

12 January 2022

# Royal Society Submission to the House of Commons Science & Technology Committee inquiry into '*Diversity in STEM*'

## Key Points

- The Royal Society is committed to increasing diversity in STEM. Any lack of diversity in the scientific workforce represents both an absence of talent that the UK could be benefitting from and a lack of opportunity for people in the UK.
- The Society is a sponsor of the All-Party Parliamentary Group ('APPG') on Diversity & Inclusion in STEM. The Society provided evidence to inquiries held by that APPG in 2022 on Equity in the STEM workforce, and in 2019/20 on Equity in STEM Education.
- The Society carries out an annual analysis of diversity data in relation to our activities including research grant recipients and our Fellowship, which is published on our website. Diversity data for Royal Society staff was included in the annual diversity data report for the first time in 2019.
- All Society Grants schemes allow flexible working, and Research Fellows can access support for childcare to enable them to attend conferences and events.
- The Society has commissioned analyses of ethnicity and of disability data in STEM academia to establish the diversity profile of the pool of researchers and students in academia to inform actions to improve diversity and inclusion internally and across the sector. The Society has also commissioned new research into the impact of socio-economic factors on degree attainment and continuation in higher education, and a literature review of existing research on degree disparity.
- The Society is working with the Institute of Employment Research at Warwick University to develop a methodology for using SOC code classifications to provide a consistent definition of STEM occupations.
- The Society is also contributing to a BEIS led STEM workforce survey, which is currently being scoped.

## 1. Introduction

1.1. The Royal Society is the national academy of science for the UK. Its Fellows include many of the world's most distinguished scientists working across a broad range of disciplines in academia, industry, charities and the public sector. The Society draws on the expertise of the Fellowship to provide independent and authoritative advice to UK, European and international decision-makers.

1.2. The Society's fundamental purpose, reflected in its founding Charters of the 1660s, is to recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity. Our strategic priorities therefore are to promote excellence in science; to support international collaboration; and to demonstrate the importance of science to everyone.

1.3. The Society is committed to increasing diversity in science, technology, engineering and mathematics ('STEM') by seeking out participation from underrepresented groups, in order to build and develop a world in which studying and working in science are open to all. Any lack of diversity

in the scientific workforce represents both an absence of talent that the UK could be benefitting from and a lack of opportunity for people in the UK. A diverse and inclusive scientific workforce draws from the widest range of backgrounds, perspectives and experiences thereby maximising innovation and creativity in science for the benefit of humanity. It is also important for researchers to follow diverse paths and approaches, taking opportunities to become more rounded and entrepreneurial and fuelling valuable innovation that we all benefit from.

- 1.4. The Diversity Committee (established in 2015) oversees the Royal Society's diversity and inclusion strategy and related activities. In 2019, the Committee set up two sub-groups to focus on supporting scientists from ethnic minorities and supporting scientists with disabilities. The Committee's other work has included developing animations on 'making better group decisions' and 'unconscious bias', the 'Parent Carer Scientist campaign' - which celebrated the work-life patterns of 150 scientists in the UK - and piloting mentoring schemes for young people, including the Destination STEMM mentoring scheme for Year 12 Black students in London and supporting in2scienceUK for students from disadvantaged backgrounds.
- 1.5. The submission shares key findings from the most recent analysis of the Royal Society's own diversity data, findings from two recent reports commissioned by the Society relating to the demographics of workers in STEM academia, details of upcoming further research relating to the impact of socio-economic on degree attainment and continuation in higher education, and an update of our ongoing work to develop a widely agreed methodology for defining the STEM workforce to inform future evidence-gathering, monitoring and reporting.
- 1.6. As well as submitting to this inquiry, the Society is a sponsor of the All-Party Parliamentary Group on Diversity and Inclusion in STEM

## **2. Diversity at the Royal Society**

- 2.1. As part of the ongoing diversity programme agreed by the Council of the Royal Society, diversity data is gathered and analysed in relation to the Society's activities. The Society has published an annual diversity data report since 2015. Each report covers diversity in relation to the Society's Fellowship, grant offers and attendees at Society meetings and events. Diversity data for Royal Society staff was included in the annual diversity data report for the first time in 2019. The most recent report (covering the calendar year 2020) published in November 2021 is available [here](#)<sup>1</sup>.

