

PIRATE and COAST

OpenScience Observatories in Tenerife

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OpenScience Observatories

OSO includes two on-campus Telescopes in Milton Keynes, and two newly installed robotic telescopes in Tenerife



OpenScience Observatories in Tenerife

The Open University had two new 3.5m and 4.5m domes installed in the Observatorio del Teide (OT) in Tenerife in July 2016

Latitude: 28.299286, Longitude: -16.510297, Altitude: 2370m



The installations were carried out by Baader Planetarium

PIRATE

- 17" Planewave CDK17 Cassegrain Telescope
- 10Micron GM4000 HPS (German Equatorial) mount
- FLI ProLine PL16803 Camera with a KAF-16803 CCD
- 4096 x 4096
- ~43' square FOV
- 0.63"/pixel
- 7 position filter wheel



COAST

- 14" Celestron Cassegrain-Schmidt Telescope
- 10Micron GM4000 HPS (German Equatorial) mount
- SBIG STL1001E Camera with a KAF-1001E CCD
- 1024 X 1024
- ~22' square FOV
- 1.21"/pixel
- 7 position filter wheel

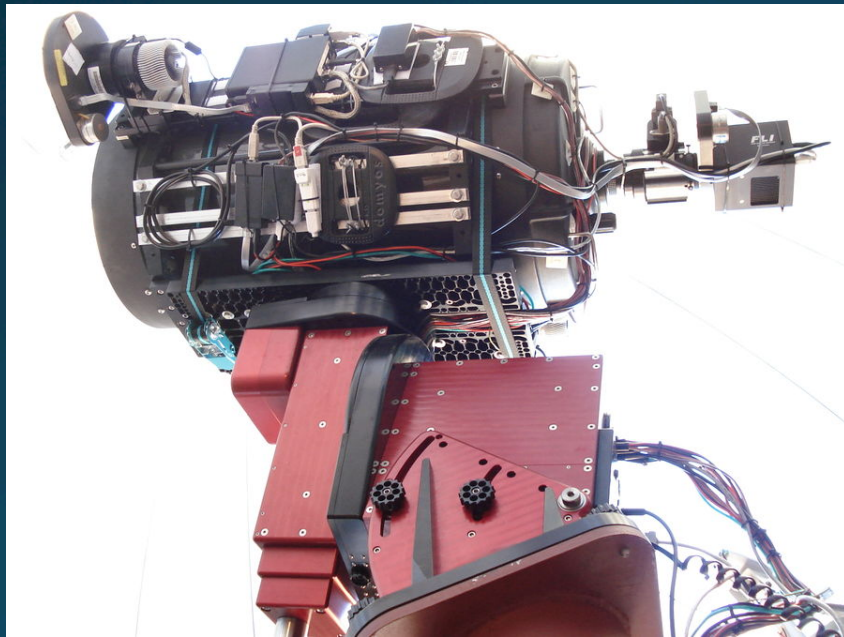


Autonomous Robotic Telescope (formerly Bradford Robotic Telescope)



