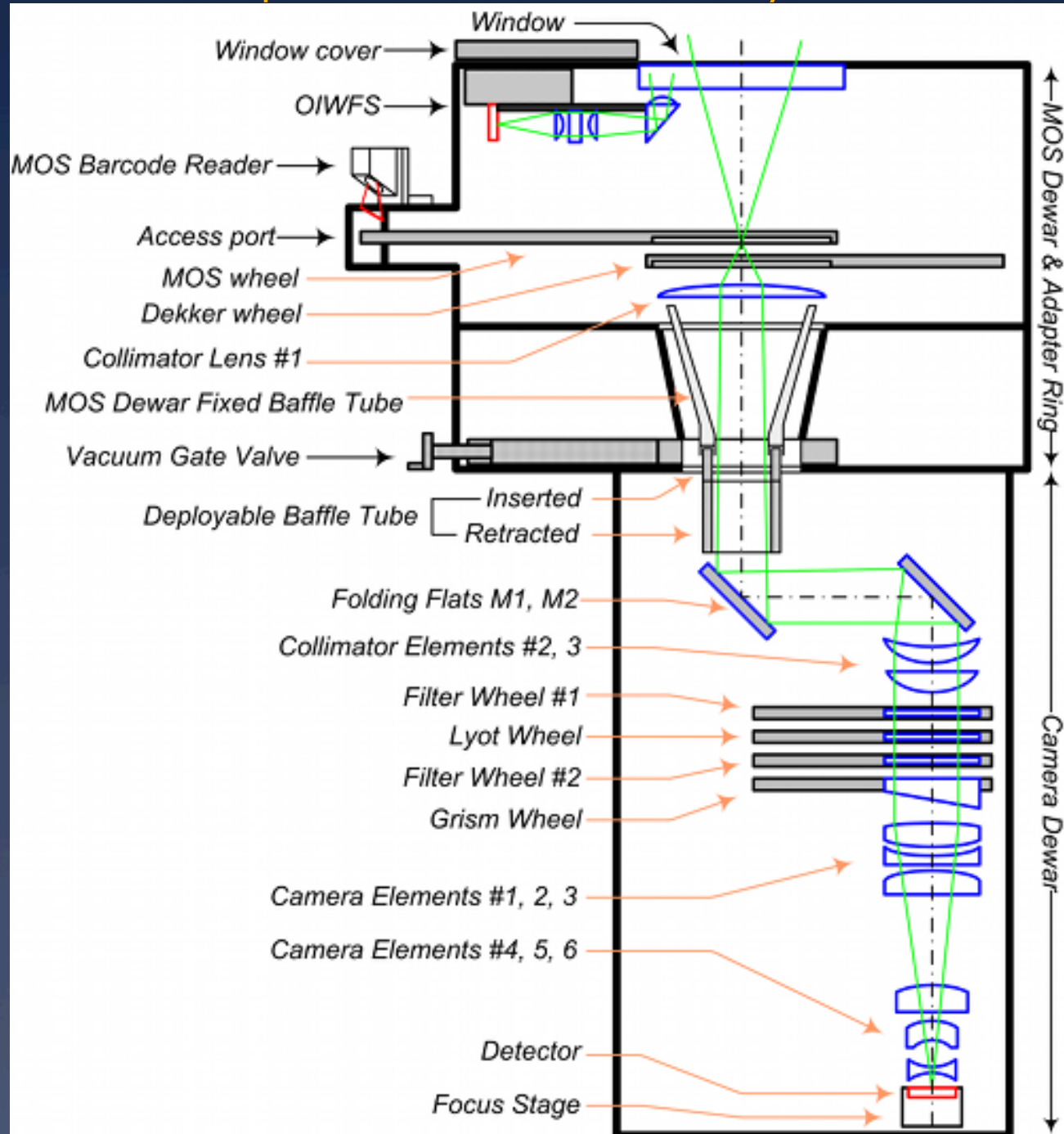


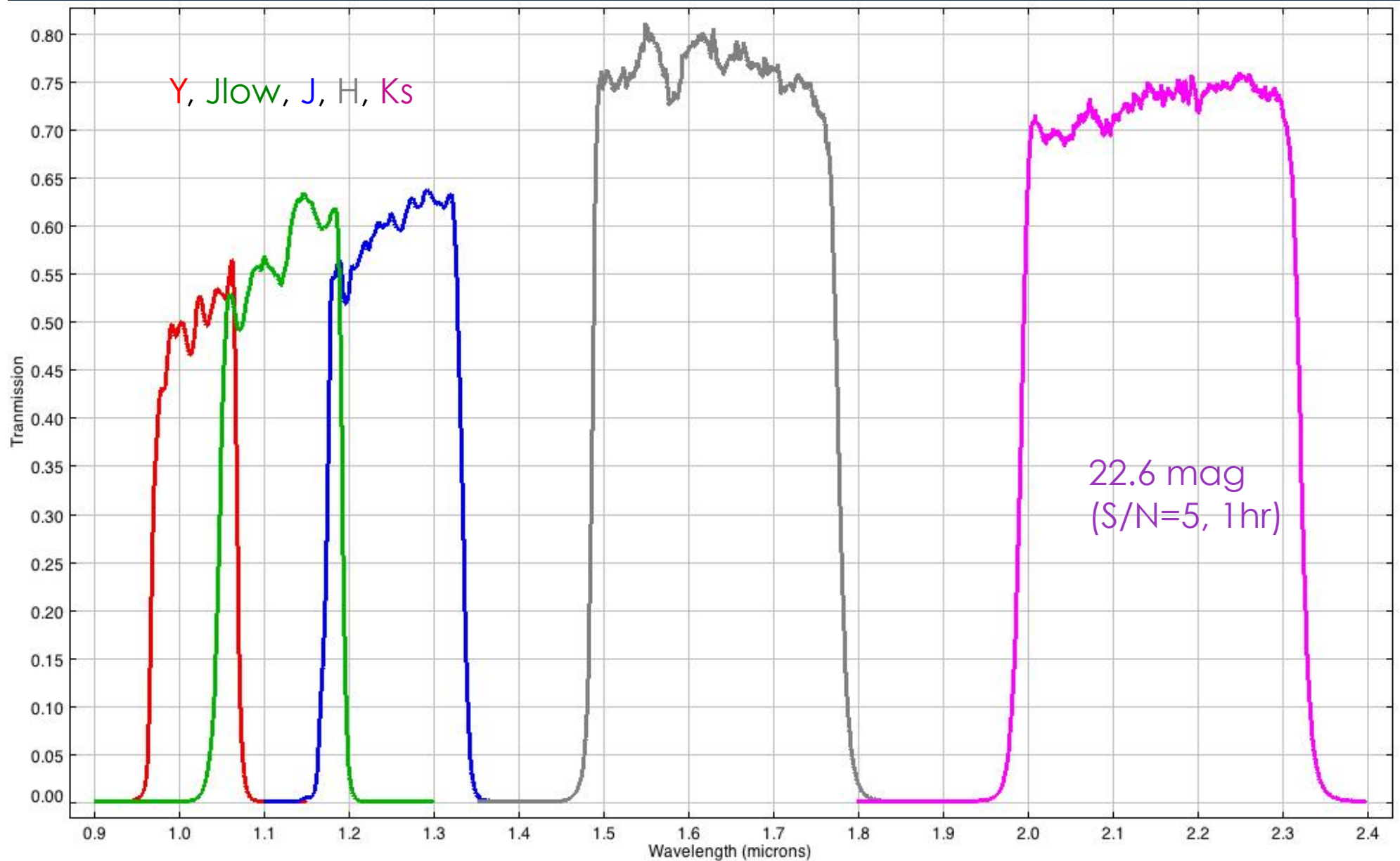
FLAMINGOS-2

