POST-DOCTORAL POSITION:
EMATs (Electromagnetic Acoustic Transducers) DEVELOPMENT FOR THE NON-DESTRUCTIVE EVALUATION OF RAILS

Organisation :	Geophysics and Non-Destructive Laboratory, Gustave Eiffel University
Location:	Nantes, France
Research Field :	Ultrasonics, Wave propagation, Acoustics, Multiphysics, Electromagnetism, Signal Processing, Instrumentation, Electrical Engineering
Type of contact :	Temporary
Job status :	Full-time
Duration :	22 months
Application deadline:	1 December 2026
Monthly gross salary :	about 3000€
Contact :	laurent.laguerre@univ-eiffel.fr, fabien.treyssede@univ-eiffel.fr
Keywords :	EMATs (Electro Magnetic Acoustic Transducers), Ultrasonics, Multiphysics

Your tasks

We are seeking a highly motivated postdoc with proven research abilities to take up a position on the development of EMATs solutions. You will participate in an applied research project funded by the French National Research Agency (ANR) within a consortium framework composed of the GeoEND Laboratory (Gustave Eiffel University, Nantes Campus), I2M (Bordeaux University) and SNCF-Réseau, dealing with the safety of rail infrastructure.

Your work will take place in the WorkPackage3 dedicated to “EMATs development towards non-contact imaging” where you will undertake the development of EMATs solutions in view of their implementation for the non-destructive evaluation of a rail structure.
(The [WP2] “Piezoelectric demonstrator for 2D contact topological imaging” and the [WP4] “3D modeling of damaged rails and digital twin for waveguide imaging” are the other main constitutive project WPs).

Of concern in the WP3 is the detection of buried defects in rail parts (i.e. head, web, foot) with EMATs located at the rail head. Surface defects will not be considered in this work.
A special attention will be paid to bulk wave EMATs (guided-wave EMATs might also be considered if any guided wave mode solutions possibly emerge from the WP4 work in progress).

In this frame, your goal will be to develop, build and test shear-wave EMATs.
To do so, experimental research will be performed at a laboratory scale to gradually conduct tests and validation. In a first stage, experiments will be carried out on free-defect metallic block samples of non-ferromagnetic and ferromagnetic materials respectively. To drive these EMATs, the existing high-power sources at the GeoEND laboratory will be used preferably. However, alternative solutions regarding other driving sources types could in some ways be addressed (i.e. low power type, specific excitation signal). In a second stage, the case of a rail specimen will be considered. The experience gained in the design of shear bulk wave EMATS in the first stage will be valuable. In this second part, your work will consist to move forward potential solutions for rails in view of the detection of special defects defined by SNCF-Reseau specifications. This will still be done at a laboratory scale on free-defect rail samples and rail samples with machined-defect.

Your profile

You must hold a PhD in Acoustics, Physics of waves or related fields (see “Research field” item in the description), or possess an equivalent qualification/experience in a related field of study and be able to demonstrate sufficient knowledge of research methods and techniques to work within the program.

You are motivated by the experimental approach and the multiphysics approach.

Skills and experience in physics of EMATs is required. Proficiency in the development of EMATs will be highly beneficial.

You must have an experience of 3 to 5 years in the domain

Application procedure

Please submit your application by email (titled: EMATs_Post Doc Application) to :
laurent.laguerre@univ-eiffel.fr,
https:// https://pagespro.univ-gustave-eiffel.fr/laurent-laguerre
fabien.treyssede@univ-eiffel.fr
https:// https://pagespro.univ-gustave-eiffel.fr/fabien.treyssede

Your application email must include the following items :
- motivation letter (.pdf) (outlining your research interests and emphasizing how your research expertise is pertinent to the position),
- CV (.pdf),
- PhD defense report / pre-defense reports (.pdf)
- list of publications,
- names and complete contact information of two academic (or professional) references.

We welcome your application no later than December 1, 2026.

Additional information

The post-doctoral position will take place at the GeoEND (Geophysics and Non-Destructive Evaluation) laboratory, Gustave Eiffel University, Nantes, France.
The appointment will be for 22 months (3048€ gross salary per month).