

Report on Science and Policy Forum on FET Flagships Brussels, 9-10 June, 2010

Rapporteur: Mark Buchanan, science writer

1. Introduction

As part of the DG INFSO ICT programme, the Future Emerging Technologies (FET) scheme is currently setting up the FET Flagship Initiatives described in the Commission Communication "[Moving the ICT frontiers – a strategy of research on future and emerging technologies in Europe](#)". The Competitiveness Council of the European Union endorsed the planning for these initiatives in its Conclusions of 3 December 2009, confirming the target of launching at least two such initiatives by 2013 and inviting the EC to "propose Europe-wide flagship initiatives in FET to tackle specific science and technology challenges at the crossover between ICT and other scientific disciplines".

The European Commission envisions the FET Flagships to be visionary, large-scale European ICT research initiatives lasting at least 10 years and aiming to achieve ambitious goals in science and technology that will provide a strong basis for future innovation and socio-economic benefits. The budget for FET Flagships could reach up to 100 M€Euros per year and per initiative. The Flagship Initiatives are to build on existing European research strengths, and target a level of ambition which requires a federated effort of the different EC services, along with Member States, funding agencies, and where appropriate, global partners and industry.

To further the likely success and impact of these initiatives, the European Commission has organized a progressive series of consultations with scientists and representatives of the European research community, both online and in physical workshops, to enable brainstorming and feedback on scientific topics and general issues of implementation. The aim is both to be as open as possible to all proposed ideas and to encourage a process that will help refine these ideas into specific Flagship proposals. A number of preliminary Flagship ideas have been developed and submitted through online consultations, and on 22 January, 2010, the European Commission had held a first workshop to encourage high-level networking and information sharing among scientists working toward proposals.



Participants at the Forum plenary

The Science and Policy Forum on FET Flagships on 9-10 June had a number of specific aims:

- To reflect on the concept and features of FET Flagships;
- To further discuss the consolidated FET Flagship ideas with scientific stakeholders and representatives of national funding agencies;
- To solicit feedback from policy makers, national funding agencies and the Science Forum Coordination Group;
- To stimulate further networking
- To share the preliminary conclusions of the FET Flagships study on the success factors of previous Flagship-like initiatives;
- To elaborate on clustering, alignment and merging of ideas, where appropriate;
- To disseminate information on the forthcoming Call for Preparatory Actions on FET Flagships, expected to be launched late July 2010.

Participants included high-level representatives of the Commission, National ICT Directors or their representatives, delegates from national funding agencies, high-level researchers and ISTAG FET members. Also present were members of the FET Flagship Coordination Group.

In interactions between scientists, the European Commission and the Member States, significant progress was made since the last meeting in defining the Flagship scheme and how it should be implemented. This two-day meeting included presentations of scientific and technological ideas involved in candidate Flagships, panel discussions and open discussions on key topics. An important aim of the workshop was to further define and communicate to scientists the process by which the scientific community, in interaction with the European Commission and other experts, will identify the best Flagship ideas. This report therefore focuses in Section 2 on the key issues and recommendations concerning the process that emerged from the discussions, and summarizes the ideas presented on science and technology in Section 3. Section 4 offers conclusions, while appendices include the agenda and other materials presented at the meeting.

2. Issues Raised and Recommendations

The diverse activities of the workshop led naturally to some key issues being discussed many times from different angles. The following pages give a summary of the points that stood out most prominently, either because they were raised so frequently or because they were expressed with particular clarity and stimulated significant discussion.

The view from the Cabinet of Commission Vice-President Neelie Kroes (Constantijn Van Oranje-Nassau):

The Forum was opened by *Constantijn Van Oranje-Nassau* who highlighted the way that the FET Flagship Initiatives fit into the high-level strategy of the EC, targeting the goal-driven coordination of European research policies as foreseen in the EU2020 and Digital Agenda communications. The joining of efforts at European scale and over a long-term period will greatly enhance the visibility of foundational research, and will open broad avenues for international cooperation with non-European nations. To make this bold initiative successful, stakeholders now need to work together to identify the unifying challenges to be pursued, to devise how to manage them most effectively, and how to assure continuity with existing programmes. These answers are not yet all known, as this is an untested scheme - the questions will need due attention from all concerned.

