

Vacancies – Postdoctoral Researcher and multiple PhD Candidates – LuMoCX

ABOUT GHENT UNIVERSITY

Ghent University is a world of its own. More than 15,000 employees are actively involved every day in education and research, management and administration, technical and social services, and many other activities. For them, Ghent University is a logical choice: it is one of the largest, most exciting, and forward-looking employers in the region.

Ghent University comprises 11 faculties and more than 85 departments, offering high-quality, research-driven education in every scientific discipline.

ABOUT THE LuMoCX PROJECT

The scarcity of raw materials and Europe's geographical dependence on critical resources are becoming increasingly important challenges. At the same time, ambitions to establish a permanent human presence on the Moon continue to grow. Because transporting materials from Earth is both costly and environmentally burdensome, the local production of metals, oxygen, and construction materials from lunar resources such as regolith will be essential for future lunar settlements.

Within the ERC Starting Grant project **LuMoCX**, an integrated experimental and modelling methodology will be developed for the production of metals, oxygen, and concrete- or glass-like construction materials from lunar regolith using solar energy. The project combines **fundamental research on high-temperature processes, material properties, and advanced simulations**. A key challenge is that experiments under lunar gravity are extremely difficult to perform. Therefore, validated computational models, combined with high-quality experimental data, will play a central role in the research.

To realize this ambitious research programme, we are seeking **one postdoctoral researcher and multiple PhD candidates**. Together, they will form an interdisciplinary team working on the modelling, simulation, and experimental characterization of high-temperature processes and molten oxide/slag systems. The exact research focus of each position will be determined based on the expertise, experience, and interests of the selected candidates.

YOUR TASKS

For PhD Candidates

You will become part of the multidisciplinary LuMoCX research team and contribute to the development of innovative processes for the conversion of lunar regolith into metals, oxygen, and construction materials.

Depending on your background, interests, and expertise, your research may involve one or more of the following topics:

- Computational Fluid Dynamics (CFD) of high-temperature and pyrometallurgical processes;
- Molecular dynamics simulations of molten oxide and slag systems;
- Experimental determination of thermophysical, structural, and rheological properties of slags and molten oxides at high temperatures;
- Modelling of heat transfer, fluid flow, mixing, and transport phenomena using multiscale modelling approaches combined with experimental validation.

You will work closely with the other researchers within the project and actively contribute to scientific publications, conference presentations, and knowledge exchange within the research team. You will also provide limited support for the educational activities of the research group.

The ultimate goal of this position is the successful completion of a PhD degree at Ghent University.

For the Postdoctoral Candidate

As a postdoctoral researcher, you will play a central role within the LuMoCX project. You will contribute to the scientific development of the research programme and support the integration of the various modelling and experimental research activities. We expect proven expertise in at least one of the domains listed below.

Depending on your expertise, your work may involve one or more of the following areas:

- Computational Fluid Dynamics (CFD) of high-temperature and pyrometallurgical processes;
- Molecular dynamics simulations of molten oxide and slag systems;
- Experimental determination of thermophysical, structural, and rheological properties of slags and molten oxides at high temperatures;
- Modelling of heat transfer, fluid flow, mixing, and transport phenomena using multiscale modelling approaches combined with experimental validation.

In addition, you will supervise PhD candidates, contribute to the scientific coordination of this and other research projects, publish in leading international journals, and present research results at national and international conferences. You will also actively contribute to the preparation of new research proposals and funding applications. Furthermore, you will provide limited support for the educational activities of the research group.

WHAT WE ARE LOOKING FOR

For PhD Candidates

- You hold, or will obtain before the start of the appointment, a Master's degree in Engineering, Materials Science and Engineering, Chemical Engineering, Mechanical Engineering, Metallurgical Engineering, Chemistry, Physics, or a related discipline.

- You have a strong interest in scientific research.
- You are motivated to contribute to innovative research at the intersection of modelling, materials science, and high-temperature processes.
- Experience with high-temperature experiments, numerical modelling, programming (e.g. Python, MATLAB, C++), or materials characterization is considered an asset.
- You have strong analytical and problem-solving skills.
- You can work both independently and as part of a team.
- You have an excellent command of English. A language certificate (ITACE, TOEFL, IELTS, or equivalent) is considered an asset.

For the Postdoctoral Candidate

- You hold a PhD degree in Engineering, Materials Science and Engineering, Chemical Engineering, Mechanical Engineering, Metallurgical Engineering, Physics, or a related discipline.
- You have demonstrated expertise in at least one of the core research areas of the project.
- Experience with numerical modelling, simulations, experimental research, or advanced data analysis is a strong advantage.
- You have a strong interest in multidisciplinary research that combines modelling and experimentation.
- You possess excellent analytical and communication skills.
- You are able to work both independently and collaboratively.
- You have an excellent command of English. A language certificate (ITACE, TOEFL, IELTS, or equivalent) is considered an asset.

WHAT WE CAN OFFER YOU

For PhD Candidates

- We offer a full-time position as a doctoral fellow, consisting of an initial period of 12 months, which - after a positive evaluation, will be extended to a total maximum of 48 months.
- The appointment can start as soon as the selection procedure has been completed and administrative formalities allow.
- The fellowship amount is 100% of the net salary of an AAP member in equal family circumstances. The individual fellowship amount is determined by Team Personnel Administration based on family status and seniority. A grant that meets the conditions and criteria of the regulations for doctoral fellowships is considered free of personal income tax. [Click here for more information about our salary scales](#)
- All Ghent University staff members enjoy a number of benefits, such as a wide range of training and education opportunities, 36 days of holiday leave (on an annual basis for a full-time job) supplemented by annual fixed bridge days, bicycle allowance and eco vouchers. [Click here for a complete overview of all the staff benefits.](#)

For the Postdoctoral Candidate

- We offer a full-time postdoctoral position with an initial duration of 12 months, renewable twice, up to a maximum total duration of 36 months.
- By exception, EEA citizens who have received a postdoctoral fellowship in the 12 months preceding an MSCA fellowship may exceed the standard maximum duration of 36 months within the framework of the MSCA fellowship, provided that the total duration does not exceed 48 months.
- The appointment can start as soon as the selection procedure has been completed and administrative formalities allow.
- The grant amount is equal to the net salary of a doctoral assistant (AAP 5) with the same level of education and seniority and based on the same family situation as the doctoral assistant. The supervisor may deviate from this and assign a higher level based on acquired experience, professional career and demonstrated competences. The grant amount will not be revised in the current year except in case of indexation. [Click here for more information about our salary scales](#)
- All Ghent University staff members enjoy a number of benefits, such as a wide range of training and education opportunities, 36 days of holiday leave (on an annual basis for a full-time job) supplemented by annual fixed bridge days, bicycle allowance and eco vouchers. [Click here for a complete overview of all the staff benefits.](#)

INTERESTED?

More information about the research group can be found at:

<https://www.ugent.be/ea/match/sms/en>

Applications should include: a **completed application form** (available on our website: <https://www.ugent.be/ea/match/sms/en/openpositions/applicationform/view>), copies of all higher-education diplomas, academic transcripts, the names and email addresses of three references willing to provide a recommendation

Applications must be submitted electronically to: vacancy.sms@ugent.be

Please mention "**Lumocx Vacancy**" in the subject line of your email.

In your motivation letter, please indicate any experience you have with modelling, simulations, programming, high-temperature processes, materials characterization, or experimental research, and describe which research themes within the LuMoCX project most strongly interest you.

Applications that do not contain the required documents will not be considered.

For further information regarding this vacancy, please contact:

Prof. Inge Bellemans Inge.Bellemans@ugent.be