



**Engineering and
Physical Sciences
Research Council**

Quick Reference

Please note that you must read the full Call document for guidance before submitting your proposal

Multidisciplinary research between the cyber-security Research Institutes

Call type: Invitation for proposals

Closing date: 16:00, 15 September 2020

Funding Available: £4m (at 80% FEC) is available to support up to eight projects

How to apply: Full proposals

Assessment Process: Full proposals will undergo postal peer review, followed by a prioritisation panel, resulting in a rank ordered list

Key Dates:

Activity	Date
Call open	9 July 2020
Call close	16:00, 15 September 2020
Prioritisation panel	February 2021
Decision	March 2021

Additional information: Applicants do not need to be current members of one of the Research Institutes or an Academic Centre of Excellence in Cyber Security Research (ACE-CSR). However, if they are not, they will be expected to become active members of this community if they are successful.

Contacts: Miriam Dowle, Senior Portfolio Manager
Email: miriam.dowle@epsrc.ukri.org, Phone: 07825734615

Je-S helpdesk
Email: JeSHelp@je-s.ukri.org

Please refer to JeS Homepage for phone line opening hours.



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Multidisciplinary research between the cyber-security Research Institutes

Call type: Invitation for proposals

Closing date: 16:00, 15 September 2020

Related themes: Digital economy, ICT

Summary

We are inviting ambitious proposals for research activities to bridge across the different cyber-security research communities operating under the four joint EPSRC-NCSC Research Institutes. The successful projects will be of a scale to add strategically important capacity and capability to the vibrant ecosystem of cyber security research and practice in the UK. They will ensure the country's expertise is working together as a team and being employed to help to solve problems of strategic significance to the UK, that have recently been summarised in the National Cyber Security Centre's Problem Book.

This call has been developed in close conjunction with the National Cyber Security Centre (NCSC). £4m (at 80% FEC) is available to support up to eight projects.

Proposals will be sent to expert postal peer review before being assessed by a prioritisation panel composed of experts from academia, users and government representatives.

Background

EPSRC and the National Cyber Security Centre (NCSC) jointly support four Research Institutes (RIs) focusing on developing cyber security capability in strategically important areas:

- Sociotechnical Security
<https://www.riscs.org.uk/>
- Verified Trustworthy Software Systems
<https://vetss.org.uk/>
- Trustworthy Interconnected Cyber Physical Systems
<https://ritics.org/>

- Secure Hardware and Embedded Systems
<https://www.ukrise.org/>

Each RI has developed and nurtured a vibrant community of researchers from academia, as well as a range of industry partners involved in the relevant disciplines.

Alongside this, NCSC has recently published a problem book which describes themes that emphasise the sorts of problems that need to be solved. It also lists some of NCSC's major activities under each theme. The full problem book can be found here:

<https://www.ncsc.gov.uk/information/the-ncsc-research-problem-book>

More research is now needed to ensure that appropriate expertise is being employed to tackle problems of strategic importance - in particular where the skills of more than one expert community is required. This call therefore seeks to build capacity and capability through projects which explore how different technical approaches could provide solutions to real-world problems aligned with the themes in the NCSC problem book.

These are complex challenges, which can only be resolved by extensive collaboration with research experts from many backgrounds. We would expect projects to be formed of a small cross-disciplinary team to actively engage with user communities as well as researchers from disciplines covering more than one of the EPSRC/NCSC Research Institutes; the former could be policy makers, organisations or individual consumers. Applicants must demonstrate an ability and willingness to actively facilitate these conversations, bringing the relevant communities of experts together to distil the key actions/areas of focus needed.

Because we want to encourage adventurous and creative approaches, it is to be expected that projects funded through this call may not culminate in a complete solution to the problem identified. However, we would expect substantial progress in clarifying the problem statement, understanding technical and non-technical constraints, and detailed evaluation of potential options.

Some examples of potential problems are below, however the published problem book (linked above) contains more challenges; proposals to tackle any of these are welcome.

Transparency

Extensive research has already been carried out into technologies such as those listed below, which offer improved understanding of complex systems. Adoption of these technologies feels feasible and yet is still very slow in practice. We would like to understand and address barriers to adoption and usability in order to realise the benefits of new approaches.

Example technologies we could use to improve transparency:

- Attestation - a number of standards, protocols and hardware architectures have been proposed to allow devices to accurately report useful status information in a reliable (authenticated) manner. Adoption of this technology at scale is low, which is one reason why it is still hard to get reliable information on the number and status of devices on a network at any given

time. How can we improve this, and what technical and non-technical barriers need to be overcome?