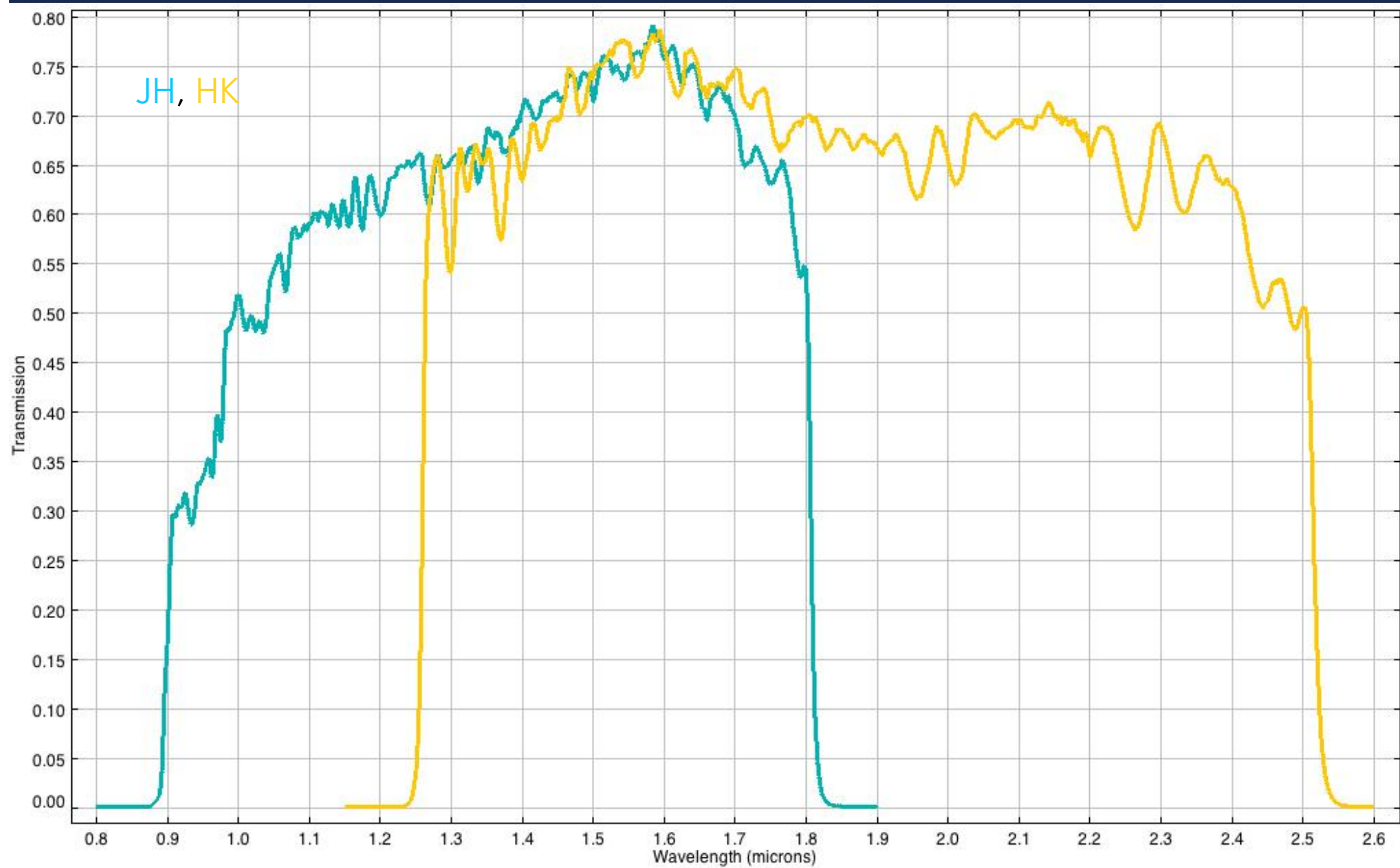
Team members : P. Hibon, P. Candia, R. Diaz, P. Gomez, M. Lazo, G. Perez, M. Schirmer

