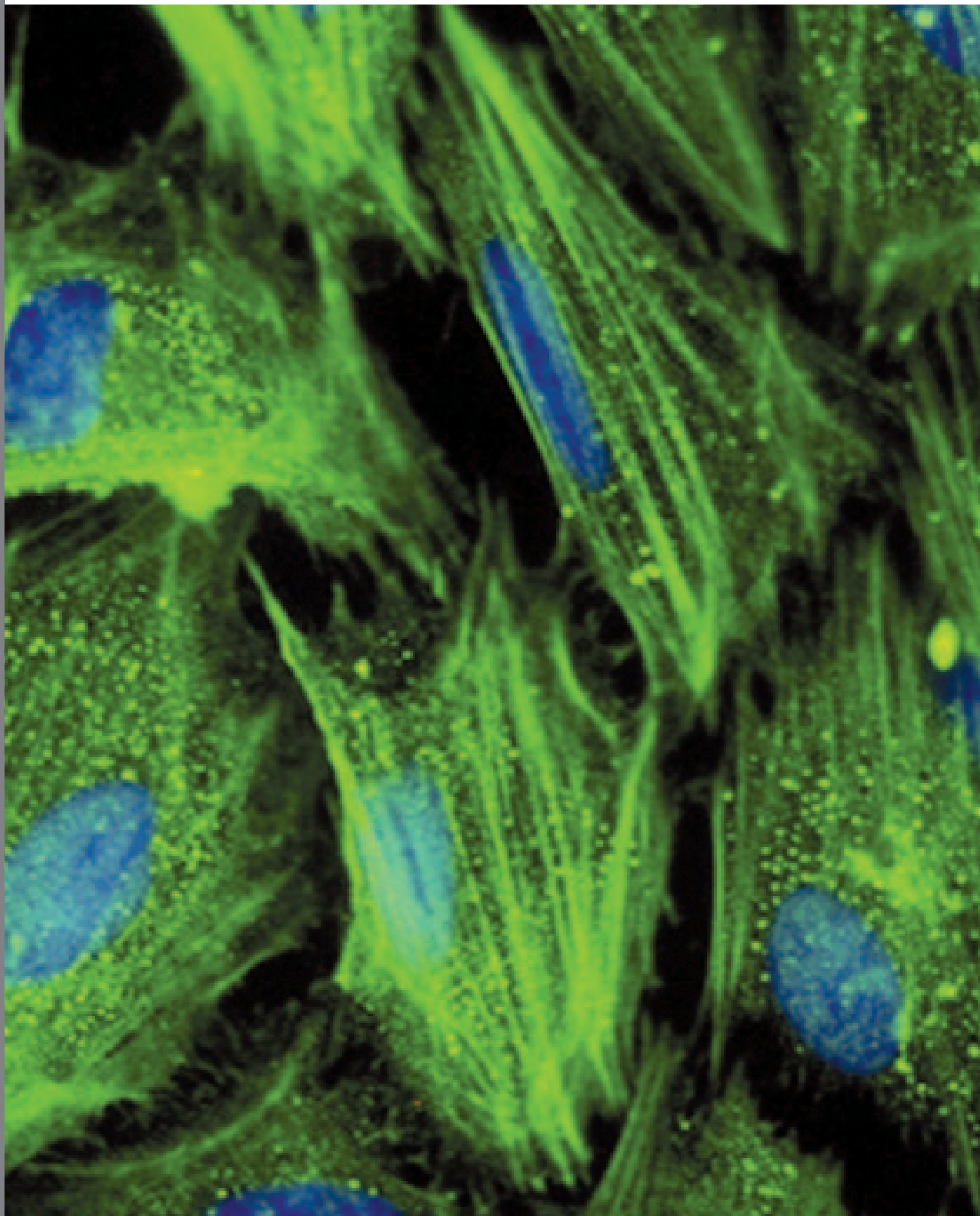
EUROPEAN SCIENCE FOUNDATION

SETTING SCIENCE AGENDAS FOR EUROPE

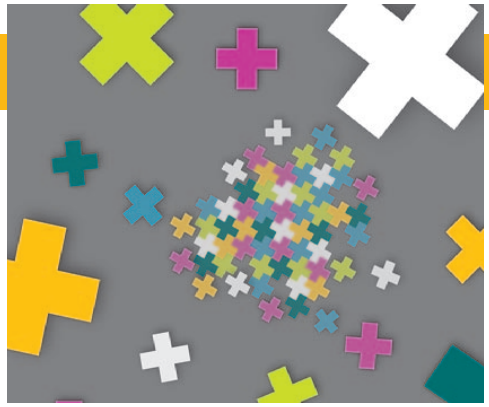
EUROCORES Scheme
European Collaborative Research

The EUROCORES Newsletter • N°2 • August 2007

EUROCORES Insight



Editorial



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Welcome to the second edition of EUROCORES Insight. Since the last issue, many important developments have been taking place for the EUROCORES Scheme. One of the major events was the publication of the EUROCORES Scheme Review Report by the independent Review Panel in April 2007. This high level Panel gave major recommendation for the future of the EUROCORES Scheme. The recommendations included such daring concepts as the developments of common pot mechanisms which was lively discussed by the ESF Governing Council in their April meeting. Subsequently, the Scheme Review recommendations and their implementations were further processed at the EUROCORES workshop where representatives from National Funding organisations came together on 22 May in Brussels and also internally by the ESF at the first retreat of the EUROCORES Team.
In addition, all Calls for outline proposals of the six new EUROCORES Programmes which were published on 13 March 2007 closed in May/June 2007 with an overall response of almost 150 Collaborative Research Projects representing more than 1000 scientists. Parallel to the Calls for outline proposals, the Call for EUROCORES themes (new ideas for EUROCORES Programmes) closed and a response of 33 theme proposals representing more than 280 scientists from all scientific areas including 10 interdisciplinary proposals is a sign that the EUROCORES Scheme is establishing itself in the European science community.

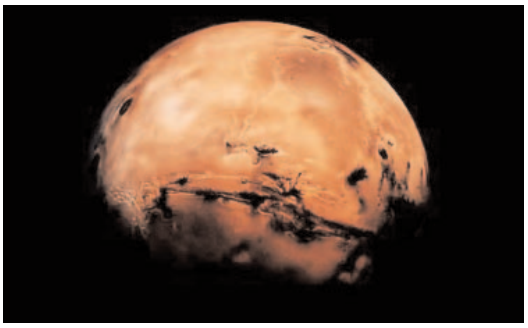
However, besides these political developments, this issue of the EUROCORES Insight continues to focus on scientific developments in several areas of the EUROCORES Programmes. EuroSTELLS, the EUROCORES Programme on stem cell research presents an article on how researchers can use fat tissue as a source of stem cells for tissue regeneration. The EuroMinSci Programme reports on how understanding the magnetic properties of rocks on Earth might give an insight into what kind of rock lies on the planet Mars. A hot topic which is high on the public agenda at the moment is climate change and we are happy to feature two articles touching on this topic, one about researchers Gilbert Camoin who is involved in the EUROCORES Programme EuroMARC and Verdansky Medal Winner Jaap Sinninghe Damsté who works with ESF through the Programmes EuroCLIMATE, EUROMARGINS and EuroDIVERSITY. We also have reports from recent workshops and conferences and the latest announcements of the new activities organised in the Programmes.

