

Quick Reference

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

Robotics and Artificial Intelligence Hubs in Extreme and Challenging (Hazardous) Environments

Call type: Invitation for Expressions of Interest

Closing date: 15 June 2017, 16:00

Funding Available: The overall budget to support this call is expected to be confirmed in the summer of 2017 subject to further assurance processes within the Department for Business, Energy and Industrial Strategy (BEIS). It is envisaged that up to £42 million will be allocated and EPSRC expects to fund four Hubs for up to four years subject to the quality of the bids received.

How to apply: Expression of Interest (EOI) submitted through the embedded form on the call page (<https://www.epsrc.ac.uk/funding/calls/raihubs/> - email RAIHubsCall@epsrc.ac.uk for password) followed by invited full proposals.

Assessment Process: EOIs will be assessed by an expert panel, invited full proposals will be considered by an expert panel, followed by an interview.

Key Dates:

Activity	Date
EOI Opens	18 May 2017
EOI Closes	15 June 2017
EOI Panel	TBC
EOI Panel Decision	3 July 2017
Full Proposal Call Closes	24 August 2017
Interview Panel	During week starting 18 September 2017
Funding Decisions	Late September 2017
Grant Start Date	02 October 2017

Please note that dates may be subject to change. EPSRC may mandate a specific spend profile across the duration of the programme and prior to EPSRC awarding the grants, all Hubs must undertake to start spend on 2 October 2017.

Additional information: This funding call is part of the Government's Industrial Strategy Challenge Fund (ISCF). This is not a standard EPSRC funding call and the remit is unique to this call. There are specific requirements that must be met. Hubs must work collaboratively with other strands of the programme, across the UK Research and Innovation landscape, and within the context of the wider aims of the Government's Industrial Strategy.

An institutional letter of support is required. Institutions may only lead on one bid but may form part (a spoke) of other Hubs led by other institutions.

Contacts: RAIHubsCall@epsrc.ac.uk

Robotics and Artificial Intelligence Hubs in Extreme and Challenging (Hazardous) Environments

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Related EPSRC themes: Energy, Engineering, ICT, Manufacturing the Future,
Research Infrastructure

Related NERC Interests: RAI for Natural Resources, Resilience to
Environmental Hazards and Managing Environmental Change

Summary

Innovate UK, EPSRC and NERC are working closely together to deliver an integrated programme investigating the development and deployment of Robotics and Artificial Intelligence (RAI) systems in extreme environments as part of the Industrial Strategy Challenge Fund (ISCF).

The ambition of the programme is to develop robotic solutions to make a safer working environment in industries such as off-shore energy, nuclear energy, space and deep mining, which will increase productivity and open up new cross disciplinary opportunities that are not currently available.

The programme is split into three separate elements, which will be delivered in parallel to provide connectivity across both research and innovation strands. The full programme will be strategically managed to meet the overall RAI challenge.

The four year RAI investment will address challenges in off-shore energy, nuclear energy, space and deep mining, and will include:

- **Use-inspired research Hubs with specific partnership resource**, to drive and accelerate translation of fundamental science in Robotics and AI systems (This call is led by EPSRC);
- **Innovation programme** to support collaborative research and development with co-investment from industry (This call will be led by Innovate UK) and;
- **Demonstrator programme** to allow companies to test these systems in world-class facilities across the UK (This call will be led by Innovate UK).

EPSRC is inviting Expressions of Interest (EOI) for four **Use-inspired research Hubs** in the area of RAI for Extreme and Challenging (Hazardous) Environments to address the programme ambition.

Hubs must develop robotic solutions to enable safer working environments in the thematic areas of off-shore energy, nuclear energy, space and deep mining, and open up new cross disciplinary opportunities that are not currently available.

Each Hub must focus on enabling technologies that underpin one or more of these thematic areas, and should actively seek to spread cross-sector learning to enable spill-over benefits of the technologies into other sectors.

The Hubs must work in partnership with the other investments and vice versa. EPSRC will facilitate this once the other programme investments are made by Innovate UK.

The overall budget to support this call is expected to be confirmed in the summer of 2017 subject to further assurance processes within BEIS. It is envisaged that up to £42 million will be allocated and EPSRC expect to fund four Hubs for up to four years subject to the quality of the bids received. Hubs must secure 50% leverage from industrial, university and/or private sources.

Expressions of Interests should be submitted by 15 June 2017 and will be assessed by an expert panel against the eligibility and peer-review criteria set out in this document.

EPSRC will task the EOI expert panel to rank proposals based on excellence and then identify obvious research synergies and possible complementarities. As a consequence, hubs may be advised to combine their proposals with other bids or aspects of other bids after the EOI stage. An applicant workshop, by invitation only, is planned for this purpose. Details of successful EOIs will be shared publically to enable wider discussions.

