FET
through the keyhole

Future and Emerging Technologies in Europe
July 2009

European Commission
Information Society and Media

The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!', but 'That's funny ...' (I. Asimov)

In this issue

Welcome

Last April, the FET community gathered in Prague for the first *"Science beyond Fiction"* conference focussed on the future of ICT in a multidisciplinary perspective. With 750 participants, a series of inspiring keynotes and sessions, and an attractive exhibition, "Science beyond Fiction" gave the opportunity to scientists and non-scientists to share their experience and views on the challenges of today's and tomorrow's science. Read more about FET09 in our "Science beyond fiction" section.

In the meantime, Fp7 is in full swing and the 5th call will open at the end of July on the FET-proactive topics "human-computer confluence", "self-awareness in autonomic systems" and "towards-zero-power ICT". For the FET-Open scheme, the continuous call runs its course and we keep on welcoming your short proposals for scientifically excellent research projects.

As usual, we also included plenty of material about our ongoing projects, prizes awarded in the FET community and upcoming events!

We wish you pleasant reading and a great summer.

The FET team

"Science beyond Fiction" - The first ever FET conference

On April 21-23rd last, the beautiful city of Prague was the stage for the effervescence and creativity of European research in ICT. *"If this is European bureaucracy, we like it!"* declared one of the participants to this new forum, in which scientists working in a large range of disciplines and coming from all over Europe, but also from the USA or Russia, discussed the future of Information and Communication Technologies.

The conference featured outstanding keynote speakers including Anton Zeilinger, Alain Berthoz, Henry Markram and Henrik Ehrsson, but beyond that it also hosted a large number of sessions on a wide variety of topics, an exhibition, a poster session and on-the-fly sessions for spontaneous discussions on topics outside the official programme.

The Conference was opened by the Czech Minister Ondřej Liška, the then acting EU president for the "Education, Youth and Culture" Council. In his opening speech, Mr Liška underlined the specificity and the importance of the FET scheme within European ICT funding. *"The present and future challenges do not focus only on purely technological problems, but also on social and human aspects of the technologies and interaction with the environment"* he declared, insisting on the great challenge the society of knowledge represents for Europe.

Research should also contribute *"to increase the competitiveness of Europe" inside the "triangle comprising research, education and innovation"* he said, giving examples of what Europe should try to achieve, ranging from the mobility of scientists to the coordination of regional, national and European funding.

A REVAMPED STRATEGY FOR FET

Viviane Reding, Commissioner for Information Society and Media, addressed the FET09 participants in a video message: *"In this period of economic uncertainty ICT becomes an even more essential tool to revitalize the real economy, to improve our competitiveness, to boost our capacity to innovate, create jobs, and to tackle key societal challenges."*

A Communication, "*Moving the ICT frontiers – a strategy for research on future and emerging technologies in Europe*" was adopted in this difficult economic context and aims at strengthening the FET research scheme in ICT. It proposes a combination of initiatives involving not only increased investment, but also stronger coordination and collaboration between all stakeholders, and new ambitious FET flagship initiatives.

The strategy includes, inter alia, actions to attract the best researchers from around the world to Europe, to increase investment by the public and the private sector and to fuel innovation. And it is expected that, in the long run, investment in research that underpins future ICT will pay back itself by boosting Europe's competitiveness in a sustainable manner.

Read the text of the FET Communication:

ec.europa.eu/information_society/events/fet/2009/documents/fetcom.pdf

FET09 Highlights

Two legs, two arms, one head. Who am I?

by Henrik Erhsson

"How do I know this is my body? To find the scientific answers to this question, neuroscientist Ehrsson and his colleagues conducted a number of experiments to identify the activity that reflects ownership in the brain. They attempted to fool the brain into thinking that it owned a rubber hand at which the subject is looking while his or her real hand is hidden behind a screen. Ehrsson pokes the rubber hand while prodding the real-but-hidden hand at exactly the same time. *"After 15 seconds or so something happens in most patients' minds and they begin to feel that the rubber hand is theirs after all. If you move your finger, you are very surprised that the rubber hand doesn't move too."* A FMRI machine was used to determine which parts of the brain are involved in ownership. And when Ehrsson asked participants to watch while he threatened their rubber hand with a syringe, the greater the feeling of ownership, the greater the activity in the part of the brain responsible for pain anticipation! From experiments like these, neuroscientists now have a preliminary model of body ownership.