The Open
University

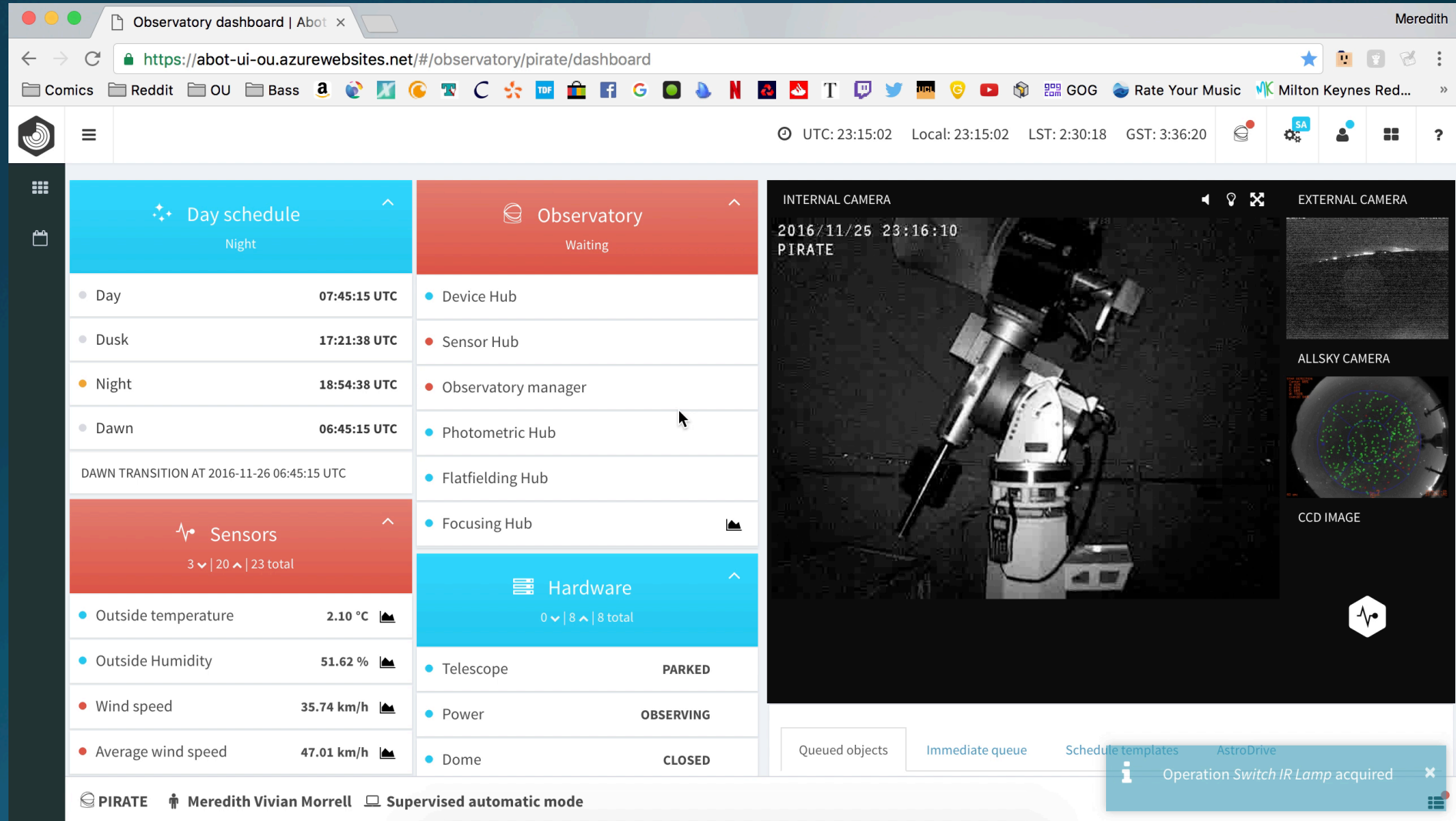
ART is due to be decommissioned in 2017, COAST will be taking over its role on telescope.org



ABOT Telescope Interface

Web interface
for PIRATE and
COAST.

Designed by
Sybilla
Technologies



The screenshot displays the ABOT Telescope Interface web dashboard. The interface is organized into several sections:

- Day schedule:** A table showing the current and upcoming schedule for the night.

Activity	Time (UTC)
Day	07:45:15 UTC
Dusk	17:21:38 UTC
Night	18:54:38 UTC
Dawn	06:45:15 UTC

DAWN TRANSITION AT 2016-11-26 06:45:15 UTC
- Sensors:** A section displaying real-time sensor data.

Sensor	Value
Outside temperature	2.10 °C
Outside Humidity	51.62 %
Wind speed	35.74 km/h
Average wind speed	47.01 km/h
- Observatory:** A section showing the status of the observatory.

Component	Status
Telescope	PARKED
Power	OBSERVING
Dome	CLOSED
- Hardware:** A section displaying the status of the hardware components.

Component	Status
Telescope	PARKED
Power	OBSERVING
Dome	CLOSED
- Internal Camera:** A live video feed of the telescope.

INTERNAL CAMERA
2016/11/25 23:16:10
PIRATE
- External Camera:** A live video feed of the sky.

EXTERNAL CAMERA
- ALLSKY CAMERA:** A live video feed of the sky.

ALLSKY CAMERA
- CCD IMAGE:** A live video feed of the sky.

