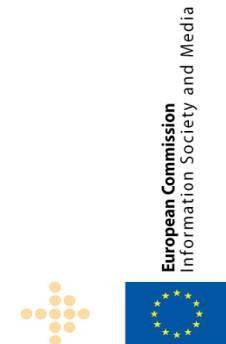


# Components, Systems and Engineering in the ICT Programme (call 5)

Henri RAJBENBACH

European Commission  
Directorate-General Information Society and Media  
Microsystems



# Outline

- Introduction: Logos and Acronyms
- Overview of call 5 – Time, Money, Content
- The “New Member States Challenge” and specific actions
- Call 5 content:
  - Nanoelectronics Technology
  - Photonics
  - Microsystems and Smart Miniaturised Systems



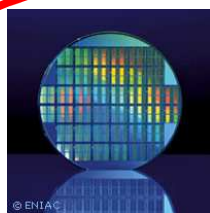
# Follow Logos and Acronyms !

**Topics:**

**Nanoelectronics**

**Photonics**

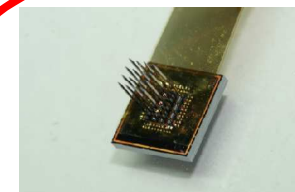
**Microsystems**



3.1: Nanoelectronics



3.7: Photonics



3.9: Microsystems

**“Instruments”:**

**STREP**

**Specific Targeted Research Project**

**IP**

**Integrated Project**

**NoE**

**Network of Excellence**

**CSA**

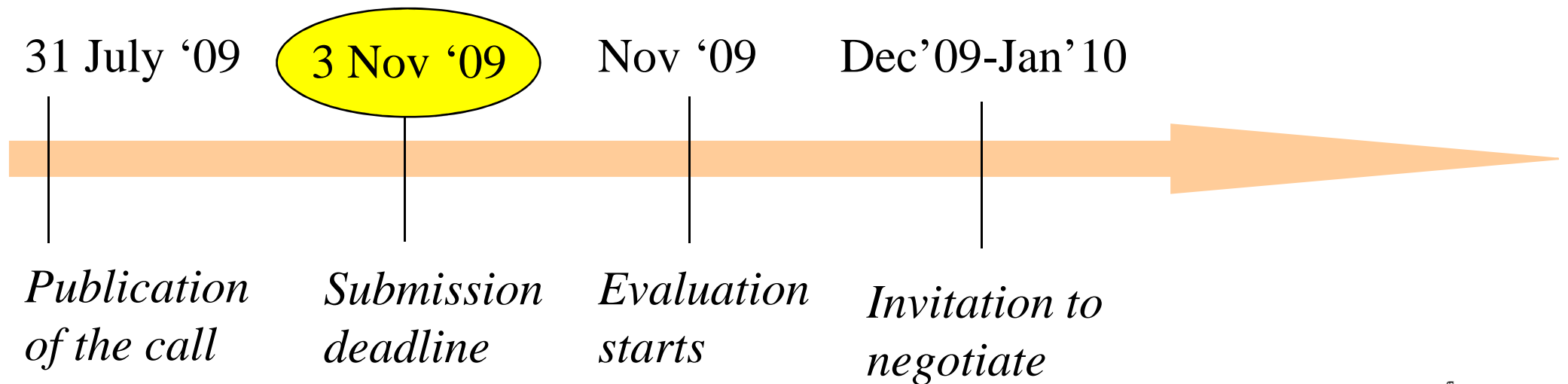
**Coordination and Support Action**



European Commission  
Information Society and Media



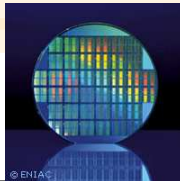
# Call 5: Time...