I hope you will enjoy this issue of EUROCORES Insight.

Svenje Mehlert, EUROCORES Scheme Coordinator and the EUROCORES Programme Coordinators
smehlert@esf.org

EUROCORES Insight
Editor: Sofia Valleley, svalleley@esf.org • **Editorial Board :** Antonella Di Trapani, aditrapani@esf.org - Inge Jonckheere, ijonckheere@esf.org
Svenje Mehlert, smehlert@esf.org - Reija Tuomaala, rtuomaala@esf.org

What makes Mars magnetic?



If you could pick up a rock from the surface of Mars, then the chances are it would be magnetic. And yet, Mars doesn't have a magnetic field coming from its core. These rocks are clinging to the signal of an ancient magnetic field, dating back billions of years, to the times when Mars had a magnetic field like Earth's.

So how have these rocks hung onto their magnetic directions and what do they tell us about Mars? Strangely, the answer to these questions might be sitting here on Earth.

Most continental rocks on Earth align their magnetic moments with the current magnetic field – they are said to have 'induced' magnetism. "I consider induced rocks to have 'Alzheimers'. These are the rocks that forgot where they were born and how to get home," explains Suzanne McEnroe from the Geological Survey of Norway at a conference near Nice, France this year.

However, not all of Earth's continental rocks have an induced magnetization. Some rocks stubbornly refuse to swing with the latest magnetic field, and instead keep hold of the direction they were born with. These rocks are said to have a remanent magnetization.

McEnroe and her colleagues have been studying some of Earth's strongest and oldest remanent magnetic rocks, to find out why they have such good memories. Understanding these rocks may give us clues as to what kind of rocks lie on Mars. One of their research projects (in cooperation with Phil Schmidt and David Clark at CSIRO, Australia and just published in the Journal of Geophysical Research) is on the Peculiar Knob Formation in South Australia. These rocks are around 1 billion years old and have a strong magnetic remanence, more than 30 times larger than typically found in basaltic rocks.

"This particular research evolved from looking for an economic mineral deposit," says McEnroe. The mining company had assumed that the rocks in this strongly magnetic area were holding an induced magnetic field and that there would be magnetite buried down below. However, they were puzzled when a different mineral – hematite, came out of the drill core. Had they missed their target, or were their assumptions wrong?

By studying the samples under a powerful microscope and modelling their magnetic properties, McEnroe was able to show that the hematite was responsible for the strong magnetic field and that it was holding a remanent field from around 1 billion years ago. "We could see that the hematite contained small intergrowths that carried the magnetism," says McEnroe, who presented her findings at the 1st EuroMinScI Conference near Nice, France in March this year.

And it turns out that the microstructure of the rock is the key to whether it can hold a remanent magnetization or not. Together with Richard Harrison, a mineral physicist at Cambridge University, UK, and Peter Robinson at NGU, McEnroe has been studying strong remanent magnetic rocks from a variety of places including Scandinavia and the USA.

A study on nearly billion-year-old rocks in Norway showed a remanent magnetic anomaly comparable in scale to those observed on Mars. The remanent magnetic anomaly dominates the local magnetic field to such a degree that more than half the Earth's field is cancelled. It is nearly impossible to use a compass in the area, which cannot point correctly north because of the strong remanent magnetization in the rocks.

What they have found is that rocks containing nanometre scale intergrowths of ilmenite and hematite are better able to cling onto their original magnetization than those without such fine-scale features. "Placing a nanoparticle of ilmenite into the hematite host creates a strong and stable magnetic signal that can survive large changes in temperature and magnetic field over billions of years," explains Harrison.

So can this tell us anything about the rocks on Mars? "These rocks are good analogues for the magnetic rocks we see on Mars because of their strong magnetism and the length of time they have retained this memory," says McEnroe. Certainly this nano-scale microstructure is a plausible candidate for the magnetic rocks on Mars.

However, the rocks on Earth can't answer all our questions. "There is not going to be one mineral or one tectonic setting on Mars. There are going to be different reasons that enhance the signature in different places," says McEnroe. The only way to definitively answer the question is to go and pick up some rocks from Mars.

For more information, contact
Bernard Avril • bavril@esf.org

Jaap Sinninghe Damsté awarded the Vernadsky Medal for innovative use of biomarkers

Jaap Sinninghe Damsté
Verdansky Medal Winner

In April 2007, the Dutch scientist Jaap Sinninghe Damsté was presented with the prestigious Vernadsky Medal at the European Geosciences Union (EGU) General Assembly. Sinninghe Damsté, from the Royal Netherlands Institute for Sea Research NIOZ, was awarded this medal for his cutting edge work in the field of biogeochemistry. "It's an honour to win this prize because it is recognition of my science and that it has a certain impact," said Sinninghe Damsté.

Using biomarkers to predict climate change

Sinninghe Damsté received the Vernadsky Medal for his innovative use of biomarkers. Biomarkers are organic compounds found in sediments. With these it is possible to trace back life to its origin. These biomarkers are a kind of organic fossil and unlike normal fossils which only show higher organisms, like dinosaurs, these organic fossils show chemical remains of microbial life like algae, bacteria and archaea. "This really opens new perspectives on all kinds of things. The nice thing about these molecules is that they don't only give the information that a certain organism was present but also about past climatic conditions," said Sinninghe Damsté.

Many of the biomarker compounds come from the membranes of organisms. Because these organisms adjust their membrane compounds according to certain external conditions, it is possible to track a preserved signal in the sediment and learn about the evolution of the organism and even the surrounding environment. The data can then be used to track climate variation going back to at least 100 Million years, a time with much higher CO_2 levels. This information could then be used as a model for what we are facing in the future. Understanding the past can help us understand the future.

"We can now look at how warm it was during for example the Cretaceous period which can give indication for climate modelling," said Sinninghe Damsté.

This means it will be possible to predict the implications of the increasing temperatures on Earth today resulting from increased concentration of CO_2 in the atmosphere. However, Sinninghe Damsté emphasises that the model has to be validated using past sediments and it's also important to compare this model to as many other proxies as possible as there is always a lot of uncertainty using only one method. If several methods show the same result then it's possible to be more sure about the results.