For the full body, Ehrsson uses a stereo camera placed elsewhere in the room that feeds images to a head mounted display that subjects wear to give them the illusion that they have a different perspective. He jabs an object towards and below the stereo camera and at the same time he jabs the subject's chest. After a few seconds, this combination of a visual change in perspective and the sensation on the subject's chest begins to induce an out of body experience. The same technique can even give people a sense that they own an entirely different body, with a manikin for example. A man can take on the ownership of a female body and vice versa, and an overweight person can suddenly feel that he or she has the perfect shape.

Ehrsson says this could be useful for better understanding of various neurological disorders, such as schizophrenia, in which there appears to be a breakdown of body ownership in some patients. It could also give virtual reality users a sense of ownership over the avatars that represent them in online worlds and to better control telerobotic machines. But the most immediate application is to give amputees a sense of ownership of prosthetic limbs. Ehrsson has now begun a project in which he has been able to map the phantom limb to the stump and then to carry out his limb ownership experiments by touching the relevant parts of this map. *"In our tests so far, we have found that this can be useful to amputees."*

www.neuro.ki.se/ehrsson

Best Exhibit Awards at FET09

Three prizes were awarded to the best exhibits at FET09. Congratulations to Xpero (1st Prize), Gazecom (2nd Prize) and Symbrion (3rd Prize)!

1st Prize: Xpero

XPERO presented Nao, the autonomous robot who learns by experimentation. Nao, a small humanoid from Aldebaran, uses Artificial Intelligence provided by the XPERO project scientists, to learn about his surroundings by autonomously exploring the world. Nao has no predefined goal but to learn as much as possible and as quickly as possible. In principle, he learns the relations between his actions and his observations, perceiving the environment with an overview camera.

The demonstration consists of 4 scenarios, beginning with the most primitive one - learning the concept of orientation. Nao measures the distances and the angles to all the objects; he soon learns a simple qualitative model describing how angles and distances change as he performs the desired action. When he knows how to approach the object, he starts pushing it and learns that the object is movable if it changes location. Nao goes from the notion of movability (in plane) to the concept of stability (in 3D) in the next scenario where he plays with boxes and balls, trying to build structures with them. He learns that the structure is stable if there is a box at the bottom while it is not stable if the ball is at the bottom of the structure. In the final scenario, Nao pushes a box as far as he can, observing that sometimes a movable box becomes unmovable (e.g. when it hits a wall). He tries to continue pushing in other directions, finally observing that (when the box is in a corner) he can not push it anymore. Describing the relations observed in his experiments, he learns a concept of "Degrees of Freedom".

At FET09 we saw Nao make the transition *"from a baby to a 1 year old"* in about 10 minutes!

www.xpero.org

2nd Prize: Gazecom

A major limitation of human visual system is that we can in fact attend only a very limited number of features and events at any one time. Gazecom proposes that future ICT systems should use gaze guidance to help the users deploy these limited attention resources more effectively, and to complement natural vision with computer-vision technology in an unobtrusive way.

In one exhibit, videos were modified as a function of gaze to filter out potential distractions and to optimize human-machine communication. In another, a head-mounted display with integrated eye tracking, visitors became fully immersed in a tunnel navigation task and peripherally flashing dots helped to steer better and faster.

www.gazecom.eu

3rd Prize: Symbrion

Imagine self-governed robots working together and looking for potential survivors in a collapsed building. They form themselves into teams, lift blocks of concrete, locate human presence and do in no time what would have normally taken days. Although such a scenario is far from our current reality, the Symbrion project is taking us one step closer.

To date, the project is experimenting with robots the size of a coffee cup which can join together, share energy and build up collective behavior (walking together for instance). Scientists found inspiration in nature itself: these little robots make us think of ants working together, carrying objects ten times their size and bringing them home. The long-term objectives of the project will be to develop new faculties for the robots: self-configuration, self-healing, self-optimization and self-protection from hardware and software perspectives.

www.symbrion.eu

FET09 in numbers

- Participation: almost 750 delegates
- Scientific Sessions: 7 keynotes, 29 scientific sessions, 1 science cafe
- Exhibits: 29
- On-the-fly Sessions: 22
- Posters: 64
- Journalists present: 50+ (including BBC News, Financial Times, Heise, AFP...)
- TV crews present: 7 (BBC TV, ZDF/3SAT, ORF, RAI, EBS...)
- Outputs: Lots of press articles, TV reports plus two TV technology programmes made directly from the event (for BBC Click, audience up to 150 million viewers worldwide).