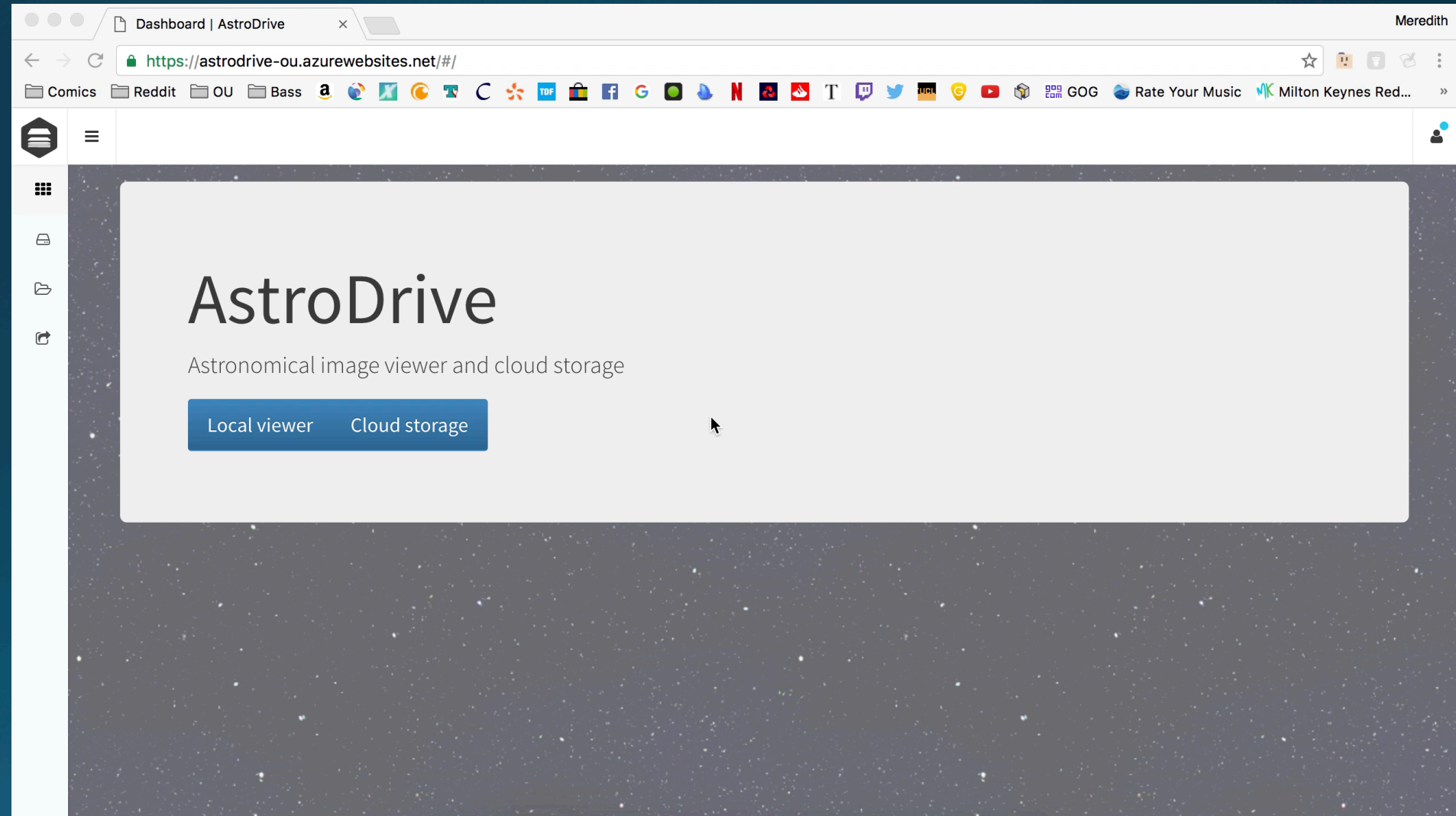
CCD IMAGE

The interface also includes a top navigation bar with the URL <https://abot-ui-ou.azurewebsites.net/#observatory/pirate/dashboard> and a bottom status bar showing the current mode as "Supervised automatic mode".

AstroDrive Image Storage

Cloud storage
web interface
for PIRATE and
COAST
images.