Successful EOIs will be invited to submit full proposals by 3 July 2017.

EPSRC may mandate a specific spend profile across the duration of the programme and prior to EPSRC awarding the grants all Hubs must undertake to start spend on 2 October 2017. EPSRC will liaise with successful EOI bids to manage this process.

Background

This call for research Hubs in RAI forms part of the Government's Industrial Strategy Challenge Fund and was announced on 21 April 2017 (<https://www.gov.uk/government/news/business-secretary-announces-industrial-strategy-challenge-fund-investments>)

This call is one component of a wider programme to enable the UK to strengthen its economy through the commercialisation of its world-leading RAI research base and promote growth across the UK.

EPSRC, NERC and Innovate UK have engaged the community through a number of workshops and other formal means. These include the EPSRC RAI theme day meeting report (to be published in July 2017) and the KTN-coordinated workshops (<https://admin.ktn-uk.co.uk/app/uploads/2017/01/Official-ISCF-Plenary-Presentation-18-01-17-v3a.pdf>). These events have provided context to the challenge as well as wider comment on opportunities for the UK in RAI.

Scope of the call

The scope of this call is to support four use-inspired Hubs in RAI in Extreme and Challenging (Hazardous) Environments that build on existing infrastructure and training provision throughout the UK and act within the spirit of the ISCF.

Hubs must develop robotic solutions to enable safer working environments in the thematic areas of off-shore energy, nuclear energy, space and deep mining, and open up new cross disciplinary opportunities which are not currently available.

Each Hub must focus on enabling technologies that underpin one or more of these thematic areas, and should actively seek to spread cross-sector learning to enable spill-over benefits of the technologies into other sectors.

In order to tackle use-inspired research challenges, it is expected that Hubs will involve consortia from more than one institution, include researchers from across a range of relevant disciplines, and work directly with industry.

Hubs must:

- Drive forward internationally leading use-inspired research in RAI for Extreme and Challenging Environments;
- Be led by an internationally respected Principal Investigator
- Have a core engineering and physical sciences research focus, but be comprised of a multi/cross disciplinary team with the right balance of skills, including those from other research council remits where required.
- Be managed proactively by a management team to ensure that resources are deployed effectively to deliver high quality research outputs.
- Focus on enabling technologies that underpin one or more of the thematic areas.
- Build on the existing investment landscape, demonstrating how the Hub proposes to maximise the capital and skills investments already made by EPSRC, Government and other funding sources.
- Have a fully costed and appropriate pathways to impact and business engagement plan.
- Have meaningful engagement with industry and other stakeholders, and professionally manage technology translation and intellectual assets
- Operate within the EPSRC framework of Responsible Research and Innovation, especially in the context of the use of RAI in high risk environments.
- Engage with other Hubs and wider UK investments to forge a UK effort.

Universities must demonstrate a commitment towards the success of the Hub and its long term sustainability.

Hubs must secure 50% leverage (from both cash and in-kind) from a range of industrial sources across scales, university and/or private sources in order to maximise the intervention from Government and increase business engagement

(from large businesses to SMEs). Project partners letters of support are only required at the full proposal stage. EOIs must demonstrate a plan to meet the 50% leverage requirement.

Working with the Demonstrator and Innovation Programme

Complementing the Hubs Call outlined herein, Innovate UK will also be leading two industry-led programmes for extreme and challenging environments: a collaborative research and development programme on RAI, focussing upon cross-cutting themes and technologies which could also find uses in other environments; and a demonstrator programme of two phases, resulting in RAI systems and/or associated sub-systems development and testing in realistic extreme or challenging environments, within the confines of the UK's world-class facilities. The first round of calls are planned for June 2017.

Please contact Nikos Pronios (Nikos.Pronios@innovateuk.gov.uk) to gain specific information on these Innovate UK led programmes and opportunities for alignment.

Working with NERC Marine Autonomous Systems Investments

In addition to the programme outlined in this document, NERC will be making a substantial investment in Marine Autonomous Systems (MAS) and associated command and control systems, to deliver efficient deployment of robotic technologies and systems in seas and oceans, including in the most extreme environments. This will build on existing world leading environmental science in the UK and national capability at the National Oceanography Centre and other marine centres. Potential Hubs that may be operating within this area are encouraged to consider how they may align with this investment.

Please contact Professor Russ Wynn (rbw1@noc.ac.uk) to gain specific information on these NERC led MAS investments and opportunities for alignment.