### Fellowship<sup>2</sup>

- 2.2. The Royal Society is a self-governing Fellowship of distinguished scientists drawn from all areas of STEM. A fixed number of new Fellows and Foreign Members are elected annually for life through a peer review process on the basis of excellence in science.
- 2.3. In 2021, 12% of the Fellowship and Foreign Membership was female (201 individuals) and 88% was male (1,504 individuals). The proportion of the Fellowship that is female has increased by 1% from

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<sup>1</sup> It should be noted that there is no comparator that can be used consistently across all sections of the Society's diversity reporting. Consequently, different benchmarks have been used across the report, or not included at all for sections where there is no appropriate benchmark data. The comparative data and the rationale behind the choice of comparator are set out in a table on pages 5 to 10 of the report and in each relevant section.

<sup>2</sup> In 2020, 50% (854) of Fellows and Foreign Members completed the Society's annual diversity survey, compared to 49% (836) of Fellows and Foreign Members in 2019. Consequently, neither data set can be interpreted as representative of the whole Fellowship and caution should therefore be taken when making comparisons between the two years.

2020. However, the proportion of female Fellows elected each year has been generally increasing over time.

2.4. In 2021, 51 new Fellows, 10 Foreign Members and one Honorary Fellow were elected to the Fellowship. 20 of the intake of new Fellows (16) and Foreign Members (4) were women – this is 32.3% of the total 2021 intake. This is the highest percentage of women ever elected to the Society.

2.5. The Society has not historically collected data on ethnicity<sup>3</sup> and disability when individuals are first elected to the Fellowship. In February 2021, an invitation to complete a diversity monitoring survey was sent to all Fellows and Foreign Members, which included questions relating to ethnicity and disability. Of the 1,700 Fellows and Foreign Members, 854 (50%) completed the survey. The data below reflects the 50% of Fellows and Foreign Members who responded to the questions on ethnicity and disability and should not be interpreted as representative of the entire Fellowship and Foreign Membership. Fellows and Foreign Members who preferred not to answer have been excluded from these figures.

2.6. Regarding ethnicity, 851 Fellows and Foreign Members provided a response. Of these, the proportion of Fellows and Foreign Members who said that they were from a Black or minority ethnic background was 5% (44 individuals) in 2020, the same proportion as in 2019 (5%, 42 individuals). In the UK in 2018/19, 11.2% of STEM professors were Black or minority ethnic. In 2020, the majority of Fellows and Foreign Members were White British (74%, 626 individuals), compared to 73% in 2019 (596 individuals). In 2020, 21% of respondents were from other White backgrounds (181 individuals), compared to 22% (180 individuals) in 2019.

2.7. Regarding disability, 854 Fellows and Foreign Members provided a response. Of these, 9% of respondents said that they have a disability (73 individuals) and 91% of respondents said that they did not have a disability (781 individuals). The proportion of Fellows and Foreign Members stating they have a disability has decreased slightly since 2019, when 10% (78 individuals) said they had a disability.

2.8. While we have made some improvements in gender representation in recent years, we have more to do to widen ethnic minority representation, and with more urgency. The Diversity Committee has commissioned analysis of Higher Education Statistics Authority (HESA) data to give us a comprehensive picture of ethnicity amongst STEM university students and researchers at different career stages (see more in section 3). This will help us understand at what point the science system is losing talented Black and ethnic minority researchers, resulting in what is now a very small percentage of BAME researchers in senior positions. This will help target the steps that the Society and others can take to prevent this loss of talent. We have published similar work to understand the challenges faced by scientists with disabilities.