Opto-Mechanical Layout



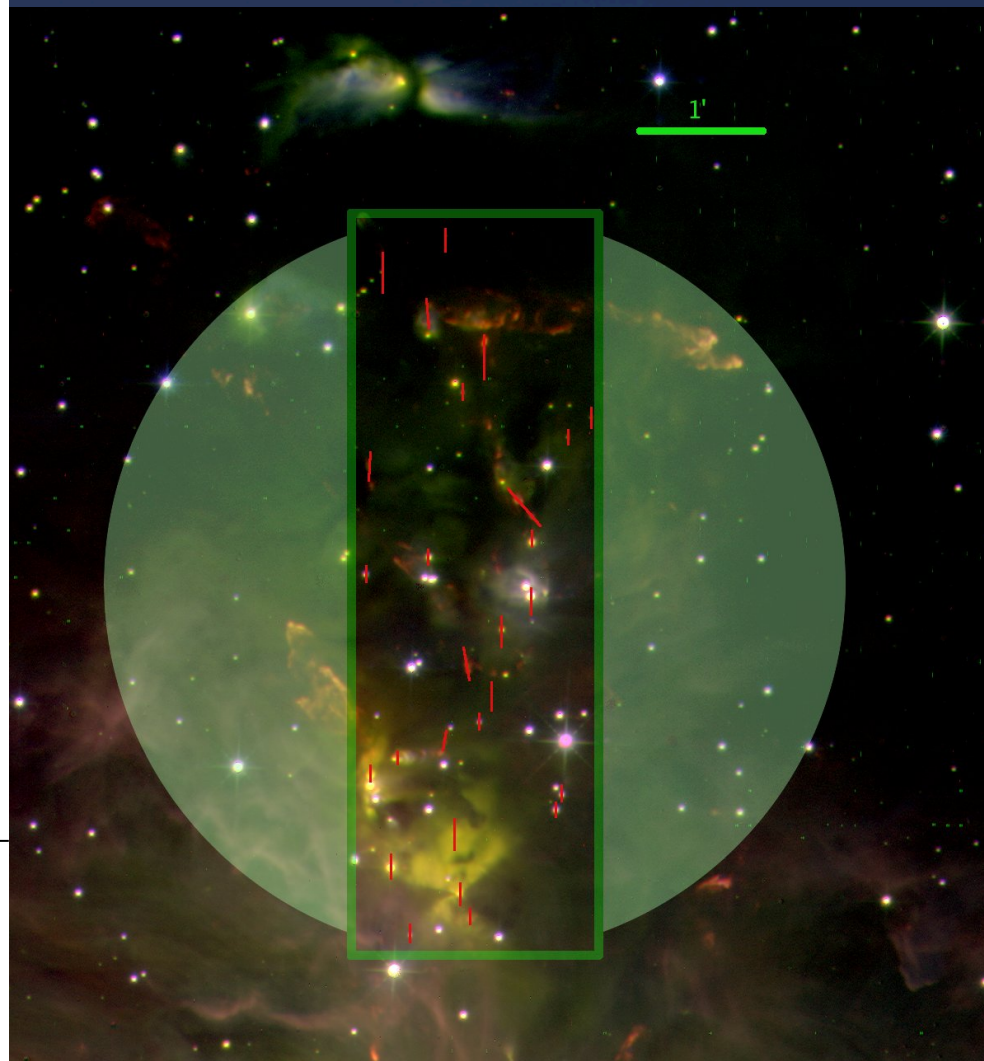
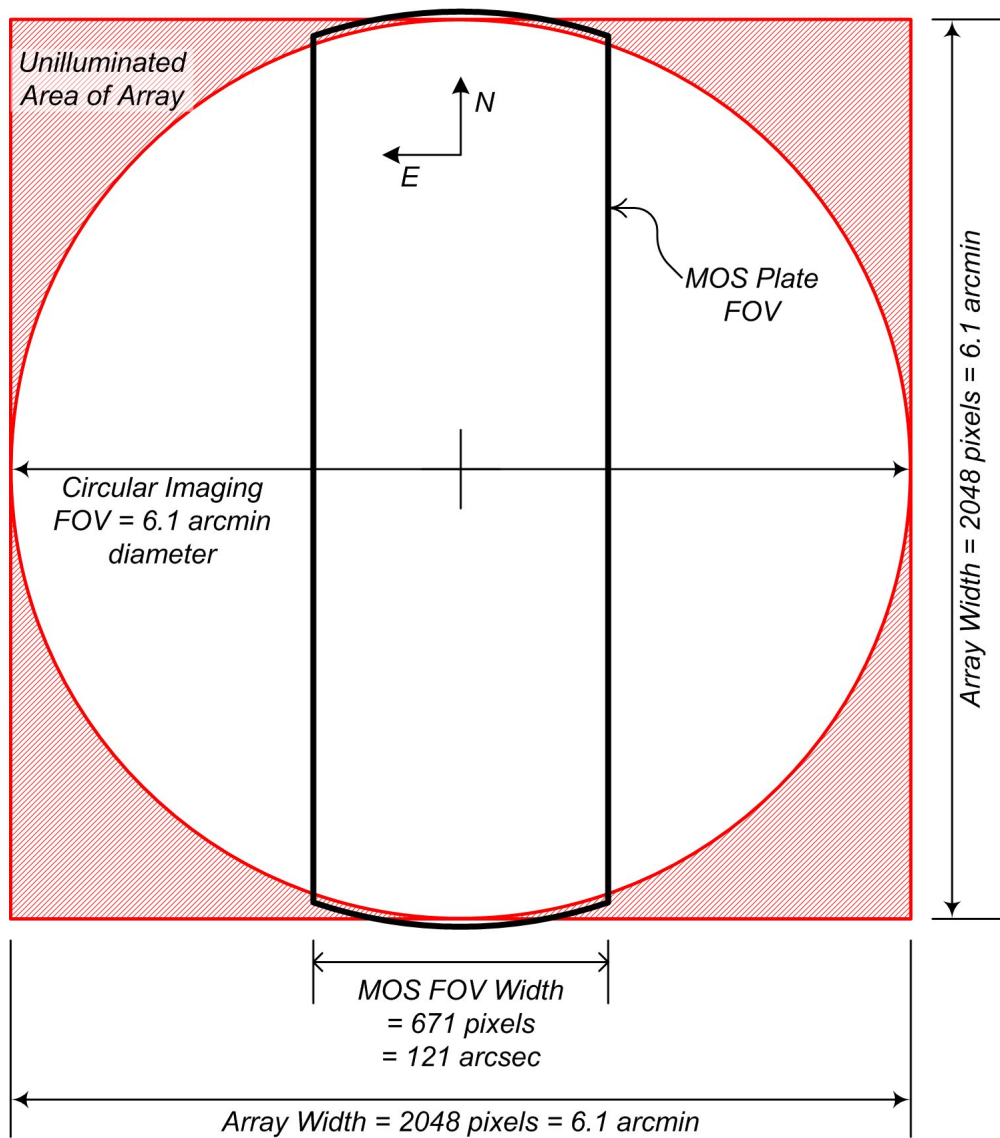
Filters Transmission



