

# Design, Test and Manufacturing Technologies for Integrated Micro/Nanosystems

## FP7 SME Support Initiatives (ICT and Capacities)

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European Commission



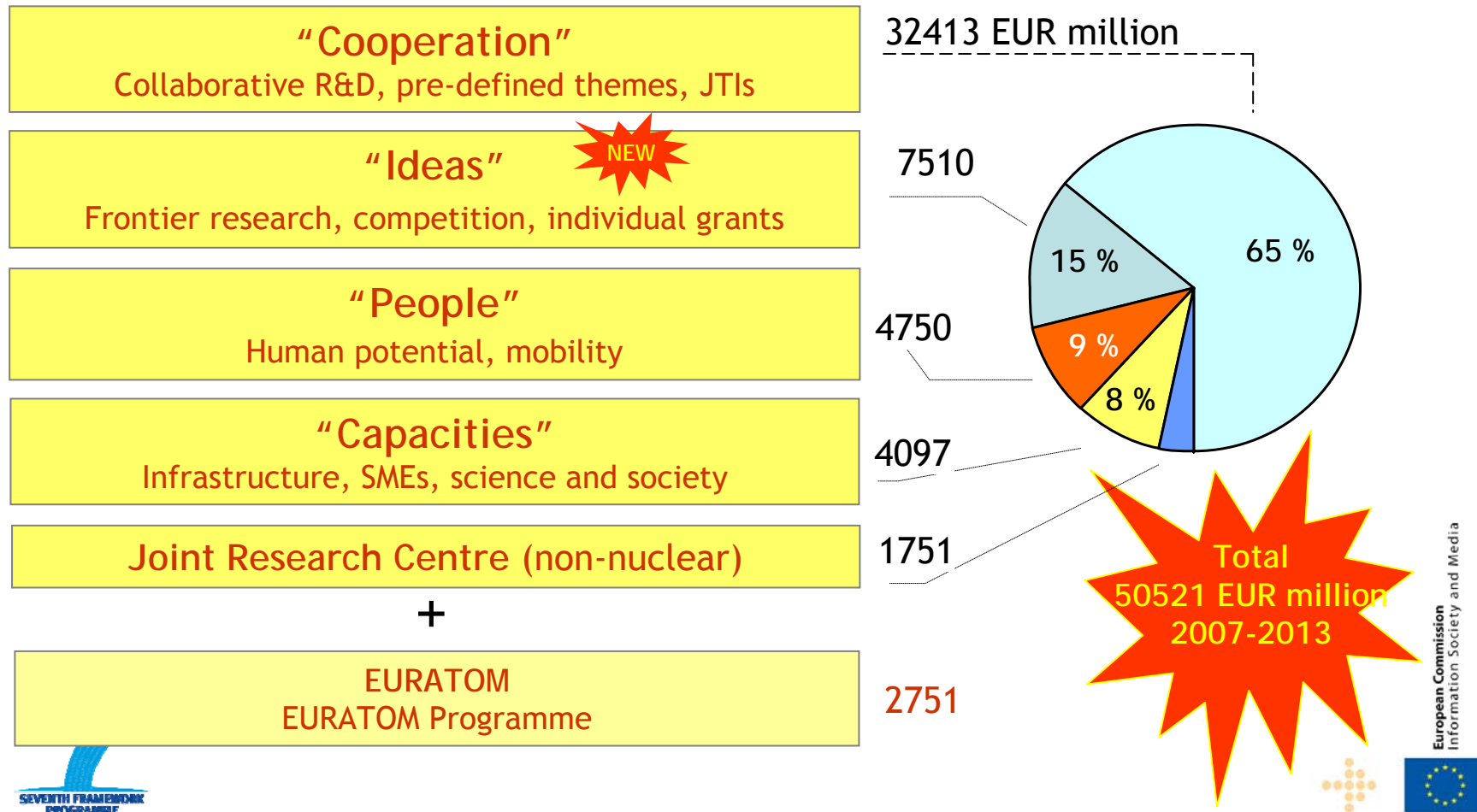
European Commission  
Information Society and Media

# Presentation outline

- FP7 and SMEs in the 7th Framework Programme (2007-2013)
- ICT Work Programme 2007-08
- ICT Call 2 Objective 3.6 Micro/Nanosystems
- RTD NMP Calls
- ICT PSP Call - SMEs benefiting from ICT-driven innovation
- European Technology Platforms



# FP7 Specific Programmes budget agreement (Nov 2006)



# FP7 Cooperation: Themes

*Budget [EUR million],  
Council's compromise, Nov 2006*

1.	Health	6100
2.	Food, Agriculture & Biotechnology	1935
3.	Information & Communication Technologies	9050
4.	Nanosciences, Nanotechnologies, Materials & new Production Technologies	3475
5.	Energy	2350
6.	Environment (including Climate Change)	1890
7.	Transport (including Aeronautics)	4160
8.	Socio-Economic Sciences & the Humanities	623
9.	Space	1430
10.	Security	1400

