



# Science and Technology Facilities Council

## STFC CDT call in Data Intensive Science Guidance Notes

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## INTRODUCTION

The UK faces a shortage of skills in managing, analysing and interpreting large, complex datasets and high rates of data flow. These skills are increasingly needed across a wide range of sectors as, aside from its many scientific applications, complex data analysis becomes an ever more important requirement underpinning many aspects of society. The STFC-funded community, driven by the need to handle the ever-increasing data rates from facilities such as the LHC, Gaia and in the future the Square Kilometre Array, is in a strong position to contribute to developing these skills by training a new generation of PhD-qualified data specialists.

This call relates to STFC's previous investment in CDTs for data intensive science but with an increased emphasis on innovation and giving the students appropriate training for future careers both in and outside of academic. Centres should nurture the capabilities, talents and skills needed to equip students to collectively address many different global challenges.

### Aim of the call

The focus of this call is addressing the data challenges presented by current and future projects within STFC's remit and applying them for broader economic and societal benefit. Allowing students to capitalise on this, the centre will be expected to develop close links with industrial / other non-academic partners and specialists in other disciplines, to ensure that knowledge and skills flow across all sectors involved.

### Funding and intake

Funding is available to support up to 5 Centres for Doctoral Training in data intensive science, starting in October 2022.

The centre will train a minimum cohort of 6 students a year on a four-year doctoral course. STFC will in the first instance fund four new students/year for three years of intake. The centre will be expected to provide at least two additional new four-year studentships each year for the same initial three years. These may be funded from industrial, institutional or other sources, but not from UKRI funding. Students funded by STFC or other Councils may also, if appropriate, be part of the centre and participate in its training activities. All departments leading the bid for the centre must already have received accreditation of their training provision from STFC.

The centre may be based in either a single institution or spread across a consortium of institutions. All departments leading the bid for the centre must already have received accreditation of their training provision from STFC.

### Key features of the centre

The centre will be expected to engage the broader user and employer community, including industry (especially small and medium enterprises) and other relevant organisations. These organisations should have active engagement in determining and providing input to the training programme and in mentoring and co-supervising students, with additional input and guidance from STFC/UKRI where appropriate.

Students will be expected to undertake an original research project, which brings together big data skills and expertise from STFC's remit (astronomy, accelerator physics, solar and planetary science, particle physics, particle astrophysics and cosmology or nuclear physics), and apply them to a different sector/industrial context during their placement. Projects should demonstrate their relationship to other STFC and UKRI investments in Data intensive science and AI where appropriate.

The non-STFC funded students will similarly be expected to undertake original research in data intensive projects. These would normally fall within STFC's remit, but could on, exception fall, outside; however, the training programme for the whole cohort of students must be coherent and add considerable value when taken together.

The centre will be required to provide a structured cohort-based training programme for the students,

particularly in their first year, in which students undertake a formal, assessable programme of taught coursework. This should be specifically designed to give them a broad and thorough grounding in computational techniques and other issues relating to big data challenges. At least six months of each studentship must be spent outside the centre in one or more private, public (including national or international facilities), or third sector organisations engaged in the development and/or use of data intensive science techniques. These placements may be undertaken in one block or split into two or more shorter periods of a minimum of three months each. They should be designed to enable students to gain additional expertise in data intensive science and develop a broader understanding on the wider uses of data intensive techniques and their application. While the skills and experience gained by the student will be beneficial to their PhD research, their time spent on placement should not be an integral part of their thesis work.

In addition, all students will be expected to access the general training opportunities required for accreditation and to enhance their understanding of the innovation process including working with industrial partners as appropriate. The centre's training activities should also develop and enhance interdisciplinary technical knowledge and demonstrate their relationship to other STFC and UKRI investments in Data intensive science and AI.

The centre will need to have an appropriate management structure, expected to comprise a director and senior management team, with independent strategic oversight which must include representation from the non-academic sector and from STFC and/or UKRI.

## TIMETABLE

<b>Call for proposals</b>	9 <sup>th</sup> September 2021
<b>Closing date</b>	11 <sup>th</sup> November 2021
<b>Assessment meeting</b>	January 2022
<b>Outcome announced</b>	Early February 2022
<b>CDT starts</b>	October 2022

## ELIGIBILITY

Any UK university or consortium of universities may apply to host a centre. Independent Research Organisations eligible for STFC studentship funding (Armagh Observatory and Natural History Museum) are also eligible to form part of a consortium. All institutions involved must be eligible to hold UKRI grants and be able to award PhD qualifications.

