

Standing Committee NEWSLETTER No. 8

LESC NEWS

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

Editorial: The View Ahead

In the face of the grand challenges of the present and future world with increasing human population, strong efforts are required in order to tackle the major societal problems. Many of them are essentially ecological in nature involving energy, food, water and environment on a local and global scale as well as health issues and ageing populations. Inter- and multidisciplinary approaches are needed to achieve a deeper understanding of living systems in the entire spectrum of processes, from the molecular to the organism, community and ecosystem level. At the same time, life, earth and environmental sciences are inseparably interconnected in many aspects.

The grand challenge for our whole society is now how to make best use of the enormous scientific and technological advances towards the development of a knowledge- and biobased economy. This will be crucial for limiting the anthropogenic impact on the geosphere, hydrosphere, atmosphere and biosphere, and will help to secure a sustainable future for the planet and its inhabitants.

The Standing Committee for Life, Earth and Environmental Sciences (LESC) is now presenting the results of an exercise on the identification of emerging or neglected topics and unifying themes in the life and environmental sciences as well as in the Earth sciences. Based on the input of many LESC members, the Position Paper "Strategic Science Position: The View Ahead" was launched recently. The aim of this paper is not to suggest a rigid thematic approach but rather further catalyze integrative to and multidisciplinary research among European researchers and beyond.

Of course, the themes and topics identified in the LESC Science Position Paper serve only as examples to illustrate the key issues; they are by no means exclusive. LESC would like to encourage and support European researchers and the national research funding agencies to further bridge their grants systems in order to stimulate cross-cutting, interdisciplinary research. Finally, major continuous efforts are needed to foster the relationship between science and society and to improve public awareness of science. Our societal challenges require strategic responses through interdisciplinary contributions of natural, social and human sciences which thereby should contribute to the development of sustainable governance. With its Science Position Paper, LESC is trying to continue and strengthen its role as a facilitator in the European Research Area and to provide a voice for European researchers to influence European science policy.



Professor Josef Glössl

Austrian representative on the LESC Standing Committee and member of the Core Group

LESC Round Table & Core Group meetings

The LESC Core Group (CG) met in Ljublijana, Slovenia, on 3-4 June followed by the Round Table meeting with disciplinary heads of Member Organizations, and in Madrid, Spain, on 3-4 September.

In Ljublijana the two main tasks of the CG were to discuss the new procedure for the evaluation of Exploratory Workshop proposals and the preparation of the Round Table meeting. The CG also approved the proposal for a Strategic Workshop on "Between Life and Earth Sciences - Palaeontology in a European perspective". The Round Table meeting focused on EUROCORES and ESF Review processes, especially for the Exploratory Workshop proposals. In addition, Professor Mike Taussig presented the final report of the Research Networking Programme on Integrated Approach for Functional Genomics and the Mid-term report of Frontiers of Functional Genomics.



Professor Andrej Umek, Chair of the Board of the Slovenian Science Foundation with Professor Reinhart Ceulemans, LESC Chair, and Dr. Edvard Kobal Director, the Slovenian Science Foundation.

The LESC Core Group (CG) met in Madrid on 3-4 September. The main task was to rank the EUROCORES theme proposals. The meeting was kindly hosted by Professor Jose Juan Sanchez Serrano. Vice President for International Relations, Spanish National Research Council (Consejo Superior de Investigaciones Cientificas). Special thanks are expressed to Mrs. Volga del Castillo for the practical arrangements.

Out of the 67 EUROCORES theme proposals received by ESF, twenty were to be considered and ranked by LESC. The GC decided to recommend six of them. It provided a priority list and wrote short comments for each of the 20 proposals to be used as feedback to the applicants and as input to the ESF Science Advisory Board, an advisory board for the ESF Governing Council. The Science Advisory Board recommended LESC's top three theme proposals, and the Governing Council, at its



Professor Reinhart Ceulemans, LESC Chair, with Spanish LESC member, Dr. Pilar Perez, and Professor José Juan Sánchez Serrano, Vice President for International Relations, Consejo Superior de Investigaciones Cientificas.

meeting on 1 October, subsequently decided to approve the three for development into EUROCORES Programmes.

The CG discussed also the use of the strategic budget of LESC and decided to support the "International Symposium on Poplar Genetics and Physiology" to be held in 2010.

In order to save energy, time and money, the CG decided not to meet physically in February 2010. A telephone conference will be arranged instead if necessary. The decision was mainly based on the concerns of the members about the consequences of travelling on the environment.

