Title of studentship:	Fast simulation tools for predicting consolidation-induced defects in large-scale aerospace components
Faculty/School/Department(s)	Faculty of Engineering (University of Bristol)
Company/Location	Stelia Aerospace / Toulouse (France)
Salary/stipend	£21,500 p.a.
Hours	Full time
Contract (temp/perm)	Contract/temporary
Closing date	Friday 9th April 2021

Project title:
Fast simulation tools for predicting consolidation-induced defects in large-scale aerospace components

Company Background
Stelia Aerospace is a global leader in aerostructures, pilot seats and First and Business Class passenger seats. In 2019, it generated a revenue of €2.3 billion and employed a workforce of 7,000 worldwide. Stelia Aerospace works alongside all major aircraft manufacturers (including Airbus, Boeing, Embraer and Bombardier).

Project Background
The challenge presented to Manufacturing Engineering is to deliver an industrial solution to produce composite structures consistently and at the desired rate and cost targets. However, for new processes, manufacturing capability information may not be fully available or understood at the concept stage, which could lead to expensive, late design changes, material and process mitigations.

Composite materials have found a widespread application in modern aircrafts. One of the major impediments for greater uptake of composite is the speed at which the pre-impregnated material is additively deposited (often by hand) on a ply-by-ply basis and that leads to high manufacturing costs. This has motivated the development of automated manufacturing methods (such as Automated Fibre Placement - AFP) that, although helping to drastically accelerate throughput, deviations from ideal design lead to knockdown of the structural properties of the manufactured parts.

Project Aims and Objectives
The aim of this project is to build a simulation tool that can predict the “as-manufactured” ply architecture of large-scale composites parts deposited by AFP and then cured/consolidated in an autoclave. The numerical framework should, in particular, be able to predict final part thickness, fibre volume fraction, ply waviness and residual stress-induced shape distortion. This would provide the basis for more robust part design that accounts for manufacturing constraints.

The candidate will work with a team of engineers as part of the Stelia Aerospace ECHOS2 development programme. The student will spend most of their time at the University of Bristol with regular visits to Stelia in Toulouse (France).

How to apply
If you are interested in applying please send your CV, covering letter and academic transcripts to idc-composites@bristol.ac.uk

Candidate requirements:
PLEASE NOTE THAT THIS PROJECT IS NOT AVAILABLE TO INTERNATIONAL STUDENTS DUE TO TIER 4 VISA REQUIREMENTS.
Applicants with 'home student' status and holding or about to graduate with a first or 2.1 degree in engineering, materials or physical sciences or related disciplines.

Funding:
Stipend: £21,500 p.a.
Standard EPSRC studentship eligibility criteria apply:
http://www.epsrc.ac.uk/skills/students/help/Pages/eligibility.aspx

Contacts:
For further information about the IDC and the EngD programme please visit:
http://www.cimcomp.ac.uk/idc
or contact **idc-composites@bristol.ac.uk**