Corelarea domeniului cu PN II si cu PC7.

Orientari strategice pe termen scurt

INCD-Microtehnologie (IMT-Bucuresti)

DOMENIU 1 - Tehnologia Informatiei si Comunicatii

Directia de cercetare 1.7
Nanoelectronica, fotonica şi micronanosisteme integrate

❑ Nanoelectronica

•***Tematica de cercetare*** **1.7.1 Experimentarea de noi materiale şi tehnologii pentru nanostructuri şi circuite integrate la scara nano**

- 3 proiecte in 2007, 1 proiect in 2008

Objective ICT-2011.3.2 Smart components and smart systems integration
Future smart components and smart systems
Materials, technologies, processes, manufacturing techniques and design methods for:
- Miniaturized and integrated smart systems with advanced functionality and performance including nanoscale sensing systems

• *Tematica de cercetare* 1.7.2 **Experimentarea de noi arhitecturi de sisteme pentru nanoelectronică**

- 1 proiect in 2007, 1 proiect in 2008

• *Tematica de cercetare* 1.7.3 **Experimentarea de noi concepte (principii) de dispozitive nanoelectronice**

- 1 proiect in 2008

Objective ICT-2007.8.1: FET proactive 1: Nano-scale ICT devices and systems

• Demonstration of new concepts for **switches or memory cells**, to substantially improve performance, cost, integration density and/or power dissipation beyond those of ultimate CMOS technology using nanostructures or non-charge based approaches. Complementary challenges include **circuit architectures, assembly and reconfiguration**.

• Demonstration of **new concepts, technologies and architectures for local and chip-level interconnects** with substantial improvements over current solutions.

• *Tematica de cercetare* 1.7.4 **Electronica transparentă**
  - 2 proiecte in 2007, 2 proiecte in 2008

Objective ICT-2007.3.2: Organic and large-area electronics, visualisation and display

Advanced visualisation systems and novel display technologies - portable display systems such as zero-power / 'ruggedised' displays, flexible and/or **transparent devices**, energy efficient microprojectors, and lightweight high-resolution vision glasses

Objective ICT-2011.3.6 Flexible, Organic and Large Area Electronics and Photonics

OLAE technology and components

Organic/printed logic and memory components; **transparent electronic components**; power supplies; polymer-based sensors and actuators; adaptable optical elements for electronics and lighting applications; large area energy scavengers & sensors

❑ Micro - şi nanosisteme

• *Tematica de cercetare* 1.7.5 **Dezvoltarea componentelor şi microsistemelor pentru sisteme de comunicaţii; microsisteme inteligente reconfigurabile şi flexibile**

- 3 proiecte in 2007, 1 proiect in 2008

Objective ICT-2007.3.6: Micro/nanosystems

Smart systems for communications and data management:

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 (e.g. RFID, RF-NEMS and HF-NEMS).

• *Tematica de cercetare* 1.7.6 **Tehnologii microfluidice, micro/nano- biosenzori, laboratoare pe un cip, „microarrays", micro- şi nanostructuri şi micro- şi nanosisteme pentru diagnosticare şi tratament medical (inclusiv nanomedicină)**

- 4 proiecte in 2007, 5 proiecte in 2008

Objective ICT-2011.3.2 Smart components and smart systems integration
Micro-Nano Bio Systems (MNBS)

For those actions addressing in particular the health area, emphasis is on:

– **integrated systems for rapid, sensitive, specific and multi-parametric in vitro molecular analysis/detection and cellular manipulation** based on biodegradable materials. Cost, manufacturing and real scenarios validation should be considered;

– **autonomous body sensor and actuator** based systems for non- or minimally invasive targeted **early detection, diagnosis and therapy**

NMP.2011.1.2-2 New targeted therapy using nanotechnology for transport of macromolecules across biological barriers

NMP.2011.1.4-4 Nanotechnology based implantable and interfaceable devices

- *Tematica de cercetare* **1.7.7 Microsenzori şi actuatori (inclusiv 3D)**
  - 1 proiect in 2007, 4 proiecte in 2008
- *Tematica de cercetare* 1.7.8 **Tehnologii de integrare eterogenă şi asamblare/încapsulare 3D pentru a permite realizarea de sisteme complexe pe un cip**

Objective ICT-2007.3.6: Micro/nanosystems
Next-generation smart systems:

- Major breakthroughs in intelligent sensor and actuator systems complexity, miniaturisation, networking, and autonomy.
- Design and packaging technologies for new sensors, actuators and microsystems, their combination and integration.

- *Tematica de cercetare* 1.7.9 **Tehnologii convergente: micro-nano-bio-info**

Objective ICT-2007.3.6: Micro/nanosystems
Micro/nano/biotechnologies' convergence

Objective ICT-2011.3.2 Smart components and smart systems integration
Micro-Nano Bio Systems (MNBS)

❑ Fotonica

• *Tematica de cercetare* 1.7.10 **Noi materiale fotonice (materiale artificiale: cristale fotonice, materiale cu indice de refracție negativ etc**.):

- 3 proiecte in 2007, 5 proiecte in 2008

NMP-2007-2.2-1 Organic materials for electronics and photonics

NMP.2011.2.2-3 Materials for solid state lighting

• *Tematica de cercetare* 1.7.11 **Componente micro/nano-fotonice şi sisteme pentru interconexiuni şi comunicații**

Objective ICT-2011.3.5 Core and disruptive photonic technologies - Core photonic technologies

Optical data communications – optical interconnects

• *Tematica de cercetare* 1.7.12 **Microsenzori optici pentru sisteme de supraveghere, monitorizare, robotizare**

Objective ICT-2007.3.5: Photonic components and subsystems

Core photonic components and subsystems, which are essential in multiple application fields: (1) High performance lasers. (2) High brightness, power efficient solid-state light sources for ICT and general lighting applications. (3) Optical fibres for high performance and for specific functions. (4) **High performance image sensors**. (5) **Sensors exploiting innovative sensing principles**

Objective ICT-2011.3.5 Core and disruptive photonic technologies - Core photonic technologies

Imaging and sensing for safety and security

• *Tematica de cercetare* 1.7.13 **Noi tehnologii fotonice şi bio-senzori fotonici pentru sisteme neinvazive de diagnostic *in vivo* şi tratament**

- 1 proiect in 2008

• *Tematica de cercetare* 1.7.14 Tehnologii fotonice pentru procese de fabricație avansate la nivel micro şi nano şi pentru controlul proceselor şi calității

-1 proiect in 2007, 1 proiect in 2008

Objective ICT-2007.3.5: Photonic components and subsystems

Application-specific photonic components and subsystems for application fields, which are strategic for Europe and which are important drivers of photonics technology development: Components and subsystems for: - **minimally invasive medical diagnosis and prevention**. - **sensing for environment, well-being, safety and security**.

Objective ICT-2011.3.5 Core and disruptive photonic technologies - Core photonic technologies

Biophotonics for early, fast and reliable medical diagnosis of diseases, such as cancer, infectious and eye-related diseases. The applications vary from point-of-care diagnosis to functional imaging.