This full research position application should be opened on february 12, 2024.
Deadline for application should be March 15, 2024.

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Université Gustave Eiffel

Job description - Recruitment 2024

Chargé·e de recherche (Normal Class) of Sustainable Development

(Chargé·e de recherche de classe normale du développement durable - CR CN)

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Université Gustave Eiffel

Job title:	Research Fellow in « Environmental Acoustics »
Institution:	**Université Gustave Eiffel -** https://www.univ-gustave-eiffel.fr/en/
Discipline(s):	Physical acoustics
Speciality(es):	Environmental acoustics
Host Research Structure:	Laboratory “Acoustique Environnementale” (UMR, Univ. Eiffel with Cerema)
Location:	Université Gustave Eiffel, Campus of Lyon-Bron
Contacts:	Judicaël Picaut, Director of « Environmental acoustics » laboratory, Phone: (+0/33) 2 40 84 57 89, Mail: judicael.picaut@univ-eiffel.fr

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1- Background

A major player in European research on cities and territories, transport and civil engineering, Université Gustave Eiffel, created on January, 1st 2020 from the merger of Ifsttar (French Institute of Transport, Planning and Network Science and Technologies) and the Université Paris-Est Marne-la-Vallée, is a scientific, cultural and professional public institution (like all French universities), with an experimental status and a national presence, which make it a unique university in France. It aims to be a major player in research on transport and cities. The research labs of Université Gustave Eiffel conduct both upstream and more finalised research and expertise in a wide variety of disciplines (mathematics and computer science, electronics, materials, chemistry, civil engineering, geosciences, social sciences, psychology, economics, management, innovation sciences, communication, ethics, history, arts, literature etc.) and in fields with a strong societal impact such as transport, infrastructures, natural hazards and cities, aiming to improve the living conditions of our fellow citizens and, more broadly, to promote the sustainable development of our societies.

Among the environmental impacts of mobility, and more generally of (peri-)urban infrastructures and systems, noise is a major societal issue, with a significant impact on health (hearing impairment, development of cardio-vascular problems, stress, insomnia, etc.). Noise (particularly from transport) is also the nuisance most cited by French households, on a par with air pollution. To meet these challenges and provide solutions, national and European legislation has been in place for several years to regulate noise pollution. Particular mention should be made of Directive 2002/49/EC on the assessment and management of environmental noise, which stresses the need to inform local residents of the risks and effects of environmental noise (via noise maps, for example), and to adopt action plans for noise prevention and reduction. The activities of the Environmental Acoustics Research Unit (UMRAE) are part of this context and aim to assess, characterize, model and reduce

the impact of environmental noise, by carrying out research on the entire chain, i.e. the following 3 themes: (1) environmental noise sources (acoustic emissions from road and rail vehicles, acoustic optimization of road surfaces, noise from energy production sources - wind turbines for example...); (2) noise propagation in the environment (from great distances to the scale of a building, effects of vegetation, soil effects, surface roughness, acoustic properties of environmental materials...); (3) the impact of noise on man and biodiversity (noise mapping tools, characterization of urban noise environments, sensor networks for noise observation, noise perception...). UMRAE's research is aimed at improving scientific knowledge, disseminating results on the generation, propagation and reception of environmental noise ("academic" research), developing acoustic forecasting tools for use by planners and specialists, and proposing noise reduction and protection solutions. The dissemination of databases, software, calculation codes, technical guides and prototypes, particularly in an Open Science context, is an important feature of UMRAE, contributing to the unit's influence in different communities (education, professionals, research).
UMRAE was created in 2018, by bringing together the Acoustics research teams of the Gustave Eiffel University and Cerema, and has around 35 staff, including 23 permanent employees, located at the Nantes (Univ Eiffel), Lyon (Univ Eiffel) and Strasbourg (Cerema) sites. The UMRAE website (www.umrae.fr) provides further details on the unit's organization and research activities.

