

EPSRC funding of Complexity in the UK

The EPSRC funds complexity through various mechanisms. The primary route for funding is through responsive mode; however there has been a variety of managed calls specifically aimed towards research in complexity. Below are details of the various schemes.

EPSRC Responsive Mode

The scheme can be used to support a wide variety of proposals, including feasibility studies, mobility for postdoctoral researchers, overseas travel grants and visiting researchers, and long-term proposals to develop or maintain critical mass.

Benefits of the scheme include:

- No closing dates - applications may be submitted at any time.
- No constraint on the field of research, providing the majority of it falls within our remit.
- Applicant determines the direction of the research.
- Research quality is the main criterion against which proposals are assessed.

The EPSRC funds various projects through responsive mode, many of which may contribute towards Complexity research.

Novel Computation

This call was an invitation to computer scientists, biologists, engineers, life scientists, mathematicians, neuroscientists, physicists, physical scientists and anyone interested in exploring new ways to create, control, model, understand or predict complex systems

Objectives (areas of potential):

- complexity and computation
- nature inspired computation
- analysis and control of complex systems
- hybrid systems
- Complexity and information uncertainty

There was up to £60,000 available, to fund a 6 or 12 month network, after which time a full research proposal was submitted. There was £10 million available to fund the full proposals.

Full proposals were submitted at the end of September 2004.

Networks were awarded to:

J Efstathiou, Oxford University – Coping with complexity

C Taylor, University of Bristol – Performance based engineering: The computational challenge.

S Saad, Aston University – Inference and cooperative behaviour in large interacting systems.

G Ackland, Edinburgh University – Novel approaches to networks of interacting agents.

A Adamatzky, University of the West of England – Non-linear media based computers.

S Bullock, University of Leeds – Simple models of complex networks research cluster.

HJ Jensen, Imperial College, London – Evolutionary models of complex systems.

Multidisciplinary Critical Mass

A call to encourage the development of novel mathematical and/or statistical methods to address research challenges in other disciplines, with funding for centres of critical mass that will enable substantial research programmes in these areas to be established. A single grant worth £1 million is available each year.

The 2004 grant was awarded to:

Prof CJ Budd, University of Bath - Establishment of the University of Bath Centre for Complex Systems

→ A 5 year programme to generate the critical mass necessary for the development of a world class maths/engineering/biology interdisciplinary centre, exploiting the blurred distinction between mathematics, statistics and computation, when analysing large complex systems.

The grant supports 5 Postdoctoral Positions linked to 5 specific themes:

- > multiple scale problems in engineering, physics and materials
- > biological networks
- > emergent behaviour in complex systems
- > numerical algorithms for complex systems
- > highly structured stochastic systems

And also includes:

- Programme inviting 30 academic visitors of international repute for two- monthly periods
- Programme of 5 international workshops linked to the themes

The grant is jointly funded by BBSRC and EPSRC.

Large Scale Complex IT

The EPSRC is aiming to establish an international institute to act as a cauldron to foster collaboration and develop tools and techniques through an international programme of study groups, similar to the Isaac Newton Institute programme.

A total of £10 million is available for the centre, £5 million from EPSRC and £5 million from external funds.

Centres for Integrated Systems Biology

This call aims to establish a number of Centres for Integrative Systems Biology, possessing the vision, breadth of intellectual leadership and research resources to integrate traditionally separate disciplines such as biology, chemistry, computer science, engineering, mathematics and physics in a programme of international quality research in quantitative and predictive systems biology.

Up to three centres to be funded per year, with awards of up to £5 Million over a five year duration.

The scheme will be funded jointly between the EPSRC and BBSRC

Call for Taught Courses in Complexity Science and Complex Systems

Through this call, EPSRC investment will focus on the training environment which will supply the skilled people most able to address the emerging research problems in complexity science and complex systems. Financial support will be provided to develop a series of training courses aimed at interested researchers who are new to the subject, whether they are young people or experienced researchers looking to understand and appreciate the underlying concepts of this emerging field.

- Taught courses should run for between a week to 10 days
- Courses should be themed to a certain area of complexity science or complex systems
- Courses should include a mixture of studies and theory taught by lectures and tutorials
- The first course should be run by the end of 2006.

A total of £0.6 million is available for this call, to cover all reasonable costs of developing, organising and running the courses .

The closing date for the call is 28th April 2005.

The Isaac Newton Institute, Cambridge

A research institute based at the Department of Applied Mathematics and Theoretical Physics, at Cambridge University. The institute aims to stimulate research in all areas of mathematical sciences by bringing together researchers from all over the world to focus on research programmes of extended duration.

The EPSRC currently contributes over £3 million towards the running of the institute.

Complexity related programmes running over the next few years, include:

- Interactions and Growth in Complex Stochastic Systems
- Statistical Mechanics of Molecular and Cellular Biological Systems
- Principles of the Dynamics of Non-equilibrium Systems
- Developments in Quantitative Finance