

ADDENDUM

as of July, 2012

Nanoscience and Nanotechnology in SPAIN

PHANTOMS
foundation

Preface

In 2011 the second version of the report “Nanoscience & Nanotechnology in Spain” providing insights by identifying R&D directions and priorities in Spain was published, aiming to be a valid source of guidance, not only for the scientific community but also for the industry.

This ADDENDUM includes updated data of the emerging N&N centers recently created in Spain and of the NanoSpain groups (289 research institutions and 45 companies) and related statistics as well as the third version of Spain Nanotechnology Companies Catalogue (81 companies) compiled by the Phantoms Foundation (coordinator of the Spanish Nanotechnology action Plan funded by ICEX).

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- Nanomaterials and Nanotechnology Research Center (CINN)

NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

Emerging N&N Centers in Spain

IMDEA Nanociencia (Madrid Institute for Advanced Studies in Nanosciences)



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Summary: The IMDEA Nanociencia Foundation, created by a joint initiative of the regional Government of Madrid and the Ministry of Science and Education of Spain, manages the IMDEA Nanociencia Institute. This new interdisciplinary research centre aims at becoming a flexible framework to create new internationally competitive research groups by hybridizing some of the best scientists in Madrid dedicated to the exploration of basic nanoscience with recognized researches recognized elsewhere recruited on an internationally competitive basis.

Opening: July 2012

Activity Areas:

Program 1: Molecular Nanoscience

- Design and Synthesis of Molecular Nanostructures and Nanomaterials
- Atomic and Molecular Self-assembly at Surfaces and Spectroscopy on Molecular Systems

Program 2: Scanning Probe Microscopies and Surfaces

- Advanced Microscopies and Local Spectroscopies
- Inelastic Spectroscopy at Surfaces

Program 3: Nanomagnetism

- Magnetic Nanomaterials
- Biomedical Applications

Program 4: Nanobiosystems: Biomachines and Manipulation of Macromolecules

- Single-molecule Analysis of Macromolecular Aggregates
- Organization of Macromolecular Aggregates on Defined Substrates

Program 5: Nanoelectronic and superconductivity

- Electric Transport in Nanosystems
- Superconducting Nanostructures

Program 6: Semiconducting Nanostructures and Nanophotonics

- Semiconducting Nanostructures for Quantum Information
- Nanophotonics

Horizontal Program on Nanofabrication and Advanced Instrumentation

Employees: Administration: 6, Scientific Staff: 32, Associated scientists: 12, Postdoctoral researchers: 18, Ph. D. students: 22 and Technicians: 3

Infrastructure (from 100.000€):

Local Probe Microscopy

- Low Temperature (4 K) STM
- Variable temperature STM+XPS
- Spin polarized STM at 4K
- Single molecule conductance STM
- Scanning Near Field Optical Microscope
- AFM
- AFM/Fluorescence Microscopy

Growth

- Chemical Vapour Deposition
- Organic MBE/X-ray Photoelectron Spectroscopy (XPS)
- Sputtering
- Atomic Layer Deposition
- Langmuir-Blodgett Deposition System

Center for Nanofabrication

- Clean Room 200 m² (Class 100:50 m²; Class 1000: 120 m²)
- Sample and surface preparation
- Sample and device inspection
- Sample and device fabrication
 - E-beam evaporator
 - Spin coating
 - Plasma Assisted Reactive Ion Etching
 - Contact thermal evaporator
 - Mask aligner
 - Conventional Optical Lithography+ Wafer bonding

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- Laser Maskless lithography
- Focused Ion Beam
- Electron Beam Lithography
- Plasma Etching (ICP-RIE)
- Hot embossing / Nanoimprinting

Helium Liquefier

Characterization

- Nuclear Magnetic Resonance
- Scanning Electron Microscopy (SEM)
- Transmission Electron Microscopy (TEM)
- Vectorial Vibrating Sample Magnetometer (v-VSM)
- Magnetometry
- Quantum Transport
- Raman Spectroscopy
- High frequency (GHz) Ultrasound Excitation and Phase-Sensitive Detection

Magneto-optics

- Transmission Time-resolved MOKE magnetometry
- Reflection Vectorial MOKE Magnetometer at 5 K
- Dual Magnetoresistance-MOKE magnetometer

Nanooptics

- Femtosecond Laser spectroscopy
- Streak camera
- Photoinduced Absorption Spectroscopy with picosecond resolution
- Low temperature optical cryostat
- Optical (UV-VIS) spectroscopy

Nanobio

- Cell and tissues chamber
- Optical Tweezers
- Hyperthermia

Projects / Funding:

- Multifun (EU): 14.6 M€
- NanoPyme (EU): 4.8 M€
- Pocaontas (EU): 3.6 M€
- Amarout (EU): 3.2 M€

CIC nanoGUNE Consolider



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Summary: The CIC nanoGUNE Consolider is a research center promoted by the Basque Government with the mission of addressing basic and applied world-class research in nanoscience and nanotechnology, fostering high-standard training and education of researchers in this field, and promoting cooperation among different agents in the Basque Science, Technology, and Innovation Network (Universities and Technological Centers) and between these agents and the industrial sector.

Opening date: January 2009

Activity Areas:

Nanomagnetism

- Magnetization reversal, dynamics, and related characterization methods
- Fabrication and magnetic properties of multilayered magnetic materials
- Fabrication and characterization of magnetic nano-structures

Nanooptics

- Ultra-broadband near-field optical microscopy.
- Near-field optical characterization of nanoscale materials and semiconductor devices
- Near-field characterization of photonic structures

Self-Assembly

- Plant viruses as scaffolds for nanoscale

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structures.

- Electrospinning of self-assembling material to wires

Nanodevices

- Carbon-based spintronics
- Multifunctional devices
- Nanofabrication

Electron Microscopy

- HR-TEM of nanocarbon materials
- E-SEM operation for microfluidics and chemistry
- FIB fabrication of functional nanodevices

Theory

- Computational and theoretical condensed matter physics
- Complex solids and liquids
- Nanoscale oxide heterostructures including multiferroics
- Non-adiabatic processes related to radiation damage of materials

Nanomaterials

- Thin-film coatings for functionalization of materials
- Hybrid inorganic-organic materials
- Bio-inorganic nanomaterials

Probe Microscopy

- Electronic structure of surfaces and nanostructures
- Elastic and inelastic elementary processes in the electronic transport through single molecules
- Molecular magnetism
- Single molecule force spectroscopy

Employees:

19/6/2012. Total: 73

Staff Researchers: 9, Post-doctoral Researchers: 19, Pre-doctoral Researchers: 20, Technical Team: 9, Guest researchers: 7 and Management & Services: 9.

Forecast 2014. Total: 90

Staff Researchers: 10, Pre & Post-doctoral Researchers: 60, Technical Team: 10 and Management & Services: 10

Infrastructure (from 100.000 €):

Nanofabrication tools

- Ion Beam Etching System
- UHV Ebeam Thermal Deposition System
- Reactive Ion Etcher
- Ultra High Resolution E-Beam Lithography Tool
- UHV Sputtering System
- Mask Aligner
- Atomic Layer Deposition System (Thermal & Plasma)
- HPLC Mass Spectrometer
- ICP Mass

Characterization tools

- High Resolution (Scanning) Transmission Electron Microscope
- Environmental Scanning Electron Microscope (SEM/ESEM)
- Dual-Beam Focused Ion Beam
- X-Ray Diffractometer
- FTIR Spectrometer
- Confocal Raman Microscope
- Laser Confocal Microscope
- Physical Properties Measurement System (PPMS/QD-SQUID)
- Scanning Near-field Optical Microscope
- AFM/STM Microscopes
- Cytometer
- Low Temperature STM
- Probe Station (Low temperature & Magnetic fields)

Projects / Funding:

- TERATOMO "Near-field Spectroscopic Nanotomography at Infrared and Terahertz Frequencies", IDEAS-Starting Grant, European Research Council (FP7, EU)
- SPINTROS "Spin Transport in Organic Semiconductors", IDEAS-Starting Grant, European Research Council (FP7, EU)
- TREASURES "Transparent Electrodes for Large Area, Large Scale Production of Organic Optoelectronic Devices", COOPERATION-Collaborative Project (FP7, EU)

Budget 2011 (2011 annual budget in M€ - including salaries - and estimation when fully operating):

- 2011: 5 M€
- 2014: 6 M€

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Institut Català de Nanotecnologia (ICN)



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ICFO - The Institute of Photonic Sciences



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Summary: The Institute of Photonic Sciences, was created in 2002 by the regional Government of Catalonia, Spain - through the Department of Universities and Research - and the Technical University of Catalonia. ICFO is a research centre of excellence devoted to the study of the optical sciences, with the mission to become one of Europe's foremost photonics research centres. The centre has a triple mission of frontier research, post-graduate education, and knowledge and technology transfer. ICFO collaborates actively with many leading research centres, universities, hospitals, health care centres, and a variety of private corporations worldwide.

Opening date: April 2002

Activity Areas:

Research at ICFO is organized in four wide-scope areas: Nonlinear Optics, Quantum Optics, Nano Photonics and Bio Photonics. Research is organized in 3 major programs: Light for Health, Light for Energy and Light for Information.

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Employees:

ICFO currently hosts more than 250 researchers, including group leaders, post-doctoral researchers, PhD students and research engineers, organized in 20 research groups working in 60 state-of-the-art research laboratories, equipped with the latest experimental facilities and supported by a range of cutting-edge facilities for nanofabrication, characterization, imaging and engineering. The Institute is located in a specially designed, 14.000 m²-building situated in the Mediterranean Technology Park in the metropolitan area of Barcelona.

Infrastructure (from 100.000€):

The Nanophotonics Fabrication Laboratory (NPL) at ICFO is a transversal facility devoted to the fabrication and characterization of nanostructured photonic devices. This laboratory, which is open to users both within and outside ICFO, includes state of the art nanofabrication tools and techniques for a wide range of optical applications, ranging from biosensing to optical communications, and spanning a broad range of materials, including polymers, semiconductors, metals, or crystals, among others. All these tools and facilities are housed in a class-10000 clean-room environment. The laboratory also includes tools for advanced material and device characterization and is complemented by other transversal facilities like the Post-Processing Lab, the Chemical Lab, the Advanced Engineering Labs or the Super Resolution Light Nanoscopy and Microscopy Facility at ICFO. Available techniques at the NPL include:

- Optical lithography.
- Electron-beam lithography (2 systems, one of them with interferometric stage for large-field stitching).
- Focused Ion Beam.
- Atomic Layer Deposition.
- Inductively and Capacitively-coupled Plasma etching.
- Sputtering.
- Thermal and electron-beam evaporation. Ion-beam densification available as an option.
- Scanning electron microscopy. Energy-dispersive X-ray Spectroscopy (EDX) available as an option
- Spectroscopic ellipsometry
- Atomic force microscopy

Projects / Funding:

ICFO has been involved in a range of projects funded by the European Union such as SCALA, QAP, QUROPE, PLASMOCOM, ASPRINT, BIO-LIGHT_TOUCH, FASTDOT, MIRSURG, SPEDOC, NANOVIISTA, NANOMATCELL, etc. We have been partners in European networks like QGates, EMALI, COCOS, PHOREMOST, PLASMO-NANO-

DEVICES and projects supported by the European Space Agency. ICFO currently belongs to the European Networks of Excellence Photonics 4 Life Europe and Nanophotonics for Energy Efficiency, to the Integrated Infrastructure Initiative Laserlab Europe, to the European Nanophotonics Association, and to the Biophotonics4Life World Consortium. Today, ICFO hosts 11 ICREA Research professors, 8 European Research Council awardees and 5 Fundacio Cellex Barcelona Nest Fellows. ICFO researchers are recipients of many international high-profile science awards.

