

# **Chair in Emerging Technologies**

**Applicant Guidance Notes 2020/21**

**Deadline: 11 February 2020**

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## Introduction

The Academy’s Chair in Emerging Technologies scheme aims to identify global research visionaries and provide them with long-term support to lead on developing emerging technology areas with high potential to deliver economic and social benefit to the UK.

As part of a wider investment in research talent from the National Productivity Investment Fund, the government has provided funding for eight new Chairs to be appointed in the 2020/2021 call.

**Please note this is the last call under the Investment in Research Talent funding cycle. As of time of publication (7 October 2019), future Chair in Emerging Technologies calls are yet to be confirmed.**

In addition to covering employment and research costs for the Chair over a period of up to ten years, the award enables sustained focus on advancing the technology to application in a strategic manner.

Such awards require a powerful case to be made for the value of an extended long-term vision through to application of the technology. This in turn should show the value for funding that provides sustained support for a world-leading researcher, ensuring continuity of their focus across other grants and contracts and removing any expectation of duties that do not support the technology programme.

It is often the nature of an emerging technology that its potential is not widely appreciated until championed by a visionary individual who can set out clearly the opportunities it offers. Thus, this call is deliberately broad and open, and we encourage applications that make a case for disruptive innovation in well-established areas or overlooked fields as well as new emerging technologies.

Applications are welcome from across a broad range of engineering and technology areas including research topics currently considered basic science, but which now require engineering ways of thinking to drive them towards application and in more-established technology areas where the applicant has identified a high-impact novel approach. Evidence of proof of concept should already be established. Beyond this, we are not prescriptive about the Technology Readiness Level or similar assessment of innovation readiness expected of applications. However, we do require a clear ten-year research vision underpinning the proposal that will make a significant difference to how the emerging technology is taken forward and the consequential economic and social benefit to the UK.

**The emerging technology should not be a set of techniques or an optimisation of existing technologies for new applications.**

The Academy welcomes applications from high-calibre researchers currently based outside the UK, in line with the government's Rutherford Fund to attract global talent to the UK. The Academy is committed to diversity, and encourages applications from women and other groups who are currently underrepresented across engineering.

The appointed Chairs will:

- lead major research, translation and innovation programmes around key emerging technologies,
- build world-leading centres of excellence in strategically important technologies, supporting their commercialisation and adoption,
- build and maintain a strong network of industrial and other partners to facilitate technology commercialisation and the creation of significant UK economic and social benefit.

These will in turn allow the UK to gain comparative advantage across a range of disruptive or platform technologies, and enable the opportunity for the nation to capture greater value from these advances.

As well as funding for their post, the appointed Chairs will be provided with:

- Mentors, who are Fellows of the Academy, with expertise of relevance to the programme of research, to provide independent advice and guidance throughout the duration of the award.
- Networking and training opportunities with and through the Academy's Fellowship and events programme.

- Support for Tier One (Exceptional Talent) visa for applicants based outside the UK.

### Eligibility criteria

- All projects must commence on **1 October 2020**, and end on **30 September 2030**. Applications with alternative dates will not be eligible.
- Chairs in Emerging Technologies are professorial appointments. Applicants who haven't been awarded a Professorial title, but have demonstrated research achievements such that they would be strongly considered for Professorial promotion at present, are eligible to apply. In supporting the submission, the university is understood to be affirming this. It is the Academy's expectation that successful non-Professional awardees gain a Professorial title upon becoming a Royal Academy of Engineering Chair in Emerging Technology.
- Awards can only be held at a university, or jointly between the university and an organisation (e.g. national laboratory, research institute, or innovation organisation), based in the UK. The Academy's contract will exclusively be with the university.
- A letter of appointment from the university (which may be conditional on receipt of the award) must be provided if the applicant is currently based outside the UK university system.
- All applications must include a letter of support from a Dean, Pro-Vice Chancellor for Research, or someone in an equivalent position, clearly outlining university's commitment to supporting the emerging technology field, and, the applicant as a global leader of the field. The expected contents of this letter are detailed towards the end of this document under title 'Letters of support and declaration'.
- Applications are welcome from across a broad remit of engineering and technology, including areas currently considered basic science, but now requiring engineering ways of thinking to drive them towards application, and in areas where technologies are well-established but could be significantly improved by novel approaches.
- Applications must be centred on enabling and driving technological innovation. Therefore, proposals whose vision is primarily around scientific advance for its own sake are not appropriate to this scheme.
- All applications must make a clear case for long-term sustained strategic support for the technology programmes. Thus, the proposal must cover a long-term vision that shows the value of the entire 10 years of appointment. Similarly, proposals whose innovation benefits are fully realisable from separate shorter duration projects are not appropriate and will not be supported.
- We will not fund activities that are primarily aimed at addressing the clearly articulated needs of a single industry partner over the next five years and would be more appropriate for our [Research Chairs/ Senior Research](#)

