

## LESC NEWS

Standing Committee for Life, Earth and Environmental Sciences (LESC)

### Editorial : Why and How to study smaller mammals in Paleontology ?

Why are many vertebrate paleontologists attracted to the study of smaller mammals? One gets excited when a saber-toothed tiger, a woolly rhinoceros or a mammoth is found. These magnificent fossils unquestionably capture our imagination. The answer is: numbers. If we don't study smaller mammals like rodents, we ignore half of the mammalian species. It is the large numbers in which they are found that makes them attractive to study.

Smaller mammal studies are important for the understanding of terrestrial ecosystems of the last 60 million years. Their study is almost exclusively based on fossil dentitions obtained by the sieving of sediments from the target area. These hundred molars can be used in statistical analysis, and changes of time and paleoenvironment can be distinguished. The different families of small mammals exhibit a great variety of basic models in their dentition allowing scientists to identify families, genera and species. For example mice have a series of small cusps while dormice have parallel ridges and voles high crowned prismatic molars. Teeth, in contrast to bones, do not grow; therefore size remains independent of the individual's age. Their functional morphology helps us to recognize the lifestyle and diet of a species, even when that species is extinct.

How are smaller mammals collected? One way is to collect fossil material from fissure fillings. However, these bear no relation to the surrounding geology. The other way is to collect them from stratified continental sediments in geological basins such as those found in Spain, Turkey and Greece. After collection, the fossils are identified and classified. Once systematics is established the next step is to determine the stratigraphy. This calls for high-level European cooperation and integration of data.

Smaller mammals are excellent biostratigraphic markers for continental sediments and can also be used as paleoecological indicators. By comparing recent faunas and the functional morphology of molars an impression of the ecological preferences of the target fauna can be

obtained. The combination of these methods has made smaller mammals a powerful tool for reconstructing past environments.

Migration patterns can be studied by using smaller mammals since these have short migration ranges compared to large mammals; however they produce more generations that would cover longer distances. Since an East to West migration of mammals is more often observed, we can follow the migration patterns of smaller mammals from Asia to Europe.

In conclusion, to reconstruct past environments and migration patterns, a well dated faunal sequence is absolutely essential. Since smaller mammals are excellent stratigraphic markers they are important elements in Paleontology research.



**Prof. Constantin S. Doukas**

Greek representative on the LESG Standing Committee

### LESC activities April-June

On 11 April the LESG Standing Committee held its 22<sup>nd</sup> meeting on the sunny island of Crete, Greece. The main topic discussed was the new LESG Position Paper which the Standing Committee is currently preparing. The Position Paper aims to identify neglected or emerging areas of science where most research within each of the LESG's three broad areas - life, earth and environment - is needed. The Standing Committee organized itself into three strategic working groups and lively and useful discussions took place. Coordinators presented the outcomes and will provide a summary to the Chair for further developments. The LESG Position Paper was further discussed during the Core Group meeting in June.

It was agreed that it should be a visionary document of where the scientists feel that LESC's scientific fields are heading and require European-wide cooperation. The Position Paper should also include integration with fields outside the LESC remit.



LESC Standing Committee members at the Crete meeting

During the April meeting LESC member Alan Jones agreed to coordinate the development of the topic "Earth System Science Grand Challenge" into a Forward Look proposal, in conjunction with the LESC Chair and the Centre National de la Recherche Scientifique (CNRS). As a preliminary step, a brainstorming meeting of CNRS representatives and ESF was held at ESF in late May. A tentative roadmap was drafted and a scoping workshop was planned for the beginning of 2009. The subsequent meeting took place at CNRS on 25<sup>th</sup> August to further develop the proposal, to define the remit and to organize the work structure



LESC Core Group members and Coordinators of the Position Paper (from left to right: Hefin Jones, Olgeir Sigmarsson and Josef Glössl)

The beginning of June 2008 was a very busy and productive period for the LESC Core Group. The 47<sup>th</sup> LESC Core Group meeting, Round Table meeting with Core Group and ESF-LESC Member Organisations, at the kind invitation of the Fonds voor Wetenschappelijk Onderzoek-Vlaanderen (FWO), and LESC-COST synergy meeting all took place in tandem in Brussels from 2-4 June. John Marks, Deputy CE of ESF, attended the Core Group and Round Table meetings to explain the new way of funding EUROCORES and to tackle the persisting

problem of a low number of Forward Look proposals from the Member Organisations. In the ensuing lively discussion the added value of ESF activities and the impact of the already completed Forward Looks were raised. Many Member Organisations clearly considered all of the ESF instruments as useful. For example, the possible discontinuation of the Exploratory Workshops was met with strong opposition.