Policy Publications

LESC Science Position Paper: "The View Ahead" now available!

The LESC Standing Committee, at its meeting in October 2007, decided to look at neglected or emerging areas of science where more research is needed, and to identify few key topics within each of LESC's three broad areas – life, Earth and environment. LESC's goal was to set the agenda for research in Europe signposting areas which urgently need support. Because LESC deals with the entire continuum of processes over all temporal and spatial scales; from molecular biology to global climate change scenarios, the task was very complex.



The LESC Science Position Paper: "The View Ahead", prepared by all members of LESC. with support from the LESC office, is now complied and printed. In the context of concern about the future of our planet and our society, the paper identifies the main

issues that LESC believes warrant the highest priority for research and international cooperation in the coming decade. The paper concentrates mainly on natural sciences but integrates economic, societal and political issues. It also promotes activities that operate at the boundaries between life, Earth and environmental sciences. With the help of the Science Position Paper, LESC would like to encourage the scientific community to initiate activities in the strategically identified science fields, and suggests to ESF that a new instrument could be developed to serve as a funding solution for fast emerging fields that need immediate support.

www.esf.org/publications/position-papers

ESF Science Policy Briefing "Impacts of Ocean Acidification"



An ESF Science Policy Briefing entitled "Impacts of Ocean Acidification", а joint activity of LESC and the ESF-Marine Board, was published in August 2009. It gives a comprehensive view from leading scientists in Europe and in the USA on this topic. Ocean

acidification is the hidden partner of climate change. The increasing acidity levels currently observed could in the future reduce the oceans' capacity to absorb carbon dioxide. In addition, this reduced absorption will contribute to irreversible changes in ocean chemistry, with yet unclear implications for marine ecosystems and fisheries resources and the human communities that rely on them.



Endemic Mediterranean coral *Cladocora caespitosa* showing severe skeletal damage and dissolution due to ocean acidification.

Photo: Riccardo Rodolfo-Metalpa and Jason Hall-Spencer, Plymouth University (UK)

Much should be done at the international level to understand and tackle the challenges posed by acidic oceans in addition to those related to global warming.

Box 1: Key Recommendations for European Actions

Key recommendations for European actions in order to fully understand the impacts of ocean acidification are as follows:

- quantify further the biological and biogeochemical responses to ocean acidification from the organismal to the ecosystem level
- 2) integrate natural and social sciences to help mitigate ocean acidification and develop adaptation strategies, taking into account the socio-economic impacts on natural resources and human communities. The full cost of abating CO₂ emissions, and of carbon capture and storage should be also considered
- ensure adequate and sustainable monitoring of key marine ecosystems and environmental services
- 4) facilitate dissemination and capacity building to help deliver scientific knowledge-based advice to research funders and policy makers, to share best practices among researchers and success stories with the general public, and to raise the profile of this issue in future environmental change assessments
- coordinate and strengthen European research on the impacts of ocean acidification, including sharing of research infrastructure, resources and knowledge.

www.esf.org/oceanacidification-strategic-ws

Forward Looks

European Food Systems in a Changing World

The launching event for the Final Report of the ESF-COST Forward Look on "European Food Systems in a Changing World" was held on 21 September in Brussels. The Final Report includes the ESF Science Policy Briefing, which is a summary of the main recommendations describing research agenda and actions to be taken in Europe.

The Final Report is an in-depth analysis of critical research areas that can support and increase the competitiveness of the European food system. A food system includes all the processes involved in feeding a population: growing, harvesting, processing, packaging, transporting, marketing, consumption, and disposal of food and food-related items.

Europe faces a complex web of changes and challenges to feed a population of 500 million people. Increasing fuel costs, climate change, shifting dietary habits, shortage of resources, such as soil and water, and agriculture's economic viability are just a few factors influencing food supplies.



Professor Rudy Rabbinge and Professor Peter Raspor, Co-Chairs of the Forward Look

The report shows new perspectives and opportunities for research, and explores the future of food and food systems. It finds that research needs to be geared towards health, particularly prevention of diseases that are related to lifestyle and demographic changes, and sustainability, including the effects of global warming and of the use of biomass for energy/fuel production.

www.esf.org/food

Launching of the Forward Look RESCUE

As reported in the previous issue, LESC is leading a new foresight activity entitled Forward Look "Responses to Environmental and Societal Challenges for our Unstable Earth" (RESCUE), a joint ESF/COST "Frontiers of Science" initiative. The Chair of the RESCUE Scientific Steering Committee is Professor Leen Hordjik (EC-JRC Institute for Environment and Sustainability) and the Vice Chair is Professor Gísli Pálsson (Social and Environmental Anthropology, University of Iceland).

