

## Who to contact:

### Complexity-NET European Partners:

Coordinator:

 **United Kingdom** - Engineering and Physical Sciences Research Council

 **Belgium** - Fonds National de la Recherche Scientifique

 **Denmark** - Ministry of Science, Technology and Innovation

 **Estonia** - Eesti Teaduste Akadeemia

 **Greece** - General Secretariat for Research and Technology

 **Hungary** - Nemzeti Kutatási és Technológiai Hivatal

 **Ireland** - Irish Research Council for Science, Engineering & Technology

 **Italy** - Istituto dei Sistemi Complessi - Consiglio Nazionale delle Ricerche

 **Netherlands** - Nederlandse Organisatie voor Wetenschappelijk Onderzoek

 **Portugal** - Fundação para a Ciência e a Tecnologia

 **Spain** - Ministerio de Educación y Ciencia

 **European Commission** - funded by the Sixth Framework Programme

### Project Office

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**European Network for the Coordination of  
Complexity Research and Training Activities**

**Complexity-NET** is a group of European science and technology funding agencies, research councils and ministries all working together to create an environment that best enables the coordination of strategically planned national activities in Complexity Science and Complex Systems.

The partners involved in Complexity-NET aim to develop and launch a joint action plan for a transnational cooperation programme on Complexity.

We aim to create a setting which could enable sharing of facilities, encourage international mobility and communication, promote public dialogue and catalyse innovation, producing the most stimulating environment for Complexity Science researchers to work in.

### The Complexity-NET vision

The strategic vision of Complexity-NET is to improve the stimulation of complexity research and innovation through a dedicated strategic plan where coordination of funding for complexity research and training in Europe is a central element.

## What is Complexity?

The study of Complex Systems refers to the emergency of collective properties in systems with a large number of parts in interaction among them. These elements can be atoms or macromolecules in a physical or biological context, or machines or companies in a socio-economic context. The science of complexity tries to discover the **nature** of the emerging behavior of Complex Systems, often invisible to the traditional approach, by focusing on the structure of the interconnections and the general architecture of systems, rather than on the individual components.

It is a change of perspective in the forma mentis of scientists rather than a new scientific discipline. Traditional science is based on reductionistic reasoning for which, if one knows the basic elements of a system, it is possible to predict its behavior and properties. It is easy to realise, however, that for a cell or for socio-economic dynamics one faces a new situation in which the knowledge of the individual parts is not sufficient to describe the global behavior of the structure.

We can represent this situation as the study of the architecture of matter and nature. It depends in some way on the individual elements but then it shows fundamental laws and properties which cannot be derived from these elements. Starting from the simplest physical systems, these emergent behaviors can be identified in many other systems, from ecology to the immunitary system to social behavior and economics.

The science of complexity has the objective of understanding the properties of these systems. Which rules govern their behavior? How do they adapt to changing conditions? How can they learn efficiently and how do they optimize their behavior?

The development of the science of complexity cannot be reduced to a single theoretical or technological innovation but it implies a novel scientific approach with enormous potential to influence deeply scientific activities.

## Why Coordinate activity?

The **Complexity-NET** partners hope that:

- By having a dedicated strategic plan with coordination of funding for Complexity research and training as a central focus we will improve the stimulation of Complexity research and innovation in Europe.
- Using a joint action plan we can set the scene for strategic funding of Complexity research and research training on the European level, including developing joint national research programmes.

## What will Complexity-NET do?

**Complexity-NET** has several key objectives, including:

- To gather and share information on national Complexity Science related research programmes, including how they work and how they are funded.
- To produce national level Complexity Science landscapes, showing the level of research and training activity and focusing on national strengths, weaknesses, opportunities and threats.
- To document and analyse the overall European wide Complexity Science research and training landscape and determine the European strengths, weaknesses, opportunities and threats in Complexity Science.
- To identify and recommend strategies that could exploit the identified opportunities and oppose the highlighted threats.
- To develop and launch a joint action plan, describing the actions to be carried out in order to exploit the opportunities and oppose the threats identified.

**Complexity-NET** is funded as a Coordination Action by the European Commission through the FP6 ERANET scheme, which aims to encourage cooperation and coordination of research activities in the Member and Associated States.

ERANET funding is restricted to the costs for the networking of research activities and the coordination of national and regional research programmes.

The scheme hopes to make a reality of the European Research Area by improving the coherence and coordination across Europe of national research programmes and it will enable national systems to take on tasks collectively that they would not have been able to tackle independently.