In the LESC-COST Synergy meeting LESC Chair Alex Quintanilha reminded participants that ESF considered the Forward Look as one of its major instruments. In the past, researcher driven proposals were encouraged, but now the Member Organisations are being challenged to come up with areas of importance for Forward Look initiatives. However, this approach has not proved successful so far. It was remarked that the Forward Look, as an instrument, is not so well known. It was agreed that more effort is required to increase Forward Look visibility and to better explain the portfolio of instruments of ESF and COST to the scientific community.

During the meeting Alex Quintanilha announced that he would be stepping down at the end of June 2008 as Chair of LESC, having served an initial appointment of three years, and then an extension of two years. He expressed his thorough enjoyment at having been involved in LESC-COST synergy. The participants unanimously agreed that Alex Quintanilha had been an exceptionally brilliant Chair and wished him all the best in future challenges.

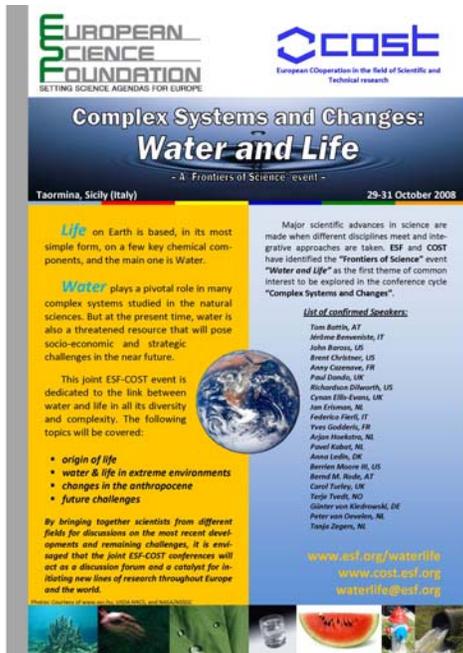
## Conference on "Complex Systems and Changes"

### A "Frontiers of Science" event focusing on "Water and Life"

A joint ESF-LESC/COST Conference dedicated to the link between water and life in all its diversity and complexity will be held from 29-31 October in Taormina, Sicily (Italy). We consider it essential to carefully examine this link, especially as, at the present time, water is a threatened natural resource that could become a marked source of socio-economic tensions.

The Conference aims to provide a stimulating opportunity for participants to identify key challenges and to propose recommendations for new lines of research to address those challenges. During the conference wrap-up, the

challenges and recommendations will be further elaborated and presented (e.g. new research agenda, foresight studies) by the rapporteurs representing ESF, LESC and COST. The ultimate goal is to take up the recommendations for further development and implementation, in cooperation with major research funding and performing organisations in Europe and beyond.



This Conference will bring together experts in their respective fields of science, as well as young scientists and research managers, in order to discuss future global research related to **Water and Life**. It will focus on four main topics: the origin of life; water and life in extreme environments; changes in the anthropocene; and future challenges.

The expected outcome of this workshop will be important for the ESF-LESC/COST synergy; this event is the first of a series of conferences on "Complex Systems and Changes" which will be jointly held each year.

<http://www.esf.org/complexsystems>

## ESF-NSF joint event

In June, ESF and National Science Foundation (NSF, US) organized a workshop in Italy in order to explore possibilities for a trans-Atlantic collaborative research programme on the topic **BioSensing and BioActuation: Interface of Living and Engineered Systems**.

The workshop brought together 35 participants from Europe and 20 from the US, including investigators working at the interface of biology and engineering, representatives from LESC and PESC as well as a number of representatives from ESF Member Organisations.

Participants discussed in depth four grand challenges: sensor informatics guided by life; hierarchical organisation of biological systems; forward engineering and design of biological components; and systems and multi-functional materials and devices for distributed actuation and sensing. The "resolution" was unanimously drawn up by the workshop participants with the following points:

- A compelling new research frontier exists in the basic science and engineering of biologically inspired sensors, actuators and engineering systems which will form the basis for revolutionary bio-derived and bio-inspired technologies.
- Tremendous opportunities exist for synergistic ESF-NSF cooperative research on the transformational science and engineering pertaining to biologically inspired sensors, actuators and engineered systems including strengthening our basic understanding of these systems and societal outcomes derived from related technological advances for the environment, health, security and energy.
- NSF and ESF should strengthen existing bonds and build new ties facilitating US-Europe interactions, synergies and strengths by supporting this multidisciplinary research initiative.
- Financial resources to support these initiatives should be developed and committed.

