International career development opportunities at INL

Opening of 16 Research Staff Positions

Introduction

The International Iberian Nanotechnology Laboratory (INL) is launching 16 research staff positions. The laboratory provides a high-tech research environment formed by state-of-the-art infrastructure equipped with the latest technologies, to address the major challenges in nanofabrication, nanocharacterization and other nanotechnologies applied to environmental & food control, nanomedicine and nanoelectronics.

A successful candidate should have a PhD degree in the relevant field of study. The applicant should have strong enthusiasm for work and excellent communication skills.

INL will offer the successful candidate a competitive salary and benefits package. The position is for two years and will be available as of July 1st, 2013. It is renewable upon satisfactory performance.

Job Offers

1 - Microfluidics and nanofluidics. INL seeks an experienced researcher on the design and fabrication of microfluidic and nanofluidic devices (PDMS, SU8, hot embossing, injection molding) for lab on chip applications. The researcher is expected to collaborate with existing teams at INL developing efficient sample separation/purification/concentration fluidic modules (electrophoretic, magnetophoretic, diffusion based, etc…) to allow more efficient analyte detection at relevant concentrations for food and medical applications.

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2 - Food safety. INL seeks an experienced researcher on the detection of microbial contamination, food poisoning bacteria, toxins, pesticides and other drugs in food, using point of care, preferentially label free, lab on chip platforms. The researcher should master the chemistry of ligand/receptor binding for particular food safety applications and needs to strongly interact with nanoparticle and device groups at INL preparing the Lab On Chip platforms used for analyte detection.

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3 - Smart labels for food packaging. INL is seeking an experienced researcher on the design and fabrication of food quality indicator sensors (freshness, ripeness, smell, taste, oxygen) that can be incorporated on the packaging envelope. The researcher will collaborate with teams at INL developing nanostructures, and incorporating nanostructures on the packaging materials, as well as teams developing electronically based sensors fabricated on flexible substrates (package).

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4 - Cancer biomarker detection systems. INL seeks to appoint a researcher to develop new methods to improve prognostics and early diagnosis of cancer. She/he should have experience in areas of nanomedicine. The work will be done in collaboration with cancer research institutions with which INL has established research links. The continued search for selective cancer biomarkers (at cell or DNA level) and their detection in multiplexed microfluidic lab on chip platforms, from small blood samples or other body fluids,

offers the possibility of implementing highly sensitive diagnostic tools for cancer early detection or treatment follow-up.

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5 - Nanoparticle-based metastatic cancer therapies. At the cancer therapy level, major challenges exist for metastatic cancer treatment where cancer cells spread through several organs forming small clusters of malignant cells. Challenges exist at stopping cancer progression during the various phases of the metastatic cell dissimination. Here, nanoparticle based therapies together with proper targeting strategies (organ or cell) can be studied to combat cancer spread at the various stages of the metastatic process. INL seeks to appoint a researcher with a nanomedicine background, which will work in close collaboration with nanoparticle synthesis teams at INL, and with cancer research institutes with whom INL has collaborations, studying nanoparticle based therapies for fighting early forms of cancer.

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6 - Magnetic Particle Imaging (MPI). INL seeks an experienced engineer/physicist to work on the development of a magnetic particle imaging system, targeting an imaging system operating at low fields, and capable of identifying particle distributions in live specimens (small animals) or equivalent phantoms. Work is envisaged to proceed either through the development of magnetic sensor arrays for dedicated sample areas or through spatial field scanning techniques coupled to the non-linear characteristics of magnetic nanoparticles. The researcher will strongly interact with sensor and signal processing groups at INL.

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7 - Low field integrated nuclear magnetic resonance probes. INL seeks to hire a NMR engineer or scientist to participate in the ongoing project of designing, fabricating and testing a low field (100mT) , integrated (chip-based) NMR system for local chemical analysis (water, olive oil, wine,...). The researcher will interact with microfabrication groups and with the signal processing group in building the integrated platforms (sensors, microcoils, electronics). He/she should coordinate the testing phase of the present platform, and the transition from a coil based (high frequencies, high fields) to a magnetic sensor based detection system (low frequency, low field).

