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

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**About Inria**

Inria, the French National Institute for computer science and applied mathematics, promotes “scientific excellence for technology transfer and society”. Graduates from the world's top universities, Inria's 2,700 employees rise to the challenges of digital sciences. With its open, agile model, Inria is able to explore original approaches with its partners in industry and academia and provide an efficient response to the multidisciplinary and application challenges of the digital transformation. Inria is the source of many innovations that add value and create jobs.

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**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.

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**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.

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**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.

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**Skills**

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

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**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.

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**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.
Benefits package

- Subsidised catering service
- Partially-reimbursed public transport

Remuneration

Additional information

- Location: Paris 12ème
- Gross Salary per month: 2653€ brut/mensuel

Security and defense procedure:

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