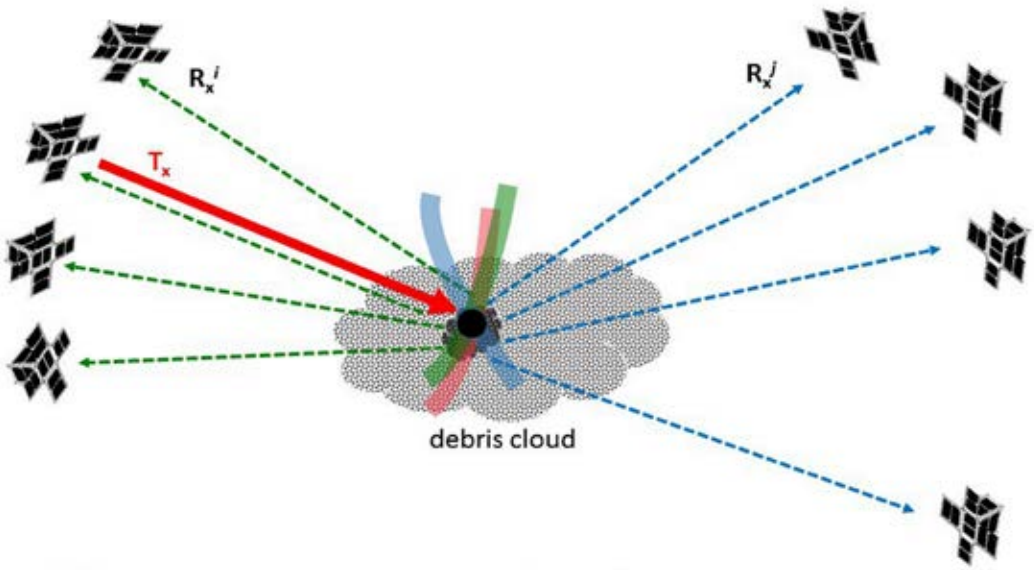
Research & Innovation Services (RIS)

UNIVERSITY OF BATH

SPACE DEBRIS IMAGING

De-risking space activities by tracking space debris



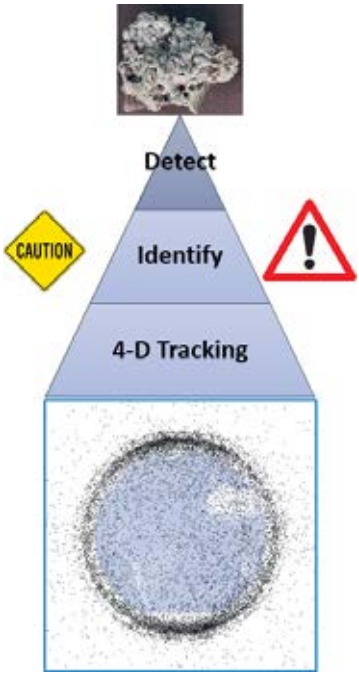
TECHNOLOGY

Researchers at the University of Bath, UK, have designed a modular constellation of radar satellites to detect space debris, including below 10 cm*. This disruptor technology is patented by the University of Bath (GB2561238; US 2021/0011148 A1 – Blondel, Guigné, & Mundell).

Space debris is causing steadily increasing risks but objects smaller than 10 cm are not identified from the ground, limiting the scope of removal missions. The risks to space assets are increasing exponentially with each new mission.

Our dynamic satellite constellation with multiple EM receivers and transmitters enables multi-aspect imaging of targets, creating virtual beams to interrogate volumes of interest and image small debris and debris clouds. They assist in mapping space debris from space and in identifying risks to space activities and platforms.

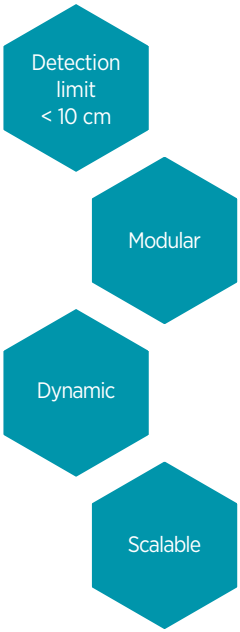
Our approach is based on field-demonstrated innovations in subsea acoustics (Guigné, Blondel) and astrophysics (Mundell). It already forms the basis of work with a Canadian space company and we are open to new collaborations to augment this team.



*Blondel et al., *Imaging space debris and small targets with space-based radars and dynamic satellite constellations – First tests,* J. British Interplanetary Society, 72:1,12-16, 2019

BENEFITS

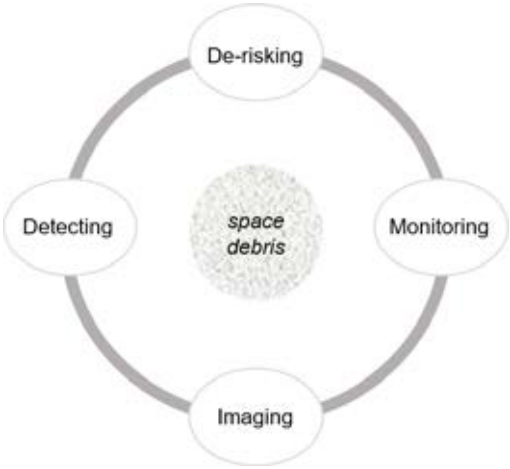
- Space-based, can detect objects below 10 cm ground limit
- Modular, can be expanded or tailored to mission
- Dynamic, range of multi-aspect configurations
- Scalable, from large volumes to immediate protection
- 4-D Space Situational Awareness: along orbits or for specific trajectories
- De-risks space activities (present and future)
- Can be incorporated into mission preparation
- Provides baseline for future regulations of space activities



COMMERCIAL APPLICATIONS

This dynamic satellite constellation enables to map space objects (like small debris) for projects such as:

- Mission preparation
- Identification of risks to space assets
- Protection of space stations
- Identification of debris removal priorities
- De-risking of space operations, including Extra Vehicular Activities
- Monitoring of third-party activities near zones of interest
- Compliance with future space regulations (debris generation)
- Asteroid and planetary mining – Regulatory compliance
- Identification of risks from other activities – Space law – Industrial litigation
- Asteroid field mapping



CONTACT

The University of Bath is looking for partnerships to help develop this technology for a variety of sectors. If you are interested to discover more then please get in contact.

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