International Iberian
Nanotechnology Laboratory

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International Iberian Nanotechnology Laboratory numbers

1) Location: Braga - Portugal
2) Status: Interngovernmental Organization
3) Projected Researchers: ~200 postdoctoral scientists
4) Projected Total Staff: ~400 people
5) Research Space: 40 Principal Investigators labs
1) **NANOMEDICINE:**
Drug Delivery systems, molecular diagnosis systems and chips, cell therapies, imaging solutions, regenerative materials, biomolecular labels, synaptic process monitoring, tissue engineering, etc.

2) **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,

3) **NANOELECTRONICS:**
NEMS/MEMS, Spintronics, Photonics, Nanofluidics, Molecular electronics, Organic electronics, Nanotechnologies to support the previous research areas

4) **NANOMANIPULATION:**
Single molecule/atom manipulation, molecular motors, nanotweezers, Self assembly controlled processes of building blocks for nanodevices.
• **Total site area**: ca. 47,000 m²
• **Total buildings area**: ca. 26,000 m²
• **Main scientific bdg**: ca. 22,000 m²
• **Social Building (Hostel, Gym and Nursery)**
• **Incubator Area**

• **Main Scientific Building**
  • Laboratories 7,500 m²,
  • Cleanroom 1000 m²,
  • Auditorium and other public areas 4,800 m²,
  • technical areas 3,500 m²,
  • Administrative areas 700 m².
The scientific infrastructure comprises central laboratories (providing services for the INL resident research personnel and visiting scientists) and specialized laboratories associated with individual Principal Investigators (PIs) or research groups and research topics.

The Scientific building includes: Cleanroom, High Accuracy Laboratory, Wet and Dry PI laboratories, Biochemistry laboratory and other support labs.
- 600 sqm and 7 Bays
- State of the art Nanofabrication equipment
- Handling 200mm wafers
Biology and Biochemistry cleanroom bay: (bay 1)
- PDMS and SU8 processing
- Spectral ellipsometry
- Contact angle measurement
- Microspotter

Analytical characterization (bay 2-I)
- 4 point Resistivity mapping
- Profilometer
- Mapping interferometer

RIE/Films Deposition: (bays 3+4)
- Multi-Target PVD cluster tool for 200mm wafers (Singulus Timaris),
- 10 targets + oxidation + heater
- Confocal Multitarget cluster tool (11x2” targets, heater, oxidation)
- Metallization tool, Singulus 4 module + soft etch
- PECVD for SiO₂ and SiNx (STS MPX)
- Ion Milling System with SIMS (NORDIKO TECH)
- RIE for SiO₂ and SiNx, STS LPX (ICP)
- RIE for Al and other metals, STS LPX (ICP)
- Deep-Silicon Etching System, STS Pegasus
- Plasma asher
**Wet Process (bay 5-I)**
- Wet Bench for contaminated solvent
- Wet Bench for oxide processes
- Wet Bench for Metal lift off processes, Cr etching
- Fume-hood for Cu electro deposition

**Hot processes + planarization (bay 5-II)**
- Chemical Mechanical Planarization
- CNT CVD tool

**Photholithography (bay 6):**
- 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 (YES)

**Nanolithography (bay 7)**
- E-beam Lithography System (VISTEC 5200 ES+, 100 kV)
- Coat/Develop Track for e-beam resist (KS 200mm, syringes)-October 2011
- Scanning Electronic Microscope (FEI NanoSEM
- 1.4nm at 1kV)
X ray, SAXS
Surface/interface Characterization

SHIELDED ROOM
(instrumentation)
Central SPM
UHV SPM
DUAL BEAM FIB
HRSEM
HRTEM/STEM

Sample prep
High Accuracy Laboratories
allow in-house detailed structural characterization
of thin films, interfaces and nanostructures:

• High accuracy labs (NIST A)
• 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 invereted
  microscope and Materials),
• 300 kV image corrected TEM/STEM (expected for 1st
  semester 2012)
Biochemistry Lab:
• Equipment for FPLC/HPLC protein purification
• 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
• Drop shape analysis system
40 PI Labs

- Wet PI labs with equipment for synthesis, catalysis, and other wet chemistry experiments.
- Dry Labs with equipment for characterization and dry experiment techniques
Dedicated Laboratories

Radio Frequency Lab:
- Wafer Tester
- Full-Wafer magneto-resistance Tester
- RF probe station
- Network/Spectrum analyzer
- Sampling Oscilloscope
- High-speed pulse generator
- Magnetic Hyperthermia

Packaging and Microfluidics Lab:
- Wire Bonding System
- Dicing Saw System
- High-Speed Machining System
Dedicated Laboratories

**Magnetometry Lab:**
- Squid-VSM
- VSM

**Magnetic Anneling set-up:**
Handling wafers up to 200 mm, under controlled magnetic fields up to 2T and environments up to 400 ºC.

**Nanochemistry and Nanostructure lab:**
- Mass Spectroscopy
- Gas Chromatography
- DLS
- ICP-OES
- TGA
- UV-Vis & Fluorescence Spectrometers
Gracias
Obrigado
Thanks!