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INSTITUTE OF NANOSCIENCE OF ARAGON



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Summary: The Institute of Nanoscience of Aragon is an interdisciplinary research institute of the University of Zaragoza (Spain) created in 2003. **Its activity is focused on R+D in nanoscience and nanotechnology**, based on the processing and fabrication of structures at the nanoscale and the study of their applications, in collaboration with companies and technological institutes from different areas.

Opening date: May 2003

Activity Areas:

Nanobiomedicine

The Nanobiomedicine line covers different aspects of the fields of the diagnosis and therapy, which involve the use of nanostructured materials.

Nanomaterials for Biomedical Applications

- Inorganic Nanoparticles
- Organic Nanoparticles
- Nanostructures functionalization

Nanodiagnostics

- Magnetic Biosensors
- Optic Biosensors
- Contrast Agents for medical imaging

Nanotherapy

- Drug Delivery: (i) mobile vectors; (ii) fixed platforms; (iii) through biological structures (transfection, using Dendritic Cells)
- Hiperthermia

Nanotoxicity

- Biocompatibility
- Biodistribution
- Citotoxicity

From the research in this field the new Spin-off NanoScale Biomagnetics® (nB) has risen. It develops and commercializes technology and equipment for research in biomedicina. www.nbnanoscale.com

Also, a new Spin-off, Nanoimmunotech®. was created in 2010. www.nanoimmunotech.es

Nanostructured Materials

The aim of the Nanostructured Materials research line is to investigate and develop new materials and devices using “bottom-up” and “top-down” approaches with applications of interest. The main research topics in this line are related to the preparation and characterization of several nanostructures, as well as with applications development:

- Nanoporous Interphases: Microreactors and sensors
- Hybrid Membranes
- Carbon Nanotubes and Nanofibers
- Nanocomposites
- Organic and organic-inorganic hybrid Mono and Multilayers
- Organic Polymers for Optical Applications
- Safety in the handling of nanomaterials

Physics of Nanosystems

Physical and chemical properties of molecules & materials at the nanoscale

- Spintronics
- Magnetism in thin films
- Materials and molecules structure with STM, AFM, MFM, HRTEM, UHRTEM microscopy
- Optic and electronic Nanolithography
- Nanofabrication through “dual-beam”
- MEMs and NEMs (Micro and Nanoelectromechanical systems)
- Optical and Magnetic sensors
- XAFS spectroscopy quantum dots.

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Employees:

147 members, (60 researchers, 60 students, 27 technical and administration staff)

Infrastructure (from 100.000€):

The seven laboratories of INA are equipped with a state-of-the-art equipment.

- Local probe microscopy Lab.: Atomic Force Microscope (AFM), Dip-Pen, two Scanning Tunneling Microscopes (STM)
- Electronic microscopy Lab.: 4 Electronic Transmission Microscopes: TEM 200kW, High Resolution TEM (HRTEM) 300kW, Ultra High Resolution TEM (UHRTEM) 300kW with probe-spherical aberration corrected and UHRTEM 300kW with image objective-spherical aberration corrected). Two Scanning Electron Microscopes (SEM)
- Thin films growth Lab.: Equipment for Pulsed Laser Deposition - Magnetron Sputtering (plasma PLD-Sputtering), and another Pulsed Laser Deposition. Molecular Beam Epitaxis (MBE)
- Optical and electronic nanolithography Lab. Clean room 100 m² class 10000 and 25m² class 100.: Electronic Nanolithography with Dual Beam (Nanolab)
- Characterization of nanostructures Lab.: X-Ray Photoelectron Spectroscopy and Auger Electron Spectroscopy (XPS-Auger), X-Ray Diffraction (XRD)
- Synthesis and functionalization of nanosystems Lab.
- Biomedical applications Lab.

Projects / Funding:

- Leader: J. Santamaria, TITLE:"Microwave-assisted microreactors: development of a highly efficient gas phase contactor with direct catalyst heating (HECTOR)", Funded by: European Research Council Advanced Grant.
- Leader: M. Ricardo Ibarra, TITLE: "Transpyrenees Action on Advanced Infraestructures for Nanoscience and Nanotechnologies (TRAIN2), Funded by: EU, Sudoe.
- Leader: J. Martínez de la Fuente, TITLE "Multifunctional Magnetic Nanoparticles: Towards Smart Drugs Design", Funded by: European Research Council, Starting Grant

Budget 2011: The annual budget in 2011 was ~8 M€ from research projects won in public competition plus also the annual budget given by the Aragon Government.

Centro Andaluz de Nanomedicina y Biotecnología / Andalusian Center for Nanomedicine & Biotechnology (BIONAND)



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Summary: The Andalusian Center for Nanomedicine and Biotechnology Centre (BIONAND) is conceived as a multidisciplinary space designed for fostering and promoting cutting-edge research in the field of nanobiotechnology applied to human diseases. The centre is a joint initiative of the Regional Ministry of Economy, Innovation, Science and Employment of Andalusia, the Regional Ministry of Health of Andalusia, the University of Malaga and the Mediterranean Institute for the Advancement of Biotechnology and Health Research (IMABIS). BIONAND is the first Spanish nanotechnology research centre entirely focused on nanomedicine. BIONAND is born to be the Spanish Nanomedicine reference centre.

Opening date: September 2011

Activity Areas:

Nanodiagnostic area

This area is focused around the implementation of more efficient diagnostic and prognosis devices, both **in vivo** and **in vitro**, with the objective of optimizing the

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identification of diseases or predisposition to them, as well as its progression at a cellular or molecular level by using nanodevices.

Therapeutic Nanosystems area

This area will focus on the development and research of nanosystems which protect, transport and release drugs or therapeutic agents by a controlled method leading to an easier administration, being more selective and effective, and therefore less toxic.

Nanobiotechnology area

This area will focus on both basic nanotechnology knowledge research, as well as applied research, leading to the development of new approaches that can be exploited by the two previous areas.

Employees:

Current Staff: Researchers (28), Specialist Technicians (4), Management Staff (5).

Expected at full operative: Researchers (150), Specialist Technicians (6), Management Staff (7)

Infrastructure (from 100.000€):

Nanoimaging Unit: composed of different equipment for imaging, both *in vitro* and *in vivo*. From which the following can be noted: fluorescence/confocal microscopy (Leica SP5 HyD confocal, Leica SP5 HyD Multiphoton, Nikon N-Storm super-resolution, Nikon Eclipse Ti Nikon TIRF), transmission/scanning electron microscopy (**FEI Quanta FEG 250 and FEI Tecnai G² 20 Twin**), Cryo-TEM and sample preparation through Cryo-Immobilization, Magnetic Resonance Imaging (Bruker **Biospec™ 94/20**), High Resolution NMR (**Bruker ASCENDTM 400 MHz, Bruker AVANCETM III600 MHz, High Resolution Magic Angle Spinning HR-MAS probe**), Whole animal intravital multi-modal imaging (**Carestream Xtreme and Albira**).

Cell/Tissue Culture Unit: unit provided with the equipment (cabins, liquid nitrogen containers, inverted microscopes, etc.), from which the following can be noted: Equipment for High Content Screening (Perkin Elmer Operetta).

Flow Cytometry Unit: Unit equipped with Flow Cytometer Beckman Coulter Gallios and Cell Sorter MoFlo XDP

Histology and Immunohistochemistry Unit: Unit equipped with Exakt 310 Cutting System, Tissue Processor LeicaTP1020 and Rotary Microtome Microm HM 360.

Animal facility: this unit will accommodate laboratory animals required to carry out pre-clinical trials regarding technologies and products developed in the centre.

Biological and Chemical Analysis Unit

Biological Sample Preparation/Imaging Processing Room

Projects / Funding:

The construction of the Andalusian Centre for Nanomedicine and Biotechnology BIONAND has been co-financed, with a distribution of 70% of the total cost, by the European Fund of Regional Development (EFRD) together with the Ministry of Science and Innovation in the frame of the Spanish National Plan for Scientific Research, Development and Technological Innovation 2008-2011 (IMBS10-1C-247, quantity: 4.979.567,61€).

The equipment of the NanoImaging Unit has been co-financed by the European Fund of Regional Development (EFRD) together with the Ministry of Science and Innovation in the frame of the Spanish National Plan for Scientific Research, Development and Technological Innovation 2008-2011 (PCT-420000-2010-003, quantity: 4.305.000€).

The equipment of the Research Support Units has been co-financed by the European Fund of Regional Development (EFRD) together with the Ministry of Science and Innovation in the frame of the Spanish National Plan for Scientific Research, Development and Technological Innovation 2008-2011 (INP-2011-0023, quantity: 2.424.447€).

As Bionand was not officially opened until September 2011, no research projects were funded before this date.

Budget 2011: This information is subject to the Spanish Legislation on Privacy (Ley Orgánica 15/99-LOPD) and could not be provided.

International Iberian Nanotechnology Laboratory



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Summary: The International Iberian Nanotechnology Laboratory (INL) is an International Intergovernmental research organisation (IGO) located in Braga, Northern Portugal. The joint research facility, created by governments of Portugal and Spain, is dedicated to foster Nanotechnology and Nanosciences.

INL provides a state-of-the-art research environment and favours an interdisciplinary effort in addressing major challenges in nanomedicine, nanotechnology applied to environmental & food control, nanoelectronics, and nanomachines and molecular manipulation at nanoscale.

Opening date: Fully operational since March 2011
Full capacity expected to be attained in 2014/15.

Activity Areas:

Nanomedicine

Drug Delivery systems, molecular diagnosis systems and chips, cell therapy, imaging solutions, regenerative materials, biomolecular labels, synaptic process monitoring, tissue engineering, etc.

Environmental and Food Control

Nanotechnology applied to food industry, food safety and environmental control. Water and soil control, air pollution monitoring, artificial nanopore sensors, lab-on-a-chip technologies, smart packaging and labels, food control process, biosensing technologies.

Nanoelectronics

NEMS/MEMS, Spintronics, Nanophotonics, Nanofluidics, Molecular electronics, Organic electronics, and other nanotechnologies for building nanodevices and system platforms to support the previous research areas

Nanomanipulation

Single molecule/atom manipulation, molecular motors, nanotweezers, Self assembly controlled processes of building blocks for nanodevices

Employees:

Researchers (45), technicians (7), administration (13), PhD students (9)

At maximum capacity 400 (200 doctoral researchers, 100 PhD students and 100 for administrative and technical support)

Infrastructure (from 100.000€):

Central micro and nanofabrication cleanroom, (class 100 and 1000) with a 400m² useful area, expandable to 600m². The gross cleanroom area (bay and chase) comprises 1100 m². The cleanroom offers Micro-and Nanofabrication solutions for 200 mm wafers down to small-sized sample pieces.

