

2 postdoctoral positions in applied mathematics and computer science

Long time numerical integration of planetary systems

Starting date : **immediate**

Qualification : Ph D degree in mathematics, computer sciences, theoretical physics, or Celestial Mechanics.

Institution : IMCCE,CNRS-UMR8028, Paris Observatory
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The Long time numerical integration of the Solar System has been a challenge since the onset of the computer era, and although it is now possible to numerically integrate a realistic model of the evolution of the Solar system over its age, that is over 5 Gyr in positive or negative time from now, many questions remains. In particular, the chaotic behavior of the planetary orbits induces an exponential divergence of nearby planetary orbits which increases the initial error by a factor of 10 every 10 millions of years. It is thus practically impossible to provide a precise solution for the planet orbits over more than a few tens of million of years. It is nevertheless important for the reconstitution of the past climate on Earth to extend these solutions as far as possible in the past. On the other hand, over billions of years, planetary collisions become possible, which imposed to devise numerical integrators that well behave in the vicinity of a collision.

The two post doc positions are proposed on the various aspects of the elaboration of highly accurate numerical integrators for planetary orbits, in presence or not of collisions, using sequential or parallel methods.

The candidates should have strong background in applied mathematics and computer programming (in C or FORTRAN).

Expertise in one or several of the following topics will be also highly appreciated

- Numerical integration methods, and in particular geometric or symplectic integrators.
- Parallel computing (MPI, SMP, or GPU computing)
- Classical Celestial Mechanics

2 Positions:

LTIP1: 8 to 12 months in the ANR-ATSCM project. No constraints of nationality or age.

LTIP2: 24 months in the Marie Curie GTS_Next Initial Training Network . The applicant cannot be French and need to start the position within one year after his PhD.

Please send your application by email to Jacques Laskar (laskar@imcce.fr)

Your email should contain a pdf-file as an attachment with the following information:

- Curriculum Vitae (CV)
- A short description of your qualifications and experience (publications, theses,...)
- A letter describing concisely your scientific interests
- Names and email-addresses of two scientists willing to provide references.