

## Détail de l'offre : International students internship offer

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| <b>Recruteur</b>            | Université Polytechnique Hauts-de-France   |
| <b>Adresse</b>              | UPHF - Campus Mont Houy  |
| <b>Code postal</b>          | 59313  |
| <b>Ville</b>                | Valenciennes Cedex 9   |
| <b>Référence</b>            | 25D1748326828  |
| <b>Titre de l'offre</b>     | International students internship offer  |
| <b>Description du poste</b> | Internship on the topic "High-Strain Rate Response of Multi-Material Hollow Lattice Metamaterials" |

### General Context:

Architected lattices are growing significant interest in various sectors (aerospace, aeronautic, biomedical, defence) due to their high stiffness-to-weight ratio, energy absorption capabilities, and functional adaptability through geometric design. The rise of additive manufacturing now enables the fabrication of complex geometries that are inaccessible by traditional methods, including hollow cylindrical lattices and multi-material compositions. These structures can be precisely filled with different topologies as well as material gradations to control specific mechanical responses and collapse mechanisms.

### Current Challenges:

Few studies have investigated the compressive behaviour of hollow cylindrical composites lattices under high dynamic loading conditions. The influence of geometry (thickness, relative density, topology), the presence of different materials or topologies, inertial effects and loading rate sensitivity on collapse mechanisms remain poorly understood, modelled and predicted. Improved knowledge of the influence of geometric parameters, as well as loading rate effects, would assist in the optimization of shock energy absorption and impact protection systems design.

### Scientific Objectives:

- Investigate the mechanical behaviour of hollow cylindrical lattices under static and dynamic compression conditions.
- Quantify the contribution of infill specimens.
- Understand the influence of topology; relative density, based materials (mono vs. multi-materials) and loading rate.
- Develop an experimental characterization approach coupled with

### Type de contrat

CDI

### Télétravail

### Description de la société

Non spécifié

Université Polytechnique Hauts-de-France (UPHF) is a transdisciplinary institution, it encourages the cross-fertilization of its faculties and research laboratories. The university has a research policy that strengthens, the link with education and, the development of transfer activities. It is recognized as a regional and national pillar and is internationally recognized, for research excellence in the field of sustainable transport and mobility. This strategy is developed within international excellence networks and strategic partners like the Lille University Federation, the EUNICE Alliance (European University), and regional non-academic partners, including Valenciennes hospital.

UPHF counts four research laboratories: LAMIH UMR – CNRS 8201 (human beings and cyber-physical systems, smart interactions and coupling, extreme conditions, adaptability and intelligence, stabilisation and improvement of mobility, physical activity for rehabilitation, embedded motion capture), CERAMATHS (bioactive ceramics, ceramization and innovative processes, geometry and global analysis, cryptography, probabilities, statistics, big data, artificial intelligence, computer-aided geometric design, popularisation history and algebra), IEMN UMR – CNRS 8520 (digital communications, micro and nanosystems, ultrasonic control and characterisation, acousto-optic systems, optronics) and LARSH (territories, organizations and society, identities, digital humanities).

The traineeship offer below is within the LAMIH UMR – CNRS 8201 (Laboratory of Industrial and Human Automation, Mechanics and Computer Science). It is a joint research unit between the Université Polytechnique Hauts de France (UPHF) and the "Centre National de la

Recherche Scientifique (CNRS)", a national research center led by the bests in their fields. It is divided into 4 departments with a total of nearly 250 researchers, engineers and research support staff, both permanent and non-permanent: Automatics, Mechanics, Computer Science and Human and Life Sciences (SHV).

UPHF is located in Valenciennes in the North of France, at the heart of the European metropolis. From the region, you can reach multiple capital cities in less than 4 hours such as Brussels, London or Amsterdam. At UPHF, a tenth of the students are international students from more than 85 countries. The intercultural ambiance is present everywhere on campus and even more during the day trips organized during the year for exchange students by the International Office (available depending on the dates of the internship). Valenciennes is the second largest student city in the region, you will find everything there... except the disadvantages of big cities! So why not join UPHF as a intern?

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| <b>Localisation</b>          | Valenciennes   |
| <b>Code localisation</b>     | Union Européenne   |
| <b>Pays</b>                  | France   |
| <b>Description du profil</b> | Currently enrolled student in Australian university, in either undergraduate or postgraduate degree (masters, honours or PhD accepted) |
| <b>Secteur</b>               | Mécanique - Automatisme - Robotique  |
| <b>Disponibilité</b>         | 3 mois et plus   |
| <b>Langue</b>                | Anglais  |