### Research Fellowship Grants

2.9. About 1,600 researchers are currently funded by the Royal Society, including approximately 1,100 Research Fellows. The Society provides grants and research fellowships to outstanding researchers primarily based in UK institutions and to foster collaborations between UK and

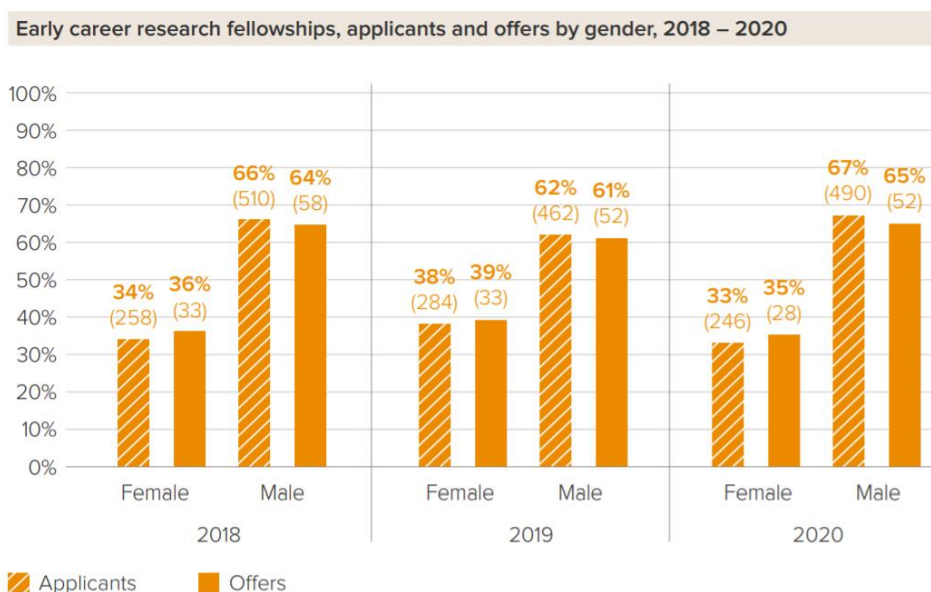
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<sup>3</sup> The Society collects data on a range of ethnicity categories, which are aligned to the ethnicity categories used on the UK Census 2011. These categories will be updated to reflect the changes to the ethnicity question on the UK Census 2021. As the results for individual categories are too small to report individually, they have been amalgamated into 'Black and minority ethnic' in this report.

international researchers. We have a range of schemes to support talented early career and senior scientists pursuing both discovery-led and applied research.

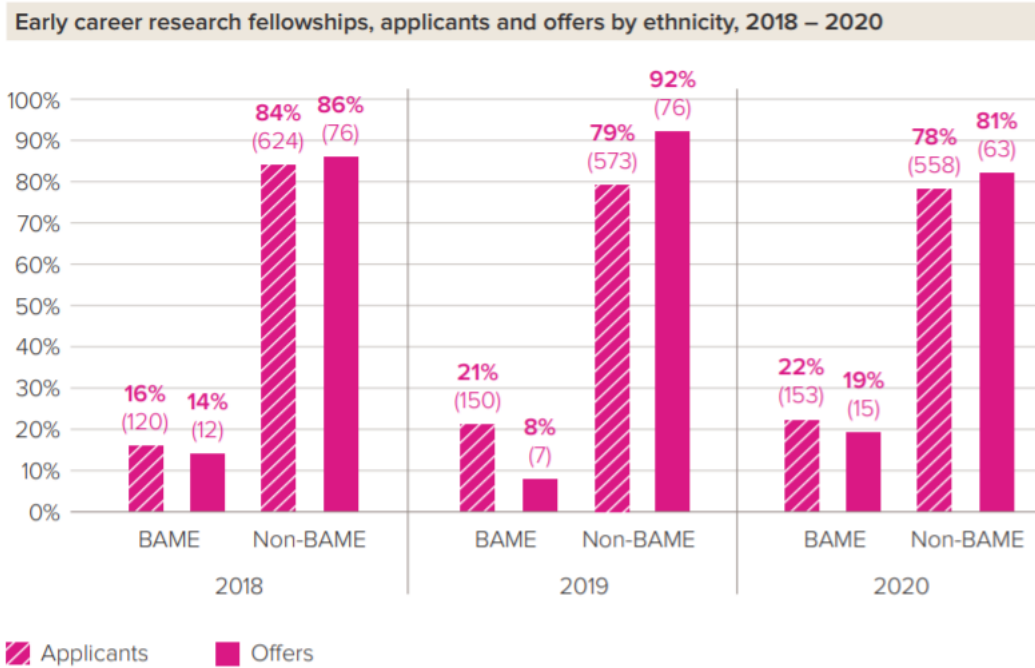
2.10. Our three early career research fellowships (Dorothy Hodgkin Fellowship, University Research Fellowship and Sir Henry Dale Fellowship) are awarded to scientists who have the potential to become leaders in their field to enable them to establish an independent research career in the UK. Applicants from all grant schemes are asked to complete an online diversity monitoring form when applying. Charts below show the proportion and number of applicants and offers for the Society’s early career fellowship schemes, by gender, ethnicity and disability, from 2018 to 2020. See from page 27 of the [full report](#) for more information on these schemes.