Biology and Biochemistry

- Spectral ellipsometry
- PDMS and SU8 processing
- Contact angle measurement
- Microspotter

Analytical characterization

- 4 point Resistivity mapping
- profilometer
- Mapping interferometer

RIE/Films Deposition

- Multi-Target PVD cluster tool for 200mm wafers (Singulus Timaris)
- Metallization tool, Singulus 4 module + soft etch
- PECVD for SiO₂ and SiN_x (STS MPX)
- Ion Milling System with SIMS (NORDIKO TECH)
- RIE for SiO₂ and SiN_x, STS LPX (ICP)
- RIE for Al and other metals, STS LPX (ICP)
- Deep-Silicon Etching System, STS Pegasus

Wet Process

- Wet Benches and Fume-hoods for wet nanofabrication process

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Hot processes + planarization

- Chemical Mechanical Planarization
- CNT CVD tool

Photolithography

- Direct Laser Writer Lithography (DWL 2000)
- UV Mask and Bond Aligner (KS MAB6)
- Coat/Develop Track for Optical Resist (KS 200mm)
- HMDS Priming and Image Reversal Oven

Nanolithography

- E-beam Lithography System (VISTEC 5200 ES+, 100 kV)
- Coat/Develop Track for e-beam resist (KS 200mm, serynges)
- Scanning Electronic Microscope (FEI NanoSEM 1.4nm at 1kV)

Central Biology and Biochemistry laboratory, this facility provides support for groups developing research in these areas, including specific facilities for Molecular Biology and Microbiology. The list of equipment includes:

- Equipment for FPLC/HPLC protein purification
- Life Science Microscope
- Spectrophotometry, mass spectrography with gas chromatography, flow cytochemistry and cell sorting
- Real-time PCR
- Confocal microscopy and centrifugation (ultra and low-speed) and cell culture
- Gel Imaging System
- Dynamic Light Scattering
- UV VIS spectrophotometer

High Accuracy Laboratories, allow in-house detailed structural characterisation of thin films, interfaces and nanostructures. Detailed equipment includes:

- Dual FIB with UHRSEM
- 200 kV probe corrected analytical TEM/STEM
- Environmental SEM
- X-Ray Photoelectron Spectroscopy (organic and inorganic surface analysis)
- X-Ray Diffractometers (Thin films and SAXS)
- Scanning Probe Microscope Systems (BIO on inverted microscope and Materials)
- 300 kV image corrected TEM/STEM (expected for 2nd semester 2013)

40 Wet and Dry Laboratories, available for PIs and their research teams to install and use equipment for synthesis, catalysis, and other wet chemistry experiments. Dry Labs are laboratories also available for PIs and their research teams to install and use

equipment for characterization and dry experiment techniques.

Projects / Funding:

- Title: Novel Nano enabled Energy Efficient and safe HVAC ducts and systems contributing to indoor healthier environment.

Objectives: The NANO-HVAC project concept aims at developing an innovative approach for ducts insulation while introducing new cleaning and maintenance technologies, all enabled by cost-effective application of nanotechnology. (Call: FP7 EeB.NMP.2012-4).

- Title: Spin Currents

Objectives: Spin Currents is a training network of European experts dedicated to providing state-of-the-art education and training for early stage and experienced researchers. The consortium will be concentrated on an aspect of spintronics – pure spin currents – and specific technical goals in order to secure a very high level of industrial involvement and strong network connectivity. (Call: FP7-PEOPLE-2012-ITN)

- Title: Creation of a Competitiveness Pole in Nanotechnology for the capitalization of R&D potential in North of Portugal-Galicia Euroregion.

Objectives: Promote collaboration between public and private sector (e.g. universities, research centres and industry) to enhance the valorisation and commercialization of nanotechnology RTD activities. (Call:POCTEP, 2010).

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Valencia Nanophotonics Technology Center



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To be updated soon.

Centro de Investigación en Nanomateriales y Nanotecnología - Nanomaterials and Nanotechnology Research Center (CINN)



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Summary: The Nanomaterials and Nanotechnology Research Center (CINN) is a joint research center created in 2007 by institutional joint initiative between the Spanish Council for Scientific Research (CSIC), the Government of Asturias and the University of Oviedo. The CINN combines interdisciplinary research strongly competitive at international level with scientific and technological demonstration activities towards enterprises technologically advanced, and has among its main objectives the creation of new technology-based firms.

Opening date: November 2007

Activity Areas:

The Nanomaterials and Nanotechnology Research Center is focused on one research line so called "Controlled Design of Multifunctional Multiscaled Materials" which comprises three research sublines:

- Modelling and Simulation
- Nanostructured Hybrid Systems
- Synthesis and Advanced Characterization of Nanocomposites and Bioinspired Materials

NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

Emerging N&N Centers in Spain

Employees:

Personnel (currently): 47

Hired: 16, Training: 11 and Civil Servant: 20

Infrastructure (from 100.000€):

- Atomic Force Microscopy/ Scanning Tunneling Microscopy
- Electron Beam Lithography
- Single Crystal and Powder X-Ray Diffractometry
- Nanoindentator Hysitron - TriboLab™
- Chemical Vapor Deposition (CVD) / Physical Vapor Deposition (PVD)
- Cryogenic dilatometer
- Spark Plasma Sintering
- Hybrid Hot Press and Spark Plasma Sintering system
- Optical Laboratory (Holography)
- Elipsometer
- Hot Isostatic Press
- Kerr Effect Microscope

Projects / Funding

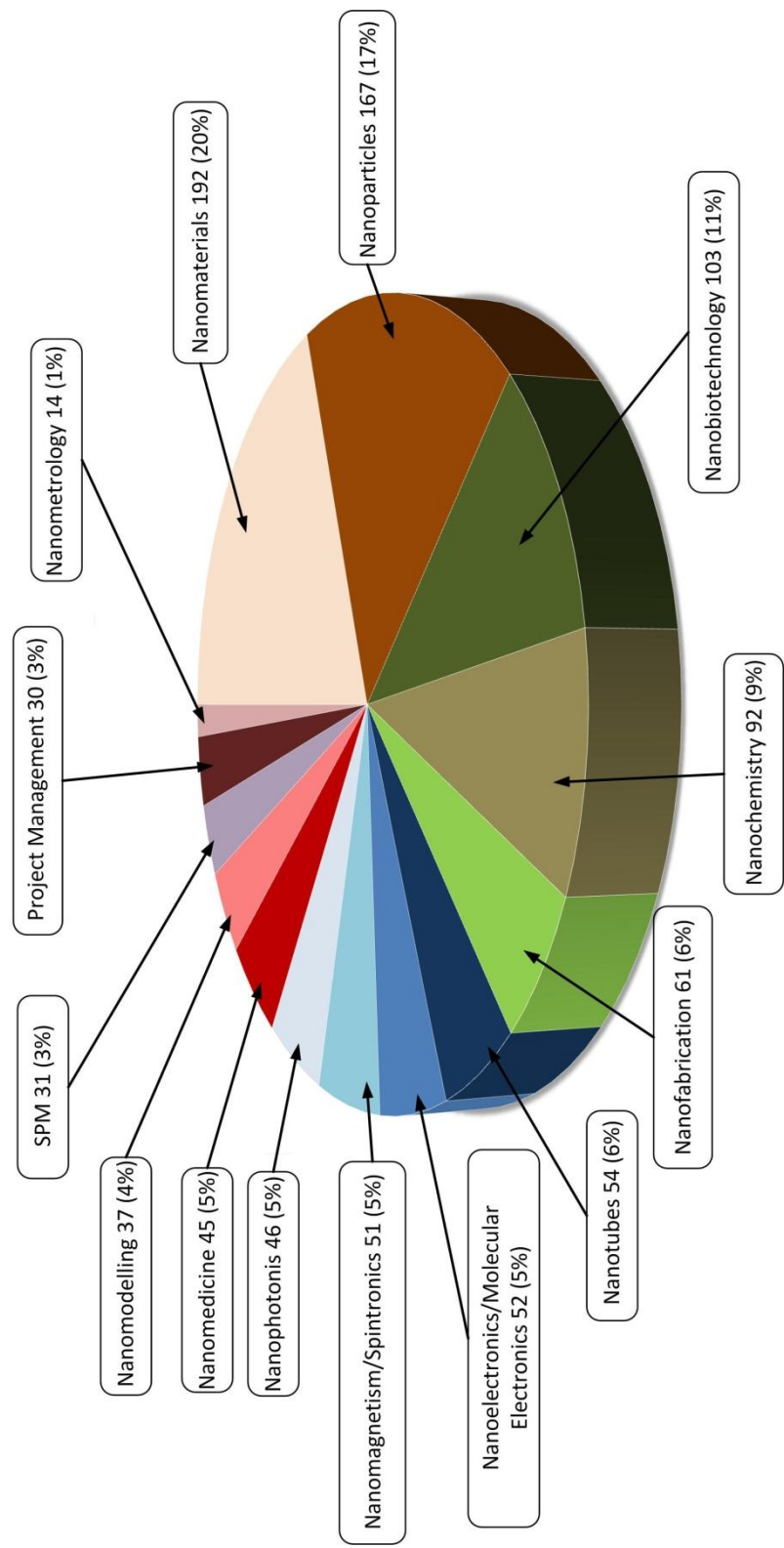
- Stand-alone lighting personal system (SPIA). Spanish Ministry of Science and Innovation. INNPACTO Subprogramme, and co-funded by the European Regional Development Fund (ERDF). Total Budget: 1.438.261,73 €.
- Nanotechnology for Market (nano4m). European Union. INTERREG IVC. Total Budget: 1.845.892 €
- Structural Ceramic Nanocomposites for top-end Functional Applications (IP NANOKER). European Union. Sixth Framework Programme. Total Budget: 18.428.407 €.

Annex I: NanoSpain Network

- Research Topics
- Regional distribution of research groups
- Members List
- Total Personnel R&D at The NanoSpain Network

