

**Research Assessment Exercise 2026**  
**Panel 3 – Physical Sciences**  
**Panel-specific Guidelines on**  
**Assessment Criteria and Working Methods**  
(October 2024)

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## Introduction

1. This document sets out the assessment criteria and working methods that the Physical Sciences Panel of the Research Assessment Exercise (RAE) 2026 will apply. It should be read alongside the General Panel Guidelines of the exercise. The provisions set out in this document serve as further elaboration and amplification on the assessment criteria and working methods as applied to the Physical Sciences Panel. In areas where no additional information has been specified, the provisions in the General Panel Guidelines will prevail and apply in the assessment process of the Panel. These guidelines do not replace or supersede the requirements for submissions that are set out in the Guidance Notes for RAE 2026.

2. This document describes the criteria and methods for assessing submissions in the Physical Sciences Panel. It provides guidance on the type of information required in the submissions. It also provides a single, consistent set of criteria that will be applied by the Panel and sub-group(s)/sub-panel(s), if any, when undertaking the assessment having regard to any differences in the nature of disciplines of respective units of assessment (“UoAs”) under purview. It also provides a common approach to the working methods applied within the Panel.

## **Section A: Submissions**

### **UoAs under the Panel**

3. The Physical Sciences Panel will assess universities' submissions from the following UoAs –

<u>Code</u>	<u>UoAs</u>
7	physics & astronomy
8	materials science and materials technology
9	chemistry
10	earth sciences (incl. oceanography, meteorology) and other physical sciences (incl. environmental science)
11	mathematics and statistics

4. The Panel expects to receive submissions whose primary research focus falls within the respective remit of the above UoAs. The UoAs under the Panel's remit cover the full spectrum of the Physical Sciences both with respect to blue-sky research and applications thereof.

### UoA descriptors and boundaries

4.1 The table<sup>1</sup> below lists the sub-disciplines of UoAs 7 to 11.

<u>UoA</u> <u>(Research Areas)</u>	<u>Sub-disciplines</u>
7 physics & astronomy  (7a - physics & astronomy)	7a-01 astronomy & astrophysics
	7a-02 instruments & instrumentation
	7a-03 optics
	7a-04 nuclear science & technology
	7a-05 physics, applied
	7a-06 physics, atomic, molecular & chemical
	7a-07 physics, condensed matter
	7a-08 physics, fluids & plasmas
	7a-09 physics, mathematical

<sup>1</sup> Reference source: Web of Science Core Collection <<http://webofscience.help.clarivate.com/en-us/Content/wos-core-collection/wos-core-collection.htm?Highlight=Subject%20Categories>>.

<u>UoA</u> ( <u>Research Areas</u> )		<u>Sub-disciplines</u>	
		7a-10	physics, multidisciplinary
		7a-11	physics, nuclear
		7a-12	physics, particles & fields
		7a-13	quantum science & technology
		7a-14	other
8	materials science and materials technology  (8a - materials science; 8b - materials technology)*	8z-01	materials science, biomaterials
		8z-02	materials science, ceramics
		8z-03	materials science, characterization & testing
		8z-04	materials science, coatings & films
		8z-05	materials science, composites
		8z-06	materials science, multidisciplinary
		8z-07	materials science, paper & wood
		8z-08	materials science, textiles
		8z-09	nanoscience & nanotechnology
		8z-10	other
9	chemistry  (9a - chemistry)	9a-01	biochemical research methods
		9a-02	chemistry, analytical
		9a-03	chemistry, applied
		9a-04	chemistry, inorganic & nuclear
		9a-05	chemistry, medicinal
		9a-06	chemistry, multidisciplinary
		9a-07	chemistry, organic
		9a-08	chemistry, physical
		9a-09	crystallography
		9a-10	spectroscopy
		9a-11	other
10	earth sciences (incl. oceanography, meteorology) and other physical sciences (incl. environmental science)  (10a - earth sciences (incl. oceanography, meteorology);	10z-01	environmental sciences
		10z-02	geochemistry & geophysics
		10z-03	geography, physical
		10z-04	geology
		10z-05	geosciences, multidisciplinary
		10z-06	green & sustainable science & technology
		10z-07	meteorology & atmospheric sciences
		10z-08	mineralogy
		10z-09	remote sensing
		10z-10	soil science

