1 POST-DOC POSITION IN "BLAST LOADS ON STRUCTURES AND MONUMENTS"

(GEM LABORATORY, ECOLE CENTRALE DE NANTES, FRANCE)

AVAILABLE POSITION

The appointment forms part of the Connect Talent project "CEEV" (Controlling Extreme Events), funded by the Pay de la Loire and Nantes Metropole (http://www.connectalent.org/). The position offers the possibility of working on a challenging and stimulating research topic. The knowledge, innovation and skills to be developed will open perspectives for career development.

RESEARCH CONTEXT

Explosive attacks are frequent in 21st Century. History shows that such attacks have been the most destructive means both in terms of human lives and our cultural heritage. A classical paradigm for the latter is the Parthenon in Athens, Greece, which was exploded in 1687. Recent examples of iconoclastic violence are the Buddha statues of Bamyan in 2001, the destructions at Palmyra in 2015 and 2016, the explosions in two Coptic Christian Churches in Tanta and Alexandria, Egypt, in 2017 and the Great Mosque of al-Nouri that was destroyed on June 21st, 2017. It is certain that more monuments and civil engineering structures will be threatened in the future. Therefore, modeling and quantifying the effects of explosions on structures is nowadays of paramount importance, both for the protection of the buildings and of people in them.

DESCRIPTION

The research topic is on "B*last loads on structures and monuments".*

We focus on the development of new approaches capable of modelling blast scenarios in order to propose blast mitigating geometrical configurations and reinforcing strategies. This effort passes through the modelling and prediction of the effects of explosions on large masonry structures of complex geometry or reinforced concrete structures. It is worth mentioning that tools to investigate and understand the behavior of structures under fast dynamics loads have already been developed, but these tools need to be further developed and experimentally validated. Therefore, a part of the proposed position is devoted to the development of analog blast laboratory experiments in reduced scale.

REQUIREMENTS

Successful candidates are expected to have strong scientific skills and high motivation. Fluency in spoken and written English is highly advantageous. French is not required, but is appreciated.

The candidates will carry out research, develop tools and write scientific articles in close collaboration with the project's PI, Pr. Ioannis Stefanou, and the members of CEEV group at the Ecole Centrale de Nantes (GeM laboratory).

The candidate is expected to have:

- A strong background in numerical modeling in fast-dynamics (e.g. Finite Elements and Discrete Elements).
- Rigid-body dynamics.
- Skills in programming (e.g. Python, C++).
- Machine Learning.

There will be highly appreciated:

- Knowledge of mechanics and physics of materials and thermodynamics.
- Existing research on masonry structures.
- Experience in experimental research in fast dynamics.
- Team skills.

CONDITIONS OF EMPLOYMENT

The duration of the appointment is two to three years.

Personal initiative and independent research tasks related with the candidate's interests and the project will be encouraged. Other activities will include PhD supervision and interaction with Master and undergraduate students.

The project will cover travel expenses for attending international conferences and making research visits.

The successful candidate will be part of the CEEV research group in GeM laboratory (https://gem.ec-nantes.fr/) of the Ecole Centrale de Nantes, which gathers nearly 230 people (including 75 researchers, approximately 120 PhD students and Post-Docs and 35 technical and administrative staff), who work in the areas of mechanics and physics of materials, structures and geomaterials, and their applications.

APPLICATIONS

The position is open and will start upon agreement.

Suitable, highly-motivated candidates should send an application (including a CV, a cover letter describing interests and qualifications related to the offered position and contact details of two reference Professors, all compiled in a single PDF file) to ioannis.stefanou@ec-nantes.fr. Candidate selection will be performed on the basis of the excellence of the CV and motivation.