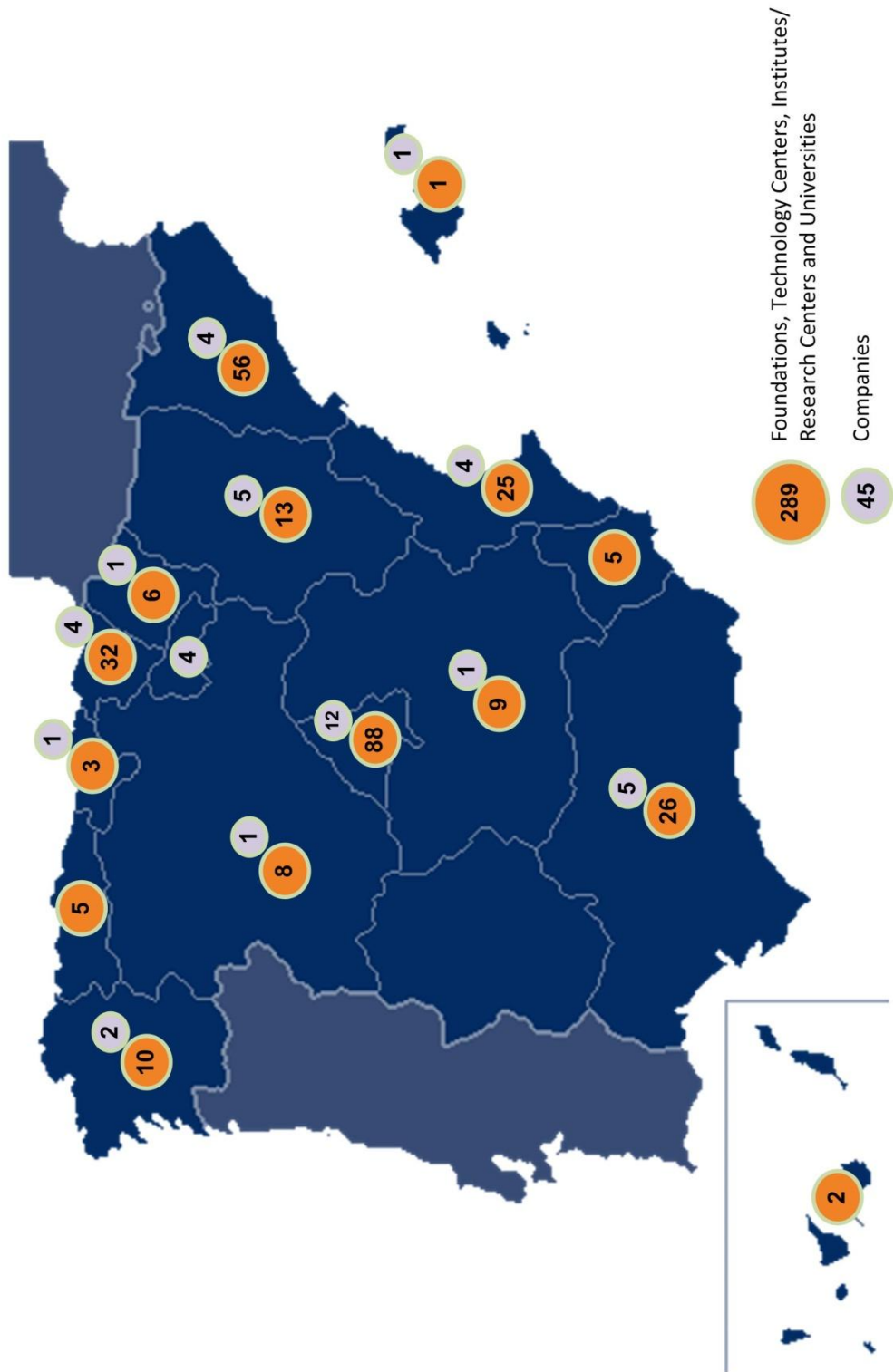
Annex I: NanoSpain Network

Number of NanoSpain Groups per research topic and %
 (Groups might work on different topics, and might have between 2 and 80 workers)



Regional Distribution of research groups NanoSpain Network

(Total: 334 groups - as of July 03, 2012)



- Members List (as of July, 2012) - 334 groups

Institution	Department	Contact Person Email
Intenanomat S.L.	Intenanomat R&D	ABARGUES LOPEZ, Rafael Rafael.Abargues@intenanomat.es
Instituto de Óptica	Fotónica y Nanociencia / Óptica Ultrarápida y No Lineal	AFONSO, Carmen N. cnafonso@io.cfmac.csic.es
Universidad Autonoma de Madrid	Física de la Materia Condensada	AGRAÏT, Nicolás nicolas.agrait@uam.es
Instituto de Ciencia de Materiales de Madrid-CSIC	Teoría de la Materia Condensada	AGUADO SOLA, Ramón raguado@icmm.csic.es
Materials Science Institute of Madrid - CSIC	Optical, Magnetic and Transport Properties	AGULLO RUEDA, Fernando far@icmm.csic.es
MECWINS, S.L.	MECWINS, S.L.	AHUMADA, Oscar mcalleja@imm.cnm.csic.es
Universidad de Oviedo	Facultad de Ciencias Departamento de Física	ALAMEDA, Jose Maria alameda@string1.ciencias.uniovi.es
Instituto de Ciencia de Materiales de Madrid - CSIC	Nanoestructuras, Superficies y Recubrimientos	ALBELLA MARTIN, Jose Maria jmalbella@icmm.csic.es
University Complutense of Madrid	School of Optics	ALDA, Javier j.alda@opt.ucm.es
Universidad Autónoma de Madrid	Dpto Fisica Materia Condensada C03	ALIEV, Farkhad farkhad.aliev@uam.es
Centro Mixto CSIC-UPV Facultad de Ciencia y Tecnología	Dept. Bioquímica y Biología Molecular; Unidad de Biofísica	ALKORTA CALVO, Itziar itzi.alkorta@ehu.es
Universidad de Salamanca Facultad de Ciencias Químicas	Departamento de Química Analítica, Nutrición y Bromatología	ALMENDRAL PARRA, María Jesús almendral@usal.es
Universidad de Santiago de Compostela	Facultad de Farmacia - Tecnología Farmacéutica	ALONSO FERNANDEZ, Maria José mariaj.alonso@usc.es
Universidad de Valladolid	Departamento de Física Teórica, Atómica y Óptica	ALONSO MARTIN, Julio Alfonso jaalonso@fta.uva.es
Instituto de Ciencia de Materiales de Madrid - CSIC	Intercaras y Crecimiento	ALONSO PRIETO, María malonso@icmm.csic.es
University of Valladolid	Chemical Engineering Department	ALONSO SANCHEZ, Esther ealonso@iq.uva.es
Instituto de Geología Económica (CSIC-UCM)	Institute of Economic Geology Petrología-Petrology	ÁLVAREZ DE BUERGO BALLESTER, Monica alvarezm@geo.ucm.es
Universidad de Santiago de Compostela Facultad de Farmacia	Farmacia y Tecnología Farmacéutica	ALVAREZ LORENZO, Carmen carmen.alvarez.lorenzo@usc.es
LEITAT	Nanotecnologia	AMANTIA, David damantia@leitat.org
Mondragon Goi-Eskola Politeknikoa (MGEP)	Departamento de Mecánica	AROSTEGI, Asier aarostegui@eps.mondragon.edu
Universidad Pública de Navarra	Ingeniería Eléctrica y Electrónica	ARREGUI SAN MARTIN, Fco. Javier parregui@unavarra.es

Annex I: NanoSpain Network

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Universidad del Pais Vasco - POLYMAT	Institute for Polymer Materials	ASUA GONZALEZ, Jose M. jmasua@sq.ehu.es
ITENE	Packaging, Transport and Logistics Research Institute	AUCEJO, Susana saucejo@itene.com
Universidad Autónoma de Barcelona	Ingeniería Electrónica	AYMERICH, Xavier xavier.aymerich@uab.es
TEKNIKER	Fundación Tekniker	AZCARATE LETURIA, Sabino sazcarate@tekniker.es
Centre Investigacions Nanociencia Nanotecnologia (CSIC-ICN) Barcelona	Quantum Nanoelectronics Group	BACHTOLD, Adrian adrian.bachtold@cin2.es
ICFO-Institut de Ciències Fotòniques	Nanophotonics	BADENES, Goncal goncal.badenes@icfo.es
Instituto de Catálisis y Petroleoquímica - CSIC	Estructura y Reactividad	BAÑARES, Miguel A. banares@icp.csic.es
Universidad de Barcelona	Facultad de Fisica, Depto. ECM	BARBERAN, Nuria nuri@ecm.ub.es
Universidad Autónoma de Barcelona	Ingeniería Electrónica Escuela Técnica Superior de Ingeniería	BARNIOL BEUMALA, Nuria Nuria.Barniol@uab.es
Universidad Autónoma de Barcelona	Ciencias Físicas	BARÓ MARINÉ, Dolors dolors.baro@uab.es
Instituto de Ciencia de Materiales de Madrid	Surfaces and Coatings	BARO VIDAL, Arturo abaro@icmm.csic.es
Consejo Superior de Investigaciones Científicas- Universidad de Zaragoza	Departamento V, Física de Bajas Temperaturas	BARTOLOMÉ SANJOAQUIN, Juan barto@unizar.es
Nanotec Red S.L.		BEIBE, Ernesto pablo.beibe@nanotecred.com
Universidad Complutense de Madrid	OPTICA - CAI FISICAS - UCM	BERNABEU, Eusebio ebernabeu@fis.ucm.es
Barcelona University	IN2UB (Institute of Nanoscience & Nanotechnology of the University of Barcelona)	BERTRAN, Enric ebertran@ub.edu
Universitat Jaume I	Física ESTCE	BISQUERT MASCARELL, Juan bisquert@fca.uji.es
Airbus España	Materiales Compuestos - EDSWCM	BLANCO VARELA, Tamara tamara.blanco@airbus.com
Instituto Ciencias Marinas Andalucía	Ecology and Coastal Ecosystems	BLASCO MORENO, Julian julian.blasco@icman.csic.es
Universidad Complutense de Madrid	Ciencia de Materiales e Ingeniería Metalúrgica	BLAZQUEZ IZQUIERDO, M ^a Luisa mlblazqu@quim.ucm.es
Soluciones Medioambientales y Agroalimentarias (EKOTEK / INKOA)	RTD	BLAZQUEZ SANCHEZ, María maria@inkoa.com
CAPHER IDI S.L	I+D	BONEL SANMARTÍN, Laura lbonel@capher.es

NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

Annex I: NanoSpain Network

Institution	Department	Contact Person Email
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Instituto de Microelectrónica de Madrid - CSIC	Fabricación y caracterización de nanoestructuras Instituto de Microelectrónica de Madrid-IMM	BRIONES, Fernando briones@imm.cnm.csic.es
Universidad Autónoma de Madrid	Facultad de Ciencias. Depto. de Química Orgánica	BRUNET ROMERO, Ernesto ernesto.brunet@uam.es
Universitat Jaume I	Departament d'Enginyeria de Sistemes Industrials i Disseny	CABEDO MAS, Luis lcabedo@esid.uji.es
Universidad Politécnica de Madrid	Ingeniería Electrónica E.T.S. Ingenieros de Telecomunicación	CALLEJA PARDO, Enrique calleja@die.upm.es
Universidad Autónoma de Madrid	Facultad de Ciencias. Física de Materiales	CALLEJA, J.M. jose.calleja@uam.es
Universidad de Alicante, Instituto Universitario de Materiales,	Facultad de Ciencias. Química Analítica, Nutrición y Bromatología	CANALS HERNANDEZ, Antonio a.canals@ua.es
Universidad de Valencia	Instituto de Ciencia de Materiales	CANTARERO SAEZ, Andres andres.cantarero@uv.es
Universidad del País Vasco	Química Física	CASTAÑO ALMENDRAL, Fernando f.castano@ehu.es
Instituto de Química Física Rocasolano - CSIC	Laser Chemistry	CASTILLEJO STRIANO, Marta marta.castillejo@iqfr.csic.es
Environmental Sciences Institute. University of Zaragoza	Chemical Sciences and Technology	CASTILLO, Juan R. jcastilo@unizar.es
Consejo Superior de Investigaciones Científicas	Fabricación y Caracterización de Nanoestructuras, Instituto de Microelectrónica de Madrid	CEBOLLADA, Alfonso alfonso@imm.cnm.csic.es
Instituto de Ciencia de Materiales de Madrid - CSIC	Departamento de Teoría y Simulación de Materiales	CHICO GÓMEZ, Leonor leonor.chico@icmm.csic.es
Universidade de Vigo	Física Aplicada, E.T.S.I. Industriales	CHIUSI, Stefano schiussi@uvigo.es
Universidad de Murcia	Departamento de Física	COLCHERO PAETZ, Jaime colchero@um.es
Universidad de Castilla- La Mancha	Física Aplicada	COLINO GARCÍA, Jose M. JoseMiguel.Colino@uclm.es
Parc Científic de Barcelona y Universitat de Barcelona	Centre de Recerca en Toxicologia	COLOMA IBARZ, Alce acoloma@pcb.ub.cat
Torrecid S.A.	Innovacion	CONCEPCION, Carlos intec@torrecid.com
Consejo Superior de Investigaciones Científicas	Catálisis Aplicada, Instituto de Catálisis y Petroleoquímica	CONESA, José C. jconesa@icp.csic.es
Universidad de Valencia	Instituto de Ciencia Molecular de la Universidad de Valencia (ICMol)	CORONADO MIRALLES, Eugenio eugenio.coronado@uv.es
Instituto de Nanociencia de Aragón	Ingeniería Química y Tecnologías del Medio Ambiente	CORONAS CERESUELA, Joaquín coronas@unizar.es
Phantoms Foundation		CORREIA, Antonio antonio@phantomsnet.net

