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8 schools + 39 laboratories

8300 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.

Researcher in additive manufacturing WAAM

Job reference number	
Research field	Metal additive manufacturing (Fabrication, Characterization, Non-destructive testing)
Host laboratory	G-SCOP (UMR 5272 Grenoble-INP, UGA et CNRS) https://g-scop.grenoble-inp.fr/
Researcher profile	Recognised researcher (R2)
Location	Grenoble, France
Date of recruitment / contract length	01/11/2024 (6 months)
Contacts	Matthieu Museau (matthieu.museau@g-scop.fr)

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 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.

Research

The research carried out by the CIPP team of the G-SCOP laboratory concerns product design for additive manufacturing, modeling of the additive manufacturing process to predict the quality of the parts produced, development of the digital chain in this field, and consideration of environmental constraints in additive manufacturing design. The G-SCOP laboratory is a member of Carnot Energies du Futur. It has equipment and cutting-edge skills in additive manufacturing. Its recent acquisition of a "hybrid" Wire Arc Additive Manufacturing (WAAM) machine makes it unique in France.

The CRIFA project to which this vacancy relates is an inter-Carnot project in collaboration with the I2M laboratory in Bordeaux, a member of the Carnot ARTS Institute, which has expertise in the metrology and thermal characterization of materials.

Offer description :

The aim of the proposed project is to develop material health control for WAAM parts. The proposed approach is based on modulated photothermal radiometry (MPTR), used for characterizing the thermal properties of materials on micrometric scales. Conventional MPTR measurement allows the exploration of characteristic micrometric dimensions in thickness, but remains millimetric in plane. Focusing the excitation and measurement will enable the measurement to be localized, so that micrometric defects such as porosities and cracks can be detected. By scanning the surface, it will be possible to map the material with micrometric resolution. The advantage of this approach over infrared (IR) thermography lies in the ability to explore characteristic times inaccessible to IR cameras. The method developed will be non-contact, inexpensive to use and suitable for opaque materials such as metals. It will be applicable to rough surfaces for rapid inspection of machined parts. The original aspect of the project lies in the fact that this development lends itself particularly well to integration in a "hybrid" WAAM machine combining additive and subtractive manufacturing in the same place.

The researcher recruited will contribute to WorkPackage 2 of the project, which involves the development of metal specimens on a hybrid WAAM. The work will take place in the G-SCOP laboratory under the responsibility of M. Museau.

The aim of this work package is to produce metal specimens using the WAAM process for investigation by MPTR thermal microscopy. In order to examine a wide range of thermal diffusivities, aluminum and steel specimens will be produced. Geometrical configurations ranging from a single vertical wall to inclined and/or curved walls, favoring the appearance of defects according to knowledge in the field, will be tested. Different operating parameters (power, synergies, torch speed, wire speed, deposition trajectories) will also be used, within the framework of standard production processes.

The specimens produced will be machined, either conventionally, outside the WAAM machine, or directly in the WAAM "hybrid" center, to produce surfaces for material inspection.

Specific requirements or conditions

Proficiency in English and French is required. In addition, international experience will be a decisive asset.

Specifics of the position

The research may be lead on 2 locations: Grenoble and St Martin-d'Hères. In view of the CRIFA project partnership, a few trips to Bordeaux are envisaged.

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 researcher to the authorization of the Defense Security Officer).

How to apply

Applications must be sent to : matthieu.museau@g-scop.fr

Application deadline : 30/06/2024