2.11.



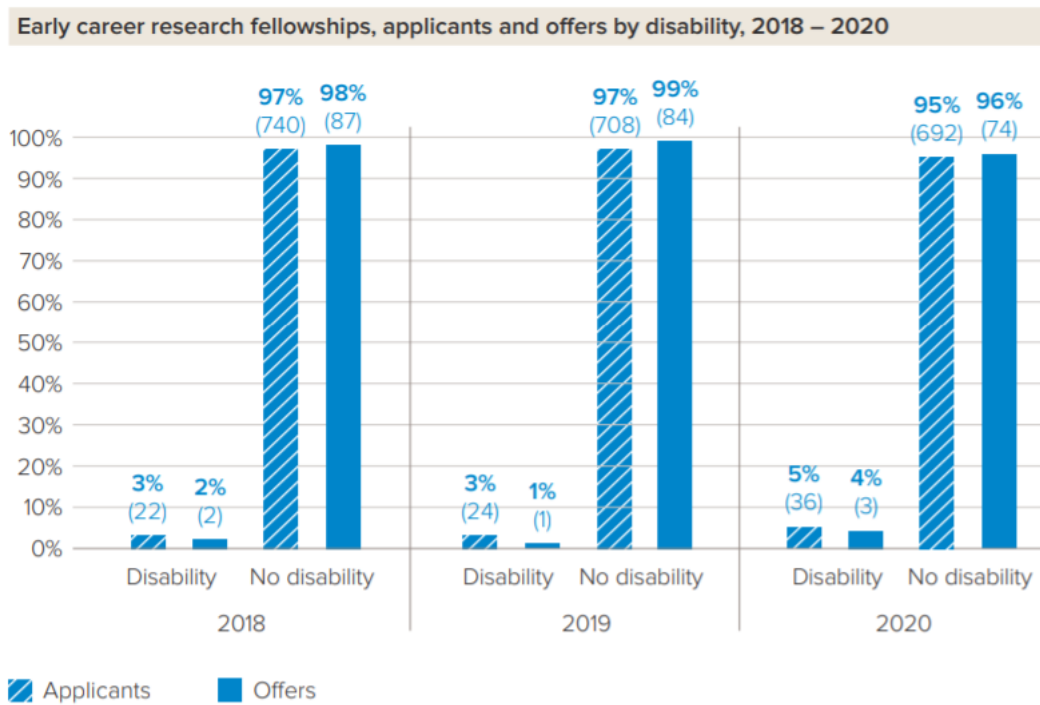
The proportion of offers made to females has been higher than the proportion of applicants in each year from 2018 to 2020. The proportion of offers made to males has been lower than the proportion of applicants in each year from 2018 to 2020.

2.12.



The proportion of applicants from Black and minority ethnic backgrounds increased in 2020 from 16% in 2018 and 2018 to 22%. The proportion of offers made to applicants from Black and minority ethnic backgrounds higher in 2020 than the preceding two years (19% (15 individuals) in 2020, compared to 8% (7 individuals) in 2019 and 14% (12 individuals) in 2018).

2.13.