The entire "resolution" and more info can be found at: <http://www.esf.org/biosensors> or alternatively, see <http://www.esf.org/pesc>



## EUROCORES

### **Schoolteachers workshop on the carbon cycle**

The EUROCORES programme EuroCLIMATE contributed to the sponsoring of the 2008 Geosciences Information for Teachers (GIFT) workshop in Vienna from 13-16 April during the European Geophysical Union (EGU) General Assembly 2008. Several EuroCLIMATE scientists participated in this event. This year's theme for the workshop was the carbon cycle, one of the main focuses of the EuroCLIMATE programme. The topics covered both the present day carbon cycle, the past variations of CO<sub>2</sub> concentration as recorded by ice cores data, the perturbations by human activities, ocean acidification and the future evolution of the carbon cycle and its impact on climate.



The main objective of the GIFT workshops is to spread first-hand scientific information to science teachers of primary and secondary schools, significantly shortening the time between discovery and textbook. They also aim at providing the teachers with material that can be directly transported to their classrooms. In addition, the full immersion of science teachers in a truly scientific context like the EGU General Assembly and the direct contact with world leader geo-scientists is expected to stimulate curiosity towards scientific research that the teachers will ultimately transmit to their pupils.

Each workshop focuses on a unique general theme, combines scientific presentations on current research in the Earth and Space Sciences, given by prominent scientists attending the EGU General Assemblies with hands-on, inquiry-based activities that can be used by the teachers in their classrooms to explain related scientific principles or topics presented by science educators. Seventy teachers from 18 countries attended the 2008 GIFT Workshop, representing a large potential for networking and

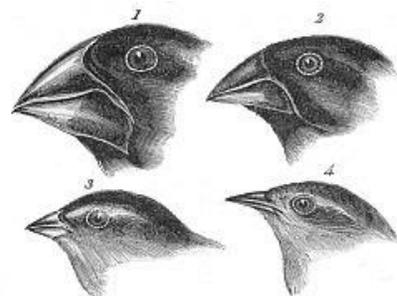
collaborations, the sharing of experiences, and an awareness of science education as it is presented outside their own countries. In addition to their scientific content, the GIFT workshops are of high societal value. Both scientists and teachers reported on their results in a very lively and creative way.

[www.esf.org/euroclimate](http://www.esf.org/euroclimate)

## LESC Research Networking Programmes

### **Frontiers of Speciation Research (FROSPECTS)**

With millions of species currently on Earth, understanding how all this magnificent variety arose is not a small task. Biologists have long accepted Darwinian selection as the principal explanation of long-term evolutionary change; yet, to date, no similar agreement has emerged about how genetic, geographical, ecological, evolutionary and environmental factors interact to create, e.g. two species out of one. The distinction between allopatric and sympatric speciation (with or without geographical isolation) has taken centre stage in the speciation debate. Other aspects to be considered are competitive speciation, ecological speciation, and adaptive speciation. Assessing the relative importance of the various modes of speciation remains an open question of tremendous interest, especially for biodiversity science. The various types of speciation process outlined above differ in many critical assumptions and predictions: e.g., about timescales; biogeography; reversal evolution; ecological and sexual interactions; ecological, genetic, and geographical signatures of speciation; speciation processes and environmental stressors



1. *Geospiza magnirostris*      2. *Geospiza fortis*  
3. *Geospiza parvula*        4. *Certhidea olivacea*

Finches from Galapagos Archipelago

In this respect, the Research Networking Programme **Frontiers of Speciation Research** (FroSpects, 2008-2013) aims to strengthen Europe's position in speciation research through the cross-fertilization and integration of empirical and theoretical approaches, and cooperation between: evolutionary ecologists, molecular biologists, systematists, biogeographers, population geneticists and ecological theorists.