Self-powered Nano-machines

Every eye in the room watched the drinking bird toy, forever dipping its head into a bowl of water and bobbing back and forth in a seemingly endless cycle of motion. The toy extracts all the energy it needs from the environment.

If this can be done with a child's toy, why not for nanomachines and nanocircuits? That may soon change thanks to the convergence of two trends in microelectronics: the relentless creation of ever smaller, more energy efficient nanocircuits and nanomachines and a newfound ability to harvest energy on the nanoscale.

For the moment, one of the leaders is Zhong-Ling Wang, an electrical engineer at the Georgia Institute of Technology in Atlanta who in 2006 unveiled an extraordinary device that looks like a tiny hairbrush and consists of an array of nanowires made of zinc oxide grown on a wafer of aluminium oxide. Zinc oxide is a piezoelectric material: it generates an electric field when it is bent. So each wire can generate a few milli-Volts. With enough of these wires packed together, the dream is that their combined output would be enough to power various kinds of miniature sensors and processors.

Another option is to build a capacitor and to use ambient vibrations to change the distance between the capacitor plates. If the voltage is constant across the plates as the distance between them increases, the amount of charge on the capacitor will increase too. This extra charge can then be siphoned off and pumped round a circuit.

Ambient light is another obvious source of energy and the kind of structures that can be built on the nanoscale provide a hugely efficient way of harvesting it. On the nanoscale, it is possible to build optical antennas which convert optical frequencies of light into electric currents in the same way that radio antennas convert radio frequency radiation. Obviously, the size of the antennas have to be in the same order of magnitude as the waves that they are designed to receive. And since visible light has a wavelength measured in nanometres, it has only recently become possible to construct them on this scale.

The potential benefits are huge. Conventional photovoltaic cells convert light into electricity with an efficiency of around 15 per cent, although various breakthroughs are pushing that ever upwards (some exotic and hugely expensive material can reach 50 per cent efficiency). Optical antennas, on the other hand, can convert radiation into current with an efficiency of 70 or 80 per cent.

The technology could also get around one of the biggest problems with solar cells: the fact that they work only during daylight hours. By tuning the antennas to operate in the infrared region of the spectrum, which is emitted by objects throughout the day and night, these nanogenerators could produce power 24 hours a day.

In addition, if the antennas are built on tiny springboards, they can increase the vibration of the springboard. And this vibration energy could also be harvested.

The "combination" of all these techniques "has great potential," says Gabriel Abadal, at the Universitat Autònoma de Barcelona in Spain.

Self-powered nano-devices was a FET09 session organized by Violeta Gracià - Universitat Autònoma de Barcelona, Research and Knowledge Transfer Office, Spain.

The Multimodal Brain Orchestra: closing FET09 in style

The Multimodal Brain Orchestra premiered at the FET Conference in Prague in April. Their multimedia show, Xmotion, was unlike anything ever performed before. It is a mixture of film, sound and data controlled entirely by the brainwaves and emotional states of the orchestra and its two conductors.

The music consists of three tracks playing simultaneously. The first track is generated by a computerised "composition engine" that combines samples of music and sounds taken from a huge database. The engine's choice is determined by a set of parameters which, when varied, change the type of music it chooses, as well as each clip's duration and volume. These parameters are not set by the computer but instead by the heart rate, skin conductance and breathing rate of the orchestra's "emotional conductor". This data is displayed at the bottom of a screen behind the orchestra.

The second track is generated by the brainwaves of the four members of the orchestra. The two right hand members of the orchestra focus on a type of brainwave called the P300 response. By controlling this response, the players can select one of 25 pre-recorded samples of music to play. Their choice is indicated by a dot on their brainwave trace on the display.

The two orchestra members on the left focus on a brainwave output called Steady State Visual Evoked Potentials. This can take one of four states which determine the property of the notes being played, such as the whether they are short or held for longer.

The conductor tells the orchestra members when and how to play, just like a conventional maestro.

The third track is a fixed pre-recorded piece of background music that determines the start and finish of the 30 minute performance. It also ensures that some music plays should there by any technical problems during the show. These three tracks are played simultaneously.

