

Alma Mater Studiorum – University of Bologna (UNIBO), Bologna (BO), Italy

Viale Risorgimento 2, 40136, Bologna (BO), Italy
Marie Skłodowska-Curie Actions, Early Stage Researcher

Deadline for applications: July 9th, 2018

Expected starting date: November 1st, 2018

Job description:

The job is a full time position for an Early Stage Researcher (ESR) in the field of road pavements and innovative construction materials. The title of the project is: **High Friction & Acoustic Surfacing for Pavements (Hi-FASP)**. The goals are to create macro and micro-textured surfacing materials with superior skid-resistance and acoustic features even at urban speeds. The proposed paving materials and solutions will be able to increase the safety of users and decrease the road noise impact on the environment.

Job duration: 36 months

Main research field: Pavement Engineering

Research subfield: Innovative Paving Materials

Institution description:

The University of Bologna is the second largest university in Italy and one of the most active in research and technology transfer. It stands among the most important institutions of higher education in EU with 87,000 enrolled students, 2,857 Academic staff, 1,198 post-docs, 1,606 PhDs, 3,014 administrative and technicians staff units. At UNIBO, research activities are promoted, coordinated and supported by the 33 Scientific Departments. The Department of Civil, Environmental and Materials Engineering (DICAM) is equipped with a Centre which gathers 11 Labs that operate in all specific areas of Civil, Chemical, Environmental and Materials Engineering and more. Road Research Laboratory (LAS) is one of these labs and for over 75 years it has been conducting research and experimentation in the field of transportation. Traditional and cutting-edge equipment is used to analyse and characterise soil materials, aggregates, asphalt, bituminous materials as well as new materials both in the laboratory and on site. LAS's institutional objectives are university research and teaching. It is moreover an authorized agency for standards testing and certification for third parties.

Working place

The project will take place at the Road Research Laboratory (LAS) of the University of Bologna. The ESR will have access to all the lab facilities and services as well as to the local Department administrative offices. A number of secondments in Germany (MBBM Müller-BBM) are scheduled, within the group of Dr. Beate Altreuther, working in the field of noise analysis. The ESR will learn and apply acoustic measurement methods and data analysis. Other secondments are planned in the premises of an Italian company (SAPABA), which is a leading supplier of heavy building materials to the construction industry. The ESR will take advantage of the company's knowledge and will learn paving production and construction technologies and lab factory controls.

Project description

The main objective of the project is to create macro and micro-textured surfacing materials that will have superior skid-resistance (especially where needed, i.e. intersections) and acoustic features even at urban speeds. Traditional and innovative materials for road and urban pavements will be used and developed for this aim. The Early Stage Researcher will assess the performances of these innovative solutions by skid and noise measurement techniques.



The main expected and desirable results are:

- develop mix design lab procedures for micro and thin surfacings with high-friction and acoustic features;
- the substitution of natural aggregates with geopolymeric artificial aggregates to enhance micro-texture durability and shape;
- construct a demonstration section and test it with standardized and innovative methodologies at time intervals.

The ESR will be required to undertake the following responsibilities and tasks:

- mix design for cold applied micro-surfacings and cold and warm applied thin-surfacings for high friction overlays;
- characterization of lab-scale skid-resistance and acoustic properties of compacted samples;
- development of engineered artificial geopolymeric aggregates for micro and thin surfacings functional durability;
- real-scale trial site for on-road verification of products. Repeated Micro-grip and Close proximity testing.

From this experience, the ESR will acquire a broad expertise in the design of macro and micro-textured surfacing materials and will have a specific knowledge in the noise analysis and acoustic measurements applied in the field of civil infrastructures.

Marie Skłodowska-Curie Initial Training Network SAFERUP!

