ATOM Society Abingdon

Space Sweepers Get Set to Clean the Orbital Highway

On Tuesday 17th February 2026 **Zoe Tenacci** *(impressive CV)* presented at the ATOM Society's monthly meeting. Astroscale, her employer, is one of the first companies in the world to focus on space sustainability, developing technologies to remove space debris.

Zoé is a senior engineer at Astroscale, who has been working for the past 5 years on space debris removal missions, developing concept of operations and spacecraft design for rendezvous and proximity operations. She previously worked on Earth observation missions at Airbus.

(There was a programme on BBC in March 2021 that sets the scene.

Astroscale space debris removal demo set for launch)

Zoé defined what space debris is. It can be anything from a failed satellite (end of life or irreparable) to thousands of fragments of a satellite (post collision). It is possible to track fragments of debris (10cms or larger) from earth by radar.

She explained how Astroscale launches retrieval servicer satellites into orbit which find the target debris. They dock either by grabbing or by using docking hardware if compatible. The servicer guides the debris to burn up in the Earth's atmosphere.

The talk was short on detail and consequently generated very many questions which plugged some gaps. One stand-out was 'what you are doing only removes a small fraction of debris, so what will make the project worthwhile going forward?' There wasn't a concrete answer as it is 'work in progress' but Zoé did explain how there is legislation for new satellites to have built-in self-destruct mechanisms which ensure atmospheric burn-up.

Read this AI copy below for more detail.

Astroscale's operations are often controlled from their specialized facilities, such as the In-orbit Servicing Control Centre in the UK

Astroscale launches its retrieval spacecraft using commercial, third-party rockets to place "servicer" satellites into orbit, which then use advanced rendezvous, proximity operations (RPO), and docking technologies to capture space debris.

Based on Astroscale's mission strategies, here is how the process works:

- **Launch Strategy:** The servicer spacecraft is launched on rockets, such as the Soyuz from Baikonur Cosmodrome for the ELSA-d mission or Rocket Lab's Electron for the ADRAS-J mission.
- **Targeting and Rendezvous:** Once in orbit, the servicer uses sensors and ground-based data to locate and approach "client" debris (defunct satellites or rocket bodies).
- **Magnetic Docking:** The ELSA-d mission uses a magnetic system, where a servicer spacecraft connects to a client satellite equipped with a docking plate.
- **Robotic Arm Technology:** For more complex, unequipped debris (like old rocket stages), Astroscale is developing robotic arms for future missions like ELSA-M and the ADRAS-J follow-on, which will grab the target and lower it into a de-orbit trajectory.
- **Atmospheric Disposal:** Once docked, the servicer guides the debris to burn up in the Earth's atmosphere.
- **Multi-Object Removal:** The upcoming ELSA-M mission, scheduled for 2026, aims to demonstrate the capability of removing multiple pieces of debris in a single mission.