

Announcement of Opportunity

Centre for Doctoral Training (CDT): Risk and mitigation; using Big Data

Proposal Deadline: 16:00 Thursday 26 June 2014

Summary

1. Proposals are sought to host a new Centre for Doctoral Training (CDT) specialising in Risk and mitigation; using big data.
2. Funding for 10 studentships will be awarded per annum, and the CDT award will provide funding for three years of new student intake, i.e. 30 studentships in total, from the start of the academic year 15/16.
3. Two of the studentships in the 2016 cohort will be interdisciplinary studentships co-funded by ESRC and NERC.
4. NERC recognises the value of delivering studentships in partnership and encourages bids from organisations that can show they are working across boundaries, including across departmental boundaries within a single organisation, or across boundaries between both academic and non-academic organisations.
5. This opportunity is open to organisations eligible for NERC research grant funding, i.e. applicants based in UK Higher Education Institutions (HEIs), NERC research centres, and Independent Research Organisations (IROs) approved by NERC. Please refer to <http://www.rcuk.ac.uk/funding/eligibilityforrcs/> for details; this competition is a managed mode scheme.
6. Applications must be submitted via the Research Councils' Joint electronic-Submission system (Je-S). The closing date for proposals is 16.00 on 26th June 2014.

Background

7. Society and the environment are becoming increasingly susceptible to changes associated with a fast expanding and ageing population, highly interdependent economies, increasingly limited resource, natural hazards events and rapid climate change. The complex, interdependent and rapidly changing risks derived from these interacting drivers, often resulting in unexpected impacts far removed from the original trigger.
8. Decision makers in business, government and society need to understand the risks faced and develop appropriate mitigation strategies. NERC science and data currently underpins a large amount of the risk assessment, and there is an urgent need for tools to help decision makers assess risk from these increasingly complex

interconnected hazards, to understand the uncertainties associated with them, to communicate risk and enable decision-making under uncertainty.

9. As identified by the recent BIS data strategy – ‘Seizing the Data Opportunity’ - the UK has some of the best universities and institutes in the world, some truly innovative small businesses and some of the richest historic datasets of any country¹. Big data technologies can act as a catalyst to transform the scientific use of environmental information in risk management. There is a clear opportunity to produce a new generation of risk scientists able to maximise the opportunities big data offer to develop risk analysis and mitigation both as a field of academic study and body of policy and industry-relevant know-how.
10. There are clear opportunities for stakeholder interest and engagement in the use of data to mitigate risk. A wide range of businesses recognise the need to understand and reduce the risks to infrastructure, operations and supply chains. In particular, through the insurance and reinsurance industries, the UK is already world renowned international centre in risk assessment, modelling and its application. This sector values strong collaboration with the UK academic research base to enable the improvement of their risk models, maintain a competitive edge and grow their markets. These industries also make a major contribution to the UK economy; a recent report by HM Treasury² stated that the UK insurance and reinsurance industries (including auxiliary services like risk modelling) make up 320,000 jobs and almost 3% of UK GDP making the UK insurance sector is the largest in Europe. There are significant opportunities to grow this sector through the expansion of overseas business, particularly in the high growth economies of Asia, Latin America and Africa. Many businesses in the sector are investing in modern information technology, but there are issues with numbers of skilled people in bringing modern computing together with environmental sciences to address risk management problems.
11. In addition, two UK-led reports³ have emphasised the need for humanitarian and development organisations to make better use of science to reduce the risks to communities from natural hazards. The international disaster risk reduction community – including UK based organisations such as UK CDS, Oxfam, CAFOD, Christian Aid, Save the Children - are at the forefront of this initiative.
12. A Centre for Doctoral Training (CDT) would address increasing and emerging skills needs in this area, It would provide an opportunity to strengthen the flow of knowledge and skilled people, into research, to the insurance sector, and to policy makers of all levels from national to international including UN Office for Disaster Risk Reduction, Cabinet Office, Civil Contingencies Secretariat (who lead on the

¹ <https://www.gov.uk/government/publications/uk-data-capability-strategy>

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263148/the_uk_insurance_growth_action_plan.pdf

³ Foresight report *Reducing Risks of Future Disasters: Priorities for Decision Makers*.