RESCUE will help address the societal and scientific challenges related to global change, including the human dimension, and will help stimulate an integrated response from natural, social and human sciences to such challenges. It is anticipated that RESCUE will impact society by favoring common strategic understanding and coordination, and transformative education delivery, to help ensuring global sustainable governance.

The RESCUE launching conference, held on 10-11 September 2009 in Rueil-Malmaison, France, brought together about 75 expert scientists and research managers representing

key science communities and initiatives, and served as a kick-off effort for the topical RESCUE Working Groups. The RESCUE workplan and key activities will be announced in the near future on the RESCUE website:

www.esf.org/rescue



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EUROCORES News

Success all the way through – EUROCORES RNAQuality

RNAQuality, the EUROCORES Programme that aims to uncover processes that act as quality control checkpoints in gene expression and understand how these function at a molecular level, has entered its mid-term. Sixteen research groups from nine European countries participate in RNAQuality and have been very active in organising and participating in the Programme's networking activities. RNAQuality has also been active beyond its boundaries, forging links with another EUROCORES Programme, EuroDYNA.

One and a half years down the line, RNAQuality has already produced a number of high-level publications, including articles in *Nature and Cell*, and the cross-CRP and cross-EUROCORES interactions have successfully laid the foundation for joint publications and possible grant submissions.

It therefore doesn't come as a surprise that the Evaluation Panel rated the Programme as excellent in terms of scientific achievements and networking, training and dissemination activities. The Panel agreed that the Programme provides an outstanding framework to further increase awareness of the field and to establish a platform for supporting high-impact and internationally competitive work.

www.esf.org/rnaquality

Research Networking Programmes (RNPs)

Interdisciplinary Tropospheric Research: from the Laboratory to Global Change (INTROP)

Climate change and air quality are key societal challenges. It has become clear over the last decades that the development of our societies cannot be uniquely wealth orientated but that sustainable development requires an environmentally friendly approach. However, such an approach is only possible if scientifically sound knowledge is made available to our societies. The INTROP Programme on atmospheric chemistry was set up to try to respond to issues of strategic importance in the European science policy regarding air pollution.

This Programe has contributed to strengthening collaborative research, enhancing multidisciplinarity in the field and promoting mutual awareness, in timely response to the up-coming research needs of the European countries. The final conference of this more than 5-year project took place in Portoroz (Slovenia) on 14-17 April 2009. More than 100 participants attended this conference cosponsored by ESF and by the EUROCHAMP (Integration of European Simulation Chambers for Investigating Atmospheric Processes) FP7 Programme. A recent paper was recently released in the British journal eStrategies presenting the Programme to a wide and general audience together with an interview of Dr Christian George, Chair of the INTROP Steering Committee.

RNPs launched in 2009

The Functionality of Iron Minerals in Environmental Processes (FIMIN)

The FIMIN RNP is supported by 11 ESF Member Organisations and other funders from Austria, Belgium, Denmark, Germany, Hungary, Netherlands, Spain, Sweden and Switzerland, and it will last 4 years until May 2013. The Chair is Professor Stefan Peiffer (University of Bayreuth, Germany).

Iron is the 5th most abundant element in the Earth's crust. It plays a dominant role in a wide range of environmental processes, such as regulation of element cycles, contaminant degradation, and biotechnological applications. Our ability to understand these processes has grown significantly in the last years due to the development of powerful instrumental and analytical tools both in geochemistry and microbiology. However, applications of this knowledge across disciplines are in their infancy.



Ferric iron minerals present in groundwater discharging from a deposit of mining waste.

FIMIN intends to contribute towards such applications, especially through an intensive training programme, to integrate scientists working on a variety of scales (e.g. from molecular geochemistry to the global scale), using different methods (e.g. spectroscopy) and investigating different environmental systems (e.g. soils, sediments, waters and remediation systems). FIMIN will help develop new insights into the role of iron as a pivotal element at the biosphere-geosphere interface, emphasizing questions related to such different fields as ground water contamination, acid mine drainage affected systems, water treatment technologies, biotechnological applications, or the global carbon cycle.

www.esf.org/fimin and www.fimin.eu

Tall Tower and Surface Research Network for Verification of Climate Relevant Emissions of Human origin in Europe (TTORCH)



The TTORCH RNP was launched in Strasbourg on 30 March 2009 and includes so far the participation of eight Member Organisations from Austria, Finland, Germany, The Netherlands, Norway, Spain, Sweden and Switzerland.