The view from the European Commission Research Directorate-General, Industrial Technologies Directorate (H. Von Bose):

Mr. Von Bose pointed out that research and innovation have perhaps never been so high on the political agenda, and the 2020 document emphasizes the achievement of social goals through research and the application of technology (e.g. smart devices for sustainable growth, etc.). But it is important to recognize that policy makers want outcomes such as solutions to social problems (ageing populations, etc.) and not merely the accumulation of scientific knowledge or technical capability. In this regard, ICT does not stand alone, but as one of many technologies that must converge to meet common goals. Realising a vision such as the "green car" for example, will require a guiding vision and breakthroughs in areas such as battery technology, means of energy distribution, new ideas for recycling and so on. In the view of Mr. Von Bose, the FET Flagships can help further the convergence of such technologies by defining a common vision that will help to spur cooperation.

He also mentioned that industry will be motivated to participate by having a visible, well-defined objective that clearly demands an interdisciplinary effort. Europe will be taking a bold step towards being world leader in launching certain new ideas. Industry is very much behind this, and the potential impact is enormous.

The message from Patrizia Toia, Member of the European Parliament, Vice Chair of the Committee on Industry, Research and Energy (ITRE):

The European Union must become a true Innovation Union. Research that tests frontiers, applies breakthroughs, deepens scientific know-how, connects researchers and delivers outcomes is at the base of this process. Since the ambition of a FET Flagship is huge, it must rely on outstanding researchers and innovators, including world-wide partnerships. The European Union has largely recognized that the structure of society will undergo major changes towards 2020 and beyond. ICT-based technologies will be key in addressing these challenges, and they will play a leading role in bringing more value to the citizens and businesses. The scientific advances envisaged in the FET Flagships will provide Europe a real competitive edge and an advantageous position to set up and promote further strategic alliances in a global context.

She also pointed out the support of ITRE for inclusion of FET Flagship initiatives as possible instruments to implement the Digital Agenda for Europe.

National perspectives on FET Flagships:

Representatives from Member State Research Institutions (**Gonzalo Leon, Spain, and Robert Plana, France**) offered views on the FET Flagships. Both speakers agreed that to respond to global challenges, such large-scale cooperation in fundamental research is both necessary and timely. It can complement national capabilities, and the magnitude of action can multiply the impact of research carried out at national level. It is politically challenging to consolidate long-term European initiatives with short-term political demands within the Member States, therefore the Flagships should be crafted so that they will also further national interests such as science and technology education and training, boosting interdisciplinary research, building research infrastructures or consolidating links with international partners. Success in this regard will require flexible coordination with national programmes through the inclusion of national research initiatives, institutes and industries in the FET Flagship Initiatives themselves.

The Flagship Vision: views from the panel¹ and questions from the floor.

The FET Flagship initiatives should aim to do a number of things. Their activities should complement existing FET research programmes by having very high ambition, by demanding interdisciplinary cooperation that will help fight scientific fragmentation and by serving the public good. They should be exciting initiatives that also help to inspire the younger generation of researchers.

The overall aim is to stay in line with general FET goals, but to scale up the operation to a new level. Doing this successfully will require meeting (at least) four specific challenges: i) mobilizing the research community around long-term, visionary goals, ii) including the participation of researchers well beyond ICT, iii) combining the initiatives effectively with the aims and expertise of Member States, and iv) reaching out to international partners.

The FET Flagships should naturally attract excellent scientists. To achieve the ambitious goals set, researchers will need long-term support and consistent focus of their efforts.

It is crucial also to begin the initiatives with a well-planned pilot phase, to gather encouraging feedback, and to adjust the programme design to reflect the characteristic needs of the scheme and of the particular objectives.

