**2018-00328 - Postdoc in Theoretical Neuroscience funded by the Human Brain Project (SP4, theory)**

**Level of qualifications required:** PhD or equivalent  
**Function:** Post-Doctoral Research Visit  
**Level of experience:** From 3 to 5 years

**About the research centre or Inria department**

The Inria Sophia Antipolis - Méditerranée center counts 37 research teams and 9 support departments. The center's staff (about 600 people including 400 Inria employees) is composed of scientists of different nationalities (250 foreigners of 50 nationalities), engineers, technicians and administrators. 1/3 of the staff are civil servants, the others are contractual. The majority of the research teams at the center are located in Sophia Antipolis and Nice in the Alpes-Maritimes. Six teams are based in Montpellier and a team is hosted by the computer science department of the University of Bologna in Italy. The Center is a member of the University and Institution Community (ComUE) "Université Côte d'Azur (UCA)".

**Context**

The project will be focused on modeling and analysing the limits of large populations of neurons. We are particularly interested in studying multiple-time scale phenomena within this framework. The position is within the SP4 (Theory) of the HBP. Candidates should have a background in mathematics or physics. They will be expected to interact with other participants of SP4 as well as with some participants of SP3. The project will be supervised by Mathieu Desroches, Olivier Faugeras and Romain Veltz.

**Assignment**

The postdoc will develop new mean field models as limits of large population of neurons, taking into account a possible timescale separation that persists up to the limit. Then the analysis of this model will involve tools from bifurcation and singular perturbation theory. The limit will be also computationally confronted to the finite size network dynamics.

**Main activities**

- mathematical analysis of a network model and its mean-field limit  
- numerical simulation of the network and comparison with the behaviour in the limit  
- interaction with experimentalists from the SP3 of HBP

**Skills**

Of particular interest to us is a familiarity of the candidate with slow-fast dynamical systems, singular perturbation theory, bifurcation theory, probability theory, large deviations theory, and a strong interest in applying these theories to neuroscience. Ability and willingness to do programming will also be a strong point to select candidates.

**Benefits package**

- Subsidised catering service  
- Partially-reimbursed public transport  
- Social security  
- Paid leave  
- Flexible working hours  
- Sports facilities

**Remuneration**

Duration: 24 months  
Location: Sophia Antipolis, France

---

**General Information**

- **Theme/Domain:** Computational Neuroscience and Medicine  
- **Scientific computing (BAP E)**  
- **Town/city:** Sophia Antipolis  
- **Inria Center:** CRI Sophia Antipolis - Méditerranée  
- **Starting date:** 2018-06-01  
- **Duration of contract:** 2 years  
- **Deadline to apply:** 2018-03-31

**Contacts**

- **Inria Team:** MATHNEURO  
- **Recruiter:** Desroches Mathieu / mathieu.desroches@inria.fr

**The keys to success**

Interested candidates should send a CV and a short research proposal regarding the proposed topic (one page maximum)

**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.
Gross Salary per month: 2653€ brut