<u>UoA</u> ( <u>Research Areas</u> )	<u>Sub-disciplines</u>
10b - other physical sciences (incl. environmental science))*	10z-11 water resources
	10z-12 other
11 mathematics and statistics  (11a - mathematics & statistics)	11a-01 mathematical & computational biology
	11a-02 mathematics
	11a-03 mathematics, applied
	11a-04 mathematics, interdisciplinary applications
	11a-05 mechanics
	11a-06 statistics & probability
	11a-07 other

\* A special code "z" is designated to denote sub-disciplines grouped under more than one research area.

### Inter-disciplinary Research

5. The Panel recognises that certain aspects of research are naturally inter-disciplinary or span the boundaries between individual UoAs, whether within the Panel or across panels. The Panel will adopt the arrangements for assessing inter-disciplinary submissions as set out in paragraphs 39-40 of the General Panel Guidelines.

6. Areas of inter-disciplinary research that are relevant to the Panel include, but not restricted to, research in physical sciences as applied to materials, life and engineering sciences and mathematical sciences relating to, but not restricted to, finance, actuary and cryptography.

### Assignment of Eligible Academic Staff in Each UoA

7. Pursuant to paragraphs 7-11 of the General Panel Guidelines, the Physical Sciences Panel expects to receive information on any sub-discipline(s) under a research area that each eligible staff member and respective research output(s) belong to. With reference to the list of sub-disciplines listed in paragraph 4.1 above, each eligible staff member could have up to four sub-disciplines applied, or the number of sub-discipline(s) equivalent to the number of his/her submitted output(s),

whichever is lower. An output could have one sub-discipline applied, which must be one of the staff member's sub-discipline(s).

8. It is critical that research outputs are assessed by the most appropriate panel. If the Panel suspects any anomaly regarding universities' assignment of eligible academic staff (and therefore their outputs) to research area(s) and UoA(s) under its remit, it will follow the procedures for re-assignment of eligible staff according to paragraphs 10-11 of the General Panel Guidelines. The Panel also recognises its responsibility to handle submissions arising from any re-assignment of eligible academic staff to the Panel. For example, the Panel would find the assignment of eligible academic staff likely susceptible to anomaly where the majority of their outputs fell outside the panel's boundary descriptor (see paragraph 4.1 above).

## **Section B: Assessment Criteria: Research Outputs**

### **Output Types**

9. The Physical Sciences Panel will consider the eligibility of research outputs as described in paragraphs 15-17 of the General Panel Guidelines, paragraphs 5.7-5.11 and Appendix E of the Guidance Notes.

10. The Panel will assess the quality of each eligible output on its own merits and not in terms of its publication category, medium or language of publication. The Panel will examine each item in detail and will not assess outputs mechanistically according to the publication venue. The Panel recognises that there can be work of the highest quality in various output forms, and no distinction will be made between types of output submitted nor whether the output has been made available electronically or in a physical form.

11. Forms of research outputs that are admissible and specifically relevant to the Physical Sciences Panel include the following examples. This list should not be regarded as an exhaustive list. Equally, there is no implication of priority or importance in the ordering of examples in this list –

- published papers in peer-reviewed journals.
- books, book chapters and research monographs.
- published conference proceedings.
- publicly accessible preprints or working papers.
- publicly accessible datasets and databases.
- awarded patents or published patent applications.
- review articles but only where these incorporate new research, or new hypotheses.
- publicly accessible software, computer code and algorithms.
- other relevant materials which are publicly accessible.

Please note the requirements for an English language abstract that includes a clear indication of what new insights or innovation are presented in outputs, as at paragraph 18 (a) of the General Panel Guidelines.

12. Research outputs will be assessed for the quality of original research they include. The Panel will accept the submission of review articles only where they contain a significant component of previously unpublished research and new insights. Such outputs will be judged only on their original research or novelty of insight. The Panel will consider communications (short research papers) as research outputs while being cognisant for the output (and associated supplementary information) to still contain sufficient detail to show originality, significance and rigour.