Participants also voiced important questions about the initiatives. First, how can these expensive initiatives be justified to the European people who are currently suffering hard economic times? It is broadly accepted that we need knowledge to achieve sustainable growth, and that our current troubles stem, at least in part from a lack of knowledge of economic and financial systems. FET Flagships can bring a message with a strong vision in a time of crisis, and better science can also help us understand what happened to us.

A second question addressed the mechanisms for FET Flagships review and monitoring: How will the progress of these initiatives be assessed? Do current practices and funding schemes of FET scale up? It is well-known (in the context of aid for economic development, for example) that those behind bold and expensive initiatives may find it embarrassing or politically difficult to admit failure, which represents a double failure in that the opportunity for learning what went wrong, or what doesn't work, is lost. To avoid this, the FET Flagships must have mechanisms for delivering sanctions or taking a negative view if progress is poor.

FET Flagships Science Forum and its Coordination Group:

The FET Flagships Science Forum is an open group of scientists working toward identifying and refining ideas for Flagship initiatives.

In July 2010, the European Commission will issue a Call for 5-6 pilot projects lasting 12 months with the aim of exploring and developing specific Flagship ideas. To improve the process of forming these ideas, the Coordination Group of the Science Forum is a team of 9 high-level experts which aims to give neutral guidance and advice to both the European Commission and scientists, not favouring any one set of ideas, but working to help all ideas find their best organization and expression. The members of the Coordination Group are listed in annex of this report.

¹ See panel composition in agenda: http://cordis.europa.eu/fp7/ict/fet-proactive/flagship-ws-june10_en.html#agenda - 9th June from 12:05 to 13:00

Stefan Michalowski acted as spokesperson for the Coordination Group and offered their initial reflections, highlighting several points on which they felt proposals should focus as they begin to take more definite form.

1. On the way the objectives are stated and the deliverables identified. Proposals should work hard to be very clear in spelling out the specific capabilities that will be produced by the initiative. What will they achieve and how will we recognise success or failure? The proposals should also explore and consider how their plans may change with time.
2. Methodology. The proposals should strive to describe in clear terms the assumptions behind the work they envision and also to identify likely obstacles and the means for overcoming them. Proposals should, in other words, not only express goals but plans for achieving them. For example, proposals centring on computational systems should make clear how much work will be based on powerful simulations and number crunching alone, and how much will likely come from new insights into social and economic phenomena.
3. Proposals aiming to offer input to policy makers should make it clear how they will do this in practice. Given the nature of complex systems and our understanding of them, the insights likely to emerge from today's science aren't of the type most useful to policy makers. Proposals intended to be policy relevant should spell out clearly how they will provide policy makers with practically useful information.
4. Governance. Proposals should address the question of how will these initiatives will be managed so as to keep track of resources. Another question is how they will be reviewed.
5. Should also explore ways to combine the best ideas with those of other proposals.

Other points emerging out of the ensuing open discussion:

In forming the FET Flagships, scientific considerations should come first and political considerations second. However, it would be good if the proposals identify any links made to national funding bodies and contacts made. In the pilot phase these could then be furthered. No flagship can start from scratch; instead they should build on existing background and excellence.

All initiatives should consider a general point that it may be difficult to convince many people that more technology will help us solve problems, when many think it is technology that has caused them. This point should be addressed.

Regarding administration of the initiative, should scientists consider some kind of cap on administration costs, as with other FET projects?

The Flagships should not be too big, just as big as is needed. There is no reason every FET Flagship has to reach the 100M level; there can be variation. Each flagship has to be judged on its own and they may have different levels of ambition. The EC may get around 10-12 FET Flagship Preparatory Action proposals (pilots) and would likely fund 5-6 of these.

What happens to the Flagships after 10 years? To make the activities sustainable, several ideas were suggested. For example, the German initiative on computational neuroscience set up centres, but other groups were free to apply to take up projects related to the theme. This helped sustainability. Also, these centres were forced to hire professors. The Flagships could include efforts directed at education and training that would help establish momentum.

