

Thursday, 25 October 2018

Royal Society submission to Department for International Trade Consultation on Trade with the USA

The Royal Society is the national academy of science for the UK and the Commonwealth. It is a self-governing Fellowship of many of the world's most distinguished scientists working across a broad range of disciplines in academia and industry. The Society draws on the expertise of its Fellows and Foreign Members to provide independent and authoritative scientific advice to regional, national, UK, European and international decision makers.

Many areas covered by trade agreements fall within the domain of science and technology policy. Indeed, much discussion surrounding trade agreements concerns technological, health, safety, and environmental standards, all of which are and should be informed by science. Scientists can have an important role in informing trade negotiations and policy by providing intellectual expertise, analyzing and solving problems, crafting clear and common definitions, and providing the sound evidence base that can help shape the agenda, including in contentious areas.

This submission therefore provides further detail of the extent and reach of the Royal Society's national and international scientific networks which are an asset for the UK's relations with the rest of the world and a key source of 'soft power'.¹ They also provide a potentially valuable resource to draw on in developing trading relationships with the rest of the world.

This submission provides further detail of the extent and reach of these international scientific networks.

The importance of international scientific collaboration

Science is an inherently international activity, and international collaboration is fundamental to conducting excellent scientific research. In recent years, this collaboration has accelerated – In 2015, over half of the UK's research output was the result of international collaborations and these collaborations are increasing – both in absolute terms and as a proportion of the UK's research output.²

The Society aims to reinforce such collaboration. A survey of nearly 1,300 Fellows and grant holders from the national academies found that 95% had been involved in international collaboration in the last five years, and nearly 90% said that international collaboration was important to their careers.³ Many of the Society's Fellows have leadership positions of considerable influence around the world, including as chief scientific advisers or in other high level government positions, or play leading roles in industry or higher education. Consequently, they frequently engage in a variety of global networks and many have access to a wide range of high level contacts, including key leaders and decision makers.

¹ <https://royalsociety.org/~media/policy/Publications/2013/rs-submission-to-soft-power-consultation-18092013.pdf>

² Elsevier. International comparative performance of the UK research base 2016. A report prepared by Elsevier for the UK's Department for Business, Energy and Industrial Strategy.

³ <https://royalsociety.org/~media/policy/projects/international-mobility/national-academies-opinion-leader-survey.pdf>

Links with the US

Looking at publication data, we can see that the US is the UK's second strongest collaborative partner, when normalised based on the countries' total research output. 14.27% of UK papers published between 2008 and 2017 were co-authored with US researchers⁴.

The Society has 280 Fellows and Foreign Members across the USA – more than any other country outside the UK. In addition, 357 Fellows and Foreign Members of the Royal Society around the world are also members (analogous to Fellows) of the US National Academy of Sciences (NAS). The Society enjoys very strong links with the NAS, encompassing an annual science policy forum and a biennial high level summit of the President and Officers of both academies. The two academies also convene high level international dialogues on gene editing and artificial intelligence, and have recently collaborated bilaterally on a wide range of topics including decarbonisation, science and the law (bringing together leading scientists and members of the judiciary), research culture, biosecurity, and climate change. The Society also regularly partners with other key US scientific organisations including the American Academy of Arts and Sciences and the American Association for the Advancement of Science, and has convened with them high level discussions on technology and the future of work, science and international trade, science diplomacy, and the impact of AI upon society.⁵

Of the Society's nearly 878 research fellows – outstanding scientists funded by the Society to carry out their research independently - 223 (25%) have indicated that they have a current collaboration with the USA. The Society has also supported 182 international exchange visits between the Royal Society and the US in the last seven years. This comprises nearly 20% of the awards made during the same period across the whole programme, which supports collaboration with scientists all over the world.

The Society's international links

- **Grants:** In 2017/18, the Society invested just over £73million in outstanding scientists, which included nearly 400 grants to specifically support international scientific collaboration and travel (this particular category represents an increase of 41% on the previous year).
- **Journals:** The Society publishes a wide range of scientific journals which each year publish thousands of articles, which are downloaded tens of millions of times, from and by leading scientists from all over the world. As Figure 1 in Annex 1 demonstrates, the vast majority of scientists who publish in Royal Society journals are based overseas (over 80%), and 94% of those accessing the research are based abroad.
- **Scientific meetings:** In 2017/18, over half of the 643 leading scientists who were speakers, chairs and organisers of the 33 events held under the Society's prestigious scientific meetings programme were from outside the UK.
- **Multilateral networks:** In addition to the individual links of the Society's Fellows, the Royal Society is itself a member of a number of multilateral scientific networks. These include a network of the world's science academies and the newly established International Science Council, which draws its membership from national scientific organisations and international unions for scientists in specific disciplines.