*32413*

... including

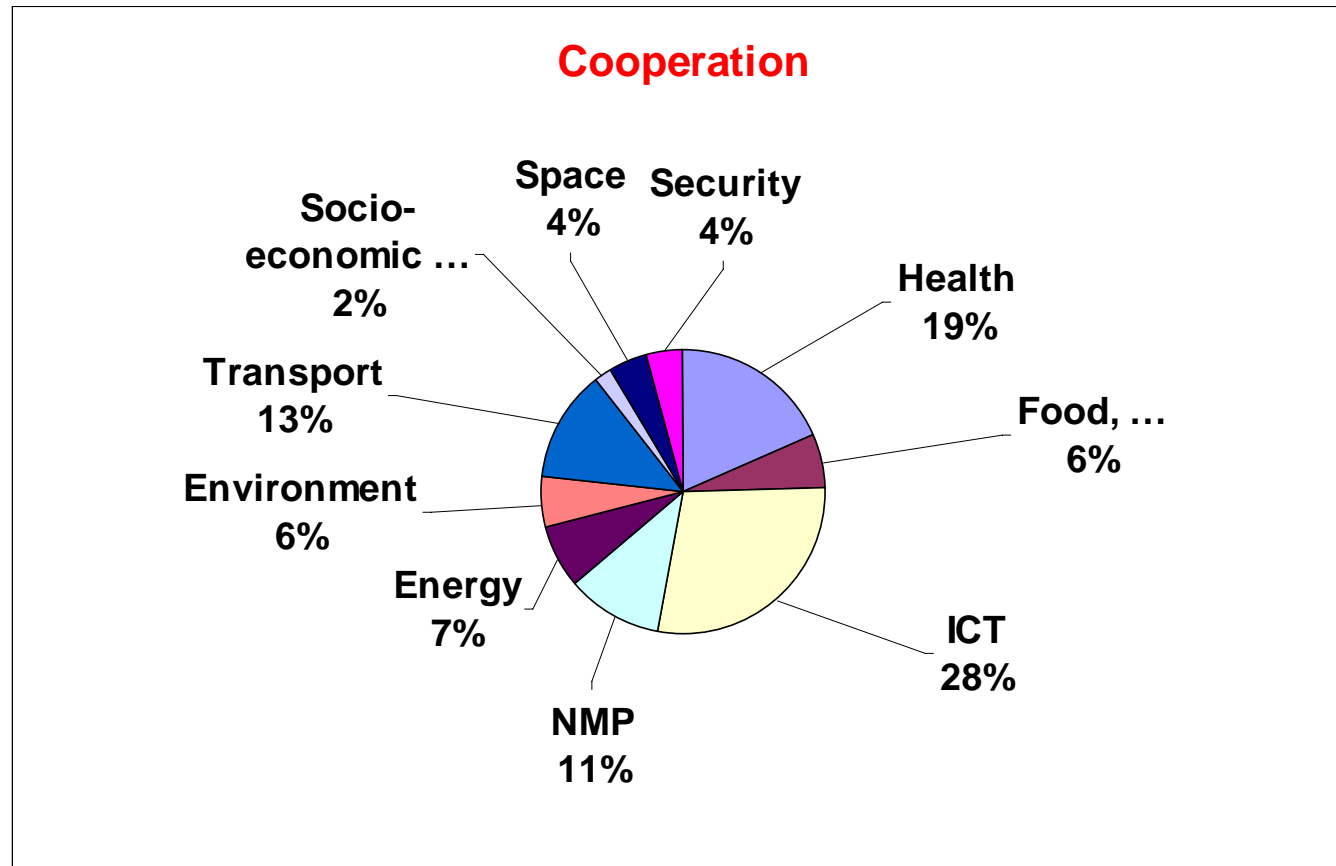
*Joint Technology Initiatives*

*ERA-Nets*

*International Co-operation*



# FP7 Cooperation: Themes



## SMEs in FP7

SMEs are at the core of European industry and key players in the innovation system.

SMEs have to respond increasingly to a strong competition in the internal market and globally.

- Need to increase their knowledge base and their research efforts in transnational cooperations.
- Actions at EU level are necessary to complement and enhance the impact of actions taken at national and regional level.

# SMEs in FP7

## Main initiatives

<b>Complementary pillars of SME support in FP7</b>		
<b>Optimized participation of SMEs</b>	<b>Dedicated scheme with special emphasis on SMEs</b>	<b>Budget increase for the SME specific measures</b>
<b>"Cooperation"</b>  Research performing SMEs  Thematic areas	<b>"People"</b>  Research performing SMEs  Industry-academia pathways	<b>"Capacities"</b>  SMEs outsourcing research  Bottom-up approach

## Budget allocation to SMEs in FP6 and FP7

€million	FP6	FP7	FP6 annual average	FP7 annual average	Increase annual average
SME specific measures	473	1.336	118	191	61%
SME participation (15% target)	1.865	4.862	466	695	49%
<b>Total</b>	<b>2.338</b>	<b>6.198</b>	<b>585</b>	<b>885</b>	<b>51%</b>

# SMEs in FP7 “Cooperation”

- **Dedicated SME strategy** under each Theme
- **Identification of areas of particular interest** to SMEs in the individual work programmes
- **15% target** for SME participation
- **Greater flexibility** in choosing the appropriate funding scheme
- **Simplified financial and administrative procedures** (e.g. 75% funding rate for SMEs, no bank guarantees)

# SMEs in FP7 “People”

## **Industry-academia partnerships and pathways**

support cooperation between academia and industry encourage SME participation through

- Staff secondments between academia and industry
- Temporary hosting of experienced researchers from outside

# Research for the benefit of SMEs Capacities Work programme

## 1. Supporting SMEs outsourcing research activities

- Research for SMEs
- Research for SME associations

## 2. Developing and coordinating support to SMEs at national level

- Eurostars Article 169 Initiative
- ERA-NET
- Support to national and/or regional “exploratory awards”
- NCP-network

## 3. Support measures

- Coordination and Support Actions
- Studies

# Supporting SMEs outsourcing research activities - Target group

## Research for SMEs:

- Low to medium technology SMEs with little or no research capability
- Research intensive SMEs that need to outsource research to complement their core research capability

## Research for SME associations:

- SME associations representing their members and their common technical problems

➔ bottom-up approach, no thematic focussing

# Research for the benefit of SMEs Work programme

## 1. Supporting SMEs outsourcing research activities

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## 3. Support measures

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- Studies

### 3. Support measures: Coordination and Support Activities

- Support to dissemination and exploitation of research results and exchange of good practices by e.g.:
  - a) clustering of projects on common topics to improve interaction and joint dissemination and exploitation activities and
  - b) developing and implementing strategies aiming at a reinforced exploitation of results.
- Contributing to the identification of priority research topics for SME associations, especially by establishing a dialogue with European Technology Platforms (ETP).

# Research for the benefit of SMEs

## Call planning

### Research for SMEs Call 1

- Closure date: 4 September 2007
- Indicative budget: € 100 Million

### Research for SMEs Associations Call 1

- Closure date: 1 June 2007 (first stage)
- Indicative closure date second stage: November 2007
- Indicative budget: € 10 Million [€ 58 Million]