Designed by
Sybilla
Technologies

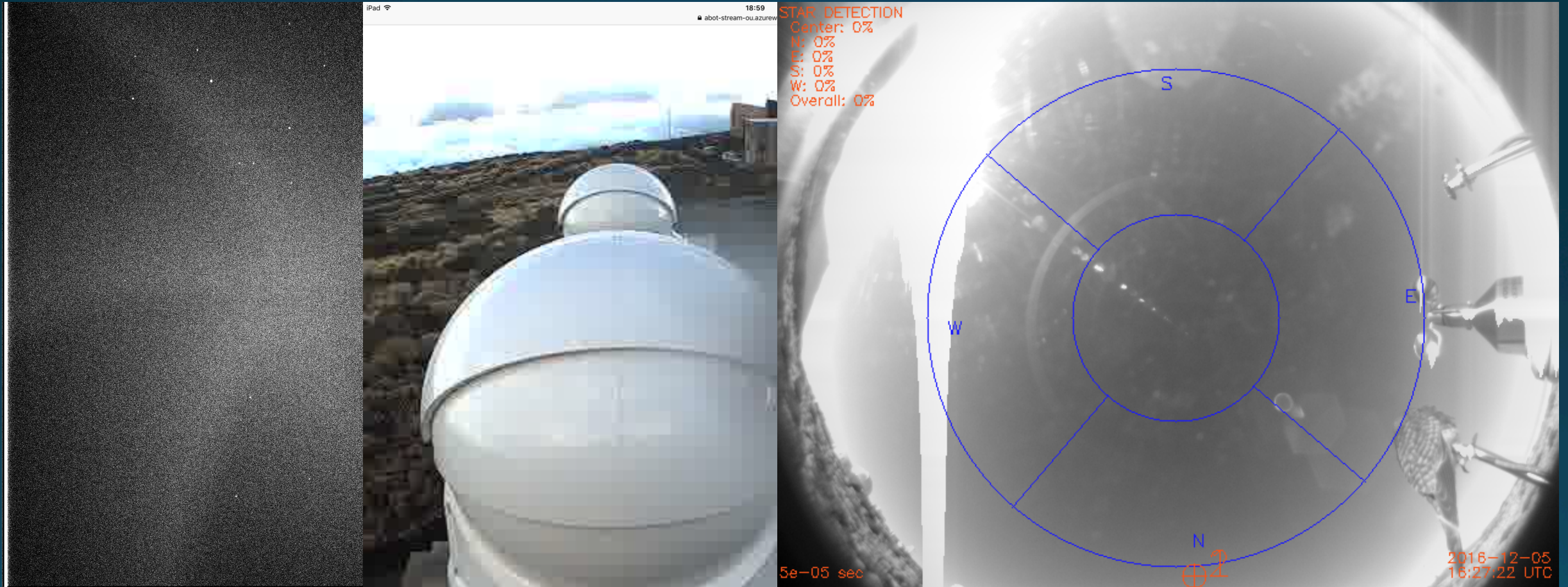


Commissioning phase

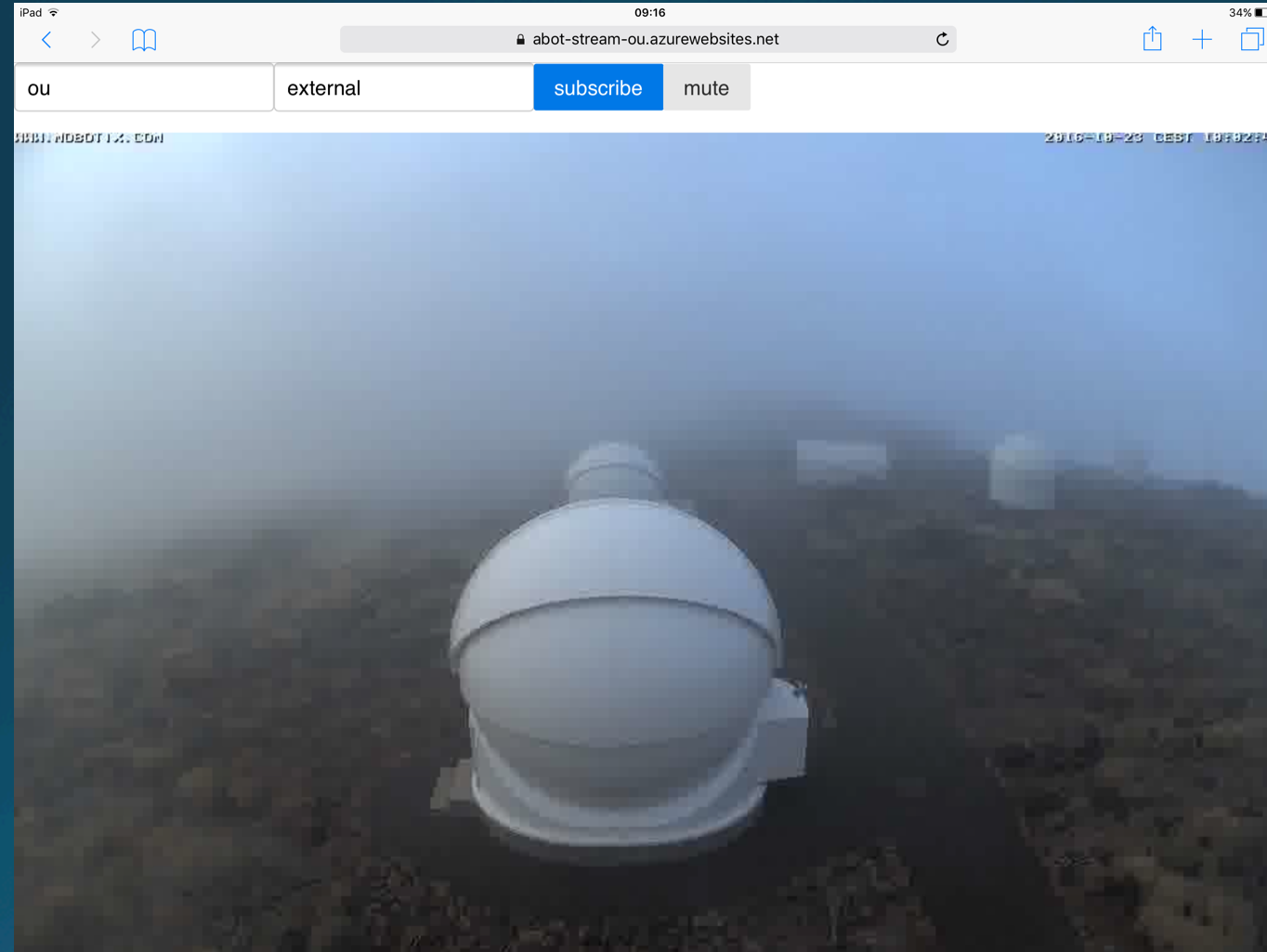
PIRATE and COAST are both still in the commissioning phase, with PIRATE currently a bit further along than COAST. Problems are still being discovered and dealt with where possible



