspective to the forum during a fireside chat about a partnership between NIST and UK Research and Innovation (UKRI) to advance research, research translation, and commercialisation in critical and emerging technologies.

A discussion about the role of standards in this work was co-presented by NIST's Claire Saundry and her UK counterpart, Stacie Hoffman, of the Department for Science, Innovation and Technology (DST).

NRLs and PSREs globally are working to strengthen their research links with industry and university partners. Tomas Coates Ulrichsen, University of Cambridge, presented the results of a NIST-funded study on ways the university-industry partnership community can leverage national labs' facilities, equipment, and expertise to drive R&D and innovation. A key observation from this study was the increasing number of initiatives aimed at "assembling collaborations to span a greater breath of the idea-to-innovation pathway to accelerate the lab-to-market journey," resulting in an increased exploration on how to co-fund activities and collaborate more extensively.

Perspectives based on experience of partnering with national labs were brought by Tim Bedford, the University of Strathclyde, and Malcolm Skingle, GSK. Because workforce development is a priority for NRLs and PSREs, the case study brought by Richard Burguete, Head of the Postgraduate Institute, NPL, provided key learning about shaping research through workforce development in collaboration with universities, government agencies, and corporations.

Find out more about UIDP:
<https://uidp.org/>



Richard Burguete - Director of Postgraduate Institute for Measurement Science



Setting the Scene - The PGI Story

Research and innovation make vital contributions to the economy. We need the whole ecosystem of businesses, government, research intensive organisations, funders, international partners, and others to come together to enable a better outcome for society. Global challenges cannot be solved in isolation, and we need to develop stronger collaborations that underpin a positive change.

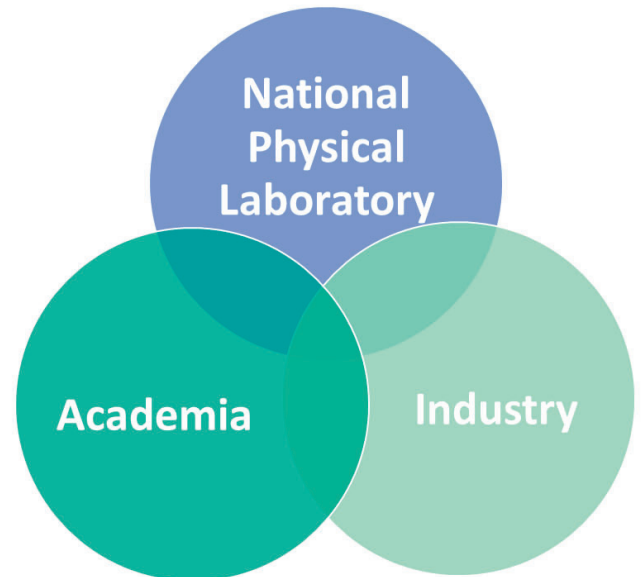
National Laboratories are strategically positioned at the interface within this ecosystems and should be utilised more as an essential partner to drive change by conducting scientific research, developing technology, nurturing talent, and testing prototypes. Their remit is to serve as technical experts for government agencies and science policy advisors. Their positioning in relation to government means they are not only part of the ecosystem, but they are well placed to help shape it.

But the perception of these entities and the value they bring to the innovation ecosystem is not always clear; we need to highlight their value. National Laboratories are national assets with diverse international links and should be used more widely by the research community. The setting up of the Postgraduate Institute for Measurement Science (PGI) is an evidence-based case study of the value of industry, academia, and PSREs working more closely together.

The creation of the PGI in 2015 has driven an appreciable growth in collaborative PhD studentships between NPL and our academic and industrial partners. It has enabled targeted and cohesive management of the large cohort of existing and new NPL-aligned postgraduate researchers. This strategic and coordinated approach has created impact through more effective alignment of our partnerships and studentships to NPL's research direction and in support of NPL's commitment to the UK's government missions.

We have driven the creation of more industry links by working closely with NPL business development teams and scientists, as well as our strategic partners and other Higher Education Institutions, and identified opportunities for funded research. The PGI model of PhD delivery has created a unique environment and approach that has led to growth in funding, training, and engagement of PGRs associated with NPL. By growing the pipeline of doctoral researchers to the current cohort size of 206, the PGI is having a considerable impact on research and its application in a range of sectors across industry and academia.

Find out more about the PGI [here](#)



The PGI is shaping collaborative research and providing a portal for PhD engagement that is inclusive, sustainable, and agile to partners across the globe.

Dr. Peter Thompson - NPL Chief Executive Officer

The industry perspective

PSREs respond to the challenges and opportunities industries face, helping businesses both large and small to introduce or improve products and processes.

PSREs provide unique or national capabilities which are critical to the functioning of the research and innovation ecosystem.

Access to these capabilities drives business engagement by playing a crucial role in de-risking business research and innovation. These capabilities are one of the main reasons that many scientists and businesses are attracted to collaborating with PSREs. In the US, consistent investment in government laboratories has demonstrated the potential of the PSRE model, with their labs playing a critical role in driving the rapid technological advancement, PSREs have a similar impact in the UK, and support the government's ambitions to become a "science superpower."

There is a general analytical challenge in measuring chemistry at surfaces and interfaces. While we can use bulk techniques like nuclear magnetic resonance (NMR) and liquid chromatography – mass spectrometry (LC-MS) and have high confidence

in what a molecule is, we have limited information on its localisation. Alternatively, we can have high-confidence in the localisation, for example following an isotopic label with NanoSIMS, but low confidence in the molecule identification. We call this the "molecular uncertainty principle." This is a major analytical problem as many scientific and technological advances require knowledge of the molecular identity and precise location.