[Fellows scheme](#). Current RAEng Research Chairs are eligible to apply, but will need to show how their strategic vision is compatible with existing commitments to industrial partners and that their salary will not be double funded by the Academy.

- The duration of the award is up to 10 years – initial 5 years with the possibility of extension for a further 5 years following a full review of award holder’s achievements and outcomes, and the project’s potential for commercialisation and impact over the next 5 years.
- Applications that are incomplete or do not adhere to the guidelines will not be accepted.

We would like to support you to achieve a balance between your personal and work demands. We are happy to discuss individual requirements and consider part time and other flexible working arrangements.

### **Submission deadline**

The submission deadline for this round of applications is **4pm on Tuesday 11 February 2020**. Incomplete applications or applications submitted after this deadline will not be accepted.

### **Contact**

If you have any further questions or queries related to this scheme, please email [Keir Bonnar](#) (Programme Manager).

### **Mentoring and Monitoring**

The awardee will be assigned a mentor (a Fellow of the Academy) to provide independent expert advice and guidance throughout the duration of the award. The mentor will also formally monitor the progress of the Awardee for the Academy.

The awardee must submit an annual progress report to the Academy, which will be reviewed and evaluated by the assigned mentor. The Academy may also convene an annual review meeting, at which the awardee, the university’s head of department/school, the mentor and a member of Academy staff, will discuss progress and agree future plans.

Annual reports should follow the reporting guidelines which will be provided by the Programme Manager post award, and will cover such aspects as: the progress made against the proposed programme, performance indicators, size of the team and dissemination activities undertaken over the past year.

A full review will be carried out in the fifth year of the award to confirm funding to the full ten-year duration. Chairs that have not made satisfactory progress towards achieving economic and social impact will be terminated after the initial five years. Similarly, awards will be terminated where institutions have not fulfilled their commitments made at the time of application.

## How to apply

All applications must be submitted via the Academy's online grants system available here: <https://grants.raeng.org.uk>

All Applicants must first register and provide some basic log-in details to create a profile.

You must get approval and support for your proposal from your Dean/ Pro-Vice Chancellor (or similar) and the research grants office prior to submitting an application. We advise consulting them as soon as possible about a potential application.

The application should be submitted by the applicant and we recommend leaving plenty of time to complete the application form ahead of the deadline and thoroughly going through your application prior to submission.

The 'Guidance Notes' are imbedded within the system itself, however we recommend you keep this document to hand when completing the application form.

Many of the questions have prescribed word limits which are designed to keep your answers focused and to give you an indication of the level of detail we require. In such cases the number of words you have used will be displayed beneath the question and updated in real time. If you have any questions concerning the application or the online grants system, please contact [Keir Bonnar](#) (Programme Manager).

## Completing the application form

After logging into the online grants system and selecting the Chair in Emerging Technologies in the 'Start application' section, you should be presented with the "Instructions" screen. Here you will see some general instructions on how to use the system as well as links to each of the seven sections of the application form given below:

1. Applicant & university details
2. Project details and person specification
3. Case for support
4. Intended impact
5. Funding requested
6. Marketing & notifications
7. Letters of support and declaration

At any stage in the application process you can save your work and return to it at a later time. You can answer the questions in any order you like so you may freely skip some sections to return to later if you so wish. It is therefore worth viewing the application early on for an indication of what is required, and you should also ensure that you have all the necessary documentation when you start completing the application, such as a copy of your CV or letters of support.