The music contrasts the deliberate actions of the orchestra members, who can control their brainwave outputs by looking at particular flashing lights in front of them, with the unconscious level of arousal of the emotional conductor who cannot easily control her skin conductance and heart rate, except by her subconscious response to the music and to a film she watches through a head-mounted display.

This film is also shown to the audience. A second version of the film is also shown which has been edited in real time using parameters set by the arousal level of the emotional conductor.

The overall result was an extraordinary event that exploited state-of-the-art brain wave-measuring technologies to produce theatre of the highest order.

FET Funding Opportunities

FET-PROACTIVE: Call FP7-ICT-2009-5 to be launched soon

The 5th call under the FP7 2009-2010 Work Programme will open on July 30th, 2009. It features 3 thematic R&D initiatives:

• **Human-Computer Confluence:** In modern life people have to assimilate massive amounts of data, either consciously or unconsciously, and there is an ever increasing demand to expand the volume of data that can be handled. This Proactive Initiative seeks to research new methods of perception which would enable people to interact with large volumes of data in as natural a fashion as possible, and without undue stress. Methods for blurring the perceived boundaries between the real world and associated virtual artefacts by an appropriate formatting and presentation of sensory information can be investigated as one aspect of this. More info on: cordis.europa.eu/fp7/ict/fet-proactive/hcco_en.html

• **Self-Awareness in Autonomic Systems:** This proactive aims to create computing and communication systems that are able to optimise overall performance and resource usage in response to changing conditions, adapting to both context (such as user behaviour) and internal changes (such as topology). To achieve this, autonomic systems should enable nodes to build up an awareness relating to higher and even global levels, e.g. of patterns of use, system performance, network conditions and available resources. More info on: cordis.europa.eu/fp7/ict/fet-proactive/aware_en.html

• **Towards Zero-Power ICT:** Powering all the electronic devices surrounding us in our daily life is still and will remain a challenge. Therefore this Proactive Initiative searches for new and disruptive ideas for energy harvesting and storage at the nanometre and molecular scale to power our future information and communication technologies. The feasibility of proposed approaches should be demonstrated by the construction of nano-scale autonomous devices able to sense, actuate and communicate. More info on: cordis.europa.eu/fp7/ict/fet-proactive/2zerop_en.html

The call aims to support these R&D Initiatives (as well as the ones currently running) through 2

different types of coordination actions focusing on:

• Coordinating Communities, Plans and Actions in FET Proactive Initiatives: Coordination actions are called for that support targeted research communities by increasing their visibility to the scientific community, industry & public. They foster the consolidation of research agendas and the coordination of national, regional and international research programmes and activities and encourage the establishment of new educational curricula.

Alternatively, coordination actions may involve national or regional research programme owners and develop actions dedicated specifically to networking of research activities at national or regional level. In this case they should facilitate joint trans-national calls and aim for an ERA-NET plus action in a subsequent phase. More info on: cordis.europa.eu/fp7/ict/fet-proactive/csafetip_en.html

• Identifying new research topics, Assessing emerging global S&T trends in ICT for future FET Proactive initiatives: These types of **coordination actions** should focus efforts on the definition of future FET Proactive initiatives. They may for example identify new research topics (at Proactive initiative level) through developing a position paper in which the required actions, research challenges and impact (foreseen in science, technology and society) is described. Alternatively, they may target the assessment of emerging global S&T trends in ICT that could lead to the definition of research topics, help to overcome roadblocks and set the future scene. In addition they may assess the potential of recent breakthroughs in FET related research. More info on: cordis.europa.eu/fp7/ict/fet-proactive/futfetip_en.html

The total budget for the FET proactive calls in WP 2009-10 is 110 M€, whereas the indicative budget for the objectives in call 5 is 39 M€. **Deadline for proposal submission: 26 October 2009.**

FET-OPEN: The Ideas Keep Flowing

FET-Open is working 24/7 on its continuous call for proposals in the period 2009-2010. We look forward to receiving your short proposals for scientifically excellent (STREP) research projects impacting on the future of ICT, and for coordination actions that help to catalyse a lasting and transformative effect on the communities and practices for high-risk and high-impact research. Please submit your short proposals as soon as they are ready.

The indicative budget is 61 M€ for those batches (from 5 to 8) with a cut-off date in 2009-2010.