Applying his knowledge to EUROCORES

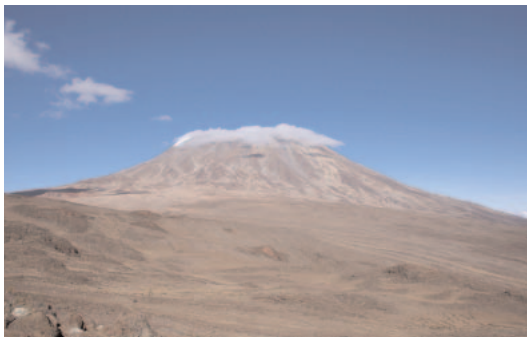
Through Sinninghe Damsté's involvement in several different European Science Foundation (ESF) EUROCORES Programmes, it is clear how very versatile these biomarkers are as they can be applied to a whole range of scientific projects.

"Being involved with EUROCORES has been a nice opportunity for my research. Usually the EC programmes only cover limited areas and the programmes have to be more applied. The ESF programmes on the other hand have fundamental science themes. And it's nice to work with different European partners which enlarges your network, it's very good to have these contacts," said Sinninghe Damsté.

For example, through the ESF EuroCLIMATE project CHALLACEA, a group of scientists from across Europe are studying a lake on the hills of Mount Kilimanjaro in tropical Africa. The lake contains sediments which have recorded the transition from the last glaciation (25,000 years ago) until present day. "We are looking at biomarkers in the sediment to find out the climate change during this time period," said Sinninghe Damsté.

The group is also studying the present day lake to understand the whole system in order be able to interpret the record of the lake sediments with more confidence. "We got involved in the project because we developed a so called 'paleothermometer' (a way to track temperature changes) based on archaeolipids. These are biomarkers from very small microorganisms living in the ocean. 3-4 years ago we found they are also present in lakes and we are interested to see if our methods also apply in lake Challa," explained Sinninghe Damsté.

During the 1 1/2 year running of the CHALLACEA project, the team has unexpectedly found that they can record the rainfall over time independently from the environmental temperature change using these proxies. During periods of lots of rain, the soil erodes and enters the lake. By looking at soil



organic matter entering the lake using a specific compound derived from soil thriving bacteria the team could then compare the specific compound from the soil bacteria present in the lake sediments at different times to calculate how much rain fell at that time. "This seems to be working pretty well and it's really quite interesting to see that at 14,000 years ago there was an increase in rainfall. In the younger Dryas period, conditions returned to mimicking the last glacial and then around 10,000 years ago it became very wet. It was only around 8,000 years ago the rainfall declined and the environment settled into what it's like in the present day," explained Sinninghe Damsté. He also emphasised that these findings still need to be confirmed by other records.

"I like to solve a puzzle and geological records are a kind of puzzle. For example in a core from the Mediterranean seabed you'll see lots of light coloured sediments, then you see a distinct black layer containing lots of organic matter and it's interesting to find out why this black layer was formed. My research is mainly curiosity driven but for example for oil exploration it is also important to know why these organic-rich layers formed because they form the basis for our present-day society as they are the precursor of petroleum," finished Sinninghe Damsté. It is clear that Sinninghe Damste's biomarkers have a range of applications and that there is still a lot more to come from his research. Through cross-discipline collaboration of for example the EURCORORES Programmes EuroCLIMATE, EUROMARGINS and EuroDIVERSITY, Sinninghe Damsté hopes to carry on demonstrating the usefulness of these compounds.

For more information, contact:
Daniela Turk • dturk@esf.org

News

Discussing the Scheme future at fifth EUROCORES Workshop

On 22 May 2007, the EUROCORES Scheme held its fifth workshop in Brussels. 37 Member Organisation representatives, one EC representative and six representatives from the ESF office participated in the meeting.

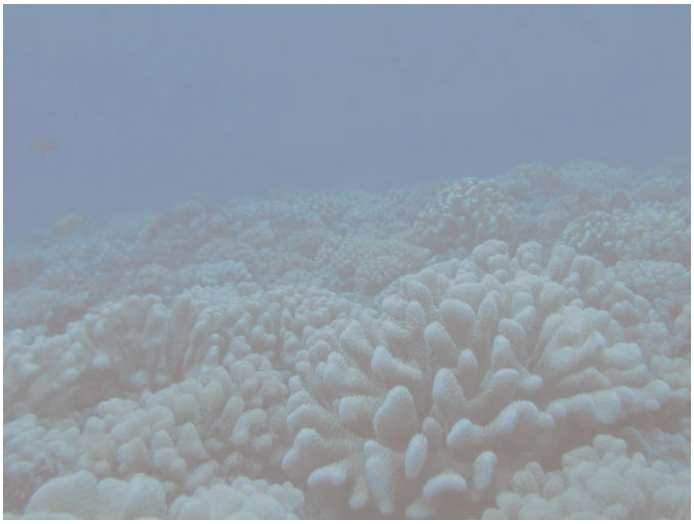
A large part of this workshop was dedicated to the implementation of the EUROCORES Scheme Review recommendations. In particular, three identified areas were discussed; a common pot mechanisms, the new EUROCORES scheme (Model 1) and the new timeline of the revised EUROCORES Scheme (Model 2). It was agreed that it is now necessary to implement a new timeline for the Scheme in order to improve the service. The theme selection will take about six months and the project selection around nine according to the new timeline.

The workshop also established working groups to further discuss and develop viable models of a common pot and development of a new EUROCORES Scheme around the ideas of Model 1 which will be presented to the Governing Council meeting in September.

Other issues discussed at the workshop included figures on coordination and networking costs for the future financing of EUROCORES, further improvements of the EUROCORES procedures, the ESF Collaborative Research Tool Kit and there was a detailed explanation by the EC representative on the ESF status for participation in FP7 ERA-Net proposals.

For more information, see
www.esf.org/eurocores

Investigating coral reefs to help understand past and future climate change



Increasing Earth temperatures and rising sea levels, both of these are effects of global climate change, as emphasized in the recent report of the Intergovernmental Panel on Climate Change (IPCC). The current concern is that human activity is changing our climate at a rate above the natural climate cycling. Understanding how the Earth's climate systems work and respond to change is therefore of uttermost importance.

"To predict future climate change we must first go back in the archives to understand a bit more about the natural cycles. This will enable us to decipher between natural changes and what's out of the ordinary," explained Gilbert Camoin, a senior research at the French Centre national de la recherche scientifique (CNRS), affiliated with the Centre Européen de Recherche et d'Enseignement des Géosciences de l'Environnement (CEREGE, Aix-en Provence, France). He was presenting his latest work and his current project during a Union Symposium entitled "Prospective views for European Cooperation in Geosciences / Environmental Sciences: Contributions in a global context" at the European Geosciences Union (EGU) General Assembly in Vienna in April 2007.

The last deglaciation period (23,000 – 6,000 years ago) is generally seen as a potential recent analogue for today's environmental changes. This period was characterised by abrupt climatic change and rapid sea-level rise due to polar ice sheets melting, similar conditions to what we see the Earth facing now and what is anticipated in the near future. Reconstructing past environments could lead to a reliable model for predicting future climate change.

