

Project 18/45: Evaluating a spaceplane's performance through the atmosphere and into orbit

Company: University of the West of England

Supervisor: Eur.Ing. Dr. Chris Toomer

Location: Bristol (Filton/Frenchay)

Company Description: University of 30000 students on the outskirts of Bristol in the aerospace industrial area

Project Description:

The applicant would be involved in the following tasks:

- To run a computational fluid dynamics code with the altitude data included so that the flow around the vehicle can be predicted;
- To postprocess the results so that flow features such as shocks, surface heating, and vortices can be "seen" and the performance characteristics of the vehicle understood.
- To compare results against available windtunnel data to understand how accurate the predictions are;
- To write a report summarising their findings;
- If time permits, to assist in improving the vehicle shape and the meshes describing it so as to obtain an improved vehicle performance.

N.B. There are already setups for the vehicle geometries required, and a few CFD results from these geometries: it is the case that far more results are required to truly understand both the computer code's accuracy and the flow behaviour around the vehicle.

Applicant Specification:

It is recommended that the candidate has

- An aptitude for attention to detail due to the postprocessing of results.
- An aptitude for problem solving is also preferred as high speed flows are difficult to model so patience in finding a stable setup can take effort

Please note that instruction and support will be given throughout the placement in any necessary aspect of the work.

Minimum Requirements:

- A basic knowledge of fluid mechanics and aerodynamics (at least university level 1) due to the aerodynamic nature of the work, so the applicant is more likely to be a university student in engineering, mathematics or physics,
- An interest in spaceplanes and rockets- especially the flow fields around them.
- A preference for working with computers - as in this project the gathering of physical data (e.g. windtunnel) and building models is not required.
- Ability to write a scientific/engineering report.

Preferred Additional Requirements:

- Knowledge of a CFD and/or a meshing code
- Knowledge of CAD
- Coding experience
- Basic chemistry (GCSE) due to the reactions at hypersonic speeds

Further details:

6 week fixed term contract to be agreed with successful candidate but nominally with a start date around 18 June 2018, when the SPIN Induction Day will be held at the Satellite Applications Catapult, Harwell. Salary is around £1,942 per calendar month.

Closing Date for Applications: 17:00, Friday 8 June, 2018

Applications should be made through the online form attaching a CV, before the closing date. Please note that elements of the form left incomplete will be deemed to render the application ineligible. They will be checked for eligibility and forwarded to the employer.

Apply here: <https://sa.catapult.org.uk/people/space-placements-industry-spin/>