# ... and Money

**Objective:**

3.1



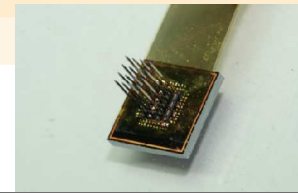
**Nanoelectronics  
Technology**

3.7



**Photonics**

3.9



**Microsystems &  
Smart Miniaturised Systems**

**Budget:**

*(New projects)*

**35 M€**

**47 M€**

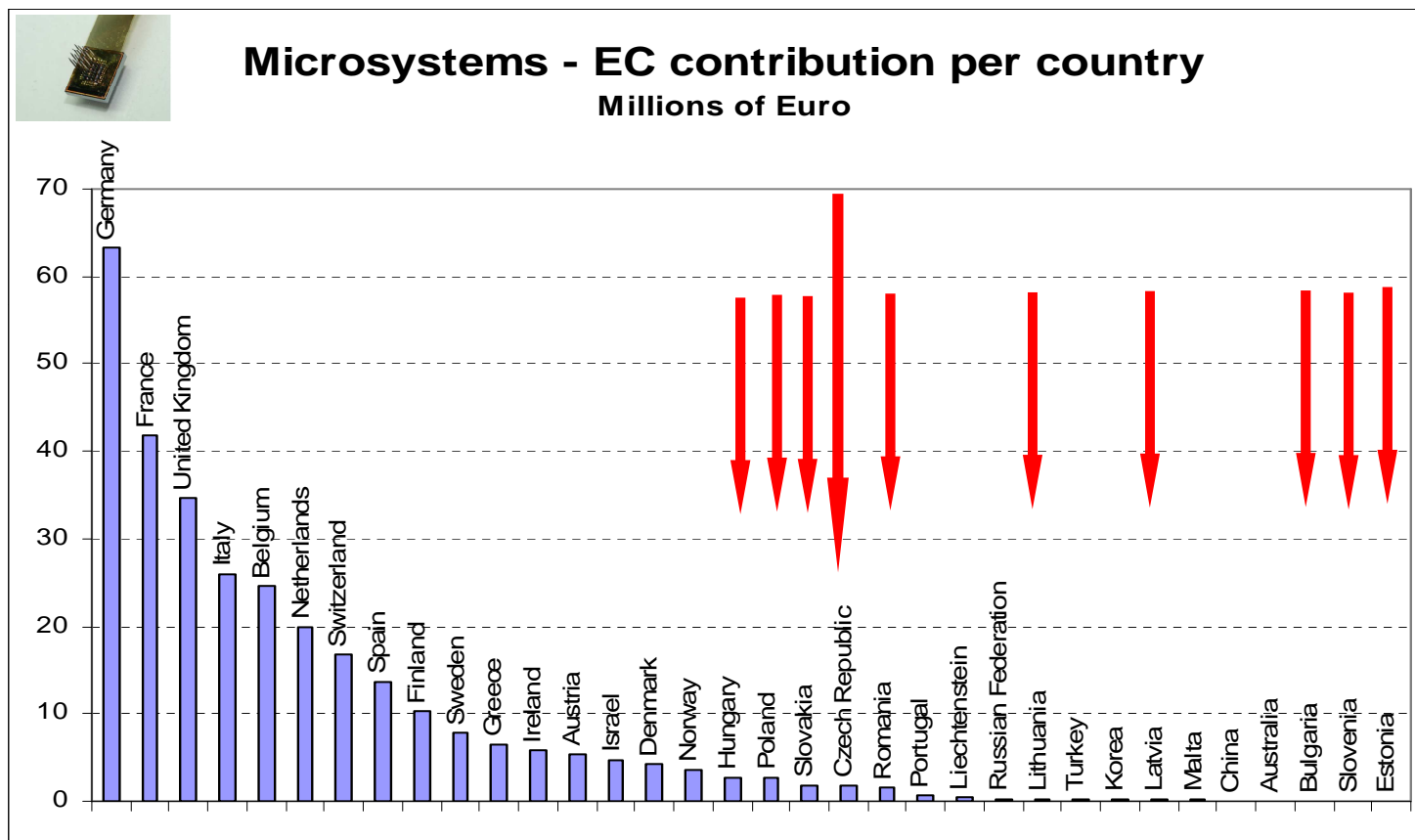
**80 M€**

**Additional Budget for cooperation in an “Enlarged Europe”:**  
*(joining existing FP7 projects)*

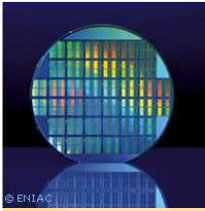
**10 M€**

**DRAFT!**

# EC contribution to “New Member States” organisations



European Commission  
Information Society and Media



# “Nanoelectronics Technology”

## Objective 3.1

### Structure of the Objective:

**(a) Miniaturisation and functionalisation**

**(b) Manufacturing technologies**

**(c) Coordination and Support Actions**





### 3.1: Nanoelectronics

## (a) Miniaturisation and functionalisation

- Beyond 22 nm devices
- Advanced components beyond CMOS:
  - non-CMOS devices, and
  - Integration and interfacing with CMOSincludes non-Si Integrated components (eg RF) for Silicon-In-Package