Centres must include a lead department at each institution. This department must be in receipt of STFC funding through the core science programme (astronomy, accelerator physics, solar and planetary science, particle physics, particle astrophysics and cosmology, and nuclear physics). Any lead departments involved in the centre must have received accreditation for their training provision from STFC by the deadline for submission.

### Lead Applicants

Any PI looking to lead a centre must meet the eligibility criteria defined in the [Research Grants Handbook](#) and be in receipt of STFC funding through the core science programme (see above).

STFC facilities are not eligible to apply to host a centre (either independently or as part of a consortium), however can be involved as a partner organisation.

### Research Organisation

All research organisations involved must be eligible to hold UKRI grants and meet the above criteria.

## Non-Academic Organisations

It is expected that industry and/or third sector organisations be actively involved in the development of the centre and its training programme and have representation on any management/advisory boards.

Non-academic organisations, (for example industry collaborators, third sector/charities, national facilities etc.) including research/training organisations and not-for-profit operations, can apply in collaboration with a lead academic partner, provided they can demonstrate that they possess the relevant technical capabilities and capacity to meet the centre's objectives.

These collaborators are expected to be **Support Partners** in developing the centre's activities.

## COVID-19

UKRI acknowledges that it is a challenge for applicants to determine the future impacts of COVID-19 while the pandemic continues to evolve. Applications should be based on the information available at the point of submission and, if applicable, the known application specific impacts of COVID-19 should be accounted for. Where known impacts have occurred, these should be highlighted in the application, including the assumptions/information at the point of submission. There is no need to include contingency plans for the potential impacts of COVID-19. Requests for travel both domestically and internationally can be included in accordance with the relevant scheme guidelines, noting the above advice.

Reviewers will receive instructions to assume that changes that arise from the COVID-19 pandemic, post-submission, will be resolved and complications related to COVID-19 should not affect their scores.

Where an application is successful, any changes in circumstances that affect the proposal will be managed as a post-award issue.

## APPLICATION PROCESS

All applications should be made *via* the Joint Electronic submission (Je-S) platform. To submit a proposal, applicants should navigate to the following:

Council: STFC  
Document Type: Studentship Proposal  
Scheme: Centre for Doctoral Training  
Call: Centre for Doctoral Training (CDT) 2021

As part of the application process, the following documents should be uploaded through Je-S and labelled accordingly. Any documents not listed, such as CVs, list of publications etc. will be returned to the lead applicant for removal.

- Je-S *pro forma*
- 14-page case for support (Mandatory)
- Letter of Support from Technology Transfer Office (Mandatory)
- Letter of Support from the Head of Department (Mandatory)
- Letter(s) of Support from industry/third sector organisations engaging with in centre (Mandatory)
- Covering Letter (Optional. Please note, cover letters will not be seen by external reviewers/the panel)

All documents should conform to the guidelines described in the [Je-S help text](#).

## Information for project partners

It is expected that project partners will contribute an appropriate level of support throughout the centre and have a vested interest in any outcomes. This information should be detailed in the Je-S application and through a letter of support. The primary investigator, who is applying through Je-S, must submit this information on behalf of the supporting partner.

## Case for Support

The case for support should be no longer than 14 pages and conform to the font and margin guidelines in the [Je-S help text](#). The case for support should be a self-contained summary of the proposed work with the necessary context given to enable panel members to make an informed judgement on the overall quality of the proposal. It should address the assessment criteria, covering the following:

### 1. **Quality and inclusivity of the training environment and approach.**

The case should set out how training specifically relevant to data intensive science will be delivered, and in what ways this will be done on a cohort basis. While there is no need to elaborate on general aspects of departmental training and supervision, as these will have been assessed as part of the accreditation process, the case should highlight the ways in which training or supervision will be enhanced through creation of the centre and cohort. This should include explaining what plans there are to train the students in skills relevant to industrial practises and ensure that research innovation / impact arises from working with the partners and through placements.

If the centre is to be distributed across more than one institution, the case should describe how the quality of the intellectual environment and interaction between students will be ensured across sites. There should be a commitment from the hosting organisations to provide a supportive and inclusive training and innovation environment including how the centre will address principles of EDI.

