Offer #2024-07791

PhD Position F/M Doctoral Position on Lattice Dynamics & Phononic Metamaterials

Contract type : Fixed-term contract

Level of qualifications required : Graduate degree or equivalent

Fonction : PhD Position

About the research centre or Inria department

The Inria Rennes - Bretagne Atlantique Centre is one of Inria's eight centres and has more than thirty research teams. The Inria Center is a major and recognized player in the field of digital sciences. It is at the heart of a rich R&D and innovation ecosystem: highly innovative PMEs, large industrial groups, competitiveness clusters, research and higher education players, laboratories of excellence, technological research institute, etc.

Context

Inria is the French national research institute for digital science and technology. This research center for scientific excellence is on the frontline of digital transformation in Europe and conducts a world-class research covering a wide range of high-impact scientific disciplines: international and industrial collaborations, ground-breaking research, software development, artificial intelligence (AI) and technological startups (DeepTech) are the DNA of the institute. Inria rank 16th worldwide at the AI Research ranking and is the number one European institute for frontier research in digital sciences.

Assignment

Lightweight structures and functional material architectures are the locus of various vibrational or acoustic phenomena which have to be properly understood, predicted and harnessed in civil and aerospace engineering. Their multi-scale nature raises computational and modeling challenges which are the subject of extensive research within the scientific community.

The ANR-JCJC Archi-Noise project aims to unveil disruptive concepts of architected (i.e., lattice-based) materials for Noise and vibration control. This research project aims to leverage a cutting edge computational framework developed within the group, to design novel metamaterials exhibiting enhance low-frequency noise and vibration mitigation capabilities. The candidate will delve into wave physics, enriched continuum theories, structural dynamics and finite element modelling. The project will cover the following topics:

- Computational mechanics and finite element methods,
- Dynamics of waveguides,
- Acoustics and propagation phenomena in complex lattice structures

The PhD applicant will therefore be hired to conduct high-level scientific research along two workpackages (WPs.1-2) of the project, which involve the conceptualization, derivation and resolution of original theoretical and numerical models describing meso-scale architected meta-structures, in order to understand, explore, design and evaluate these novel materials.

Main activities

Requirements for applicants:

- Outstanding problem-solving ability,
- Very good track record, including a relevant higher education degree in physical sciences, mathematics or engineering,
- Rigorous and self-motivated mindset, ability to learn, organize and prioritize own work with minimal supervision,
- Professional English proficiency,
- Background in mechanics, vibrations, acoustics, finite element modelling, or a good computer literacy (e.g. programming experience in Python, Matlab or Julia) would be an advantage,
- Share our passion for science and technology.

Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Possibility of teleworking (90 days per year) and flexible organization of working hours
- Partial payment of insurance costs

Remuneration

Monthly gross salary amounting to 2051 euros for the first and second years and 2158 euros for the third year

General Information

- **Theme/Domain :** Optimization and control of dynamic systems
  Scientific computing (BAP E)
- **Town/city :** Rennes
- **Inria Center :** Centre Inria de l'Université de Rennes
- **Starting date :** 2024-09-01
- **Duration of contract :** 3 years
- **Deadline to apply :** 2024-07-31

Contacts

- **Inria Team :** I4S
- **PhD Supervisor :**
  Droz Christophe / christophe.droz@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.

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

Please submit online : your resume, cover letter and letters of recommendation eventually

For more information, please contact christophe.droz@inria.fr

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.