In pharmaceutical research and development, there is a concerted effort to reduce the number of candidate drugs that fail at a late stage, known as drug attrition. Since most of the cost of drug development is in the final phases (pre-clinical and clinical studies) of a decade-long process, spotting early signals of failure can result in big savings and focus resources on candidates that have more chance of becoming a medicine.

Find out more [here](#)

GSK



Malcolm Skingle
Director, Academic Liaison
United Kingdom GSK



Scientific advances are made at the interfaces of scientific disciplines. No single organisation has all the skills & knowledge to effectively deliver innovation. Collaborating with partners who have complementary skills is essential, and
PSREs are an important part of the innovation jigsaw.

Malcolm Skingle
Director, Academic Liaison
United Kingdom GSK

The academic perspective

PSREs respond to the challenges and opportunities industries face, helping businesses both large and small to introduce or improve products and processes.

In 2015 the University of Surrey, along with the University of Strathclyde, entered into a strategic partnership with the National Physical Laboratory (NPL) and the former Department for Business, Energy and Industrial Strategy (BEIS) with the aim of drawing on the expertise and knowledge from all of the organisations to address some of the major scientific challenges we face today.

This partnership brings together academia with industry and government to address key challenges underpinned by measurement science and enables all parties to strengthen both the excellence of their science and their engagement with business.

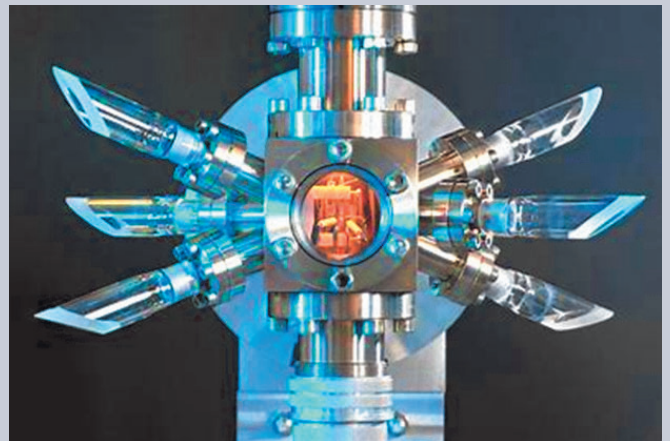
The National Physical Laboratory (NPL), with £4.7m of grant funding being made available through the National Timing Centre programme together with Innovate UK, part of UK Research and Innovation (UKRI), is developing three innovation nodes in partnership with the University of Strathclyde, University of Surrey, and Cranfield University. These will enable the application of timing and frequency across any sector.

The NTC Innovation node in Strathclyde was installed at the John Anderson Lab JA322a on early Jan 2023 and is operational supporting quantum and photonics industry and academia with reference time and frequency signals. Strathclyde and partners M-Squared, Spire, and Fraunhofer are working with the system and are gaining interest from financial services through university partnership with FinTech Scotland and Innovation Accelerator, a true demonstration of how we can link up with partners from across a diversity of sectors.

Find out more [here](#)



Professor Tim Bedford
FRSE FSA RS FIMA
Associate Principal
Management Science



I am both proud of and impressed by the impact of our strategic partnership with the National Physical Laboratory (NPL), Surrey University, and former Department for Business, Energy and Industrial Strategy (BEIS). We deliver this value alongside our additional bilateral activities with NPL. Together we have extended the breadth and depth of joint research in a wide range of topics in measurement science, often in collaboration with industrial partners.

Sir Jim McDonald, Principal and Vice-Chancellor of the University of Strathclyde

Practical session summary

The day's presentations culminated in the forum's final interactive activity, the Global Café, which engaged participants to reflect and build on the discussions in small group sessions. Using six questions to frame the interaction, each table was assigned a question for responses, which were scribed onto paper table coverings. Participants proceeded from table to table to address the questions and contribute their ideas, while facilitators at each table connected the thoughts and ideas and contributed their own. The outputs created were in the form of a visual strategy and best practices webs, mapping out ways to support the research landscape through programs, activities, and approaches. The Global Café questions were:

1. How do you think PSREs can improve their position in the R&D landscape?
2. How can we develop a coordinated approach to support government policy development?
3. What characteristics would new long-term funding streams for R&D have, and how can PSREs help develop and deliver them?
4. What activities or mechanisms would help bridge the gap between PSREs, industry, and academia?
5. What is your top tip for maintaining long-term relationships between PSREs and other parts of the R&D landscape?
6. What do you think should be the next steps? What outcome do you expect from this workshop?

Highlights of what people said.



Need to ensure our owners understand our purpose and drivers – and help us overcome limitations related to levers of influence.	PSREs need to be proactive in bringing people together.	Clarify on role/purpose/performance (value to taxpayers) drivers (effective leadership?) within innovation ecosystems.
PSREs can convene for shared outcomes across stakeholders (includes strong competitors).	Clear value for all partners to make sure they can find future work.	What needs long-term funding? Areas that require strategic future proofing.
Limited levers to influence; there is a need for them to be better embedded.	General lack of understanding on who are PSREs—standard definitions need to be developed.	Include mechanisms to ensure critical mass of expertise is retained, i.e., the plan is bigger than any individual.



We are keen to keep the conversation going. Check our website for upcoming events:
[UIDP](#)
[NPL](#)