

# ESF Plan

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*2002-2006*



European Science Foundation

The European Science Foundation (ESF) acts as a catalyst for the development of science by bringing together leading scientists and funding agencies to debate, plan and implement pan-European scientific and science policy initiatives.

ESF is the European association of 70 major national funding agencies devoted to scientific research in 27 countries. It represents all scientific disciplines: physical and engineering sciences, life and environmental sciences, medical sciences, humanities and social sciences. The Foundation assists its Member Organisations in two main ways: by bringing scientists together in its scientific programmes, EUROCORES, forward looks, networks, exploratory workshops and European research conferences, to work on topics of common concern; and through the joint study of issues of strategic importance in European science policy.

It maintains close relations with other scientific institutions within and outside Europe. By its activities, the ESF adds value by cooperation and coordination across national frontiers and endeavours, offers expert scientific advice on strategic issues, and provides the European forum for science.

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## Contents

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<b>Foreword</b>	<b>3</b>
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### **ESF Plan 2002-2006**

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Introduction	<b>4</b>
The ESF mission	<b>4</b>
Where does ESF stand now? An assessment of the ESF's current position	<b>5</b>
Positioning of ESF within European S&T	<b>6</b>
Operating principles	<b>7</b>
ESF internal structures and functioning	<b>7</b>
<i>Membership</i>	<b>7</b>
<i>Governance</i>	<b>8</b>
<i>Scientific Standing Committees</i>	<b>8</b>
<i>ESF relationship with specialised groups (Expert Committees)</i>	<b>9</b>
Science policy and advice	<b>10</b>
ESF instruments	<b>11</b>
<i>'Traditional' networking</i>	<b>11</b>
<i>New Action Lines</i>	<b>12</b>
– <i>EUROCORES</i>	<b>12</b>
– <i>Scientific Forward Looks</i>	<b>13</b>
– <i>Research Infrastructures</i>	<b>13</b>
Development of internal and external partnerships	<b>14</b>
Resources (financial and human)	<b>15</b>

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<b>Implementation report of the ESF Plan 1998-2001</b>	<b>17</b>
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# Foreword

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**I**n 1998, ESF published its first 'corporate' plan setting out its aims and the targets to be achieved over the next four years. We consider that we have substantially accomplished the targets set at that time.

An organisation such as the ESF needs to be responsive to changing circumstances and new challenges. We believe that the new Plan for the next five years, 2002-2006, provides a framework for the development of the Foundation coupled with the flexibility necessary to adapt both to scientific advances and political changes.

To respond to changing needs, ESF is introducing significant new Action Lines. One focus is on bringing together research funding to support pan-European collaborative research (EUROCORES) which is a substantial development from ESF's successful networking role between individuals and groups. The second Action Line reinforces and increases the Foundation's work on developing the science case for research infrastructures in Europe and the third new Action Line is that of providing medium term perspectives on future directions of multi-disciplinary research in Europe (the ESF Scientific Forward Looks). These are key developments in the progress of ESF in serving its Member Organisations and the research community at large.

The introduction of these new Action Lines takes place at a time when there are new political initiatives underway in the organisation of research in Europe. The acceptance of the concept of the European Research Area (ERA) by both the scientific community and at the highest political level is very important. Given this, ESF must now seek to position itself to good effect within the ERA. In response to this ESF has been asked to lead the debate on the future structure of science funding in Europe and especially to examine the case for a European Research Council. Whatever may eventually emerge, it will have a major effect on the long term prospects for the Foundation.

Now ESF and its Member Organisations have to implement the actions set out in the Plan and we have every confidence that, in 2006, we will be able to look back on a significant delivery of our aims and aspirations.



**Reinder van Duinen**

*ESF President*



**Enric Banda**

*ESF Secretary General*

## Introduction

Starting in the late 1980's with its "Forward Look" planning, the ESF has endeavoured to map out its future development in response to the demands of its Member Organisations and to the evolving nature of European S&T collaboration. This led to a series of reviews and reforms during the 1990s which started with the ESF Strategic Re-Appraisal and which ended at the ESF Assembly 1999 with the adoption of a revised Statute and new methods of Governance. During this period, ESF adopted a 'corporate planning' approach and the *ESF Plan 1998-2001* was an attempt to establish a set of strategic goals to which ESF should aim. Many of the targets set out in the first Plan were rather general in character. Most have been addressed over the past four years and the Plan has been substantially delivered.

The aim of the new Plan must be to consolidate these changes and to develop ESF further. In the past quarter of a century, ESF has played an early and significant role in the creation of what is now known as of the European Research Area. At the time of its establishment in 1974, European science interactions were at a low level and much needed to be done by ESF in view of the scale of the task. There is now a new and changing environment for research in Europe which is leading both to a greater level of activity and a desire for strengthened and extended collaboration. ESF needs to define its position in this new environment. The Plan introduces general objectives with some more detailed targets in order to provide a measure of performance over the Plan period.

*"The test of science is its ability to predict"* Richard Feynman

## The ESF mission

The ESF Mission Statement:

*"The ESF promotes the development of European science at the forefront of knowledge by bringing together leading scientists and scholars and research and funding agencies to debate, plan and implement European research."*

The ESF works with two communities, its Member Organisations (funding agencies, national research organisations and academies of sciences and letters) and the European research community at large, which ESF and its Member Organisations exist to serve.

ESF takes into account:

- the potential of a European added value;
- the priorities of its Member Organisations;
- the needs and aspirations of the wider research community.

In so doing, ESF endeavours to promote:

- the integration of the European research community;
- the development of multidisciplinary;
- the contact and cooperation between European countries (both 'larger' and 'smaller') and their science communities, building on scientific and cultural diversity;
- the development of a coordinated European approach to global programmes;
- the synchronisation of the activities of the ESF Member Organisations; and
- the development of an ESF 'voice' as an independent scientific organisation.

