

Commons Education Committee: inquiry into Threat of Insolvency and International Students in universities: Response from the Royal Astronomical Society

1. This is the official response from the Royal Astronomical Society (RAS) to the mini-inquiry by the House of Commons Education Committee into the sustainability of universities.
2. The RAS represents more than 4,000 astronomers and geophysicists, in the UK and around the world, in occupations in academia, industry, education and public engagement, and journalism, as well as others in the wider economy. Our members are described as 'Fellows'. This evidence was shaped by input from our governing Council and our Policy Group.
3. We do not believe there are any prejudicial conflicts of interest to declare. For the completeness of the record, many members of our governing Council are employed in universities, working as academic faculty staff with teaching responsibilities, and as postdoctoral research associates. This reflects our wider membership, where research active Fellows are concentrated in the university sector, and in addition includes many undergraduate and postgraduate students, whose studies and career prospects are also directly affected by the health of higher education.
4. The RAS is a member of the Science Council, the umbrella body representing science membership bodies, and we support its separate wider submission covering the impact of the university funding crisis on the science workforce.

How do higher education institutions contribute to growth in their local economies, the provision of public services, and their wider communities?

5. The RAS has serious concerns about the provision of courses related to our sciences i.e. high cost science, technology, engineering and mathematics (STEM) programmes, including those in astronomy and geophysics. These are typically delivered in university departments covering physics, Earth sciences and mathematics.
6. These are sciences where the UK excels in academic research, and are a core part of the higher education ecosystem. For example, in global citation indices we are ranked fourth in the world in astronomy and astrophysics, fourth in space and planetary science, and fifth in geophysics¹.
7. UCAS data purchased by the Society indicate that recruitment to astronomy undergraduate programmes (almost always combined with physics or mathematics – for our purposes we include all those covering astronomy, astrophysics, cosmology, space science, and planetary science) is strong, with places accepted rising from 1335 in 2019 to 1545 in 2024, an increase of 16%. Longer term data (albeit collected on a different basis) indicates that acceptances on these courses have at least

¹ Scimago Journal and Country Rank <https://www.scimagojr.com/countryrank.php>

doubled since early 2000s. In the last five years places accepted on physics undergraduate programmes declined from 5880 to 5510, a drop of 7%.

8. Astronomy and related disciplines have a substantial impact at both a regional and national level. The Society captured examples in publications based on evidence from our fellowship and from past Research Excellence Framework programmes.
9. These include spinout companies such as Symetrica with offices in Southampton and turnover amounting to tens of millions of pounds, and contractors working hand in hand with academia, including Blackford Analysis in Edinburgh, QMC Instruments in Cardiff, Teledyne e2v in Chelmsford, and Europe's largest space company, Airbus, in Stevenage^{2,3}.
10. Overall, in 2022/23 (the year most recently assessed) is that the UK space industry, in many cases benefiting from talented space scientists and astronomers, employs around 55,000 people and has an income of £18.6 billion^{4,5}.
11. Space and astronomy also has a proven inspirational value, bringing young people in particular into careers in science, demonstrated by the continued growth in undergraduate programmes in this area, and also by schools-based educational research⁶. Our own RAS 200: Sky and Earth project in addition demonstrated how our sciences have the power to engage traditionally underserved groups, from prisoners to young people not in education, employment or training⁷.
12. Geophysics, the other main discipline represented by the RAS, has in contrast seen a collapse in undergraduate recruitment. UCAS data reveal that in 2024 just 80 places in this subject were accepted across the whole of the UK. There are now fewer than ten undergraduate degree programmes in geophysics remaining.
13. This is in spite of it being a science of national strategic importance, one vital for areas including energy security, delivery of Net Zero targets for CO2 emissions, and discovery and exploitation of new mineral and energy resources. As long ago as 2012, the Natural Environment Research Council (NERC) report on skills priorities included a requirement for geophysics in around half of the identified key challenges.

² Astronomy Means Business <https://www.ras.ac.uk/sites/default/files/2018-05/AstronomyMeansBusiness.pdf>

³ Beyond the Stars: Why Astronomy Matters <https://www.ras.ac.uk/sites/default/files/2018-05/BeyondTheStars.pdf>

⁴ Size and Health of the UK Space Industry 2024 <https://www.gov.uk/government/publications/size-and-health-of-the-uk-space-industry-2024/size-and-health-of-the-uk-space-industry-2024#:~:text=This%20edition%20of%20the%20%27Size,jobs%20across%20the%20supply%20chain.>

⁵ TechUK: Emerging Space Technologies Report <https://www.techuk.org/resource/techuk-s-first-emerging-space-technologies-report-is-now-live.html>

⁶ "Pupils' and Parents' View of the School Science Curriculum", J. Osborne, S. Collins, School Science Review, 2000: <https://www.semanticscholar.org/paper/Pupils'-and-parents'-views-of-the-school-science-Osborne-Collins/05286c0a117b97d52d45f2582eb6e2e95b3cbcc4>

⁷ RAS 200: Sky & Earth: Report of the Royal Astronomical Society's bicentennial programme of outreach and engagement https://ras.ac.uk/sites/default/files/2024-06/RAS200%20report_Final_Digital.pdf

