

## Space Debris Mitigation: Solutions from the Dark Skies of the Remote Australian Outback Using a Proposed Network of Mobile Astronomical Observatories

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**Abstract :** There are tens of thousands of undetected and uncatalogued pieces of space debris in the Low Earth Orbit (LEO). They are not only difficult to be detected and tracked, their sheer number puts active satellites and humans in orbit around Earth into danger. With the entry of more governments and private companies into harnessing the Earth's orbit for communication, research and military purposes, there is an ever-increasing need for not only the detection and cataloguing of these pieces of space debris, it is time to take measures to take them out and clean up the space around Earth. Current optical and radar-based Space Situational Awareness initiatives are useful mostly in detecting and cataloguing larger pieces of debris mainly for avoidance measures. Smaller than 10 cm pieces are in a relatively dark zone, yet these are deadly and capable of destroying satellites and human missions. A network of mobile observatories, connected to each other in real time and working in unison as a single instrument, may be able to detect small pieces of debris and achieve effective triangulation to help create a comprehensive database of their trajectories and parameters to the highest level of precision. This data may enable ground-based laser systems to help deorbit individual debris. Such a network of observatories can join current efforts in detection and removal of space debris in Earth's orbit.

**Keywords :** space debris, low earth orbit, mobile observatories, triangulation, seamless operability

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