The Compact Imaging and Infrared Radiometer (CIIR)

Neil BOWLES[1], Simon Calcutt[1], Rory Evans[1], Tristram Warren[1], and the CIIR consortium
[1]neil.bowles@physics.ox.ac.uk, Department of Physics, University of Oxford, United Kingdom

Overview

The Compact Imaging Infrared Radiometer (CIIR) is an 11 channel thermal infrared radiometer that is compatible with a 6U form factor for a CubeSat/Nanosat (Figure 1, Table 1).

Key Features:

- **Multi (e.g. 11) channel imaging infrared radiometer**
- **Uncooled microbolometer array for thermal-IR**
- **Optional visible context imager**
- **Integrated scan/calibration system**
- **Limb and nadir viewing modes**

Example Applications

- Fire detection and disaster monitoring
- Aerosol measurements (stratosphere, volcanic etc.)
- Pollution monitoring (also via UAV version)
- Agriculture/land use
- Plus many more...

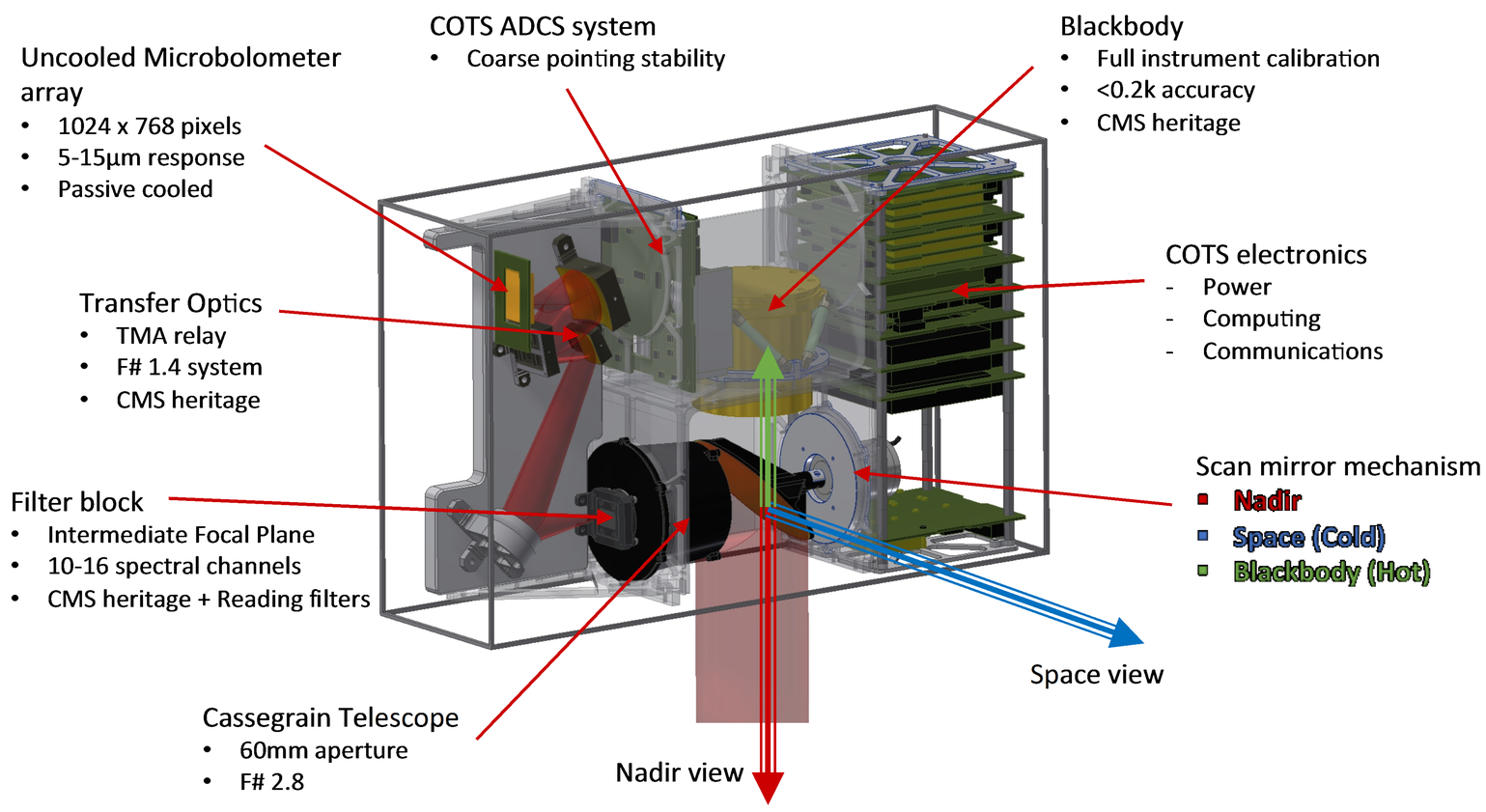

Figure 1. CIIR instrument concept in a 6U CubeSat

Table 1. CIIR instrument summary table

Overall Instrument	Stability	ements

CEOI Funded Development Activities

2015 Phase A Study

- The integrated CubeSat/instrument concept is viable for low cost Earth system science where global coverage is a requirement.
