

## 2007 CALLS FOR PROPOSALS Founded Projects

Major Topic	Action	Description	Labs	Funding k€
Life sciences at the limits of nanoelectronics	Chair of Excellence * Donald Martin * Full time	<b>Biomimetic Artificial Membrane Systems for Generating Electrochemical Energy</b> This project utilizes the natural ion-selectivity of cell membranes in a biologically-inspired approach to developing novel nano electrochemical energy sources. It will allow harvesting of energy from a living organism to provide a permanent energy supply to micro- or nano-systems designed to perform diagnostic or therapeutic actions.	<a href="#">TIMC</a> <a href="#">LETI</a> <a href="#">DCM</a> <a href="#">TIMA</a>	458
Nanomagnetism	Chair of Excellence * Mairbek Chshiev * Full time	<b>Modelisation of magnetic nanostructures</b> Mairbek Chshiev is a specialist of the theory of spin-dependent electronic transport phenomena in nanostructures. His is developing a group that strengthens theoretical research activities among Grenoble Laboratories to help clarify fundamental transport mechanisms necessary for developments of future spintronic devices.	<a href="#">SPINTEC</a>	369
Quantum Nanoelectronics Nanomagnetism and spintronics	Chair of Excellence * Leonid Glazman * Part time	<b>Coherent quantum phenomena.</b> Prof. Leonid Glazman is a leading theorist in the field of quantum coherent phenomena in mesoscopic and nanoscopic systems. The research developed is focused on superconducting and quantum-coherent devices and coherent spin evolution and spin structure factors in low-dimensional and nano-scale systems .	<a href="#">SPSMS</a> <a href="#">LP2M</a> <a href="#">Inst. Neel</a>	375
Nano-characterisation	Chair of Excellence * Vincent Bayot * Part time	<b>Scanning gate nanoelectronics</b> Vincent Bayot is a specialist of thermodynamics and quantum transport in two dimensional electron systems and semiconductor nanostructures made of GaAs/AlGaAs or InGaAs/InAlAs heterostructures or of Silicon-on-insulator (SOI). The project is focused on Imaging and controlling coherent and ballistic transport in semiconductor devices and on coherent and spin-dependent transport at very low-temperature.	<a href="#">Institut Néel</a> <a href="#">IMEP</a>	342,5
Quantum Nanoelectronics & Nanomodeling	Chair of Excellence * Philip Wong * Part time	<b>Transport in core/shell nanowires</b> Pr Philip Wong is internationally renowned for his work on novel concepts of devices for integration in a CMOS compatible platform. The objectives of the project are the development of simulation tools for quantum transport in core/shell heterostructures accounting for surface roughness and localized Coulomb defects, and of transport parameter extraction methodologies for efficient characterization of Si nanowires with diameters and gate lengths in the 10nm range.	<a href="#">IMEP</a> <a href="#">LETI</a>	306
Nanomagnetism	Chair of Excellence * Joaquin Fernandez-Rossier * Part time	<b>Downsizing nanospintronics: single atom control</b> Joaquin Fernandez-Rossier is Professor at the University of Alicante. The aim of the project is to understand the spin relaxation dynamics of the single Mn atom, to establish laser pulse protocols to control the Mn spin in a chosen quantum state, and to study how far the exchange interaction of the Mn atom to carriers can be increased.	<a href="#">Institut Néel</a> <a href="#">INAC</a> <a href="#">LITEN</a>	211
Quantum Nanoelectronics	Chair of Excellence * Michael Roukes * Part time	<b>Very Large Scale Integration of NEMS</b> Michael Roukes is one of the best specialists worldwide on NEMS, and hosting him in Grenoble will contribute to create strong dynamics on that topic. This project takes place in the general framework of an ongoing collaboration between LETI and CALTECH to explore the opportunities of Very Large Scale Integration of such components with industry-like foundry processes, enabling the transition from nanocraft to real nanotechnology.	<a href="#">LETI</a> <a href="#">LTM</a>	160
Nano-characterisation	Chair of Excellence * Vaclav Holy * Part time	<b>X ray investigations on nanoparticles</b> Professor Holy is an internationally renowned specialist of X-ray scattering on nanostructures. He will work with the network groups that are using X ray lines at ESRF to set experiments and data acquisition methods well adapted to the study of nanostructures.	<a href="#">INAC</a> <a href="#">Institut Néel</a> <a href="#">LMGP</a>	65