### Coordination and Support Activities Call 1

- Closure date: 10 May 2007
- Indicative budget: € 2 Million

## More information

### Research for the benefit of SMEs:

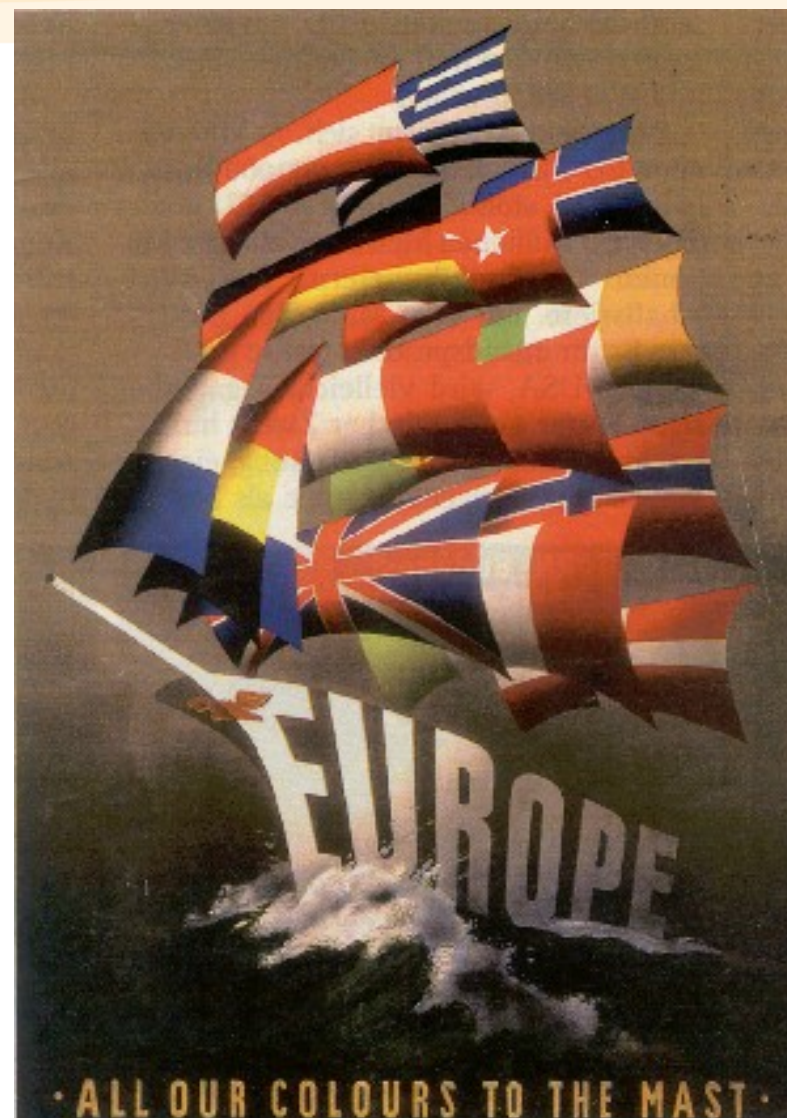
[http://cordis.europa.eu/fp7/capacities/research-sme\\_en.html](http://cordis.europa.eu/fp7/capacities/research-sme_en.html)

### CORDIS/SME TechWeb:

<http://ec.europa.eu/research/sme-techweb>

### National Contact Points

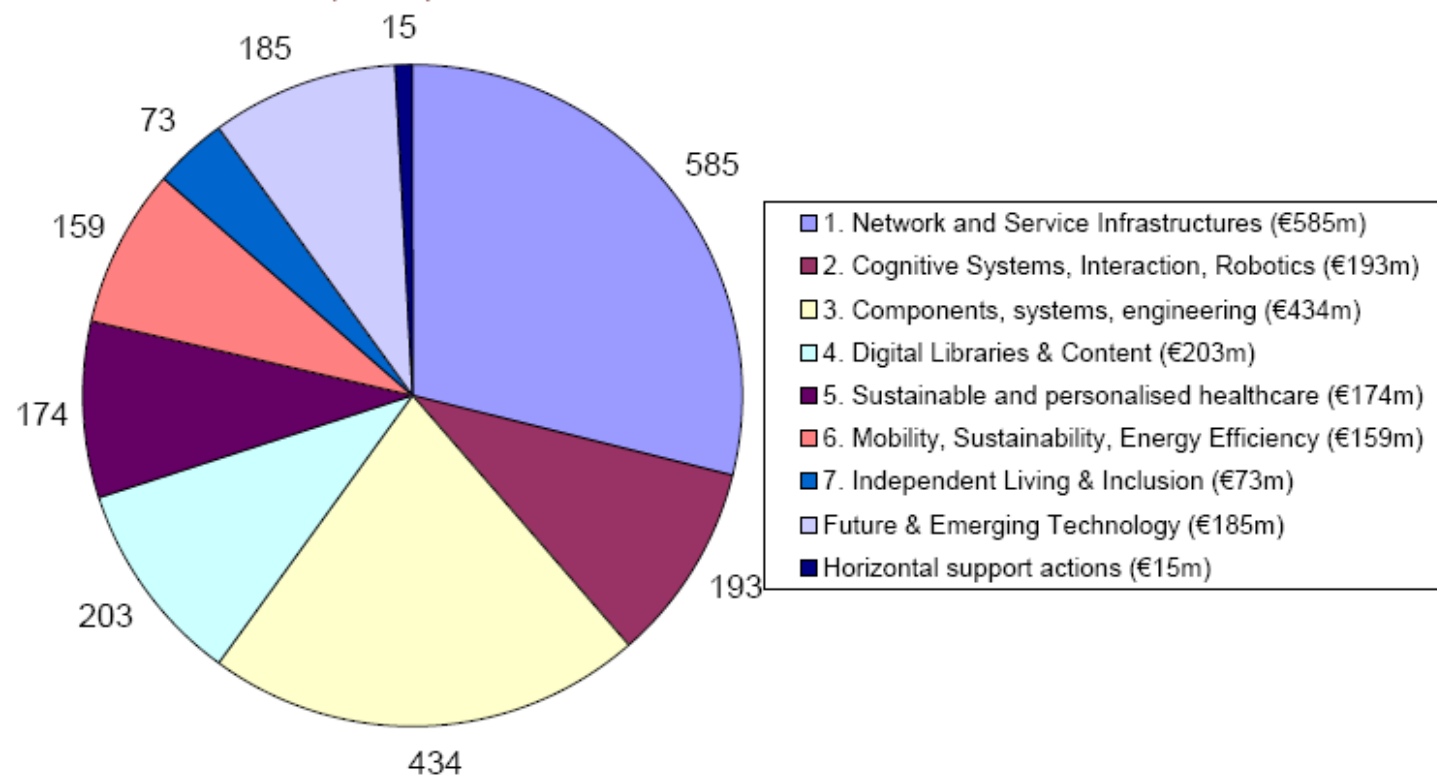
<http://cordis.europa.eu/fp6/ncp.htm>



# ICT Work Programme 2007-08: Budget breakdown

BUDGET BREAKDOWN, 2007-2008 (DRAFT)

(mid November, 2006)



The ICT Theme's budget for the first two years of FP7 will be just over €2 billion. The e-Infrastructures budget (not shown) is an additional ~€600m over the entire Framework Programme. All figures are draft, and are in millions of euros.

# ICT Policy Support Programme

Presentation outline

- Under Objective 4.1 b) of ICT Policy Support Programme :
  - SMEs benefiting from ICT-driven innovation in microelectronic components (including photonics), microsystems & embedded systems
- Why this action?
- Building on past experiences
- What is expected from a Thematic Network ?
  - Who?
  - What?
  - How?