Observations of the long lived non-CO₂ greenhouse gases and related tracers are an essential part of the Earth observation system. The combination of atmospheric observations and inverse atmospheric transport models foreseen in TTORCH will enable the detection of trends in concentrations and emissions and hence provide independent checking for the Kyoto protocol. It will also take up the challenge to validate the emission estimates of these gases of natural and anthropogenic sources for large areas of Europe and to test process based emission models. TTORCH will strengthen the further integration of the network of observatories of these gases and related tracers in Europe to an observational system of high consistency, quality and precision.

TTORCH will contribute by preparing and helping in building the necessary infrastructure and will aid in the capacity building of scientists in Europe. The Programme will also provide the framework to continue the development and improvement of the current network and prepare its extension to other parts of Europe. The exchange of young scientists and students between observation sites but also with modelling groups will be an important tool for this European capacity building.

www.esf.org/ttorch

EuroGlycoForum

The EuroGlycoForum RNP (2009-2014) recently held its 1st Steering Committee meeting in Strasbourg, France. So far, ESF Member Organisations from Austria, Belgium, Croatia, Czech Republic, Estonia, Finland, France, Germany, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Spain, Sweden, Switzerland and the United Kingdom are contributing to the Programme. The Chair is Professor Sabine Flitsch (Manchester University, UK).

Glycoscience is a term used to describe all the areas which relate to complex carbohydrates, their synthesis and biosynthesis, analysis, function and applications. A significant number of European laboratories are being considered to be at the forefront of current glycoscience research. Whilst important discoveries have been made in the individual disciplines of glycoscience, it is generally recognised that future successes will rely on large interdisciplinary consortia with sufficient tools and resources to address the complex questions that lie ahead.



Glycans are present in high abundance on all cell surfaces as well as on bacterial, fungal, parasitic and viral surfaces. Picture: Peter Seeberger, Potsdam, Golm

There are several 'glycoscience' related initiatives throughout Europe at the present time but it is felt that these would benefit from a coordinated approach. Such coordination has been very beneficial in the US through the formation of the Glycomics Consortium.

In its five year funding period (2009-2014), EuroGlycoForum aims at providing a resource for information and training in all aspects of glycoscience. It would like to play a role in fostering international links with other groups such as those throughout Europe, the USA, and Japan. The Forum will try to act as a catalyst for multidisciplinary collaboration that will facilitate ambitious research programmes to keep the European community at the forefront in the field of glycosciences and related areas.

www.esf.org/glycoscience

Exploratory Workshop

Bionanotechnology: Development and Application of Principles of Nano- and Bio-Sciences to Sensing, Diagnostics & Therapy

Bionanotechnology is an emerging interdisciplinary field at the interface of Nanotechnology and Biotechnology. Advances at this interface are already exerting an influence on the more established fields of Chemistry, Materials Science, Biochemistry, Biosensing, Cell Biology, Molecular Diagnostics and Therapies, and Computer Modelling. Applications in sensing and diagnostics are already being developed, with applications in medicine and therapeutics being predicted for the coming years.

The Exploratory Workshop took place from 31 August – 2 September 2009 in Sintra, Portugal, and was attended by 27 scientists from twelve ESF countries and one non-ESF country. Talks were organized around five positions papers, each with a keynote speaker who introduced and contextualized the subtopics, followed by short presentations from all other participants grouped under the five subtopics. At the end of each block of presentations, lively discussions were facilitated by the keynote speakers.



Photo: Ricardo Franco, Universidade Nova de Lisboa (PT)

Due to the interdisciplinary nature of the theme, this Exploratory Workshop was a joint activity of three ESF Standing Committees. Most of the participating researchers had no previously established collaboration schemes so the Workshop was really "exploratory" in the sense of facilitating the detection of points of common interest and future collaboration.

Three main conclusions emerged on future directions of Bionanotechnology: (1) The need for increased investment in basic studies of bio/non-bio interactions from the physicochemical point-of-view and with consideration the toxicological implications. of (2) Establishment of reference in vivo models of levels of complexity to varying study nanoparticle-cell interactions. (3) Development of diagnostic assay kits that are point-of-care, very low-cost, quick to perform and develop, and require minimal manipulation by a nonexpert.

