

NASA's Orbital Debris Optical Program: MCAT Operational on Ascension

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The Orbital Debris Program Office at NASA Johnson Space Center has a long history of an optical observational program. The Meter Class Autonomous Telescope, MCAT, was dedicated to Eugene Stansbery (now also known as ES-MCAT) in 2017. MCAT, a 1.3m DFM telescope, has a proven capability for tracking known objects from Low-Earth Orbits (LEO) out to Geosynchronous (GEO) orbits.

Monitoring the population of the GEO belt is accomplished through surveys. A GEO survey statistically samples the GEO belt (0 to ~15 deg orbital inclinations) to detect both correlated and uncorrelated targets. A GEO survey, the initial focus for MCAT, will commence in 2019 to map out the current state of the GEO population as input for the ORbital Debris Engineering Model (ORDEM 4.x).

If a break-up occurs, surveys of the break-up field can be followed for discovery and investigations of daughter debris fragments from the parent satellite. Discovery can be accomplished by surveying orbits near to and including the parent object's orbit. Targeted observations of debris can be taken with a suite of broadband filters for characterizing individual objects by rate-tracking their known or calculated orbital elements (Two-Line Element sets, TLEs). These observations can be used in conjunction with NASA's Standard Satellite Break-up Model (SSBM).

In 2018, MCAT's primary mirror was realuminized with a high-end protected, enhanced silver ZeCoat and the CCD chip was replaced in the Spectral Instruments camera. With these updates completed, MCAT is now well on track to reach Full Operational Capability (FOC) in 2019 for its survey and rate-track capabilities. A full overview of MCAT's operational state, capabilities, and mission will be discussed.

QUICK RECAP:

NASA's orbital debris telescope, MCAT, is now well on track to reach Full Operational Capability (FOC) in 2019 for its survey, TLE and rate-track capabilities. A full overview of MCAT's operational state, capabilities, and mission will be discussed.