# Objective 4.1 b) ICT Policy Support Programme

To improve the capacity of businesses (in particular SMEs) to benefit from ICT-based innovations in their products & services

In terms of

- User acceptance of innovative solutions, e.g.
  - through Living Labs, experience research centres, etc.
- Creating favourable environments for ICT-based innovation, e.g.
  - through a wide & fast uptake of innovative solutions involving microelectronic components, microsystems, embedded systems

**Thematic  
Networks**

# Why this action?

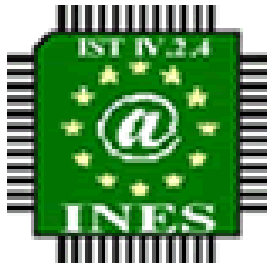
- Europe is a laggard when it comes to turning innovation into products
- This action will help develop ideas to support rapid & first use of innovative ICT:
  - Sharing best practices in enhancing end-user ICT uptake
  - Devising strategies to effectively disseminate & demonstrate innovative ICT solutions to end-users
  - Identifying suitable joint actions for the assessment of materials, processes, equipment, ...
  - Through targeted & efficient training measures
  - . . .

# Building on past experiences



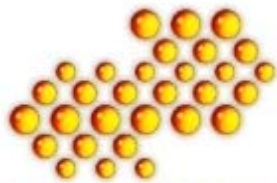
**FUSE: Support Action under Esprit to enable the first use of microelectronics technologies**

A funded “Application Experiment” & “Replication Exercise” as instruments. To help the companies a network of technology transfer nodes (TTNs) was installed



**EUROPRACTICE: To improve the competitiveness of Europe’s industry through advanced electronics**

Service-type projects in the microsystems & microelectronics fields



**EUTIST-AMI**

**SEA-NET: Semiconductor Equipment Assessment - Nano-Electronic Technologies**

- to improve co-operation between SME suppliers & users of microelectronics manufacturing equipment & materials (large companies)
- effective user-supplier relations with quick feed-back loops



# What is expected from a Thematic Network?

- To bring together relevant major stakeholders (e.g. multiplier organisations), expertise & facilities
  - To explore ways of efficient take up by European businesses of ICT-driven solutions in microelectronics components, microsystems & embedded systems
- Activities:
  - Identify areas of pilot actions in this field & prepare future partnerships
  - Build consensus on best practices, action plans, specifications & standards
  - Raise awareness: Outcomes to be adapted to local needs & conditions & widely disseminated
  - Funded up to 100 % - maximum funding: 400-500 kEUR

## For more information

### ICT PSP & DG Information Society and Media:

[http://ec.europa.eu/ict\\_psp/](http://ec.europa.eu/ict_psp/)

[http://ec.europa.eu/information\\_society/](http://ec.europa.eu/information_society/)

### See also: FP7 ICT on the web:

<http://cordis.europa.eu/fp7/ict>

[http://cordis.europa.eu/fp7/ict/programme/challenge3\\_en.html](http://cordis.europa.eu/fp7/ict/programme/challenge3_en.html)

### Contacts:

G1-Nanoelectronics: [gisele.roesems@ec.europa.eu](mailto:gisele.roesems@ec.europa.eu)

G2-Microsystems: [erastos.filos@ec.europa.eu](mailto:erastos.filos@ec.europa.eu)

G3-Embedded Systems: [merce.griera-i-fisa@ec.europa.eu](mailto:merce.griera-i-fisa@ec.europa.eu)

G5-Photonics: [christoph.helmrath@ec.europa.eu](mailto:christoph.helmrath@ec.europa.eu)



# Challenge 3: Components, Systems, Engineering

## Objectives

Call 1

- IST-2007.3.1: Next generation nanoelectronics components and electronics integration
- IST-2007.3.2: Organic and large area electronics and displays
- IST-2007.3.3: Embedded systems design
- IST-2007.3.4: Computing systems

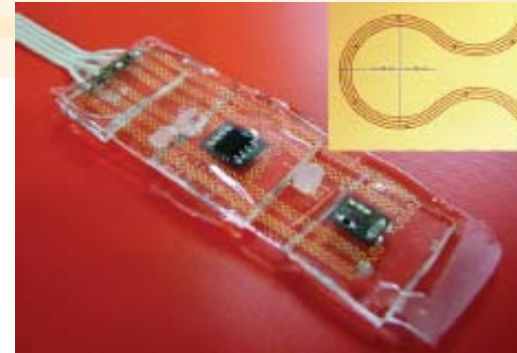
Call 2

- IST-2007.3.5: Photonic components and subsystems
- IST-2007.3.6: Micro/Nanosystems
- IST-2007.3.7: Networked embedded and control systems



## IST-2007.3.6: Micro/Nanosystems

- **Next generation smart systems**  
*Sensor- & actuator-based systems*  
*High density mass storage*
- **Micro/Nano-Bio-ICT convergence**  
*Biosensors, lab-on-a-chip, bioMEMS,*  
*autonomous implants*
- **Integration of smart materials**  
*Integration of micro-nano technologies and smart systems into new &*  
*traditional materials, e.g. textiles, glass, paper*
- **From smart systems to viable products**  
*Microsystems manufacturing technologies*
- **Smart systems for communications & data management**  
*Smart micro/nanosystems enabling wireless access & facilitating*  
*intelligent networking*
- **Support actions**  
*Technology access, education & training, coordination &*  
*dissemination at EU level*



Courtesy STELLA

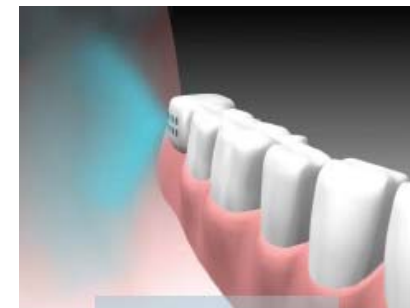


Image courtesy of project IntelliDrug  
Courtesy INTELLIDRUG

**Call 2      83 M€(\*)**

**75 M€ CP (min 20 M€ IPs and 32 M€ STREPs)**

**4 M€ NoE**

**4 M€ CSA**

(\*) Total amounts to be confirmed after a new financing decision for the 2008 budget

# Objective 3.6.a: Next Generation Smart Systems

## Main Challenges

1. Multi-disciplinarity  
*Mechanics, electronics, fluidics, biology, magnetism, Photonics*
2. Convergence  
*Micro/nano, ICT, bio*
3. Heterogeneity  
*Semiconductor, ceramic, glass, organic*
4. Multi-functionality  
*Sensing, processing, logic, memory, communication*
5. Integration  
*Monolithic, hybrid, multichip, large area*

*Complexity, performance, miniaturisation, autonomy, cost*

## Objective 3.3.6: Micro/Nanosystems

### Expected Impact

- Achieve substantial improvement on various aspects of smart systems integration: Higher product quality and reliability, increased miniaturisation, integration and functionality, lower costs, reduced power consumption, higher speed requirements and/or shorter time-to-market.
- Provide innovative micro/nanosystems concepts and deeply transform industrial production by adding intelligence to process control and the manufacturing shop floor, and by improving logistics and distribution - thereby increasing productivity.
- Contribute to increased market share for European companies across different industrial sectors by delivering systems with new functional capabilities and improved quality within a competitive timeframe.