13. The Panel will consider subsequent editions of previous work only where they contain a significant component of previously unpublished research. Material that appeared in editions published before 1 October 2019 will not be assessed.

14. Other than the requirement in paragraph 18(a) of the General Panel Guidelines, the Panel does not require a brief statement of no more than 100 words be submitted for each output item to specify the originality and significance of the output. The panel believes that within Physical Sciences any such contextualisation should be contained in the output itself.

## **Double-weighting of Research Outputs**

15. Paragraphs 29-31 of the General Panel Guidelines indicate that in exceptional cases a submitting university may request that outputs of extended scale and scope be double-weighted in the assessment. However, given the publication patterns in Physical Sciences, this Panel does not expect to receive many items proposed for double-weighting.

16. In exceptional cases the Panel will consider the items submitted for double-weighting in line with the General Panel Guidelines. In such case, universities should submit a statement in not more than 100 words, explaining in what ways the output is of sufficiently extended scale and scope to justify the claim.

## **Co-authored/Co-produced Outputs**

17. The Panel affirms the principles and arrangements on assessing co-authored/co-produced research outputs as set out in paragraphs 32-34 of the General Panel Guidelines.

18. The Panel considers co-authorship to be a normal element of research activity in Physical Sciences and expects all named co-authors to have made a significant contribution to the research process leading to the output concerned where there are fewer than 15 co-authors. While we acknowledge that in some subfields a large number of co-authors is the normal expectation, in assessing co-authored outputs where there are 15 or more co-authors, the Panel requires a brief submission of no more than 100 words describing the specific contribution of the submitting co-author. The Panel will assess the information provided and if it considers that the co-author has made a significant contribution to the output then the output will be scored in the normal way. If, however, the Panel considers the individual co-author contribution to be very limited then the paper will be graded as unclassified.

## **Non-traditional Outputs**

19. The Panel will handle research outputs in non-traditional form according to paragraphs 35-37 of the General Panel Guidelines.

## Criteria and Quality Levels for Assessing Research Outputs

20. Panel members will use their professional judgement with reference to international standards of excellence in assessing research outputs.

21. In assessing outputs, the Panel will look for evidence of originality, significance and rigour, and will grade each output into one of the five categories of quality level as set out in paragraph 19 of the General Panel Guidelines. The generic description of the quality levels as set out in paragraph 20 of the General Panel Guidelines will be applied in the Panel's assessment.

22. The Physical Sciences Panel provides the following amplifications on the criteria of assessing research outputs –

- originality: will be understood as the extent to which the output makes an important and innovative contribution to understanding and knowledge in the field. Research outputs that demonstrate originality may do one or more of the following: produce and interpret new empirical findings or new material; propose new paradigm shift; engage with new and/or complex problems; develop innovative research methods, methodologies and analytical techniques; show imaginative and creative scope; provide new arguments and/or new forms of expression, formal innovations, interpretations and/or insights; collect and engage with novel types of data; and/or advance theory or the analysis of doctrine, policy or practice, and new forms of expression.
- significance: will be understood as the extent to which the work has influenced, or has the capacity to influence, knowledge and scholarly thought, or the development and understanding of policy and/or practice.
- rigour: will be understood as the extent to which the work demonstrates intellectual coherence and integrity, and adopts robust and appropriate concepts, analyses, sources, theories and/or methodologies.



23. In addition, the Panel provides the following advice on their understanding of the quality definitions adopted for assessing research outputs. The Panel will take into consideration the following characteristics in particular –

- scientific rigour, integrity and excellence regarding the design, research method, execution and analysis of the work.
- whether or not the output has been subject to peer-review.
- significance of output to addition of knowledge and to the conceptual framework of the field.
- potential and actual significance of the output both within and beyond the field concerned.
- scale, challenge and logistical difficulty posed by the research detailed in the output.
- logical coherence of argument.
- contribution of the output to new theory and concepts.
- significance of output to advancement of knowledge, skills, understanding and scholarship in theory, practice, education.