## *Where does ESF stand now? An assessment of the ESF's current position*

Perhaps the greatest strength of the Foundation is its access to and its ability to gather together top level scientists from across Europe in fostering collaborative and comparative research and it has very good track record and reputation in the promotion of different forms of research networks. This is backed by the support and the strength of its Member Organisations, which, together, are responsible for a large part of publicly funded research in Europe. However, ESF is also independent and can, thus, speak in an authoritative manner on many subjects. Its recent policy guidance on a variety of issues in the development of European science (the *ESF Science Policy Briefing* series) have been widely accepted as important in forming a framework of good research practice.

At the same time, ESF often lacks 'visibility' in the scientific community which stems partly from its relatively small budget and partly from the low priority frequently given to ESF by its Member Organisations and their scientific communities. They tend to be more focused on national rather than European issues. We recognise that the daily life of a researcher is frequently driven by the search for resources to enable research to take place. The lower than desirable impact of the ESF on the research community is a reflection of its budgetary limitations. Furthermore, it is also recognised that, for a variety of reasons, the Foundation does not have a balanced 'presence' in all areas of science, thereby leaving some parts uncovered, which may also contribute to a lack of 'visibility'.

*“A wise man will make more opportunities than he finds”*

Francis Bacon

One weakness is and has been in the development of links with industry, and this will need attention in the period of the new Plan. Much research of a rather

### **Urban and peri-urban science – an example of a multi-disciplinary ESF Scientific Forward Look**

Urbanisation, in Europe and elsewhere, is leading to the recognition that this environment has become a significant habitat not only for humankind but for many other species. We need to study how urban and peri-urban areas interact with their hinterland and to understand the dynamic



processes occurring within towns and cities. Research in this topic spans most areas of scientific endeavour. Policy-makers should be able to use the results of such multi-disciplinary research which must be accompanied by strong communication and involvement with the general public and the political process at all levels from European to local. A medium term perspective for research in this area, from a European standpoint, is of high priority and which can build on and bring together the various national research initiatives which are taking place.

fundamental nature is being undertaken either within industry or by 'academic' scientists with strong industrial connections and it will be important for ESF to improve its links, while, as a publicly funded organisation, preserving its independence and its 'non-exclusive' approach.

Because ESF needs to approach its Member Organisations individually, in order to fund activities by an *à la carte* arrangement, the system is frequently ponderous, especially considering the rather low level of resources involved. This is because ESF has to work at the pace of its Member Organisations who often duplicate ESF peer review and approval processes at the national level and it is this which creates much of the time lag.

ESF must re-position itself in the light of new developments in European research policy. The significantly different approach to research policy in Europe signalled by the European Commission's initiative promoting the concept of a "European Research

Area” (ERA) has created a new political environment. The need for the development of multi- and trans-disciplinary scientific fields provides new opportunities for ESF actions, as does the ability to bring together new funding mechanisms for collaborative research, for the development of ‘Foresight’ activities and for playing an increasingly important role in the design of new research infrastructures in Europe (these are all discussed further under ‘Instruments’) and in the development of science policy. In addition, ESF will have an increasingly important role to play as ‘Europe’ itself and the ESF enlarges, and as collaborative research activities take on a growing global perspective.

The ESF Governing Council (mainly composed of the Heads of ESF Member Organisations), in discussing the future strategy for the Foundation, expressed the view that ESF:

- is the platform of choice for harmonising and coordinating activities in science and science policy where and when this is needed;

- deals with longer-term science issues, primarily in the ‘knowledge creation’ part of the scientific spectrum; and
- should be seen to continue to act as an organisation independent of governments and the EU.

## *Positioning of ESF within European S&T*

*“Knowledge must be the currency of the European Research Area and ESF should be its mint”* Enric Banda

There is a significant opportunity within the ERA for the ESF, with its Member Organisations, to develop mechanisms to expand the scale of European science to ‘continental’ scales and, thus, increase the competitiveness of European research. This should be welcomed because this will increase both collaboration and competition between European scientists which will lead to a better competitive position for European science and scientists at a global level. The new Action Lines proposed within the Plan provide new mechanisms of working together which are expected to contribute substantially to the ERA.

Although there are various proposals to bring together national agencies (most of which are ESF Member Organisations) to discuss enhanced cooperation within the ERA, it is entirely appropriate that this should be carried out primarily within the ESF and should not duplicate such existing structures. As the ‘platform of choice’, ESF should be viewed as the natural place to develop enhanced collaboration between national agencies, including the networking of ongoing activities and the ‘opening up’ of funding mechanisms. In addition, ESF should also be seen as the logical place to promote a coordinated European approach to global science initiatives and programmes.

### **Origin of Man, language and languages – a ground-breaking EUROCORES**

Language and communication may be considered as one of the defining characteristics of the human species. The development of linguistic and cognitive skills in the prehistoric



past can be studied nowadays with reasonable expectations of success thanks to the converging developments of several disciplines. New perspectives

have been opened by genetics and linguistics, evolutionary anthropology, neuro-physiology, and cognitive science are converging so offering a fresh approach to understanding the origin of language. Comparative maps of genetic and linguistic human families have been produced which show large similarities between the distribution of genetic diversities and that of linguistic groups. Such a correlation implies that language has a biological basis, and that the development of linguistic skill can be linked to the evolution of the brain and of its cognitive strategies. Research on the origin of language and of languages is now emerging as a multi-disciplinary field, where prehistoric archaeology, palaeo-anthropology, genetics, linguistics, neuro-physiology, cognitive science, and computer science, can profitably collaborate.



The ERA proposal has inevitably led to debate and speculation about the need, or not, of having a European Research Council (ERC) or similar body, which could take responsibility for the expansion of research funding from the national to the continental scale. The creation of an ERC or ‘agency’ is a matter for which the ESF and its Member Organisations must be ready to develop an informed view and be ready to take appropriate action. The debate could move ahead fairly quickly and ESF and its Member Organisations must be prepared. To achieve this, a high level Expert Group needs to be appointed, with some urgency, to develop proposals and arguments (including analysis of cost/benefit matters and related policy and administrative issues) and to initiate a broad debate within both ESF Member Organisations and in the wider community about the possible implementation of a European Research Council.

