Institute of Engineering and Management of Grenoble Alpes University

HR EXCELLENCE IN RESEARCH

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 + **39** laboratories

8 300 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.

University Professor Position

Short profile	Valorization of plant biomass: development of high value-added materials
Body	Professor
Position number	62-33 PR 0499
CNU Section	62, 33
Location	Grenoble
Date of recruitment	01/09/2023
Key words	Extraction, fractionation, separation and valorization of biomass constituents, cellulose, biobased materials, biopolymers, functionalization of fibers and nanocellulose, physical chemistry of interfaces, polymer chemistry, formulation

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 8300 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 39 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 s 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 - Pagora

School website : http://pagora.grenoble-inp.fr/

Contacts : agnes.boyer@grenoble-inp.fr ; evelyne.mauret@grenoble-inp.fr

Grenoble INP-Pagora is the only French public school offering engineering education for the industries of plant fibers, paper and cardboard, printed communication, packaging and biomaterials. Its ambition is to become an international reference in these fields. Pagora addresses current societal concerns that aim to develop renewable, biobased and recyclable solutions to replace many of our everyday products, such as single-use plastics. Pagora, in close collaboration with its research laboratory, LGP2, has constantly innovated and anticipated the expectations of its partners. It thus offers a training program that is as close as possible to the new needs in biobased materials, biofuels and surface functionalization (printed electronics). Grenoble INP-Pagora offers three-year training programs (initial training and apprenticeships) for students who will be working in senior technical and management positions in these fields, including abroad. The program also leads to a Master's degree in Biomaterials/Biorefinery (part of the Master's program in Materials Science and Engineering).

Teaching profile:

In line with Pagora's continued international outreach and the school's objectives related to the replacement of petroleum-based materials by biobased materials, the successful candidate will be expected to work within the existing teaching team to teach the following courses:

- Biorefinery: processes of deconstruction of plant material for the production of monomers and/or biofuels
- Biopolymers: structure, properties and uses of natural polymers,
- Biomaterials: production routes of biobased materials from various resources,
- Biofuels: synthesis processes.

These courses will be given as part of the training of engineers at Grenoble INP-Pagora, in the "Fiber and Biomaterials Engineering" option, and also as part of the Master Bio2 (Master Biorefinery and Biomaterials), which has been significantly strengthened in recent years.

The candidate will be responsible for the Biorefinery and Biomaterials Master in the short term and will continue working on its international outreach.

The successful candidate will have a particular interest in practical teaching and the implementation of projects within the framework of the courses. Like all the other teachers at the school, he or she will supervise apprentices, internships and end-of-study projects and will be in regular contact with the industrial world. She will have a taste for active teaching and will integrate the skills approach deployed at Pagora. She or he will participate in juries and other pedagogical meetings. The position will strengthen the teaching team, in particular for the management and responsibility of the new Master's program and will contribute to the organization's international development strategy.

Research

Team : LGP2 (UMR 5518 Grenoble-INP, UGA and CNRS)

Laboratory website : https://lgp2.grenoble-inp.fr

Contacts : anne.blayo@grenoble-inp.fr

The Laboratory of Process Engineering for Biorefinery, Biobased Materials and Functional Printing (LGP2) is a Joint Research Unit, UMR CNRS 5518, created in 1995 and whose supervisory bodies and partners are the UGA, Grenoble INP, CNRS and Agefpi (association law 1901). The staff of the unit (~ 75 persons) includes 23 permanent researchers,

21 support staff (9 FTE), about thirty PhD and post-doctoral students. LGP2 is composed of 3 research teams (BioChip/MatBio/FunPrint).

The position will be assigned to the MatBio team (Multiscale Biobased Materials) or to the BioChip team (Biorefinery: Chemistry and Eco-processes). The Matbio team develops research in the field of elaboration processes and final properties of biobased materials with a multidisciplinary and integrated approach (from the elementary brick to the final material). The materials studied are mainly heterogeneous fibrous materials (paper and cardboard, nonwovens, felts), flexible films and bio- and nanocomposites. The work of the Biochip team aims to develop research in the field of fractionation, characterization and valorization of lignocellulosic biomass to produce biobased materials and biofuels in response to societal and industrial expectations. These topics are in line with the axes of the LabEx Tec 21 and the Carnot Institute PolyNat.

In recent years, the laboratory has conducted numerous research activities in the field of the valorization of plant biomass. These actions aim in particular :

- to replace products derived from fossil raw materials by renewable products, in order to manufacture substitute products with properties equivalent or even superior to those of the substituted products;

- to use the specific properties of certain biobased raw materials for the elaboration of products or materials with high added value in particular in the field of health (biocompatibility, antimicrobial action, ...)

- to study high value-added diversification avenues for the production of special papers (especially in the field of packaging).

In this context, research related to the production and use of nanocellulose and more generally of nanopolysaccharides (cellulose or starch nanocrystals, cellulose nanofibrils) has developed strongly. Renewable and biodegradable, they can be used in the production of bionanocomposites, in the formulation of coating baths, for the manufacture of functional materials or complex fluids with controlled properties. Nevertheless, many obstacles remain to be overcome for the production of biobased materials, in particular with regard to the industrial production of cellulose microfibrils and the shaping of biocomposites.

Research profile:

The research activities of the successful candidate will have to be in line with the development of clean chemical, biological and physico-chemical processes for the following operations

- deconstruction of plant biomass: extraction and fractionation by hydrolysis, by oxidation, by enzymatic treatment, membrane processes..,

- transformation and valorization of the products obtained in the form of biobased products and materials with high added value.

To do this, the person recruited must have expertise in the areas of:

- the implementation and optimization of chemical and enzymatic treatment processes of lignocellulosic biomass,

- functionalization of fibers and nanocellulose, physical chemistry of interfaces, polymer chemistry, formulation,

- the study and optimization of unit operations associated with the production of biobased products (extraction, fractionation, separation of biomass constituents), and/or the production of biobased materials (extrusion, injection, impregnation...),

- the study of the coupling of processes, in particular mechanical processes and chemical or enzymatic treatments, with a view to their intensification.

These directions in research must be developed without losing sight of societal requirements such as the rational management of raw materials, energy and water.

Position assigned to a restricted area: NO

(Device for the protection of the scientific and technical potential of the nation, conditioning the appointment of the lecturer-researcher to the authorization of the Defense Security Officer).

Specific requirements or conditions

In order to achieve excellence and to increase the scope of internationalization of our University, the applicant selected for the position must provide evidence of the quality of his/her research activities through recent papers given at highly recognized international conferences or articles published in the best international journals in their fields.

How to apply

Applicants must submit their applications on the Galaxie Platform of the French Ministry of Higher Education and Research from the 23rd of February 2023, 10 a.m. (Paris time) to the 30th of March 2023, 4 p.m. (Paris time), deadline.

Any document sent outside the Galaxie procedure will not be taken into account.

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 conducted in English.