The "FET Flagship" concept offers a nice metaphor, but is only a metaphor and we should not be locked into it if some of its associated meaning doesn't fit the scheme. The French scheme for visionary projects follows a different metaphor: they see them as "North Star" initiatives that are so ambitious they probably cannot be achieved, but efforts directed toward them will nevertheless generate many benefits along the way. The initiatives should be breathtaking and beautiful in the scientific sense. Something that everyone wants to see achieved and that is useful and very difficult. A collection of ideas or research areas is not likely to be so compelling.

Some national research plans have already been finalized for several years. Does this mean that FET Flagships involving ideas not represented in such national plans will be penalised (for lacking support at the national level)? What kinds of mechanisms are in place, or might be created, to help people who do not have political clout in their Member States? These issues can at least partly be addressed through the horizontal coordination action that could result from the Preparatory Action call.

Lessons learnt from history:

In the FET Flagships study commissioned by the EC, EUTEMA and the Austrian Research Promotion Agency (FFG) have worked with AAAS (American Association for the Advancement of Science) to identify 60 past EU and international research initiatives that were Flagship-like in their ambition. Of these, 6 were selected for close study, looking to identify factors linked to success or failure. Initiatives included the Human Genome Project, the Large Hadron Collider, assembling the tree of Life, etc. All were extremely ambitious, highly-focused and yet had plausible goals. The analysis of previous flagship-like initiatives and their success factors is available at the FET Flagships website.

The success factors identified would require initiatives to consider the following:

- Engage the research community in shaping the program to achieve a sense of shared ownership and identity.
- Clearly define the unifying goal. Evaluate progress periodically.
- Short-term individual research agendas must be aligned towards the overall long-term goal in a flexible way.
- The structure of the initiative must reflect the needs and characteristics of both the Flagship goal and of the participating entities.
- An environment conducive to integration is indispensable for efficient collaboration.
- Implement data management plan prior to data acquisition.
- Strong leadership is fundamental.
- The formulation of an explicit initial hypothesis is not always necessary in large-scale initiatives that are productive and successful.

Further points identified in consultations with experts indicated that the initiatives should:

- Have a “mission” character,
- Focus on science first, with other (social and economic) impacts to follow,
- Avoid focussing on "breakthroughs", which cannot be planned,
- Give adequate space to single researchers and small groups,
- Allow room for creative thinking,
- And focus on areas of true European excellence.

Management should focus on the main challenge, which is initiative integration, and the core of the initiative should act in a manner akin to a funding body.

From these and other points, the study research team suggested a set of broad recommendations to be considered as FET Flagship proposals move forward. These included:

- Flagships should clearly be science-driven with inherent risks, but the “mission achieving” character of flagships is also key.
- The scientific mission should be complex, comprehensive and broad, but it must be clear when it is fulfilled and should be easy to communicate.
- Goals are important for alignment, interdisciplinary integration, and for agencies, politicians and a broad public.
- Flagships are focused, long-term initiatives, but create impact, new technologies, and evaluations along the way.
- Flagships will benefit from strong scientific leadership. Leaders act as the glue binding people and projects together; they have to be identified early.
- Consider efforts and infrastructure to integrate data between various research groups.

Next actions:

The next step of the FET Flagships process is the July launch of a Call for Flagship Pilot preparatory actions implemented through Coordination and Support Actions (CSAs) and expected to last 12 months. The evaluation will judge proposals by the ordinary criteria of the CA or SA funding instruments. These projects should address the technical feasibility, design and description of a Flagship Initiative, and must also meet a number of subsidiary demands including offering a clear description of an operational framework, outlining financial feasibility and demonstrating commitment from stakeholders.

In addition to these CSAs, the call will also seek proposals for a second category of CSAs that should focus exclusively on handling horizontal issues (i.e. issues common to all Flagships).

Final general thoughts on the Flagship proposals, as they currently stand, is that most of them are not sufficiently ambitious, and their goal is often too obscure. They should target a scale and scope that could not be implemented in the present ICT FP structure, but will necessitate collaborations across different EU themes and national research programmes. Thus people need to think in bigger terms and define a very clear, tangible output.