The proportion of offers made to individuals who declared a disability has been lower than the proportion of applicants with a disability in each year from 2018 to 2020. As the number of applicants who declared a disability and the number of offers made to individuals who declared a disability is low in each year, caution should be taken when drawing conclusions from the data. Comparative analysis carried out by the Careers Research and Advisory Centre (CRAC) on behalf of the Society showed that the proportion researchers with a known disability in this 'eligible' pool is 3.1% (410 individuals)<sup>4</sup>.

2.14. The Society's Grants and Diversity Committees commissioned the Careers Research Advisory Centre (CRAC) to establish the diversity profile of postdoctoral researchers in the UK eligible for the Royal Society's early career fellowship programmes. This analysis is available on the Society's [website](#). Further information about the findings and next steps is at section 3.7 – 3.9 below.

#### *Flexible Grants Schemes*

2.15. All Royal Society Grants schemes allow flexible working. Under the terms of our fellowships, holders are entitled to take the full period of maternity, paternity, shared parental and adoptive leave, or extended sick leave outlined in your employing institution's standard policies and procedures

2.16. The Society can also provide financial support to Research Fellows for any additional childcare costs that arise when attending conferences, collaborative research visits or invited talks directly related to their fellowship or award. This policy is also applicable to meeting organisers, Chairs and invited speakers when attending a Royal Society organised meeting or event.

### **3. The demographics of workers in STEM academia**

#### *Black and ethnic minority students and staff*

3.1. In 2019, the Diversity Committee recommended that the Society should obtain detailed data on the proportion of ethnic minority students and staff in STEM, in order to identify areas of disparity and possible interventions that the Society could take.

3.2. The Society commissioned the Joint Information Systems Committee (Jisc) to carry out detailed quantitative research into the proportion of black and ethnic minority students and staff working in science, technology, engineering and mathematics ('STEM') and how this has changed over time. The data in the report will enable the Society to identify areas of under-representation and target interventions appropriately.

The [report](#) contains analysis on UK domiciled STEM students, graduates and leavers and academic staff working in STEM at UK higher education providers from 2007/08 to 2018/19. It analyses contextual and outcomes data comparing those who are black, Asian and minority ethnic with those who are white. It also provides further analysis broken down by ethnic group.

3.3. The report was published in March 2021, and showed that there is significant variation in rates of progression and outcomes across ethnic minority groups, though Black staff and students have consistently poorer outcomes than white and Asian students. The proportion of Black students

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<sup>4</sup> The profile of postdoctoral researchers in the UK eligible for Royal Society early career fellowship programmes, (Careers Research and Advisory Centre, March 2021). <https://royalsociety.org/topics-policy/publications/2021/trendsethnic-minorities-stem/>

entering undergraduate and postgraduate education has increased over the past decade, as it has for other minority ethnic groups, but they are leaving STEM in greater numbers at all stages of the career pipeline.

- 3.4. Following the recommendations in the Jisc report, the Society has commissioned two pieces of further research to extend its understanding of the barriers facing scientists from Black and ethnic minority backgrounds.
- 3.5. The Society has commissioned Jisc to carry out further statistical analysis to identify factors driving disparities in attainment and progression, with a focus on the role of socio-economic background. The Society is aiming to publish this report later in 2022.
- 3.6. The Society has also commissioned a literature review of existing research examining the causes of disparities in degree outcomes and dropout rates. The Society is aiming to publish this report later in 2022.

