

ESFRI

European Strategy Forum
on Research Infrastructures

European **S**trategy **F**orum on **R**esearch **I**nfrastructures

Annual Report
2005 – 2006

November 2006

Overview

- ESFRI Charter
- Research Infrastructure Policy
- Incubator Role of ESFRI
- Future Activities
- Communication Strategy



Chairman's Foreword

It is my pleasure to present ESFRI's third annual report. In my view, it shows that, in the relatively short period since it has been set up, ESFRI has already demonstrated its capacity to act as a catalyst for a more coherent and efficient approach to research infrastructures in Europe.

The report illustrates its main activities from September 2004 up to the autumn of 2005, presented according to the specific fields that ESFRI has examined. In some of these fields, Research Ministers will soon have to take decisions. The report gives also a picture of some of ESFRI's future activities.

I believe the preparatory work which has been done so far will enable ESFRI, in the coming year, to provide good policy advice and to act as an incubator for practical, variable-geometry initiatives. In the longer term, it is in the development of an overall approach to infrastructures at a European level that I hope the full success of ESFRI will be measured.

I was invited to become the new Chair of ESFRI at the beginning of this year following the retirement of Hans Chang. On behalf of all the delegations I would like to express a warm thank you to Hans for his excellent Chairmanship of ESFRI during its formative years.

A handwritten signature in dark ink, reading "John Wood". The signature is fluid and cursive, with a large initial "J" and "W".

John Wood
November, 2005

1. INTRODUCTION

The European Strategy Forum on Research Infrastructures (ESFRI) was set up by Member States in 2002, following an initiative by Philippe Busquin, the European Commissioner for Research. ESFRI brings together senior decision-makers, namely representatives appointed by research ministers of all EU Member States and representatives of the European Commission. The Associated States joined in September 2004.

The objectives of ESFRI are to support a coherent and strategy-led approach to policy making on research infrastructures in Europe and to facilitate multilateral initiatives leading to the better development, construction and use of research infrastructures in Europe. These objectives take into account that government decisions on major infrastructures of European significance are usually reached through a complex phase of informal policy discussions and negotiations. Consequently, the main challenge for ESFRI is to speed-up such negotiations and act as an incubator in the process of convergence which will take these negotiations to concrete initiatives.

The functions of ESFRI in meeting this challenge consist in acquiring and exchanging information on the need for strategic facilities in Europe in diverse fields of research, in discussing the main elements in the relevant Roadmaps and time-schedules in each of these fields and, where relevant, comparing priorities among different fields, reviewing and clarifying the key factors to be taken into account in future government decisions.

2. UPDATE OF THE ESFRI CHARTER

Based on the evolution of ESFRI in 2004-2005 a revised version of procedural guidelines was agreed by the ESFRI delegates in June 2005.

Among the main changes, particular attention was given to a better precision of objectives, clarification on the management of ESFRI as well as the process for nomination/replacement of the Chair and Members and clarification about the voting procedure. The consensus process has been preferred to the voting method, because it helps to maintain the degree of informality www.cordis.europa.eu/int/esfri/history.htm

3. RESEARCH INFRASTRUCTURE POLICY

3.1 Preparation of a Roadmap

During the meeting of 3 September 2004, ESFRI decided to prepare a Roadmap for research infrastructures in Europe, for the next 10 to 20 years. This is in line with the conclusions of the Informal Competitiveness Council of 1-3 July 2004 and the meeting of the Competitiveness Council (November 2004).

The objective of the ESFRI Roadmap will be to provide an overview of the needs for research infrastructures of pan-European interest. This will be used to facilitate decision-making by Member States and by the European Commission. The aim of ESFRI will not be to prioritise or to decide on funding and the location of future infrastructures. The strategic Roadmap for Europe will allow the identification of those infrastructures that European researchers will need to conduct leading-edge research, providing a focus for long-term budgetary planning, preventing over-provision of facilities and setting out the basis for strategic prioritisation.

The ESFRI Roadmap is an on-going process; therefore this Roadmap will be periodically updated.