## PLAN ACTION:

**ESF, as a matter of priority, will organise, structure and lead a swift and thorough debate on the merits of an ERC and how it may be achieved. ESF will appoint, as a matter of urgency, a high level Expert Group to investigate the issue and to propose options for a wide consultation in 2002. A final Position Paper shall be made available for further discussion during the first half of 2003.** The role of ESF and other European organisations, as well as national organisations, and their demonstrated competences, within an ERC structure, should be considered. Without prejudice to the conclusions from such a debate, ESF must be ready to take appropriate action whatever the outcome.

## *Operating principles*

The next few years will see many exciting new developments and a number of examples are given in this document to illustrate some areas of science which have such a potential for the future. The aim of this document is not to provide a specific science agenda with descriptions of science targets to be met, rather the ESF Plan has to set out a series of guiding principles for the ESF approach to delivering its mission, and to which the Foundation has to be committed in supporting its own scientific activities, and in providing a European added value for both its Member Organisations and the European research community.

The ESF, therefore, commits itself to:

- ensure scientific excellence at all times, while promoting good and ethically sound research practice;
- actively stimulate the implementation of innovative research at a European level and reinforce European scientific capacity and capability;
- take into account the interests of all those involved in the ESF and its activities and to reconcile them in a common European approach;
- ensure swiftness, flexibility and efficiency of response;
- operate in an open and transparent variable geometry mode.

## *ESF internal structures and functioning*

### Membership

The aim of the Foundation is to bring together all organisations responsible for supporting research and, thus, should be open to organisations which fulfil the criteria for membership. These are, as stated in the current Statute and still reflecting the original position taken at its founding in 1974, that “an organisation seeking ESF membership should be a national funding agency or analogous body in a democratic European country supporting or conducting a significant part of that country’s basic scientific research from resources assigned to it by the government of that country”.

The procedures of the organisation (levels of decision making, appointment to committees, etc.) should ensure that the award of research funds and the conduct of research is based on scientifically independent decision-making and the use of peer review. Thus, while ESF is sympathetic to receive proposals for an enlargement of membership, it is nevertheless important that the criteria are fully met by applicant organisations.

At the same time, taking into account changes in the European science system over the past 25 years or so, the criteria set out above need to be reviewed in depth. This study should not only review membership criteria but also consider whether and how best to develop links between ESF and those organisations currently outside the ESF 'family' involved in 'public good' research.

### PLAN ACTION:

**Establish a group to review membership criteria and consider how best to develop better links with other types of organisations sponsoring 'public good' research, and report to the Assembly in 2003.**

## Governance

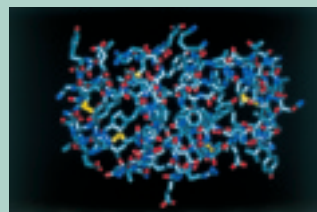
It is accepted that ESF must be flexible and that there must be a willingness on the part of the ESF and its Member Organisations to adapt structures and procedures to meet changing circumstances within European research, especially possible developments relating to an ERA. While no major changes in ESF governance other than those mentioned below are foreseen, the Governing Council and the Executive Board have the responsibility for keeping the organisation and management of the Foundation under review, even though the new Statute and governance have only been in place since 2000.

### PLAN ACTION:

**The Governing Council and the Executive Board will review the operation of the Statute and the operation of the ESF governance procedures towards the end of the Plan period (end of 2005).**

## Functional Genomics – an ESF programme at the forefront of research

Functional genomics has emerged as a new and rapidly evolving scientific discipline dedicated to studying the functions of genes.



With the complete sequencing of an increasing number of organisms (bacteria, fungi, plants and

animals), culminating in 2001 with the full sequence of the human genome, research priority has to be shifted from the identification of genes to the elucidation of their functions. The ultimate goal of functional genomics is the improved understanding of cell organisation at different levels, from individual genes to groups of biomolecules and complete genomes.

## Scientific Standing Committees

ESF sees the Scientific Standing Committee system as its principal means of engaging with Europe's research and scholarly community. Thus it asks that the Member Organisations nominate leading scientists to these Committees, while having, at the same time, a significant link to their nominating organisation. This is normally achieved by having institute directors or chairs of national committees as members of the Standing Committees. At the same time, the Committees must be receptive to the ideas of the scientific community at large and have an adequate disciplinary balance within their membership. In addition, they must also develop better cohesion and linkages in order to address the new problem-orientated and multi-disciplinary issues which are emerging, and the problem identified in paragraph 6 above of increasing the disciplinary 'presence' of the Foundation.

It is a requirement within the Statute that the Scientific Standing Committee structure should be reviewed at least every five years. The Governing Council has already initiated a review of those Committees covering the natural and medical sciences (LESC, PESC and EMRC) and will initiate a further review of the committees for the humanities and the social sciences (SCH and SCSS). Both reviews, conducted independently, will report during 2002. The aim of these independent reviews is to ensure that the Scientific

Standing Committees not only fulfil their statutory role but that they are responsive to proposals from their communities and have a significant impact within their domains of science.

## ➔ PLAN ACTION:

**Changes recommended from the independent reviews will be considered in 2002 and, if accepted, implemented under the guidance of the Governing Council and the Executive Board during 2003.** At the same time, both bodies will need to look at the adequacy of the current scientific advisory structure of ESF in response to emerging multi-disciplinary needs and the overall role of the Standing Committees in the development of ESF.