The Research Networking Programme FroSpects will also promote research of applied interest, on topics such as the biodiversity crisis; the biodiversity hotspots; climatic change and speciation; speciation in agriculture and medicine; speciation in Europe; speciation in plants. Many more examples exist in the work of European speciation researchers on systems outside of Europe. Overall, better understanding of the ecology and genetics of speciation will strengthen conservation biology, aid the protection of biodiversity and contribute to the management of pathogens, parasites and pests in the context of agriculture and medicine.

[www.esf.org/frospects](http://www.esf.org/frospects)

### ***The functional genomics in *Aspergillus fumigatus* and new strategies to fight against fungal pathogen in Europe (FUMINOMICS, 2008-2012)***

The recent death of an English gardener who died from aspergilliosis 3 days after apparently having inhaled a great number of aspergillus spores re-emphasises the great danger this fungus can pose. At present, aspergilliosis is often mixed up with pneumonia and therefore mal-diagnosed and mal-treated. While ubiquitous and normally neutralised by a functioning immune system, the opportunistic pathogen *Aspergillus fumigatus* is a saprophytic filamentous fungus that causes life-threatening invasive pulmonary diseases in immuno-compromised hosts. Aspergilliosis now represents the most common invasive human mould infection in our European countries.

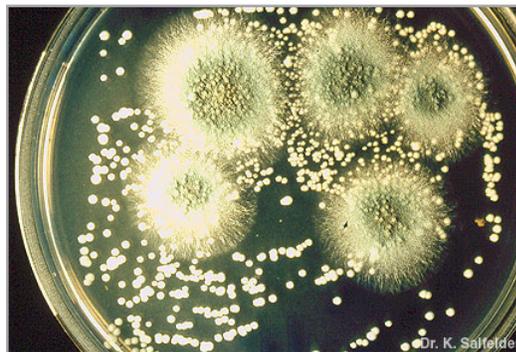
One of the reasons for the increasing burden is the poor understanding of the metabolic pathways controlling the multigenic virulence of the fungus in its host. Understanding how the fungal pathogen perceives and adapts to its host environment requires fundamental research in fungal gene expression and regulation. The FUMINOMICS Programme is aimed at a

multidisciplinary and fully integrated functional genomics analysis of the basic mechanisms of the opportunistic traits developed by *Aspergillus fumigatus* when infecting host cells.

This objective has now become feasible because:

- The genome of *Aspergillus fumigatus* is now publicly available;
- Microarrays have been produced in Toulouse;
- Proteome analysis has been established in Jena that will also coordinate the bioinformatics of the project;
- Recent methodological improvements now make it possible to generate knockout mutant strains on a large scale basis.

FUMINOMICS brings together the major laboratories studying *A. fumigatus* in Europe (18 teams from 8 different countries presently) and aims to reach its scientific goals through the integration of bioinformatics, transcriptomics, proteomics, physiology, molecular genetics and medicine.



*Aspergillus fumigatus* culture

[www.esf.org/fuminomics](http://www.esf.org/fuminomics)

### ***Role of Soils in the Terrestrial Carbon Balance (RSTCB, 2002-2007)***

During the LESC Round Table meeting in June 2008 (see above), the Final Report of the Research Networking Programme (RNP) ***Role of Soils in the Terrestrial Carbon Balance (RSTCB, 2002-2007)*** was presented by Werner Kutsch, Chair of the RSTCB Steering Committee

Carbon stored in soils represents the largest active terrestrial carbon pool and one of the most vulnerable pools in the complex puzzle of

feedback between the global climate and carbon cycle. In this context, the RSTCB Programme aimed to bring together soil carbon researchers to create a Europe-wide perspective on the role of soils in the terrestrial carbon balance. The Programme was specifically set up to improve estimates of soil carbon flux and stock in order to generate reliable and consistent datasets; to develop a new generation of models describing soil carbon dynamics; and, finally, to investigate the effects of perturbation on soil carbon balance and the potential for carbon mitigation.



The RSTCB Programme managed to bring together soil carbon researchers from all over Europe to develop a global perspective on the role of soils in the terrestrial carbon balance.

Among the main RSTCB results is the soil respiration database that has been recently launched. It is very important for modellers to have adequate datasets to achieve high quality models and to undertake global comparisons, thanks to the common protocol for soil carbon flux assessment developed by RSTCB participants. A book entitled **"Integrated Methodology on Soil Carbon Flux Measurements"**, edited by W.L. Kutsch, M. Bahn and A. Heinemeyer, will soon be published by Cambridge University Press as a result of this RSTC endeavour.