Potential new RI (or major upgrades) identified could have different degrees of maturity but should be supported by a relevant European partnership or intergovernmental research organisation and to be realised in the next 10 to 20 years. Project description should demonstrate how it would impact on science and technology development at international level, how it supports new ways of doing science in Europe, and how it supports the enhancement of the ERA.

By publishing the Roadmap, ESFRI will act as an incubator for concrete negotiations and decisions by (groups of) Member States to be supported by the European institutions (Commission and/or EIB).

In the context of developing Research Infrastructures of European interest, the Council of the European Union welcomes the development of a strategic roadmap for Europe in the field of research infrastructures and the role of the European Strategy Forum for Research Infrastructures (ESFRI) in this context. This roadmap should describe the scientific needs for research infrastructures for the next 10-20 years, on the basis of a methodology recognised by all stakeholders and take into account input from relevant inter-governmental research organisations as well as the industrial community. The Council stresses that this roadmap should identify vital new European research infrastructures of different size and scope, including medium-sized infrastructures and those in the fields of humanities and bio-informatics such as electronic archiving systems for scientific publications and databases.

**Extract from the Competitiveness Council Conclusions,
25-26 November, 2004**

3.2 Setting-up of Roadmap Working Groups

ESFRI, in its work towards a European Roadmap has decided to set-up specific Working Groups to analyse topical issues and to report to ESFRI. Three dedicated Roadmap Working Groups (RWG) will advise ESFRI in the following areas:

- Physical Sciences and Engineering: Chair Carlo Rizzuto (IT), who replaced John Wood from June 2005
- Biological and Medical Sciences: chair Ruth Barrington (IE)
- Social Sciences and Humanities: chair Bjorn Henrichsen (NO)

Within the remit of the Roadmap Working Groups, Expert Groups can be created at any time to cover specific areas; they should be aimed at supporting, from a scientific point of view, a coherent and strategy-led approach to European policy making on new research infrastructures in specific fields of scientific research.

During summer 2005, 15 Expert Groups were therefore set up, to support the process of creating Europe's first ever Roadmap for pan-European infrastructures.

The objective is to identify new Research Infrastructures (RI) of pan-European interest (or major upgrades to existing ones) open to use by and corresponding to the needs of the European research communities, covering all scientific areas, regardless of possible location.

In such a Roadmap each plan/proposal should be described in terms of (1) the science case, and (2) the concept case (including the technical case, cost analysis and the maturity of the project).

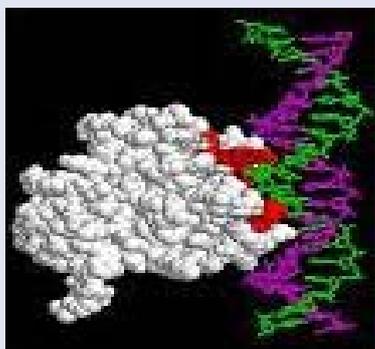
The current status of the work is the following:

Social Sciences and Humanities

Two expert groups were set up:

- One on a European Research Observatory for Humanities and Social Sciences (EROHS);
- The other on European Cultural Heritage

In addition, ESFRI decided to receive direct input from the European Social Survey. At ESFRI's June Meeting, Roger Jowell was invited to present this survey.



Biological and Medical Sciences

The BMS Roadmap Working Group recommended the setting up of three expert groups:

- genomics, proteomics, bioinformatics and biology;
- Clinical and translational research, imaging and radiation; and
- Biodiversity and environment.

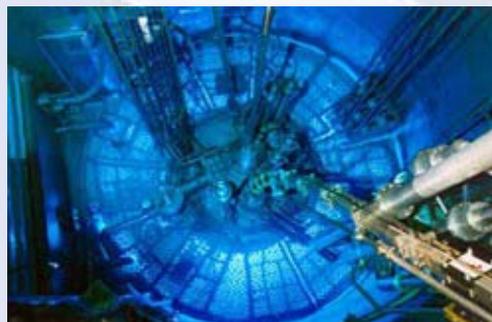
Physical Sciences and Engineering

The PSE Roadmap Working Group set up 10 expert groups:

- Astronomy/Astroparticles;
- Computer Data Treatment;
- Environmental Monitoring, Natural Hazards and Resources;
- Hard X-Rays;
- High Power Lasers;
- Large Neutron Infrastructures;
- Material Testing;
- Nanosciences;
- Nuclear Physics; and
- Soft X-ray Free Electron Lasers.