## 1. Applicant & university details

### Q – Applicant contact details

Please provide your name, job title and contact details including postal address and a telephone number. Some of your details and those of your institution should be automatically generated by the system, as you provided these at registration. Please ensure the contact email address is correct and will be valid for the entirety of the application process as this will be the main method of communication regarding the application.

### Q – Contact details of employer and host organisation

Please provide the name and contact details for both your current employer and your chosen host UK university and, if applicable, the partner organisation in conjunction to the university that will appoint you during the entirety of your award. Applications can be a joint appointment between a university and another UK organisation. Examples include National Laboratory, research institutes, or innovation organisations. Please mark the host UK university as the lead.

### Q – Country of residence

Please state your country of residence at the time of application.

## 2. Project details and person specification

Here you will provide a few summary details of the application and details for the person specification.

### Q – Project title

Your project title should not be longer than 10 words and should be understandable to a non-specialist reader. The essence of the research should be captured in the title and should be as informative as possible.

### Q – Project start date and end date

Please enter your proposed start and end dates. **Note:** All proposals awarded in this round must start on **1 October 2020 and end on 30 September 2030**.

Where the Chair is new to the host university, their employment can begin after 1 October 2020 but no later than 31 December 2020. In such cases the award must still end by 30 September 2030 as the proposed project is expected to start 1 October 2020, ahead of the award holder's start date at the university (see 'Funding requested' section). The Academy must be informed of the specific start date of the Chair at the time of acceptance of the award.

### Q – Subject area

Select the broad engineering category that best describes your research area. This will be used to guide the reviewers. If your research fits into several categories, please pick the category which is most applicable to your proposal. The categories are:

**MECHANICAL** (Mechanical, aeronautical, marine and manufacturing engineering)

**CIVIL** (Civil, structural, environmental, public works and building services engineering)

**ELECTRICAL & ELECTRONICS** (Electrical, electronic, control engineering, and materials for electronics and electronics in and healthcare)

**CHEMICAL & PROCESS** (Chemical, bio- and biomedical engineering, fuel, process, mining and materials engineering)

**INFORMATICS** (Information and communications technology, Telecommunications, networks and systems, computing and informatics)

*Q – Subject*

Please add keywords for your proposal to further define the area of your project. This will help us identify expert reviewers for your application.

*Q – Declare Conflicts of Interest*

Please list potential reviewers who would have a conflict of interest and therefore would not be able to review this application. Listing should be made in the following format: Dr John Xyz [ABC University], Prof. Jane Abc [XYZ University].

*Q – Extended Synopsis*

Describe the programme and its expected outcomes in terms that can be understood and evaluated by a reviewer with extensive engineering and technology innovation expertise, but not necessarily any familiarity with the particular field of the proposal.

The extended synopsis should set out:

- the area of emerging technology, making a case for its strategic significance, and the potential for economic and social benefit to the UK;
- your vision for the long-term application of the technology;
- the distinctive contribution that you can make to realising that vision with sustained personal support, including expected outcomes.

You have up to 700 words to answer this question.

*Q – Challenge areas related to your proposal*

Please list any specific challenge area(s) where long-term impact could arise as a result of your project being awarded such as the four [Grand Challenges](#), [Eight Great Technologies](#), [Sustainable Development Goals](#) and the areas highlighted in the [Industrial Strategy Challenge Fund](#). Maximum 250 words.

*Q – Applicant's CV*

The format and content of your CV is left to your discretion. You do not need to include contact details here again as these are included earlier in the application. Please include the following: your research track record, a list of key publications and conference presentations, PhD students supervised, awards and prizes

received, and details of grant income secured. The CV should be uploaded as a PDF but the file size should be less than 5MB.

*Q – Applicant’s track record*

Outline how your professional experience and academic track record makes you suitable of this award along with benchmarking your capabilities against peers and individuals and competitors in the same fields globally. Maximum 500 words.

### **3. Case for support**

This section should expand upon the case made in the Extended Synopsis.

*Q – Area of emerging technology and vision*

Please expand upon your description of the area of emerging technology you wish to pursue and your vision for the long-term application of the technology. Please make a case for the timeliness of the case in the context of “emerging technology”. Expand upon the case for the distinctive contribution you make towards realising that vision with sustained personal support over the ten-year period of this award. A maximum of 700 words available for this section.