Fossil coral reefs can be used to accurately reconstruct past sea level change, climate change and environmental change. According to Camoin, they provide the most precise records of past sea-level changes. This is because corals always live within very strict ecological requirements and have not varied much in their physiology and ecology over the geological time scale. They need clear and oxygenated water, only live in the first 50m of the sea column, at temperatures ranging from 18-35°C and within the narrow salinity range of 35-36 ‰ or g per liter. Any physical, chemical or ecological changes affecting the narrow requirements of the coral reef environment will lead to changes in coral reef growth and composition. Thus, a fossiled coral reef sampled by drilling provides accurate information about the sea level, salinity and temperature at different times in the past history. Interpreting this information provides a way to reconstruct past climate change in the sampling area.

Using coral reefs as climatic archives started about 30 years ago. Initially, due to technical constraints, it was only possible to capture a continuous record for the last 10,000 years through coral reef drilling. To get datasets covering the entire period of the last deglaciation, it was crucial to find another technique. This became possible during a project where the Integrated Ocean Drilling Program (IODP) provided Camoin and his colleagues with the technology to drill down to 1100m in the ocean recovering in total more than 600m of ancient reef cores from 37 holes at depths ranging from 40 – 117m from the area around the island of Tahiti. Based on this initial successful fieldwork, the CHECREEF project was developed with research teams from France, Germany, United Kingdom and Switzerland. CHECREEF is part of the European Science Foundation EUROCORES Programme "Challenges of Marine Coring Research" (EuroMARC). CHECREEF will look at data from both the Tahiti drilling site and a complementary drilling site in the Great Barrier Reef of Australia.

"We think that we will be able to reconstruct the sea level change going back 16-17,000 years in Tahiti and even further back in time at the Great Barrier Reef site. With this new study we will be able to reconstruct sea surface temperature and salinity which are major indicators of the past climatic changes as experienced by the reefs. We are pretty sure that we will achieve this goal within three years based on the datasets we have already

collected and the new oceanographic cruises scheduled," said Camoin

The two sites provide a good basis for creating a picture of past climate change. Firstly, they are away from the regions of the world covered by ice during the last ice age. Secondly, the core sites are located in the tropical Pacific ocean, a crucial point of the globe where many major climatic anomalies are observed e.g. El Nino. In addition, the two sites are located in zones which are tectonically quiet unlike volcanic islands and continental margins. This context is the rational behind the CHECREEF proposal. However, Camoin goes on to say that to get a clear and more complete picture and a very good dataset, with a global meaning, it is necessary to investigate other tropical sites in the Indian Ocean and the Caribbean. This is Camoin's plan for the future.

Camoin also highlighted that it is crucial to collaborate especially at the European level and to compare the coral reef data with those derived from other techniques, or acquired from other archives, such as ice cores, oceanic and lacustrine sediment cores, to cross-check and establish common chronology for the various datasets.

"The CHECREEF project has just started and we are trying to get a good chronological frame to make sure where we are. The ice core records are well advanced and we will go back to compare our data to theirs in a year of two. We also have geophysical modellers waiting for our results to enter into their models," explained Camoin.

Many of the European Science Foundation activities contribute towards a better understanding of the Earth processes, both past and future. With its emphasis on a multidisciplinary and pan-European approach, the Foundation provides the leadership necessary to open new frontiers in European science.

For more information, contact:
Didier Hauglustaine • dhauglustaine@esf.org

News

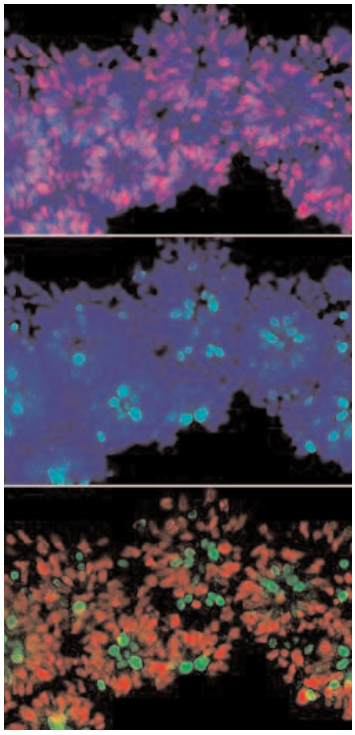
The first EUROCORES retreat

For two days in the middle of May, the ESF EUROCORES Team (almost all ESF scientific staff as well as the administrative staff supporting EUROCORES Scheme and Programmes) went into retreat in the village of Le Hohwald in the Vosges Mountains to discuss the impact of the EUROCORES Scheme Review Report and the future of the EUROCORES Scheme. While it was pouring with rain outside, the ESF staff discussed how to develop the EUROCORES Scheme to better meet the expectations of the Scientific Community as well as the National Funding organisations. The future challenges of the financing and organisation as well as harmonisation of work after the end of the generic support the contract within the EC Framework Programme 6 in the end of 2008 were debated.

Some participants at the EUROCORES retreat

Liposuctioned fat stem cells to repair bodies

Expanding waistlines, unsightly bulges: people will gladly remove excess body fat to improve their looks. But unwanted fat also contains stem cells with the potential to repair defects and heal injuries in the body. A team led by Philippe Collas at the University of Oslo in Norway has identified certain chemical marks that allow him to predict which, among the hundreds of millions of stem cells in liposuctioned fat, are best at regenerating tissue.



Expanding waistlines, unsightly bulges: people will gladly remove excess body fat to improve their looks. But unwanted fat also contains stem cells with the potential to repair defects and heal injuries in the body. A team led by Philippe Collas at the University of Oslo in Norway has identified certain chemical marks that allow him to predict which, among the hundreds of millions of stem cells in liposuctioned fat, are best at regenerating tissue.

Uncovering the nature and location of these molecular tags could allow scientists to pull off the ultimate trick of taking a patient's own fat cells and using them for therapy, Collas told researchers gathered at the EuroSTELLS Workshop 'Exploring Chromatin in Stem Cells' held on January 23-24, in Montpellier, France.

"Fat tissue is an underappreciated source of stem cells," Collas pointed out. Unlike other sources of adult stem cells, such as bone marrow, fat is abundant and there is no shortage of donors. "It's wonderful, we have litres and litres of material from cosmetic surgery clinics and end up with bucketfuls of stem cells to work with," he notes.

EuroSTELLS Project Leader Cesare Galli, from the University of Bologna, Italy has high hopes that transplanted fat stem cells will restore injured sports horses to their former glory. "Our aim is to regenerate the tendon structure that does not repair spontaneously," says Galli. Once scar tissue is formed, it hinders the animal's recovery. "If you intervene, with cell transplants, within one week, you can repair the lesion," Galli notes.