## ESF relationship with specialised groups (Expert Committees)

ESF already has, within its structures, a number of specialised groups covering the topics of nuclear physics, radio-astronomy frequencies, space science, marine science, and polar science. Each has arisen in a different manner but what they have in common is that all are funded *à la carte* by ESF Member Organisations and, in some cases by external bodies, and meet a particular need or desire for the coordination of science and the development of science policy. There is now an increasing proliferation of specialist European scientific groups of all types, and ESF needs to establish a general policy in which relationships with specialist groups can develop. The issue which ESF has to face in linking to some of the groups is not to be seen as acting for a lobby of individual scientists but rather to work with and for its Member Organisations in promoting, on their behalf, specific areas of science at a European level. All Expert Committees within ESF should have a common approach to their terms of reference and their operating procedures as well as to the relationship with ESF Scientific Standing Committees and other groups and committees within the ESF 'family'. Some harmonisation has already taken place but the detailed terms of reference must, perforce, reflect the specific nature and composition of each group. Input from such groups in the development of science policy needs to fall within the overall ESF policy guidelines, and this must be the responsibility of the ESF Executive Board to whom Expert Groups could make recommendations.

An approach is proposed that distinguishes between those groups structurally within the Foundation and which must adhere to the operating procedures and rules of the ESF, and those to which ESF has established a link, or 'alliance'. In the first case, the principle of open and variable geometry will apply while the other groups may be more selective. Those groups which are part of the ESF structure must make a contribution to the overall ESF mission and should have the support of the Member Organisations. They will require adequate resources including the ability to promote occasional specialised workshops. They should be seen as having a limited life and not as permanent parts of the structure, and must be subject to regular review.

## ➔ PLAN ACTION:

**The Executive Board, in consultation with the Scientific Standing Committees, will have the responsibility to:**

- **develop structures and criteria to accommodate specialist groups within or associated with the Foundation.** In particular, 'open variable geometry' groups of Member Organisations to promote specific areas of science that are considered to be important in delivering the ESF mission should be invited to be associated under the ESF 'umbrella'. This will need to be put in place, after consultation, during 2003 and beyond, as appropriate;

### Protecting radio astronomy – defending the science base

Radio astronomy plays a key role in our understanding of the Universe, through the reception of cosmic radio signals, which are more than nine orders of magnitude weaker than

man-made radio signals. Protecting against unwanted interference in frequency bands allocated to radio astronomy,



passive remote sensing and related sciences will remain a challenge for the research community as use of the radio spectrum increases on Earth as in space. The ESF Committee on Radio Astronomy Frequencies (CRAF) plays a major role in ensuring that the needs of research are fully taken into account when radio bands are allocated.

- **recommend Statute changes** to recognise the different nature of such groups and to provide a structure for their interaction with other parts of ESF, in particular with the Scientific Standing Committees, which may need to be implemented;
- **examine each request for 'association' on a case by case basis and ensure that each group, if accepted, is adequately resourced.**

## *Science policy and advice*

ESF has established itself as providing an authoritative European scientific 'voice' for both its Member Organisations and the European science community at large. In particular, issues such as those of 'Biology and Society' provide important opportunities for ESF to represent the interests of its Member Organisations and the research community to policy makers at all levels, and ESF has been strongly encouraged to do so. In speaking with this independent 'voice', it has to be recognised that the ESF views will not necessarily reflect the individual opinions of science groups nor of individual Member Organisations.

While it will provide views on many science policy issues on its own initiative, the ESF may also be asked to deliver advice to the EC or similar bodies. In this case, it should not be seen as a general science policy advice 'donor' without being adequately compensated for such actions.

Generally, science policy activities will be generated by requests from Member Organisations, or arising from the Standing Committees and other parts of the ESF or in response to external issues. Member Organisations and other agencies should be encouraged to look to ESF as one of the most important sources of impartial advice at the European level. There are now a number of bodies operating at the European level able to provide science policy advice. ESF is the only one of these bringing together the different interests and expertise of funding agencies, national research organisations, academies and individual scientists.

### **The European Social Survey – ESF promotes European initiatives to develop research**

Through an ESF research programme (the "Beliefs in Government" programme), aimed at a stocktaking of social and political orientations of Western Europe's citizens as they



had emerged through the second half of the 20<sup>th</sup> century, it was realised that there was a need to have better data than

those in existence in order to analyse the change in public attitudes and beliefs. This resulted in an ESF plan for an ongoing representative sample survey of the people of Europe in a wide array of fields – the European Social Survey (ESS). The ESS is now in full operation with the first wave of data collection in more than 20 countries from both Western and Eastern Europe scheduled to begin in September 2002. This truly "large facility" has come in to existence because of an ESF initiative, which prepared the "blue print" for the project and which has been implemented by a combination of national funding, for the principal investigators and the conduct of the Survey in each participating country, together with European-level funding to support the ESS Coordinating Team. As more waves of the survey accumulate through time, the ESS will be a growing resource for research and for policy-makers alike in providing social analysis.

### **PLAN ACTION:**

**The role of ESF in providing views and position statements on science and science policy matters is a major task and should be developed further.**

There is likely to be an increasing demand for independent science policy advice at the European level to which ESF will need to respond positively.

## ESF instruments

ESF has operated a number of different instruments in its actions to develop European science. These have traditionally been aimed at the ‘networking of scientists’. Recent developments within the ERA and the general desire that the more fundamental sciences require to be supported at the European level has led ESF to introduce new schemes to address funding issues and to provide new European-wide mechanisms addressing ‘Foresight’ and research infrastructures. These new instruments will be important in the future positioning of ESF within the ERA.

### ‘Traditional’ networking

The ‘core business’ of the ESF is the networking of scientists across Europe. This has to remain the main activity for ESF during the period of the Plan. However, needs may well change during this period. ESF will have to respond to changing demands while generally maintaining and adapting its current range of instruments and actions. However, any changes, other than simplifying systems, should occur in an evolutionary manner.

### PLAN ACTION:

**ESF will keep its present system of ‘traditional’ networking instruments (Exploratory Workshops, Networks and Programmes) under review and will adapt them to meet changing demands.**

The Exploratory Workshop scheme is a particularly useful tool to incubate and explore new ideas and which will have an important role to play in the identification of suitable themes for development under the new Action Lines, especially for EUROCORES.