As forefront investments in doctoral training, STFC CDTs are expected to take a leading role in promoting Equality, Diversity and Inclusion (EDI) within their relevant areas. CDTs are expected to demonstrate a commitment to providing a supportive and inclusive training environment for all individuals involved. Plans could for example include:

- any proposed approaches, actions or plan by the CDT to further promote and improve EDI in the context of the area of research they are proposing,
- Any considerations that will take place when recruiting positions relevant to the CDT (students, supervisors, staff etc).
- What indicators will be used to measure and monitor EDI of the proposed CDT.
- How to raise awareness and mitigate against unconscious bias in the management and governance of the CDT.

### 2. **Quality of the research environment and the team.**

The case should provide a brief overview of the STFC science funded at the organisations involved, along with links to data science. It should summarise the relevant research strengths of the centre, including a list of the academic staff who would be involved in supervising and training students, with a brief summary of their expertise and relevance to the centre. Information about REF scores / funding / other indicators of research strength and impact may be included.

The case should include the relevance of the projects to be undertaken for advancing capabilities in data intensive science. The case should set out how in general the types of PhD project to be undertaken will enable students to gain advanced skills in data intensive science techniques, and how research will be undertaken in an ethical way, where appropriate.

UKRI are committed to ensure that all public funding is used to create value for society in an ethical and responsible way. Given the data-focused nature of the centres, applicants should consider the potential risks with regards for RRI, and plan accordingly. Whilst these may be difficult to articulate at the outset, RRI should be built into any research practises/projects which will be undertaken through the centre and planned for accordingly. For more information, applicants are encouraged to visit the UKRI webpage for [Responsible research and innovation](#)

### 3. **Partnerships and Engagement.**

The case should set out the links established with non-academic partners, how they have been involved

in the development of the bid, the extent of their proposed involvement in determining and providing the training programme and co-supervising students, and any direct or in kind contribution they are offering to the centre.

This information will need to be supported by statements of support from the partners and will be considered as part of the assessment process. The case should also indicate any potential for future engagement with additional partners.

It is expected that the centre's activities will generate IP in some capacity. Whilst specific details may not be known at the point of submission, there should be evidence showing how the management and ownership of IP will be undertaken through the lifetime of the centre. A letter of support from the Technology Transfer Office (or equivalent) should detail this.

The case should set out the proposed arrangements for enabling students to undertake placements with non-academic organisations, and how these will be managed / supervised. It should also state how the partner organisations will be selected, and how the placements will fit with the proposed thesis topics (i.e. how will students be matched with placements and monitored, and what is their relevance to the project?)

#### 4. **The Value for money and level of co-funding for the centre**

The case should specify how many additional 4-year data intensive science studentships (minimum 2) will be provided each year from non-Research Council sources, together with any additional contributions (financial or in kind) provided from institutional, industrial, or other sources. This additional support should include any financial contribution offered by the hosts of placements: as a minimum they are expected to cover any additional travel and accommodation costs incurred by students undertaking the placement and could also include contributions to stipend, fees and consumables/equipment costs.

In-direct contribution should also be listed, for example – representation on management/oversight boards, or any staff time given to teaching or training etc.

#### 5. **The management and governance of the centre**

The case should describe the management arrangements, briefly explaining the suitability of the director and senior management team, including representation from industry where relevant. It should also set out plans for obtaining independent strategic oversight of the centre and how students will be involved in the management process.

#### 6. **Justification of resources**

The case should provide an overview of the resources requested, including justification where appropriate (table format is recommended)

#### **Letters of Support**

Please note, Je-S only allows a max of 3 letters of support to be uploaded. Merging more into a single PDF is recommended as required. All submissions:

- Can be either letters or e-mails;
  - Letters of support should be on headed paper and signed by a senior member of staff or director
  - E-mails of support should be from an appropriate person and clearly named alongside their job title and affiliation.
- Be dated within 3 months of submission

#### **Supporting organisations**

The application must include letter(s) of support from each non-academic project partner involved in the creation and design of the centre. Letters (or e-mails) should outline:

- the benefits the partner expects to achieve from participating in the centre
- how their involvement will enhance the quality of the centre
- how they have been involved in the development of the bid and will be involved in the operation of the centre
- the level of resource they are proposing to put into the centre.