*Q – Significance of the emerging technology*

You should make a case for its strategic significance, relationship between the emerging technology and wider UK technological priorities, and the potential for economic and social benefit to the UK. Particularly consider the potential for the UK to gain comparative advantage in disruptive or platform technologies, and the opportunity for the nation to capture greater value from these advances. A maximum of 500 words is available for this section.

*Q – Goals and objectives*

Please state the goals and objectives for the project, distinguishing those of highest priority. All award holders are expected to:

- lead major research, translation and innovation programmes around key emerging technologies
- build world-leading centres of excellence in strategically important technologies, supporting their commercialisation and adoption
- build and maintain a strong network of industrial and other partners to facilitate technology commercialisation and the creation of significant UK economic and social benefit.

Please explain how your programme will deliver such goals. Please note that should you be supported; your performance will be assessed against these objectives. You have 500 words to complete this section.

*Q – Research programme, methodology and key deliverables*

Describe the ten-year work programme, indicating the research to be undertaken and the methodology to be used in pursuit of the research. Outline specific deliverables anticipated. Also include details on how novel, realistic/ambitious the project is, and include milestones by which to measure progress. A maximum of 3,000 words is available for this section.

*Q – Images and pictures (optional)*

Use this section to upload any pictures related to your project, as a **single PDF** document with the images in the order you would like them viewed and reference them in your response to the methodology questions.

*Q – Gantt chart*

Upload a Gantt chart in PDF format detailing the plan and timeline for the project over the **ten-year period**.

*Q – Risk management*

Identify and assess any risks that may jeopardise the success of the project. Outline any contingency plans designed to mitigate these risks. You have 300 words to complete this section.

*Q – Choice of host organization*

Provide justification for the choice of your host institution. Provide background to the research group/centre of excellence, including comparison with other centres in the UK and its scale (how large is it, staff numbers, funding, research facilities). A maximum of 150 words is available for this section.

#### **4. Intended impact**

*Q – Plans for outreach/public engagement*

Describe plans for public engagement and outreach to increase impact of your research project over the ten-years of the award. The Chairs are highly prestigious positions, and the holder will be expected to be a leader and a champion for UK activities in their field and delivery of impact. Chairs should expect to be called upon by the Academy to take part in activities relating to the UK's innovation strategy and the implementation of their technology. You have 300 words to complete this section.

*Q – Beneficiaries and impact*

What are the benefits of this research? Quantify the extent of the benefits and identify potential beneficiaries. If the benefits do not directly relate to wealth creation and/or to improving the quality of life, give details of other beneficiaries and explain their importance. Also indicate when these impacts are likely to accrue. You have up to 300 words to answer this question.

*Q – Exploitation*

How will the results be exploited? In the previous question, you explained what the benefits of the research are. Here you should explain how the benefits and impacts mentioned above will be achieved.

Identify what mechanisms are in place for identification, protection and subsequent exploitation of any deliverable which may arise from the research (including details of any specific collaborative agreement, where relevant). You should also indicate when these routes to exploitation are likely to be implemented over the ten years. You have up to 800 words to answer this question.

## 5. Funding requested

### *Q – Financial expenditure summary*

The total value of each award can be up to a maximum of **£2,780,000** for the full ten years of award. Of this, up to £207,000 can be dedicated to start-up costs of the project, to be spent over the first two years. (If the award holder is in the process of joining the proposed university, these costs can be utilised ahead of the award holder's appointment by the host university, which must be no later than **31 December 2020**.)

The remainder of the funds, up to a maximum of £257,300 for each year of the award (1 October 2020 to 30 September 2030), can be utilised flexibly towards some, or all, of the following categories:

- Employment costs of Chair, calculated at 80% of direct costs (salary and on-costs). Plus, up to 80% of the associated indirect and estates cost, as calculated under the fEC methodology for that one FTE
- Research staff, including administrative support staff calculated at 80% fEC (including direct employment costs, estates and indirect costs)
- Technical support, calculated at 80% fEC (including direct employment costs, estates and indirect costs)
- Costs for research students, covering a stipend and the UK student fee
- Research expenses, including equipment, consumables, or similar calculated at 100% direct cost (Note that for any equipment worth over £10k funded from the grant, the Academy must give permission for any disposal or change of use to be used primarily outside the programme work proposed.)
- Other, including training or similar costs for the Chair, calculated at 100% direct cost, that supports leadership (e.g. mentoring training, media/public engagement, policy influencing is considered eligible costs).