The process will go through several stages between now and 2 December 2010 (expected deadline for the CSA proposals). The Commission requests 5-page draft pilot descriptions by 15 September 2010 to take stock of the latest developments of the candidate Flagship proposals, and to facilitate preliminary discussions with the Science Forum Coordination Group and the Member States.

On 30 September 2010 there will be a FET Proactive information day on Pilot Flagships and other FET actions. Following this info day, there will be a possibility for pre-proposal feedback until about four weeks before the call deadline.

For the 2 December deadline for Flagship Pilot proposals, the EC expects the proposals to state if participants have been in contact with relevant national groups; have letters of intent, etc. The implementation phase of the selected pilot projects should then go much further, and will have to build mechanisms to make effective contacts with potential centres of support. The horizontal CSA might help with this.

All information on the FET Flagships study, the draft pilot descriptions, the CSA call, and everything else can be found at:

<http://cordis.europa.eu/fp7/ict/programme/fet/flagship>

3. Flagship Presentations: Science and Technology

The meeting offered ample opportunity for researchers from very different areas of science and technology to interact and exchange ideas. This networking activity was intense, and clearly boosted several nascent alliances. There was a perception that the initial steps of the FET Flagships setup process have already had a disruptive effect on the European scientific community in a very positive manner. A large number of new ideas have already been exchanged, and as a consequence many leading scientific groups in Europe appear now to be open for new ideas and are actively seeking new partners in related areas. Some areas could likely not represent a FET Flagship alone, and there is now a greater understanding by principal investigators, as well as a willingness to discuss new ideas, approaches and collaborations.

The networking activities also presented, however, the difficulty of integrating ideas from different disciplines in a complementary manner. To achieve this it will require a truly overarching scientific objective with a tangible outcome.

A number of scientists gave presentations during the two days, detailing preliminary Flagship ideas, or other areas of modern science and technology which they viewed as being ripe for being part of a larger Flagship initiative. The full presentations offered on the first (and second) days can be found in http://cordis.europa.eu/fp7/ict/fet-proactive/flagship-ws-june10_en.html. Some of them are:

ICT Beyond Limits (Peter Zoller): Inspired by the looming limits on current ICT trends toward increasing speed and miniaturization, this initiative would aim at a massive furthering of ICT technologies by harnessing new physics at the atomic and quantum scales and by learning to build such components into future ICT technologies.

Robot Companions for Citizens (Paolo Dario): Today's robots in industry, medicine and space exploration have several limitations, especially high energy use and a lack of adaptability. The challenge is to make bio-inspired robots able to interact with people and to contribute to new developments in ICT.

The Future ITC Knowledge Accelerator (Dirk Helbing): Inspired by the immense power of modern ICT technology both for performing computational simulations of complex systems, and for gathering and processing enormous amounts of real-world data, this initiative aims to revolutionize our ability to understand and manage social systems so as to avoid financial and economic crises, manage our ecosystems and build a sustainable future on the basis of sound knowledge.

Simulating the Human Brain (Henry Markram): The challenge is to build realistic large scale simulations of the operation of the mammalian brain, both in health and in disease, across all species and ages.

Computing with Evolution (Marc Schoenauer): The full richness and potential for evolutionary dynamics in computing have yet to be explored. This initiative aims to bring together biologists, computer scientists, mathematicians and other experts to forge breakthroughs in this area which may change our view of computation fundamentally.

The Social Computer (Fausto Guinchiglia): The social computer is a future computational system that harnesses the problem solving, action and information gathering powers of humans and the environments in which they live to tackle large-scale social problems beyond current capabilities.

Virtual Physiological Human (Marco Viceconti): The Virtual Physiological Human would be an ICT framework that will enable deep investigation of the human body by building integrated computer models of the mechanical, physical and biochemical functions of a living human body.