2- Job Content

The position offered and the research to be carried out take place in a dramatic change in mobility patterns (electrification, autonomous guided mobility, for example), with a strong industrial focus (many projects are being carried out by major companies: Airbus, Uber, Amazon, Siemens, Alstom...), and in the absence of sufficient scientific knowledge (acoustic emissions, impact of changes in the transport fleet, multiplicity of sources/autonomous transport modes...). Fundamentally, the aim is to be able to anticipate the noise impact of these developments, in the environment, and not to suffer them when it's already too late. This activity will also require the development of new industrial collaborations, as well as exchanges with specialists in acoustic perception ("sound acceptability" issues). The expertise developed as part of this research activity will be used to support public policies, but also in standardization and expert groups on the subject of noise pollution control.

The aim of opening this position is to develop research into noise sources in the environment, particularly in urban environments (conventional road and rail vehicles, new forms of mobility: autonomous shuttles, guided transport, drones, flying cabs, robotized logistics, etc.). Firstly, new measurement methodologies will be implemented (localization, tracking of mobile sources, inverse methods, machine learning techniques, microphone array, etc.) in order to characterize the acoustic emission of sound sources, and secondly, emission models will be proposed that integrate the physical mechanisms involved. These models could be used to propose noise reduction solutions at source, but could also be integrated, possibly in a simplified form, into noise mapping tools in order to assess the noise impact of these sound sources in a more global way (i.e. in their environment, using UMRAE's NoiseModelling code for example). This experimental work will be based on equipment available on the Lyon-Bron Campus (microphones arrays, Transpolis test track), collaborations with LabEx CeLyA partners (INSA, ECL, ENTPE), industrial collaborations, and the supervision of students from local training in Lyon (e.g. Master of Science in Acoustics, MEGA doctoral school).

Generally speaking, a person recruited as a Research Fellow is expected to be involved in production, supervision, research promotion and participation in the development of research programmes at different levels (regional, national, European, international). In particular, the candidate will be expected to publish her/his work in international peer-reviewed journals that meet the standards of her/his discipline, but also in journals or books in the more applied fields of the laboratory. It is also expected to communicate the work to peers, but also to the general public. She/he may also be required to contribute to or carry out expertise tasks. He/she will also participate in the collective scientific life of the laboratory and the university.

In addition to his or her research production activity, a Research Fellow is also expected to develop, in the long term, a diversified activity in all or part of the following activities

- Teaching and research training (teaching, supervision of trainees, doctoral and post-doctoral students, participation in juries and bodies or committees related to teaching)
- Research administration and facilitation activities (team facilitation, project coordination, staff management, management of test facilities)
- Valorisation and transfer activities (research and industrial contracts, consultancy and advisory activities, transfer of research results to the socio-economic world, contribution to public policy development, dissemination of scientific culture)

- International activities (participation in European projects, ongoing international collaborations, contributions to the international visibility of the university)
- Scientific outreach (membership of learned societies, editorial boards, scientific committees of institutes, conferences, recruiting committees).

3- Expected profile

The candidate must hold a PhD in Acoustics, or be able to prove an equivalent level, in particular for applicants from abroad (publications, participation in projects, teaching).

The candidate is expected to have general knowledge of physical acoustics, signal processing, acoustic metrology, numerical simulation (Matlab, Comsol, finite element software), etc. The candidate should also be able to develop and implement ambitious experiments related to his/her research, in partnership with other members of the unit and, where appropriate, external partners (industry, university laboratories, foreign teams). It is highly desirable that the candidate has research experience in environmental acoustics, or can provide evidence of a particular appetite for developing research in environmental acoustics.

The candidate's application file should highlight his/her ability to develop the activities (listed above) expected of a research Fellow. Scientific publications at the highest level (international peer-reviewed journals and/or international conferences), participation in research projects (national and/or European), an aptitude for teamwork and scientific leadership, interpersonal skills and oral and written communication skills in French and English will be particularly appreciated. Scientific rigour, as well as autonomy and organisational skills, are obviously expected.

The person recruited will be assigned to the research structure "UMR Acoustique Environnementale" on the university campus in Campus de Lyon-Bron.

4- Recommendation

The candidate is expected to propose in his/her application a scientific project in line with the activities of the targeted research team and it is therefore strongly recommended to contact the persons indicated.