Annex I: NanoSpain Network

Institution	Department	Contact Person Email
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Instituto Tecnológico de Aragón	Área de Investigación, Desarrollo y Servicios Tecnológicos	CRESPO MIÑANA, Cristina ccrespo@ita.es
Escuela Universitaria Politécnica, Universidad de Castilla - La Mancha	Mecánica Aplicada e Ingeniería de Proyectos	CUBERES MONTSERRAT , M ^a Teresa teresa.cuberes@uclm.es
Dynasol	Marketing (New developments & Applications)	CUERVO RAMIREZ, Jose M. jmcuervor.dynasol@repsol.com
GAIKER Centro Tecnológico		CUEVAS ZARRAGA, Jose María cuevas@gaiker.es
Universidad Carlos III de Madrid	Departamento de Física, Escuela Politécnica Superior	DE LA CRUZ, Rosa M ^a rmc@fis.uc3m.es
Instituto de QUÍMICA-FÍSICA "ROCASOLANO" (IQFR) - CSIC	Dpto. de sistemas de baja dimensionalidad, superficies y materia condensada	DE LA FIGUERA, Juan juan.delafiguera@iqfr.csic.es
University of Zaragoza	Instituto de Nanociencia de Aragón	DE LA FUENTE, Jesús M. jmfuente@unizar.es
Asociación para la Investigación y Desarrollo AITEMIN	Medio Ambiente e Hidrogeología	DEL REINO QUERENCIA, Susana susana.del.reino@aitemin.es
Universidad de Barcelona	Unidad de Técnicas NanoSPM	DIAZ MARCOS, Jordi jdiaz@ccit.ub.edu
School of Telecommunication Engineering	Information Technology and Communications	DIAZ MORCILLO, Alejandro alejandro.diaz@upct.es
University Rovira i Virgili	Centro de investigación en Ingeniería de materiales y Micro/Nano sistemas	DIAZ, Francesc f.diaz@urv.cat
Universidad de Oviedo, Faculty of Chemistry	Department of Physical and Analytical Chemistry	DIAZ-GARCIA, Marta Elena medg@uniovi.es
Universidad de Valladolid	Instituto Universitario de Oftalmobiología Aplicada (IOBA)	DIEBOLD LUQUE, Yolanda yol@ioba.med.uva.es
Universidad de Granada	Química Orgánica	DOBADO, José Antonio dobado@ugr.es
Universidad de Sevilla	Física de la Materia Condensada, Facultad de Física	DOMIGUEZ RODRIGUEZ, Arturo adorod@us.es
Universidad de Granada	Química Inorgánica	DOMINGUEZ VERA, José M. josema@ugr.es
Universidad de Castilla La Mancha	Química Física - Facultad del Medio Ambiente	DOUHAL ALAUI, Abderrazzak abderrazzak.douhal@uclm.es
Donostia International Physics Center (DIPC) & Centro de Física de Materiales CSIC-UPV/EHU	DIPC, Dep. de Física de Materiales y Centro de Física de Materiales	ECHENIQUE LANDIRIBAR, Pedro wapetlap@sq.ehu.es
Universidad de Salamanca	Facultad de Ciencias Químicas Dpto. de Ing. Química y Textil	EDMOND REIS DA SILVA , Paulo Aloisio pauloaugusto@usal.es
Polymat	Processing and mechanical characterization	EGUIAZABAL, José Ignacio josei.eguiazabal@ehu.es

Annex I: NanoSpain Network

Institution	Department	Contact Person Email
Asoc. Investigación Industria Agroalimentaria	Tecnologías del Envase	ENGUIX NICOLÁS, Carlos cenguix@ainia.es
IRB Barcelona, IQAC - CSIC	Química y Farmacología Molecular	ERITJA CASADELLA, Ramón recgma@cid.csic.es
Instituto de Estructura de la Materia - CSIC	Macromolecular Physics	EZQUERRA SANZ, Tiberio imte155@iem.cfmac.csic.es
CENTRO TECNOLÓGICO L'UREDERRA	CENTRO TECNOLÓGICO L'UREDERRA	FERNANDEZ ACEVEDO, Claudio claudio.fernandez@lurederra.es
Universidad de Sevilla	Facultad de Farmacia. Farmacia y Tecnología Farmacéutica	FERNANDEZ AREVALO, Mercedes mfarevalo@us.es
Universidad de Cantabria	CITIMAC	FERNANDEZ BARQUIN, Luis barquinl@unican.es
Instituto de Ciencia de Materiales de Sevilla - CSIC	Superficies e Interfases	FERNANDEZ CAMACHO, M ^a Asunción asuncion@icmse.csic.es
Instituto de Catálisis y Petroleoquímica - CSIC		FERNANDEZ GARCIA, Marcos mfg@icp.csic.es
Universidad País Vasco	Facultad de Ciencia y Tecnología Electricidad y Electrónica	FERNANDEZ GUBIEDA, M ^a Luisa malu@we.lc.ehu.es
Universidad Autónoma de Madrid	Faculty of Sciences. Biology	FERNANDEZ PIÑAS, Francisca francisca.pina@uam.es
FIDAMC		FERNANDEZ SANCHEZ, Francisco Jose Fco.Fernandez@fidamc.es
DOLMAR S.L.	CEAD	FERNANDEZ SOTO, Mariano mariano@dolmar.es
Institute of Catalysis - CSIC	Biocatálisis, Catálisis	FERNANDEZ, Victor M. vmfernandez@icp.csic.es
Universidad de Oviedo	Facultad de Ciencias. Física	FERRER RODRIGUEZ, Jaime ferrer@condmat01.geol.uniovi.es
Nanoinnova Technologies S.L.		FERRITO, Rafael rafa@nanoinnova.com
ITENE- I.Tecnologico, Embalaje, Transporte y Logística	Seguridad	FITO LÓPEZ, Carlos cfito@itene.com
Universidad de Alcalá	Facultad de Química. Química Inorgánica	FLORES, Juan Carlos juanc.flores@uah.es
Repsol YPF - Technology Centre	E&P and Polymers	FRAGA TRILLO, Luisa Maria lmfragat@repsol.com
Centre d' Investigació en Nanociència i Nanotecnologia	Small Molecules on surfaces in ambient and pristine conditions	FRAXEDAS CALDUCH, Jordi jordi.fraxedas@cin2.es
Instituto Nacional del Carbón - CSIC	Materiales porosos funcionales	FUERTES, Antonio B. abefu@incar.csic.es
Yflow Sistemas y Desarrollos S.L.		GALAN, David davidgalan@yflow.com
Universidad de Cádiz Escuela Superior de Ingeniería	Lenguajes y Sistemas Informáticos	GALINDO RIAÑO, Pedro L. pedro.galindo@uca.es
INAEL Electrical Systems	Investigación, Innovación y Nuevas Áreas de Negocio	GALLEGO GÓMEZ, Beatriz bgallego@inael.com

Annex I: NanoSpain Network

Institution	Department	Contact Person Email
Catalan Institute of Nanotechnology	Atomic Manipulation and Spectroscopy Group	GAMBARDELLA, Pietro pietro.gambardella.icn@uab.es
Universidad de Granada	Electrónica y Tecnología de Computadores	GAMIZ, Francisco fgamiz@ugr.es
Universidad de Valencia	Fac. Ciències Biològiques. Biología Funcional i Antropologia Física	GARCERÁ ZAMORANO, M ^a Dolores maria.d.garcera@uv.es
Instituto de Carboquímica - CSIC	Proc. Químicos y Nanotecnología	GARCIA BORDEJE, José Enrique jegarcia@icb.csic.es
Instituto de Óptica - CSIC	Nanophotonics Group	GARCIA DE ABAJO, F. Javier J.G.deAbajo@csic.es
Instituto de Microelectrónica de Madrid - CSIC	Fabricación y Caracterización de Nanoestructuras	GARCIA GARCIA, Ricardo rgarcia@imm.cnm.csic.es
Facultad de Ciencias - Universidad de Alicante	Química Inorgánica	GARCIA MARTINEZ, Javier j.garcia@ua.es
Agroindustrial Kimatec		GARCIA, Felix felixgarcia@kimatec.es
Universidad de Cádiz Hospital de Puerto Real	Facultad de Medicina Biomedicina, Biotecnología y Salud Pública	GARCIA-COZAR, Francisco curro.garcia@uca.es
Instituto de Estructura de la Materia (IEM)	Espectroscopía Vibracional y Procesos Multifotónicos	GARCIA-RAMOS, José V. imtg160@iem.cfmac.csic.es
SOLUTEX GC, S.L.		GARGALLO INSA, Sebastián sgargallo@enanotex.com
Nanotec Electronica S.L.	Nanotec Electronica	GIL, Adriana adriana.gil@nanotec.es
Sgenia	Tecnología	GIL, Isabel igil@sgenia.com
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AVANZARE Innovación Tecnológica S.L.	Dpto de Proyectos de I+D+I	GÓMEZ CORDON, Julio jgomez@avanzare.es
Universidad de Córdoba	Faculty of Sciences. Department of Analytical Chemistry	GÓMEZ HENS, Agustina qa1gohea@uco.es
Universidad Autónoma de Madrid	Física de la Materia Condensada	GÓMEZ RODRÍGUEZ, José María josem.gomez@uam.es
Instituto de Ciencia y Tecnología de Polímeros - CSIC	Polymer Physics and Engineering	GÓMEZ RODRÍGUEZ, Marián magomez@ictp.csic.es
Centro de Investigaciones en Nanociencia y Nanotecnología, CIN2 (CSIC-ICN)	NEOEnergy - Novel Energy Oriented Nanomaterials	GOMEZ ROMERO, Pedro pedro.gomez@cin2.es
NANORIOJA S.L.	I+D	GOMEZ, Javier info@nanorioja.es
Universidad Carlos III de Madrid Escuela Politécnica Superior	Ciencia e Ingeniería de Materiales e Ingeniería Química	GONZÁLEZ BENITO, Francisco Javier javid@ing.uc3m.es
Instituto de Ciencia de Materiales de Madrid - CSIC	Mat. nanoestructurados y superficies	GONZALEZ FERNANDEZ, Jesús M ^a jesus.m.gonzalez@icmm.csic.es
Lab Oficial de Metroloxía de Galicia	I+D	GONZALEZ JORGE, Higinio hgonzalez@lomg.net

NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

Annex I: NanoSpain Network

Institution	Department	Contact Person Email
University of Salamanca	Departamento de Física Aplicada	GONZALEZ SANCHEZ, Tomas tomasg@usal.es
Universidad del País Vasco	Física de Materiales	GONZALEZ, Julián wapgoesj@sc.ehu.es
Universidad Complutense de Madrid	Química Inorgánica	GONZALEZ-CALBET, José Maria jgcalbet@quim.ucm.es
Universidad de Vigo. Edificio de Ciencias Experimentales	Bioquímica, Genética e Inmunología	GONZÁLEZ-FERNÁNDEZ, África africa@uvigo.es
CIDETEC	Dpto. de Nuevos Materiales y Dpto. de Energía	GRANDE TELLERIA, Hans Jürgen jhgrande@cidetec.es
Universidad Autónoma de Madrid	Física Aplicada, Facultad de Ciencias	GUTIERREZ DELGADO, Alejandro a.gutierrez@uam.es
IMDEA Materials	Nano-Architectures and Materials Design	GUZMAN DE VILLORIA, Roberto roberto.guzman@imdea.org
Universitat Rovira i Virgili	ETSEQ	HENRY, Olivier olivier.henry@urv.cat
Universidad de Oviedo	Dpto. de Física, Facultad de Ciencias	HERNANDO GRANDE, Blanca grande@uniovi.es
Universidad Complutense de Madrid	Laboratorio Salvador Velayos	HERNANDO, Antonio antonio.hernando@adif.es
Centro Nacional de Investigaciones Cardiovasculares	Atherothrombosis and Imaging	HERRANZ RABANAL, Fernando fherranz@cnic.es
Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas	Combustibles Fósiles	HONTAÑÓN, Esther Esther.Hontanon@ciemat.es
Instituto de Nanociencia de Aragón (INA)	Physics of Nanosystems	IBARRA GARCIA, Manuel Ricardo ibarra@unizar.es
Universidad de Navarra	Farmacia y Tecnología Farmacéutica	IRACHE GARRETA, Juan Manuel jmirache@unav.es
Universidad de Sevilla	Faculty of Pharmacy. Nutrition and Bromatology, Toxicology and Legal Medicine	JOS, Angeles angelesjos@us.es
Universitat Rovira i Virgili	Departamento de Ingeniería Química	KATAKIS, Ioanis ikatakis@etseq.urv.es
Instituto de Investigaciones Químicas - CSIC	Química Bioorgánica	KHIAR EI WAHABI, Nouredine khiar@iiq.csic.es
Universidad de Barcelona	Física Fundamental, Facultad de Física	LABARTA RODRIGUEZ, Amílcar amilcar.labarta@ub.edu
Instituto de Agroquímica y Tecnología de Alimentos - CSIC	Conservación y calidad de los alimentos	LAGARON, Jose María lagaron@iata.csic.es
Instituto de Nanociencia, Nanotecnología y Materiales Moleculares - Universidad de Castilla-La Mancha	Química Inorgánica, Orgánica y Bioquímica	LANGA DE LA PUENTE, Fernando Fernando.LPuente@uclm.es
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Annex I: NanoSpain Network

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Research Center on Nanoscience and Nanotechnology (CIN2)	CSIC-ICN	LECHUGA, Laura llechuga@cin2.es
University of Vigo	Department of Physical Chemistry	LIZ-MARZÁN, Luis M. Lmarzan@uvigo.es
NLAB Bioscience	NLAB Bioscience	LLAUDET, Quique quique@nlabbioscience.com
Threellop Nanotechnology		LLOPIS LLOPIS, Silvia silvia.llopis@threellop.com
University of The Basque Country	Faculty of Science and Thecnology Department of Physical Chemistry	LOPEZ ARBEOLA, Iñigo iñigo.lopezarbeola@ehu.es
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NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

Annex I: NanoSpain Network

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Annex I: NanoSpain Network

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NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

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NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

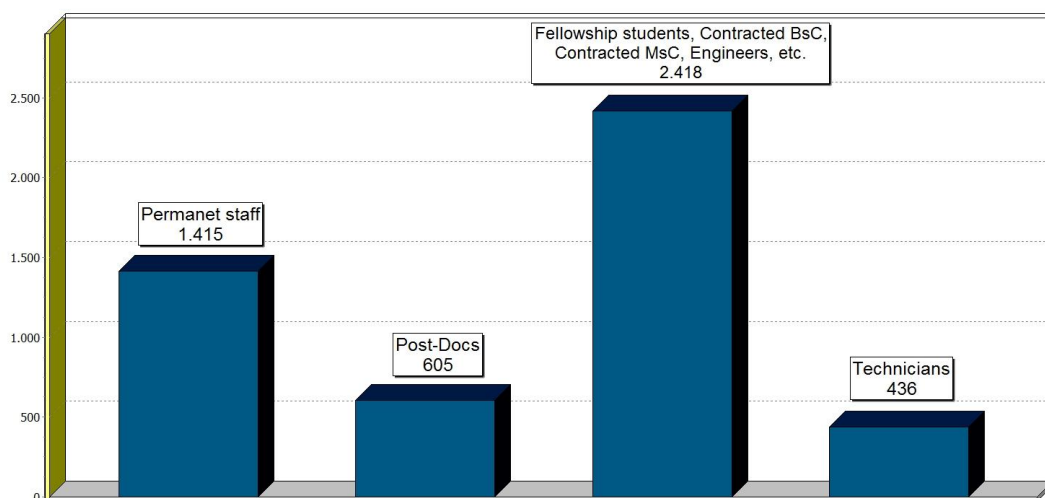
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This catalogue: (3rd version, updated July, 2012), compiled by the Phantoms Foundation (coordinator of the Spanish Nanotechnology action Plan funded by ICEX), provides a general overview of the Nanoscience and Nanotechnology companies (81) in Spain and in particular the importance of this market research, etc.

Note: only those contacted companies which provided their details are listed.



The Phantoms Foundation based in Madrid, Spain, focuses its activities on Nanoscience and Nanotechnology (N&N) and is now a key actor in structuring and fostering European Excellence and enhancing collaborations in these fields. The Phantoms Foundation, a non-profit organisation, gives high level management profile to National and European scientific projects (among others, the COST Bio-Inspired nanotechnologies, ICT-FET Integrated Project AtMol, ICT/FET nanoICT Coordination Action, EU/NMP nanomagma project, NanoCode project under the Programme Capacities, in the area Science in Society FP7...) and provides an innovative platform for dissemination, transfer and transformation of basic nanoscience knowledge, strengthening interdisciplinary research in nanoscience and nanotechnology and catalysing collaboration among international research groups.

The Foundation also works in close collaboration with Spanish and European Governmental Institutions to provide focused reports on N&N related research areas (infrastructure needs, emerging research, etc.).

The NanoSpain Network (coordinated by the Phantoms Foundation and the Spanish National Research Council, CSIC) scheme aims to promote Spanish science and research through a multi-national networking action and to stimulate commercial Nanotechnology applications. NanoSpain involves about 334 research groups and companies around 5000 researchers, technicians, etc.

The Phantoms Foundation is also coordinator of the Spanish Nanotechnology Plan funded by ICEX (Spanish Institute for Foreign Trade, www.icex.es) under the program España, Technology for Life, to enhance the promotion in foreign markets of Spain's more innovative and leading industrial technologies and products in order to:

1. Represent the scientific, technological and innovative agents of the country as a whole.
2. Foster relationships with other markets/countries.
3. Promote country culture of innovation.
4. Better integrate the Spanish "Science - Technology - Company - Society" system in other countries.
5. Generate and develop scientific and technological knowledge.
6. Improve competitiveness and contribute to the economic and social development of Spain.



The Spanish Institute for Foreign Trade ("Instituto Español de Comercio Exterior") is the Spanish Government agency serving Spanish companies to promote their exports and facilitate their international expansion, assisted by the network of Spanish Embassy's Economic and Commercial Offices and, within Spain, by the Regional and Territorial Offices. It is part of the Spanish Ministry of Economy and Competitiveness ("Ministerio de Economía y Competitividad")

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NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

Annex IV: Spain Nanotechnology Companies (Catalogue)

COMPANIES (81)

as of July, 2012

	Carbon nanofibres	Drug delivery	Encapsulation	Energy	Graphene	Manufacturing	Microsensors	Microwires / Nanowires	Modelling/Simulation/Software	NanoBio	Nanochemistry	Nanoclays	Nanocoating	Nanocomposites	Nanoelec. / Molecular Electr.	Nanofabrication	Nanomagnetism / Spintronics	Nanomaterials	Nanomedicine	Nanometrology	Nanophotonics	Nanoparticles	Nanosensors	Nanotoxicology	Nanotubes	Project Management	SPM
3P BIOPHARMACEUTICALS S.L.																			■								
ACCIONA INFRAESTRUCTURA												■	■														
ACTIVERY BIOTECH S. L.		■																	■								
ADVANCED NANOTECHNOLOGIES S.L.																	■										
AGROINDUSTRIAL KIMITEC										■	■																
AIRBUS OPERATIONS S. L.												■	■													■	
APPLIED MASS SPECTROSCOPY LABORATORY S.L.																			■								
APPLIED RESEARCH USING OMIC SCIENCES S.L.										■													■				
ARAGONESA DE COMPONENTES PASIVOS S. A.																	■	■				■					
ARQUEBIO S.L.																			■								
ASOCIACION DE LA INDUSTRIA NAVARRA				■		■						■						■			■				■		
ATOS ORIGIN								■											■			■				■	
AVANZARE INNOVACION TECNOLOGICA S. L.					■								■					■				■	■				
BIOBIDE S.L.										■								■						■			
BIOKER RESEARCH S. L.										■								■				■					
BIOMOL - INFORMATICS S.L.								■																			
BIONANOPLUS S.L.		■																				■					
CAPHER IDI S.L.										■								■									
CELEROMICS																■		■	■								
CIDETE INGENIEROS S. L.															■			■					■				
COLOR ESMALT S.A.												■						■				■					
DAS PHOTONICS										■									■		■		■				
DATAPIXEL S. L.						■		■												■			■				
DOLMAR INNOVA S. L.										■													■	■			
DRAKA CABLES INDUSTRIAL S.L.																		■				■					
DROPSENS S. L.										■	■							■						■			
DYNASOL ELASTOMEROS														■				■									
EM-SILICON NANO-TECHNOLOGIES S.L.		■																■	■								
ENDOR NANOTECHNOLOGIES		■																	■								
FAGOR AUTOMOTION KOOP. E																				■							
FUNDACION PHANTOMS																										■	
FUNDACION PRIVADA ASCAMM			■											■													
GP PHARM																			■								
GRANPH NANOTECH						■								■	■								■				
GRAPHENEA S.A.						■					■								■								
GRUPO ANTOLIN-INGENIERIA S. A.		■												■	■								■				
INAEI ELECTRICAL SYSTEMS															■				■								
ICON NANOTECH																						■					
INGENIATRICS TECNOLOGIAS S. L.		■	■			■				■	■		■			■			■			■					
INGENIEROS ASESORES/ELVIRA SOSTENIBLE																■							■				
INNOVATEC SENSORIZACION Y COM. S. L.														■				■									

NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

Annex IV: Spain Nanotechnology Companies (Catalogue)