The scientific challenges identified at the end of the Programme include:

- a better understanding of the biotic interactions and soil dynamics, linking soil biology to soil chemistry
- a better understanding of the effect of global environmental changes (e.g., temperature increase, biodiversity decrease) on soil processes

- the need to integrate new techniques, large sets of data and models, with adequate calibration
- the need for integrated experiments with climatic or vegetation gradient, through ecosystem manipulation or mesocosm experiments

[www.esf.org/rstcb](http://www.esf.org/rstcb)

## Exploratory Workshop

### ***Mitigation of methane emissions through microbial oxidation on landfills – evaluation and quantification approaches***

Landfills – sites for the disposal of waste materials by burial – can contribute as much as 20% to the global anthropogenic methane emissions, and according to estimates made by the IPCC, the landfill methane emissions shall increase by a further 30% until 2020. Although landfill operators are obliged to report the annual emission situation under the European Pollutants Release and Transfer Registers regulation, no sole consistent, reliable and comparable methodology exists even to estimate the total methane emissions and the efficiency of methane oxidation in commonly used biocovers and biofilters in particular.

The ESF-LESC Exploratory Workshop gathered 22 leading scientists from 11 European countries and the United States, who discussed new approaches and the development of some new promising techniques, particularly in the molecular and micro-scale sector, for the estimation of the rate and extent of methane oxidation. Since the advancement and application of field evaluation methods is very costly and time consuming, international cooperation and exchange may lead to synergies and more cost-efficient development of a new monitoring concept and methodologies. Participants envisaged establishing coordinated international research co-operations in the future, taking advantage of other ESF instruments.



**Dr. Sonja Lojen**  
LESC Standing Committee  
member and Rapporteur of the  
above Workshop

## ESF-EMBO Symposium on Cyanobacteria

Cyanobacteria are an ancient group of prokaryotes which are capable of both oxygenic photosynthesis and N<sub>2</sub> fixation. They are globally widespread and represent key organisms in evolution and harbour genes and functions with potential for different applications such as novel compounds for biotechnology, medicine and energy production.

The potential to use these organisms as cell factories for biofuels was a central topic at the ESF-EMBO Research Conference entitled; “**Molecular Bioenergetics of Cyanobacteria: Towards System Biology level of Understanding**”, which was arranged early spring this year. A central issue addressed was; can nitrogen-fixing cyanobacteria be engineered and optimised towards more efficient large-scale photobiological hydrogen production? This applied potential is derived from basic knowledge and key topics at the conference included the importance of regulatory RNA molecules in their relevance for intracellular regulatory networks. Gene expression related to environmental stress conditions such as light and nitrogen and functional aspects of the photosynthetic apparatus were thoroughly presented.

During the conference it was concluded that although the systems using cyanobacteria for H<sub>2</sub> production are not cost-effective yet there are high hopes that in the future improvements can be achieved by new technologies and genetic modifications.



The conference was characterised by high scientific quality and with several in front scientific presentations. The topics addressed were a balanced combination of issues that have been studied for a long time and novel approaches based on recent developments in modern biology both from a theoretical and methodological perspective. Some very interesting and novel

approaches involving very advanced technology in biological systems were presented. The conference documented that genome sequence information combined with new knowledge about the functional aspect at both RNA and protein levels provide promising future perspectives for cyanobacterial research.



Left: **Eva-Mari Aro** (Conference Chair) and right: **Mette Svenning** (LESC Standing Committee Rapporteur)

This conference was part of a series of complementary and established activities and collaborations involving leading scientists in cyanobacterial research from Europe and USA.

### **Prof. Mette Svenning**

LESC Standing Committee member and Rapporteur of the above conference

[www.esf.org/cyanobacteria](http://www.esf.org/cyanobacteria)

## New LESG Standing Committee members

### **Arnold Driessen**

representing Royal Netherlands Academy of Arts and Science (KNAW) and the Netherlands Organisation for Scientific Research NWO)  
*Scientific field:* microbiology

### **Mike Gale**

representing the Biotechnology and Biological Sciences Research Council (BBSRC)  
*Scientific field:* plant genetics

### **Georgi Markov**

representing the Bulgarian Academy of Sciences  
*Scientific field:* population biology, ecology and genetics of mammals

### **Giuseppe Scarascia-Mugnozza**

(LESC Core Group Member) representing Consiglio Nazionale delle Ricerche (CNR)  
*Scientific field:* agro-environmental and forest biology

## Changes in LESC Unit

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Päivi McIntosh joined the LESC unit in April 2008. She is an Administrator for the EUROCORES Programmes Topo-Europe and EuroCLIMATE. She previously worked on the Reference Index project in the Humanities Unit.