<http://www.bis.gov.uk/assets/foresight/docs/reducing-risk-management/12-1289-reducing-risks-of-future-disasters-report.pdf>

National Risk Register), the Environment Agency and the Met Office, and to humanitarian and development organisations.

Remit of the call

13. Training provided by the CDT must be within the NERC remit, and may include training at the interface between environmental sciences and other disciplines, where many major research challenges exist.
14. An expected key outcome of the CDT will be that the NERC funding will be used to leverage an investment (funding and in-kind support) from multiple stakeholders. Proposals must:
 - a. evidence a track record of collaborative working; and
 - b. outline a strategy for engaging with the multiple stakeholders in industry, policy making, regulation and society to nurture additional investments; and
 - c. detail how working with stakeholders will add value to the CDT and to the studentships.
15. The CDT must include training under all of the following areas:
 - a. Approaches and tools for the identification of sources of risks, their drivers and impacts within complex systems;
 - b. Robust methods to quantify and analyse risks and their drivers including sound mathematical and statistical approaches;
 - c. Tools for developing, managing and analysing 'Big Data', to understand risk better, and to apply modern cloud computing approaches;
 - d. Utilisation of multiple models and integrated modelling (for multi-hazard modelling and to combine environmental hazard models with information about vulnerabilities/exposure of a population);
 - e. New tools and approaches to multi-hazard assessment and interconnected risks (cascade effects);
 - f. Security and legal issues for handling data and information as it relates to risk management;
 - g. Measurement, characterisation and handling of uncertainty, including within model chains;
 - h. New approaches to visualise and communicate risk, including the public, to enable decision-making; and
 - i. Risk perception, communication, decision making and management.

16. Two of the studentships in the 2016 cohort will be interdisciplinary studentships co-funded by ESRC and NERC. These studentships will link the social science research areas with environmental sciences research areas and may include any of the above topics, or others such as ethical issues around data storage and linkage, and the ways in which individuals and groups respond to and use information on risk. Applications must demonstrate appropriate links and expertise to the social sciences to ensure that at least two studentships are interdisciplinary research between the NERC and ESRC remits.
17. NERC recognises the value of delivering studentships in partnership and encourages bids from organisations that can show they are working across boundaries, including across departmental boundaries within a single organisation, or across boundaries between organisations.
18. Proposals must evidence a track record of collaborative working with non-academic organisations including business, government and civil society, and should outline a strategy for engaging with partners to nurture additional investments.
19. Applicants should also outline any agreed or expected in-kind support or additional funding for supporting additional studentships within the CDT.
20. NERC will award ten notional studentships per annum for three years (these awards will be cash-limited within the limits described below). Each notional studentship will be four years in duration; it is expected that individual students will undertake training over a variety of time frames (between three and four years as appropriate, depending on the discipline and the student's experience/knowledge).

Funding

19. Indicative funding total per notional doctoral studentship:

Student Stipend	£55,452
Fees	£15,984
Research Training Support Grant	£11,000
Management Costs	£1,500
Total	£83,936

21. The CDT will have flexibility in how they use the funding ([subject to the normal training grant terms and conditions](#)), as long as the minimum notional numbers of students are supported per annum. The funding is for the training of PhD studentships.

CASE Studentships:

22. Given the expected high level of non-academic partner involvement in the CDT there are no additional or minimal CASE studentship requirements.

Management

23. The CDT will need to have strong leadership and management. The CDT should have both a lead operational manager and steering committee. The steering committee should be comprised of all the CDT partners (both academic and non-academic), have overall responsibility for the effective governance of the CDT and its relationship with NERC and provide a strategic needs framework to aid the prioritisation and development of PhD projects.
24. The CDT will be able to demonstrate that robust and transparent governance arrangements are in place, which may include formal partnership agreements, communication plans and systems for monitoring the CDT's overall progress and success. NERC strongly encourages applicants to incorporate CDT students into the management/running of activities of the CDT.

