

The Universities of Glasgow, Kingston, and Sheffield have agreed to develop a proposal for a distributed research, training, and teaching activity in the field of rocket propulsion. Our ambition is that this programme should be transformative for the skills pipeline in respect of the UK launch activity.



The student experience. Each student will have one year of foundation activity, consisting of taught courses in launch vehicle technology. We have consulted with academia and industry to identify many of the partners that will be required to deliver such a hub: providers of training in skills such as propellant handling and clean room etiquette, such as the Space Industry Centre for Excellence (SICE); and providers of test facilities, such as the Space Propulsion Research Institute (SPRI). The first year will also include placements at UK, US, and Ukrainian establishments wherever possible.

This will lead into a three-year doctoral research activity with an industrial sponsor, with the expectation that this will de-risk recruitment. We are developing links with UK spaceport sites that can facilitate hot-fire tests to support these activities, and we anticipate that our research programmes will provide a simultaneous route to professional chartership.

In parallel, students will have the opportunity to build rockets, either through the rocketry societies that already exist in each university, or as part of research-led teams that may develop across the academic institutions. The objective will be to enter these vehicles into rocketry competitions on a rolling basis, which will provide a drumbeat flight opportunity for our research activities and our spaceport partners.

This programme will have the scale of a Doctoral Training Centre, with an intake of around ten students per year. Our graduates will have an industrially-relevant PhD, hot-fire test experience, and practical skills in rocketry development programmes.

Management and duration. We will have a central academic leadership team that will ensure that individual research projects are delivered at the institutions of best fit. This will be supported by an industrial board and representatives of the key spaceport sites. We anticipate that the programme should run for 5 to 10 years, and train 80 to 100 PhD students over that time. In steady-state, we anticipate running costs of around £1.75m per annum, but a soft-start (industrially-sponsored PhDs with a separately-funded practical element) could begin at a lower price-point.

How you can help. We are seeking governmental and industrial support for the R2T2 concept. To define the concept for our potential funders, we have agreed a set of principles that our supporters have endorsed.

If your organisation is able also able to support these principles, can help in other ways, or would like to learn more, please use the contact form on the website to get in touch.

The R2T2 principles:

1. This document is not a contract or a legal agreement of any kind. Its sole purpose is to capture interest in our shared vision for a Rocketry Research, Training, and Teaching Hub (R2T2).
2. The signatories note the UK's ambition to become a regular launching state, and believe that these ambitions would be best served by the establishment of an R2T2 entity.
3. R2T2 should have both academic and skills-based elements. An ideal offering would be similar to a Doctoral Training Centre: a taught element, broadly equivalent to an MSc, followed by a three-year industrially-focused doctoral research project. Where possible, this project should be aligned, sponsored, or co-supervised by an industrial partner. The industrial partner may be based or operate overseas but, ideally, would have some link to the UK's commercial spaceflight programme and launch sites.
4. A programme should be put in place whereby the taught and research elements can lead to professional Engineering Council registration alongside the doctoral training activity.
5. The taught and research elements should be supported by skills-based training, according to the specialisation of the individual. These skills-based training elements should be accredited or CPD certified, where possible, through one or more professional engineering bodies.
6. Students should have an opportunity to participate in practical aspects of rocket engine and vehicle testing and operations, through the academic partners' rocketry societies.
7. The students should have an opportunity to spend time in industry, through the industrial partners' placement opportunities.
8. The scale of the UK's ambitions suggest that the hub should seek to train at least 10 rocket engineers, with a PhD, professional registration, and practical skills, per year, over the next ten years.
9. The academic partners intend to host students for the purposes of completing their higher degrees, and to support knowledge transfer (for example, through a KTP programme), should sufficient funding be secured.
10. The industrial partners aim to offer aligned, sponsored, or co-supervised projects to be agreed with the academic partners, and to support research grant applications lead by the academic partners.
11. The hub should facilitate the development of appropriate space launch legislation/regulation and the sharing of best practise in license submissions for large launches under the existing Air Navigation Order and Space Industry Regulations, including but not limited to Operational Safety Cases and Operations Manuals.