

SPACE DEBRIS SYMPOSIUM (A6)
Space Debris Detection and Characterisation (6)

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STUDENT DESIGNED SOLUTIONS FOR IN-ORBIT DETECTION AND TRACKING OF SMALL
ORBITAL DEBRIS**Abstract**

Orbital debris is a mounting concern for all space-faring nations. Estimates indicate that small debris (up to 10 cm in diameter) make up the majority of existing orbital debris, with an approximate 500,000 occurrences in low earth orbit (LEO). Additionally, this small debris is currently impossible to track from Earth. Because of this, the risk of impact posed by small debris for spacecraft in LEO is particularly high. If small debris could be catalogued and tracked, the danger of impact for future LEO missions could be diminished and the possibility of eventual removal of the debris could be improved. Undergraduate engineering students from the University of Alabama in Huntsville (UAHuntsville) Integrated Product Team (IPT) worked alongside members of the NASA Small Orbital Debris Detection, Acquisition and Tracking (SODDAT) team to investigate solutions for the design of a spacecraft that will track and catalog small debris in LEO. The UAHuntsville IPT students researched and compared options for a payload capable of detecting and tracking the debris, the spacecraft platform, major spacecraft subsystems needed to support the payload, and the launch vehicle. The present paper describes the UAHuntsville IPT's methods of research, the results of the UAHuntsville IPT studies and the recommendations for the design of the spacecraft.