



Grenoble INP - UGA is a member of **international** engineering and management education and research **networks**. It is widely recognized in national and international rankings.



8 schools + **38** laboratories

8 350 students

1 300 teaching, research, administrative and technical staff

Grenoble INP-UGA is a renowned public institution of higher education and research, and a major player in the Grenoble ecosystem. It is the engineering and management institute of Grenoble Alpes University, and plays a leading role in the scientific and industrial community.

Associate Professor

Research profile field	Materials
Requested job profile	Associate Professor
Ministerial reference for the position	33 MCF 0651
CNU Section	33
Job location	Grenoble and Saint Martin d'Hères campus (SIMaP Laboratory)
Hiring date	01/09/2024 (DD/MM/YY)
keywords	Materials, characterization/development

Grenoble INP - UGA is a leading public institution accredited with the French label "Initiative d'excellence". It offers innovative engineering and management programs, with an increasing internationalization of its course offers. The courses are grounded in sound scientific knowledge and linked to digital, industrial, organizational, environmental and energy transitions. The Engineering and Management Institute of Grenoble Alpes brings together more than 1300 staff members (teacher-researchers, lecturers, administrative and technical staff) and 8 350 students, located on 8 sites (Grenoble INP - Ense3, Grenoble INP - Ensimag, Grenoble INP - Esisar, Grenoble INP - Génie industriel GI, Grenoble INP - Pagora, Grenoble INP - Phelma, Polytech Grenoble, Grenoble IAE and the INP Prepa). Grenoble INP is also a highly-ranked institution of higher education and research, leading the way in the fields of engineering and management on an international scale. It is a member of a large number of international academic and research networks. It is part of the European University UNITE!.

As part of Grenoble Alpes University, Grenoble INP has associated guardianship of 38 national and international research laboratories and of technological platforms. The research conducted there benefits both its socio-economic partners and its students. Grenoble INP is at the heart of the following scientific fields: physics, energy, mechanics and materials; digital; micronanoelectronics, embedded systems; industry of the future, production systems, environment; management and business sciences.

Grenoble INP - UGA is an equal opportunity employer committed to sustainability. Grenoble INP-UGA celebrates diversity and equity and is committed to creating an inclusive environment for all employees. All qualified applications will be considered without discrimination of any kind.

Teaching

School: Grenoble INP - Phelma

School website: <https://phelma.grenoble-inp.fr/>

Contact: alice.caplier@grenoble-inp.fr

School presentation:

Grenoble INP Phelma is an engineering school of the Grenoble Polytechnic Institute. It offers students a wide choice of courses at the cutting edge of scientific and technological progress: micro & nanotechnologies, instrumentation, energy, innovative materials, information technologies, biomedical engineering, process engineering and the environment. It welcomes more than 1,400 students in 11 engineering courses, including one apprenticeship, and a dozen masters courses. The teaching staff is made up of around one hundred full professors and over 300 part-time lecturers. The administrative and technical staff numbers around fifty. The school has two sites: the Minatec site in Grenoble and the university campus in Saint-Martin d'Hères. While reaffirming its three main pillars of physics, electronics and materials, Phelma is ensuring that the training of its engineering students and masters students evolves in line with changes in careers, linked primarily to the energy transition and the digital transition.

Teaching Profile:

The associate professor should have a solid background in materials science in general, and in the development of solid materials in particular. He or she will need to master the fundamental aspects of the latter field, as well as having a fairly broad knowledge of their practical applications in industry. This could involve the development of materials for metallurgy (steels, aluminium alloys, for example) and/or for functional materials (single crystals of semiconductors or functional ceramics, etc.).

The disciplines concerned include in particular: physical chemistry and interfaces, materials thermodynamics and phase equilibria, solidification and its relationship with the microstructure of the materials produced (dendrites, eutectic and peritectic alloys, etc.), growth processes for massive single crystals (relationship with point defects and dislocations), production processes from a dispersed scale (sintering, additive manufacturing). An ability to put fundamental concepts into perspective with concrete cases of industrial applications is expected.