Activities with a **high risk factor**

Industrialisation perspective **beyond 2014** and  
having a **generic development** focus

STREPs, 1 NoE



### 3.1: Nanoelectronics

## (b) Manufacturing technologies

- New **processes** and **tools** for:
  - flexible manufacturing
  - sustainable short cycle time manufacturing
- **Joint Assessments** of:
  - process and metrology equipment
- Supporting **200/300mm wafer** integration platforms
- Preparatory work for **450mm wafer** processing

STREPs, at least 1 IP





### 3.1: Nanoelectronics

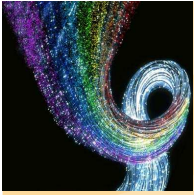
## (c) Coordination and Support Actions



1. Roadmaps and benchmarks for the industrial use of 'Beyond CMOS'
2. Access to affordable silicon state-of-the-art technologies for:
  - prototyping and low volume
  - design expertise and commercial tools
3. Training and education - Stimulation of interest of young people
4. Linking of R&D strategies and stimulation of International Cooperation
5. Preparatory work for 450 mm processing and equipment

CSA (4.5 M€ reserved)





# “Photonics”

3.7: Photonics

Objective 3.7

## Structure of the objective:

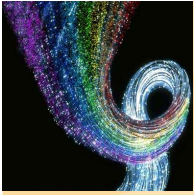
**(a) Components and Subsystems**

**(b) III-V Foundry Processes**

*(c) ERA-NET Plus (call 4, closed)*

**(d) Coordination and Support Actions**





# (a) Photonic Components and Subsystems

3.7: Photonics

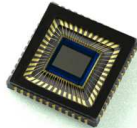
## Focus:

**Highly Integrated components**



Lasers : high average/peak-power with integrated functions  
(Fiber and Diode lasers)

**Imaging**  
(Safety and Security)



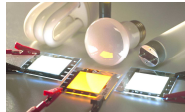
Sensors: CMOS-compatible (uncooled, high dynamic range..)  
Systems: Smart pixels, multi-spectral, on-chip processing..

**Bio-Photonics**



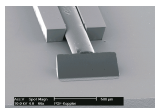
Imaging (Molecular and functional)  
Diagnosis and treatment monitoring  
(Minimally Invasive and Point of Care)

**Light Sources**



Lighting Systems: LED / LED-Based for general illumination:  
- High colour rendering, tunable spectrum, adaptable output level  
Solid-state lasers and lighting engines (for Displays and Lighting)

**Communications**

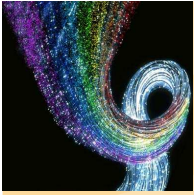


Vision of Future-proof Networks with Unlimited Bandwidth  
→ Components for: - More optical processing  
- High spectral density transmission  
- Low power consumption

STREPs

IPs and STREPs

ledia



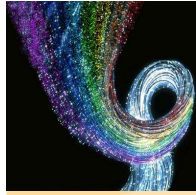
## (b) III-V Semiconductors Foundries

### 3.7: Photonics

- **III-V Processes: Cost effective and Versatile**
- **Application to Photonic Integrated Components (PICs)**
  - III-V materials possibly combined with other materials -  
(GaAs, GaN, InP...) +
- **Integration and Packaging technologies**
- **Design:**
  - Interface with Processes based on agreed concepts and standards
  - Supported by library based platforms

IP





## (d) Coordination and Support Actions



### 1. Support of **SME & Researchers**

- Access to:
- Technology & design expertise
  - Prototype components & manufacturing facilities

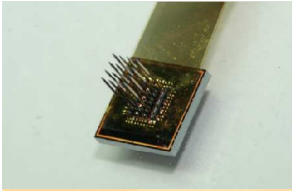
### 2. **International** (ie, beyond EU) **cooperation**

- LED/OLED:
  - Procedures to measure/compare lighting performances
  - Exchange of best practices for trials and deployment
  - Development of lighting standards
- Other research topics:
  - Organisation of International workshops
  - Research roadmaps

CSA  
(3M€)

### 3. **Education and Training** (excludes direct support of conferences)

- Activities to encourage interest in photonics at secondary school level
- Transnational education programmes in photonics at third level