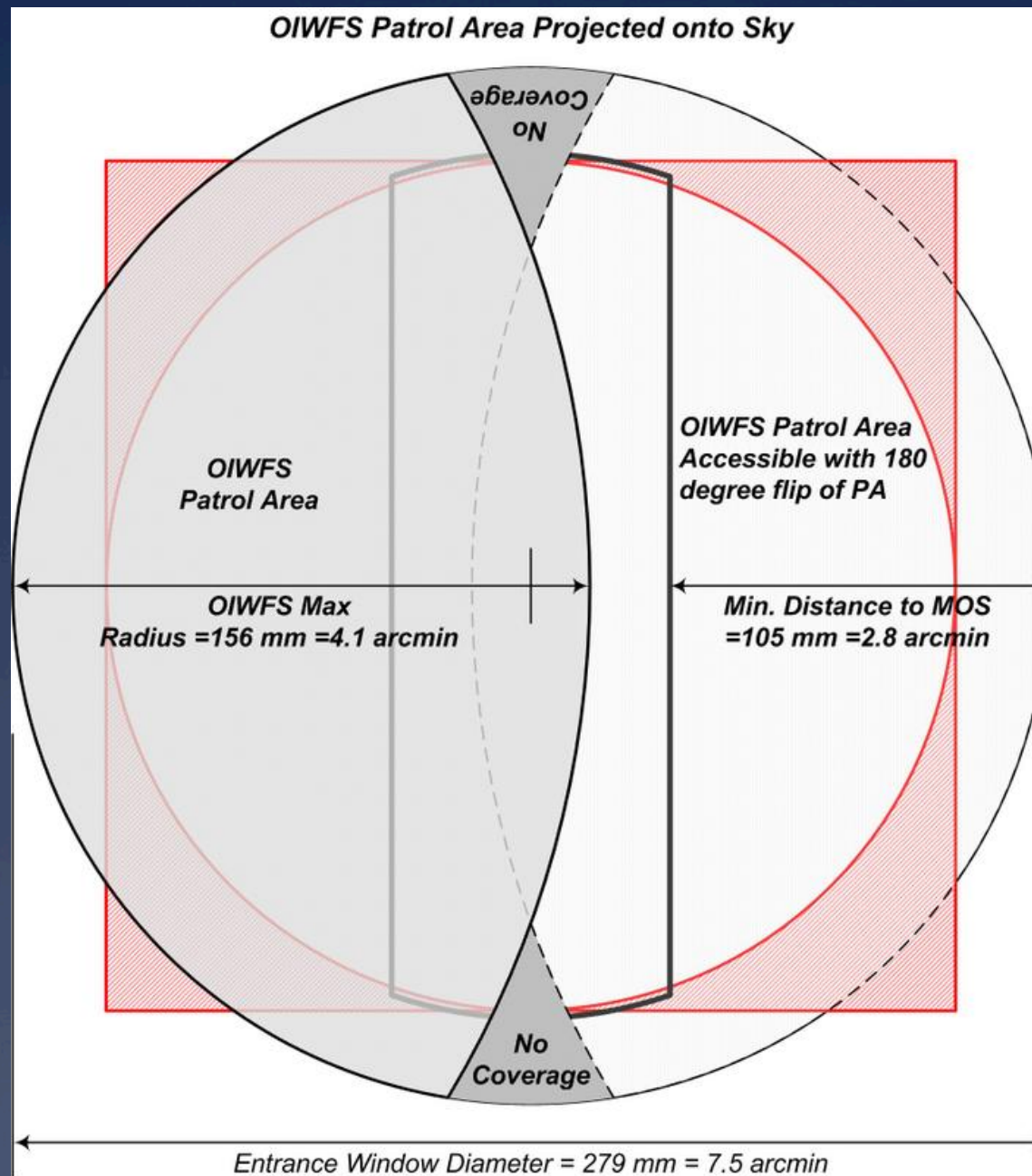


Fields of View

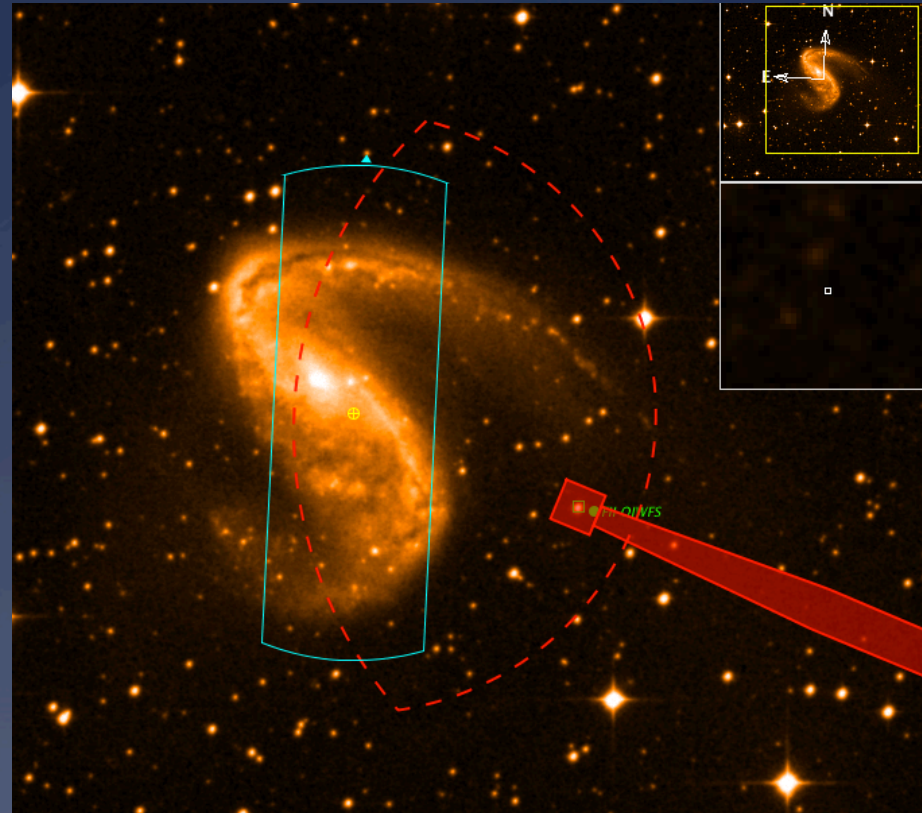
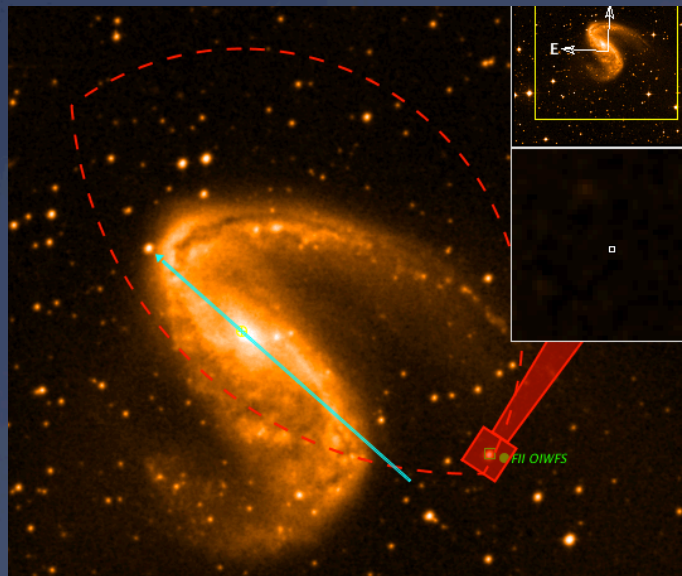
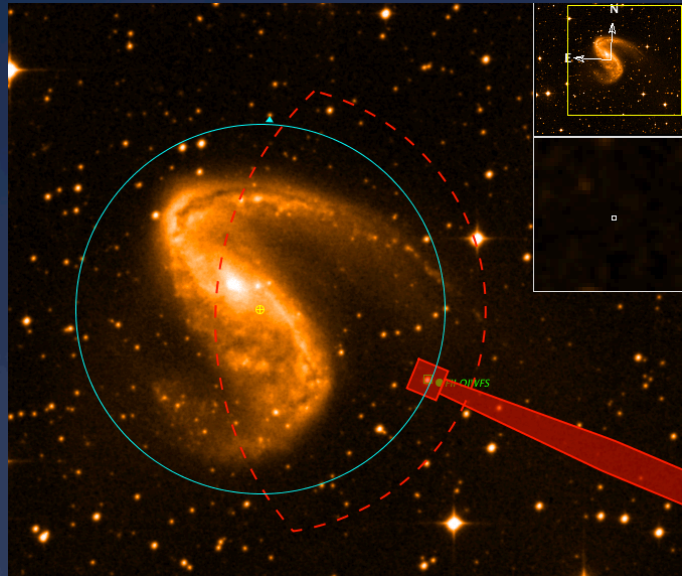
*Imaging & MOS Fields of View
Projected onto Sky for PA = 0 degrees*



- Guiding options : Similar in design and function to the GMOS OIWFS though with a larger patrol field of view



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LAST NEWS

➤ F2 new science detector tested and characterized - End of Sept 2011.

➤ F2 being re-integrated at Pachón Laboratory





The instrument arrived to Cerro Pachón
in June 2009.
It was completely disassembled for the
transport.