Nanomagnetism	RTRA project	<b>POMME : properties of magnetic metals under electric field.</b> POMME will explore the potential of a newly-discovered electric-charge effect on the magnetism of ultra-thin metallic films. This discovery opens the prospect of using an electric field instead of a magnetic field to control the properties of magnetic nanosystems.	<a href="#">Institut Néel</a> <a href="#">INAC</a> <a href="#">G2ELAB</a>	264
Nanomaterials	RTRA project	<b>Cellulose hybrid block copolymers</b> The aim is to take advantage of the self-organizing diblock copolymer thin films - low-cost and efficient means to engineer nanometer-scale structures over large surface areas. build a versatile hierarchical approach for the assembly of <i>hybrid (synthetic-b-natural) diblock copolymer (cellulose based material)</i> by investigating patterning process in different applications including electronic and optic. The research focuses on fundamental understanding of the physics of self-assembly of these new class of hybrid block copolymer systems.	<a href="#">CERMAV</a> <a href="#">LTM</a> <a href="#">LETI</a>	264
Nanomaterials	RTRA project	<b>New electronic properties with Group IV nanowires</b> The project addresses the basic issue of modifying the electronic properties of group IV nanowires without the need to decrease the NW diameter to very small values. The work explores the effect of large strains on their band diagram and crystallographic structure, and will alloy Si, Ge and Sn to tailor the transport or photonic properties.	<a href="#">INAC</a> <a href="#">LTM</a> <a href="#">LMGP</a>	225
Nanomodeling	RTRA project	<b>Nanostar: spectroscopy and transport properties in nanomaterials</b> The aim is to develop high-accurate and efficient methods et to use them for theoretical spectroscopy at the interface between molecules and solids, and for the modelisation of quantum transport in nanodevices. It will contribute to create the Grenoble Node of the European Theoretical Spectroscopy Facility (an initiative of the Nanoquanta European Network of excellence).	<a href="#">Institut Néel</a> <a href="#">SIMAP</a> <a href="#">DCM</a>	180 (+ PF)
Life sciences at the limits of nanoelectronics	RTRA project	<b>NeuroFETs</b> The projects is focused on the coupling of neurons with functionalized surfaces and their stimulation /recording with silicon nano Field Effect Transistors. Its objectives are connected with 2 major neurosciences issues: the axonal differentiation and the computational properties of neuron networks in the presence of neural noise.	<a href="#">Institut Néel</a> <a href="#">GIN</a> <a href="#">GIPSA Lab</a>	158
Nano-characterisation	Young incoming researcher * Alessandro Monfardini	<b>A DC-to-THZ cryogenic platform for new generation of nano-detectors</b> Fabrication of a versatile, 100mK cryogenic testing facility for new generations of low temperature nano detectors	<a href="#">Institut Néel</a> <a href="#">IMEP</a> <a href="#">SPINTEC</a>	245
Nanophotonics	Young incoming researcher * Julien Claudon	<b>STRONGCHIP</b> The project proposes an original approach to explore the light-matter interaction and to reach the strong coupling regime: light is an ultra-high quality factor whispering gallery mode confined in a fused-silica microtoroid cavity, the emitter is a single InGaAs/GaAs quantum dot with a strong dipolar moment.	<a href="#">INAC</a> <a href="#">IMEP</a> <a href="#">Institut Néel</a>	175
Life sciences at the limits of nanoelectronics	Young incoming researcher * Julien Douady	<b>Dendritic potentials imaging by second harmonic generation</b> The aim of the project is to get a better understanding of the computational function of dendrites. The approach is to study the sinusoidal voltage propagation at different frequencies.	<a href="#">SPECTRO</a> <a href="#">GIN</a> <a href="#">Institut Néel</a>	183
Nanomodeling	Young incoming researcher * Natalio Mingo	<b>Computational modelling of novel nanostructured thermoelectric materials</b> The project investigates theoretically and computationally the thermoelectric properties of complex materials, including superlattices, self-assembled nano-dot composites, and nanowires array.	<a href="#">LITEN</a>	126
Nano-characterisation	Young incoming researcher * Tobias Shulli	<b>UHV-CVD growth and measuring equipment</b>	<a href="#">INAC</a> <a href="#">Institut Néel</a>	84 (+PF)