The Expert Group on Computer Data Treatment will be coordinated with the activities of the e-IRG, and linked with the Expert Groups in Biology and Medical Sciences and Social Sciences and Humanities.

ESFRI decided also to possibly set-up ad-hoc groups to examine the cross-cutting issues between the different expert groups.



3.3 Report of the other Working Groups: Large scale computing and networking facilities

ESFRI discussed the report presented by the "Computing and Networking Working Group" referring to:

- a wide overview of the available resources available in Europe, and their relative position compared to similar instruments in other world regions;
- a set of guidelines and prospective views for the evolution of these instruments in the future, in order to keep Europe at a forefront position;
- an identification of science cases for which major progress may be critically dependent of the evolution of these instruments, either in a continuous stream wise mode, or eventually through a major breakthrough.

(see <http://www.cordis.europa.eu.int/esfri/publications-reports.htm>)

3.4 List of opportunities

Following a request from the European Commission, ESFRI compiled in early 2005 a List of Opportunities in order to assist in the preparation of the Seventh Framework programme (FP7) (<http://www.cordis.lu/fp7/home.html>).

The List of Opportunities is a balanced set of examples of projects for new Research Infrastructures of pan-European interest, which could in the future be financed by the European Union and Member States budget, if they comply with the criteria adopted for the Roadmap and are of sufficient excellence and maturity to be developed during the period of FP7.

(see <http://www.cordis.europa.eu.int/esfri/publications-others.htm>)

3.5 Contacts with existing organisations

Technology Platforms

Twenty two (22) Technology Platforms are today in development, led by industry and developing specific research agendas for the next 10-15 years. Relations between Technology Platforms and Research Infrastructures were initiated. A letter from the Chair was sent to the TP contact persons. Through responses received to date (and others expected in the coming months), it is hoped that this will soon provide ESFRI with identified needs for new RIs.

e-IRG

Different approaches were discussed concerning the creation of a specific Roadmap Working Group on Virtual infrastructures, Computing and Networking or to enter in contacts with the e-IRG organisation (<http://www.e-irg.org>).

Tony Hey gave a short presentation about e-IRG activities. He pointed out that the activities are very similar to those of ESFRI Roadmap Working Groups and that he sees a good opportunity to create a 'bridge' as there are cross-linkages to all the other thematic areas. The Chair received a mandate to meet the new chair of e-IRG to explore how to cooperate more efficiently on the Roadmap process.

A representative from e-IRG has now been appointed as an observer to meetings of the Physical Sciences and Engineering RWG.

EIROforum, ESF, GSF

Considering their experience and key role in the development of international research infrastructures, ESFRI agreed that **EIROforum** will be regularly invited to present their point of view to ESFRI and will interact as necessary to support the elaboration of the ESFRI Roadmap.

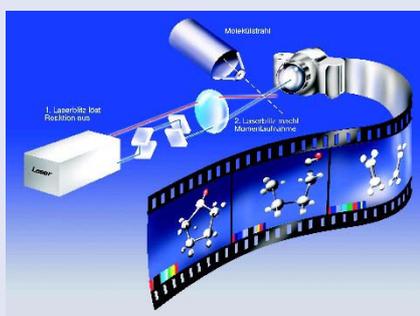
ESF will continue to be invited to attend the general part of the ESFRI meetings and to contribute as appropriate. ESFRI will also continue to consult with other European level organisations which have similar or complementary interests, such as **EUROHORCs**.

ESFRI will to maintain through its members a strict contact with the **Global Science Forum** in particular regarding the discussion about nuclear physics, polar physics, cultural heritage and biology. The reinforcement of links between ESFRI and GSF will be further stimulated.

