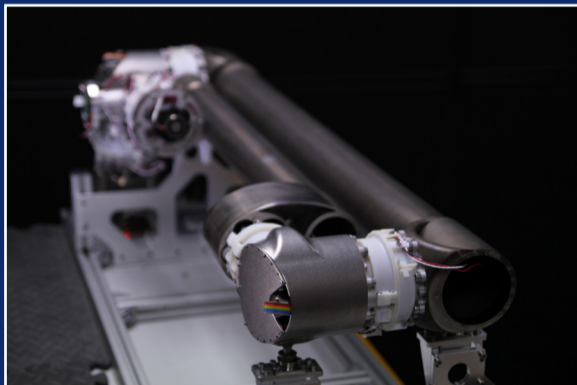


# Robotic in-space manufacturing and assembly

Phase 1 – Feasibility Study 9-months (ongoing)

Phase 2 – Test Scenario Implementation

In the next decade, both government and commercial entities are exploring new mission concepts that will rely on robotic in-space assembly, manufacturing and servicing for the setup and maintenance of future space assets. This project will assess the feasibility of combining the Lightweight Advanced Robotic Arm Demonstrator (LARAD) technologies to robotically demonstrate the manufacturing and assembly of representative space structures in a laboratory environment. The demonstration phase will be a major stepping stone in providing our end-user with the means to fly an actual in-space manufacturing spacecraft in the early 2020's.



Lightweight Advanced Robotic Arm Demonstrator

## Potential targets and market

- In-space manufacturing/assembly allows for the creation of larger craft, stations, or instruments than can currently be launched. It is central to the future growth of the space industry.
- Due to this technology less structural mass is needed for conditions at launch, making the space market more accessible to new customers. This is similar to the effect CubeSats have had on the market.
- The UK, with its increasing experience in autonomy, robotics, and space-related technology is well placed to capitalize on this new area.

## Project update

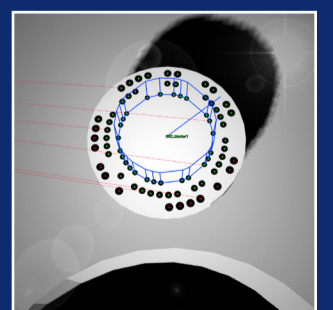
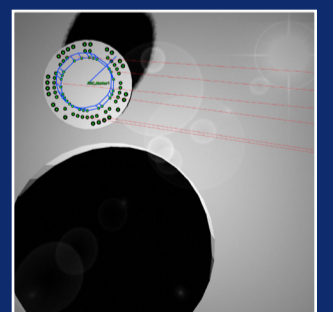
- Analysed on-Earth manufacturing and assembly techniques, their characteristics and how they could be applied to space environment.
- In-depth analysis of current RISMA techniques and their areas of development.

## The next steps

- Address the user requirements of the in-space manufacturing setup with design of the arm(s) and the autonomy levels required to perform the various operations they have to support.
- Design definition of the arm, building upon the previous LARAD heritage, and specifying the mechanical joint design, interfaces, etc.
- Prototype new manufacturing and assembly techniques that could be used in future missions.
- Define the testing scenario for implementation in Phase 2

## What are we looking for to get the project to market?

- Generation of ideas
- Progression of key technologies
- Full-scale demonstration



Visual Servoing