In terms of simplifying instruments, which may appear confusing to the ‘user’, the research scientist, there is a need to critically examine the

continuum of ESF networking, from Exploratory Workshops through the present Network Scheme to *à la carte* programmes, with a view to ensuring that they meet the ‘user’ needs. This may require revisions to the current arrangements. Due to the different funding mechanisms involved in these instruments, and the implications for the budgetary process, this is not a simple matter and **a Task Force from Member Organisations will be established under the Executive Board as a priority action. This will consider how best to meet the needs of the research community and the financial consequences of merging or re-aligning the schemes. The Executive Board should report to the ESF governing bodies and the Member Organisations within the first half of the Plan period.**

Methods to provide for long term funding stability for the research conference programme (EURESCO), one of ESF’s activities which gives it its highest ‘visibility’ within the research community, will need to be investigated to ensure the continuation of this programme at the end of the current Consolidation Fund action in 2002. **Block funding from the Framework Programme will be sought. In the event that this is unobtainable, the Governing Council will then need to consider the long-term viability of the programme and Member Organisations will also need to devote resources to ESF to maintain this activity.** In addition, collaborative arrangements with other organisations promoting advanced research conferences will be investigated.



## New Action Lines

Recognising changing needs within Europe for the support of science, ESF, its Executive Board and its Governing Council have responded by introducing three new Action Lines which are discussed below. The three new priority action lines of EUROCORES, Forward Looks and Research Infrastructure actions will be an important part of its development and re-positioning. In order to take these forward, ESF will need to adopt some of the more formal methodologies followed by national research councils. The Executive Board and the Governing Council will need to keep a close watch on the evolution of these new Actions, which will require a review by the end of the period of the Plan.

## EUROCORES

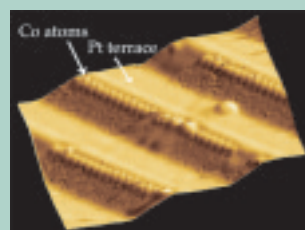
The EUROCORES scheme has been designed to bring together research funding at a European scale to address key priority science topics. Recognising the difficulty of moving research funds across national frontiers, EUROCORES has been designed to provide for common actions while maintaining the independence of national funding decisions by the participating Member Organisations. EUROCORES are designed to meet identified needs in research and produce a European ‘critical mass’. EUROCORES initiatives involve open and transparent variable geometry.

The key features of EUROCORES are that there is a single specification and Call for proposals issued, there is a common international high-quality peer review and there is ‘post-award’ project management and networking. The preparation of a EUROCORES will need to be undertaken by the Scientific Standing Committees within the ESF budgetary process. In addition, each EUROCORES will generate its own “overhead” costs in terms of project management and networking and exchange activities, and this will need to be built in to the budget and provided for in each EUROCORES. The possibility that the Framework Programme could assist the scheme in relation to its desired aim of encouraging the coordination of national research activities as part of ‘Strengthening the ERA’ is being investigated.

The EUROCORES process has raised a number of administrative issues which need to be resolved. For example, there has to be some harmonisation and/or

### Self-Organised Nanostructures – EUROCORES forming the basis for future innovation

Researchers can now design materials that assemble themselves into complex, finished structures. Self-assembly, or self-organisation, is a process in which organisation is established in a complex system of interlocking components, where the organisation is determined by competing interactions. New ways of bonding, assembly and linking macromolecules and nano-objects have been developed based on interactions that are more complex and individually weaker



than the classical covalent bond. The last decade has seen spectacular advances in both *molecular engineering*, whereby molecules, clusters and

nanocrystals with novel properties are synthesised, and *molecular self-assembly*, where these building blocks are designed in such a way as to automatically produce novel materials. Self-organised nanostructures (SONS) is a field which offers breakthroughs in many areas such as quantum dot lasers or magnetic storage devices, to molecular electronics, genetic diagnostics, anti-icing coatings, and rechargeable batteries. SONS is a subject in which it is essential for engineering development and the resolution of the scientific challenges to work hand in hand.

flexibility of Member Organisations’ procedures. ESF office procedures and resources for handling EUROCORES also require further attention.

This initiative should be seen as meeting the needs of increasing collaboration and competition in European science and so enhancing the work of the ESF Member Organisations. In addition, the benefit to the ‘working’ researcher is that it enables the research community at large to propose broad topics and so attract research funds to a specific key scientific area and provide for European collaborative research to which it is difficult to gain funding.

***“A man would do nothing if he waited until he could do it so well that no one would find fault with what he has done”***

Cardinal Ernest Newman

## ➔ PLAN ACTION:

**EUROCORES will be ESF's preferred instrument for the development and implementation of collaborative funding for research in Europe.**

It will provide ESF with the trust and credibility in delivering such a system which must be aimed at the support of the highest quality science. The scheme must be responsive to both the needs and priorities of the ESF Member Organisations (reflecting national priorities in science) and to 'bottom-up' proposals from the research community.

In many cases, there is likely to be an industrial contribution to be made to the activities of EUROCORES and this needs to be taken into account when planning new actions.

Forward Looks and other similar studies as well as existing ESF instruments, especially through the Exploratory Workshop approach, should be seen as 'feeders' for the promotion of EUROCORES.

The Executive Board and the Governing Council must, on an ongoing basis, evaluate the experiences gained from the 'learning by doing' approach to EUROCORES in order to develop best practice and improve this instrument.

## SCIENTIFIC FORWARD LOOKS

The ESF Scientific Forward Looks were introduced in 2001 as a means of bringing the scientific community and decision-makers in Member Organisations together to provide medium-term to long-term high quality perspectives in particular areas of European science. An emphasis has been given to multi- and trans-disciplinarity in the themes to be studied. These studies are intended to have an output which should provide the templates for future actions at both the national and European levels as well as provide the basis for the future development of EUROCORES.

