

Coupled experimental-numerical techniques to identify impact-dynamic properties of advanced materials

Vacant PhD position

Job description

The research group Materials Science and Technology-DyMaLab is looking for a PhD researcher to contribute to ongoing research on advanced materials used by the automotive and aeronautical industry. These materials include advanced high strength steels, lightweight alloys, polymer composites, nanocomposites, etc. which might be prone to impact or, more generally, high speed deformation processes. Main aim of the PhD is to obtain an enhanced understanding of the impact-dynamic mechanical properties of materials, including the microstructural factors lying at the origin of the observed behaviour. Understanding these properties will result in a better prediction of high speed forming processes, the crashworthiness of car components and impact incidents in the aeronautical industry.

MST-DyMaLab is a research group of the faculty of Engineering and Architecture of Ghent University, which is among the top 100 global universities according to several international rankings. To characterise the dynamic behaviour of materials, DyMaLab disposes of experimental facilities and measurement devices that are unique in the world (see <https://mst.ugent.be/dymalab/research/>). The introduction of highly advanced measurement methodologies, including high-speed full-field deformation measurements, has opened a world of new opportunities. It even allows for a paradigm shift in material testing. Indeed, by combining large measurement datasets with numerical simulations, Material Testing 2.0 methodologies allow to completely discard traditional test restrictions and assumptions. In the framework of present PhD, we would like to further explore Materials Testing 2.0 for advanced automotive and aeronautical materials.

Therefore, a keen interest in mechanical material behaviour, material testing and measurement techniques, is a prerequisite for the position. Additionally, the use of advanced devices requires elementary knowledge of mechanics, optics, electronics, measurement procedures, data processing, etc. Experience with Labview, Matlab, Python scripting and finite element modelling is highly useful.

Next to scientific research, the researcher will also have the opportunity to develop his/her teaching skills by providing assistance to the courses provided by the MST group. We also expect the PhD researcher to contribute to the daily operation of the lab.

We offer an intellectually challenging, international work environment. Additionally, the PhD researcher will have access to high-quality training to develop hard and soft skills, opportunities to participate in international scientific conferences and to interact with international researchers.

The selected PhD researcher will receive a competitive scholarship (monthly minimum 2100 EUR nett spendable plus other benefits. For comparison: the average nett monthly income in Belgium is 1700 EUR. More information on the cost of living in Ghent can be found on <https://www.numbeo.com/cost-of-living/in/Gent>).

Furthermore, Ghent is a charming medieval Flemish town, filled with canals, full of energy, history and culture.

The position is available from spring 2022 onwards. The actual starting data is flexible, but preferably not later than September 2022. Students who graduate in July 2022 can apply.

Profile of the candidate

We are looking for a researcher with a keen interest in experimental and numerical work related to materials. Typically someone who, from an early age, was busy playing (and probably breaking) all kinds of appliances. Someone who has later turned this 'destructive attitude' into the creation of mechanical tools, electronic gadgets, software, And, finally, further building on a strong interest in how things work, has chosen to study engineering.

More specifically:

- You have a master's degree (or equivalent) in mechanical engineering, materials science or civil engineering. Materials science, with a strong focus on the mechanical behaviour of materials, must have been an important part of your curriculum.
- You have a keen interest in materials, including how their properties and microstructure can be identified and modelled.
- You are familiar with materials testing and you do not fear experimental work, including the use of advanced measuring equipment such as high-speed cameras and (optical, SEM, TEM) microscopes.
- You are familiar with mathematical packages such as Matlab, Python programming, and preferably also a finite element package.
- You have an independent, problem-solving, organised and result-oriented attitude.
- You have been a hard-working and dedicated student, proven by your study results.
- You have the necessary social skills, flexibility and critical thinking ability to function in a multidisciplinary and international academic environment.
- Good knowledge of English (reading, writing and speaking) is required.

How to apply

Applications have to be sent in via email to Patricia.Verleysen@UGent.be. Use 'Dynamic testing' as subject. The following documents should be attached: motivation letter (no more than 1 page), CV (no more than 3 pages) and copies of your MSc degree. Please merge all documents into one PDF attachment.

Short-listed applicants will be informed at short notice and names of referees will be requested. The vacancy will remain open until the position is filled.