For more information:
cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.CooperationDetailsCallPage&call_id=189

Study Announcements:

The Role of High-Tech SMEs in European Transformative Research

FET-Open has launched a tender for a study to analyse the potential roles of **high-tech SMEs** in long-term collaborative transformative research in Europe.

Deadline for proposal submissions: 22/07/2009 16:00 (GMT+01)

Further information:
cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.CooperationDetailsCallPage&call_id=220

FET Flagships – Smart 2009/0051

The study is expected to produce a design, operational, assessment and legal framework for FET flagships and to apply the framework to two candidate FET-Fs. This framework should be based on the lessons learnt from studying and analysing similar initiatives and by building candidate flagships proposed by the ISTAG FET Working Group.

Deadline for proposal submissions: 14/08/2009 16:00 (GMT+01).

Further information:
cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.CooperationDetailsCallPage&call_id=234

La Vie des Projets

NODE - High performance nanowire devices

During the past half century, a dramatic downscaling of electronics has taken place, a miniaturization that the industry expects to continue for at least a decade. To serve that purpose, the three-year old NODE project uses the self-assembly quality of one-dimensional

semiconductor nanowires in order to bring new and high performance nanowire devices as an add-on to mainstream Silicon technology.

The key achievement of the consortium is the production and characterization of ultra-pure nanowires consisting of silicon, or so called III-V semiconductors, and their integration into a switching device which can be used as an add-on to the conventional silicon CMOS (complementary metal–oxide–semiconductor) technology that have become ubiquitous in today's hardware. The main advantage of the nanowire technology is that it enables an extremely high density of switching devices and at the same time a comparatively simple manufacturing process.

The NODE project brings together researchers from several scientific disciplines such as solid state physics, materials science and chemistry, team up with experts from the semiconductor industry (IBM, ST Microelectronics, NXP, Philips, and Qimonda). The impressive number of 39 patents filed by the partners as a result of the project is a visible proof of the potential commercial impact of the achieved R&D results.

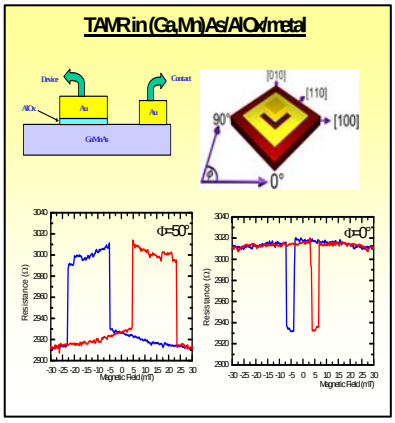
www.node-project.com

NANOSPIN – Spintronics, the new electronics?

Spintronics - short for spin transport electronics - devices could be the next great wave of microchip innovation. They have created enormous advances in microelectronics, leading to faster, instant-on start times and orders-of-magnitude increases in data storage capacity.

Currently, semiconductor devices work using charge. *"But electrons have another degree of freedom,"* says Charles Gould, co-coordinator of Nanospin, *"and you can also control their spin, or their magnetic orientation."* Spin then becomes another information carrier, and there are numerous advantages to the technique.

First, information stored by charge is volatile. But in the proper environment, spin is non-volatile. In magnetic material, once you switch spin to up or down it stays in that orientation until you switch it back. "It means that when you cut the current, everything stays as it is," explains Gould. Spintronic devices also use little power. And, at least theoretically, spintronic devices could have very high switching speed, although this has not been proven in the lab yet. This could mean that spintronic devices reach the terahertz range, which is pretty fast. Finally, spintronic devices have excellent scalability, because they are based on ferromagnetic semiconductors. And as semiconductor manufacturing technologies are well established, the engineering challenges appear as quite feasible in the future. Another challenge is the use of semiconductors rather than metals, mainly because researchers have yet to find a semiconducting material that works at room temperatures. The search is on, and researchers are confident they will find an appropriate material.



There were four strands to the team's work: writing information to ferromagnetic semiconductors, retrieving it, high-speed switching between different states and the theoretical modelling of the devices to explain their operation and allow for optimisation.