## ➔ PLAN ACTION:

**Criteria and guidelines for the Forward Looks will be further defined and the resources needed for their full implementation will need to be considered within the budgetary process. It is estimated that, with current resources, ESF could sustain at least two Forward Look exercises per year.** The topics will need to be developed

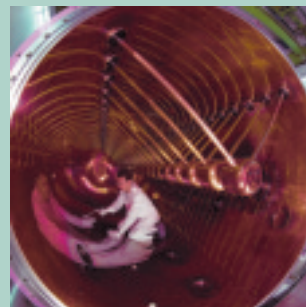
through the Standing Committees, reporting to the Executive Board, so that there is a clear 'ownership' of each action. Member Organisations will be encouraged to suggest and 'lead' topics.

## RESEARCH INFRASTRUCTURES

The development of European science and the ERA is critically dependent on the provision of advanced research infrastructures across Europe through sharing, pooling or networking existing facilities and by the development and installation of new facilities. This was recognised at the Conference on Research Infrastructures held in Strasbourg in September 2000. The Conference Declaration considered that there was a need for a better decision-making process within Europe based on high quality independent scientific advice. The role of ESF in the past in providing such advice was acknowledged and the Conference recommended that ESF should have such a role in the future. This was further reflected in the European Commission's proposals for the Sixth Framework Programme. The Governing Council has

### Radioactive Ion Beam facilities in Europe – delivering facilities for research

Nuclear physics treats the atomic nucleus as a collection of nucleons – neutrons and protons – but this is only part of the story. Nucleons are built up of quarks and gluons, and these have an effect beyond their nucleon cages. Interactions between nucleons are different inside a nucleus from that as free nucleons, and depend particularly on



proton and neutron densities. There is no analytical form of the effective interaction between them, and first principle calculations can only be used for the lightest (simplest) nuclei.

A fundamental goal of nuclear physics is to derive the correct form of these interactions and to present a unified description of the nucleus. This needs the creation of exotic nuclei which, in turn, requires new technology – the ability to generate high-quality beams of radioactive nuclei, many of which have extremely short lives. Through ESF and its Member Organisations, Europe has taken the lead in this field and is now preparing a new generation of radioactive ion beam accelerators to explore exotic matter.

responded to these recommendations for ESF to provide advice, assessments and evaluations of research infrastructures by identifying this activity as the third of the ESF new priority Action Lines. This also recognised that ESF, with its broader European scientific interests, can also ensure the full involvement of the EU candidate countries in this debate.

### ➔ PLAN ACTION:

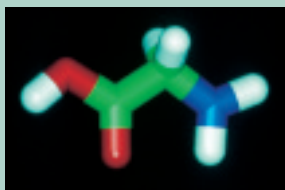
**ESF will continue to develop and strengthen its role in giving independent scientific advice on all aspects of infrastructures.**

The definitive agenda will derive from external requests from ESF Member Organisations, the European Commission, other European and national authorities and in response to the emerging needs of the research community, usually identified through the ESF committee structure and the Scientific Standing Committees will have an important role to play in this action.

Arrangements for the oversight of this activity with responsibility for accepting studies and for providing quality control and advice on any follow-up actions will be put in place by the ESF Executive Board early in 2002.

#### Developing models of life processes – new ideas for the future

The test of science is its ability to predict and, for this, one needs to have an understanding of how processes work



and to be able to build predictive models. The life sciences have now reached the stage where processes are

being understood and modelled at a wide variety of complexity (genomic, proteomic, metabolic, cellular, multi-cellular, individual, species, and environment) and ranging in scale from that of the genome to the binome ( $10^9$  m to  $10^2$  m). Each level of activity now needs to have an appropriate research infrastructure if progress is to be made. The need to use biological data effectively, to produce computational models of life processes is a major challenge and one which can serve as an integrating activity across the various levels of the biological processes. The production of a models of life processes *in silico*, in order to simulate these processes, is now feasible, starting with a very simple organism.

## Development of internal and external partnerships

ESF is only one of many ‘actors’ promoting European research and its resources do not allow it to take on actions in all areas of science. Therefore, it has already adopted ‘partnership’ working, especially in many of its science policy and advisory activities, as a way of meeting the many calls on its staff and budgetary resources. ESF also needs to position its actions not only at the European level but at the global level in extending its links outside Europe. The involvement of researchers from other parts of the world in ESF’s networking actions can only serve to strengthen European research.

### ➔ PLAN ACTION:

**ESF will develop partnership approaches in order to deliver its mandate, especially in priority areas as well as in the promotion of its traditional ‘core’ activities.** Partnership arrangements will be either ‘internal’ with ESF Member Organisations or ‘external’ with a variety of other authorities and organisations.

It will develop special arrangements with non-European agencies in order to provide an opportunity for global networking of researchers and scholars. For example, current arrangements with the National Science Foundation could be extended and, in the area of *à la carte* programme development, all agencies having observer status on ESF Scientific Standing Committees should be routinely invited to participate in new activities.



## *Resources (financial and human)*

There is an increasing scientific demand for ESF instruments and, while accepting that many Member Organisations' budgets are static, there needs to be some increase in the financial provision for ESF, given the increasing demands of its Member Organisations. On the part of ESF this demands a commitment to strong cost control and efficient and effective operations. In turn, this will require a commitment from the Member Organisations to ensure that resources and activities are matched.

*“Survival is not determined by size or strength but by the ability to adapt to change”* Charles Darwin

### **PLAN ACTION:**

**Stable or increased funding (in real terms) is needed to sustain 'traditional networking' activities and to provide stability and continuity for the research conference programme.**

**During the Plan period resources will be needed to develop EUROCORES**, some of which will be sought from external sources. The launching expenditure for a EUROCORES initiative (preparation of the specification and the Call) should be seen as part of the General Budget while, from then onwards, each EUROCORES will need to rely on its own 'overhead' charge for project management and networking, derived from other sources. Additional resources will be needed to implement Forward Looks and the enhanced action on Research Infrastructures. As in the case of EUROCORES, some external funding will need to be sought for the infrastructure action.