4. INCUBATOR ROLE OF ESFRI

In its incubator role for the development of new research infrastructures in Europe, ESFRI has in 2005 continued discussions on two projects initiated by Germany. Following the setting-up of International Steering Committees, for each project, a Memorandum of Understanding (MOU) governing the participation of the various partners in the preparation has now been signed.

Femtochemistry: "Filming" chemical reactions using ultra-fast lasers



The extremely brief and intense X-ray pulses will enable researchers to record what are essentially films with atomic resolution – for example, how a chemical reaction progresses, how biomolecules move, and how solids are formed. This will benefit a wide range of natural sciences and industrial users will also profit from the ability to develop new materials in the nanoworld. As can be noticed, the construction of the facility is itself a technological challenge. The new facility will not replace existing X-Ray sources; instead, it will open up new vistas for research that are inconceivable today.

- The European **XFEL project** aims at building a hard X-ray free electron laser at DESY in Hamburg. The XFEL-MoU has been signed by 11 countries (DE, DK, ES, FR, GR, HU, IT, PL, SW, UK and Switzerland); at least two more signatures (Russia and the Netherlands) are expected. Detailed information on the project can be found on the XFEL website (<http://xfel.desy.de>).
- The **FAIR** project aims at building an accelerator facility producing beams of ions and antiprotons. A Memorandum of Understanding has been signed by 10 countries (DE, ES, FI, FR, GR, IT, PL, SW, UK and Russia) to develop FAIR at GSI in Darmstadt. Detailed information on the project can be found on the FAIR website (<http://www.gsi.de/fair>).

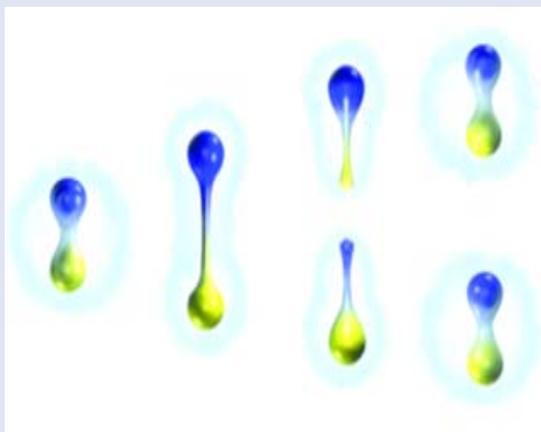
Other projects are incubating, involving agreements between national Governments, on the basis of discussions initiated by ESFRI:

- Sweden and Scandinavian Countries, as well as ES, UK and Hungary, are now studying a possible next generation Neutron Scattering Facility.
- Italy has proposed that the construction of the Soft X-ray FEL in Trieste, financed by the EIB within the "Quick Start Projects" approved by the EU Council of Ministers, is developed in collaboration with other interested Countries, as a node of complementary international facilities;
- Coordinated proposals for Oceanographic Ships are being discussed in the Baltic and Mediterranean regions.

Facility for Antiproton and Ion Research – *Looking for the Quarks*

Natural sciences have taught us a lot about the structure of matter and the evolution of the Universe. Despite tremendous progress in this field, many puzzles are still to be solved.

As an example, we still know little about the properties of "hadronic matter", ie, matter that is composed of quarks and bound by the strong force – one of the fundamental sources in nature. Thus, our knowledge about protons and neutrons, which make up more than 99.9% of the visible mass of the universe, remains rather sketchy.



The evolution of the universe also confronts us with many open questions. We know that tiny fractions of a second after the Big Bang all matter existed as a primordial soup consisting of quarks, gluons, photons and leptons. As the universe expanded and cooled down, a new phase of matter came into being, composed of protons, neutrons and electrons – the building blocks of our present world.

To answer these fascinating questions, European scientists plan for the new international accelerator centre FAIR for intense, high-energy beams of ions and antiprotons.

5. FUTURE ACTIVITIES

5.1 Capacity Building

During the June meeting, the ESFRI chair opened up the discussion on Capacity Building. Pan-European Research Infrastructures can (and do) contribute to capacities in the following five areas:

- Research capacities (e.g. availability of sufficient research infrastructures; improving quality, service and availability; coordination);
- Strategic and Knowledge-based capacities (efficient use of knowledge; better preservation of existing knowledge for future generations);
- Innovation capacities (stimulation of technology transfer e.g. through enhancing cooperation with industry);
- Education and training capacities (to enhance skills and stimulate scientific careers);
- A balanced and efficient development of these capacities all over Europe.