Like horses, humans are also vulnerable to joint injuries, and rehabilitations are long and costly. Now experience with horses is paving the way to cell therapies for sport-related tendon injuries in humans. Therapies using bone marrow stem cells, similar to fat stem cells, have achieved some successes, but the focus is shifting to fat, since the tissue is easier to access and extract than the bone marrow.

That fat-based methods work is not surprising, perhaps, because adipose tissue is closely related to bone, cartilage, muscle and other connective tissue. But some say it is impossible to re-programme adult cells to become nerve or liver cells, for example, without using embryos.

Adult stem cells, such as those from fat, are thought to have more limited potential.

Collas insists that the transformation is possible. The hurdle lies not with the genes but with a cell's epigenetic status, the subtle chemical modifications of DNA and its surrounding histone proteins. Epigenetic marks contribute to switching genes on and off, and stem cells rely on them heavily as they divide and mature. The Oslo team has found that low rates of DNA methylation, for instance, boost the chances of transforming fat stem cells from one cell type into another. "Look at a cell's epigenetic profile," says Collas, "and you may be able to predict what that cell is likely to turn into."

These epigenetic signatures have grabbed everyone's attention, acknowledges Ernest Arenas, a EuroSTELLS researcher at the Karolinska Institute in Stockholm, Sweden. "Scientists in the stem cell field are starting to realise that for cell manipulations to succeed they need to pay attention to their epigenetic marks. Cells can't be pushed along to become a different cell type unless they start out with the right set of [epigenetic] conditions."

It is a complex area but one that is loaded with promise. "Everyone is talking about epigenetics," says Collas. If he has his way, people may soon be visiting plastic surgeons not just for cosmetic reasons, but for therapy.

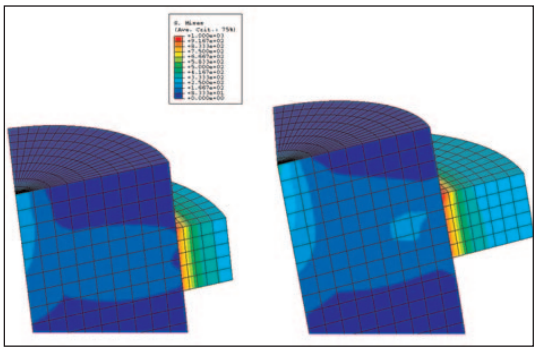
For further information,
contact Fiona Kernan • fkernan@esf.org

S3T contributes to the development of specialised training programmes and for the development of young researchers in the area of Smart Structures and Materials

S3T is providing support for the development of short courses to be offered by programme principal investigators. It also sponsors participation of S3T graduate students to these and other specialised courses. Two course proposals coordinated by S3T Principal Investigators have already been accepted and will be held at the Advanced School of the International Centre for Mechanical Sciences (CISM) in Udine, Italy:

- SEMI-ACTIVE VIBRATION SUPPRESSION: THE BEST FROM ACTIVE AND PASSIVE TECHNOLOGIES, Coordinated by André Preumont, Université Libre de Bruxelles, Belgium, 1 – 5 October 2007.
- New Trends in Vibration Based Structural Health Monitoring, Coordinated by Prof. Keith Worden Department of Mechanical Engineering, University of Sheffield, U.K. and Arnaud Deraemaeker - Université Libre de Bruxelles, Belgium, 22-26 September 2008.

Two PhD students, Katarzyna Majewska from the Polish Academy of Science, Institute of Fluid Flow Machinery, Gdansk, Polandand and Simon Miller from the University of Manchseter in the UK, have been sponsored to attend the Short Course on Active Vibration Control held on 24-26 April 2007 at the “Institut National des Sciences Appliquées de Lyon” (INSA - CAST), France.



S3T at the World forum on Smart Materials and Smart Structures Technology – SMSST’07

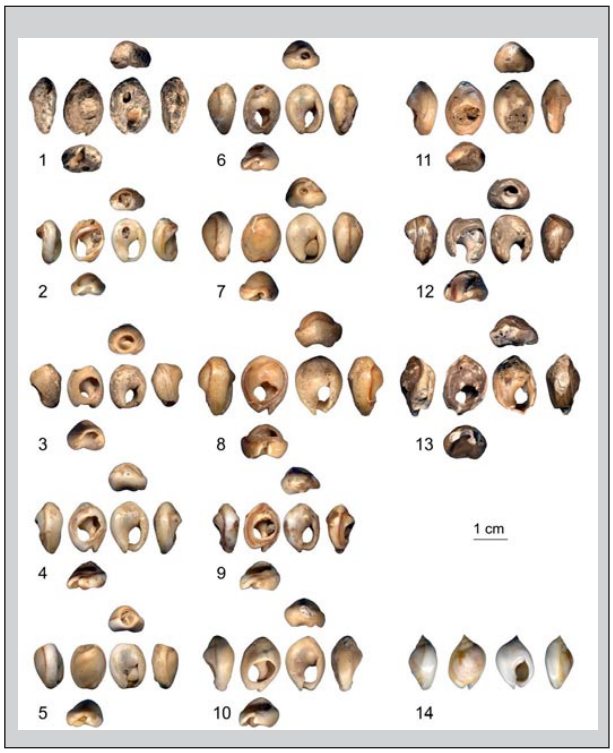
SMSST’07 is the outcome of ongoing US-Europe and US-Asia Pacific collaborations in the area of Smart Materials and Smart Structures. The forum took place on 21-27 May at two different locations. The first part of the conference was in Chongqing and was hosted by Chongqing University with focus on optoelectronics and fiber sensing technologies. The last two days of the conference happened in the city of Nanjing focusing on aerospace applications of smart structures and materials.

The EURCORES Programme Smart Structural Systems Technologies (S3T) and ESF had three joint invited sessions at the forum. The first invited session co-chaired by the S3T Programme Coordinator Farzam Ranjbaran and Professor Rahmat Shoureshi (Dean f Engineering University of Denver) showcased S3T and its seven Collaborative Research Projects (CRPs). It brought together the project leaders of these seven CRPs or a delegated Principal Investigator for them. The S3T session was successful and had a good turn up.
In the second session, chaired by Professors Lucia Faravelli (University of Pavia Italy) and Rahmat Shoureshi, the rest of the ongoing US-Europe collaborations that are not part of the S3T were presented and discussed.

The third session in the form of a Panel Discussion was held on the last day of the forum in Nanjing. Six panel members from various funding organisations in addition to the S3T Programme Coordinator described their organisations outlook and opportunities for Global Collaborative Research. The conference also drew representatives from the NSF (three members), EPSRC, and from China, Korea, Taiwan, and Thailand.