The Academy does not cover the costs of an apprentice levy on any of its grants.

A summary of costings can be provided in the application form: direct costs at 80%, indirect costs at 80%, and research and other costs at 100%.

### Year 1:

- Start-up costs: £105,000
- Direct employment costs of the award holder at 80% fEC:
- Associated indirect employment costs of award holder costs at 80% fEC:
- Direct employment costs of research, support, technical staff etc. at 80% fEC
- Associated indirect employment costs employment costs of research, support, technical staff etc. at 80% fEC
- Research student costs at 100%
- Research expenses at 100%:
- Other, training or similar costs for award holder at 100%:

#### Year 2:

- Start-up costs: £102,000
- Direct employment costs of the award holder at 80% fEC:
- Associated indirect employment costs of award holder at 80% fEC:
- Direct employment costs of research, support, technical staff etc. at 80% fEC
- Associated indirect employment costs employment costs of research, support, technical staff etc. at 80% fEC
- Research student costs at 100%
- Research expenses at 100%:
- Other, training or similar costs for award holder at 100%:

#### Year 3:

- Direct employment costs of the award holder at 80% fEC:
- Associated indirect of award holder costs at 80% fEC:
- Direct employment costs of research, support, technical staff etc. at 80% fEC
- Associated indirect employment costs employment costs of research, support, technical staff etc. at 80% fEC
- Research student costs at 100%
- Research expenses at 100%:
- Other, training or similar costs for award holder at 100%:

[... And so on until Year 10 of the award]

**Total amount: £2,780,000**

**Please note:** the costing rules have changed slightly since the previous call to allow greater flexibility.

#### *Q – Financial expenditure detail*

Please upload a detailed breakdown of costs within the categories in the costing table template provided. Please upload as a **single PDF** document.

## **6. Marketing and notifications**

This section is optional and any information provided will help the Academy to understand which of our marketing materials and methods are most successful, so enabling us to improve our future communications activities. Reviewers will not see this section.

## **7. Letters of support and declaration**

This section seeks confirmation for the support that the UK host university will provide. A declaration of support is also required from the applicant's chosen UK university grants/research office or equivalent.

Q - Letter of support from the university

A Pro Vice-Chancellor, Dean or equivalent at the host university should provide this letter of support. It should be on a headed paper, signed by the author and uploaded by the applicant as a PDF.

The letter should address the points given below:

- 1) The institutional commitment to supporting the emerging technology field and the candidate as a global leader of the field. The strategic alignment with university strategy and research priorities including details of previous and planned investment and support to facilitate the development of this research group over the ten years of award.
- 2) A clear commitment to free the candidate from administrative duties and teaching that do not promote the emerging technology
- 3) Details of how the university intends to reinvest any other funding for the employment costs recovered from the award to appropriately develop the institutions capability in the field.
- 4) Qualities and capabilities of the university department hosting the applicant and how this activity relates to the research strategy of the department/school.
- 5) Outline of the capabilities and achievements of the applicant, and why they have the qualities appropriate for global leadership in this field.
- 6) The institutions approach to commercialisation and intellectual property regarding the emerging technology field.

Q - Letter of appointment from the university

A letter of appointment from the university, which may be conditional on receipt of the award, if the candidate is based outside the UK university system. This should be left blank if the candidate is currently working at the university where the award is intended to be carried out over its entirety.

Q - University declaration letter

Declaration from the applicant's chosen UK University should be completed by an appropriate officer of the Central Research Office or equivalent (i.e. the body which administers grant applications).

The letter should be on University Headed paper and should carry the signatory's name, position and the university's official stamp (if available).