#### *Diversity profile of researchers eligible for early career fellowships*

- 3.7. The Society also commissioned the Careers Research and Advisory Centre ('CRAC') to establish the [diversity profile of postdoctoral researchers in the UK](#) (PDF) that meet the eligibility criteria for its three early career fellowship programmes: University Research Fellowship, Sir Henry Dale Fellowship and Dorothy Hodgkin Fellowship. This profile ('the eligible pool') has then been used as a benchmark for the Society to consider the ethnicity and gender diversity of its own early career research fellows, specifically individuals who applied for these schemes between 2018 and 2020 inclusive.
- 3.8. The data shows that the applicants for the three UK early career fellowship schemes are not fully representative of the ethnicity and gender profile of the eligible pool. There is low representation of Black, Asian and multi-ethnic groups for UK nationals in the eligible pool and among applicants to the Society's schemes, and little to no representation of Black postdoctoral researchers.
- 3.9. The Society is keen to address these concerning trends. Building on its ongoing efforts, the Society will take action to broaden applications from talented individuals from diverse backgrounds to its early career fellowship schemes. This will include:
  - Sharing approaches and continued working with other funders and partners: The Society has convened and continues to work with a funders' forum to share the data and methodology, and aim to work collaboratively to broaden participation from under-represented groups.
  - The Society will use the eligible pool data to benchmark the diversity of applicants and awardees for early career fellowships in future Royal Society annual diversity data reports.
  - Continue working with academic institutions: The Society will meet with institutions collectively and individually to share data and encourage them to support a broader range of talented candidates to apply.
  - Mentorship and workshops: The Society will work with partners to deliver workshops and/or webinars on planning and applying for early career fellowships for potential applicants (including future applicants such as final year PhD students) from ethnic minority backgrounds and socially disadvantaged backgrounds. It will organise webinars and networking events for potential applicants from under-represented groups, institutions or departments to explain more about the fellowships, dispel the 'myths' that exist about applying successfully and provide general guidance on how to apply for these schemes. The Society will also facilitate and

encourage peer-to-peer support for applicants, including from existing grant holders who might be well-placed to provide advice and support.

- The Society will develop initiatives (subject to funding) to contribute to efforts to support talented individuals from under-represented groups to pursue careers in STEM.

#### *Staff with disabilities in STEM - trends*

3.10. In 2019, the Diversity Committee recommended that the Society obtain detailed quantitative research into the proportion of students and staff with disabilities in STEM, in order to identify areas of under-representation and be able to target interventions appropriately. The Society commissioned Jisc to carry out this analysis, again based on HESA data. Jisc's final report contains analysis on UK-domiciled students, graduates and leavers studying STEM, and academic staff working in STEM at UK higher education providers from 2007/08 to 2018/19. It analyses contextual and outcomes data comparing those with a known disability with those without a known disability. It also provides further analysis broken down by type of disability. The report was published on 21 January 2021 and is available here: <https://royalsociety.org/topics-policy/diversity-in-science/disability-reports/>

#### *Barriers to disability disclosure and progression in STEM for staff with disabilities*

3.11. Available statistical data shows a disparity in the proportion of students and staff declaring a disability in various STEM fields. The reason for this is not clear from the available data. It is possible that the variation is due to people with disabilities leaving STEM altogether or choosing not to declare their disability at later career stages in academia.

3.12. In November 2019, the Society commissioned the Careers Research and Advisory Centre (CRAC) to carry out qualitative research to understand the low level of disclosure of disability amongst scientists in the academic workforce, why this occurs, and how the Royal Society might address it. The report was published on 21 January and is available here: <https://royalsociety.org/topics-policy/diversity-in-science/disability-reports/>. It is based on an evidence review of published literature and professional practice about disability disclosure (covering higher education and other sectors). CRAC also carried out interviews with subject matter experts, and 22 interviews with scientists with disabilities to inform the report.

3.13. The final report makes 15 recommendations, divided into recommendations for funders, higher education institutions and the sector more generally. The recommendations for funders are aimed at making the process for applying for, and being awarded research grants, more inclusive. The recommendations for higher education institutions are aimed at making recruitment, progression and the working environment in higher education more accessible and inclusive for people with disabilities. Finally, the recommendations for the STEM sector as a whole are aimed at challenging perceptions and embedding consistency. For example, it is recommended that the sector works together to embed a consistent definition of what is considered to be a disability and publicise more widely how the disability disclosure process works.

3.14. The report also makes recommendations for further research that the sector should undertake, including exploring the reasons for the low levels of disability disclosure at senior career stages, and whether more disabled scientists are selecting teaching-focused pathways (and why).