# Funding for Nanotechnology R&D in FP7 Nanoscience



- More than 50 activities in the calls opened in 2007 are *directly* relevant
- Many more activities are indirectly relevant (e.g. in Health)
- 300-400M€ estimated in 2007
- Doubling of the FP6 funding expected over duration of FP7

<a href="#">NMP-2007-1.1-1</a> CP	Nano-scale mechanisms of bio/non-bio interactions
<a href="#">NMP-2007-1.1-2</a> CP	Self-assembling and self-organisation
<a href="#">NMP-2007-1.1-3</a> CSA	Support to ICPC researchers in nanotechnology and creation of a free and open electronic archive of nanosciences and nanotechnologies scientific and technical publications
<a href="#">NMP-2007-1.1-4</a> CSA	Development of methodology, collection and elaboration of scientific-technical and socio-economic data and studies on nanosciences and nanotechnologies, including risk assessment, and establishment of an observatory
<a href="#">NMP-2007-1.1-5</a> CSA (ERANET)	ERANET Plus in nanosciences

# Technology development



<a href="#"><u>NMP-2007-1.2-1</u></a> Large CP	Pilot lines to study, develop and up-scale nanotechnology-based processes from laboratory
<a href="#"><u>NMP-2007-1.2-2</u></a> SME-targeted CP	Equipment and methods for nanotechnology
<a href="#"><u>NMP-2007-1.2-4</u></a> CSA	Coordination in nanometrology
<a href="#"><u>NMP-2007-1.2-5</u></a> CSA	Examining capacity building in nanobiotechnology
<a href="#"><u>NMP-2007-3.4-1</u></a> SME-targeted CP	Rapid Manufacturing Concepts for Small Series Industrial Production
<a href="#"><u>NMP-2007-3.5-1</u></a> Large CP	Processes and Equipment for High Quality Industrial Production of 3-Dimensional Nanosurfaces
<a href="#"><u>NMP-2007-3.5-2</u></a> Large CP	Production Technologies and equipment for Micro-Manufacturing
<a href="#"><u>NMP-2007-4.0-2</u></a> SME-targeted CP	Application of new materials including bio-based fibres in high-added value textile products



# Impact assessment and societal issues



<p><u><a href="#">NMP-2007-1.3-1</a></u> Large CP</p>	<p>Specific, easy-to-use portable devices for measurement and analysis</p>
<p><u><a href="#">NMP-2007-1.3-2</a></u> CP</p>	<p>Risk assessment of engineered nanoparticles on health and the environment</p>
<p><u><a href="#">NMP-2007-1.3-3</a></u> CSA</p>	<p>Scientific review on the data and studies on the potential impact on health, safety and the environment of engineered nanoparticles</p>
<p><u><a href="#">NMP-2007-1.3-4</a></u> CSA</p>	<p>Creation of a critical and commented database on the health, safety and environmental impact of nanoparticles</p>
<p><u><a href="#">NMP-2007-1.3-5</a></u> CSA</p>	<p>Coordination in studying the environmental, safety and health impact of engineered nanoparticles and nanotechnology based materials and products</p>
<p><u><a href="#">HEALTH-2007-1.3-4</a></u> CP</p>	<p>Alternative testing strategies for the assessment of the toxicological profile of nanoparticles used in medical diagnostics</p>
<p><u><a href="#">SIS-2007-1.2.3.2-CT</a></u> CSA</p>	<p>Science in Society: Nanoscience and Nanotechnology</p>



# Nanomaterials



<a href="#">NMP-2007-2.1.1</a> Large CP	Nanostructured polymer-matrix composites
<a href="#">NMP-2007-2.1.2</a> CP	Nanostructured coatings and thin films
<a href="#">NMP-2007-2.1.3</a> CSA	Characterisation of nanostructured materials
<a href="#">NMP-2007-2.2-1</a> Large CP	Organic materials for electronics and photonics
<a href="#">NMP-2007-2.2-2</a> CP	Nanostructured materials with tailored magnetic properties
<a href="#">NMP-2007-2.2.-3</a> CP	Advanced material architectures for energy conversion
<a href="#">NMP-2007-2.4-2</a> CP	Nanostructured catalysts with tailor-made functional surfaces
<a href="#">NMP-2007-2.4-3</a> CP	Renewable materials for functional packaging applications
<a href="#">NMP-2007-2.5-2</a> CP	Modelling of microstructural evolution under work conditions and in materials processing



# Nanomaterials –cont'd



<u>ENERGY-2007.1.2.4</u> CP	Novel nanostructured materials for hydrogen storage
<u>ENERGY-2007.1.1.1</u> CP	Basic research for materials and processes for Polymer Electrolyte Membrane Fuel Cells (PEMFC)
<u>ENERGY-2007.1.1.2</u> CP	Basic research on materials and processes for High Temperature Fuel Cells (SOFC & MCFC)
<u>ENERGY-2007.1.2.1</u> CP	New materials and processes for advanced electrolyzers
<u>ENERGY-2007.1.2.2</u> CP	New materials and processes for advanced multi-fuel processors
<u>AAT-2007.1.1.2</u> CP, CSA	Aerostructures

# Nanoelectronics

<u>ICT-2007.3.1</u> CP, NoE, CSA	Next generation nanoelectronics components and electronics integration
<u>ICT-2007.8.1</u> CP, CSA (CA only)	Nano-scale ICT devices and systems



# Nanomedicine



<p><u><a href="#">NMP-2007-4.0-4</a></u> Large CP</p>	<p>Substantial innovation in the European medical industry: development of nanotechnology-based systems for in-vivo diagnosis and therapy (<i>in coordination with topics HEALTH-2007-2.4.1-7 and HEALTH-2007-1.2-3</i>)</p>
<p><u><a href="#">HEALTH-2007-2.4.1-7</a></u> CP</p>	<p>Improving targeted drug delivery to cancer cells for cancer therapeutics other than gene therapy</p>
<p><u><a href="#">HEALTH-2007-1.2.3</a></u> Large CP</p>	<p>Novel targeted imaging probes for early in vivo diagnosis and/or evaluation of response to therapy</p>
<p><u><a href="#">NMP-2007-2.3.-1</a></u> Large CP</p>	<p>Highly porous bioactive scaffolds controlling angiogenesis for tissue engineering</p>
<p><u><a href="#">NMP-2007-1.2-3</a></u> CSA</p>	<p>Analysis of the ethical, regulatory, social and economic environment of nanomedicine</p>
<p><u><a href="#">ICT-2007-5.1</a></u> Large CP, CSA</p>	<p>Personal Health Systems for Monitoring and Point-of-Care diagnostics</p>
<p><b><a href="#">HEALTH-2007-1.4.4</a></b> Large CP 2<sup>nd</sup> call</p>	<p>Development of emerging gene therapy tools and technologies for clinical application</p>

