

Rocket Engine Injector Modelling

Code: 21/44

Company: Protolaunch Ltd

Location: Remote Working

Company Description:

Protolaunch is a start-up developing novel rocket propulsion systems that will enable a new generation of small launch vehicles. These engines leverage a novel and bespoke thermodynamic cycle designed specifically for the launch of small payloads.

Simplicity, reliability, and sustainability are at the core of our engine design to enable new value propositions for our launch partners. We are currently engaged in a project with ESA to de-risk and assess our thermodynamic cycle, have recently completed hot-fire testing of our technology demonstrator engine. <https://www.protolaunch.co.uk/>

Project Description:

We are currently developing a novel engine-cycle for a rocket engine that eliminates turbopumps. These are complex, expensive, and potentially unreliable components that drive up the cost of design, testing and manufacturing of a rocket engine.

To better predict the engine performance, plan test campaigns and design variants of the engine, Protolaunch is developing a high-fidelity model of the fuel and oxidiser injector which is a key sub-system within the engine.

As part of this project, the successful applicant will assist in developing and simulating models of multiple injectors of different architectures. During this project, the successful applicant will:

- Review existing injector designs and performance metrics.
- Develop simulation models of fluid systems.
- Use these models to predict system performance and identify key modelling assumptions that need to be tested experimentally.

Applicant Specification:

Student, preferably graduate or 3rd/4th year undergraduate in engineering, maths, physics or equivalent. Applicant should be enthusiastic and willing to get stuck into problems which they won't have had much experience in before!

Minimum Requirements:

- Experience with Python/MATLAB.
- Good written and verbal communication skills.

Preferred Additional Requirements:

- Undertaken a course on either fluid mechanics, thermodynamics, or control theory.

Further details:

An 8-week fixed term contract is to be agreed with the successful candidate. The Virtual Induction Event is to be held on 21 June 2021. Ideally the placement will complete before the start of the next academic year. Salary is £1,350 per calendar month gross.

Closing Date for Applications: 5pm Monday 7 June

Applications should be made through the online form on the Satellite Applications Catapult website before the closing date.

<https://sa.catapult.org.uk/work-with-us/space-placements-industry-spin/>

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. Email applications made to the Satellite Applications Catapult, UK Space Agency, or host organisations will not be processed.