**An appropriate and fully justified increase in resources will be needed in order to undertake an enlarged agenda of science and science policy activities. The Executive Board and the**

**Governing Council must have the responsibility to develop the Foundation's financial planning for 2002-2006 based on the agreed 2002 General Budget.**

The introduction of schemes for *stagiaires* (trainees) and for short-term secondments of staff from Member Organisations will be investigated and instituted as a means of providing flexible staff support and, for the Member Organisations' staff, an opportunity to gain experience of working in a European environment.



# Implementation report of the ESF Plan 1998-2001

Action proposed	Status
<p><b>1. Exploratory Workshops</b></p> <p>will be used systematically as primary tool for ESF in identifying and 'spearheading' new science activities.</p>	<ul style="list-style-type: none"> <li>• Instrument extended with a coordinated call for proposals for all Standing Committees introduced in 2000.</li> <li>• 52 workshops promoted in 2001. Approximately 40 workshops per annum envisaged in a steady state.</li> </ul>
<p><b>2. Network Scheme</b></p> <p>Strengthening and streamlining Network Scheme with more cost-effective management and with multi-disciplinarity to be emphasised.</p>	<ul style="list-style-type: none"> <li>• Smaller Network Group (3 Executive Board members and Chairs of Standing Committees) introduced in 2000. Need for multi-disciplinarity emphasised for all networks.</li> </ul>
<p><b>3. EURESCO</b></p> <p>Continuation of bids to EC Framework Programme. New funding approach to be introduced. New committee with stronger links to Standing Committees to be introduced.</p>	<ul style="list-style-type: none"> <li>• Bids to FP remain successful.</li> <li>• Consolidation fund introduced in 1998 and supported to a level of approximately 260 000 EUR p.a. for 3 years plus some 'in-kind' contributions.</li> <li>• Number of events stabilising at 40-50.</li> <li>• New committee (chaired by Executive Board member) with representation from Standing Committees introduced in 1999 together with the implementation of external peer review. Development of partnership with other research conference organisers in Europe still needed.</li> </ul>
<p><b>4. À la carte Scientific Programmes</b></p> <p>increased systematic development with need for a number of structural and funding issues to be overcome including funding balance and "delay" time between ideas and launches.</p>	<ul style="list-style-type: none"> <li>• ESF Standing Committee for Physical and Engineering Sciences (PESC) introduced a two-stage "Open Call" system in 1998. Other committees retained current "evolutionary" approach from other ESF activities, especially workshops.</li> <li>• Overall number of activities stable at 40+.</li> <li>• New Governance enables Executive Board to approve launches at any time but delays remain lengthy in part due to Member Organisations' procedures. Problem of wide involvement and funding remains. New system for determining the scale of contributions is required.</li> </ul>
<p><b>5. Science Policy Agenda</b></p> <p>a) Identification of topics</p> <p>b) Consider jointly funded activities and possible à la carte approach</p> <p>c) 25<sup>th</sup> Anniversary events</p>	<ul style="list-style-type: none"> <li>• Executive Board acting as "oversight" committee.</li> <li>• ESF involvement with other bodies in developing its science policy agenda has increased. Most activities now involve external partners, although not always involving joint funding.</li> <li>• Successfully completed in 1999.</li> </ul>

## Implementation report of the ESF Plan 1998-2001

Action proposed	Status
<b>6. Large Research Facilities in Europe (LRFs)</b>	
<p><b>a)</b> ESF should promote coordination and undertake case studies</p> <p><b>b)</b> Generic issues identified for ESF attention</p> <p><b>c)</b> Specific issues identified in Plan 1998-2001</p> <p><b>d)</b> ESF should aim to be complementary key point for scientific assessment and advice in relation to OECD Megascience Forum and EC activities</p> <p><b>e)</b> Inter-Committee Working Group should play a coordination role in ESF</p>	<ul style="list-style-type: none"> <li>● <i>Increased activities within ESF as a new Action Line. A number of assessments/evaluations were completed at the request of Member Organisations and others:</i> <ul style="list-style-type: none"> <li>– <i>Review of the Needs for European Synchrotron and Related Beam-lines for Biological and Biomedical Research</i></li> <li>– <i>ESF Coordinated Review and Assessment of the very Long Baseline Interferometry Network (EVN) and its Joint Institute for VLBI in Europe (JIVE)</i></li> <li>– <i>Recommendations for ESA’s Future Programme in Life and Physical Sciences in Space</i></li> <li>– <i>Review of the ESA Microgravity Programme’s Advanced Crystallisation Facility (APCF).</i></li> </ul> </li> <li>● <i>Limited activity only.</i></li> <li>● <i>Studies completed or ongoing and new items introduced.</i></li> <li>● <i>ESF role to be a focus for scientific advice on research infrastructures recognised in Strasbourg Conference declaration (2000) and in original FP6 proposal. This part of the EC proposal unlikely to be accepted by the EU Member States. ESF fully involved in variable geometry discussions promoted by several national authorities.</i></li> <li>● <i>In abeyance.</i></li> <li>● <i>In response to new ESF advisory role identified in FP6, ESF will need to introduce a high level “oversight” Committee.</i></li> </ul>
<b>7. External Relationships</b>	
<b>a) EU institutions</b>	
<p>(i) ESF to continue strategic dialogue with the EC</p> <p>(ii) ESF to continue to provide scientific advice on the development of FPV</p> <p>(iii) ESF to redefine its relationship to COST</p>	<ul style="list-style-type: none"> <li>● <i>Ongoing – formal and informal meetings held. EC observers invited to Standing Committee meetings.</i></li> <li>● <i>Completed</i></li> <li>● <i>Liaison meeting held January in 1999.</i></li> <li>● <i>COST observer at ESF Standing Committee for the Social Sciences (SCSS). ESF representatives attend some COST groups. Relationship may need redefinition.</i></li> </ul>
<b>b) Council of Europe</b>	
<p>ESF to continue to provide independent advice</p>	<ul style="list-style-type: none"> <li>● <i>Partners in Gdansk meeting 2000 and in “Science and media” hearings.</i></li> <li>● <i>Ongoing liaison and ad hoc partnerships.</i></li> </ul>