### **Metrics/Citation Data**

24. Pursuant to paragraph 24 of the General Panel Guidelines, the Panel acknowledges that metrics and citation data may serve as advisory or secondary information, and that they should not be used in any algorithmic or deterministic way for the evaluation of research quality.

25. While the Physical Sciences Panel will examine each output in detail for the assessment, the Panel may use article-level metrics such as citation data contextualised by sub-discipline and year of publication to inform its assessment of individual items. However, such metrics and data will not be used in any algorithmic or deterministic way for the evaluation of research quality. The Panel is aware of the limitations of citation data, in particular their variability within as well as between disciplines, and the need to consider that some excellent work takes time to demonstrate its full achievements.

## **Additional Information on Research Outputs**

26. Other than the information required on research outputs as specified in the Guidance Notes, and unless specifically required by the Panel during the assessment process, no other information should be provided, and the Panel will take no account of any such information if submitted.

## **Section C: Assessment Criteria: Research Impact**

### **Range of Impacts**

27. The Physical Sciences Panel will accept submissions on research impacts that meet the generic definition and criteria as set out in paragraphs 47-49 of the General Panel Guidelines.

28. The Panel will assess the quality of all eligible impact submissions based on their merits on equal footing with no consideration given to the differences among submitting universities/units in terms of staff size, resources and histories. The Panel recognises that impacts within its remit can be manifested in various ways and may occur in a wide range of spheres whether locally, regionally or internationally.

29. Examples are provided to illustrate the range of potential impacts from research across the Physical Sciences Panel in Table A. These examples are indicative only and are not exhaustive or exclusive. Equally, there is no implication of priority or importance in the ordering of examples in the list.

30. Universities are expected to submit their strongest impact cases and not to align submitted cases specifically with the particular types of impact listed, as an impact case may describe more than one type of impact, see Table A below.

Table A: Examples of Impact<sup>2</sup>

Impacts on the economy	<ul style="list-style-type: none"> <li>• Gains in productivity have been realised as a result of research-led practices.</li> <li>• A spin-out or new business has been created, established its viability, or generated revenue or profits.</li> <li>• Contributing to economic prosperity, adoption of new policies or procedures, innovation and entrepreneurial activities through licensing and similar to existing or new companies.</li> </ul>
Impacts on the environment	<ul style="list-style-type: none"> <li>• The management of an environmental risk or hazard has changed.</li> <li>• Ensuring the supply of resources critical to the sustainability and development of infrastructure, technologies, and economic growth and stability.</li> <li>• The management or conservation of natural resources (e.g. water) has been influenced or changed.</li> <li>• Changes in practices or policies.</li> </ul>
Impacts on public policy and services	<ul style="list-style-type: none"> <li>• Policy decisions or changes to legislation, regulations or guidelines have been informed by research.</li> <li>• Policy or public debate has been stimulated or informed by research evidence.</li> <li>• Influencing the work of public or non-governmental organisations.</li> </ul>

<sup>2</sup> Examples of impact case studies in RAE 2020 may be accessed online at <<https://impact.ugc.edu.hk/>> and <<https://www.ugc.edu.hk/eng/ugc/activity/research/rae/2020/impacts/submissions.html>>. Other examples of research impact as assessed in other jurisdictions may be accessible online such as <<https://results2021.ref.ac.uk/impact>> from the United Kingdom.

Universities may also refer to examples of impacts and indicators detailed in Annex A of <[https://2021.ref.ac.uk/media/1450/ref-2019\\_02-panel-criteria-and-working-methods.pdf](https://2021.ref.ac.uk/media/1450/ref-2019_02-panel-criteria-and-working-methods.pdf)> of the United Kingdom Research Excellence Framework 2021.

Impacts on quality of life and welfare	<ul style="list-style-type: none"> <li>• Improved provision or access to services.</li> <li>• Improved standards of training.</li> <li>• Improving health within society through new treatments and procedures.</li> <li>• The user experience has improved.</li> </ul>
Impacts on society and culture	<ul style="list-style-type: none"> <li>• The awareness, attitudes or understanding of (sections of) the society have been informed or enhanced.</li> <li>• Enhancements to preserving, conserving and presenting culture heritage.</li> <li>• Generating new ways of thinking that influence discussion and debate within society.</li> <li>• Improving the Public Understanding and Engagement with research issues and their implications.</li> <li>• Instigating change within the broader educational sector.</li> </ul>

## Impact Strategy

31. Universities are reminded to set out their impact strategy in the University-level and UoA-level Environment Overview Statements.