For more information, contact Farzam Ranjbaran • franjbaran@esf.org

EUROCORES Programme OMLL helps uncover ancient human behaviour



A major question in evolutionary studies today is how early did humans begin to think and behave in ways we would see as fundamentally modern? One index of 'behavioural modernity' is in the appearance of objects used purely as decoration or ornaments. Such items are widely regarded as having symbolic rather than practical value. By displaying them on the body as necklaces, pendants or bracelets or attached to clothing this also greatly increased their visual impact. The appearance of ornaments may be linked to a growing sense of self-awareness and identity amongst humans and any symbolic meanings would have been shared by members of the same group.

In Europe, amongst the oldest known symbolic ornaments are perforated animal teeth and shell beads, found in Upper Palaeolithic contexts that date to no more than 40,000 years ago. Such finds are apparently associated with both modern human and late Neanderthal sites. Together with cave paintings and engravings they offer the strongest indications that European societies of those times were capable of thinking in an abstract manner, and symbolising their ideas without relying on obvious links between a meaning and a sign. But, now, a growing body of evidence indicates symbolic material culture consisting of engravings, personal ornaments and systematic use of beads had emerged much earlier in Africa.

In a recently published paper in PNAS (Proceedings of the National Academy of Sciences of America) archaeologists from Morocco, UK, France and Germany, including researchers (M. Vanhaeren and F. d'Errico) funded by the Origin of Man, Language and Languages programme of the European Science Foundation, have been able to show that some of the earliest examples of bead making may date back as far as 82,000 years ago in North Africa. The evidence is in the form of deliberately perforated Nassarius marine shells, some still smeared with red ochre, that were found deeply stratified in archaeological levels in Grotte des Pigeons at Taforalt in northeastern Morocco. Led by Abdeljalil Bouzouggar of Rabat University and Nick Barton of Oxford University, a multidisciplinary team has been working in this massive limestone cave for the past five years. The finds come from a sequence of ashy deposits that have been independently dated by scientists at Oxford and in Australia using four different techniques which allow accurate age estimates for the layers with shells to be made. According to Nick Barton, the singular importance of these discoveries "is that they come from securely dated archaeological contexts and show unequivocally that beadmaking traditions existed in Africa that are twice as old as those in Europe".

The interpretation of the findings are still regarded as controversial by some who would question any appearance of modern symbolic activity before about 40-50,000 years ago. The archaeological dating evidence from the Moroccan site is however indisputable. At Taforalt, 13 Nassarius gibbosulus shell beads have been recovered in a deeply stratified occupation horizon towards the back of the cave. The finds were all made close together and sealed in lightly cemented ashy lenses (the remains of hearths) combined with abundant evidence of human activity in the form of lithic artefacts and animal bones. Amongst the stone tools associated with the shells are thin, bifacially worked foliate points typical of the Middle Palaeolithic Aterian technology, and probably used as spear heads. The bones of wild horse and African hare, found with them, represent human food residues.

Preservation of environmental evidence at Taforalt is also exceptionally good and reveals that at the time of the 'bead occupation' the landscape was dry, open and sparsely vegetated with some locally

wooded habitat. This information is based on the charcoal identified in the hearth deposits of wood species including cedar that only grows in drier, upland environments in Morocco today. Small mammals, including desert-edge species such as jirds (brought into the cave by natural predators like owls) help prove that the climate was much drier at this point in the past.

The shell beads have been closely studied by Francesco d'Errico and Marian Vanhaeren of the French CNRS who have confirmed that they are a shallow marine species gathered from the beach, which even in the past lay more than 40 km from the cave. Once collected, the dead shells were then probably perforated, ochred and used as personal ornaments. Some of the beads show microscopic wear patterns that would suggest they were suspended from a necklace or bracelet. The application of red pigment may have been intended to give them added visual symbolic value. There can be no doubt at all that this was part of a very deliberate cultural practice.

The beads are all the more extraordinary because the same types of marine tick shell (Nassarius) were used for making beads at a number of other Middle Palaeolithic sites in Africa and the Near East. D'Errico points out that "beads in the same shell species as at Taforalt, have also been found at Djebbana (in Algeria) and Skhul (in the Near East), and Nassarius shells of the same genus were employed at Blombos Cave, a site located at the other end of the continent in South Africa". The new dating for Taforalt is older than at any of the other African sites and demonstrates that some time after 100,000 years ago personal ornamentation came into widespread use in Africa and the Near East. Preliminary work by the team has also shown that Nassarius shells are not isolated occurrences but are present at various other sites in Morocco. Dating evidence is still awaited for these and they may turn out to be as old or even older than Taforalt.

For more information, contact:
Eva Hooglund • ehooglund@esf.org

EuroDEEP and CIESM Collaboration: ESF at the 38th CIESM Congress

After a successful week at the Lutfi Kirdar Convention and Exhibition Center in Istanbul, 9-13 April, the 38th CIESM (the Mediterranean Science Commission) Congress concluded its work. Following welcome speeches by Turkish personalities such as the Minister of Transport, the Rector of the University of Istanbul and the national CIESM Board Representative of Turkey, the Congress was formally open with an inaugural address by the President of the Commission, HRH Prince Albert II of Monaco, followed by a scientific overview presented by the Director General, Professor Frederic Briand.

The Congress was attended by some 750 scientists with a record number of presentations (over 700) in oral and poster committee sessions covering all marine disciplines from marine geophysics to microbiology. In addition morning panels, each concluded by a general debate, attracted a lot of interest.

Fig.1. The President of CIESM, Prince Albert of Monaco, surrounded (left to right) by G. De Lange, J. Font, A. Yilmaz, C. Christaki, the Director General of CIESM F. Briand, C. Turan, E. Sala and F. Boero. Courtesy of Christian Tamburini.

The EuroDEEP Programme was invited by the CIESM President on the 'Deep Mediterranean Sea – New insights and perspectives' Morning Panel Session. Both the EuroDEEP Programme Coordinator, on behalf of ESF, as well as four high-profile European scientists involved in EuroDEEP Collaborative research projects, presented their work and participated at the public discussions.

The election of the Chairs of the six CIESM scientific committees by secret ballot took place in the framework of this Istanbul congress. Dr. Gert De Lange (the Netherlands), principal investigator (PI) in the EuroDEEP MIDDLE project was elected Chair of Committee C1 'Marine Geosciences' for the period 2007-2010 (Fig.1).

Fig. 2. Muddy sediments with an asteroid, an ophiuroid and animal tracks in the Norwegian Basin. Copyright: DEEPSCAPE, NOCS 2006.

For more information:
www.esf.org/eurodeep or contact
Inge Jonckheere • ijonckheere@esf.org.