Governance and Management

All Hubs must commit to aligning with the overall ISCF governance arrangements. This will include regular reporting against key performance indicators and Hubs will be expected to work with EPSRC in monitoring these, including the collation of baseline data. Further guidance will be provided to the successful EOIs in due course.

EPSRC requires each Hub to establish:

- A management board with responsibility for progressing the day to day research objectives
- An independent steering committee with business, academic and EPSRC representation
- Independent industrial and/or international advisory streams

Hub Principal Investigators will be expected to meet biannually as a collective with EPSRC to review progress, to share emerging ideas and maintain oversight of Hub interactions.

In order to focus on the scientific direction of the Hub, the Principal Investigator must be supported by a professional full time Project Manager.

A Project Manager must be empowered with the authority and responsibility to ensure that the objectives of the Hub are achieved (in close collaboration with the Principal Investigator and Co-Investigators). This must be balanced against other skills including, but not limited to, financial management, experience in the use of best practice project planning and management approaches, and the ability to liaise with researchers at all levels within and across Hubs.

Funding available

The overall budget to support this call is expected to be confirmed in the summer of 2017, and is subject to further assurance processes within BEIS. It is envisaged that up to £42 million will be allocated and EPSRC expects to fund four Hubs for up to four years subject to the quality of the bids received.

The funding for each Hub is available to support the following activities:

- The Principal Investigator's salary costs for the portion of their time dedicated to scientific leadership of the Hub;
- A project manager's salary costs where the remuneration package is commensurate with attracting and retaining an appropriately skilled person who has substantial experience;
- Core research activities or technologies that are necessary or valuable to the Hub, including the appropriate dissemination of research knowledge;
- Networking with other centres in the UK and overseas, including visiting researchers where appropriate;
- Hub administration, marketing, business development/engagement managers, outreach and public engagement;
- Travel costs associated with Hub operations and advisory boards;
- Pathways to impact and commercialisation activities;
- Flexible funding to explore promising research activities and bring in new skills and expertise into the Hub. This includes working with the Demonstrator and Innovation Programme activities once these programmes come online (see 'working with' sections).
- Costs associated with access and running of facilities that are core to the Hub's activities.

Equipment

Only equipment and consumables up to a value of £10,000 are eligible as part of this call, with no exceptions. EPSRC and NERC have already made significant capital investments in RAI. Resource may be requested to maximise these investments where these investments contribute to a Hub's activities.

For recent EPSRC capital investment information, please see <https://www.epsrc.ac.uk/newsevents/news/extremeenvironmentrobotics/>

For more information on equipment funding, please see:
<https://www.epsrc.ac.uk/research/facilities/equipment/>

Eligibility

Hubs must fit within the scope of the call, the programme ambition and build on existing infrastructure, Centres for Doctoral Training and other investments. EOIs not meeting the eligibility criteria will be rejected.

Hubs must also be able to start on **2 October 2017** without delay.

For information on the eligibility of organisations and individuals to receive EPSRC funding, see the EPSRC Funding Guide:
<https://www.epsrc.ac.uk/funding/howtoapply/fundingguide/>

A list of eligible organisations to apply to EPSRC is provided at:
<http://www.rcuk.ac.uk/funding/eligibilityforrcs/>

How to apply

A two stage application process will be used.

- **Stage 1 Expression of Interest (EOI)**
- **Stage 2 Full proposals** – details will be issued to the successful EOI applicants. Only successful EOIs will be invited to submit, no other applications will be accepted.

Submitting your Expression of Interest

You should submit your EOI as a **single PDF document** using the embedded form on the call page (<https://www.epsrc.ac.uk/funding/calls/raihubs/>).

Form Password: Please email RAIHubsCall@epsrc.ac.uk to obtain the submission password.

EPSRC must receive your application by **16:00** on **15 June 2017**.

Please also note that it is the responsibility of the lead organisation to ensure all the documentation is submitted through the form. No late documentation will be accepted.

You should consult your Research Administration at the earliest opportunity when preparing your EOI, specifically with regard to costing and any internal procedures you need to follow. Please note that potential Hubs will have to be flexible with costing between EOI and full proposals.

Guidance on writing your EOI

For advice on writing proposals see:
<https://www.epsrc.ac.uk/funding/howtoapply/preparing/>

You will need to prepare a **single document** comprising the following:

- Case for Support (Four sides of A4)
- CV of the proposed Hub Principal Investigator (One side of A4)

- Lead Host Organisation Letter of Support (One side of A4)

EOI Case for Support

This should be a **maximum of four sides of A4** and should use the following headings:

- Overall Hub Vision and Fit to the Programme Ambition
- Leadership Qualities and Capability of the Principal Investigator and Team
- Proposed Programme of Work
- National Importance
- Impact Plan
- Partnership and User Engagement Strategy
- Resources and Management Strategy
- Responsible Research and Innovation

CV of the proposed Hub Principal Investigator

This should be a **maximum of one side of A4** and demonstrate the track record of the Principal Investigator in managing large complex research grants in collaboration with industry and users.

