



OPEN POSITIONS AT CNR NANO MODENA, ITALY (www.nano.cnr.it)

Two positions for research physics/computational materials scientists are available in the group of Dr. Arrigo Calzolari at CNR Nano in Modena, Italy, in the framework of EU-funded project "Interoperable Material-to-Device Simulation box for disruptive electronics - INTERSECT" – GA nr. 814487.

Outstanding candidates are sought with a background in the physical sciences alongside strong programming skills. Women are strongly encouraged to apply.

Position 1: 1 Researcher. "Study of structural and electronic properties of complex systems, such as ferroelectrics and phase change materials, through classical and first principles approaches"

The position is for 1 year (renewable).

Candidates must have

- a master degree in Physics, Chemistry, Electronic Engineering or Computer Engineering
- a 3-year or more experience in the study of solid-state systems and nanosciences based on the Functional Density Theory, or a PhD in relevant subjects.
- advanced knowledge of written and spoken English
- good knowledge of programming language such as Fortran and/or MPI C; good knowledge of object-oriented programming (e.g. Python); language such as Fortran and/or MPI C; data analysis and physical-statistical correlations.

The candidate will be involved in the study of complex materials (such as ferroelectrics and phase change materials) for synaptic electronics e.g. 3D integrated memories, selectors, and neuromorphic devices. The development of these emerging technology calls for the investigation of materials at device level, since materials characteristics - including structural disorder, defects, impurities and boundaries - are inherently connected to the device performance requirements.

On the theoretical side, this requires an unprecedented capability of simulating properties of materials well beyond the standard solid-state analysis. The complexity of the systems will require multi-scale multi-model computational techniques mostly based on both first principles (e.g. DFT) and classical molecular dynamics approaches.

The research activity, within the EU INTERSECT project, will include a tight collaboration with engineering and experimental groups, expert in the fabrication and the simulation of advanced synaptic devices and circuits.

Position 2: 1 Postdoc fellowship. "Development of scientific computing software (also in MPI-environment) for the study of complex models and electronic devices for synaptic electronics and neuromorphic computing"

The position is for 1 year (renewable).

Candidates must have

- a master degree in Physics, Chemistry, Electronic Engineering or Computer Engineering.
- a PhD degree in Physics, Chemistry, Electronic Engineering or Computer Engineering.
- a 3-year or more experience in the study of solid-state systems and nanosciences based on the Functional Density Theory, or a PhD in relevant subjects.
- advanced knowledge of written and spoken English





- knowledge of programming language such as Fortran and/or MPI C; good knowledge of object-oriented programming (e.g. Python).

Within the INTERSECT project, this activity will aim at accelerating the uptake of materials modelling software in the field of synaptic electronics and neuromorphic computing to provide industry-ready software solutions. In particular, the candidate will be involved in the development/implementation of an interoperable, interdisciplinary and multi-physics simulation platform for simulation of disruptive electronics. This includes a software integration action, by means of the linking-and-coupling of existing materials and device simulation codes, as well as the formalization/development of specific workflows for the automation of the process that control the entire modelling pipeline.

For information on the positions, please contact intersect@nano.cnr.it.