- Verification - formal verification produces insight into how critical components perform as part of a system; this insight can improve decision making during development and system design. How do we encourage the uptake of verification technologies by product developers? The state of the art is now such that the benefits of formal verification are clear to many large vendors, and tools are beginning to exist that can be used without deep subject expertise. What factors are slowing their adoption and how could they be addressed?

Resilience

Given a particular critical national infrastructure (CNI) sector, how can we improve resilience in existing and future systems?

How can we use leading-edge research in a variety of disciplines to improve the development of critical systems, noting that practical constraints vary widely across different sectors. What practical interventions will make a difference? Interventions could be in the form of technology, but also policy/regulatory approaches, so investigation will require a range of expertise.

How can we achieve the necessary resilience for security products in high-threat environments, balanced with the user needs such as portability and usability? What are the right trade-offs to make? NCSC has published principles¹ for such devices, and principle 5 clearly identifies the need for resilience.

Funding available

There is up to £4m (at 80% FEC) to commit to around 8 projects. There is no restriction on the timeframe, and it is up to the applicant to determine what is most appropriate for their project.

Funding can be requested for standard research activities and associated support, but we do encourage applicants to take creative, adventurous approaches to research and request whatever they need to deliver that.

We recognise that the problems described above can only be resolved by extensive collaboration across different backgrounds and communities. For this reason, resources should be requested to support activities which facilitate this collaboration. This could include:

- Academic-stakeholder networking events
- Workshops
- Dissemination events suited to a range of audiences
- Communications support

¹ <https://www.ncsc.gov.uk/guidance/design-guidelines-for-high-assurance-products>

- Representation at appropriate national and international events
- Website hosting and maintenance
- Active Press/Media relations

Because we expect there to be a significant management and admin overhead associated with this work, please include resources for project management and coordination, which could include a dedicated manager or other administrative support.

Equality, Diversity and Inclusion

The long-term strength of the UK research base depends on harnessing all the available talent. EPSRC expects that equality and diversity is embedded at all levels and in all aspects of research practice and funding policy. We are committed to supporting the research community, offering a range of flexible options which allow applicants to design a package that fits their research goals, career and personal circumstances. This includes career breaks, support for people with caring responsibilities, flexible working and alternative working patterns. With this in mind, we welcome applications from academics who job share, have a part-time contract, or need flexible working arrangements.

Peer review is central to EPSRC funding decisions, we require expert advice and robust decision-making processes for all EPSRC funding initiatives. We are committed to ensuring that fairness is fully reflected in all our funding processes by advancing policy which supports equality, diversity and inclusion. Please see our Equality and Diversity webpages <https://epsrc.ukri.org/funding/equalitydiversity/> for further information.

Responsible Innovation

EPSRC is fully committed to develop and promote responsible innovation. Research has the ability to not only produce understanding, knowledge and value, but also unintended consequences, questions, ethical dilemmas and, at times, unexpected social transformations. We recognise that we have a duty of care to promote approaches to responsible innovation that will initiate ongoing reflection about the potential ethical and societal implications of the research that we sponsor and to encourage our research community to do likewise.

Responsible innovation creates spaces and processes to explore innovation and its consequences in an open, inclusive and timely way, going beyond consideration of ethics, public engagement, risk and regulation. Innovation is a collective responsibility, where funders, researchers, interested and affected parties, including the public, all have an important role to play. Applicants are expected to work within the EPSRC Framework for Responsible Innovation given on the EPSRC website (<https://epsrc.ukri.org/research/framework/>).

Guidance on Journal-based metrics

As part of our commitment to support the recommendations and principles set out by the San Francisco Declaration on Research Assessment (DORA; <https://sfdora.org/read/>), UKRI reviewers and panel members are advised not to use journal-based metrics, such as journal impact factors, as a surrogate measure of the quality of individual research articles, to assess an investigator's contributions, or to make funding decisions.

The content of a paper is more important than publication metrics, or the identity of the journal, in which it was published, especially for early-stage researchers. Reviewers and panel members are encouraged to consider the value and impact of all research outputs (including datasets, software, inventions, patents, preprints, other commercial activities, etc.) in addition to research publications. We advise our peer reviewers and panel members to consider a broad range of impact measures including qualitative indicators of research impact, such as influence on policy and practice.

Equipment

Equipment over £10,000 in value (inc. vat) is not available through this call. Smaller items of equipment (individually under £10,000) should be in the Directly Incurred - Other Costs heading.

For more information on equipment funding, please see: <https://epsrc.ukri.org/research/facilities/equipment/>

Eligibility

Applicants do not need to be current members of one of the RIs or an Academic Centre of Excellence in Cyber Security Research (ACE-CSR).