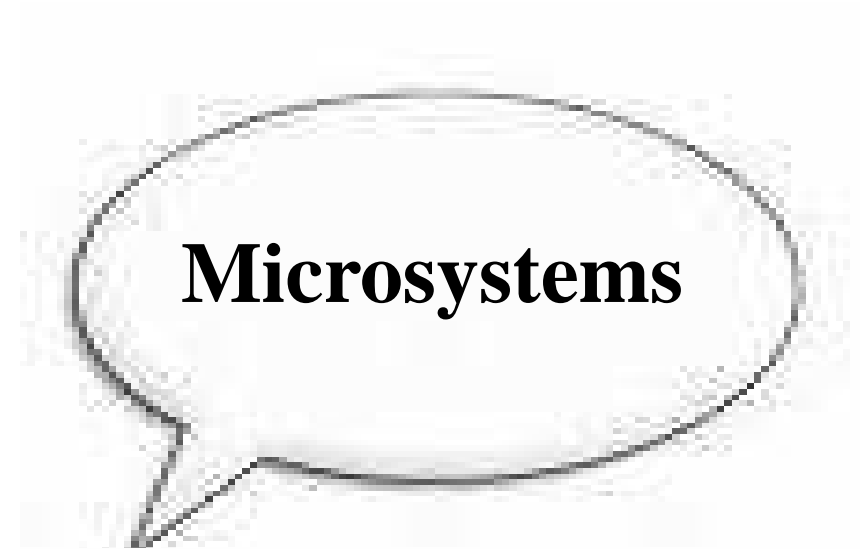
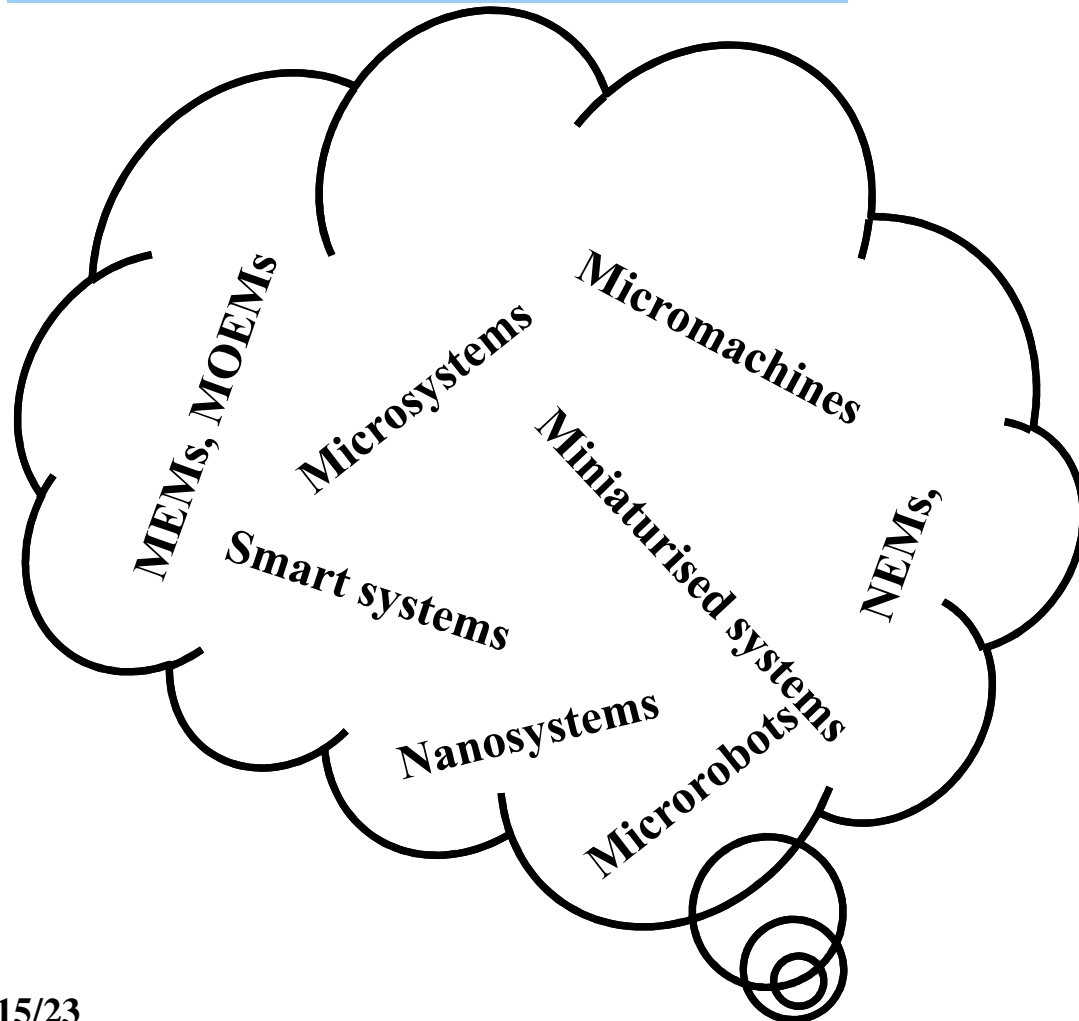


