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

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| **Short profile** | From graphic printing processes to additive manufacturing, functional printing and printed electronics. |
| **Body** | University Professor |
| **Position number** | 62 PR 0308 |
| **CNU Section** | 62 |
| **Location** | Grenoble |
| **Date of recruitment** | 01/09/2023 |
| **Key words** | Printing process engineering, Surface functionalization by printing and coating processes, Additive manufacturing, Multi-material printing, Complex fluids: physicochemical and rheological properties. |

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/**

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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** : This position is being created in the dual context of the retirement of a professor from Grenoble INP-Pagora and the creation of a Master's degree in "Sustainable Printed and Integrated Electronics". The curriculum will allow future graduates to develop their skills in the various printing processes: inkjet, flexography, rotogravure, screen printing, offset, and electrophotography. Thanks to this recruitment, the training will be opened up more widely to new courses in the specific fields of additive manufacturing (including 3D printing), structural electronics and robotics.

The topics of the training, which are in perfect adequacy with the "research" profile, are thus :

- printing processes,

- printed electronics,

- functional printing,

- additive manufacturing (3D printing by printer or robot)

Within this framework, the in-depth study of the relations existing between functional fluids (including conventional inks), the supports used and the processes implemented constitutes the main thread of these courses.

These courses will be given as part of the training of engineers at Grenoble INP-Pagora, particularly in the "Printed Communication Engineering" option, and also as part of the Master's degree currently being created, dedicated to structural electronics and functional printing, which will start in September 2023.

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 FunPrint team (Functionalization of surfaces by printing processes).

This team develops projects ranging from ink formulation to materials and printed objects, on a wide range of applications from traditional printing to printed electronics, with various printing supports (lignocellulosic materials, polymers, non-wovens, glass, ceramics, etc.), and using different printing processes: inkjet, flexography, rotogravure, silkscreen, offset, electrophotography and other additive technologies (including 3D printing).

The scope of this team is therefore multidisciplinary and includes all stages of the graphic chain, from design to printing. This implies a good knowledge of the materials used, the parametrization and the on-line control of the process and the control of the final quality of the printed object. Thus, the study of the printing supports (structures, physical properties) is a necessary element for their implementation in the printing processes. The knowledge of inks and other functional fluids, their composition and their rheological and physicochemical behavior is also crucial. Their formulation is complex since it must ensure good compatibility with the printing substrate, be adapted to the targeted process and the final operation of the product by integrating its operating constraints. The analysis of the fluid/substrate interactions is thus essential for the control of the transfer of the functional liquids and passes by the study of surfaces and interfaces (physicochemistry, topography...).

At present, the main focus of this team's research is on the development and optimization of printing processes for new applications, for example in the field of energy (fuel cells, photovoltaic cells, batteries...) and in the field of printed electronics (conductive tracks for communicating objects, RFID, sensors...). More recently, the team has developed research on additive manufacturing processes, combined with precision robotics systems.

**Research profile:** The research axes to be developed must be among the following themes

- Surface functionalization by printing and coating processes,
- Additive manufacturing: 2D and 3D printing processes,
- Functional printing,
- Structural electronics,
- Multi-material printing on various supports,
- Formulation and characterization of complex fluids,
- Functional fluids/substrates/processes interactions.

The newly appointed professor will be in charge of initiating close and lasting collaborations with research teams in the following complementary fields

- Design chain of a functionalized object, integration of electronic devices,
- Process automation / Precision industrial robotics / Mechatronics,
- Simulation, modeling of electronic behaviors (transistor effect type etc.),
- Analysis and processing of 3D images.

**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.