

# ACOUCTECT

## Open Position at MATELYS - Research Lab in the field of Building Acoustics

### Prediction and control of rolling noise in buildings (ESR4)

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Acoutect is a European project running from January 2017 until December 2020. This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement number 721536.

Acoutect marries "Acoustics" and "Architect" and responds to the important role that Acousticians have in the design of modern buildings. The overarching aim of Acoutect is to set up a PhD training network on building acoustics and react to the acoustic challenges stemming from modern building concepts to deliver sustainable indoor environments with respect to health and well-being.

Within this project we are seeking an early-stage researcher (ESR) for a 36 months PhD position hosted at Matelys – Research Lab in Lyon Métropole (France). Matelys is an independent research laboratory dedicated to the study of materials, which expertise covers acoustics, vibrations, thermodynamics and fluid dynamics problematics in buildings, transportation, equipment and environment ([www.matelys.com](http://www.matelys.com)).

### Project Background

To ensure a healthy environment for people living and working in buildings, research and engineering in the area of building acoustics is essential. Developments in modern building concepts, such as sustainable low-energy consuming buildings, buildings with lightweight materials and open plan working environments, as well as the need to build in extremely noisy areas, require involvement of acoustic experts in order to successfully (re)design buildings without negatively impacting upon people's health and well-being. Taking up current and future acoustic challenges requires innovative solutions based on a thorough understanding and mastering of modern methods and tools, as well as a holistic acoustic approach involving acoustic design, products and subjective evaluation. However, in the complex field of building acoustics, research activities typically are not holistic and have become slightly marginalised. As a consequence, there is a lack of building acoustics experts.

To meet the future acoustic needs of the built environment, Acoutect is constructed around two objectives:

1. Establish a long-lasting European-wide training programme on building acoustics.
2. Launch an innovative research programme.

With these objectives, Acoutect will equip early stage researchers (ESRs) with skills to ensure acoustic quality of modern and future building concepts, and with excellent perspectives for a career in industry or academia within the area of building acoustics. The training and supervision to reach these objectives is offered by the Acoutect consortium.

### Research context

The candidate will be hosted at Matelys and will also benefit from a co-supervision at Eindhoven University of Technology. The candidate work takes part of Matelys research theme related to the characterization and the prediction of the noise source in building acoustics.

Matelys characterises, models and designs innovative passive materials for the control of sound and vibrations in Buildings and Transportation. Matelys has a broad track record of successful applications with industrial and academic research laboratories for the development of porous media featuring multiple scales of porosity and increased sound absorption and/or transmission properties. Matelys has a solid experience in the development of porous media with multi-physical criteria (i.e. acoustics, mechanics, thermals).

From its expertise, gained at the characterization of various porous media Matelys addresses the description of the dissipation mechanisms using dedicated modelling tools and advanced experimental set-ups, including a series of specially designed impedance tubes.

Matelys actions cover the wide range of micro-, meso- and macro-scopic scales; therefore, having a true multi-scale approach, allowing the characterization of the material, the understanding of the material functioning and the optimisation of their performances. Matelys's approach has been awarded in 2012 with the Industry Price of SFA (French Acoustical Society) and in 2011 with the Research Gold Decibel of CNB (National Council against noise).

### Vacancy description

New buildings in urban areas are divided in commercial and living surfaces. This usage has revealed critical disturbances due to the noise of the trolleys delivering at time where the buildings are mostly occupied, e.g. early in the morning. Rolling trolleys indeed generate low frequency vibrations

(below 100 Hz) which propagate easily in the entire building structure and in upper storeys.

The ESR's work aims at developing an original model for rolling noise in buildings accounting for the ground surface roughness as well as the rolling wheel asperity profile. The model will also consider the mechanical impedance of the ground including some possible flooring noise treatment.

This model will be validated by comparison with experimental data. Finally, the ESR will define design guidelines to develop new material solutions and draw prescriptions to overcome the rolling noise issue in Building construction.

The work will be supported by research stays at University of Technology of Eindhoven (Netherlands, <https://www.tue.nl>). Additional stays related to the setting-up of demonstrators are also planned in Sweden, at Moelven-Limträ construction company ([www.molven.se](http://www.molven.se)) and Akustikverkstan consulting company ([www.akustikverkstan.se](http://www.akustikverkstan.se)). Financial support is provided to help this mobility, see section "Job Conditions".

## Candidate Profile

All candidates must be fluent in spoken and written English. The R&D is highly multidisciplinary. An ideal candidate has a M.Sc. in acoustics, mechanical engineering or physics.

- Knowledge of computational modelling and programming languages will be appreciated.
- Good skills in signal processing and measurement methods will be a strong advantage.
- Candidates get the opportunity to perform this work as part of a PhD study.
- All members of the network are equal opportunity employers, both female and male candidates are invited to apply.

## Job conditions

The host organisation will appoint the successful applicant under an employment contract with a very competitive salary according to EU regulation, including social security. The duration of the contract is, at least, 36 months. The fellow is expected to join their host organizations starting from July 2017 (estimated time). The salary is composed from the following allowances depending on the personal status of each fellow (see more details at [www.acoutect.eu](http://www.acoutect.eu)):

- Living allowance: Monthly rate of €3,110. This amount will be multiplied by the Country Correction Coefficient of the recruiting institution. This amount includes the monthly salary for the fellow before any deductions (contributions of both employers and employees to social security, pension, taxation, voluntary deductions, etc).
- Mobility Allowance: Monthly rate of €600. Contributes to the expenses of the researcher caused by the mobility.

- Family Allowance: Monthly rate of €500. For all the recruited fellows who have family at the time of the recruitment.

Additional funding for participation to courses, workshops, international conferences, etc. is ensured.

This position includes doctoral studies. The successful applicant must register for the 3-year PhD program at MEGA doctoral school of Université de Lyon (<http://edmega.universite-lyon.fr>) and will get a co-supervision at Eindhoven University of Technology.

## EU Eligibility criteria for candidates (in short)

The applicant may be of any nationality.

The applicant shall at the time of recruitment be in the first four years of his/her research career and have not been awarded a doctoral degree. This is measured from the date when the applicant obtained the degree, which would formally entitle him/her to register as PhD candidate.

The applicant must not have resided or carried out his/her main activity in the country of the host institute for more than 12 months in the 3 years immediately prior to the recruitment.

## Benefits

The candidate has a chance of joining a European wide research training network gathering 14 other ESRs. The ESRs will get trained on scientific level together with industry practices. ESRs will also be equipped with complementary skills related to communication and entrepreneurship and will follow a personal career development plan.

The candidate will be fully integrated to Matelys team. As a complement to the PhD framework, the candidate will have the opportunity to touch on the other domain of activities of the company : automotive, aircraft, railway, industrial and domestic appliances, software development and experimental work. Matelys offers an attractive working environment at the interface between industry and academic research activities. Matelys is a growing business company having a broad track record of successful applications from which the candidate will take profit for its own career plan.

## How to Apply

Follow the instructions at [www.acoutect.eu](http://www.acoutect.eu).

**APPLY NOW!** Application open from February 1<sup>st</sup> 2017. The evaluation process of the applications will start from April 1<sup>st</sup> 2017.

Questions regarding this position: [info@acoutect.eu](mailto:info@acoutect.eu).