NB: Many more activities in the [Health theme](#) are relevant to nanomedicine, e.g. imaging, stem cells and translating research for human health



# Other Important Topics



<p><b>ICT-2007.3.6</b> CP, NoE, CSA 2<sup>nd</sup> call</p>	Micro/nanosystems
<p><b>ICT-2007.3.5</b> CP, NoE, CSA 2<sup>nd</sup> call</p>	Photonic components and subsystems
<p><b>ICT-2007-C</b> CP, CSA (CA only)</p>	FET (Future and Emerging Technologies) Open <i>(Open call for bottom-up activities)</i>
<p><b>AAT-2007.6.1.4</b> CP, CSA</p>	Life-cycle [of air vehicles, including increased use of nanotechnologies]
<p><b>KBBE-2007-2-3-04</b> CP</p>	Nano-devices for quality assurance, food safety and product properties
<p><b>KBBE-2007-2-4-04</b> CP</p>	Innovative and safe packaging
<p><b>KBBE-2007-2-5-02</b> CP</p>	Converging technologies and their potential for the food area

Please consider also opportunities within  
**COST** actions (funding for co-ordination activities)  
<http://www.cost.esf.org/>



# Human Resources



<a href="#">PEOPLE-2007-1-1-ITN</a>	Marie Curie Initial Training Networks <i>(all research areas)</i>
<a href="#">PEOPLE-2007-5-2-Awards</a>	Marie Curie Awards <i>(all research areas)</i>

Please consider also the opportunities in [educational programmes](#) managed by DG EAC

[http://ec.europa.eu/education/programmes/programmes\\_en.html](http://ec.europa.eu/education/programmes/programmes_en.html)




# Ideas – European Research Council



<a href="#">ERC-2007-StG</a>	ERC Starting Independent Researcher Grants <i>(all research areas)</i>
Expected in 2 <sup>nd</sup> call	ERC Advanced Investigator Grants <i>(all research areas)</i>

# Infrastructures & SMEs



<a href="#">INFRA-2007-2.2.1.27</a> Combination CP/CSA	PRINS, Pan-European Research Infrastructures for Nano-structures <i>(from 2006 ESFRI Roadmap)</i>
<a href="#">FP7-SME-2007-1</a> 	Research for the benefit of SMEs  

# References



[http://cordis.europa.eu/nanotechnology/src/eu\\_funding.htm](http://cordis.europa.eu/nanotechnology/src/eu_funding.htm)

**FP7:** [http://cordis.europa.eu/fp7/home\\_en.html](http://cordis.europa.eu/fp7/home_en.html)

**FP7 calls:** <http://cordis.europa.eu/fp7/dc/index.cfm>

**Nanotechnology homepage:**

<http://cordis.europa.eu/nanotechnology/>

**Nanosciences and Nanotechnologies:**

**An Action Plan for Europe 2005-2009**

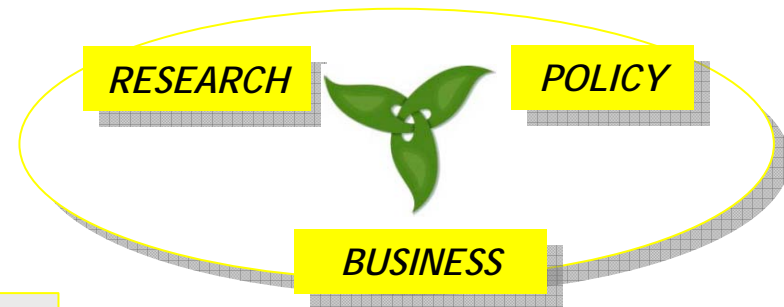
<http://cordis.europa.eu/nanotechnology/actionplan.htm>

**Additional information  
on nanotechnology:**



# European Technology Platforms

*A spiral model of innovation capitalising on the multiple reciprocal relationships between public & private stakeholders at various knowledge stages*



31 European Technology Platforms launched so far:

- Addressing major technological challenges in specific domains
- Aiming to leverage public & private investment for R&D & innovation
- Involving key R&D stakeholders
  - eg industry, the research community & public authorities
- Bundling fragmented R&D efforts towards agreed goals
  - Vision 2020 document & Strategic Research Agenda

[cordis.europa.eu/technology-platforms](http://cordis.europa.eu/technology-platforms)

# Nanoelectronics & Embedded Systems Technology Platforms

## *Nanoelectronics:*

addressing the needs of silicon-based technologies & beyond

- shrinking of CMOS logic & memory devices
- development of value-added functions for system-on-chip or system-in-package solutions
- equipment & materials
- design automation



[eniac.eu](http://eniac.eu)

## *Embedded Computing Systems:*

ubiquitous, interoperable & cost-effective embedded systems

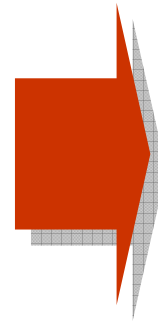
- reference designs and architectures
- middleware for interoperability and seamless connectivity
- integrated design software tools for rapid development & prototyping



[artemis-office.org](http://artemis-office.org)

# Technology Platform of Systems Integration: EPoSS

- **A multi-disciplinary endeavour:**  
Combining optics, mechanics, electronics, fluidics, thermodynamics, chemistry, biology
- **Converging scientific disciplines:**  
Looking at the overlapping areas between nano-, bio-, information & cognitive sciences
- **Multi-material integration:**  
Semiconductors, polymers (plastics), ceramics, glass, ...
- **Multi-technology integration:**  
Monolithic, hybrid, multichip, large-area, ... miniaturisation techniques
- **Multi-functional integration:**  
Combining sensing, processing, actuating



## Experts call

<https://cordis.europa.eu/emmfp7/>

- Call for experts for FP7
- FP6 experts have been invited\* to transfer to FP7 and to update their CV  
(\* using the email address in FP6 database!)
- Nacional contact points can suggest names for experts in micro/nanosystems

# For more information

## European research on the web:

<http://cordis.europa.eu>

<http://cordis.europa.eu/fp7>

<http://ec.europa.eu/comm/research/future/>

## Information Society and Media:

[http://ec.europa.eu/information\\_society/](http://ec.europa.eu/information_society/)

<http://cordis.europa.eu/ist>

## Directorate G:

[http://cordis.europa.eu/ist/directorate\\_g](http://cordis.europa.eu/ist/directorate_g)