"We were essentially looking at devices for memory and storage of information using ferromagnetic semiconductors," Gould notes. The project was very successful, and generated a lot of interest from industry. *"IBM, Seagate, Hitachi and Western Digital have all expressed interest in our work, and Hitachi was a partner in Nanospin,"* says Gould. For now, work continues and, while the Nanospin project is over, the partners are continuing to collaborate through a Marie Curie European network called SemiSpinNet. *"Currently, we are looking at logic schemes for spintronics, so we are moving from memory and storage to processing,"* says Gould.

obelix.physik.uni-wuerzburg.de/nanospin

LAMPETRA – swimming lamprey robot

Inside the FET09 exhibition hall, a small group gathers to watch a researcher holding what appears to be a snake-like toy. In fact it is a robot designed to swim like a lamprey made of a series of articulated segments with a head at one end and a tail at the other. A video nearby shows a robotic salamander swimming through the water like a lamprey and then walking out on to the beach using its legs.

These robots are test beds for a new kind of neuroscience. If evolution has already worked out how to walk, why not exploit it?

LAMPETRA (Life-like Artefacts for Motor-Postural Experiments and Development of New Control Technologies inspired by Rapid Animal locomotion) is a three-year collaborative project funded by the Seventh EU framework programme under the theme ICT-2007.8.3-FET proactive 3, "Bio-ICT Convergence", aimed at consolidating multidisciplinary Bio-ICT research carried out by a recently established scientific community. The ICT perspective is to exploit knowledge in biology and to adapt a range of solutions observed in the natural world in order to face engineering challenges. One core aspect is the understanding of information processing in biological systems (networks of neurons or other cells) or the computational interpretation of biological processes (molecular signalling, metabolism); these processes provide considerable hints in terms of functionality, operating conditions, resilience or adaptability or lead to systems that can be naturally combined with biological systems. Biomimetic artefacts, bidirectional interfaces and biohybrid artefacts are fundamental devices foreseen by the Bio-ICT Proactive Initiative.

The project aims at developing a lamprey/salamander bioinspired artefact in order to find new solutions for high-performance artificial locomotion in terms of fast-response, adaptability, reliability, energy efficiency and control. The artefact replicates living animal characteristics, from the neuronal level up to control and behavioural functions. Robots are supposed to control locomotion and body orientation in goal-directed tasks, moving like real animals in their natural environment. Researchers can also study how neural circuits must have changed as living things evolved from swimmers to walkers. These robots are laboratories of evolution, as evolutionary biologists have long been interested in creatures such as the lamprey and the salamander because they represent closely related steps on the evolutionary ladder. And the collaboration between neuroscience and robotics goes both ways, says Paolo Dario, a mechanical engineer and robotics expert at the Scuola Superiore Sant'Anna in Pisa, Italy. Initially, the robots are used to implement theoretical models of neural mechanisms. Then, the results of these experiments are used to fine tune the models and also to help redesign the robots for real-world applications.

www.lampetra.org

Awards

The American Philosophical Association has awarded the 2009 **Barwise Prize** to **Professor Luciano Floridi** (Hertfordshire and Oxford) *"for significant and sustained contributions to areas relevant to philosophy and computing [...] in recognition of his research on the philosophy of information"*. Prof. Floridi will receive the award during the APA's annual meeting in New York next December, where he will deliver the Barwise Lecture.
www.apaonline.org/opportunities/prizes/barwise.aspx

Professor Ioannis Antoniou was awarded the **Prigogine 2008 award** for his contribution to the theory of chaos. A student of Prigogine himself for 24 years, Antoniou's contribution offers the mathematical formula for the Prigorine theory to be applied to fields such as optical tomography, electrocardiograms, 3D display, nanotechnology, etc. The 2008 prize was presented at The Sustainable City 2008 conference in Greece (Dec2008). Prof Antoniou was involved in several FP5 FET projects such as: TDIS (Three-Dimensional Imaging System Based on Integral Photography for Precise Simulation of 3D Perception and Enhancement of the Telepresence Effect) IMCOMP (IMMUNOCOMPUTING),
SQID (Semiconductor-based implementation of quantum information devices).
www.wessex.ac.uk/08-conferences/the-sustainable-city-2008.html

Professor Giorgio Parisi of the University of Roma La Sapienza received the **European Prize for Science** awarded by **the Royal Society, the Académie des Sciences** and **Microsoft Research** for his work on computational science. He was also awarded the Lagrange-CTR Foundation Prize for his research in complex systems. Giorgio Parisi is the director of the Statistical Mechanics and Complexity research centre of the National Institute for Matter Physics and a professor of quantum theory at the University of La Sapienza in Rome. He was involved in the FP5 FET project "Existence".
royalsociety.org/page.asp?tip=1&id=4236