Nanomagnetism	PhD. Student	<b>Subhadeep DATTA</b> Molecular spintronics using single-molecule magnets	<a href="#">Institut Néel</a>	108,0
Life sciences at the limits of nanoelectronics	PhD. Student	<b>Xu WANG</b> New nanometric bio-sensors from carbon nanotubes	<a href="#">DCM</a>	108,0
Nano-characterisation	PhD. Student	<b>Thomas QUAGLIO</b> Local spectroscopy of nanostructured superconductors out of equilibrium	<a href="#">Institut Néel</a>	108,0
Quantum Nanoelectronics	PhD. Student	<b>M.KUMAR</b>	<a href="#">INAC</a>	108,0
Nanophotonics	PhD. Student	<b>Jun-Seok HWANG</b> Transport and optics of single nanowires	<a href="#">Institut Néel</a>	108,0
Nanomagnetism	PhD. Student	<b>Mickail KUSTOV</b> Micromanipulation of nanoparticles using the diamagnetic levitation approach	<a href="#">G2ELAB</a>	108,0
Nanomagnetism	PhD. Student	<b>Marcio MEDEIROS-SOARES</b> Growth, structure and magnetism in perpendicular coupled systems.	<a href="#">Institut Néel</a>	111,0
Nanomagnetism & Nanophotonics	PhD. Student	<b>Sandeep AGNIHOTRI</b> Spin-based electronics in II-VI semiconductors : Spin-dependent tunnel current in heterostructures	<a href="#">Institut Néel</a> <a href="#">SP2M</a>	111,0
<b>TOTAL (k€)</b>				<b>5060,5</b>

## SUPPORT TO EDUCATION AND SCIENTIFIC ANIMATION

Major topics	Name	Place	Dates	Funding (k€)
<b>COLLOQUES and SEMINARS</b>				
Quantum nanoelectronics	<a href="#"><u>Séminaires de Nanoélectronique Quantique</u></a>	Grenoble	Weekly	5
<b>TOTAL (k€)</b>				<b>5</b>

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### Support to Nanotechnology Platforms

Platform	Equipment	Funding (k€)
<a href="#">CMTC</a>	Diffractionmetry equipment	100
<a href="#">PTA</a>	Operating expenses	300
	Deep UV Lithography	125
	Development of new technological processes	32
<a href="#">NanoBio</a>	Quartz microbalance, AFM scanner, transient spectroscopy equipment	203
	Development of new technological processes	32
<a href="#">NanoFab</a>	Cathodic pulverization equipment,	340
<a href="#">CIME</a>	PECVD reactor (part of)	100
<a href="#">PFNC</a>	Gatan image filter to complete the equipment of the transmission electron microscope JEOL 3010	90
<a href="#">CRG</a>	Equipment allowing X ray characterization of CVD grown nanostructures (as part of the " Young incoming researcher" project: Tobias Schüllli)	250
<a href="#">CIMENT</a>	High performance computing equipment (contribution to) (as part of the " Young incoming researcher" project: Nanostar)	135
<b>TOTAL (k€)</b>		<b>1775</b>