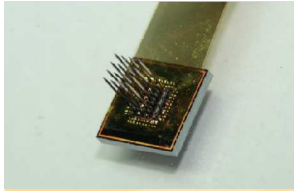
# “Microsystems and Smart Miniaturised Systems”

## Objective 3.9

3.9: Microsystems

Some simplified vocabulary:

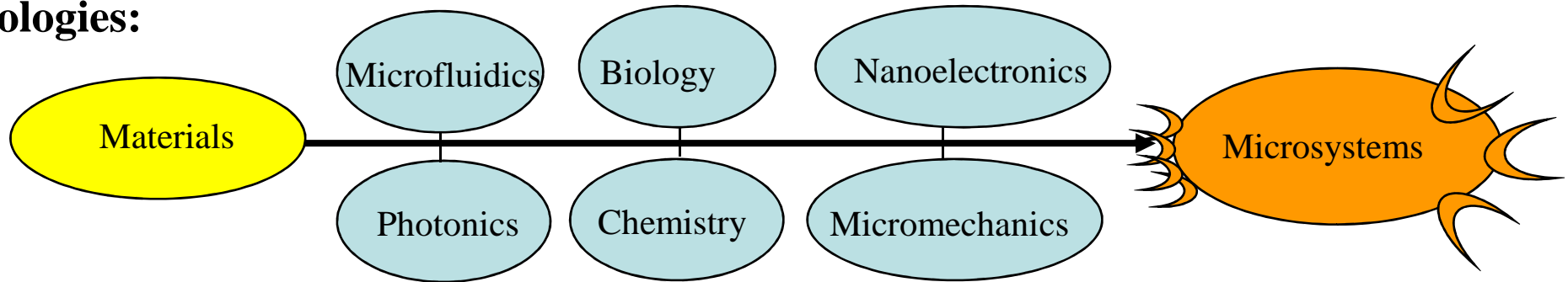




### 3.9: Microsystems

# The key to Microsystems: Integration of technologies and functions

## Technologies:



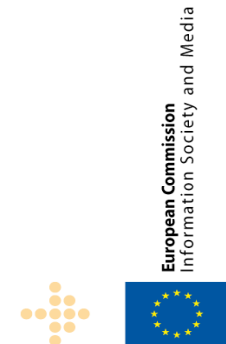
## Functions:

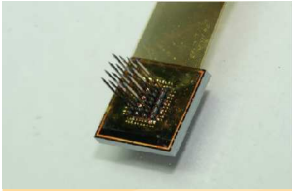
**Sensing, storing, processing, actuation, communication**



**At least 2 Technologies and 2 Functions !**

(including sensing or/and actuation)





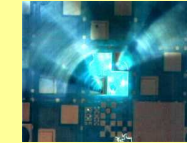
3.9: Microsystems

# “Microsystems and Smart Miniaturised Systems”

## Objective 3.9

### Structure of the objective:

(a) Heterogeneous Integration



(b) Autonomous energy efficient smart systems



(c) Application-specific Microsystems

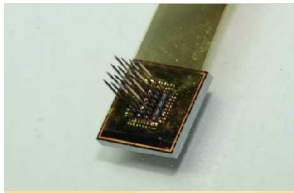


(d) Coordination and Support actions



European Commission  
Information Society and Media





## (a) Heterogeneous Integration

### Multiple technologies and materials, *integrated and interfaced*:

- Emphasis:
- Innovative concepts of industrial relevance
  - Address challenges that limit the industrial take-up

### Focus:

#### 1 - More **intelligence** in microsystems:

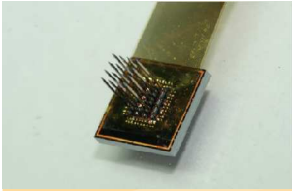
multi-sensing, processing, wireless communication, actuation