## Impact Case Study(ies)

32. Following paragraphs 7.7 (a) and (b), 7.9-7.10 and Appendix F of the Guidance Notes and also paragraph 51 of the General Panel Guidelines, submitting units are required to provide a narrative account in each case study that should be coherent, clearly explaining the relationship between the research and impact, and evidence of the nature of the changes or benefits arising during the assessment period.

33. Each impact case study must include appropriate evidence and indicators that support the claims for the impact achieved, including who and what has/have benefitted, when the impact occurs/occurred, and the relationship between the case study and how it has/had sustained further innovation and impact. Individual case studies may draw on various

evidence and indicators, which may take different forms depending on the type of impact.

34. Examples are provided in Table B to illustrate potential evidence or indicators that may be mostly relevant to the Physical Sciences Panel. These examples are not intended to be exhaustive. Equally, there is no implication of priority or importance in the ordering of examples in the list.

Table B: Examples of Evidence or Indicators for Impact<sup>3</sup>

Quantitative indicators	<ul style="list-style-type: none"> <li>Quantitative data relating to cost-effectiveness.</li> <li>Performance measures (e.g. sales, turnover, profits associated).</li> <li>Audience or attendance figures.</li> <li>Analysis of audience or participant feedback.</li> </ul>
Documentary evidence	<ul style="list-style-type: none"> <li>Documented changes to public policy / legislation / regulations / guidelines.</li> <li>New professional codes and standards.</li> <li>Licences awarded and brought to market.</li> </ul>
Engagements	<ul style="list-style-type: none"> <li>Commercial adoption of new technology, process, knowledge or concept.</li> <li>Application or incorporation in professional best practice, training and continuing development materials.</li> <li>Evidence of policy or public debate.</li> </ul>
Independent testimony	<ul style="list-style-type: none"> <li>Formal acknowledgements of and/or evaluations by relevant beneficiaries, bodies and organisations.</li> </ul>
Reviews and citations	<ul style="list-style-type: none"> <li>Citations and reviews outside the academic literature, e.g. in policy, regulatory, practice documents.</li> </ul>

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<sup>3</sup> See footnote 1.

35. The Panel provides the following advice on particular aspects of impact case studies –

- Applied research is important and fully valued in the assessment of outputs. However, impact is about the outcomes/benefits of the research rather than the research itself.
- In presenting the evidence for impact, one must distinguish activity, however worthwhile, from the resulting impact itself.
- Impacts from research can arise over many years. The assessment of impact case studies pertains only to impacts that have occurred during the assessment period.
- The assessment will be based upon the impact(s) that have been evidenced to occur during the assessment period rather than any prediction of possible or future impact(s) of the research.

### **Underpinning Research**

36. The Panel acknowledges the level of quality required for research underpinning impact cases, i.e. equivalent to at least 2 star (2\*) or international standing, as stipulated in the General Panel Guidelines. Impact case studies should include appropriate evidence or indicators of the quality of the underpinning research, such as details on number of citations/peer-reviewed funding received. Where necessary, the Panel will review the outputs concerned in order to ensure the quality of the research is of at least 2 star (2\*).

37. Provided that the Panel is satisfied that the quality threshold has been met, the quality of the underpinning research will not be taken further into account in the assessment of the quality of impact. Underpinning research referenced in a case study may also be submitted for assessment under the research output element. The evaluation of the outputs concerned under the impact element is a separate assessment only for assuring the threshold of underpinning research. In this case, the guidance on output types and criteria for assessing research outputs as stipulated in paragraphs 9-14, 20-23 above would apply.

## Criteria and Quality Levels for Assessing Research Impact

38. Panels will exercise their expert judgement in assessing the quality of each impact submission and will not judge in terms of the type of research underpinning the impact cases.