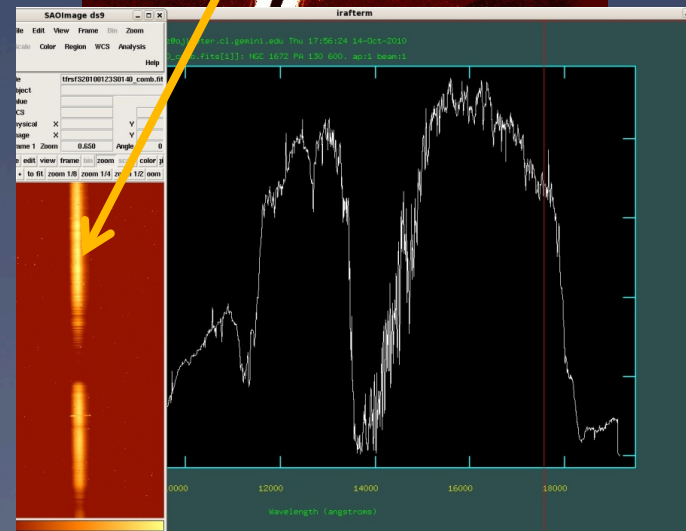
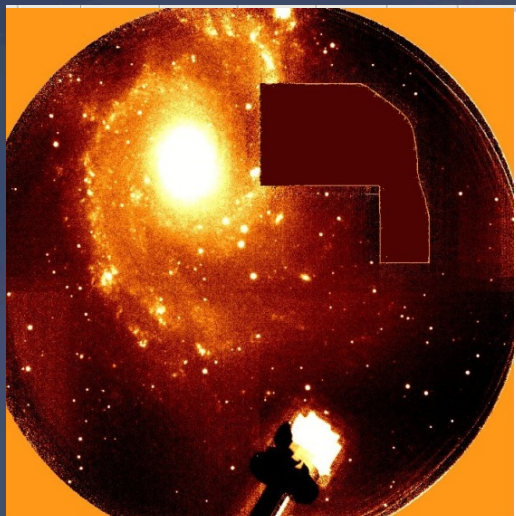
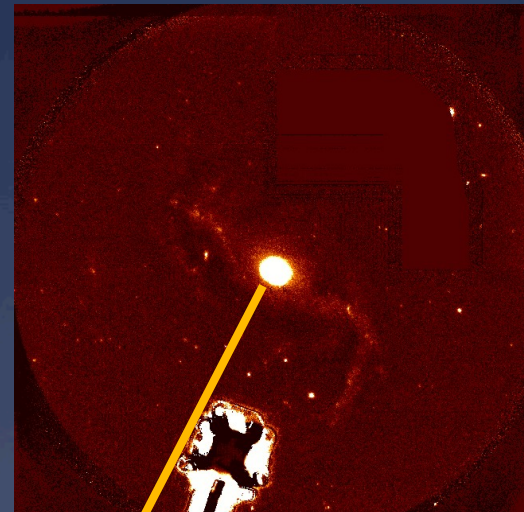
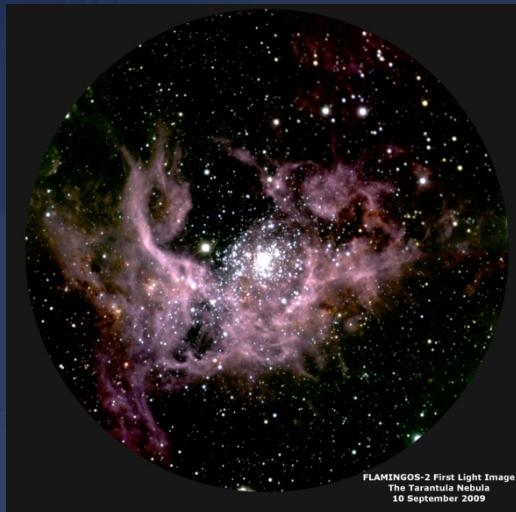


F2 was installed in the up-looking
port in late Sep 2009



F2 performed well during the on-sky AT, but with outstanding issues.

Gemini took responsibility in January 2010 in order to address remaining issues in-house



Sept. 10th 2009



J, H, Ks
6' FOV

FWHM 0.6"
Natural Seeing
(OIWFS was not
operational yet)

Total exp. Time
~8mins
(the blue objects
would be visible
on an optical
image from a 8m
telescope).

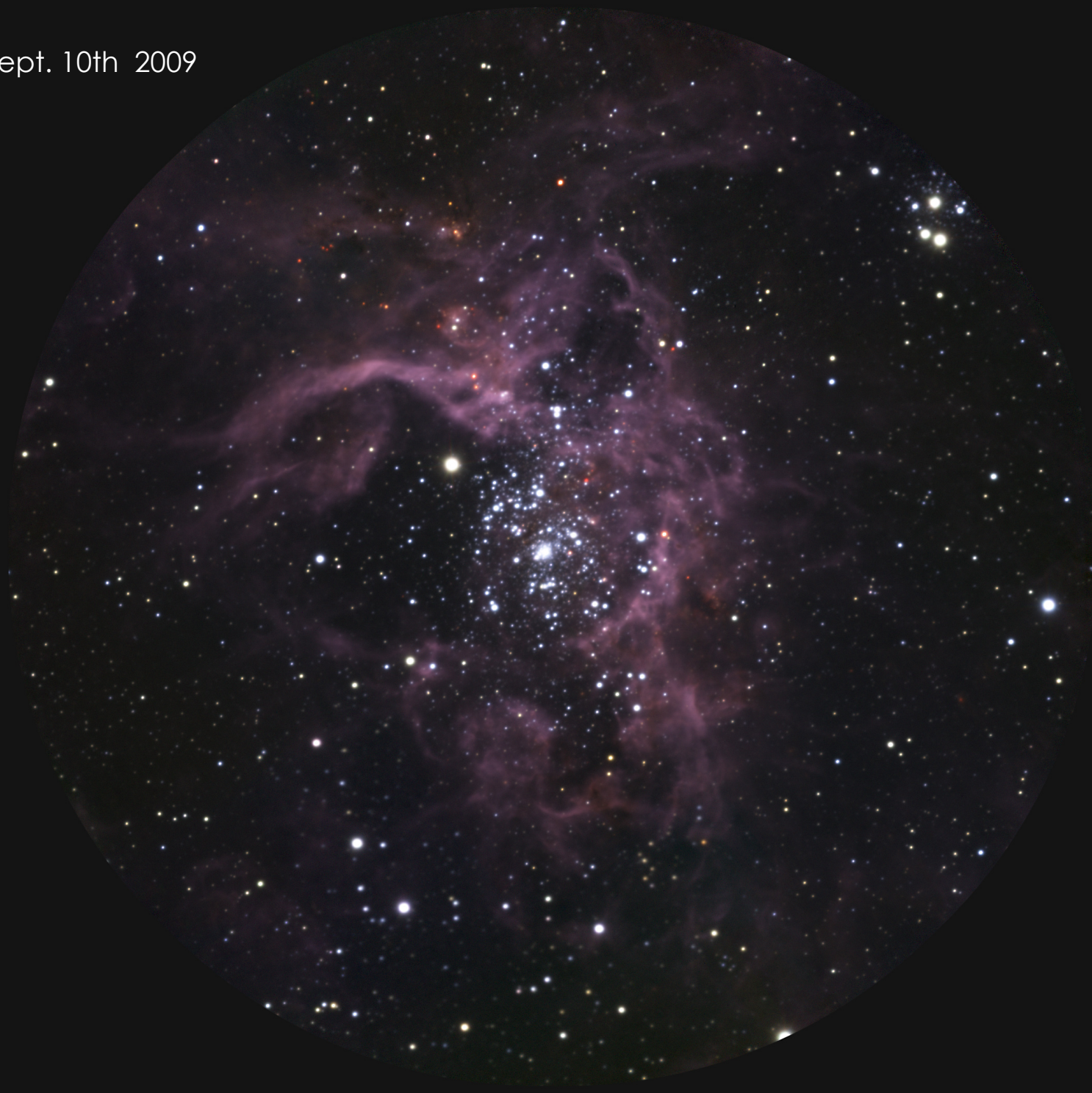
F2 team

Sept. 10th 2009

J, H, Ks
6' FOV

FWHM 0.6"
Natural Seeing
(OIWFS was not
operational yet)