Brain-Inspired Hardware (Karlheinz Meier): The vision of this proposal is to build new computing devices using hardware inspired by that of the human brain. Such devices, capable of 10^{15} – 10^{18} operations per second, possessing fault tolerance and consuming very little power, would be powerful new tools for neuroscience, and new nano-scale computing technologies.

World Society Modeller (John Sutcliffe-Braithwaite): To use computational techniques of many kinds to model society and our world.

Further contributions were presented in the second day during three parallel sessions. The topics of the talks are listed in the agenda and slides are available at the website indicated above.

4. Conclusions

The FET Flagships should be visionary European ICT research initiatives lasting at least 10 years and aiming to achieve ambitious goals in science and technology that will serve as a strong basis for future innovation and socio-economic benefit; policy makers want tangible outcomes, leading to solutions of social problems (ageing populations, etc.), and not merely the accumulation of scientific knowledge or technical capability. In forming the FET Flagships, scientific considerations should be first and political second. However, it would be good if the proposals identify any links and contacts made to national funding bodies.

Success of these initiatives will require the joining of different scientific disciplines and the close integration of research programmes at the European and national levels. They must also further partnerships with non-European nations such as the U.S. and Japan.

The overall consensus of the meeting was that the ideas now being developed are currently not in general sufficiently ambitious, and require considerable further elaboration. Among other points, the Coordination Group reflected that high quality proposals must ultimately spell out clearly what specific capabilities they will produce, and need to do a better job of describing not just goals, but plans for achieving them. Proposals will also need to communicate better the benefits of their proposal towards decision makers.

Scientists shaping proposals should also consider the success factors evident from a study of earlier Flagship-like initiatives. Those that were successful had strong individual leadership, were focussed on a clear "mission," and had their programme shaped through wide consultation with the community. The initiatives should also focus on areas of clear European excellence, and foster an environment conducive to integration and cooperation.

The next step of the process is the Call for proposals in July. The EC will launch a call for preparatory actions (Coordination and Support Actions (CSAs) in July which are expected to last 12 months. These projects should aim to "assess the technical feasibility, design and description" of a FET Flagship Initiative, and must also meet a number of subsidiary demands including offering a clear description of an operational framework and demonstrating commitment from stakeholders.

The Commission representatives warmly thanked and greatly appreciated the enthusiasm, the constructive criticism and the excellent contributions made by all speakers, in particular the opening speakers, experts from the Coordination Group, and the representatives of the National ICT Directors.

Appendices

Members of the FET Flagships Science Forum Coordination Group

Agenda

List of participants

The S&T Contributions are available online at:

http://cordis.europa.eu/fp7/ict/fet-proactive/flagship-ws-june10_en.html

Members of the FET Flagships Science Forum Coordination Group

Alain	Berthoz	FR	Professor Collège de France, Scientific Board of CNRS
Chris	Hankin	UK	Imperial College London, Director of the Institute for Security Science and Technology, Professor of computation science, ISTAG member
Carl-Henrik	Heldin	SE	Director and Professor in Molecular Cell Biology, Ludwig Institute for Cancer Research and of Univ Uppsala. Member of the Scientific Council of the ERC
Thomas	Lengauer	DE	Computational Biology and Applied Algorithmics, Max-Planck-Institut für Informatik
Iain	Mattaj	UK	European Molecular Biology Laboratory, Director General
Stefan	Michalowski	US	OECD Global Science Forum, Executive Secretary
Erkki	Oja	FI	Professor of Computer Science and Engineering at Aalto University, Chairman of the Research Council for Natural Sciences and Engineering of the Academy of Finland.
Mario	Rasetti	IT	Professor Politecnico de Torino and President of the Insitute for Scientific Interexchange
Gregori	Vazquez	ES	Full Professor at the Department of Signal Theory and Communications, Technical University of Catalonia (UPC), Barcelona. ICTC

DRAFT AGENDA
"SCIENCE & POLICY FORUM on
FET Flagships' Workshop Brussels, 9 - 10 June 2010
Centre Albert Borschette, Brussels

WEDNESDAY 9th June 2010, Room AB-0A

09:00 - 09:30 Registration

SESSION 1: FET FLAGSHIPS AND THEIR RESEARCH POLICY DIMENSION

Chair: *Mario Campolargo*, Director Emerging Technologies and Infrastructures, DG INFSO

09:30 - 10:00 Opening session: *Constantijn Van Oranje-Nassau*, Cabinet Kroes;
Herbert von Bose, Director Industrial Technologies, DG RTD;
Patrizia Toia, MEP, Vice-Chair of ITRE.