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8 - In-vivo immuno-assay plaque probing in intervention cardiology-I. INL seeks to hire a researcher (biological engineer, biochemist, …) to perform a histological and immuno-histochemical study of biomarkers characteristic of various types of coronary plaques (stable, unstable, ruptured). In a second stage, work will proceed to bind labels (fluorophores, magnetic nanoparticles) through appropriate antibodies to the chosen biomarkers. In a third phase, work will proceed first in vitro, and then mimicking blood flow conditions in a live heart, to immobilize the labeled biomarkers to the plaque receptors. Work will be done in collaboration with the intervention cardiology groups.

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9 - In-vivo immuno-assay plaque probing in intervention cardiology-II. INL seeks to hire a researcher (electrical engineer, physicist) with a strong background in instrumentation to develop an intra-coronary, catheter based label (nanoparticle) excitation/detection system eventually compatible with the imaging systems already in use (infrared spectroscopy, coherent optical tomography, intracoronary ultrasound). Work will be done in collaboration with the intervention cardiology groups.

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10 - e-beam lithography. INL seeks to hire a researcher with a good knowledge of high voltage e-beam lithography systems(100kV), and in particular used to the VISTEC EG5200 systems and Gemini mask preparation software. The researcher will interact with nanodevice groups at INL providing nanolithography solutions for current nanodevices being fabricated at INL (spintronic, graphene, NEMS, ….).

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11 - Nano particle synthesis. INL seeks to hire a researcher (chemist) with a strong background on nanoparticle synthesis and characterization for food and biomedical related applications. The researcher should interact with various groups at INL requiring nanoparticles as labels for biosensor, environmental and food applications. The use of efficient and cost effective chemical routes is expected to obtain monodisperse , if required biocompatible particles at the nanoscale with different composition, particle size and morphology. Experience in scale-up production will be appreciated.

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12 - Design and Preparation of high performance nanostructures for hyperthermia related food and biomedical applications. INL seeks an experienced researcher to work on the design, synthesis and characterization of complex nanosized magnetic nanostructures for hyperthermia related biotechnology applications, such as food storage/packaging, anti-cancer therapy, bone-tissue regeneration, drug release,

etc. A strong background in magnetic nanostructures preparation, characterization and hyperthermia applications will be highly required. The candidate should be willing to interact with other teams at INL and potentially collaborate with medical institutions, hospitals and companies.

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13 - High resolution electron microscopy. INL seeks to hire researcher with a strong background on nanostructure and nanodevice characterization using high resolution corrected electron microscopes. The researcher should also be familiar with the use of focused ion beam systems for sample fibbing and analysis. He/she will strongly interact with INL nanodevice and nanostructure fabrication (chemical and physical) groups providing support for chemical and wafer process analysis as well as post process of nanostructures and device analysis. He/she is expected to carry his/her own research activities exploring unique features of the instruments installed at INL.

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14 - Photonics and optical instrumentation. INL seeks to hire an engineer/physicist with a strong background on optical instrumentation and optical sensing technologies. The researcher will be responsible for coordinating INLs optical instrumentation equipment ensuring optimum configuration for the ongoing experiments (bio-imaging laboratory, spectroscopic ellipsometry, others). The researcher is expected to profit from INL´s micro and nanofabrication facilities to design and fabricate new photonic/nanophotonic devices.

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15 - Spintronic nanodevices. INL seeks to hire an experienced researcher on spintronic nanodevice fabrication and characterization. In particular the candidate should have a strong experience in magnetic thin film deposition aiming at the preparation of tunnel junction devices with perpendicular magnetic anisotropy, and in device micro and nanofabrication clean room processes.

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16 - Central biology and biochemistry facility. INL has a central bio facility incorporating the central biochemistry laboratory, the animal cell culture laboratory, the molecular biology laboratory, and the microbiology laboratory. INL seeks to hire a researcher (biologist, biological engineer, and biochemist) that will oversee the central facility utilization and services. The researcher is expected to carry his/her personal research goals in line with ongoing activities at INL, maintaining a strong collaboration with the biosensor and biointerface activities.

How to apply

Interested applicants should submit, until **May 8th 2013**, their curriculum vitae, a cover letter describing motivation and research experience, and two reference letters through INL's recruitment website at: http://inl.int/job_offers

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