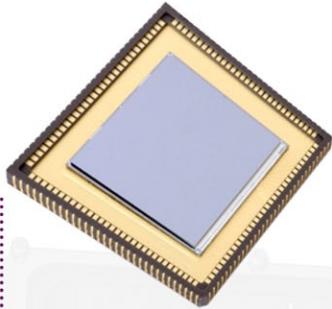


# The MIRI Imager Ground Support Equipment Control System Based on PCs



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CEA-Saclay/DAPNIA

The Mid Infra Red Instrument MIRI is one of three instruments to be built for the James Web Space Telescope (JWST). JWST is the successor of Hubble in the infrared and will be launched in 2013. MIRI is a spectrometer and an imager. Our division, Dapnia, is in charge of the design and completion of the optomechanical part of the imager called MIRIM, and of its test bench called the Ground Support Equipment (GSE). This GSE consists of a warm telescope simulator, of the imager, of a cryostat to cool the imager down to its operating temperature, and of an infrared detector. The major part of the hardware architecture is based on PCs and COTS boards.

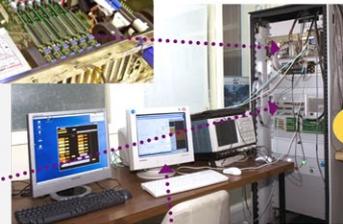


The Raytheon infrared detector 1024x1024 pixels

**Infrared detector fast acquisition:**  
The software IRACE from the European Southern Observatory is used. A port has been carried out on COTS Spectrum boards.

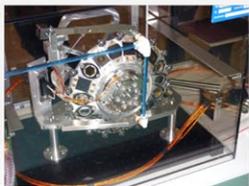


**Infrared detector slow control:**  
This EPICS VME software is in charge of the setting for 13 biases and clocks levels and monitors the safety of the detector.



**BOB user interface:**  
The ESO software tool BOB is the high-level interface. It operates on Observation Blocks Descriptions to execute exposures. Tcl object classes access to the subsystems.

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Filter wheel



MPIA Heidelberg Electronics box



**Filter Wheel Control:**  
(Windows XP Visual C++ PC housing I/O Meilhaus board)

- API was provided by MPIA Heidelberg to interface MPIA classes with EPICS
- EPICS windows host-based IOC
- EPICS Channel Access client with callback calling the API.

**The warm telescope simulator:**  
Controlled by a PC Linux running EPICS on a host-based IOC Using streamPackage to drive devices through serial lines (RS232).



Cryostat



Optical bench



Rack with device controllers

• XPC8 motion controller

RS232

Extended IR source



Monochromator



Hexapod

Ethernet

PC web server Anibus-FBI

**Cryogenics control:**  
Cryostat is controlled by a PLC through Anibus-FBI supervisory control system based on real-time fieldbus WorldFIP

WorldFIP



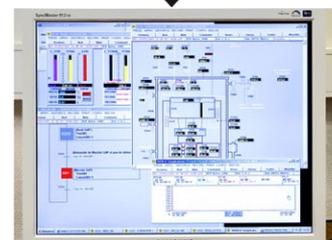
CEA CABTF  $\theta^\circ$  measurement device

Goal:  
6-7K  $\pm$  30mK



PLC

PC web client



Anibus-FBI supervisory control

CA EPICS Channel access software is used by the different subsystems to communicate

Ethernet