COMPANIES (81) as of July, 2012

	Carbon nanofibres	Drug delivery	Encapsulation	Energy	Graphene	Manufacturing	Microsensors	Microwires / Nanowires	Modelling/Simulation/Software	NanoBio	Nanochemistry	Nanoclays	Nanocoating	Nanocomposites	Nanoelec. / Molecular Electr.	Nanofabrication	Nanomagnetism / Spintronics	Nanomaterials	Nanomedicine	Nanometrology	Nanophotonics	Nanoparticles	Nanosensors	Nanotoxicology	Nanotubes	Project Management	SPM	
INTERQUIMICA					■					■	■			■				■	■			■	■					
IUCT S.A.		■								■				■	■				■									
LABORATORIOS ALPHASIP							■													■						■		
LABORATORIOS ARGENOL S. L.										■													■					
LAIMAT SOLUCIONES CIENTÍFICO TÉCNICAS		■	■				■													■								
MECWINS, S.L.										■														■				
NANOATE S.L.										■						■												
NANOBIOMATTERS INDUSTRIES S.L.										■		■	■	■		■												
NANOGAP SUB-NM-POWDER S.A.																				■	■							
NANOINMUNOTECH S. L.																				■								
NANOINNOVA TECHNOLOGIES S.L.					■																			■		■		
NANOMYP®			■							■													■			■		
NANOQUIMIA S.L.														■		■		■										
NANORIOJA S.L.					■									■					■									
NANOTEC ELECTRONICA S.L.																												■
NANOTECNOLOGIA SPAIN S. L.														■														
NANOZAR S.L.					■								■	■												■		
NB NANOSCALE BIOMAGNETICS																	■					■						
NEOKER S.L.														■					■									
NLAB DRUG DELIVERY		■	■																	■	■							
NUREL S.A.														■					■									
OPERON S. A.										■													■					
RAMEM S.A.																							■					
REINER MICROTEK S.L.																■				■								
REPSOL YPF (CHEMICAL PROGRAM)				■						■				■					■									
SCIENTIFICA INTERNACIONAL S.L.																							■					
SENSIA S.L.																								■				
SGENIA S.L.				■				■																■				
SINATEC S.L.														■					■							■		
SOLUTEX GC S.L.		■				■				■	■					■	■	■	■	■	■							
TAMAG IBERICA S.L.							■	■																				
TECNICAS REUNIDAS																				■			■					
TEC. NAVARRA DE NANOPROD. (TECNAN)												■	■	■					■	■			■					
THREELLOP NANOTECHNOLOGY								■	■																			
TOLSA S. A.											■			■					■				■					
TORRECID S.A.													■						■				■					
TRIMEK S. A.						■														■								
UNIMETRIK S. A.						■														■			■					■
YFLOW SISTEMAS Y DESARROLLOS S.L.			■										■	■									■					
ZF BIOLABS										■															■			
TOTAL	1	9	6	3	7	6	2	2	5	21	5	4	10	21	5	9	3	31	21	4	3	22	16	3	7	2	2	

Annex V: NanoSpain Conferences

As a direct and most effective way to enhance the interaction between The NanoSpain network members, a first network meeting was organized, within The NanoSpain Conference, in **San Sebastian** (March 10-12, 2004) with around 210 participants registered. Due to this success, the network decided organising its annual meeting, **Barcelona** (March 14-17, 2005), **Pamplona** (March 20-23, 2006), **Seville** (March 12-15, 2007), **Braga-Portugal** (April 14-18, 2008), **Zaragoza** (March 09-12, 2009), **Malaga** (March 09-12, 2010), **Bilbao - Imaginenano2011** (April 11-14, 2011) and **Santander** (February 28 - March 01, 2012) with a similar format. Its objective was also to facilitate the dissemination of knowledge and promote interdisciplinary discussions among the different NanoSpain groups. In order to organise the various sessions and to select contributions, the meeting was structured in the following thematic lines, but interactions among them were promoted:

1. Advanced Nanofabrication Methods
2. NanoBiotechnology
3. NanoMaterials
4. NanoChemistry
5. NanoElectronics / Molecular Electronics
6. Scanning Probe Microscopies (SPM)
7. Nanophotonic & Nanooptic
8. Scientific infrastructures and Scientific Parks
9. Simulation at the nanoscale

In 2008, Spain, Portugal and France (through their respective networks NanoSpain, PortugalNano and C´Nano GSO) decided to join efforts in order that NanoSpain events facilitate the dissemination of knowledge not only in Spain but among the different groups from Southern Europe.



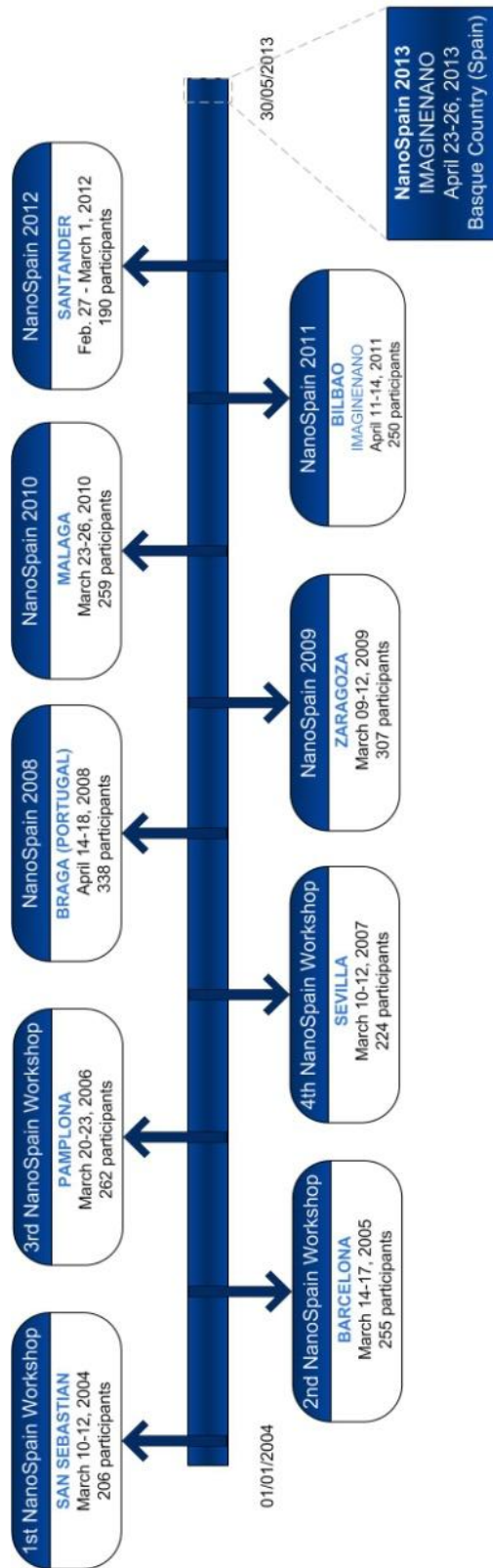
A list of all institutions involved in the organisation of the Nanospain conference series up to now, is provided below:

NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

Annex V: NanoSpain Conferences

INSTITUTION	COUNTRY	No. of participation in the Organising Committee	YEAR								
			04	05	06	07	08	09	10	11	12
Phantoms Foundation	Spain	9	●	●	●	●	●	●	●	●	●
Donostia International Physics Center - DIPC	Spain	9	●	●	●	●	●	●	●	●	●
Consejo Superior de Investigaciones Científicas	Spain	9	●	●	●	●	●	●	●	●	●
Universidad Autónoma de Madrid	Spain	8		●	●	●	●	●	●	●	●
CEM (Centro Español de Metrología)	Spain	7			●	●	●	●	●	●	●
CEMES-CNRS & C'Nano Grand Sud-Ouest	France	5					●	●	●	●	●
Parc Científic de Barcelona	Spain	4		●	●	●	●				
Universidad Pública de Navarra	Spain	4			●	●	●	●			
Fundação para a Ciência e a Tecnologia	Portugal	4					●	●	●	●	
IBEC/Universidad de Barcelona	Spain	4						●	●	●	●
Instituto Universitario de Investigación de Nanociencia de Aragón (INA)	Spain	2						●	●		
Universidad del País Vasco	Spain	2	●							●	
Universidad de Zaragoza	Spain	1						●			
Sodena	Spain	1			●						
Universidad de Sevilla	Spain	1				●					
Universidad de Navarra	Spain	1			●						
CENIMET / IBN / UNL	Portugal	1					●				
Universidade de Aveiro	Portugal	1					●				
Instituto Gulbenkian de Ciência and Escola Superior de Tecnologia da Saúde de Lisboa	Portugal	1					●				
INESC-MN & IST	Portugal	1					●				
CABIMER-Andalusian Centre for Molecular Biology and Regenerative Medicine.	Spain	1							●		
Universidad de Cantabria	Spain	1									●
TOTAL INSTITUTIONS			4	5	9	8	13	11	10	9	8