14. The dearth of qualified geophysicists is demonstrated by the vacancy rate, with approximately 2.5 times as many job openings each year as there are graduating students, and the inclusion of the role on the UK Government's skilled worker visa list.
15. Discussing possible explanations for the recruitment shortfall, in a 2024 article in *Astronomy and Geophysics*, the RAS member magazine⁸, Jenny Jenkins, Amy Gilligan, and Lidong Bie, all leading geophysicists from the British Geophysical Association (BGA), considered the (un-)popularity of geophysics programmes, noting the lack of awareness among undergraduate students who by definition have already chosen their programmes of study.
16. There are also areas of the UK where local economies particularly depend on geophysicists, not least where there is particular expertise in renewable energy and/or energy resource extraction (one example is Aberdeen, where a university course has already closed and another is reportedly at risk).
17. As with astronomy, the RAS captured examples of the wider impact of geophysics in publications based on information from our membership and from REF returns⁹. The direct benefits include areas such as space weather forecasting (vital for satellite infrastructure and power grids), seismology, and understanding the subsurface.
18. To take just one example, geosciences staff at the University of Edinburgh (working in satellite based Earth observation) started at least four companies in the past six years (Space Intelligence, EarthBlox, EarthWave, Quosient). In addition an undergraduate on the Edinburgh Geophysics degree was the CEO of the student-run, international, not-for-profit space design company Asteria¹⁰. This vibrant ecosystem creates jobs, and a foundational hive of activity from which future large companies can emerge.

What strategies should be implemented to prevent insolvency and ensure sustainable regional provision of courses?

19. Physics-based courses in general are defined by the Office for Students as 'very high cost' STEM programmes, given that they demand laboratory use and fieldwork, and their costs are not completely covered by student tuition fees¹¹. This gap is at least in part covered by internal cross-subsidies by lower cost arts and humanities courses.

⁸ "Who wants to be a geophysicist?", J. Jenkins, A. Gilligan, L. Bie, *Astronomy & Geophysics*, Volume 65, Issue 5, October 2024, Pages 5.28-5.30, <https://doi.org/10.1093/astrogeo/atae056>

⁹ The Business of Geophysics <https://ras.ac.uk/sites/default/files/2018-05/GeophysicsMeansBusiness.pdf>

¹⁰ Asteria Space and Satellite Development <https://www.asteria-space.com/>

¹¹ Office for Students: Guide to Funding 2024-25 <https://www.officeforstudents.org.uk/media/0bkppnsu/guide-to-funding-2024-25-jan-2025.pdf>

20. Nonetheless very high cost courses in physics, including astronomy, are likely at risk in the currently stringent financial climate for universities. Geophysics courses are typically part of Earth sciences departments, and have similarly high overheads.
21. If these courses close it will likely mean redundancies of research active staff responsible for teaching. This will thus have a direct impact on the capacity of the UK to carry out academic research in these areas, and is a threat to our global standing. The parlous state of university finances and pressure on staff, partly a result of dependency on declining teaching income, was identified as a risk to research in the review by Sir Paul Nurse in 2023 of the Research, Development and Innovation landscape¹².
22. We earlier set out some of the wider economic and societal benefits accruing from investment in astronomy and space science and geophysics, including in undergraduate programmes, which will also be jeopardised by course closures.
23. Specifically in response to the recruitment crisis in geophysics, the RAS and the Geological Society of London, with support from the Institute of Physics, wrote joint letters to Lord Vallance, the Minister of State for Science, and to Graeme Dey MSP, the Minister for Further and Higher Education in the Scottish Government. We copied in the vice-chancellors and provosts of the universities where courses are believed to be under threat.
24. Committee members can see our points in more detail in those letters, both submitted as evidence, including a call for the kind of measures used to support subjects like physics in the 1990s and 2000s, namely the Strategically Important and Vulnerable Subjects programme¹³, and the Joint Infrastructure Fund to refurbish laboratory and research facilities¹⁴.
25. The replies from both ministers reiterated the position that the two governments do not intervene in the delivery of programmes in universities. This is disappointing, and we call on both administrations to reconsider their approach, for example in Scotland to look at placing geophysics on the list of controlled subjects (currently covering medical disciplines¹⁵) and in England in the recommendations in the White Paper on higher education we are advised will be published later this summer.
26. We did receive full support for our concerns, and calls for action from the Government, from Professor Peter Edwards, the Acting Vice-Principal of the

¹² Independent Review of the UK's Research, Development and Innovation Organisational Landscape: Final Report and Recommendations <https://assets.publishing.service.gov.uk/media/6409fda2d3bf7f02fef8832b/rdi-landscape-review.pdf>

¹³ Strategically Important and Vulnerable Subjects: The HEFCE advisory group's 2010-11 report https://dera.ioe.ac.uk/id/eprint/10338/1/11_24.pdf

¹⁴ <https://www.admin.cam.ac.uk/reporter/1998-99/weekly/5780/3.html>

¹⁵ Scottish Funding Council: University Indicative Funding Allocations 2025-26 <https://www.sfc.ac.uk/publications/university-indicative-funding-allocations-2025-26/> (see paragraphs 33 and 34)

University of Aberdeen, as well as geosciences staff there, who in addition offered to support a national effort to secure geophysics provision.

27. In their article referred to earlier, Jenkins, Gilligan and Bie recommended enhanced resources for outreach and careers advice and guidance to help rebuild the supply of applicants for geophysics programmes, and the Society would be happy to work with the BGA, university partners and others in support of this aim.
28. Our overall message across all the disciplines we represent is that the approach of not intervening in the university sector is simply no longer tenable, and needs an immediate response. If the Government is serious about growing the UK economy through the development of highly skilled people, who work in high value, well paid employment, then it must act now to secure the higher education sector.