# Mechanical Engineering

Université Polytechnique Hauts-de-France

FRANCE EXCELLENCE NICOLAS BAUDIN

| | |
|---|---|
| Name of the hosting institution in France | Université Polytechnique Hauts-de-France |
| Name of the host laboratory / research team | LAMIH UMR – CNRS 8201 Laboratoire d'Automatique de Mécanique et d'Informatique industrielles et Humaines |
| Address | LAMIH UMR – CNRS 8201, Université Polytechnique Hauts-de-France, Campus Mont Houy, 59313 VALENCIENNES Cedex 9 |
| Name of the supervisor | Pr. Eric MARKIEWICZ |
| Function | Vice-President for Research |
| Email | Eric.Markiewicz@uphf.fr |
| Phone number | +33 3 27 51 13 02 |

## Internship offer

| | | | | |
|---|---|---|---|---|
| Topic of the internship (title) | Project in Mechanical Engineering | | | |
| Proposed dates of the internship | Start | 02/09/2024 | End | 20/12/2024 |

**Scientific and academic objectives of the internship:**

Conduct quasi-static and dynamic experiments under uniaxial and mixed shear/compression loading directions to analyze the mechanical properties (stability, collapse modes, specific energy absorption,...) of various Pa12 architectured structures obtained by additive manufacturing. Quasi-static machine and a Split Hopkinson Pressure Bar (SHPB) apparatus will be used with additional advanced measurement techniques such as tracking and Digital Image Correlation (DIC). In the specific case of mixed shear/compression conditions, we aim to develop a special connecting system to detect and measure radial forces. In a second step, FEM modeling approach will be implemented to define digital twins of architectured structures with the better mechanical properties, aiding in lightweight protective structural design.

## Industrial partner

| | |
|---|---|
| Does the project involve a French industry partner? | No |
| Name | / |
| Role of the industrial partner in the internship project | / |
| Main contact | / |
| Email | / |
| Main contact industrial partner's branch in Australia | / |
| Email | / |

## Australian partner

| | |
|---|---|
| Is the internship project proposed in the framework of an existing collaboration with an Australian partner university? | Yes |
| Name of the Australian partner institution | Ongoing discussions with Swinburne University |
| Lab/department/team involved in the collaboration | Department of Mechanical Engineering and Product Design Engineering |
| Main contact in the Australian partner institution | Pr. Guoxing Lu |
| Function | Associate Dean Research |
| Email | glu@swin.edu.au |
| Outside of this ongoing collaboration, will students from other Australian universities be considered by the hosting institution in France? | Yes |

## Expected profile of applicant

| | |
|---|---|
| Level of study | Master or PhD |
| Discipline | Mechanical Engineering |
| Prerequisite knowledge, qualities and skills | Bachelor degree in Mechanical Engineering, autonomy, rigorous scientific approach |
| Language of Internship | English |
| Other specific eligibility criteria | / |

AMBASSADE DE FRANCE EN AUSTRALIE
Liberté
Égalité