⁴ Data and Analysis: Thomson Reuters. InCites. See <https://clarivate.com/products/incites/> This data is based on research output as specified by number of papers published between 2008 and 2017. Strength of collaboration between UK-based and overseas authors is calculated using Salton's cosine, which normalises collaboration strength based on the countries' total research output. The UK's total research output for the period was 1,060,186 papers.

⁵ <https://royalsociety.org/about-us/international/north-south-america/>

Science and international trade

The Society has also recently convened discussions on the links between science and international trade policy. These have included a 2017 high level breakfast with DIT Permanent Secretary Antonia Romeo and a roundtable with the American Association for the Advancement of Science, which brought together scientists and trade experts from both countries. Some key conclusions from participants in the latter event were:

- Science has always been a fundamental part of international trade, and many areas negotiated in trade agreements fall within the domain of science and technology policy (eg technological, health, safety and environmental standards).
- The data and AI revolutions are having a transformative effect on international trade, with the distinctions between goods, products and services becoming increasingly blurred; science is more important than ever in understanding this new landscape and the opportunities and challenges it presents.
- The current architecture of bilateral trade agreements and global trade policy is increasingly ill-suited to today's fast-changing world, characterised by rapid technological innovation.⁶

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⁶ See <https://royalsociety.org/topics-policy/publications/2017/5th-neureiter-science-diplomacy-roundtable/> and <http://www.sciencediplomacy.org/editorial/2018/beyond-political-moment-strengthening-science-trade-ties>

Annex 1 - The Royal Society's international networks – examples

Table 1 – Top 10 geographic locations of the Royal Society's Fellowship

<u>Country</u>	<u>Number of Fellows</u>
UK	1096
USA	281
Australia	84
Canada	74
Germany	28
Switzerland	25
France	23
India	16
China	9
NZ	7

Figure 1 – Geographical spread of authors in Royal Society journals, 2017

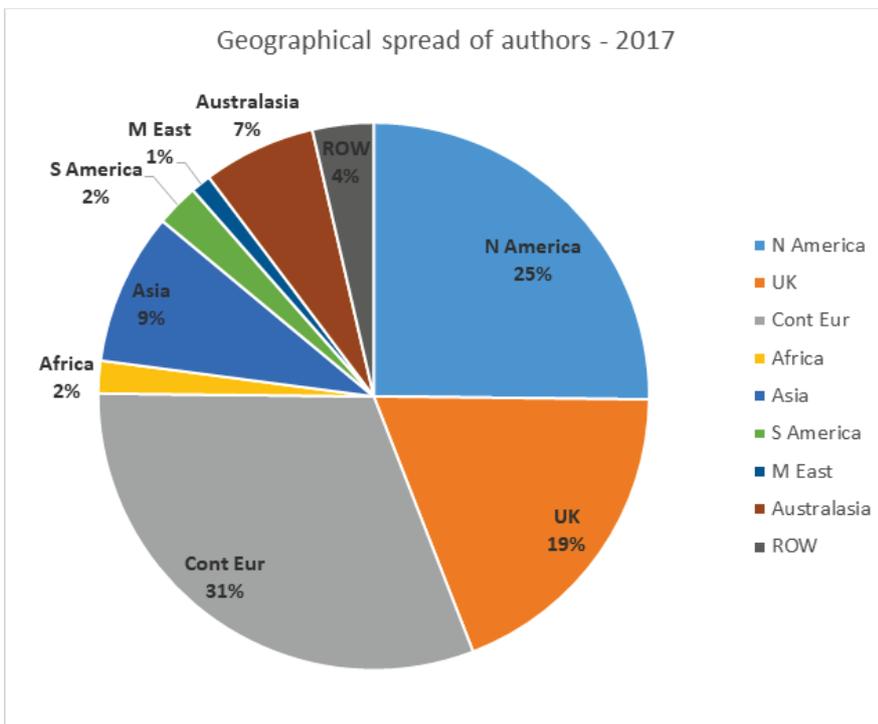


Figure 2 - Geographical spread of end users of Royal Society journals, 2017