Commissioning

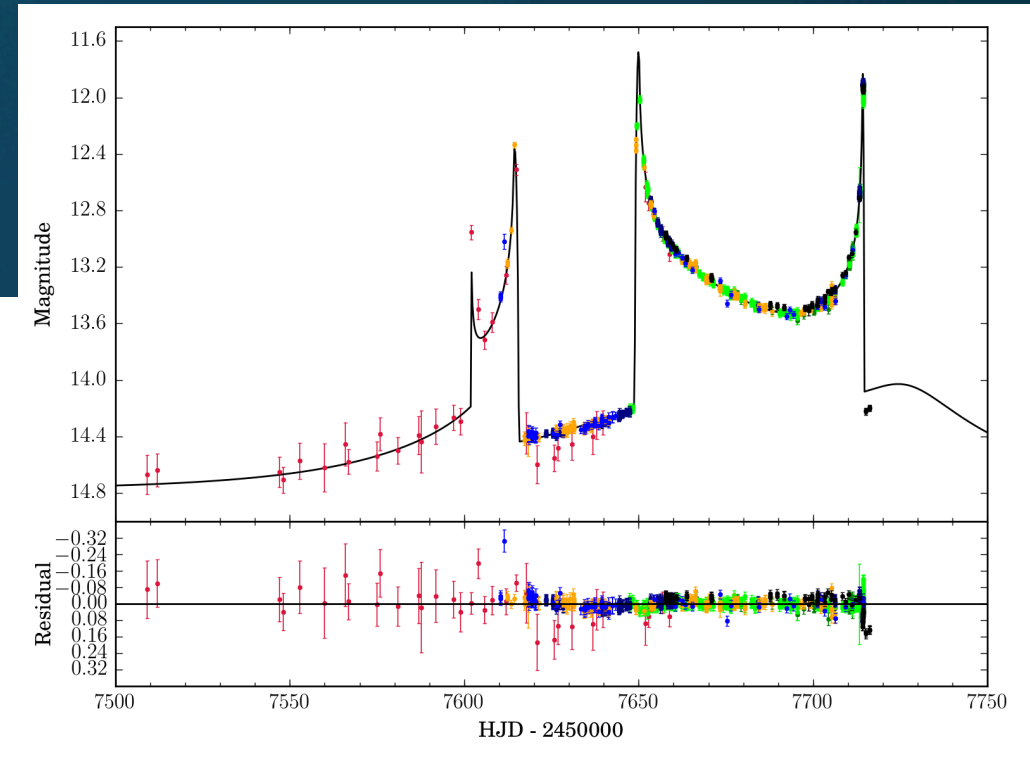
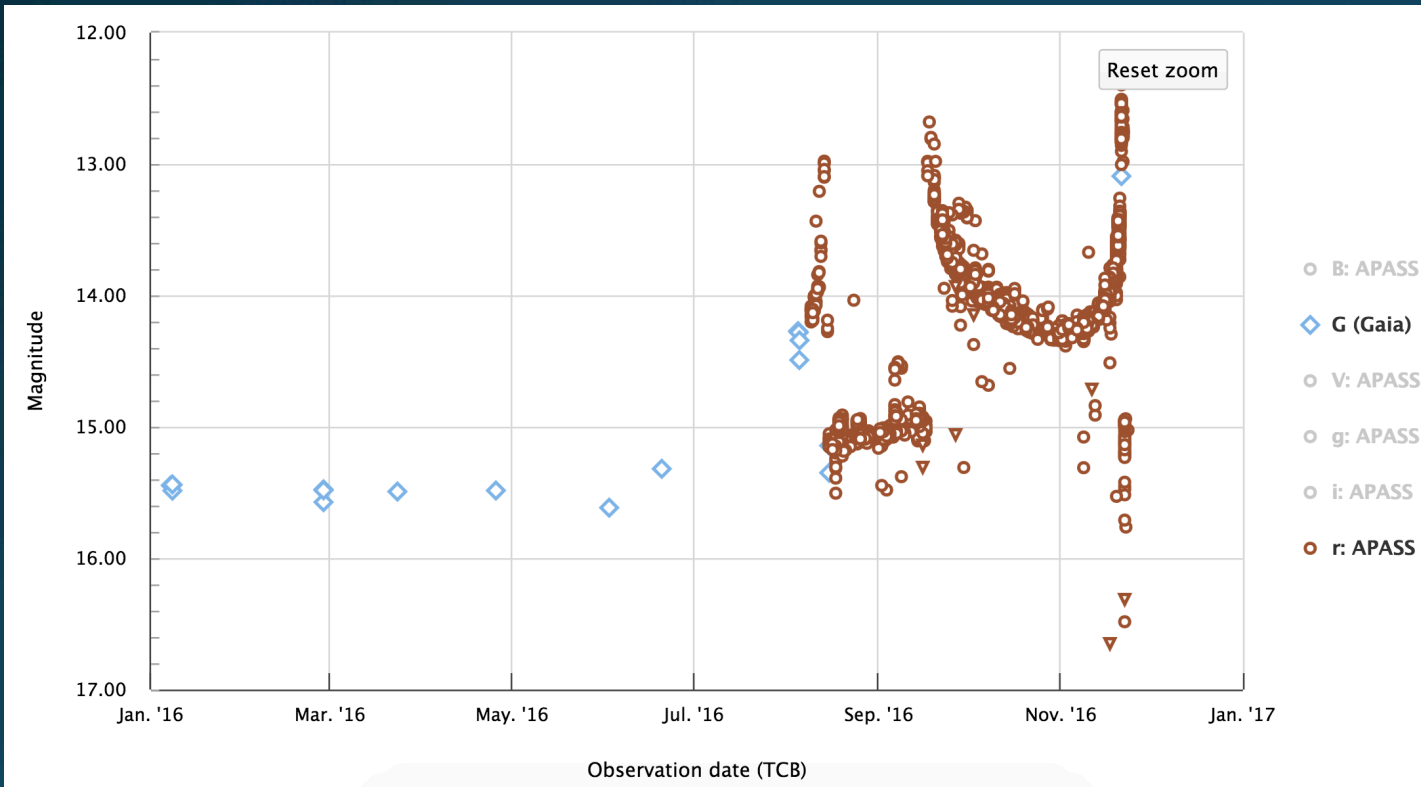


Commissioning



Gaia16aye (Ayers Rock)

