Every day for more than 45 years, Landsat satellites have provided essential measurements to help the Nation make informed decisions about natural resource management, including compiling routine drought assessments; developing wildfire prevention strategies; monitoring land surface changes; effectively planning land uses; and understanding the Earth’s ecosystem.

Ball Aerospace is partnering with NASA, USGS and the science community to develop and demonstrate a future Landsat architecture that maintains data integrity, while enabling a more flexible and sustainable architecture.
ENABLING FUTURES

SUSTAINABLE LAND IMAGING

The instruments on Landsat satellites have evolved significantly over the years, with the Operational Land Imager (OLI) on Landsat 8 representing the most advanced technology launched to date. Instrument innovation is continuing under NASA’s Sustainable Land Imaging-Technology (SLI-T) program. SLI-T is a partnership with industry to design and demonstrate the Landsat instruments of the future, focusing on reducing size and cost, and incorporating emerging technologies.

Ball Aerospace is at the forefront of miniaturizing remote sensing instruments. We are combining this expertise with our Landsat heritage to develop and demonstrate small instruments that meet SLI objectives for Landsat continuity.

BALL LANDSAT HERITAGE: OLI

Ball designed and built the Operational Land Imager (OLI) on Landsat 8, which has demonstrated successful performance and exquisite calibration on orbit since its launch in 2013, enabling new coastal and inland water science.

In 2019, Ball delivered a second OLI instrument for Landsat 9 on schedule and under budget, achieving significant cost savings. Landsat 9 is expected to launch in early 2021.

MISSION-LEVEL SOLUTIONS FOR LANDSAT 10 & BEYOND

As a partner on the Sustainable Land Imaging-Technology program, Ball has developed and demonstrated innovative instruments that provide for a flexible and sustainable next-generation Landsat architecture.

MULTI/SUPER SPECTRAL

Reduced Envelope Multispectral Imager (REMI)

REMI achieves Landsat continuity in a significantly smaller sensor with no image quality loss. In a single, compact sensor, REMI yields visible (VIS) through thermal (TIR) data equivalent to that currently delivered by Landsat’s OLI and Thermal Infrared Sensor (TIRS) instruments.

- More than 40% reduction in size and cost over OLI
- Airborne instrument proven during test flights

Reduced Envelope Super Spectral Imager (RESSI)

Extends REMI with additional bands and higher spatial resolution to match Sentinel VIS-SWIR performance.

- Low-risk disaggregated technical solution for Landsat 10

Next Gen Super Spectral Imager (NG-SSI)

Extends REMI with additional bands through the TIR and higher spatial resolution to match all Sentinel bands and performance.

- Low-risk, single-instrument solution for Landsat 10

HYPERSPECTRAL

Compact Hyperspectral Prism Spectrometer (CHPS)

CHPS provides Landsat continuity and the enhanced science potential of a compact hyperspectral spectrometer. In a compact sensor, CHPS delivers visible (VIS) through shortwave infrared (SWIR) data while enabling new science applications such as mineral mapping and categorizing plant species.

- More than 30% reduction in size and cost over OLI
- Airborne instrument proven during test flights

Hybrid Multispectral/Hyperspectral Sensor (HyMSS)

Novel hybrid demonstration instrument that provides concurrent hyperspectral and multispectral observations across the SLI spectral range.

- Natural technical advancement from NG-SSI
- Intended for infusion into SLI constellation post Landsat 10