International Review Panel commends ESF's efforts in collaborative research

A detailed Review Panel Report submitted to and approved by the ESF Governing Council on 19 - 20 April 2007 outlines how to best develop the EUROCORES (European Collaborative Research) Scheme, one of the European Science Foundation's most successful instruments, in the future. The Scheme currently has 28 active programmes which all individually encompass between five and 15 projects. It offers a flexible framework for researchers to come together to tackle scientific questions which are best addressed in larger scale collaborative research projects. Since its creation in 2001, the EUROCORES Scheme has developed into a widely accepted tool for interdisciplinary scientific cooperation on a European level and a means for improved interaction between national research funding agencies.

"EUROCORES leads to very high-quality projects involving worthwhile cooperation or researchers from across Europe," commented the Irish ESF Member Organisation, Enterprise Ireland.
As part of the Scheme Review Panel Report, which also included an independent survey, the EUROCORES Scheme was identified as the instrument of choice for fighting the fragmentation of research in Europe. This is an important starting point for developing the Scheme. Seventy per cent of the science community feel that the Scheme is a useful instrument which complements other EU instruments, but is more open and flexible in terms of the subject areas, types of project and types of networking activities supported. Out of the 33 consulted ESF Member Organisations, 25 were positive towards the EUROCORES Scheme but would like to see some improvements.
"ESF as an agency of the agencies can offer a healthy new system," said Reinhard Grunwald, Chair of the Scheme Review Panel, at the ESF Governing Council.

However, while the survey found that EUROCORES has considerable strengths, it has yet to build a high profile and credibility within many communities. The Scheme is not well known within many scientific communities mainly due to its small scale compared to other EU instruments and also due to the fact that EUROCORES is still a relatively new scheme. Other areas for improvements were that the procedure takes too long and and there is a risk of duplication of national efforts.
"EUROCORES is now, after a trial and error period, a reasonably well-working instrument; it would be a waste of resources to totally discontinue it. It must find its own and unique role at EU level cooperation," said the Finnish ESF Member Organisation, the Finnish Academy, when asked to comment on EUROCORES in a questionnaire sent out by the Panel in November 2006.

As a result, the Report identifies key areas for improvement through three operative models which aim to improve the speed and reliability of the Scheme procedures, by adding features such as a common pot which would improve and speed up the funding process, a binding peer review and clearer procedures. It was also recommended that the theme selection process could be shortened by requiring more detailed theme proposals and by linking these to other ESF instruments such as Forward Looks.

Nevertheless, the Scheme is also described as more scientifically driven, more focused on fundamental research, less politically motivated, more suitable for collaboration between small teams, and less bureaucratic than other EU instruments. It is considered to support high quality work, and employ good processes.
"EUROCORES stimulates free/bottom up European cooperation as a complement to the more directed initiatives of the European Commission," commented the Swedish Research Council.

The report concluded that developing the EUROCORES Scheme into a more competitive instrument to rival the best and most creative on the European scientific stage and meet the challenges ahead is the only way forward. The EUCORORES Scheme needs to maintain the cutting-edge in a world where international scientific cooperation has developed and become the most fruitful and promising arena for scientific endeavors. The Panel report can be downloaded from the ESF website at www.esf.org/eurocores.

For more information, contact:
Svenje Mehlert • smehlert@esf.org

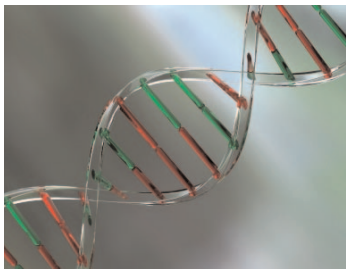
EUROCORES Calls Attract Record Application Numbers

Over 1000 scientists, both Principal Investigators and Associated Partners, submitted proposals to the Call for Proposals of the six new EUROCORES Programmes. TOPO-EUROPE, the programme on 4-D Topography Evolution in Europe: Uplift, Subsidence and Sea level Change, received the most outline proposals (47) from a record 503 scientists. This was more than any other programme but the other five programmes also received many proposals.

- FANAS (Friction and Adhesion in Nanomechanical Systems) received 18 outline proposals from 104 scientists (96 Principal Investigators and 8 Associate Partners).
- EuroQUASAR (European Quantum Standards and Metrology) received seven outline proposals from 57 scientists (45 Principal Investigators and 12 Associated Partners
- HumVIB (Cross-National and Multi-level Analysis of Human Values, Institutions and Behaviour) received 28 outline oroposals from 161 scientists (125 Principal Investigators and 36 Associated Partners)
- LogICCC (Modelling intelligent interaction - Logic in the Humanities, Social and Computational sciences) received 34 outline proposals from 203 scientists (157 Principal Investigators and 46 Associated Partners)
- TOPO-EUROPE (4-D Topography Evolution in Europe: Uplift, Subsidence and Sea level Change) received 47 outline proposals received from 503 scientists (305 Principal Investigators and 198 Associated Partners)
- EuroSTRESS (Stress and Mental Health) received 10 outline proposals from 51 scientists (36 Principal Investigators and 15 Associated Partners)

The 2007 Call for EUROCORES themes also received a large amount of proposals. As many as 33 proposals (involving 286 proposers) were received on a broad range of subject, 10 interdisciplinary proposals, 10 in Life, Earth and Environmental Sciences, two in Physical and Engineering Sciences, two in Medical Sciences, three in Social Sciences and six in Humanities.

RNAQuality - A new EUROCORES Programme in the Life Sciences



The RNAQuality community met at its kick-off meeting on 11 May 2007 in Strasbourg to discuss the needs of this scientific field. Future activities will put emphasis on training of young researchers and establishing a platform for European investigators to join forces and to stimulate new research initiatives in this exciting field.

RNA quality control has only recently emerged as a new field of RNA research and is now one of the most exciting areas of molecular biology. ESF promotes research on this cutting-edge topic through the EUROCORES Programme RNAQuality. Sixteen research groups from nine European countries participate in RNAQuality. Their projects aim at uncovering processes that act as quality control checkpoints in gene expression and understand how these function at a molecular level. Multidisciplinary approaches, ranging from molecular and cellular biology to structural analysis and high-throughput and computational approaches will be employed in diverse model systems.

This EUROCORES Programme is the first European-wide Programme to address the next big challenges in quality control of gene expression.

For more information, contact: Astrid Lunkes • alunkes@esf.org

EuroDIVERSITY at a glance – Challenges of Biodiversity Science

The ESF **EuroDIVERSITY** Programme 'Challenges of Biodiversity Science' is a European Collaborative Research Programme (EUROCORES) in biodiversity science that brings together more than 100 research groups from 20 countries. After the Call for Proposals, EuroDIVERSITY was launched in April 2006 and includes ten international, multidisciplinary Collaborative Research Projects (CRPs) which were selected for funding, with a total budget of about 10 Mio Euros. Each Collaborative Research Project is typically funded for 3 or 4 years. Some projects deal primarily with microbial diversity (COMIX, METHECO, MiCROSYSTEMS); others try to investigate the biogeochemistry in ecosystems (BEGIN, BioCycle); the landscape and community ecology of biodiversity changes (ASSEMBLE, AGRIPOPES; EcoTRADE), and focus on the diversity in freshwater (BIOPOOL, MOLARCH).

