# Offer #2025-09124

# Post-Doctorant F/H Numerical methods for high-dimensional problems

**Contract type :** Fixed-term contract

**Level of qualifications required :** PhD or equivalent

**Fonction :** Post-Doctoral Research Visit

## Context

**Context and Objective:**

High dimensional problems are ubiquitous in many areas of science and engineering. Some examples are all the applications in which we have to perform uncertainty quantification, optimisation, or we have to deal with high-dimensional PDEs such as in kinetic theory or quantum mechanics.

The goal of the project is to set up and investigate novel numerical methods to parsimoniously discretise high-dimensional problems. The goal is to introduce a notion of adaptivity in which the architecture of the approximation evolves dynamically on the basis of error and parsimony criteria.

## Assignment

**Assignments :**
The recruited post-doc will actively participate to the research on the set up of numerical methods for high-dimensional problems.

**Collaboration :**
The recruited person will be in connection with Damiano Lombardi, and will participate to the scientific discussions with collaborators in France and abroad.

## Main activities

Main activities (5 maximum) :

- Litterature review on adaptive tensor methods, neural networks methods for PDEs and hybrid approaches, as well as some pertinent results in approximation theory
- Start analysing novels ideas of adaptivity

- Study compression tasks as well as solving schemes for PDEs

## Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

## General Information

- **Theme/Domain :** Numerical schemes and simulations
  Scientific computing (BAP E)
- **Town/city :** Paris
- **Inria Center :** Centre Inria de Paris
- **Starting date :** 2026-01-01
- **Duration of contract :** 2 years
- **Deadline to apply :** 2025-08-06

## Contacts

- **Inria Team :** COMMEDIA
- **Recruiter :**
  Lombardi Damiano / Damiano.Lombardi@inria.fr

## About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

## The keys to success

The recruited person must have:

- Expertiese in applied mathematic, in particular, numerical analysis and scientific computing
- A knowledge of at least one of these programming languages: Pyhton, Julia, C/C++
- An interest in high-dimensional problems and their numerical approximation

**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.

# Instruction to apply

**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.