Annex V: NanoSpain Conferences

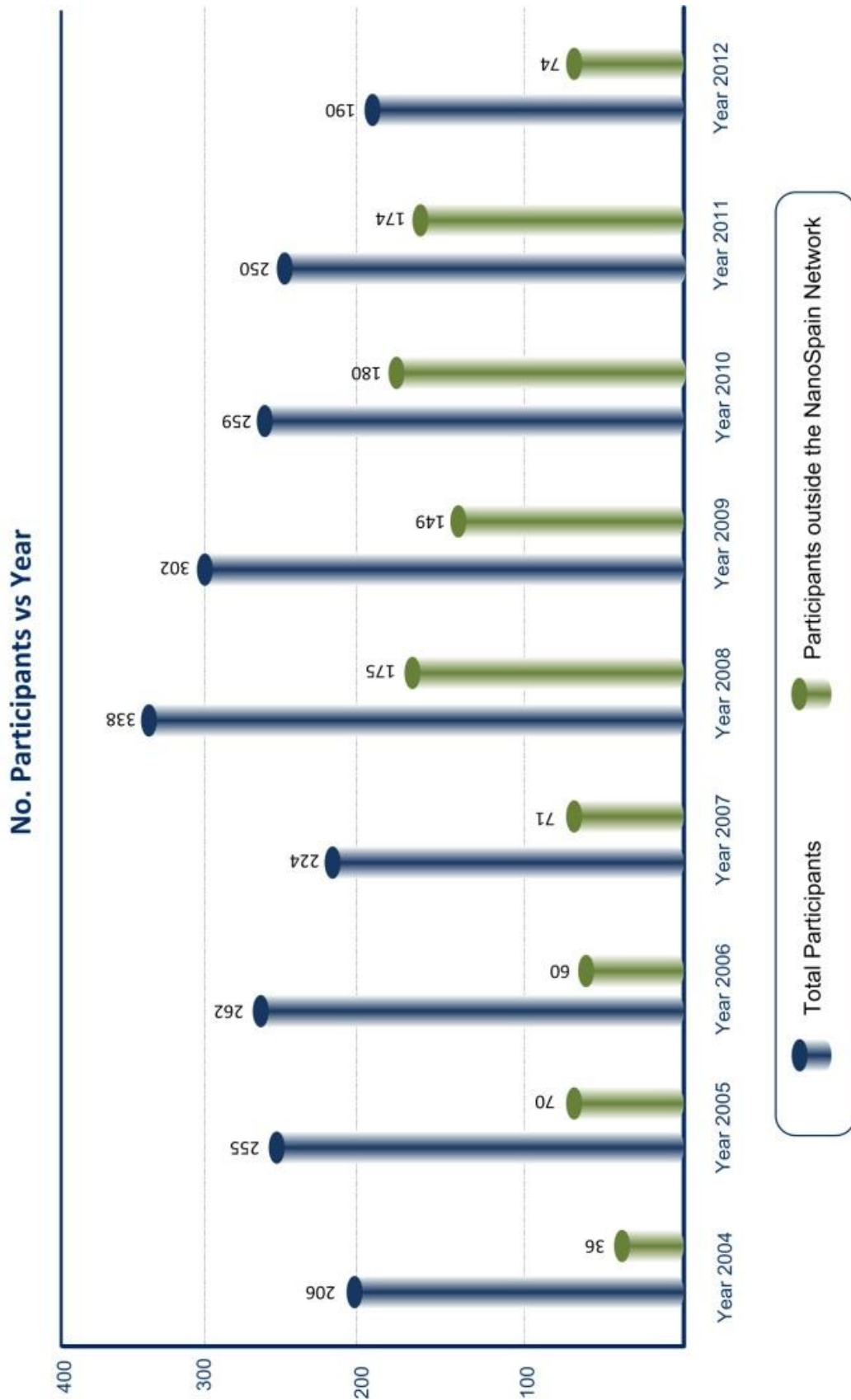


NANOSCIENCE & NANOTECHNOLOGY IN SPAIN

Annex V: NanoSpain Conferences

"NANOSPAIN" CONFERENCES: MAIN FIGURES										
Year	Location	Country	Dates	Nb. of participants	Spanish participants (%)	Keynotes	Orals	Posters (Poster-Flash)	Exhibitors	Grants
2004	San Sebastian	Spain	March 10-12	207	93	10	36	95 (-)	1	-
2005	Barcelona	Spain	March 14-17	255	95	7	29	129 (22)	4	20
2006	Pamplona	Spain	March 20-23	262	92	11	26	133 (23)	22	51
2007	Sevilla	Spain	March 12-15	223	81	9	25	116 (10)	6	43
2008	Braga	Portugal	April 14-18	341	54	22	77	284 (10)	10	105
2009	Zaragoza	Spain	March 09-12	307	81	18	62	156 (10)	17	43
2010	Malaga	Spain	March 23-26	259	77	12	59	115 (10)	20	36
2011	Bilbao	Spain	April 11-14	250	86	17	43	170 (-)	+100	45
2012	Santander	Spain	February 27- March 01	190	91	10	70	57 (6)	16	16

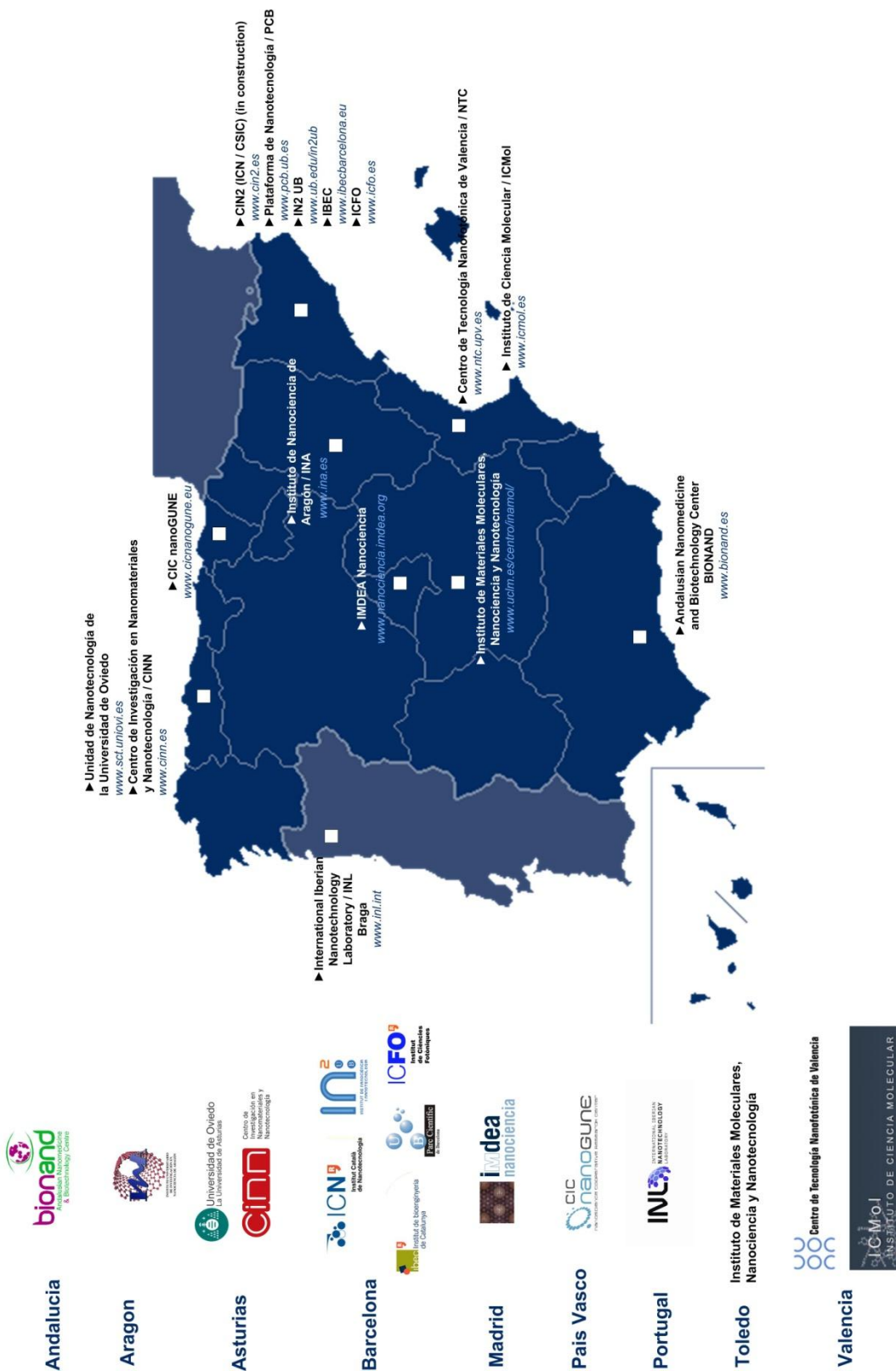
Annex V: NanoSpain Conferences

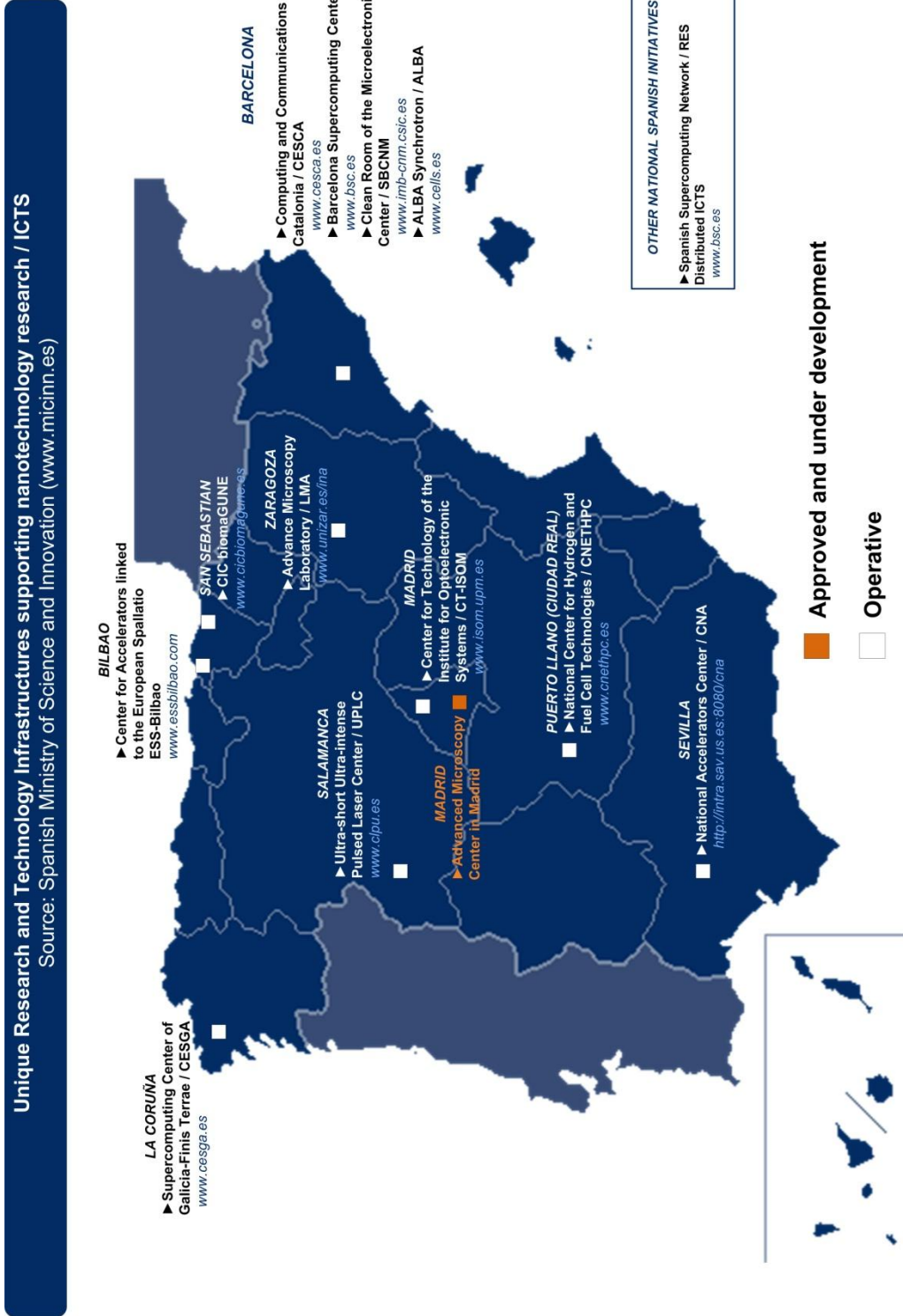


Annex VI: Maps for relevant Spanish initiatives

- Emerging N&N Centers in Spain.
- Unique Research and Technology Infrastructures supporting nanotechnology research / ICTS.
- Other initiatives (networks, platforms, regional programmes, conferences, etc.) related to nanotechnology promotion.

Emerging N&N Centers in Spain





Other initiatives (networks, platforms, regional programmes, etc) related to nanotechnology promotion



- OTHER NATIONAL SPANISH INITIATIVES**
- ▶ Modelling for Nanotechnology / M4nano
www.m4nano.com
 - ▶ Spanish Nanomedicine Platform / NANOMED
www.nanomedspain.net
 - ▶ Spanish Nanotechnology Network / NanoSpain
www.nanospain.org
 - ▶ Spanish Network on Nanolithography / NANOLITO
www.unizar.es/nanolito/
 - ▶ Spanish Technology Platform of Advanced Materials and Nanomaterials / MATERPLAT
www.materplat.es
 - ▶ Spanish Technology Platform of Photonics / FOTONICA
www.fotonica21.org
 - ▶ Spanish Technology Platform of Research in fabrication / MANUFACTURE
www.manufacture.es
 - ▶ Spanish Technology Platform for Sustainable Chemistry / SusChem - ES
www.ple-quimicasostenible.org
 - ▶ Spanish Technology Platform of CO2 / PTECO2
www.pleco2.es
 - ▶ Spanish Technology Platform of Hydrogen and Fuel Cells / PTEHPC
www.ple/hpc.org
 - ▶ Technological Platform on Nanoelectronics and Smart Systems Integrations / GENESIS
www.genesisred.net

In collaboration with



Red Española de Nanotecnología
Spanish Nanotechnology Network

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