INFORMATION DAY EVENT in BRUSSELS 29 May 2007 IS ON

[http://cordis.europa.eu/fp7/ict/programme/events3-20070529\\_en.html](http://cordis.europa.eu/fp7/ict/programme/events3-20070529_en.html)

Call 2 published on:

[http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.CooperationDetailsCallPage&call\\_id=65](http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.CooperationDetailsCallPage&call_id=65)



# Micro/Nanosystems

# Thank you!

## Website:

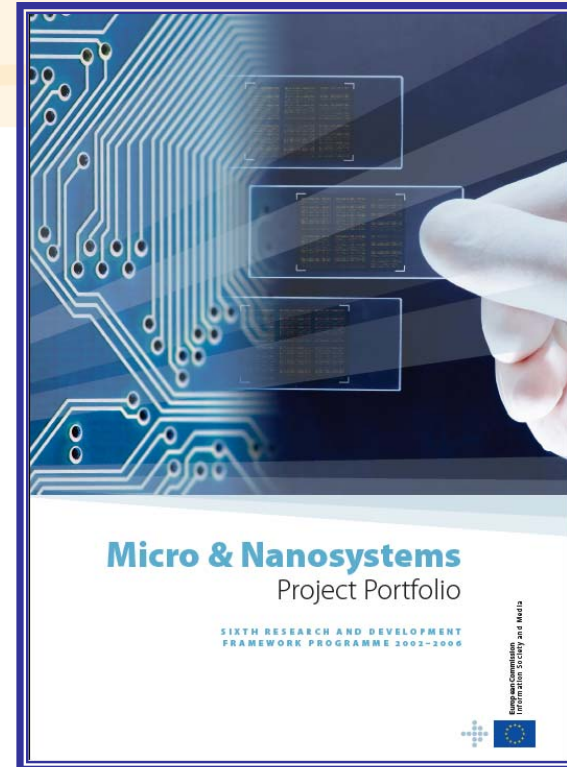
<http://cordis.europa.eu/ist/mnd/>

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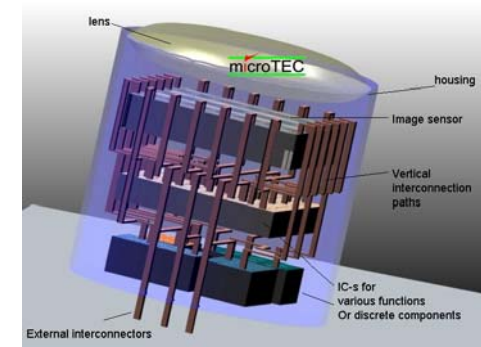
[Gordana.Popovic@ec.europa.eu](mailto:Gordana.Popovic@ec.europa.eu)



## Objective 3.6 (a): Next Generation Smart Systems

### Outcome

- Major breakthroughs in intelligent sensors and actuators
- Integrated micro/nanoscale smart systems (closed-loop)
- Energy scavenging, storing and management techniques
- Design and packaging technologies
- Integrated systems for very high density mass storage

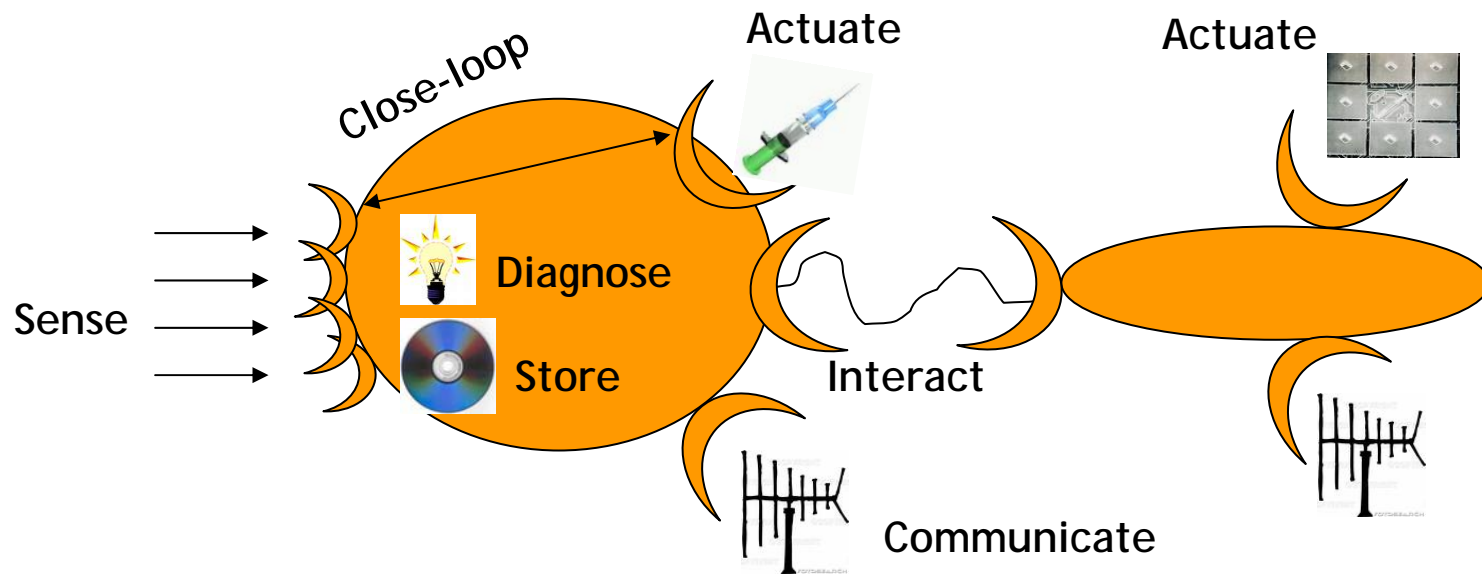


*Courtesy of project INOS*

*Complexity, performance, miniaturisation, autonomy, cost*

# Objective 3.6.a: Next Generation Smart Systems

## Key functions



## Objective 3.6 (b): Nano-Bio-ICTechnologies convergence

### Outcome

- Converging micro/nano, bio and information technologies
- Application areas including environmental monitoring, agriculture and food quality, safety, security, biomedical and lifestyle
- Address packaging, interfacing, as well as ethical and societal issues.



Courtesy of project OPTOLABCARD

*biosensors, lab-on-chip, biorobots,, nanoimplants, bioMEMS, microsystems for food, safety, environment*

## Objective 3.6 (c): Integration of Smart Materials

### Outcome

- Integration of micro-nano technologies and smart systems into new and traditional materials, e.g. textiles, glass, paper, etc.
  - Active opto/electronic fiber devices & addressable arrays of meshed devices, integration of smart systems into flexible substrates,
  - Emphasis on SFIT (Smart Fabric Interactive Textiles) using micro/nanosystems at the fiber core, microelectronics, user interfaces, power sources, all-in-one fabric, for personal (wearable) or other applications.