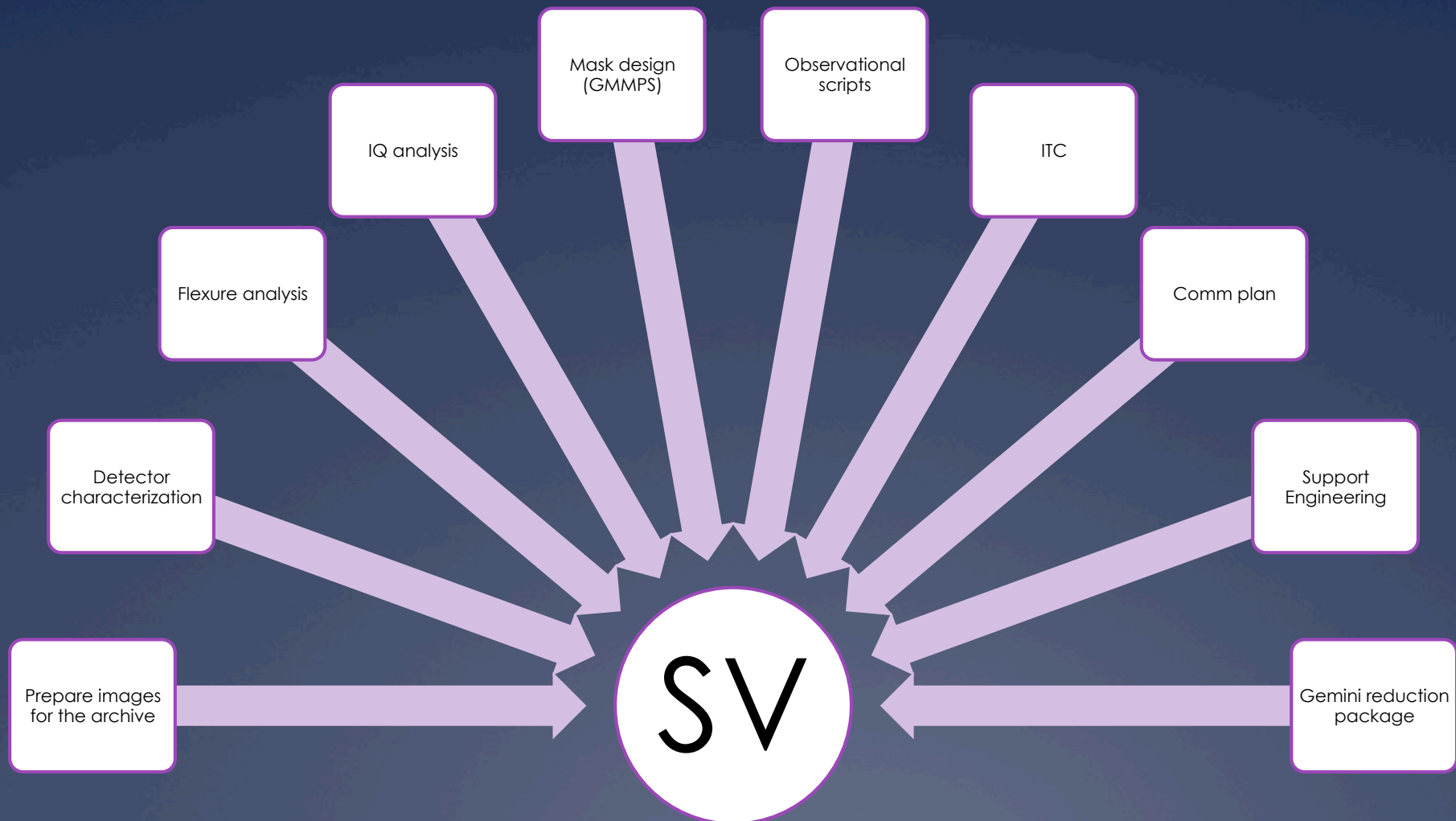
F2 team



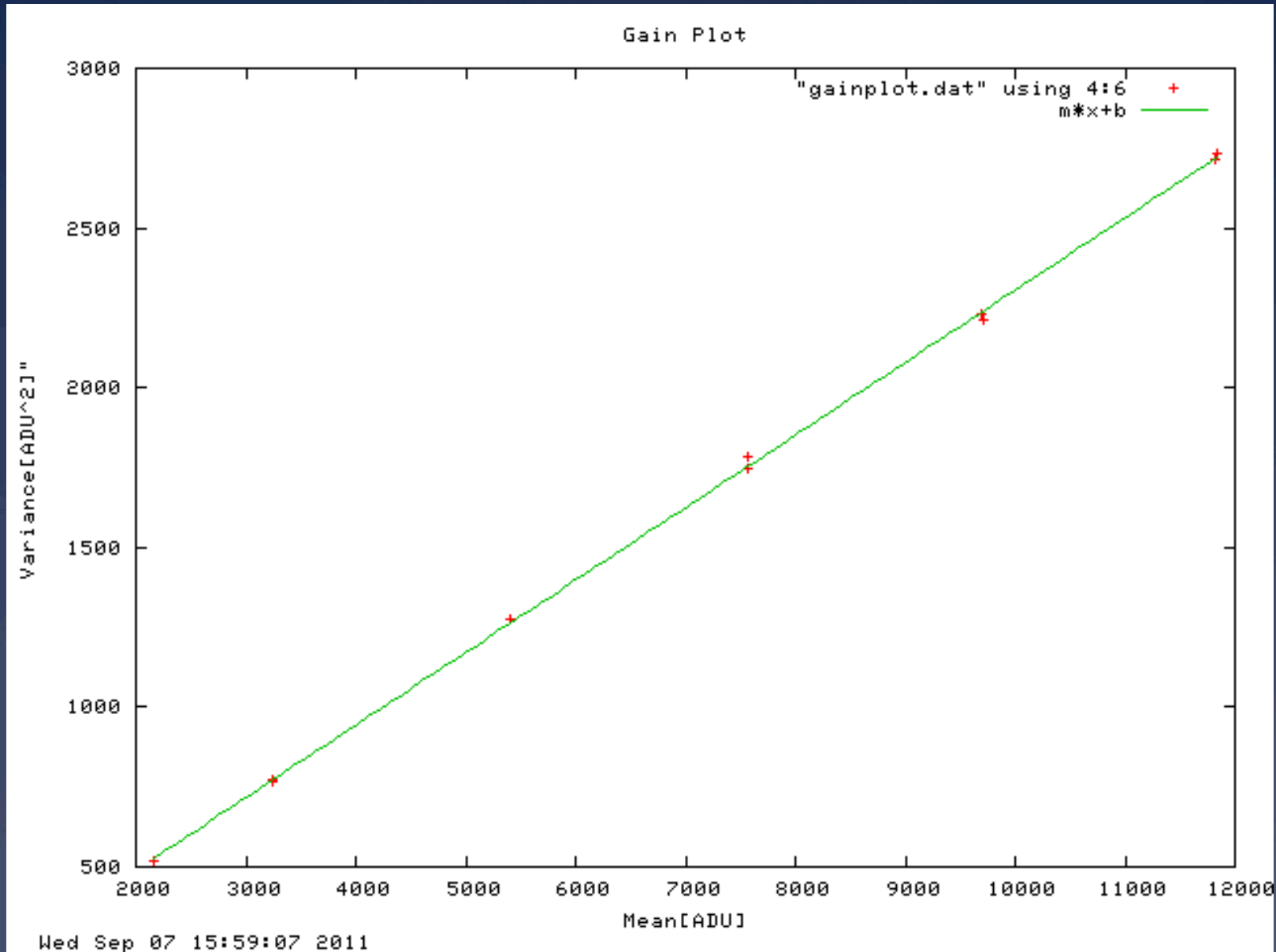
F2 was moved to La Serena instrument Lab for an extensive period of repairs and improvements to address problems.
F2 sent to the flexure test (Nov 2011)