39. In assessing impacts, the Panel will look for evidence of reach and significance, and will grade each impact submission as a whole and give a rating using one or more of the five categories of quality level following paragraphs 53-55 of the General Panel Guidelines. In respect of the Physical Sciences Panel, the criteria of reach and significance will be understood as follows –

- reach: the extent and/or diversity of the beneficiaries of the impact, as relevant to the nature of the impact. Reach will be assessed in terms of the extent to which the potential constituencies, number or groups of beneficiaries have been reached; it will not be assessed in purely geographic terms, nor in terms of absolute numbers of beneficiaries. The criteria will be applied wherever the impact occurred, regardless of geography or location, and whether in Hong Kong or elsewhere. For example, the Panel will evaluate the extent to which society as a whole, communities or individuals have been benefitted or been positively affected from the impact.
- significance: the degree of beneficial effects to policies, practices, perspectives or awareness of organisations, communities or individuals, constructive change to the prevention or reduction of harm, risk or cost.

40. The Panel will make an overall judgement about the reach and significance of impacts, rather than assessing each criterion separately. The criteria will be applied in the assessment of the research impact regardless of the domain to which the impact relates.

## **Section D: Assessment Criteria: Research Environment**

### **Research Environment**

41. The Physical Sciences Panel will accept submissions on research environment according to paragraphs 57-58 of the General Panel Guidelines. The Panel recognises that excellent research can be undertaken in a wide variety of research structures and environments. The Panel has no pre-formed view of the ideal size or organisational structure for a research environment. The Panel will assess each submission based on what has been presented in relation to the work of the submitting unit in providing and ensuring a good environment.

42. A research environment submission includes one University-level Environment Overview Statement across the same university, and one UoA-level Environment Overview Statement and environment data for each UoA. The UoA submissions may relate to a single coherent faculty and equally to multiple departments, and may depict the commonalities and dynamics among faculties and departments within the submitting unit, and define their prime activities, how they operate and their main achievements.

### **Environment Overview Statements (One University-level Environment Overview Statement across the University and One UoA-level Environment Overview Statement for Each UoA)**

43. Following paragraphs 9.6 (a) and (b), 9.7, 9.8 and Appendix G of the Guidance Notes, and also paragraphs 59 & 60 of the General Panel Guidelines, the Panel will use the information provided in the University-level Environment Overview Statement to inform and contextualise their assessment of relevant sections of the UoA-level Environment Overview Statement. Submitting units are required to describe how they have supported the conduct and production of research, in the context of the university's policies as set out in the University-level Environment Overview Statement.

44. Within the terms of the Guidance Notes, the Physical Sciences Panel will expect in particular to see the following in the –



#### 44.1 University-level Environment Overview Statement

- context and mission: an overview describing the submitting university's size, structure, mission and stage of development in view of its role statement so as to provide a context for the submission.
- research policy and strategy: describing the institutional strategy for research (including research strengths, research focus areas, distribution of research activities across research areas), enabling impact (including stakeholder engagement and knowledge transfer), developing a sustainable research culture (including open access and open data policies, approach to contributing to the Sustainable Development Goals, how inter-disciplinary and collaborative research has been supported, how research integrity and research ethics are embedded in the institution), and how the overall institutional policy and strategy contribute to government priorities.
- people: institutional staffing strategy, staff development and training (e.g. recruitment, leave policies, equality and diversity agenda, measures/facilities for early career researchers/research students, etc.), and development, training and supervision of research students.
- research funding sources: breakdown by funding source as a percentage total of overall funding; and university-level resources, infrastructure, and facilities available to support research and impact.

In the context of research environment, the university is encouraged to comment on the extent to which generative AI technologies have been addressed, applied or used within any of the above elements.