Applicants should ensure they are able to tackle the problems described – we therefore encourage the inclusion of researchers from other disciplines and project partners from user communities if needed.

Please ensure sufficient time to create Je-S accounts for Investigators who do not currently have one.

For information on the eligibility of organisations and individuals to receive EPSRC funding, see the EPSRC Funding Guide: <https://epsrc.ukri.org/funding/applicationprocess/fundingguide/>

A list of eligible organisations is provided at: <https://www.ukri.org/funding/how-to-apply/eligibility/>

How to apply

Submitting an application

You should prepare and submit your proposal using the Research Councils' Joint electronic Submission (Je-S) System (<https://je-s.rcuk.ac.uk/>).

When adding a new proposal, you should go to documents, select New Document, then select:

- Council 'EPSRC'
- Document type 'Standard Proposal'
- Scheme 'Standard'
- On the Project Details page you should select the "Research bridging the security Research Institutes" call.

Note that clicking 'submit document' on your proposal form in Je-S initially submits the proposal to your host organisation's administration, not to EPSRC. Please allow sufficient time for your organisation's submission process between submitting your proposal to them and the call closing date. EPSRC must receive your application by 16:00 on 15 September 2020.

Guidance on the types of support that may be sought and advice on the completion of the research proposal forms are given on the EPSRC website (<https://epsrc.ukri.org/funding/applicationprocess/>) which should be consulted when preparing all proposals.

Guidance on writing an application

The following documents should be added as PDF attachments and submitted with the Je-S form:

- Case for support: should be up to eight pages in total, to include:
 - Two-page track record, which should detail the relevant expertise that each investigator will bring to the research
 - Six-page description of the proposed research focus and how this fits the aim and scope of the call. This should include a clear statement of the proposal's vision, and how each strand of activity complements this vision.
- Justification of resources: should be up to two pages. This should be a narrative description of the need for the resources requested.
- Work plan: should be up to one page. It is not expected that this will be a Gantt chart for the whole time of the project, but should include a comprehensive plan for the start of the project and then refer to the management strategy to give appropriate milestones for when important decisions on the direction of the research will be taken.
- Project partner letters of support: if you include project partners, you must include a letter of support from them which states:
 - Why they are partners on the project;
 - what they hope to get out of the collaboration;

- what they will contribute toward the project, including any cash and in-kind contributions (which can include staff time, access to equipment, provision of data, software or materials - expressed as cash equivalent).

Applicants should use the Ethical Information section on the Je-S form to demonstrate to peer reviewers that they have fully considered any ethical issues concerning the material they intend to use, the nature and choice, current public perceptions and attitudes towards the subject matter or research area. EPSRC will not fund a project if it believes that there are ethical concerns that have been overlooked or not appropriately accounted for. All relevant parts of the Ethical Information section must be completed. If the research will involve human participation or the use of animals covered by the Animals (Scientific Procedures) Act 1986 it is recommended that applicants pay particular attention to the guidance highlighted below. EPSRC reserves the right to reject applications prior to peer review if the Ethical Information sections are not completed correctly.

Further guidance on completing the Je-S form can be found at <https://je-s.rcuk.ac.uk/Handbook/pages/GuidanceonCompletingaStandardG/EthicalInformation.htm>. Other relevant guidance includes: EPSRC's policy on animal use in research (<https://www.epsrc.ukri.org/about/standards/animalresearchpolicy/>) and the Responsible Innovation Framework (<https://epsrc.ukri.org/research/framework/>).

Please note that on submission to EPSRC **all** non-PDF documents uploaded onto Je-S are converted to PDF, the use of non-standard fonts may result in errors or font conversion, which could affect the overall length of the document.

For advice on writing proposals see:

<https://epsrc.ukri.org/funding/howtoapply/preparing/>

User Engagement Strategy

Successful applicants will be required to develop and execute a strategy for engaging with potential users of the research funded in the project (resources for this activity can be requested and must be justified in the application). This strategy should be reviewed and updated regularly as part of the formal management of the grant.

The strategy should cover:

- how and when potential users have been / will be identified;
- what form the engagement will take;
- what steps will be taken to ensure that outputs of the research are made available to potential users;
- suitable metrics for determining the success of the strategy in delivering value to users.

Assessment

Assessment process

Assessment of proposals will take the form of a 2-stage process: (1) postal peer review and (2) prioritisation panel.

