

UK builds leadership in space debris removal and in-orbit manufacturing with national mission and funding boost



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Two UK-based companies are designing missions to clear hazardous space junk alongside the launch of a new programme to back cutting-edge space technology, the UK Space Agency has announced.

ClearSpace and Astroscale have been awarded £4 million from the UK Space Agency to design missions to remove existing pieces of space debris, working with a consortium of industry partners. Once the designs are complete, the teams, along with other UK space companies, could receive further funding to see the UK's first national space debris removal mission launch in 2026.

The projects will directly support the creation of 70 new jobs, with further opportunities to increase growth in the wider UK space sector, which already supports 47,000 jobs and generates an income of £16.5 billion each year.

The UK Space Agency has also announced a new Enabling Technology Programme (ETP), with up to £15 million to support innovative space research and develop emerging space technologies across the UK.

The first of six calls for funding from ETP opened today and will include technology for in-orbit servicing and manufacturing, which can extend the lifetime of satellites, building resilience and reducing space debris. Future calls will focus on emerging technologies to support the UK's contribution to future space science missions.

Orbital congestion and space debris is one of the biggest challenges facing the global space sector and the UK Space Agency has committed £102 million, over the next three years, to deliver capabilities to track objects in space and reduce debris. The UK is also leading on global regulation and standard setting to make space activities more sustainable, in line with the government's National Space Strategy.

There are estimated to be more than 130 million pieces of space debris orbiting Earth, from tiny flecks of paint from spacecraft, to old satellites, spent rocket bodies and even tools dropped by astronauts. This debris can stay in orbit for hundreds of years and present a real danger to satellites and the public services that they deliver, from communications and navigation to environmental monitoring.

Dr Paul Bate, Chief Executive of the UK Space Agency, said:

As our reliance on space technologies increases rapidly and the UK becomes a global hub of satellite design, manufacturing and launch, we are committed to leading efforts to make space more sustainable.

With 1,700 satellites launched last year alone, the need to safeguard the space environment for the benefit of everyone on Earth has never been more pressing.

By catalysing investment, backing innovative new technologies and supporting a national mission to remove space debris, we can keep space open for future generations and protect the important satellite services that modern life depends on.

ClearSpace UK, based in London, and Astroscale Ltd., based at the Harwell Space Cluster in Oxfordshire, were chosen after completing feasibility studies of the missions to remove derelict objects from space earlier this year.

ClearSpace has been awarded £2.25 million to conduct the next phase of a study into a mission which would remove derelict satellites from Low Earth orbit (LEO). This design phase will last until October 2023 and will finish with the preliminary design review — an evaluation of the progress on

the design and the technical adequacy of the proposed mission. The Clearing the LEO Environment with Active Removal (CLEAR) mission, which will advance key technology building blocks, is a catalyst for the development of commercially viable disposal services and other in-orbit services.

Rory Holmes, ClearSpace UK Managing Director said:

ClearSpace is honoured that the UK Space Agency is continuing their support to the CLEAR Mission.

Space is getting more and more congested with defunct satellites, rocket bodies and other fragments - we have to act now to ensure this precious environment remains usable for future generations.

The CLEAR Mission is a vital step on the path to making the removal of space debris a reality, and will allow us to develop state-of-the-art space technologies, such as complex robotics and AI-based algorithms, within the UK. We cannot solve the challenge of space debris alone, and we are proud that 9 cutting-edge UK-based space companies – Alden Legal, AstroAgency, Critical Software, Deimos, MDA, Orbit Fab, Satellite Applications Catapult, University of Surrey – will work with us to address this issue.

Astroscale Ltd. has been awarded £1.7 million to design a satellite servicer that is capable of removing multiple retired or defunct satellites in a single mission. The Cleaning Outer Space Mission through Innovative Capture (COSMIC) will harness Astroscale's rendezvous and Remote Proximity Operations (RPO), and debris capture capabilities.

Astroscale most recently proved their magnetic capture and RPO capability in-orbit during the End-of-Life Services by Astroscale-demonstration (ELSA-d) satellite mission launched in 2021.

The COSMIC servicer will be a technological progression of Astroscale's Sunrise programme ELSA-M servicer – a commercial partnership between the UK Space Agency, the European Space Agency and OneWeb, the global satellite

operator. The ELSA-M multi-client debris removal space servicer will be launched ahead of the UK's Active Debris Removal mission in late 2024.

Nick Shave, Managing Director, Astroscale Ltd, said:

We rely on space in so many areas of our lives, yet without the rapid development of the in-orbit servicing market we cannot start removing the hazardous debris that threatens our societal dependence on satellites.

We are very pleased and honoured to have been selected by the UK Space Agency for this Active Debris Removal Mission Study award. Astroscale, working closely with expert UK partner companies, will design a national robotic capture capability that can safely remove two defunct UK-registered satellites in Low Earth Orbit. With our proven space mission heritage and strong industrial partnerships, we can deliver the UK government's ambitious plans to develop a sustainable space economy for the benefit of future generations. Our goal is to make in-orbit debris removal and satellite servicing routine by 2030.

The government recently unveiled its Plan for Space Sustainability to tackle the growing volume of debris in space, which is both environmentally and commercially unsustainable. The plan includes action to clean up the Earth's orbit as well as to ensure future projects minimise their footprint, for instance through in-orbit servicing and manufacturing to prolong a satellite's life or recycle satellites in orbit, as well as retrieving satellites and mitigating debris.

The UK has previously provided funding for the implementation of the UN Office for Outer Space Activities (UNOOSA) guidelines for the long-term sustainability of outer space. To achieve a safe and sustainable space environment, the UK is playing a leading role alongside UNOOSA in the adoption of these guidelines, which set out how countries and companies can help preserve the outer space environment for future generations.

The UK is also the leading contributor to the European Space Agency's (ESA) Space Safety programme, which provides

collaboration and funding opportunities for UK scientists and industry.

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