#### 44.2 UoA-level Environment Overview Statement

In the context of the university's policies as stipulated in the University-level Environment Overview Statement –

- UoA context and structure: brief description of the organisation and structure of the unit, which research groups are covered in the submission and how research is structured across the submitting unit.
- research and impact strategy: evidence of the achievement of strategic aims for research and impact during the assessment period, details of current/future strategic aims and goals for research and impact; how these relate to the structure described above; and how they will be taken forward; methods for monitoring attainment of targets; new and developing initiatives not yet producing visible outcomes but of strategic importance; identification of priority developmental areas for the unit, including research topics, funding streams, postgraduate research activity, facilities, administration and management.
- research integrity and research ethics: give evidence of the steps taken to ensure that the research is undertaken in an ethical manner with rigour, honesty and care and respect for those involved in the process. Research conducted with integrity leads to findings people can trust and have confidence in. Disciplinary best practice may consider, but is not limited to, issues ranging from approaches to training, ensuring dissemination and accessibility of results, data availability, registration of protocols, ethical compliance, authorship policies, reproducibility, open research, participatory research, the handling of conflicts of interest and intellectual property, and approaches to dealing with allegations of research misconduct and questionable research practices.
- people: evidence of staffing strategy, staff development and training (e.g. leave policies, equality and diversity agenda, measures for early career researchers, etc.) and evidence of their effectiveness; how individuals at the beginning of their research careers are being supported and integrated into the research culture of the submitting unit; information on postgraduate recruitment, training and support mechanisms; measures/facilities for development and supervision of research students.

- income (e.g. grants received), infrastructure and facilities: information on research funding portfolio; evidence of successful generation of research income; major and prestigious grant awards made by external bodies on a competitive basis; provision and operation of research infrastructure and facilities, including special equipment, library, technical support, space and facilities for research groups and research students; information on joint-university or cross-institution shared or collaborative use of research infrastructure.
- collaborations: information on support for and exemplars of research collaborations; mechanisms to promote collaborative research at local and international level; support for inter-disciplinary research collaborations; research collaboration with research users.
- esteem: prestigious/competitive research fellowships held by individual researchers; external prizes, awards and election to fellowships and academy membership in recognition of research achievement.
- contribution to the discipline or research base: exemplars of leadership in the academic community such as advisory board membership; participation in the peer-review process for grants committees or editorial boards.

In the context of research environment, the submitting UoA is encouraged to comment on the extent to which generative AI technologies have been addressed, applied or used within any of the above elements.

## Environment Data

45. Following paragraphs 9.6 (d) and (e), 9.9 and Appendix H of the Guidance Notes, and also paragraph 61 of the General Panel Guidelines, submitting units are required to provide environment data in conjunction with the UoA-level Environment Overview Statement. The Panel will consider the environment data within the context of the information provided in the UoA-level Environment Overview Statement, and within the context of the disciplines concerned.

46. Data on “staff employed by the university proper” and “graduates of research postgraduate programmes” will be used to inform the Panel’s assessment in relation to “people” (section (4) of the UoA-level Environment Overview Statement). Data on “on-going research grants/contracts” will be used to inform the Panel’s assessment on “income (e.g. grants received)” (part of section (5) of the UoA-level Environment Overview Statement). Additional quantitative data or indicators that are particularly relevant to the Panel are indicated in paragraph 44 above. Such additional information should be submitted within the appropriate section(s) of the UoA-level Environment Overview Statement.

### **Criteria and Quality Levels for Assessing Research Environment**

47. Panels will exercise their expert judgement in assessing the merits of each environment submission, and will not judge automatically in terms of the scale of research environment concerned.

48. In assessing environment, the Panel will consider research environment in terms of vitality and sustainability, including its contribution to the vitality and sustainability of the wider discipline or research base. The Panel will grade each environment submission with weighting attached to individual aspects as follows –

- research and impact strategy – 10%
- research integrity and research ethics – 10%
- people – 15%
- income (e.g. grants received), infrastructure and facilities – 30%
- collaboration – 15%
- esteem – 10%
- contribution to the discipline or research base – 10%

The Panel will use one or more of the five categories of quality level as specified in paragraphs 63-65 of the General Panel Guidelines for assessing each aspect within the environment element and by aggregating assessments of individual aspects to form an overall assessment for each UoA-level environment submission.