Dr. Iseult Lynch (IE) and Dr. Ricardo Franco (PT)

Exploratory Workshop Convenors

For more information:

www.cbni.eu/sections/ProjectsFunding/Bionano technology-Sintra

www.esf.org/activities/exploratoryworkshops/life-earth-and-environmentalsciences-lesc/workshops-detail.html?ew=7796

Changes in LESC Unit

Farewell

Farewell to Science Officers Didier Hauglustaine and Astrid Lunkes, who left ESF in August and September respectively after several years of service. Didier has returned to his research at the CNRS, France, and Astrid has joined the IGBMC in Illkirch, France. We wish them every success in the future.

Welcome



Haimanti Bhattacharya joined the LESC unit in July, 2009. She is a Junior Science Officer involved in both ESA **EUROCORES** and Programmes. She has background in а Marine Biology and fish research. She carried out her

postdoctoral research as an Alexander von Humboldt Fellow at Freie University of Berlin, Germany in the field of Behavioural Biology/ Bioacoustics.



Shane Murphy joined the LESC unit in July 2009 as a Junior Science Officer. He is scientific coordinator for the EUROCORES Programmes Euro-MARC, EuroDEEP and TOPO-EUROPE.

Shane's research has been in applied geophysics and

earthquake seismology specializing in earthquake early warning systems. Before joining ESF, Shane worked as a research fellow at University College Dublin.



development studies.



Lars V. Kristiansen will join the LESC Unit Science as Officer in mid-October 2009. Lars holds a Ph.D. in molecular health sciences from University the of Copenhagen (DK). During his academic training, he has been

working within the area of molecular neuroscience and has been associated several international research environments including Spain and USA. Lars will replace Dr. Astrid Lunkes's previous responsibilities as ESF Science Officer and EUROCORES Coordinator.

LESC in July for a three month's internship. She is working on the Forward Look RESCUE communication and network building. She is a student at the University of Helsinki, studying environmental science and policy and

Emilia Runeberg joined

Forthcoming meetings

October-December 2009

- Global Change Challenges **ESF** Research Conference 3-7 October - Nynäshamn (SE)
- MOLTER Workshop: Global change and feedback from organic carbon dynamics 4-7 October – Zürich (CH)
- FFG Conference: 3rd Central and Eastern **European Proteomic Conference** 6-9 October - Budapest (HU)
- MedCLIVAR Workshop: Severe Thunderstorm Reporting in Europe and the whole Mediterranean Region - Focus session and dedicated side meeting at the 5th European Conference on Severe Storms 12-13 October - Landshut (DE)
- <u>TOPO-EUROPE</u> Scientific Committee meeting 16 October - Heidelberg (DE)
- MedCLIVAR Workshop: Impacts of the Mediterranean Climate Change on Human Health 19-21 October - Paphos (CY)

- ThermAdapt & ConGen Summer School on **Ecological Genomics** 19-24 October - Bertinoro, Italy (IT)
- CLIMMANI Workshop: Climatic change and water - what determines terrestrial ecosystem responses and regulates changes and adaptation? 21-23 October - Basel (CH)
- FUMINOMICS Workshop: Proteomics and **Bioinformatic Tools** 22-25 October - Nouan-le-Fuzelier (FR)
- **CLIMMANI** Steering Committee meeting 23 October - Basel (CH)
- MAGELLAN Workshop on Pliocene Climate 23-25 October - Bordeaux (FR)
- ArchEnviron Steering Committee meeting 28 October – London (UK)
- FUNCDYN Steering Committee meeting 9-10 November - Lausanne (CH)

- EUROGLYCOFORUM Conference: Polysaccharides -**Glycoscience V** 11-13 November - Praha (CZ)
- MOLTER Steering Committee meeting 17 November - Freising (DE)
- GPCR Signalling Systems: A New Avenue for Drug Discovery? Exploratory Workshop 24-25 November - Paris (FR)
- FFG Workshop: Quality Control in **Proteomics Workshop** 25-27 November - EMB-EBI, Hinxton (UK)
- FUNCDYN Conference: Collective Dynamics and Pattern Formation in **Active Matter Systems** 25-27 November - Berlin (DE)
- Observation, Characterisation and **Evolution of Habitable Exoplanets and** their Host Stars Exploratory Workshop 29 November - 1 December - Bairisch Kölldorf (AT)
- **Diversity And Function In Ectomycorrhizal Communities** Exploratory Workshop 6-9 December - Nancy (FR)
- LESC Core Group meeting 4-5 November – Strasbourg (FR)
- LESC Standing Committee meeting 5-6 November – Strasbourg (FR)
- LESC/COST Synergy meeting 4 December - Brussels (BE)

LESC Unit

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