The EuroDIVERSITY programme fosters pan-European collaborative research, networking and training as well as dissemination of scientific results and activities developed in the frame of the programme.

The **first Topical Workshop** "Microbial Diversity and Ecosystem Functions" organized by Dr. Tom Battin (University of Vienna, Project leader COMIX Project) and Dr. Peter Frenzel (Max-Planck-Institut Marburg, Project leader METHECO Project and Chair EuroDIVERSITY Scientific Committee) in the framework of this Programme, has taken place from 7 to 11 March in WasserCluster, Lunz (AT). The Workshop was a great success, bringing together more than 50 scientists from 4 different Collaborative Research Projects and complemented with invited key note speakers from Europe and the US. The Workshop has provided a unique platform for world-class leading scientists and young researchers in the field of microbial diversity science and ecosystem modelling to interact and discuss the biodiversity of microbes. In the framework of the Workshop, there were oral presentations of young and senior scientists, poster sessions and working groups working on specific themes.

In the context of this congress, researchers concluded that the biodiversity of microbes is similar to that of animals and plants, since microbes steer global processes in the environment. Further human activity is increasingly impairing natural microbe action something which will contribute to Earth changing processes such as climatic change. The researchers concluded that there should be a "red list" for micro organisms, above all bacteria and mushrooms, as they play a crucial role in the production of the greenhouse gas methane.

In the framework of the EURODIVERSITY Programme, scientists will further try to bridge the gap between the natural and social sciences, between work on terrestrial, freshwater and marine ecosystems and between work on plants, animals and micro-organisms.

Future programme-level planned activities are the participation of young researchers in the 25th IALE 2007 Intensive summer Courses in Wageningen (the Netherlands), and a first Annual Programme-wide conference in Paris (France) from 3 to 5 October 2007.

For more information:
www.esf.org/eurodiversity or contact
Inge Jonckheere • ijonckheere@esf.org.

US-Europe Workshop on Adaptive Aerospace Structures and Materials - Future Requirements and Developments

Couvent Royal, Saint-Maximin, France / 5-7 November 2007

The European Science Foundation (ESF), in collaboration with the National Science Foundation (NSF), and the US Air Force Office of Scientific Research (AFOSR) are organising a workshop focusing on the future aerospace applications of Adaptive Structures and Materials. This joint initiative is the result of the networking and dissemination activities supported by the ESF-S3T Programme. The EUROCORES Programme S3T within the Engineering remit is in the early stages of its Networking and Dissemination phase and brings together seven consortia, consisting of over 40 principal investigators and associated partners, focusing on diverse topics of research within the domain of Structural Systems Technologies (www.esf.org/s3t).

The workshop is organised as a networking and collaborative effort in line with the research focus of a subset of the seven consortia within S3T, namely: MAFESMA (Tools for modelling, design and control of smart structural systems based on shape memory alloys: material algorithms, finite element methods, experiments), SCMeRe (Shape Control of Membrane Reflectors) and SMORPH (Smart Aircraft Morphing Technologies).

Serving the central objectives of the EUROCORES Programme, the main goals of this workshop are to:

1- Create a platform for scientific dissemination, exchange of ideas and discussions among scientists, engineers, and practitioners mainly from Europe, the US and possibly Canada in the areas of adaptive aerospace structures and materials.

2- Create opportunities for the enhancement of existing collaborative links and for the creation of new prospects.

3- Provide consolidated strategic advice for the benefit of the funding agencies, the aerospace industry, research establishments and academia. This includes foresight for research planning, promotion and dissemination of knowledge, creation or enhancement of standards and best practices and applications of adaptive structures and materials for future aerospace use.

During this 3-day event, participants will not only present their current projects and their future plans and ideas, but also hear from the leading invited speakers addressing each of the main topics of the workshop illustrating the state of the art, latest advances, future research possibilities and directions. The three main research topics to be covered are:

1- Adaptive Materials for Aerospace Applications

2- Future Space Telescopes

3- Morphing Aircraft

Participation to the workshop is through invitation. Interested participants who have not received an invitation should contact the S3T Programme coordinator, Farzam Ranjbaran (franjbaran@esf.org) or Administrative Assistant, Catherine Lobstein (clobstein@esf.org).

For more information, contact Farzam Ranjbaran • franjbaran@esf.org

Conferences in 2007

August	**16-18**	**FoNE Summer School on 'Quantum Transport and Dynamics in Nanostructures',** Cumberland Lodge, Windsor, UK. (www.lancs.ac.uk/users/esgn/windsor07)
	27-1 Sept.	**Inventing Europe Summer School"Cold War Technology in Europe",** Chios (Greece) and Izmir (Turkey).
	19-23	**ECRP symposium at the '14th European Conference on Eye Movements',** Potsdam, Germany. (kliegl@uni-potsdam.de)
September	**1-5**	**EuroDYNA sub-section meeting "Chromatin and Cell Cycle"** at the ELSO meeting in Dresden, Germany.
	5 -7	**OMLL Workshop 'Migrations'** , Porquerolles, France.
	16-19	**EuroSCOPE session at the 13th ECB Meeting in Barcelona**, Spain.
	26-28	**EuroCLIMATE Workshop on 'Atmospheric CO2, ocean acidification, and ecological changes in planktonic calcifying organisms'**, Barcelona, Spain.
	30 – 3 Oct.	**EuroSTELLS 'Challenges in Stem Cell Differentiation and Transplantation'**, Milan, Italy.
October	**4 -7**	**OMLL Workshop 'Migrations',** Porquerolles, France.
November	**3-5**	**1st Annual EuroDIVERSITY Conference,** Marne-la-Vallée, France. (www.esf.org/eurodiversity)
	16-19	**CNCC Workshop 'Subjective Pre-Reflective Experience and Action',** Paris, France.
	23-24	**CNCC Workshop "Self and Other in Social Neuroscience and Philosophy of Mind", Institute of Philosophy, School of Advanced Study**, University of London, UK.
	26-29	**1st Annual EuroDEEP Conference**, Taormina, Italy.
December	**6-8**	**ECRP Conference 'New migration dynamics: Regular and irregular activities on the European labour market',** University of Nice Sophia Antipolis, France.
	10-13	**FANAS A Workshop on 'Quantum Transport, Magnetic Nanodevices and Spintronics' between 'SpiCo-Spintra-Spincurrent'** will take place in Naples, Italy.
	12-14	**OMLL Final Conference**, Rome, Italy.

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SETTING SCIENCE AGENDAS FOR EUROPE

1 quai Lezay-Marnésia • BP 90015
67080 Strasbourg cedex • France
Tel: +33 (0)3 88 76 71 00 • Fax: +33 (0)3 88 37 05 32
www.esf.org