

**Institut de Mathématiques de Bordeaux (Université Bordeaux 1)  
Unité de Mathématiques Pures et Appliquées (Ecole Normale de Lyon)**

## **Postdoctoral Research Position**

**Project BLAN07-3\_187245  
Hamilton-Jacobi and Weak KAM Theory**

### **in partnership with**

Laboratoire de Mathématiques et Physique Théorique  
**Université de Tours** : G. Barles, O. Ley  
Centre de Recherche en Mathématiques de la Décision  
**Paris-Dauphine** : P. Dauphine, P. Bernard, C. Imbert  
Laboratoire de Mathématiques  
**Université Paris-Sud** : T. Bousch,  
Département de Mathématiques  
**Université de Brest** : P. Cardaliaguet  
Institut de Mécanique Céleste et de Calcul des Ephémérides  
**Observatoire de Paris** : A. Chanciner, J. Fejoz  
Mathématiques pour l'Industrie et la Physique  
**Université de Toulouse 3** : J.M. Roquejoffre,  
Laboratoire de Mathématiques et Applications, Physique Mathématique d'Orléans  
**Université d'Orléans** : E. Trelat  
Centre de Mathématiques Laurent Schwartz  
**Ecole Polytechnique** : N. Anantharaman,  
Laboratoire d'Analyse Non Linéaire et Géométrie  
**Université d'Avignon** : M.C. Arnaud, A. Venturelli  
Laboratoire J.A Dieudonné  
**Université de NiceSophia-Antipolis** : L. Rifford, A. Figalli  
Institut de Mathématiques et de Modélisation de Montpellier  
**Université Montpellier 2** : D. Massart  
Institut de Mathématiques de Bordeaux  
**Université Bordeaux 1** : E. Abgrall, Ph. Thieullen  
Unité de Mathématiques Pures et Appliquées  
**Ecole Normale de Lyon** : A. Fathi, C. Villani  
Université D'Analyse, Topologie, Probabilités  
**Université Paul-Cézanne** : Y. Sire

### **The appointment**

The postdoctoral position for this project is funded by the french Agence Nationale de la Recherche , ANR, under the program BLAN07-3\_187245. Appointments will be made initially for one year, beginning 1 september 2008 with the possibility of an extension for a second year. The permanent location during the first year is at the University Bordeaux 1 and at the Ecole Normale de Lyon during the second year. The candidate is encouraged to work with the members of the team of this project. Research expenses for travel and accommodation may be given to the candidate to meet the other members of the project.

## The project

The aim of this project is to bring together mathematicians coming from different horizons : Hamilton-Jacobi equations, Optimal control, Monge-Kantorovitch Transport problem, dynamical systems, weak KAM theory, Aubry-Mather theory, ergodic optimisation, Lagrangian dynamics, Celestial Mechanics. The candidat is intended to work on some of the following problems :

- regularity of viscosity solutions Hamilton-Jacobi Equations
- convergence of the Lax-Oleinik semi-group
- Eikonal equations
- Monge-Kantorovitch optimal transport
- Lyapunov functions and control theory
- stochastic homogenization
- non convex Hamiltonians
- ergodic optimisation, Frenkel Kontorova, quasicristals
- generic Lagrangian dynamics
- Mather's beta function and homogenized Hamiltonian
- Celestian Mechanics

## Selection criteria

Successful appointees must demonstrate, through their research achievements , background and availability; the ability to significantly contribute to developing connections between applied or theoretic PDE in weak KAM theory, and dynamical systems. A scientific committee will selection the best suitable candidate on the basis of international standards.

## Terms and conditions

- Salary: the salary is estimated at 1800 euros net per month for a 12 months year.
- Holidays: 6 weeks per year plus public holidays
- Duration: one year and a possibility of one year extension

## Applications

Application should include:

- Curriculum Vitae
- list of publications
- Research project (one page)
- Letter of recommendation (to be sent separately by the applicant's supervisor )
- names, email and postal addresses of two referees

Application should be sent to

Philippe Thieullen  
Institut de Mathématiques  
Université Bordeaux 1  
33405 Talence cedex  
France  
email: [philippe.thieullen@math.u-bordeaux1.fr](mailto:philippe.thieullen@math.u-bordeaux1.fr)

Deadline

Application should be sent before: **end of december 2009**