Interest was shown by the delegates, and it was agreed that ESFRI will soon prepare a discussion paper in order to participate in the political debate.

5.2 Legal, Financial & Managerial Aspects of EU Research Infrastructures

"I welcome the fact that ESFRI is looking at the types of legal, financial and management arrangements that are currently used by internationally owned research facilities to identify best practice. As the number of potential large scale European research facilities expands, it is vital that a common approach to managing such facilities is developed avoiding the need to learn from scratch each time."

**Lord David Sainsbury,
London, 22 September 2005**

It is likely that most, if not all, of the projects that will appear on the ESFRI European Research Infrastructures Roadmap will be built by a consortium of at least two or more Member States and potentially, with the EC also involved as a full member. In several cases, the number of Member States involved could exceed 10 or more members.

It was therefore agreed that ESFRI should prepare a discussion document on the possible legal, financial and managerial aspects of pan-European RIs to be set-up in the coming year.

Various current experiences at the level of Member states as well as of the intergovernmental organisations, and the pros and cons of each model should be analysed.

To start the debate, Italy agreed to present the Italian situation on the Sustainable Management of RIs at the September meeting.

Sustainable Management – a view from Elettra

In addition to the usual R&D indicators, socio-economic indicators might be used to report on Social Accountability. Such indicators relate in particular to:

- Society and culture, measuring eg. impacts on training and education;
- Economy and employment, measuring impacts on innovation capacities;
- Environment and sustainability, measuring impacts on our quality of life.

The study of these indicators will facilitate the better understanding of the RI's impact, not only from a scientific as well as a financial viewpoint, but also from a sustainable development perspective.



<http://www.elettra.trieste.it/>

6. COMMUNICATION STRATEGY

6.1 To support **Communication Strategy** for ESFRI, a new logo was agreed during the September meeting. In addition, the new ESFRI website was presented and will be continually updated.

6.2 ESFRI's September 2005 meeting was held in London under the auspices of the UK's Presidency of the EU. Meetings of the three Roadmap Working Groups were also arranged giving delegates the opportunity to discuss issues with their colleagues in other Working Groups and with the ESFRI delegates. Lord Sainsbury, the UK's Minister for Science, addressed the delegates at the Conference dinner whilst Achilleas Mitsos attended the main session of ESFRI to present the newly launched proposal for the FP7 "Capacities" Programme.

6.3 Third EU Research Infrastructures' Conference, 6-7 December, 2005

Following the first European conference organised in Strasbourg in 2000 and then in Trieste in 2003, this third European conference will look at the current and future needs of users and operators of Research Infrastructures, and will help to identify problems and opportunities at European level. This will in turn provide valuable feedback in the preparation of the EC's 7th Framework Programme. The Conference will cover all types of Research Infrastructures including a specific focus on digital libraries and scientific repositories.

This conference will take place at the East Midlands Conference Centre in Nottingham, UK. The Conference is being organised jointly by the European Commission and the Council for the Central Laboratory of the Research Councils (CCLRC), with the support of the UK presidency of the EU. The University of Nottingham is in charge of the local arrangements.



ESFRI - European Strategy Forum on Research Infrastructures

The European Strategy Forum on Research Infrastructures (ESFRI) was launched in April 2002. ESFRI brings together representatives of the 25 EU Member States, appointed by Ministers in charge of Research, and a representative of the European Commission. The countries associated with the Framework Programme for Research were invited to join in 2004.

The role of ESFRI is to support a coherent approach to policy-making on research infrastructures in Europe, and to act as an incubator for international negotiations about concrete initiatives. In particular, ESFRI is currently preparing a European roadmap for new research infrastructures of pan-European interest.

A general report on the activities of **ESFRI** is made available once a year.

For more information: <http://www.cordis.europa.eu.int/esfri/publications-others.htm>

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