Action proposed	Status
<p><b>c) Other European bodies</b></p> <p>ESF to continue to work closely with other organisations and promote periodic meetings</p>	<ul style="list-style-type: none"> <li>• Good relations established and occasional joint actions with AE, ALLEA, EUA and others.</li> <li>• No action taken on general meetings.</li> <li>• ESF organised (2001) a meeting of major "scientific" Trusts and Foundations in Europe.</li> </ul>
<p><b>d) European learned societies and professional associations</b></p> <p>ESF to develop closer links with groups</p>	<ul style="list-style-type: none"> <li>• ESF has encouraged specialised groups to come under the ESF "umbrella" but without substantial progress.</li> <li>• General liaison established with ELSF, Euragri and APPEC. ENSA still seeking to become ESF Expert Group.</li> </ul>
<p><b>e) Global and regional international bodies</b></p> <p>ESF to continue to liaise with bodies such as OECD and ICSU</p>	<ul style="list-style-type: none"> <li>• Ongoing – Forward Look on Global Change includes IGBP, IHDP and WCRP.</li> </ul>
<p><b>f) Links with non-European funding agencies</b></p> <p>ESF to maintain and develop its existing relationships</p>	<ul style="list-style-type: none"> <li>• Links with NSF strengthened and formalised in the case of networks. NIH and NEH involved in Standing Committees.</li> <li>• Talks held with JSPS and JST.</li> </ul>
<p><b>8. Organisation and Procedures – Membership</b></p>	
<p><b>a)</b> Encourage full participation from qualified agencies in countries of existing Member Organisations</p>	<ul style="list-style-type: none"> <li>• No specific action taken. Extension of membership has taken place in France and Ireland.</li> </ul>
<p><b>b)</b> Extend membership on a case by case basis to Central and Eastern Europe</p>	<ul style="list-style-type: none"> <li>• Passive approach. Agencies from Czech Republic joined in 1999, Estonia in 2000 and Slovakia in 2001.</li> </ul>
<p><b>c)</b> Establish regular forum for agencies from Central and Eastern Europe</p>	<ul style="list-style-type: none"> <li>• No action taken.</li> </ul>
<p><b>d)</b> Extension of membership should not impose financial burdens on existing membership</p>	<ul style="list-style-type: none"> <li>• New formula for calculation of contributions has been introduced by Finance Committee.</li> </ul>
<p><b>e)</b> Keep method for determining General Budget contribution scales under review</p>	<ul style="list-style-type: none"> <li>• Ongoing – new formula introduced on GDP basis to start in 2002.</li> </ul>
<p><b>9. Organisation and Procedures – Organisation and Operating Mechanisms</b></p>	
<p><b>a)</b> Governance review</p>	<ul style="list-style-type: none"> <li>• New Governance and Statutes introduced from January 2000.</li> <li>• Roles of Governing Council, Executive Board, Standing Committees and specialised groups clarified.</li> <li>• Executive Board and Standing Committees' Chairs meet regularly.</li> <li>• Standing Committee Core Groups required to meet Member Organisations on an annual basis.</li> </ul>

## Implementation report of the ESF Plan 1998-2001

Action proposed	Status
<p><b>b)</b> Board and Executive Council to be responsible for Plan implementation</p> <p><b>c)</b> Balanced membership of Standing Committees</p> <p><b>d)</b> Gender imbalance</p>	<ul style="list-style-type: none"> <li>● <i>Governing Council has strategy development role and Executive Board has executing responsibility.</i></li> <li>● <i>Still difficult to ensure. Representatives should be closely linked to their MOs and should meet disciplinary balance needs of the committee.</i></li> <li>● <i>Still difficult to achieve. Dependent on MOs nominations.</i></li> </ul>
<h3>10. Organisation and Procedures – Communications and Dissemination</h3>	
<p><b>a)</b> ESF will build and reinforce the communications position and will enhance the use of electronic media</p> <p><b>b)</b> A general dissemination policy and procedure will be introduced</p>	<ul style="list-style-type: none"> <li>● <i>Web site revised in 1999 and 2001.</i></li> <li>● <i>Most meeting papers now distributed electronically. Applications and external reviews now electronic.</i></li> <li>● <i>Ongoing.</i></li> </ul>
<h3>11. Finance</h3>	
<p><b>a)</b> Development of ESF General Budget, taking into account new financial circumstances and demands from activities</p> <p><b>b)</b> Options for additional finance</p> <p>(i) Partnerships for joint activities will be encouraged</p> <p>(ii) Trusts and Foundations</p> <p>(iii) Industry</p> <p>(iv) Involvement of non-ESF public funding agencies</p>	<ul style="list-style-type: none"> <li>● <i>General Budget increase in line with evolving activities.</i></li> <li>● <i>Only limited success to date.</i></li> <li>● <i>Joint symposia agreement with Wenner-Gren Foundations.</i></li> <li>● <i>Occasional activity has attracted external support but is limited.</i></li> <li>● <i>Policy for involvement of industrial scientists on Web 2000.</i></li> <li>● <i>Policy for industrial sponsorship of activities agreed in 2001.</i></li> <li>● <i>Limited success e.g. partnership with EEA in 2000 with possible prolongation envisaged.</i></li> </ul>
<h3>12. Devolved Management – External Support</h3>	
	<ul style="list-style-type: none"> <li>● <i>Targets of 30 000 EUR and 45 000 EUR for external funding in 2000 and 2001 respectively were only partially achieved.</i></li> </ul>
<h3>13. Member Organisations to second staff to ESF for specific issues</h3>	
	<ul style="list-style-type: none"> <li>● <i>One senior staff member in this position starting in 2001.</i></li> </ul>
<h3>14. Introduction of stagiaires from Member Organisations</h3>	
	<ul style="list-style-type: none"> <li>● <i>No action taken.</i></li> </ul>