10:00 - 11:15 **Science Forum presentations (I)**
- ICT beyond limits, *Peter Zoller*
- Robot companions for citizens, *Paolo Dario*
- The Future ICT knowledge Accelerator, *Dirk Helbing*
- Simulating the Human Brain, *Henry Markram*

11:15 - 11:45 Coffee break

11:45 - 12:05 FET Flagships – opportunities from a national perspective
Gonzalo Leon, ES
Robert Plana, FR

12:05- 13:00 Panel discussion: How FET Flagships will impact on European Science, the
ERA and the European Digital Agenda?
Panellists: *Constantijn Van Oranje-Nassau*; *Herbert von Bose*; *Patrizia Toia*,
Gonzalo Leon; *Robert Plana*; *Paolo Dario*; *Khalil Rouhana*, Head of Unit
Strategy for ICT Research and Innovation, DG INFSO.

13:00- 14:30 Lunch

SESSION 2: FET FLAGSHIPS AND FEEDBACK FROM THE COORDINATION GROUP

Chair: *Wolfgang Boch*, Head of Unit FET Proactive, DG INFSO

14:30- 14:45 The FET Flagships Science Forum and its Coordination Group
Wolfgang Boch

14:45 – 15:00 Feedback from the Coordination Group

15:00 – 16:30 **Science Forum presentations (II)**
- Using Evolution to compute, *Marc Schoenauer*
- The Social Computer, *Fausto Giunchiglia*
- Virtual Physiological Human Infostructure, *Marco Viceconti*
- Brain-inspired hardware architectures, *Karlheinz Meier*

- World Society Modeller (S-GAIA), *John Sutcliffe-Braithwaite*

16:30 – 17:15 Open Discussion moderated by *Coordination Group*

17:15- 17:30 Agenda for Day 2 and close

THURSDAY 10th June 2010

09:00 - 09:30 Registration

SESSION 3: FET FLAGSHIPS: FROM IDEAS TO ACTIONS

Room AB-0A

Chair: *Wolfgang Boch*

09:30 - 09:45 The FET Flagships study: Lessons learnt, success factors from previous similar initiatives and conclusions from validation workshop
Jürgen Rattenberger, FFG

09:45 – 10:00 Call for Preparatory Actions
José-Luis Fernández-Villacañas Martín, FET, DG INFSO

10:00 – 12:15 **Science Forum presentations (III) with Q&A**
Parallel Session 1: **Biological-Material ICT confluence**
Room AB-0A
Parallel Session 2: **New Paradigms for Computing and Engineering**
Room AB-0B
Parallel Session 3: **Complex Socio-Techno Systems**
Room AB-OC

PARALLEL SESSION 1: Biological-Material ICT confluence

Moderated by: *Pekka Karp; Cecile Huet, EC*
Rapporteur: *Mario Rasetti, Coordination Group*

Online Submission presentations:

- The Bionic Man: Towards Augmented Humanity, *Gusz Eiben*
- Living Technology: Exploiting Life's principles for ICT, *Steen Rasmussen*
- Model guided medicine, *Heinz Lemke*

Additional presentations:

- Uncovering the Human cell lineage three in health and disease, *Ehud Saphiro*
- Understanding the human brain requires monkey studies, *Guy Orban*
- Disruptive technologies for interfacing with the brain, *Herc Neves*
- The uni-interface: Principles of conscious information processing, *Maxim Stamenov*
- Unlocking 21st century medicine by knowledge transformation, *Anthony J. Brookes*