In addition, he or she will be expected to be involved in the roll-out of teaching on environmental transitions at Phelma. For example, in materials science, this will involve teaching life cycle analyses and software for selecting materials and processes.

The associate professor will be part of the teaching team for the Materials Science and Engineering and Advanced Materials programmes, and should therefore be able to teach in English. He or she will also be involved in setting up the Materials, Energy and Processes apprenticeship programme, and will give lectures, tutorials and practical work in Phelma's 1st year Materials courses.

Research

Host laboratory: SIMAP

Laboratory website: <https://simap.grenoble-inp.fr/>

Contacts: Marc.Fivel@simap.grenoble-inp.fr , didier.chaussende@simap.grenoble-inp.fr

Research Profile: Elaboration: new processes, new architectures, new functionalities

For several decades, the SIMAP laboratory has been conducting research into the development of solid materials for applications in fields such as aeronautics, nuclear power, electronics, photonics, industry and biomedicine Whether metallic or ceramic, polycrystalline or monocrystalline, these materials have to meet increasingly demanding specifications and new functionalities. In terms of development, this translates into a thorough understanding of the mechanisms involved in the processes, as well as the exploration of innovative processes such as additive manufacturing from powders, whether based on fusion/solidification or sintering mechanisms.

The associate professor will develop fundamental and applied research, combining experience and modelling, on the development of metallic and/or ceramic parts that are complex in terms of composition, architecture and shape, in close collaboration with industry. This research will be based on a detailed understanding of the physico-chemical and mechanical phenomena at work during the process, with access to modern characterisation techniques (electron microscopy, X-ray tomography, tomographic atom probe, large instruments) and multi-scale modelling in materials science.

Applicants will propose projects involving the development of metallic or ceramic materials either by additive manufacturing or by solidification, including crystal growth from the liquid state.

For additive manufacturing on a powder bed, the issues concern powder mixing, microstructure control during the local fusion-solidification stage with solidification speeds that lead to a rethink of new metallurgy. They will also concern indirect manufacturing processes that print parts of various shapes, which then need to be consolidated and densified by sintering while controlling their microstructure and geometry (e.g. paste extrusion and binder projection processes). This field is interested in the very recent issues surrounding the development of heterogeneous materials: multi-materials, gradient materials and spatially controlled microstructures.

For liquid processing (solidification, directed solidification, crystal growth, etc.), control of the moving solid/liquid interface determines the microstructure, crystal perfection, composition, incorporation of dopants and, consequently, the properties of the materials. This vast field of research presents many scientific challenges, which arise either from the increasing complexity of the systems studied, such as the solidification of complex multi-element systems (e.g. high-entropy alloys), complex multi-phase systems (e.g. binary and ternary eutectic crystals), or from the level of perfection of the materials produced (semiconductor crystals, crystals for optics and photonics, or for high-energy physics). He or she will fit into this theme by carrying out original research to study, understand and optimise the interfacial mechanisms in liquid elaboration processes through a clever combination of model cases, real industrial cases, in-situ and ex-situ methods and by coupling experimentation and numerical simulation. The use of external fields (electrical, magnetic, etc.) to study and control interfacial phenomena could be one of the main thrusts of the research activity.

The research activity presented in the application must be proven, in particular by international publications

Specific requirements

The ability to teach in English is imperative, as a number of the school's courses are given strictly in English. International experience would also be an asset.

Administrative activities:

In the medium term, the person recruited will take on traditional responsibilities for a teaching unit or practical work platform.

Special features of the post:

Teaching may be given on either of the school's two sites: Grenoble (Polygone scientifique) and Saint Martin-d'Hères (campus est).

How to apply

Applicants must submit their applications on the Galaxie Platform of the French Ministry of Higher Education and Research from the 22nd of February 2024, 10 a.m. (Paris time zone) to the 29th of March 2024, 4 p.m. (Paris time zone), deadline.

Any document sent outside the Galaxie procedure will not be considered.

The interview will include simulation/situational exercises.

The details will be communicated when the invitation is sent out. In addition, part of the interview may be carried out in English.