- Scientifically useful data on stratospheric aerosol are achievable with the baseline design.
- Nadir viewing at moderate spatial resolution (~150 m) is achievable in the thermal-IR.
- Trace gas abundances such as water vapour and ozone are more challenging but further optimisation is possible.
- A significant source of error in limb sounding is the pointing performance.

2017 Calibration and Pointing Breadboard Development

- Address key technical concerns raised following phase A study review to bring CIIR to level of maturity needed for flight build.
- Development of calibration and pointing breadboard (figure 2).
- Test the target absolute accuracy of the on-board calibration of <0.5K as this was considered ambitious, better than achieved by some major high cost investigations.
- Test the pointing stability, which during an observation limits the possible trace species targets for limb scanning.

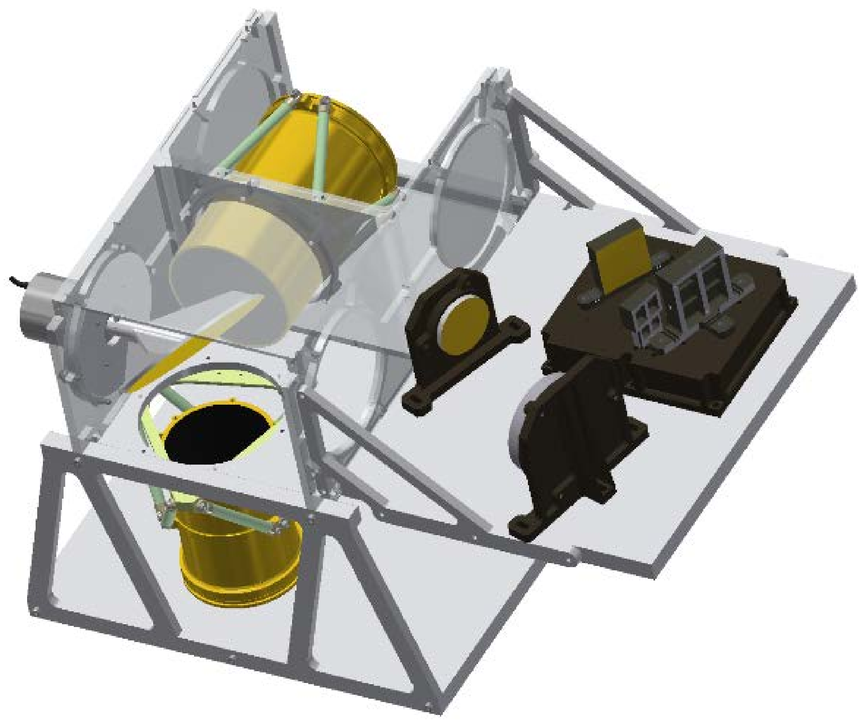

Figure 2. CIIR calibration and pointing breadboard, currently in manufacture in Oxford Physics

More information?

Contact: Neil Bowles, Simon Calcutt
neil.bowles@physics.ox.ac.uk

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