The letter must confirm the application has been approved by the university, and must contain the exact wording given in the box below, as well as any further remarks the university wishes to make:

On behalf of the university I can confirm that I have read and accept the Application guidance and other information regarding this scheme which is provided on the website of the Royal Academy of Engineering, and I also confirm that:

- The costs provided in this application are correct and sufficient to complete the award as envisioned.
- Any shortfall in funding discovered after the award has been made will be covered by the university.
- If awarded, the applicant will be given full access to the facilities, equipment, personnel and funding as required by the application.
- The applicant will be employed by the university for the duration of the award.
- The applicant will be released from all teaching and administrative duties for the duration of the award, unless where these are desirable for impact of the research.
- I am authorised to approve the submission of applications for funding and this application has successfully met all our internal approval procedures.

#### Q – Applicant declaration

This section will ask the applicant to confirm that all the information they have submitted in their application is accurate and that they will update the Academy of any changes which may affect the project.

This section will also ask the applicant to acknowledge that the Academy will disclose the information contained within this application to external parties for the purpose of assessing the application.

### **Assessment of applications**

Assessment of the applications will consist of a multi-stage process, described in detail below.

Please be assured that the Academy requests anyone involved in reviewing applications to consider them in confidence. The Academy does not contact any third parties listed in the application and these details are handled in confidence.

### **Stage 1: Initial Sift**

The initial sift will be assessing applications based on the extended synopsis of the proposal, the applicant's CV and track record, and the university letter of support. This includes determining if the proposed research is within the scope of this scheme.

The Initial Sift will identify a long-list of applicants for further consideration, prioritising according to:

- The potential of the applicant to be a global leader in the emerging technology, as judged from their track record, scientific insight/originality;
- The potential of the area of emerging technology for economic and social benefit to the UK, and wider strategic significance;
- The quality of the applicant's long-term vision for the development of the technology and their distinctive contribution to it;
- The host university's commitment to appropriately support the technology programme and the applicant;
- The suitability of the application to the Chairs in Emerging Technology, rather than other Academy schemes, such as a '[Research Chair/Senior Research Fellowship](#)' award;
- Potential of the application to attract world-leading talent to the UK.

### **Stage 2: Expert Reviews**

Each proposal in the long-list will be sent to expert reviewers, expert in the technology field(s) of the proposal and commercialisation within them.

Expert reviewers will consider all the submitted application materials. They will be asked to evaluate the factors considered by the Initial Selection Panel above, as well as:

- the potential of the applicant and their vision to build a world-leading centre of excellence in the emerging technology;
- the quality of the research and innovation programme, its significance, goals and objectives, methodology and deliverables, approaches to risk and similar;
- the proposal's potential for economic and social benefit to the UK, and the viability of the approaches to commercialisation, industrial partnership and similar proposed to achieve that impact;
- the distinctive value of long-term personal support for the potential Chair in achieving the goals of the programme.

### **Stage 3: Selection Panel**

The Selection Panel will identify candidates for interview considering the comments of expert reviewers.

## Stage 4: Interviews

Interviews are currently scheduled for **Wednesday 8 and Thursday 9 July 2020**. Please reserve these dates at the time of submitting this application should you be invited for interview. Shortlisted applicants will be invited for interview the week commencing by 15 June 2020. Interviews will take place at the Royal Academy of Engineering, Prince Philip House, 3 Carlton House Terrace, London SW1 5AG. It is expected that the applicants will be notified of the outcome of their interview by the end of July 2020. Further guidance will be provided at time of invitation (including potential to interview international candidates via video-link).

## Timeline and schedule

The overall assessment schedule for this round of applications will be:

<u>Deadline</u>	<u>Stage 1 Initial Sift</u>	<u>Stage 2 Expert Reviews</u>	<u>Selection Panel</u>	<u>Stage 3 Interviews</u>	<u>Awards</u>
Submission deadline is <b>Tuesday 11 February 2020</b>	1 <sup>st</sup> stage decisions announced <b>early April 2020</b>	Reviews by experts complete by <b>end of May 2020</b>	2 <sup>nd</sup> stage decisions announced by <b>mid-June 2020</b>	Interviews <b>8 and 9 July 2020</b>	Interviewed candidates informed of the outcome of application by <b>end of July 2020</b>