Jane Swift is currently on maternity leave. During her absence Céline Seewald will be in charge of LESC Unit coordination tasks.

Consequently, Eléonore Piémont will replace Céline as Administrator for Research Networking Programmes in Life Sciences.

## Forthcoming meetings

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### *September - December 2008*

- **CONGEN** School: **Assessing populations structure and dynamics through the use of molecular markers and novel computational models**  
1-8 September – Liblice (CZ)
- **EuroDEEP: DEECON-BIOFUN** Training School  
1 September – 31 December (NO)
- **BEPAR** School: **Chemical Approaches to Parasitoids Behavioural Ecology**  
4-8 September – University of Nottingham and University of Lancaster (UK)
- **BEPAR**: Steering Committee meeting  
8 September – Strasbourg (FR)
- **EUROCORES Scheme**: Workshop VI  
8-9 September – Brussels (BE)
- **Magellan** Workshop: **Lithospheric heterogeneities, hydrothermal regimes, and links between abiotic and biotic processes at slow spreading ridges**  
10-12 September – Montpellier (FR)
- **EuroMinSci**-supported Conference: **International Alloy (IACV)**  
11-14 September – Ruegen (DE)
- **Bacterial Networks**  
ESF Research Conferences  
13-18 September – Sant Feliu de Guixols (ES)
- **MedCLIVAR** Workshop: **Climate Extremes During Recent Millennia and their Impact on Mediterranean Societies**  
14-16 September – Athens (GR)
- **EuroMARC**: First EuroMARC Conference  
15-17 September – La Colle-sur-Loup (FR)
- **FUNCDYN** 2<sup>nd</sup> ESF Conference: **Functional Dynamics**  
15-18 September – Rothenburg ob der Tauber (DE)
- **EuroDIVERSITY**: Four EuroDIVERSITY sessions in Leipzig Conference: **Biodiversity in an Ecosystem Context**  
15- 19 September – Leipzig (DE)
- **MedCLIVAR** School: **Climate variability over the Mediterranean area: atmospheric and oceanic components**  
17-27 September – Island of Rhodes, Greece (GR)
- **EuroBioForum** Conference  
17-19 September – Strasbourg (FR)
- **Fuminomics** Workshop: **Transcriptomics and Molecular Tools**  
18-20 September – Giens, France (FR)
- **Heterochromatin Structure And Function: From Repetitive Dna Sequences To Epigenetics** [Exploratory Workshop](#)  
20-23 September – Donja Stubica (HR)
- **CONGEN** meeting: **Plant reproductive systems in conservation genetics**  
22-23 September – University of Lille (FR)
- **CONGEN** meeting: First meeting of the EU ConGen Consortium: **development of the CGToolBox and exploring the genomic approach to conservation genetics**  
23-25 September – Trento (IT)
- **Computational Disease Modeling** [Exploratory Workshop](#)  
24-26 September – Barcelona (ES)
- **EuroSCOPE** Satellite Conference: **The Fifth EFB meeting on Recombinant Protein Production**  
24-28 September – Sardinia (IT)
- **FFG** Workshop: **Dynamics of Cell Signal Systems**  
25-28 September – Oslo (NO)
- **Large Animal Models for Biomedicine** [Exploratory Workshop](#)  
25-26 September – Munich (DE)

