Nanoactivity in Portugal

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Introduction

• Nanotechnology: What is it?

  – Deals with (fabricates, manipulates, uses) objects ≤ 100nm in at least one dimension
  – Is concerned with properties due specifically to this size range
Introduction

• Why has Nanotechnology gained relevance in the last years?
  – Development of the technologies necessary
  – New properties (namely quantum) can be used
Introduction

• But also...
  – Very strong motivation: biological and chemical processes occur at nanoscale. Seeing and actuating at this scale has almost unlimited potential, in Biomedicine as well as Electronics or Materials science and technology.
Introduction

• Notice that:
  - It is multidisciplinary in nature, as classic disciplines like Biology, Chemistry or Physics are hard to separate at this scale. A new class of applications is at reach if the appropriate effort is placed into Research and Development in this area.
Evolution

• Since the word Nanotechnology started being used in the early 1990’s the growth of Scientific production in the area has grown very rapidly

• But do not forget that some people were in fact working in the field without using the word. This is the case of many remarkable groups and labs working in Nanotechnology today
Evolution

Nano / Total (%)

%: 0 2 4 6 8 10 12 14


NanoWorld/World, NanoPT / PT, NanoSP / SP
Evolution

• Nano picked up very quickly in the World
• Even more quickly in Portugal and Spain
• In a similar way in both Countries
Evolution

PT papers / World Papers (%)

0 0,1 0,2 0,3 0,4 0,5 0,6 0,7 0,8

Year

NanoPT/NanoWorld (%)

PT/World (%)
Evolution

- Portuguese Scientific production grows steadily
- The percentage of Portuguese Nano papers over the total World Nano papers is higher and grows more quickly than the equivalent percentage for papers in all fields ⇒ Higher PT impact in Nano
Actions

• Coordination
• Foster
• Outreach
Activities: Coordination

- PortugalNano: Portuguese Nanotechnology Network
  - Public database with PT Scientists working in the field
  - Papers (ISI) database
  - News broadcast (e-mail)
  - Web site: www.portugalnano.org
  - Launch a regular Workshop series
Activities: Foster

- Cooperation: Infrastructures
  - International Iberian Nanotechnology Laboratory (INL), between Spain and Portugal, located in Braga, to start on-site activity in 2009
Activities: Foster

- Cooperation: Infrastructures
  - Two Associated Laboratories in Nanotechnologies created in 2006
Activities: Foster

• Cooperation: Capacitation and Networking
  – Joint call between Spain and Portugal for collaborative projects in:
    • Nanomedicine
    • Nanotechnologies for Environmental Monitoring and Food Quality Control and Safety
  – Graduate Course on NanoMedicine starting between Galician and Northern Portuguese Universities
  – This Nanoiberian Conference
Activities: Foster

• Cooperation: Portugal-France Scientific Bilateral Agreement involving Nanotechnologies specifically
  – Activities under consideration:
    • Short courses
    • Interchange of Scientists
Activities: Foster

• Cooperation: Integrated approach to European and International Collaboration:
  – **ERANETs:**
    • NanoSciERA
    • MNT ERANET (Micro and Nano Technologies) - Joining phase 2
    • EuroNanoMed (Nanomedicine) – preparing proposal
  – **FP7:**
    • NanoTechnology, Materials and New Production Technologies
  – **Joint Technology Initiatives (JTI):**
    • ENIAC (Nanoelectronics)
  – **OECD:**
    • Working Party on Nanotechnology

**FCT** Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR  Portugal
Activities: Outreach

• Ciência Viva:
  – Events organized in 2006 and 2007, with active participation of the Scientific Community
Future: Bright!

• More spread and effective collaboration between Scientists, plus
• Better infrastructures available, plus
• Better knowledge and coordination, should establish:
  • Nanotechnology and Nanoscience as a key R&D topic in Portugal in the near future