

Astroscale

For the responsible use of space

Driven by a passion for space environmentalism, we are the first private company to offer space debris removal services to assure orbital sustainability and secure long-term spaceflight safety for the benefit of future generations.

The impact of space debris

Society depends on data from satellites. Every day people around the world use satellite data to exchange messages, talk to family and friends, check the weather, manage finances, and undertake numerous other tasks. In addition to these daily activities, satellites are used to manage and mitigate natural disasters, monitor the Earth's climate and well-being and provide information for national security. In short, without satellite data, the lives of people all around the world would be dramatically different.

Now the source of satellite data is being threatened. Millions of pieces of debris, all human made and ranging in size from spent rocket bodies and inoperable satellites as big as a city bus, to tiny paint chips a millimetre wide, are polluting space. It is also anticipated that thousands more satellites will be launched in the next 10-15 years, up to three times the amount that have been launched in the past 60 years. To maintain a sustainable orbital environment, we need to limit further debris from being added to orbit as well as remove debris that already exists.

The solution

Astroscale is developing two product families:

1. End-of-life (EoL)
Satellites will be prepared before launch with a docking mechanism that will allow for eventual removal from orbit. Targeting satellites between 150kg to 500kg, this "semi-cooperative" solution incorporates a magnetic capture mechanism on the satellite as well as rendezvous and proximity operation technologies for target and approach. The primary customers for this service will be commercial satellite operators.
2. Active debris removal (ADR)
Removing debris that is currently in orbit requires a "non-cooperative" solution as this debris was not prepared for deorbit before launch. Astroscale will partner with national space agencies and international organizations to research and develop missions that incorporate innovative solutions for capture and removal of environmentally critical debris from 500kg to several tons, such as used rocket upper stages and defunct satellites. The primary customers for this service will be space agencies."

The technology

Our technology demonstration mission ELSA-d (End-of-Life Services by Astroscale) is scheduled to be launched in early 2020 and will prove our capabilities in providing an end-to-end solution for space debris removal, including:

1. Find and approach
Optimized approach for locating and making in-situ observations of object orbit and characteristics
2. Satellite proximity operations
Relative navigation to rendezvous with object using optical sensors and distributed data processing
3. Capture
Magnetic capture of target using ferromagnetic docking plate
4. Deorbit
Use of advanced Collision Avoidance Manoeuvres, to pacify, re-orbit and deorbit debris

Grand Segment Operations for In-Orbit Servicing

In 2018, Astroscale UK was awarded a grant of £4 million from the UK Government to lead the establishment of a National In-Orbit Servicing Control Facility at the Satellite Applications Catapult in Harwell, Oxfordshire. The National In-Orbit Servicing Control Facility will support advanced robotics activities in the hostile environment of space, specifically enabling the provision of a commercial service for deorbiting failed satellites. The new facility will initially be the control center for Astroscale's pioneering ELSA-d mission, the first project to demonstrate the core rendezvous, capture and de-orbit technologies used by the ELSA program.

About us

Astroscale was founded by an IT entrepreneur who is using a start-up mentality to address the business of orbital debris mitigation. Our growing team, now over 60 people, comes from a strong technical background – 80% are engineers – and brings an international mindset to this global problem.

Astroscale currently has offices in Singapore, Japan and the UK, as well as a representative working in Washington DC. Our experienced team have joined us from space agencies, government, start-ups and aerospace industry from around the world. We are uniquely suited to solving the technical, policy and business case issues around space debris.