Stage 1: Postal peer review

Proposals will be reviewed via standard postal peer review. If a proposal receives sufficiently supportive reviewers' comments it will go forward to stage 2 of the assessment process. Please find more information about this standard assessment process here

<https://www.epsrc.ac.uk/funding/assessmentprocess/overview/>

Stage 2: Prioritisation Panel

If the reviews are sufficiently supportive, the applicants will be given an opportunity to respond in writing to the reviewer's comments. The proposal will then be assessed and ranked by a panel based on the reviewers' comments and the applicant response, using the assessment criteria provided below. The panel will consist of cross-disciplinary researchers and will include relevant experts and users from across the area.

Assessment criteria

Proposals will be assessed on their fit to the scope of the call, and to the following criteria.

Standard Assessment Criteria

Quality of research (Primary):

- Novelty and timeliness
- Appropriateness of proposed methodology

National importance (Secondary):

- Clear articulation of how the research activities will make a difference in the real world
- New activity that builds on recent investments in the area
- Responsible innovation has been considered and explored, and a plan for how it will be continually monitored has been provided

Ability of applicant team to deliver the research (Secondary):

- Track record of the team, including experience of bringing disparate communities together

- Balance of skills of the project team and integration of different methodologies and approaches, to ensure the research challenge is tackled holistically

Resources and management (Secondary):

- Effectiveness of planning and resource management strategy
- Appropriateness of resources requested, including that for project management and coordination

Call Specific Criteria

Fit to call (Primary):

- Addresses at least one of the problem sets laid out in the NCSC Problem Book
- Relevance and appropriateness of any beneficiaries or collaborators and articulation of a strategy for identifying and engaging with these key stakeholders
- Plans for bespoke dissemination and knowledge exchange to the communities/stakeholders who really need to know about the potential impacts of the research
- Appropriate resources have been requested to support community building, responsible innovation and/or public engagement

Feedback

Feedback will consist of reviewer's reports and, if they are sufficiently supportive, the ranking position at the prioritisation panel. The prioritisation panel may provide specific feedback if deemed necessary, but this will not be given as standard.

Guidance for reviewers

Information about the EPSRC peer review process and guidance for reviewers can be found at: <https://epsrc.ukri.org/funding/assessmentprocess/review/>

Guidance for reviewing standard grants can be found here:

<https://epsrc.ukri.org/funding/assessmentprocess/review/formsandguidancenotes/standardgrants/>

Grant additional conditions (GACs)

Grants will be subject to the standard UK Research and Innovation grant conditions however additional grant conditions will be added to this call including

the requirement to engage with NCSC and the Research Institutes and produce regular reporting.

Moving forward

Submissions to this call will count towards the Repeatedly Unsuccessful Applicants Policy. Further information about the policy can be found at: <https://epsrc.ukri.org/funding/howtoapply/basics/resubpol/rua/>

Key dates

Activity	Date*
Call open	9 July 2020
Call close	16:00, 15 September 2020
Prioritisation panel	February 2021
Decision	March 2021

*EPSRC aims to adhere to the key dates as published, however there may be exceptions where the sift, prioritisation or interview meeting may have to change due to panel member availability.

Contacts

For general enquiries, including any questions about the call process or scope, please contact:

Miriam Dowle, Senior Portfolio Manager
Email: miriam.dowle@epsrc.ukri.org
Phone: 07825734615

If you experience difficulties using Je-S or have questions regarding its use, the helpdesk can be contacted:

Email: JeSHelp@je-s.ukri.org

Please refer to JeS Homepage for phone line opening hours.

Change log

Name	Date	Version	Change
Miriam Dowle	30 June 2020	1	N/A

Name	Date	Version	Change

Appendices

Je-S attachments Check List

Attachment Type	Maximum Page length	Mandatory/Optional	Extra Guidance
Case for Support	Eight pages	Mandatory	Comprising up to two A4 sides for a track record, and six A4 sides describing proposed research and its context.
Workplan	One page	Mandatory	
Justification for Resources	Two pages	Mandatory	
CVs	Two pages each	Optional	For named and visiting researchers, and researcher co-investigators only.
Project Partner Letters of Support	No page limits	Mandatory	Must be included from all named project partners. Must be on headed paper, and be signed and dated within six months of the proposal submission date.
Letters of Support	No page limits	Optional	In exceptional circumstances a maximum of three letters can be submitted.
Proposal Cover Letter	No page limit	Optional	The cover letter can be used to highlight any important information to EPSRC. This attachment type is not seen by reviewers or panel members.

Please ensure you adhere to the above attachment requirements when submitting your proposal. Any missing, over length or unnecessary attachments may result in your proposal being rejected.