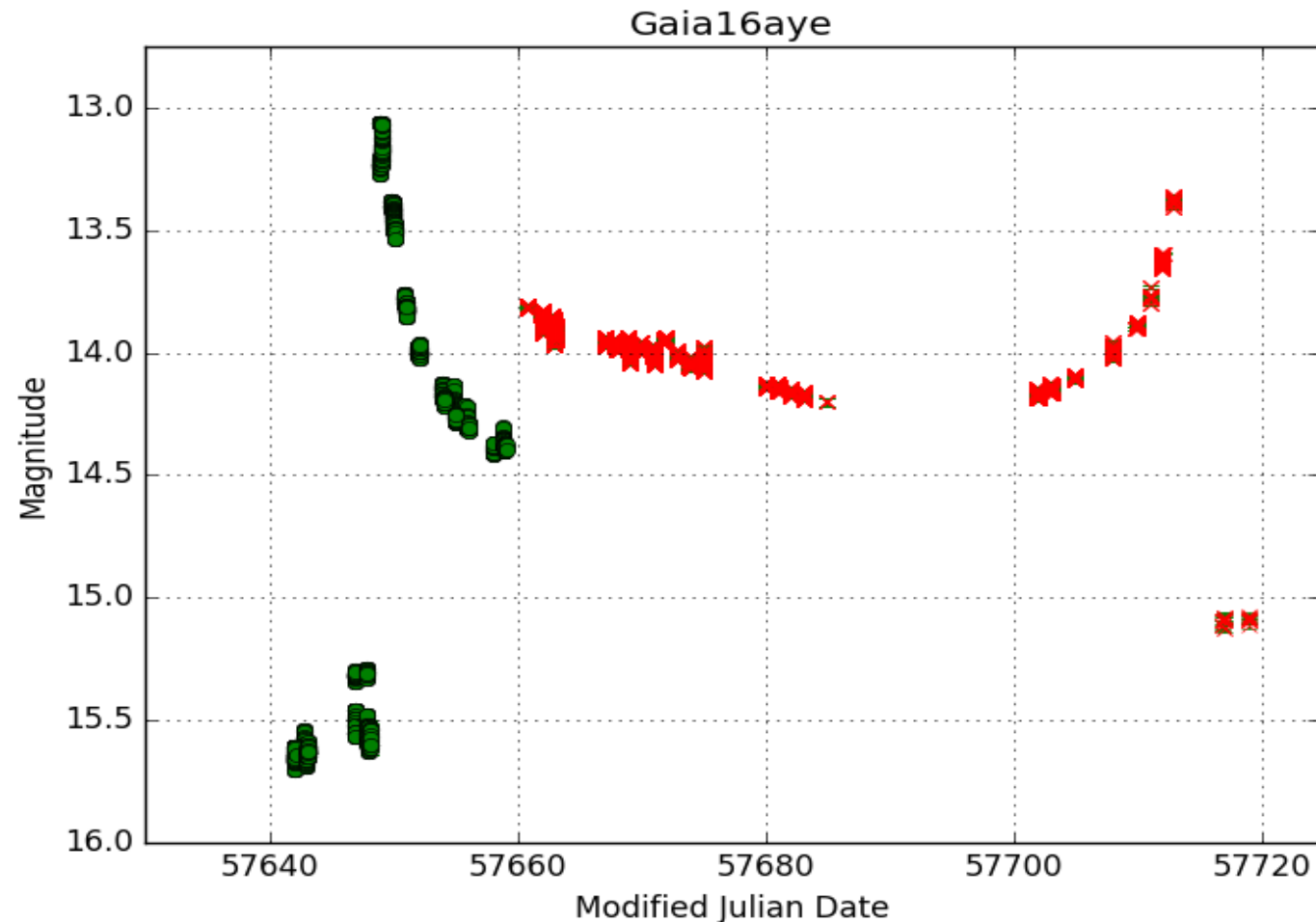
Binary microlensing event



Gaia16aye

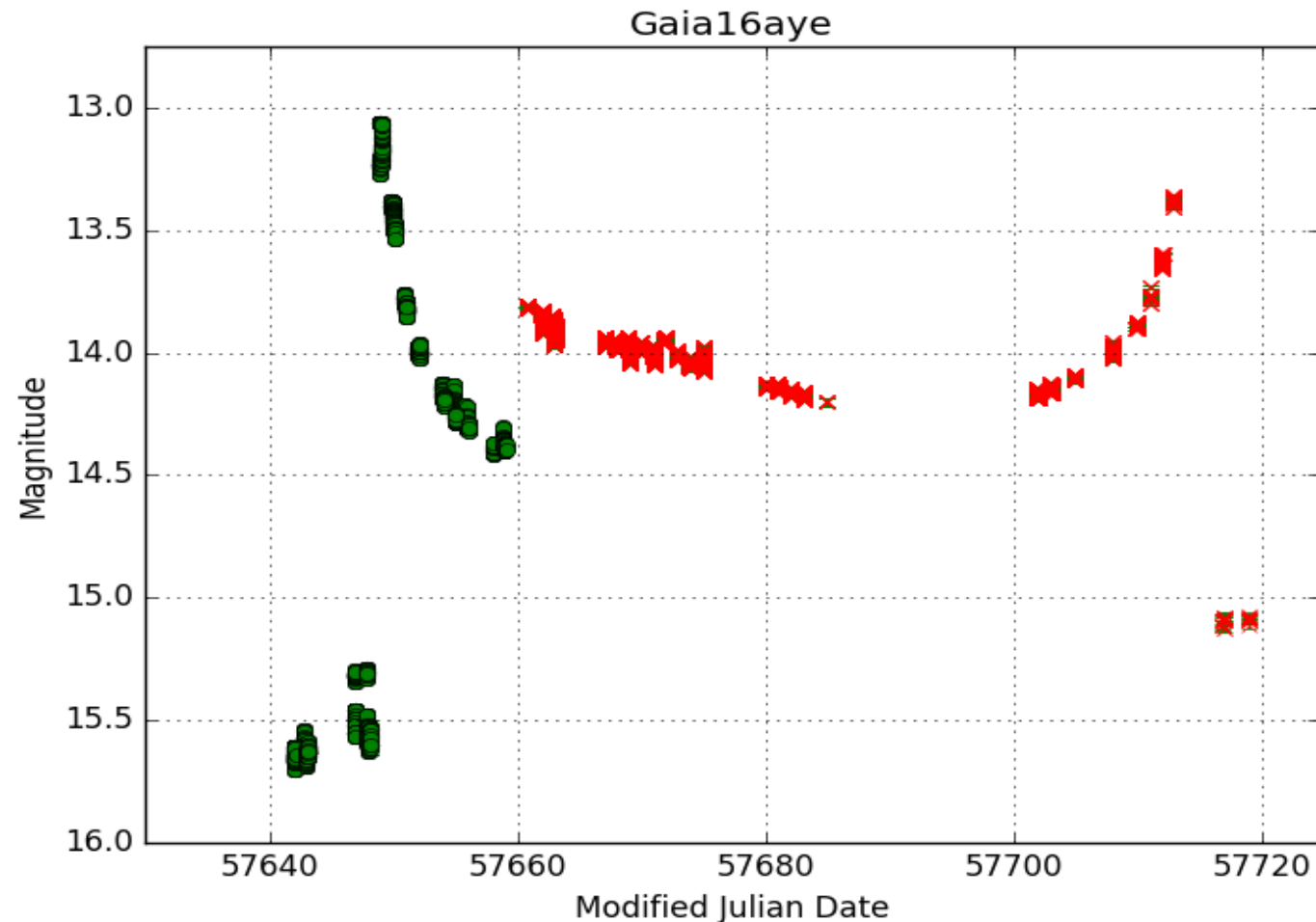
I have been writing a pipeline to automatically reduce the data from PIRATE and COAST, and potentially upload source catalogues to the Gaia follow up server.

So far I have been testing the pipeline using images captured by PIRATE of Gaia16aye



Gaia16aye

Our early data was captured through our "G" filter (which corresponds with APASS/V), due to the issue with the filter wheel we were unaware of this until recently



Future for PIRATE and COAST

Currently we are still working through commissioning issues and finding a quick, automatic way to reduce the science frames we collect, and to upload Gaia target data straight to the follow up server.

Hopefully in the not too distant future we will be using PIRATE to quickly follow up time sensitive Gaia alerts and consistently observe long duration variable Gaia transients.

Open University MSc in Space Science and Technology



A part-time, distance learning qualification launching Feb 2017 which includes in the first year a course called S818 Space Science

The S818 module will be based around a series of case studies:

- Apollo XI
- Gaia
- Rosetta
- Mars Curiosity

In particular, the final activity of Gaia case study:

- Select a Gaia transient
- Follow-up observations with robotic telescope
- Reduction & analysis of data
- Upload to Gaia follow-up server

Students may also choose to carry out another Gaia case study as their main project

Summary

- New OpenScience Observatory site
- Includes two new robotic telescopes: PIRATE and COAST
- COAST to take over public facility on telescope.org formally occupied by ART
- New web interfaces for students: Abot and AstroDrive
- Both new telescopes still commissioning, PIRATE a little further along
- Images of Gaia16aye taken during commissioning phase
- Soon to automatically follow up Gaia alerts and automatically reduce and upload the data
- New MSc course in Space Science and Technology which will look at Gaia transients.