2018-00327 - [Campagne Post-Doctorat 2018/CRI PARIS] -
Post-Doctoral Research Visit / Scientific computing /
Numerical schemes and simulations

Contract type : Public service-fixed-term contract
Renewable contract : Oui
Level of qualifications required : PhD or equivalent
Fonction : Post-Doctoral Research Visit
Level of experience : Recently graduated

Context
The source of many phenomena in physical and life sciences, and in most engineering disciplines, is to
be found in microscopic features of the system under consideration. Linking the properties of matter
at these different scales is a major challenge, both from the theoretical perspective (understanding
how to link a model or an equation at a certain scale to another one at a different scale) and the
numerical one (how to couple two consistent descriptions of matter, e.g. atomistic and continuum,
using the same code).

MATHERIALS originally focused on computational chemistry issues (electronic structure calculations
for materials, laser control of chemical reactions) before gradually widening its scope beyond such
considerations and their applications, and applying its expertise to related topics at very different
scales. This has led to studies in molecular dynamics (in situ molecular system evolution), in
computational statistical mechanics (computation of ensemble averages), and studies of
relationships with more traditional mechanical models at the continuum scale and multiscale
simulation of fluid or solid materials in general (including periodic and random homogenization).

MATHERIALS currently offers a range of expertise, rarely found on the international scene, in
a number of promising topics for numerical simulation and applied mathematics in general: molecular
chemistry, solid-state physics, numerical modeling in materials science, etc.

Assignment
The team is currently involved in the study of various numerical methods for electronic structure
calculation, molecular and multiscale simulation. Concerning the first theme, the focus is currently on
models of defects in crystalline materials. For molecular simulation models, efficient numerical
algorithms for accelerating the computation of a long trajectory in molecular dynamics are currently
investigated, including parallel algorithms and algorithms dedicated to out-of-equilibrium models.
Numerical techniques for stochastic homogenization are also investigated.

Many of these works are made in collaboration with other groups in Paris, in particular CNRS and
University Paris 6.

Main activities
The postdoctoral fellow will conduct his/her research within the MATHERIALS team, interacting with
its permanent members. He/She will write research articles and present his/her work in international
conferences.

Skills
Candidates are required to have a strong experience in numerical scientific computing.

Benefits package
- Subsidised catering service
- Partially-reimbursed public transport

Remuneration
Additional information

General Information
- Theme/Domain: Numerical schemes and simulations
  Scientific computing (BAP E)
- Town/city: Paris
- Inria Center: CRI de Paris
- Starting date: 10/1/18
- Duration of contract: 1 year, 4 months
- Deadline to apply: 3/23/18

Contacts
- Inria Team: MATHERIALS
- Recruiter: Stoltz Gabriel / gabriel.stoltz@inria.fr

The keys to success
Applicants should hold a PhD in applied mathematics, or other related areas with a
competitive track record.

Conditions for application
Defence Security:
This position is likely to be situated in a restricted area (ZRR), as defined in Decree No.
2011-1425 relating to the protection of national scientific and technical potential
(PPST). Authorisation to enter an area is granted by the director of the unit, following a
favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST.
An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in
the cancellation of the appointment.

Recruitment Policy:
As part of its diversity policy, all Inria positions are accessible to people with disabilities.

Warning: you must enter your e-mail address in order to save your application to Inria. Applications must
be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.
Location: Paris 12ème
Gross Salary per month: 2653€ brut/mensuel

Security and defense procedure:

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