Eligibility

25. This opportunity is open to organisations eligible for NERC research grant funding, i.e. applicants based in UK Higher Education Institutions (HEIs), NERC Research Centres, and Independent Research Organisations (IROs) approved by NERC. Please refer to <http://www.rcuk.ac.uk/funding/eligibilityforrcs/> for details; this competition is a managed mode scheme.
26. Each CDT must include an accredited higher education PhD award-making body.

Application process

27. Full proposals must be submitted using the Research Council's Joint Electronic Submission System ([Je-S](#)) by 16:00 GMT on 26 June 2014. Applicants should select Proposal Type – 'Studentship Proposal' and then select the Scheme – 'Doctoral Training' and the Call – 'CDT June 2014'.
28. To use the Je-S system, the Research Organisation must be registered as a Je-S user. Full details are available on the Je-S website. Further information can also be obtained by contacting the Je-S Helpdesk by email at JeSHelp@rcuk.ac.uk, or by telephone on 01793 444164.
29. Applicants must ensure that their proposal is received by NERC by 16:00 on the closing date. They should leave enough time for their application to pass through their organisation's Je-S submission route before this date. Any proposal that is received after the closing date, is incomplete, or does not meet NERC's eligibility criteria, will be returned to the applicant and will not be considered. Please note, this call will not be open on Je-S until 26 March.
30. A single proposal should be submitted from the administrative lead partner.

Proposals:

31. All proposals must be contained within 14 sides of A4, using the pro forma provided on the NERC website. Applicants will need to provide details under the following headings:

- i. Research excellence
- ii. Training excellence
- iii. Multidisciplinary Training Environment
- iv. Partnership Operational Management (QA and Excellent Students)

32. No other attachments will be accepted. Wording about links to websites will be ignored.

Assessment process

33. Proposals will be assessed by a peer review assessment panel, consisting of international experts, supplemented by member(s) of the NERC Training Advisory Group (TAG). The assessment criteria used by the Panel is given in Annex A. The process includes applicant presentation and interview at the assessment panel.

34. Proposals will be assessed on four criteria: Research Excellence, Training Excellence, Multidisciplinary Training Environment and Partnership Operational Management. These criteria will be weighted as shown in Table A.

Table A: Proposals Scoring System

DTP Assessment Criteria	Weighting	Score	Overall Excellence Score
1. Research Excellence	35%	/10	= 0.35 x Score
2. Training Excellence	35%	/10	= 0.35 x Score
3. Multidisciplinary Training Environment	15%	/10	= 0.15 x Score
4. Partnership Operational Management	15%	/10	= 0.15 x Score
Overall Grade Excellence Score	100%		/10

35. Applicants will be invited to make a presentation and answer questions at the assessment panel meeting to assist the assessment process. NERC will try to provide early notice of an invitation to attend, but applicants should note that the panel meeting is currently scheduled for the second week of September 2014.

36. Following the assessment panel meeting, feedback for unsuccessful proposals will be available upon request.

Reporting

37. There will be mandatory annual reporting requirements for the CDT in addition to the standard studentships information captured through the Je-S Studentship Details Portal (SDP). This information will be used by NERC to report on the success of our training investments to government and other partners. Information provided will also be used to provide assurance that the CDT is being managed appropriately and is progressing in accordance with the NERC Training Strategy and the aims and expectations outlined in this AO document. This additional reporting will take the form of an annual return. Indicative reporting headings include:

- i. Information regarding the student population – demographics, application information, etc.
- ii. Information regarding additional partner engagement, collaborations and co-funding
- iii. CASE partner engagement
- iv. Student Research outputs
- v. Cohort Specific Training Progress and Development updates
- vi. Information regarding supervisor training and professional development
- vii. Any structural and managerial changes that have occurred within the CDT.

