

**PhD Project Title:** Particle aggregation in fluid flow onboard the International Space Station.

**Requirements:** UK or EU candidates. For this specific application, non-EU candidates are kindly asked to refrain from submitting their CV.

**Duration:** 36 Months

**Salary:** 14000 pounds per year.

**Starting Date:** interested candidates are requested to submit a complete CV and transcripts immediately

**Description:**

This project relates to the investigation of particle accumulation phenomena in non-isothermal fluids under the effect of vibrations. It will concentrate on new mechanisms discovered recently in the framework of microgravity research.

The research will involve the application of numerical techniques. Flows of thermovibrational nature with dispersed particles will be considered under various heating conditions, for a range of different fluids (including Newtonian and viscoelastic fluids), different density and size of dispersed particles and possible combinations of all these variants. Starting from relatively simple test cases, the student will progressively consider configurations and problems with an increasing degree of complexity. Numerical simulations will be based on specific software developed at the Department of Mechanical and Aerospace Engineering of the University of Strathclyde and the OpenFoam computational platform. The student may also be trained to use laser-based and optical techniques for flow visualization. For such activities, the student will take advantage of the facilities available at the James Weir Fluid Labs and other sophisticated diagnostic instruments made available in the framework of a space project recently funded by the UK Space Agency.

The project aligns with the core activities of the James Weir Fluids Laboratory and the Aerospace Centre of Excellence of the University of Strathclyde.

The James Weir Fluids Laboratory exists to explore the fundamental flow physics that facilitates new fluids technologies underpinning energy, sustainability, nanotechnology, health, and transport. Related research is focused on understanding the underlying principles of flow physics required to enable technological advancements in a variety of applications. Being a space-related project, the present project also fits the strategies of the Aerospace Centre of Excellence of the Department of Mechanical and Aerospace Engineering, a multidisciplinary research group developing frontier research on innovative concepts and pursuing the exploitation of space.

**Requirements:** the candidate will hold an integrated Master's degree or equivalent in Mechanical Engineering, Chemical Engineering, Materials Science, Materials Engineering, Aeronautical or Aerospace Engineering, Physics, or another discipline related to the proposed research projects.

Experience with OpenFoam or Ansys Fluent will be taken into account (but it is not strictly required).

Please send Your CV and transcripts to [marcello.lappa@strath.ac.uk](mailto:marcello.lappa@strath.ac.uk)