#### 2 - Efficient manufacturing by addressing the “**value chain**”:

Materials, modeling, design, processes, packaging, characterisation, testing

#### 3 - Disruptive approaches for **nanosensor**-based microsystems

STREPs, IP



## (b) Autonomous energy efficient smart systems

Objective:

**Long-lasting autonomous operation**

Focus:

1 - Energy:

Scavenging, storage and transmission

Power generation, accumulation and consumption

2 - Communication:

Smart transceivers for wireless communication


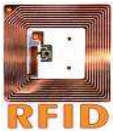



- reconfigurable, low power, adaptive, miniature...

**STREPs**

## (c) Application-specific Microsystems

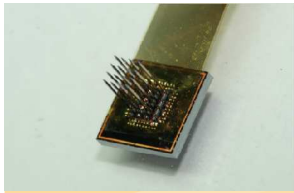
### 3.9: Microsystems

#### Focus:

<p><b>Biomedical</b></p>		<p>Lab-on-chip platforms, from R&amp;D to validation (Drug discovery, diagnosis/therapy) Microinstruments for cell manipulation and micro-injection Microsystems interacting with the human body</p>
<p><b>Telecom</b></p>		<p>Miniaturisation for multi-functional networked microsystems: Smart RFID, Ultra-low power transceivers, Reconfigurable antenna</p>
<p><b>Environment Food/Beverage</b></p>		<p>Multi-sensing microsystems (reliable and low-cost) for:</p> <ul style="list-style-type: none"> <li>- Environment (including water treatment)</li> <li>- Food and beverages quality and safety</li> </ul>
<p><b>Transport Safety &amp; Security</b></p>		<p>Transport: Safety critical microsystems: Emphasis: full electrical vehicle Safety and Security: Sensors and actuators Emphasis: networking capabilities, operation in harsh environment</p>
<p><b>Smart Fabrics Interactive Textile</b></p>		<ul style="list-style-type: none"> <li>- Multi-functional textiles and fabrics: sensing, actuating, communication, processing, power sourcing</li> <li>- Integration of fibre-level components into textiles</li> <li>- Stretchable and wearable electronics embedded in textiles</li> </ul>

Media

IPs and STREPs



### 3.9: Microsystems

## (d) Coordination and Support actions



1. Techno-economic analysis
2. Dissemination and promotion actions, public awareness
3. Identification of international cooperation opportunities
4. Coordination between Technology providers and Users  
(for in-vitro diagnostics and food/beverage quality)

CSA



## **Additional Budget for cooperation in an “Enlarged Europe”: New ICT Objective: 9.5 (updated workprogramme 2009-10)**

**DRAFT !**

**10 M€ (but covering all ICT topics)**

**Target:** - to reinforce the cooperation across the 27 Member States  
- to further integrate on the ERA (European Research Area)

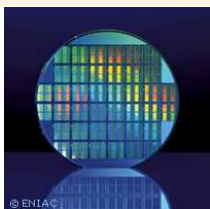
**How ? By Adding partners in on-going FP7 projects  
(only those ending after April 2011)**

**Look at the project portfolios and contact the coordinators !**

**(web addresses next slide)**



## More information ? Web sites and Contacts for call 5



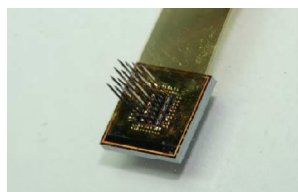
**3.1: Nanoelectronics**

[http://cordis.europa.eu/fp7/ict/nanoelectronics/home\\_en.html](http://cordis.europa.eu/fp7/ict/nanoelectronics/home_en.html)  
infso-nanoelectronics@ec.europa.eu  
Isabel.vergara-ogando@ec.europa.eu



**3.7: Photonics**

[http://cordis.europa.eu/fp7/ict/photonics/home\\_en.html](http://cordis.europa.eu/fp7/ict/photonics/home_en.html)  
infso-photonics@ec.europa.eu  
Gustav.kalbe@ec.europa.eu



**3.9: Microsystems**

[http://cordis.europa.eu/fp7/ict/micro-nanosystems/home\\_en.html](http://cordis.europa.eu/fp7/ict/micro-nanosystems/home_en.html)  
infso-microsystems@ec.europa.eu  
Griet.van-caenegem@ec.europa.eu

Henri.rajbenbach@ec.europa.eu