Timetable

38. Overview of the competition timetable:

- 26 June 2014 16.00: Closing date for full proposals
- W/C 8 September 2014: Assessment Panel meeting and interview
- October 2014: Decision communicated to applicants
- October 2015: First CDT studentships commence

39. For further information please contact Katie Tearall (kattea@nerc.ac.uk).

Annex A: Assessment Criteria

The assessment criteria used to judge proposals will be as follows:

Assessment Criteria	Key aspects for an outstanding CDT	Factors and Evidence that might be discussed
1. Research excellence (35%)	<p>The training and training environment must include scientifically excellent and original research within NERC's remit, including interdisciplinary interface with ESRC, and specifically within the remit of the call.</p> <p>Critical mass of relevant researchers/teams/projects to allow students to be supported effectively and sufficiently exposed to excellent research and researchers.</p>	<p>Number of active NERC-funded research projects at host RO's in the remit of the call.</p> <p>RAE 2008 profiles (where relevant).</p> <p>Standing in the appropriate academic community – national, international etc.</p> <p>Institutional commitment to research excellence the remit of the call.</p> <p>Amount of NERC and Research Council research income in appropriate research areas.</p>
2. Training excellence (35%)	<p>Students are part of an active community and managed as a cohort.</p> <p>Excellent scientific training and transferable/professional skills development opportunities.</p> <p>Challenging and relevant projects.</p> <p>Timely access to world-class facilities, direct</p>	<p>Students have access to, and are encouraged, by peer to peer learning and support.</p> <p>Mechanisms for supervision and monitoring of both student and supervisor.</p> <p>Integration of students into the relevant teams/projects/departments/schools.</p> <p>How generalist and specialist development needs of individual students will be identified and delivered.</p>

	<p>experience of cutting-edge techniques, technologies and up to date methodologies.</p> <p>End user engagement: Students will gain value from interaction with end-users in industry, government and civil society) and leave equipped with skills applicable to the environment sector: skills for policy-makers and regulators; industry and business; and NGOs and charities.</p> <p>Excellent training and support for supervisors.</p>	<p>The personal/ professional/ career learning and development that students will receive.</p> <p>The collaborative opportunities, which may include internships, industrial placements, overseas studies, and co-supervisory arrangements if appropriate.</p> <p>Completion rates, publication and first destination data for students hosted within CDT institutions.</p> <p>Employability.</p> <p>Mechanisms to ensure the development of independent researchers and world-leading scientists.</p> <p>Leveraged funding and in-kind support for the CDT.</p>
<p>3. Multidisciplinary Training Environments (15%)</p>	<p>Training is embedded in multidisciplinary training environments.</p>	<p>How students will be made aware of the context of their research and how it relates to other areas.</p> <p>Supervisory or wider advisory team engagement in research outside the relevant discipline(s).</p> <p>Ability to expose students to different disciplines via, for example:</p> <ul style="list-style-type: none"> i. Establishing cohorts beyond the NERC funded students by using the CDT as a magnet/nucleus for research and training activities and investment; ii. Placing students within multidisciplinary research teams; iii. Giving students the opportunity to attend transferrable skills training programmes at which students from different disciplines come together;

		<p>iv. Offering rotations across different disciplines within the first few months of training, where appropriate;</p> <p>v. Networking opportunities including multi-discipline student conferences or poster competitions;</p> <p>vi. Seminars open to students across different disciplines.</p>
<p>4. Partnership Operational Management (15%)</p>	<p>Robust and transparent governance arrangements.</p> <p>Mechanism for planning, managing and monitoring training.</p> <p>Mechanism for managing partnerships between or within organisations.</p> <p>Mechanism for aligning and agreeing ways of working and sharing resources between different organisations (including non-academic partners).</p>	<p>Systems and processes for assessing the suitability of supervisors and projects.</p> <p>Competitive mechanisms for awarding studentships within the CDT.</p> <p>Excellent students - processes for student recruitment, induction, progression, monitoring and submission.</p> <p>Arrangements for returning accurate and timely data on studentships to NERC.</p> <p>Mechanisms for improving and maintaining submission rates.</p> <p>Establishing cohorts beyond the NERC funded students by using the CDT as a magnet/nucleus for research and training activities.</p> <p>Robust quality-assurance procedures and structures.</p> <p>Development and demonstration of Success Stories.</p> <p>Arrangements in place for management of data generated by studentship projects.</p> <p>Plans for engaging with end-users.</p>