Lead Host Organisation Letter of Support

This should be a **maximum of one side of A4** from the Pro-Vice Chancellor for Research (or equivalent) and articulate the institutional commitment towards supporting the Hub, and the Hub's alignment to the Industrial Strategy Challenge Fund. It should also set out how the Organisation will support the long term sustainability of the Hub and the universities commitment to start immediately on **2 October 2017**.

Letters of support from project partners are not required at the EOI stage.

Assessment

Assessment process

A two-stage assessment process will be used with an expert peer review panel.

Stage 1: EOI stage

All EOIs will be considered by an expert peer review panel, who will rank the proposals based on the assessment criteria. EPSRC will decide, based on the advice of the peer review panel, which EOIs to invite to the full proposal stage.

Stage 2: Full Proposal

Please note that additional guidance for full proposals will be issued at the invitation stage. Hubs will be expected to secure 50% leverage on the requested resources.

There will be no postal peer review and full proposals will be assessed by an expert peer review panel followed by an interview. Applicants will be able to respond to the panel's comments before interview.

Assessment criteria for both stages:

- **Research Quality (primary):** International standing and an established record of relevant technology research. Clear contribution to the challenges stated in the call. A strong, multidisciplinary partnership of researchers with the necessary skills, including associated enabling disciplines, to address the challenges.
- **Vision and Ambition:** Articulation of how the Hub will address the ambition of this programme in the context of the ISCF. A Hub should be ambitious, transformative, and significantly raise the UK's international profile
- **Leadership Quality:** Effective leadership by the Hub Principal Investigator and senior leadership team.
- **National Importance:** The international context, how the Hub will meet the UK need in the context of this programme. Demonstration of underpinning or contribution to: health of other disciplines, addressing key societal challenges, current or future UK economic success and/or enables future development of emerging industries.
- **Exploitation strategy and potential impact:** Articulation of who will benefit from the research and how. Appropriate plans for management of IP, dissemination of results, knowledge exchange and collaboration building.
- **Partnership and User Engagement Strategy:** Demonstration of a strong user engagement and partnership approach, with clear plans to develop these to the benefit of the Hub that open up translation pathways and benefit the broader UK RAI landscape.
- **Resources and Management strategy:** Demonstration of a clear management plan that ensures resources, including manpower, are deployed in the most effective way to deliver high quality research outputs.
- **Responsible Research and Innovation:** Appropriate plans to explore Hub research in the context of EPSRC's Framework for Responsible Research and Innovation.
- **Institutional Commitment:** Clear institutional commitment from all HEIs involved in the Hub.

Feedback

Feedback will only be provided to successful EOIs. There is the intention to hold a workshop for this purpose with details released in due course.

Successful EOIs may be asked to consider combining their proposals with aspects of other bids after the EOI stage. This will be based on the recommendations of

the expert panel to enable the optimisation of the research landscape to achieve the ambition of this ISCF investment.

Details of successful EOI proposals will be shared publically to enable wider discussions. Successful Hubs will be expected to work together and with the wider programme to realise the ambition of the programme.

Guidance

Guidance for Reviewers

Hubs will be reviewed against the assessment criteria set out above. Research quality will be the primary assessment criterion.

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

Additional grant conditions

Additional grant conditions will include mid-term review details, key performance indicators requirements, EPSRC relationship management, working with other Hubs, amongst other conditions.

Details of the grant conditions will be shared at the full proposal stage.

Key dates

Activity	Date
EOI stage opens	18 May 2017
EOI stage closes	15 June 2017
EOI Panel	TBC
EOI panel decision	3 July 2017
Full Proposal call closes	24 August 2017
Interview Panel	During week starting 18 September 2017
Funding Decisions	Late September 2017
Grant Start Date	02 October 2017

Contacts

For further information, advice or queries regarding the application process, please contact: RAIHubsCall@epsrc.ac.uk

Change log

Name	Date	Version	Change
Daniel Smith	17 May 2017	1	Document created for website

Form Attachments Check List

EOI stage	6 pages	Mandatory	Combined PDF document of the EOI Case for Support (four pages), CV of the Hub Principal Investigator (one page) and Lead Host Organisation Letter of Support (one page).
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Please ensure you adhere to the above attachment requirements when submitting your EOI. Any missing, over length or unnecessary attachments will result in your proposal being rejected.