

Postdoctoral in nanoscale modeling at LGCgE, University of Lille, France

A postdoctoral position will soon be available in Ali Zaoui's group at LGCgE, University of Lille. Prospective candidates are invited to send a manifestation of interest including a CV and a detailed description of their scientific achievement.

Title: Nanoscale modeling of advanced nano-reinforced geopolymer/CNTs materials

Details of the project:

Nowadays, geopolymers are advanced alternatives to cementitious materials, where their excellent chemical and fire resistance are some of its most appealing properties. Geopolymers enable the use of industrial waste materials while converting them into a novel binding material. Reinforcing geopolymers with nano-carbons would significantly strengthen its microstructure and with this enhancing the long-term mechanical and durability performance.

The proposed project is supported by ANR project NanoGP. It will mainly focus on modeling, validating metakaolin and fly ash based geopolymers reinforced with carbon nanotubes (CNTs). Although some experimental studies have been conducted on nano-reinforced geopolymers, the molecular nano-structure, the relationship with the chemical composition, the reaction kinetics, and its effect on the mechanical properties and durability is still not fully understood. It remains difficult to tailor the properties of CNT_geopolymers since they are influenced by multiple synthesis factors, such as the properties of raw materials, chemical composition (e.g. Si/Al and Na/Al ratios), CNT density and dispersion, water content, curing temperature and humidity. Therefore, a clear understanding the characteristics of CNT_geopolymer-based microstructures, at the nano-scale level, is of vital importance for achieving the desired macro-mechanical properties.

Duration: 36 months

Candidature:

Successful candidate should have solid skills in nano-scale modeling especially Molecular dynamics simulations. In addition, good knowledge of geomaterials including experience on nanoscale modeling of minerals, nanomaterials, and cementitious materials is required. The selected candidate should be highly qualified and having a great knowledge and experience in the elaboration of the scientific research.

Contact:

Interested candidates can submit their detailed CV (pdf file) to the following address:

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More information concerning the research group and/or the laboratory can be found at: <https://www.lgcge.fr/en/> Or <https://ali-zaoui.univ-lille.fr>