Urban pavements comprise almost 40% of European cities and are the main means by which the public travels every day. Urban pavements must accommodate all users in the most efficient, safe, sustainable and smart way. A key factor to increase the liveability of tomorrow's Smart Cities will be transforming the way urban pavements are perceived, designed, built, maintained and function. SAFERUP! aims at providing cities with innovative solutions that will form the future urban paved environment, by training talented researchers in the fields of: smart, recycled and durable paving materials; enhancing accessibility and safety of vulnerable users (e.g. elderly & disabled); studying user behaviour; analysing life cycles; managing wash-off water and bioremediation; producing tempered and acoustic pavements; enabling energy harvesting and self-sensing technologies. The SAFERUP! Consortium believes in this future and has created a unique team of world leading commercial and academic research engineers and scientists, with a diverse range of expertise needed to develop the novel solutions required to deliver this future and its anticipated benefits. Fifteen ESRs will undertake their PhDs in a research and training programme designed to optimise their multidisciplinary and cross-sectoral experience through secondments and a variety of SAFERUP!-wide forums. All ESRs' projects are interrelated and considerable synergies, trans-project contributions and collaborations will occur. A key focus of the training will be career planning, entrepreneurship and skills development in particular communication. SAFERUP! participants with communication expertise will develop the communication and dissemination strategy to maximise the exploitation of the developed solutions. SAFERUP! will create a new generation of professionals with multidisciplinary expertise in urban pavements and related fields appealing to employers, who will expand the social benefits of the new urban pavements well beyond the end of SAFERUP!

Candidate profile

The candidate is required to have a master degree in Civil or Materials Engineering giving access to the PhD school and NOT to hold any PhD degree. Previous research experience, (which must be no longer than 4 years), although appreciated, is not mandatory. Good oral communication skills in English is compulsory. Willingness to travel internationally for the purpose of research, training and dissemination is mandatory.

Eligibility requirements

ESR appointments are full-time fixed term for 36 months. Candidates matching the required profile will be evaluated until a successful candidate is appointed. There are strict eligibility rules associated



with the recruitment of Early Stage Researchers in MSCA Innovative Training Networks.

Career: At the time of recruitment, the ESR must hold a Master degree giving access to PhD and not more than 4 years of previous research activity. A PhD degree in any field is not compatible with this ESR position.

Mobility: Transnational mobility is an essential requirement of Marie Skłodowska-Curie Training Networks. At the time of recruitment, the ESR must not have resided in Italy for more than 12 months in the 3 years immediately prior to the recruitment date and not have carried out in Italy his/her main activity (work, studies, etc.). Applicants must be prepared for a secondment for a total of 3 months at Müller-BBM, and another secondment for at least two months at SAPABA in Italy.

Language: A good knowledge of spoken and written English is required and will be evaluated during the selection process.

How to apply

Applicant shall provide the documentation listed in the corresponding Application Form. The documents shall be sent by e-mail to both the following address: cesare.sangiorgi4@unibo.it AND dicam.saferup@unibo.it. A confirmation message will be sent upon submission.

Evaluation and interview

The selection process will consist of CVs, motivation and records evaluation and an interview (additional interviews could be required). The interview to assert the skills, the motivation and the fluency in English, will take place at the host institution or, for those candidates who are not able to travel to Bologna (Italy), by internet connection. The candidates will be ranked according to both their records and the interview. The candidate at the highest ranking position will be offered the position. If, for any reason, the selected candidate will decline the offer or will fail to comply with the requirements for enrolment in the position, the one following in the list will be selected. More details on the selection process could be found on <https://site.unibo.it/saferup> and on <https://euraxess.ec.europa.eu/>.

Rights and responsibilities of researchers participating in Marie Skłodowska-Curie Actions

The European Charter for Researchers is a set of general principles and requirements which specify the roles, responsibilities and entitlements of both researchers and the employers and/or funders of researchers. The aim of the Charter is to ensure that the nature of the relationship between researchers and employers or funders is conducive to successful performance in generating, transferring, sharing and disseminating knowledge and technological development and to the career development of the researchers. It is obligatory for applicants to read and understand the detailed information regarding the rights and responsibilities of researchers engaged in a Marie Skłodowska-Curie Innovative Training Network. The European Charter for researchers can be accessed at: <https://euraxess.ec.europa.eu/jobs/charter/european-charter>

Employment contract and remuneration

The selected candidate will be appointed under a 36-months full-time employment contract with full social security and fiscal coverage, as foreseen by the Italian national legislation. The remuneration will be compliant with the rules of the ITN-MSCA, as by the Marie Skłodowska-Curie Actions Work Programme 2016-17, 'European Union Contribution and Applicable Rates'. The gross amount per year of the allowances includes the salary (39820€), the mobility allowance (7200€) and a family allowance if eligible (6000€). These gross amounts include all compulsory deductions under national applicable legislation (taxes depend on the country of the host institution).