49. The Physical Sciences Panel provides the following amplifications to supplement the generic criteria for assessing research environment –

- vitality: the extent to which a unit supports a thriving and inclusive research culture for all staff and research students, that is based on a clearly articulated strategy for research and enabling its impact, is engaged with the local and international research and user communities and is able to attract excellent postgraduate and postdoctoral researchers through a worldwide reputation.
- sustainability: the extent to which the research environment ensures the future health, diversity, wellbeing and wider contribution of the unit and the discipline(s), including investment in people and in infrastructure, and where appropriate for the subject area, the extent to which activity is supported by a portfolio of research funding.

50. The Panel will make an overall judgement about the vitality and sustainability of research environments, rather than assessing each criterion separately. The quality standards for assessing research environment will be those indicated in paragraph 65 of the General Panel Guidelines.

## **Section E: Working Methods**

### **Use of Sub-Group(s)/Sub-Panel(s)**

51. There will not be any sub-group or sub-panel formed under the Physical Sciences Panel. The final assessment and grading will be a collective decision of the Panel.

### **Allocation of Work in the Assessment Process**

52. The Convenor, consulting the Deputy Convenor and other panel members, as appropriate, will allocate work to members and, if necessary, lay members, impact assessors and/or external reviewers in light of their expertise and workload. In allocating the work, the Convenor will also take into account any potential conflicts of interest of respective panel members and assessors. All panel members will take account of the requirements of

the General Panel Guidelines to ensure that the exercise is conducted fairly and equitably.

53. Panel members will examine the submitted outputs in detail and put forward a recommendation to the Panel for a collective decision on the final grading. To ensure fairness and consistency, each research output will be assessed in detail by at least two members, one of whom should be a non-local member to the extent possible. For UoA(s) which is(are) only housed at one or two local universities, submissions will be assigned to at least one non-local member in order to ensure fair and impartial assessment. Final grading on research outputs will be decided by the Panel as a whole.

54. Subject to conflicts of interest of individual members, the impact and environment submissions will be assessed by panel members and/or impact assessors in respective UoA(s) or research area(s) under the Panel. Final grading of individual submissions will be a collective decision of the Panel.

55. Where appropriate, the Panel will decide, by exercising their professional judgement, whether lay members (local “research end-users” or professionals in respective fields from business, government, industry and the arts, who need not be academics) with suitable expertise will be invited to take part in the assessment. Lay members who are academically qualified may also be invited for assessment of research outputs and research environment. The engagement of lay members will be by invitation from the Panel on a case-by-case basis only.

### **Cross-Panel Referrals**

56. This Panel will follow the procedures in paragraphs 41-43 of the General Panel Guidelines when initiating referrals to other panels and assessing submissions cross-referred by another panel.

57. Generally, research on pedagogy and education issues submitted to this Panel will be assessed by panel members or external reviewers with expertise in pedagogy or cross-referred to Panel 13 – Education.

58. Cross-panel referrals are envisaged in areas such as, but not restricted to: biomedical engineering (to Panel 1 or 2) and device engineering (to Panel 4, 5, 6).

### **External Advice**

59. This Panel will follow the procedure in paragraph 67 of the General Panel Guidelines when referral to external reviewers for expert advice becomes necessary for panel assessment. External reviews may be sought in the cases for which members of the Panel do not have the necessary expertise such as outputs in a foreign language or niche research work.

### **Trial Assessment**

60. With reference to paragraphs 91-93 of the General Panel Guidelines, the Panel will conduct a trial assessment using a sample of submissions selected from universities' submissions. These sample submissions will be assessed by all members of the Panel. Members will share among themselves any important observations in the assessment to ensure fairness and consistency in the actual assessment. Submissions used for the trial assessment will be assessed afresh during the main assessment period regardless of their assessment results during the trial. The Panel will decide on the sample size after the submissions are received.

### **Panel Feedback Report**

61. With reference to paragraph 73 and Appendices E and F of the General Panel Guidelines, the Panel will provide feedback to the University Grants Committee (UGC) after the assessment process. Non-local panel members will be involved in offering comments for an impressionistic international comparison. The Convenor on behalf of the whole panel will submit the panel feedback report to the UGC by November 2026. Sector-wide comments in the panel feedback report will be released for public information after announcement of the RAE results. Comments on individual universities will be provided to the respective universities under confidential cover in accordance with paragraph 11.3 of the Guidance Notes.