Title:  A virtual platform for porosity prediction in thermoplastic AFP deposition

Type of award  PhD Research Studentship

Department  Bristol Composites Institute (BCI), School of Civil, Aerospace, and Design Engineering

Scholarship Details  Minimum £21,622 p.a.

Duration  3.5 years

 Eligibility  Home (UK) and EU citizens who have confirmation of UK settlement or pre-settlement status under the EU Settlement Scheme

Start Date  From December 2023

PhD Topic Background/Description
Automated Fibre Placement (AFP) of thermoplastics could potentially offer many advantages to the composites industry allowing a one-step manufacturing process, hence reducing costs and throughput. There are also advantages in terms of the perceived better recyclability of these materials compared with their thermoset counter-parts. However, the manufacturing technique is not without challenges as the method is prone to the creation of voids within the laminates and achieving the right level of crystallinity (for optimum structural performances) is difficult. This project aims to develop a virtual thermoplastic AFP platform that will support the optimisation of deposition parameters (i.e., temperature, deposition speed, roller compaction) to maximise part quality (i.e., reduce void level whilst maximising crystallinity). This project will build on recent breakthroughs made at Bristol Composites Institute (BCI) in the development of fast simulation tools for the prediction of defects generated during AFP.

The project is fully funded by the French RTO IRT St Exupery and will be based at BCI a world-leading research centre at the University of Bristol. The institute has over 150 researchers and works closely with the £60M National Composites Centre, which is a wholly owned subsidiary of the University engaged with industry to fully exploit and develop composites technology. The student will be expected to make a number of visits to IRT St Exupery facilities in Toulouse (France) during the duration of the project.

Further details of our composites research can be found via www.bris.ac.uk/composites/research. More details on the activities of the project funder are available at: https://www.irt-saintexupery.com/.

Candidate Requirements
Applicants must hold/achieve a minimum of a master’s degree (or international equivalent) in a science, mathematics, or engineering discipline. Applicants without a master’s qualification may be considered on an exceptional basis, provided they hold a first-class undergraduate degree. Please note, acceptance will also depend on evidence of readiness to pursue a research degree.

If English is not your first language, you need to meet this profile level:
Profile E
Further information about English language requirements and profile levels.

Scholarship Details
Stipend at the UKRI minimum stipend level (£18,622) plus industrial top up (£3,000) will also cover tuition fees at the UK student rate. Funding is subject to eligibility status and confirmation of award.

To be treated as a home student, candidates must meet one of these criteria:
- be a UK national (meeting residency requirements)
- have settled status
- have pre-settled status (meeting residency requirements)
- have indefinite leave to remain or enter.

Informal enquiries
For questions about the research topic, please contact Dr Jonathan Belnoue and Professor Stephen Hallett

For questions about eligibility and the application process please contact Engineering Postgraduate Research Admissions admissions-engpgr@bristol.ac.uk

Application Details
To apply for this studentship, submit a PhD application using our online application system [www.bristol.ac.uk/pg-howtoapply]

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the School of Civil, Aerospace, and Design Engineering” and specify the title of the scholarship in the “other” box below with the name of the supervisor.