- Of Men and Robots: Embodying Intelligence in Manufacts, Antonio Bicchi
- Awake-matrix redone, *Andrea Gaglioli*
- From Nanolab to reality, *Jari Kinaret*
- Silkbio-optronics, *Roberto Zamboni*
- 3D Silicon Nanowire Architectures for Neuro-Morphic Computing, *Y. Leblebici*
- Ubiquitous powering: energy aware Nanoelectronic Companions, *Mihai Ionescu*

PARALLEL SESSION 2: New Paradigms for Computing and Engineering

Moderated by: *Marton Haraszti; Wide Hogenhout*, EC
 Rapporteur: *Chris Hankin*, Coordination Group

Online Submission presentations:

- Simplicity in ICT, *Tiziana Margaria*
- Integral Biomathics: a new era of Biological computation, *Plamen Simeonov*
- Transforming modelling and Simulation for European Growth, *Mark Parsons*
- Towards a theory of the evolution of the web, *Guus Schreiber*
- Internet Science, *Georg Carle*
- Live Internet, *Ferran Cabrer I Vilagut*

Additional presentations:

- The 3.0 revolution, *Michaela Ulieru*
- Towards solidifying a Science of the Internet, *Iordanis Koutsopoulos*
- Live ecology, *Opher Etzion*
- Autonomic Network Computing Science, *D.R. Avresky*
- Aerial robots, *Yasmina Bestaoui*
- Rethinking Wireless Network Design, Management and Operation, *S. Stanczak*
- GPS-enhanced Bio-authentication for ubiquitous applications, *Sabah Jassim*
- ICT Driven Social Dynamics, *J. Holyst*
- ICT Changing the Global Village: Individual Life Footprint, *A. Ferreira*

PARALLEL SESSION 3: Complex Socio-Techno Systems

Moderated by *J.L. Fernandez-Villacañas; Jean-Marie Auger*, EC
 Rapporteur: *Stefan Michalowski*, Coordination Group

Online Submission presentations:

- Ubiquitous Complex Event Processing, *Rainer Von Ammon*
- Computational Socio-Geonomics, *John Sutcliffe-Braithwaite*
- Transforming Production for the 21st century, *Stuart Anderson*

- Transforming medical education with immersive Virtual clinical environments,
T. Poulton
- NGN & NGN: New generation network for new governance network,
Sylvie Occelli

Additional presentations:

- Modelling complex economic and social systems with supercomputers,
M. Holcombe
- Fundamentals of Evolutionary Social Behaviours, *Xiaoming Fu*
- Computational Sustainability, *Barry O'Sullivan*
- Augmented Communications for scale free Collaboration in Very Large Communities, *Fabrizio Davide*
- Visual Analytics, *Jorn Kohlhammer*
- Emerging Intelligence, *Geir Horn*
- Distributed Digital Labour, *Otto Chrons*

12:15 – 12:30	Coffee break and initial informal networking
12:30- 13:30	Networking in smaller groups - Parallel session 1 – Room AB-0A Networking in smaller groups - Parallel session 2 – Room AB-0B Networking in smaller groups - Parallel session 3 – Room AB-0C
13:30 - 14:45	Lunch

SESSION 4: FET FLAGSHIPS: LESSONS LEARNT AND THE WAY FORWARD

Room AB-0A

Chair: *José-Luis Fernández-Villacañas Martín*

14:45 – 15:30	Reporting back from the parallel sessions – lessons learnt, <i>Coordination Group</i>
15:30 - 16:30	Panel: Practical implementation issues, <i>Coordination Group and EC</i>
16:30 - 16:45	Next steps, <i>Wolfgang Boch</i>
16:45 – 17:00	Concluding remarks, <i>Zoran Stančić</i> , Deputy Director General, DG INFSO

All background and practical info about the workshop at:
http://cordis.europa.eu/fp7/ict/fet-proactive/flagship-ws-june10_en.html

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