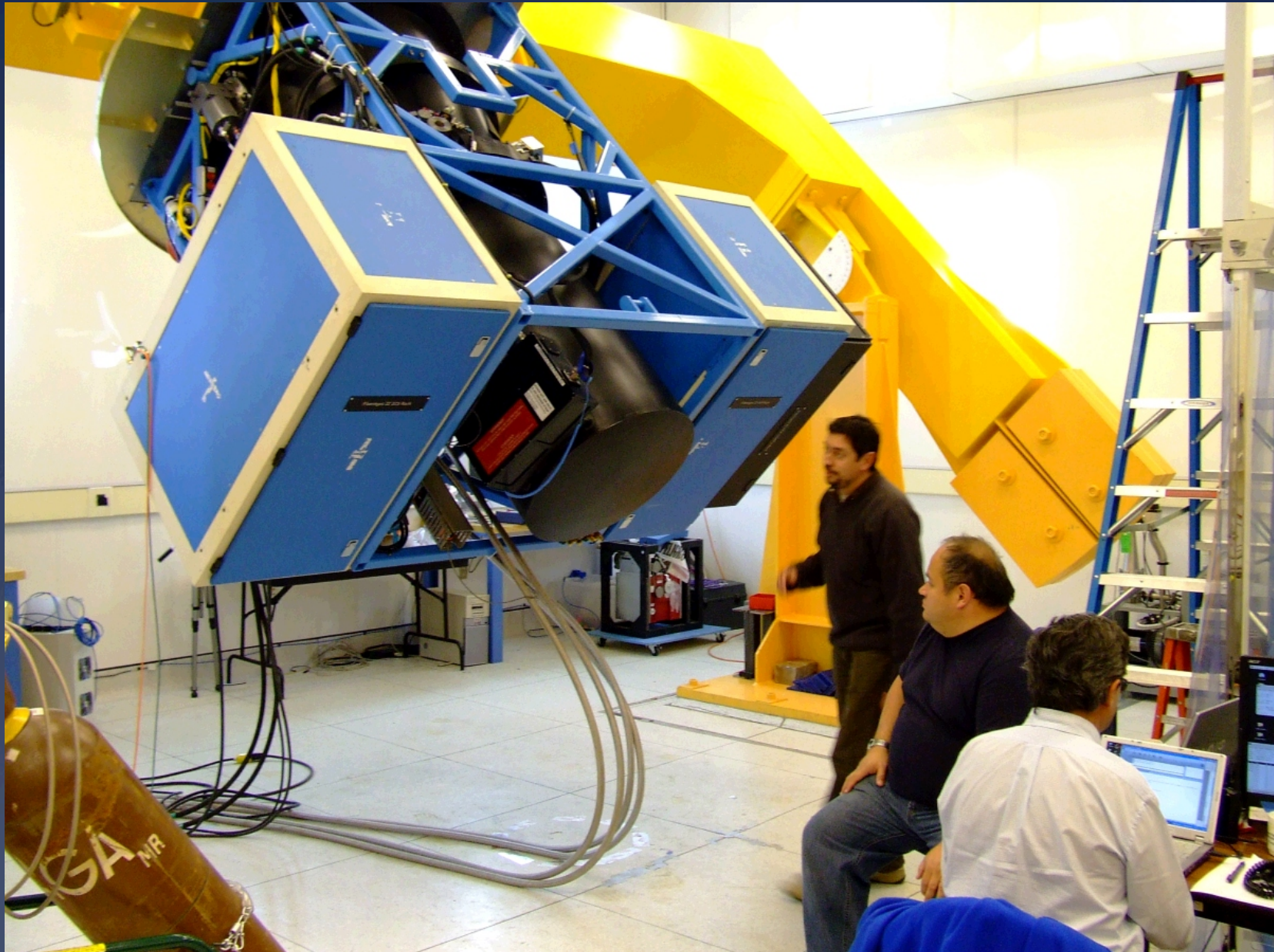
In parallel, we are also working on these items to be ready for science in 2012