### **Technology Transfer Office**

A letter or e-mail of support an institutions Technology Transfer Office (or equivalent) must be included with each application. If the centre will span multiple institutions, then a Letter of support will be needed from each named institution.

The letter should relate to how the wider University will support innovation which will occur through the centre, and how it will help to engage with industry/third-sector organisations. It should also detail how any IP will be managed between the CDT and supporting organisations.

### **Head of Department**

The application should include a letter from the Head of Department, for each university (or other academic institution) involved in the bid, which should set out the university's commitment to the centre for at least the lifetime of the award, the alignment of the centre to the university's strategy and the availability of appropriate supervisors.

### **Data Protection**

Grants submitted *via* Je-S are done so under their [terms and conditions](#). Please make sure you have permission from any relevant bodies before submitting any sensitive data. STFC will not be held accountable if data submitted has been done so without the relevant permissions sought.

### **Ethical considerations**

It is possible that some projects funded through the centre will involve holding or using sensitive information on individuals. Applicants should ensure all the centres activities conform to [UKRI's research integrity policy](#). Although an ethical statement will not need to be submitted alongside any proposals, all the involved researchers should have a consideration of such requirements. STFC reserves the right to suspend any grants that do not meet these requirements.

All projects and activities should conform to [UKRI Trusted Research and Innovation](#) and [EDI](#) practises. STFC reserves the right to terminate any grants if there are any concerns over the above considerations.

## **ASSESSMENT**

### **Panel Assessment**

All applications will be reviewed by a Panel of experts consisting of industry and academia. There is potential for applicants to be interviewed as part of the process if required.

### **Criteria for Assessment**

Assessment of all proposals will be split between primary and secondary criteria. Primary assessment criteria will be considered in the first instance and weighted accordingly.

#### Primary criteria:

1. **Quality of training environment including approach to supporting a healthy and inclusive centre**
  - The overall quality of the research training environment, and cohort approach to training focussed on the student experience. For example, how specific training on data intensive science techniques and innovation will be delivered on a cohort basis.
  - The degree to which you are supporting a healthy and inclusive research and innovation culture, including for example the approach to equality diversity and inclusion, and innovation.

## 2. **Quality of the research environment and team**

- The quality and diversity in the scientific areas to be addressed by the centre, including appropriateness with regards to data intensive science.
- The alignment of the centre to wider host institution strategies.
- The potential impact which could arise as a result of the centres success, both in terms of academic/scientific benefit, and wider economic/societal benefit.
- The extent to which responsible research and innovation will be supported and delivered in the centres research activities.

## 3. **Partnership and Engagement**

- The relevance and strength of the links formed with other organisations (particularly local small and medium enterprises) and other potential users.
- The extent of their involvement in determining and providing input to the proposed training programme, in mentoring and co-supervising students / in exploiting the outcomes of the research and training, and overall involvement in helping to manage the centre.
- Evidence of what plans are there to match students to placements and monitor their progress, and strength of the research innovation arising from those placements.

### Secondary criteria:

## 4. **Value for money**

- The level of funding, in addition to that provided by STFC/UKRI, that would be available for supporting additional studentships and associated training activities. This includes any support offered to fund placements, contributions from external sources, and the level of commitment from the institution(s) applying to host the centre.

## 5. **Management and Delivery**

- The effectiveness of the plans for the management and governance of the centre including the suitability and commitment of the director and senior management team, plans for obtaining independent strategic oversight and the involvement of students in the management process

## **SUCCESSFUL APPLICATIONS**

Grants are awarded under the [terms and conditions](#) of UKRI. Please see [UKRI privacy note](#) for more details

## **RESEARCHFISH**

All award holders are required to submit any outputs on the [Researchfish platform](#). Award holders are required to provide information about outputs arising from their work annually during the award period, and for at least 5 years after the award has terminated.

Successful applicants may be required to submit a mid-term report. Details of this, and the review process, will be shared with the Principle Investigators closer to the time.

## **CONTACTS**

We encourage potential applicants to contact the office to discuss their proposal, and the STFC office will be able to help and provide advice on applications where appropriate. Please [studentships@stfc.ukri.org](mailto:studentships@stfc.ukri.org) for more information.

## **USEFUL LINKS**

Below is a list of links which applicants may find useful when applying for STFC grants:

[UKRI Principles of Assessment and Decision Making](#)  
[Researchfish](#),  
[Equality of opportunity](#)  
[Unconscious Bias](#)