G.tec (Guger Technologies) won the 12th **"Fast Forward Award"**, the most important Austrian innovation price. The partner in the FET funded Renachip project was rewarded for the combination of a brain-computer interface system to a smart home environment. This system can be used to control several elements such as the light, the TV, the radio: just by

thought! G.tech was a winner of the prestigious **ICT Prize in 2007**.
www.renachip.org/news/News2.aspx
www.gtec.at/profile/FastForward2008Styria.htm

The **Glazebrook Medal of the Institute of Physics**, another of the Institute of Physics' gold medals, was awarded to **Professor Sir Peter Knight** FRS, Imperial's Senior Principal and Professor of Quantum Optics. He received the Glazebrook Medal for his outstanding contributions to physics in the UK and globally, through both his scholarship as a pre-eminent atomic and molecular optics theoretician and as a charismatic and effective leader of research and research organisations. Sir Peter recently formulated and led two initiatives at Imperial College that resulted in the creation of the Grantham Institute for Climate Change and of the Institute for Shock Physics. Sir Peter participated in the FP6 project SCALA and in the FP5 project QGATES.

www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news_3-7-2009-12-39-59?newsid=70421

Serge Haroche - one of the founding fathers of cavity quantum electrodynamics (QED) - was awarded this year's **'gold medal' by the French national research council (CNRS)**. This most prestigious French scientific honour was awarded to the economist Jean Tirole in 2007 and to the geneticist Jean Weissenbach last year. Haroche is a specialist in atomic physics and quantum optics. He was one of the pionneers for the manipulation of matter with light, a theory he called the "dressed atom" in his thesis. Serge Haroche has been a professor at the Collège de France since 2001 and he heads the electrodynamics and simple systems group at CNRS's Kastler Brossel Lab in Paris. He contributed to the QUROPE research agenda and is partner in the FP6 project SCALA. He is also member of the French Academy of Sciences.
www.enseignementsup-recherche.gouv.fr/cid28377/serge-haroche-laureat-de-la-medaille-d-or-2009-du-cnrs.html

Forthcoming events

HCI Human Computer Interaction 2009
19-24 July 2009 – San Diego (USA)
www.hcii2009.org

Sound and Music Computing Conference
23-25 July 2009 – Porto (PT)
smc2009.smcnetwork.org

Trends in Nanotechnology 2009 (TNT2009)
07-11 September 2009 – Barcelona (ES)
www.tntconf.org/2009/index.php?conf=09

Unconventional Computation 2009 (UC09)
07-11 September 2009 – Ponta Delgada (PT)
www.uc09.uac.pt

ECAL 2009 – European Conference on Artificial Life
13-16 September 2009 - Budapest (HU)
www.ecal2009.org/

ESSA 2009 - Conference of the European Social Simulation Association
14-18 September 2009 - Guilford (UK)
cress.soc.surrey.ac.uk/essa2009/

3rd IEEE International Conference on Self-adaptive and Self-organizing Systems (SASO)
14- 18 September 2009 – San Francisco (USA)
www.radlab.cs.berkeley.edu/saso2009

The Future of Complexity
15-16 September 2009 - Bath (UK)
www.bath.ac.uk/math-sci/events/2009/fcs/

European Conference on Complex Systems 2009 (ECCS'09)
21-25 Sept 2009 – University of Warwick (UK)
www.eccs09.info

European Science Foundation (ESF) -'Can Complexity Improve European Health Policy?'
23-25 Sept 2009 - Lancaster University (UK)
www.lancs.ac.uk/fass/politics/event/2876

Second International Workshop on Remote Entrusting (RE-TRUST 2009)
Call for Contributions now open
30 Sept – 1 Oct 2009 - Riva del Garda (IT)
www.re-trust.org

14th International Workshop on Formal Methods for Industrial Critical Systems (FMICS 2009)
2-3 November 2009 – Eindhoven (NL)
www.dsic.upv.es/workshops/fmics2009

About this Newsletter

FET through the keyhole is published periodically by the FET-Proactive and FET-Open units at the European Commission Directorate General for Information Society and Media

Please contact the editors below if you would like to consider any FET or project related news for publication in this newsletter.

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