- **Mesophyll Conductance To CO<sub>2</sub>: Mechanisms, Modeling And Ecological Implications** [Exploratory Workshop](#)  
28-30 September – Palma De Mallorca (ES)
- **MedCLIVAR** Workshop: **Understanding the mechanisms responsible for the changes in the Mediterranean Sea circulation and sea-level trends**  
29 September -1 October – Island of Rhodes, Greece (GR)
- **EuroCLIMATE** Final Conference  
29-30 September – Giens (FR)
- **INTROP** Workshop: **Reactive Indoor Air Chemistry**  
29 September -1 October – Borås, Sweden (SE)
- **3<sup>rd</sup> ESF Functional Genomics Conference**  
1-4 October – Innsbruck (AT)
- **EuroIce2008** [Exploratory Workshop](#):  
1-4 October – Granada (ES)
- **TOPO-EUROPE** International Conference  
5-8 October – Madrid (ES)
- **ThermAdapt** Workshop: **Genetics of thermal adaptation in ectotherms**  
5-6 October – Wageningen (NL)
- **EuroMinSci** Workshop: **Mineral Spectroscopy by Theory and Experiment**  
6-9 October – Lausanne (CH)
- **NinE** Workshop: **Opening Nitrogen Science to the People**  
6-8 October – Madrid, Spain (ES)
- **CONGEN** Workshop: **The Omics of inbreeding**  
8-10 October – Aarhus (DK)
- **Topo-Europe** kick off meeting  
8 October – Madrid (ES)
- **Europe's Green Backbone - Post-Socialist Land Use Change In The Carpathian Region** [Exploratory Workshop](#)  
9-10 October – Berlin (DE)
- **FFG: 2nd Central and Eastern Proteomic Conference 2008**  
12-15 October – Jena (DE)
- **MedCLIVAR** Workshop: **Climate Change Modeling for the Mediterranean region**  
13-15 October – Trieste (IT)
- **New Challenges in Earthquake Dynamics**  
ESF Research Conferences  
18-23 October – Obergurgl (AT)
- **CONGEN** Workshop: **Landscape Genetics**  
20-23 October – Grenoble (FR)
- **Protein Design and Evolution for Biocatalysis**  
ESF Research Conferences  
25-30 October – Sant Feliu de Guixols (ES)
- **Complex Systems and Changes: Water and Life**  
ESF-LESC/COST Conference:  
29-31 October – Taormina (IT)
- **The New Role Of The Extended Phenotype In Evolutionary Biology** [Exploratory Workshop](#)  
2-5 November – Copenhagen (DK)
- **FFG** Conference: **22nd International Mammalian Genome Meeting**  
2-5 November – Prague (CZ)
- **INTROP** Workshop: **Atmospheric Chemical Mechanisms**  
3-7 November – Almagro, Ciudad Real (ES)
- **NinE** Workshop: **Third workshop on the European Nitrogen Assessment (ENA 3)**  
4-6 November – Dourdan (FR)
- **New Methodologies and Interdisciplinary Approaches in Global Change Researches**  
ESF Research Conferences  
5-10 November – Ile de Porquerolles (FR)
- **EuroDEEP**: EuroDEEP session in World conference on **Marine Biodiversity**  
10-15 November – Valencia (ES)
- **CONGEN** meeting: **Animal Genetic Resources Conservation Consortium (AnGR-C)**  
10-12 November – Vigo (ES)
- **Magellan** Workshop: **Arctic Climate Change: From Greenhouse to Icehouse conditions**  
10-12 November – Bremerhaven (DE)
- **VOCBAS** School: **Winter school 'Ecology of plant VOCs'**  
11-15 November – Wageningen (NL)
- **EuroDEEP** annual meeting  
15 November – Valencia (ES)
- **CONGEN** Workshop: **Genetic diversity in wildlife and related livestock-marker-assisted**  
16-18 November – Salzburg (AT)
- **NinE** Workshop: **Comparison of static chambers to measure N<sub>2</sub>O, CH<sub>4</sub> and CO<sub>2</sub> fluxes from soils**  
17-19 November – Copenhagen (DK) (workshop), Hyytiälä forestry field station (measurement campaign) (DK)
- **TESSY**: Implementation Workshop  
18 November – Evry (FR)

- **Seismic Oceanography**  
[Exploratory Workshop](#)  
19-21 November – Barcelona (ES)
- **CALCAS**: Workshop with the research community and the stakeholders  
24-25 November – Brussels (BE)
- **EuroMinSci**: Final Conference  
24-26 November – Obernai (near Strasbourg) (FR)
- **EuroMEMBRANE** Review Panel ranking meeting  
1-2 December – Brussels (BE)

- **LESC Core Group meeting**  
1-2 September – Vienna (AT)
- **LESC Core Group and Standing Committee meetings**  
3-5 November – Strasbourg (FR)

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The European Science Foundation (ESF) provides a platform for its Member Organisations to advance European research and explore new directions for research at the European level.

Established in 1974 as an independent non-governmental organisation, the ESF currently serves 77 Member Organisations across 30 countries.