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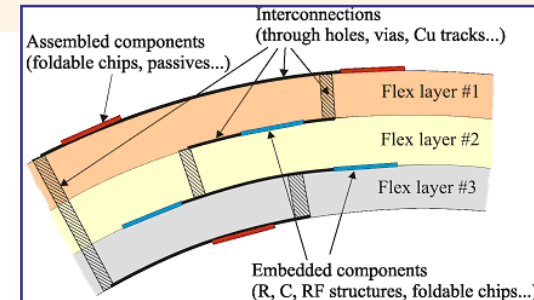
**Related FP6 Activities - SFIT Cluster: [www.csem.ch/sfit](http://www.csem.ch/sfit)**



## Objective 3.6 (c): Integration of Smart Materials

- Lamination of functional subsystem sheets into complete mechanically flexible terminals including power, processing, communication, sensing, interface & display.

- Hardening and encapsulation techniques to guarantee durability of the flexible systems



*Courtesy of project SHIFT*



## Objective 3.6 (c): Integration of Smart Materials

- New materials & devices for sensitive direct bio-detection
- Use of new materials (e.g. nano-structured or organics) to the benefit of new low cost manufacturing paradigms for flexible & large area devices like biocompatible e-bandaids, stretchable/wearable electronics, e-textile, e-tags and e-signs, photovoltaic cells.

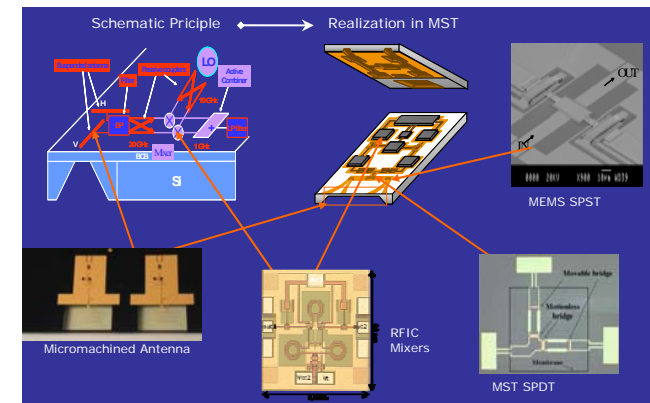


*Biocompatible, bioconnective, flexible, durable materials*

# Objective 3.6 (d): From smart systems to viable products

## Outcome

- Advanced, cost-effective technologies for sensor/actuator manufacturing and system integration
- Alternative fabrication and testing processes for low/medium scale volume and short time-to-market
- Pre-industrial validation of manufacturing concepts suitable for large-scale production



Courtesy of project AMICON

*Materials, equipment, design, manufacturing, modelling, testing, reliability*

## FP6 Activities in the area

- **DAVID - STREP** “Downscaled Assembly of Vertically Interconnected Devices” (2.8 M€)
- **DELILA - STREP** “Development of Lithography Technology for nanoscale structuring of materials using Laser Beam Interference” ( 2 M€)
- **HIDING DIES - STREP** “High density integration of Dies into Electronics Substrates” (1.9 M€)
- **PROMENADE - STREP** “Process management and design system for microsystem technologies” (3 M€)
- **Q2M - STREP** “Batch integration of high-quality materials to microsystems” ( 3.2 M€)
- **PATENT - NoE** “Design for Micro & Nano Manufacture” (6.2 M€)
- **Service Actions:** RF-Platform, microBuilder, Integramplus

**FP6 EC Contribution: 31 M€**  
**10% FP6 Unit's Budget**

## Objective 3.6 (e): Smart Systems for communications and data management

### Outcome

- Smart micro/nanosystems enabling wireless access and facilitating intelligent networking with emphasis on the hardware required for communications and the management of smart device information.
- This includes solutions for adaptable RF and HF technologies (RFID, RF-M/NEMS, HF-NEMS)
- Data management, storage and processing functions of smart systems

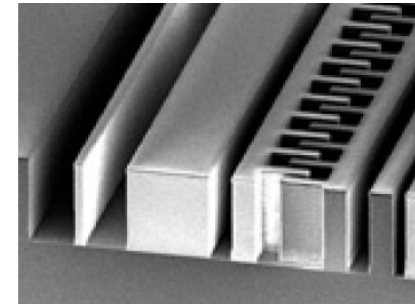


Photo: Inertial sensors, pressure sensors, resonators, etc. (Source: Tronic)

*RFID, HF-M/NEMS, data management*

## Objective 3.6 (f): Coordination and Support Actions (CSA)

### Expected Outcome

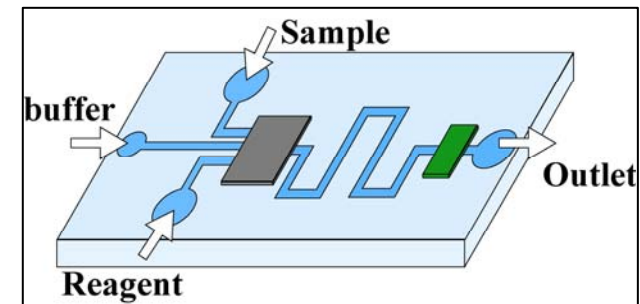
- Ensure access to micro/nanosystems manufacturing technologies, in particular by SMEs
- Identify training and education needs; propose actions
- Coordination and dissemination of smart systems integration R&D at European level

### Instruments

- Coordination or Networking Actions (CA)
- Specific Support Actions (SSA)

### Funding

- 100% of Direct Costs (- Subcontracting) + Indirect Costs (Maximum of 7% of DC)



*Courtesy of project NANOSPAD*

## Objective IST-2007.3.6: Micro/nanosystems (f) Coordination and Support Actions (CSA)

### Coordination and Networking Actions (CA)

- **Types of activities**
  - Coordination activities
  - Consortium management activities
- **Workplan incorporating**
  - Organisation of events (conferences, meetings);
  - Performance of studies, analysis;
  - Exchanges of personnel;
  - Exchange and dissemination of good practice;
  - Setting up of common information systems
  - Setting up of expert groups;
  - Definition, organisation, management of joint or common initiatives
  - Management of the action

## Objective IST-2007.3.6: Micro/nanosystems (f) Coordination and Support Actions (CSA)

### Specific Support Actions (SSA)

- **Types of activities**
  - Support activities
  - Consortium management activities
- **Workplan incorporating**
  - Conferences, seminars, working groups and expert groups;
  - Studies, analysis;
  - Fact findings and monitoring;
  - Preparatory technical work, including feasibility studies
  - Development of research or innovation strategies;
  - High level scientific awards and competitions;
  - Operational support, data access and dissemination, information and communication activities