

EARTH OBSERVATION SYMPOSIUM (B1)
Future Earth Observation Systems (2)

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THE WORLD'S FIRST COMMERCIAL SAR AND OPTICAL 16-SATELLITE CONSTELLATION

Abstract

UrtheCast plans to build, launch and operate the world's first fully-integrated, multispectral optical and Synthetic Aperture Radar (SAR) commercial constellation of Earth Observation satellites. These will be deployed over multiple launches in 2019 and 2020. This constellation will comprise of 8 optical and 8 SAR satellites flying in two orbital planes, with each plane consisting of four satellite pairs. Each pair of satellites will consist of a dual-mode, high-resolution optical satellite (video and pushbroom) and a dual-band high-resolution SAR satellite (X-band and L-band) flying in tandem. The constellation will provide an unmatched space-imaging capability, including high collection capacity, optical and SAR data fusion, weather-independent high-resolution imaging using the SAR, target revisit, and imaging latency. By flying the satellites in tightly-paired SAR and optical tandem formations, the constellation is expected to offer a number of innovative capabilities, including onboard real-time processing, cross-cueing between the satellites, and real-time cloud imaging on the leading SAR satellites that enables cloud avoidance in the trailing optical satellites. By employing two orbital planes, the constellation will allow for maximum revisit rates in the mid-latitudes, while providing global coverage extending to the poles. This paper will describe how the envisaged constellation will create new opportunities for both businesses and government with an altogether new and responsive way to addressing applications. SSTL is the strategic implementation partner for the satellite design and build and will use its considerable experience in designing spacecraft constellations to tackle this new challenge. This paper will provide some insight into the mission engineering and constellation design that goes into a constellation of this complexity and performance.