

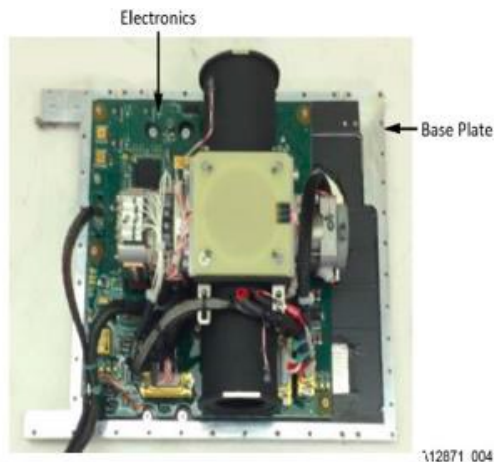


CIRiS- Compact Infrared Radiometer in Space

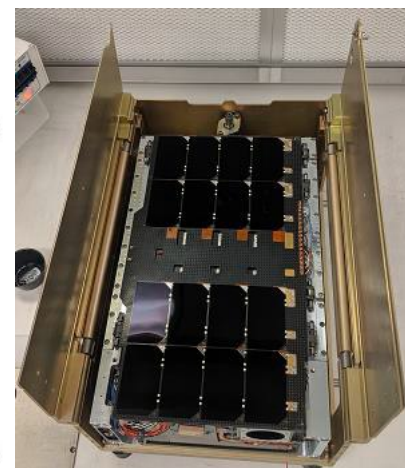
PI: David Osterman, Ball Aerospace and Technologies (BATC)

Objective

- Validate in space an infrared imaging radiometer that uses an uncooled microbolometer and carbon nanotube calibration source.
- Verify that the radiometric uncertainty is compliant with Sustainable Land Imaging requirements.
- Measure the major components of radiometric uncertainty.
- Raise the TRL of the detector and source from 5 to 6.



The CIRiS Instrument



CIRiS and CubeSat bus stowed in dispenser for launch

Approach

Integrate a 6U CubeSat from Blue Canyon Technologies (BCT) with an imaging radiometer that uses a carbon nanotube blackbody for calibration.

- Measure thermal drifts in instrument components throughout the low Earth orbit.
- Using algorithm correct radiometer signal for component thermal drifts.
- Monitor source radiance to verify stability.
- Verify calibration uncertainty and repeatability by imaging deep space and Earth scenes.

Co-Is/Partners: Sandra Collins, Bill Good, BATC

Key Milestones

- | | |
|--|-------|
| • Detector core procurement complete / PDR | 06/16 |
| • Payload design finalized / CDR | 01/17 |
| • Bus procurement complete | 05/17 |
| • Integration of instrument to spacecraft | 09/17 |
| • Environmental test complete / PSR | 10/18 |
| • Launch ready | 10/19 |
| • Initiate operation | 04/20 |
| • Analysis of instrument performance | 12/21 |
| • Artifact/thermal/drift characterization complete | 06/22 |
| • Optimize radiometric correction algorithms | 07/22 |
| • Measure optimized radiometric uncertainty | 09/22 |

TRL_{in} = 5 TRL_{current} = 7