*Work to address barriers for researchers from all under-represented groups: April 2021 roundtable and outcomes*

3.15. In April 2021, the Society hosted an online roundtable discussion with a range of key partners to share the findings from the Jisc report on data relating to Black and ethnic minority students and staff, and to identify areas where practical action could be taken collectively by the sector to deliver tangible change. Recurring themes of the April roundtable discussion included:

- The lack of clear, readily accessible information around pathways into – and through - research careers, particularly for academic career trajectories.
- Smaller programmes and organisations have limited resources with which to work and may benefit from collaboration and support from larger, better-resourced organisations. Existing efforts to improve the system for Black and minority ethnic staff and students are currently fragmented, and that it would be useful to create greater connections between those working across the sector.
- For researchers from under-represented groups who are involved in outreach and other activities mentoring and outreach activities can occupy significant proportion of their time and resources, often to the detriment of their research and career progression. Greater recognition of – and support for - these efforts from universities and funders would enable staff from under-represented groups to continue their important outreach work while actively progressing their careers.
- The positive and tangible impact that sponsorship can have on the retention and progression of under-represented groups in STEM.

3.16. The Society has started several projects to help address the issues raised at the roundtable, and aims to work in collaboration with key partners across the STEM sectors to overcome the barriers identified.

#### **4. Other recommendations to address issues relating to diversity in STEM**

4.1. In 2021, the Society submitted evidence to an inquiry undertaken by the APPG on Diversity & Inclusion in STEM, of which we are an official sponsor. The resulting report, [Equity in the STEM workforce](#), set out five key recommendations to address the issues identified:

1. The UK Government and STEM organisations, across the private, public and voluntary sectors should commit to leading a 'STEM Diversity Decade of Action' to tackle the historic and systemic underrepresentation of minoritised groups at all levels in the sector.
2. The Prime Minister and UK Government should set a bold vision for a diverse and equitable STEM sector at the heart of their ambitions for the UK to become a 'global science superpower'.
3. STEM leaders from organisations from across the private, public and voluntary sectors should work together to form and co-fund an Employers' Coalition for STEM Diversity to address the structural inequity in the STEM workforce and drive long-term change.
4. The UK Government must deliver a statutory workforce data strategy and drive forward changes in policy and legislation to support employers to improve equity for minoritised communities in many sectors of the UK workforce, including STEM.

5. The UK Government and STEM organisations must quickly look to address and reverse worsening inequity within the STEM workforce as a result of the pandemic.

4.2. Other recommendations suggested by the Society which were not adopted in the final APPG report included:

- The STEM sector must build on the work currently being undertaken by the Royal Society and the University of Warwick to agree a methodology for defining the STEM workforce. This will allow for better harmonised data collection on the demographics of the workforce across the sector (see more in section 5).
- The Government should bring forward legislation to make provision for an expansion of mandatory reporting on pay gaps based on protected characteristics beyond gender, which will allow for greater visibility of inequity challenges within the workforce. These characteristics should include disability, ethnicity, sexual orientation and gender identity.
- Organisations in the STEM sector should actively demonstrate their commitment to creating an inclusive workforce by remunerating and crediting inclusion and diversity work undertaken by employees in the same way any other additional work would be.

## **5. Developing a definition of the STEM workforce to inform future evidence-gathering, monitoring and reporting**

5.1. The Office for National Statistics classifies jobs according to a system of Standard Occupation Classification ('SOC') codes. The SOC codes alone cannot be used straightforwardly to define the STEM workforce. In the past, this has resulted in organisations using different sets of SOC codes to define the STEM workforce, resulting in inconsistent figures being stated when discussing the proportion of under-represented groups in the workforce.

5.2. In 2017, the Royal Society commissioned the Institute for Employment Research at Warwick University ('IER') to propose a detailed methodology for using SOC code classifications to define STEM occupations. The IER produced a draft report that set out a four-category approach to defining STEM occupations using the 4-digit SOC codes. Following the publication of SOC 2020 by the Office for National Statistics ('ONS'), the Society has asked the IER to update their 2017 report to reflect SOC 2020 using 6-digit SOC codes for greater granularity. Using the IER methodology will allow organisations to track diversity in STEM in a consistent way. The Society hopes to publish the updated report later in 2022.

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