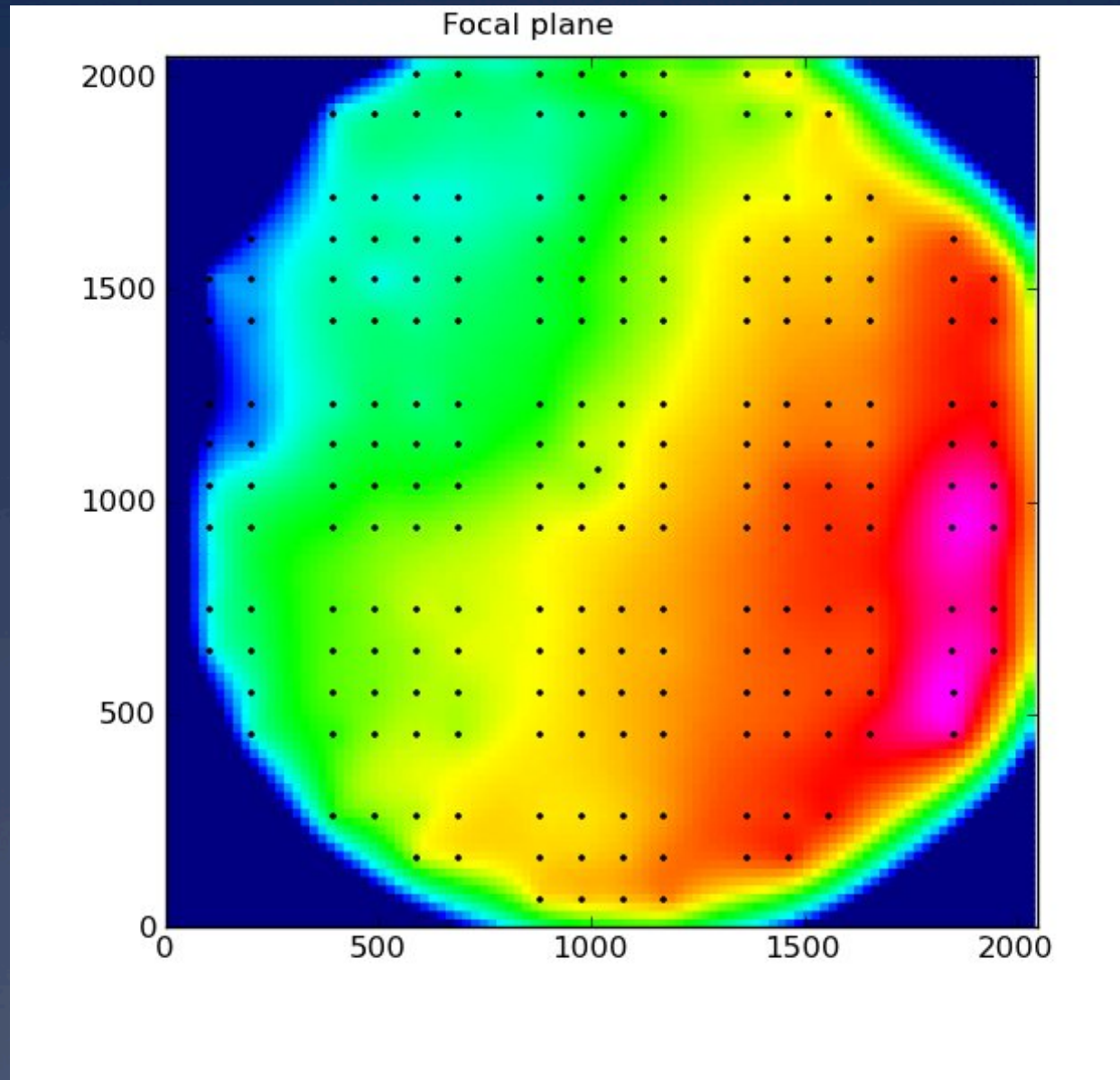
Detector characterization



Flexure Tests to be repeated in Nov. 2011



IQ analysis



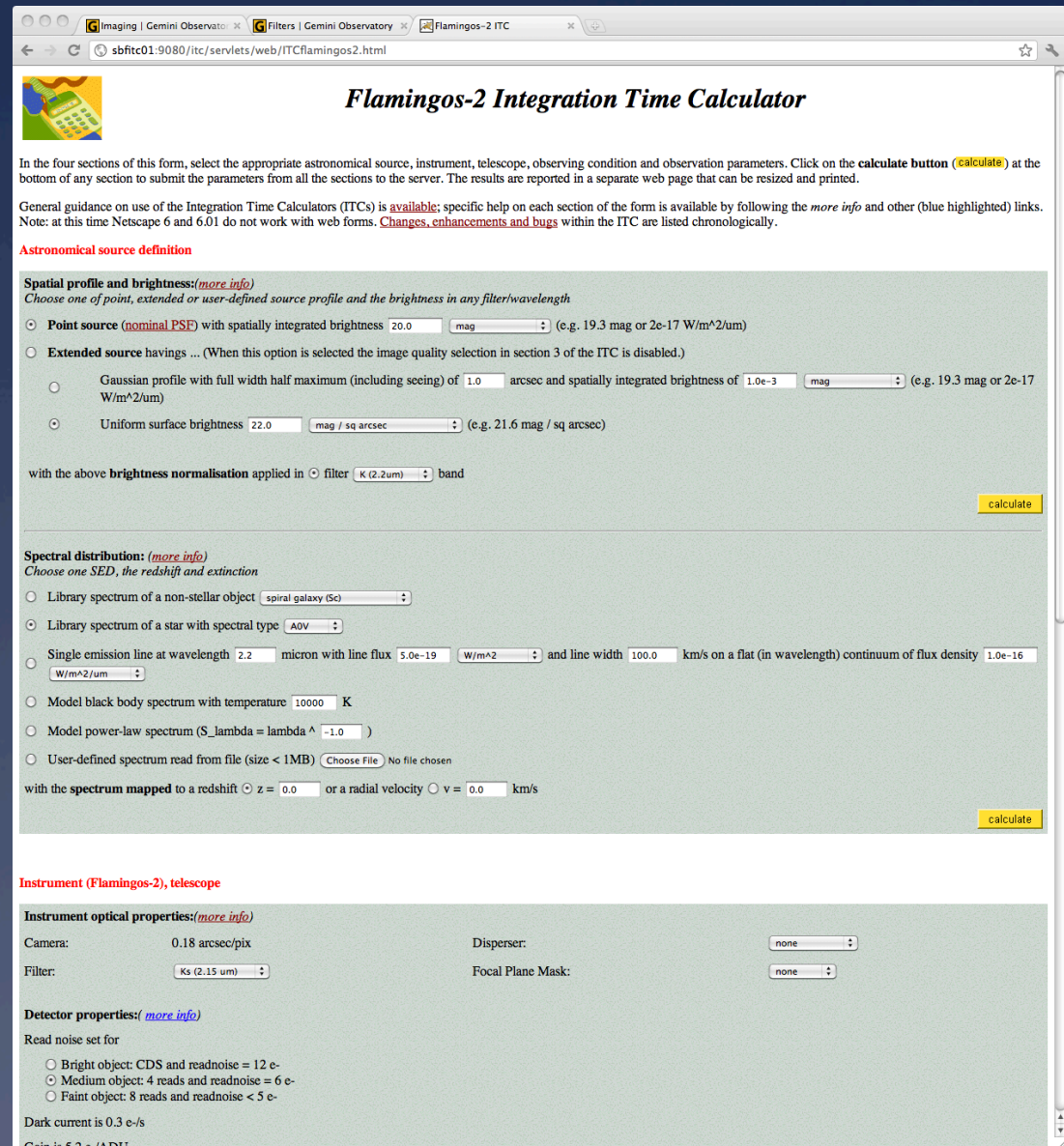
Mask design



ITC

➤ ITC has been tested and verified

➤ Available for next call



The screenshot shows a web browser window with three tabs: 'Imaging | Gemini Observato...', 'Filters | Gemini Observato...', and 'Flamingos-2 ITC'. The address bar shows 'sbftc01:9080/itc/servlets/web/ITCflamingos2.html'. The page title is 'Flamingos-2 Integration Time Calculator'. Below the title is a small icon of a calculator and a green arrow. The main content area is divided into several sections:

- Astronomical source definition**
 - Spatial profile and brightness:** (more info) Choose one of point, extended or user-defined source profile and the brightness in any filter/wavelength.
 - ☒ **Point source (nominal PSF)** with spatially integrated brightness 20.0 mag (e.g. 19.3 mag or 2e-17 W/m^2/um)
 - ☐ **Extended source** having ... (When this option is selected the image quality selection in section 3 of the ITC is disabled.)
 - ☐ Gaussian profile with full width half maximum (including seeing) of 1.0 arcsec and spatially integrated brightness of 1.0e-3 mag (e.g. 19.3 mag or 2e-17 W/m^2/um)
 - ☐ Uniform surface brightness 22.0 mag / sq arcsec (e.g. 21.6 mag / sq arcsec)
 - with the above **brightness normalisation** applied in filter K (2.2um) band
 - calculate** button
- Spectral distribution:** (more info) Choose one SED, the redshift and extinction.
 - ☐ Library spectrum of a non-stellar object spiral galaxy (Sc)
 - ☐ Library spectrum of a star with spectral type A0V
 - ☐ Single emission line at wavelength 2.2 micron with line flux 5.0e-19 W/m^2 and line width 100.0 km/s on a flat (in wavelength) continuum of flux density 1.0e-16 W/m^2/um
 - ☐ Model black body spectrum with temperature 10000 K
 - ☐ Model power-law spectrum ($S_{\lambda} = \lambda^{-1.0}$)
 - ☐ User-defined spectrum read from file (size < 1MB) Choose File No file chosen
- with the **spectrum mapped** to a redshift $z = 0.0$ or a radial velocity $v = 0.0$ km/s
- calculate** button

- Instrument (Flamingos-2), telescope**
- Instrument optical properties:** (more info)
 - Camera: 0.18 arcsec/pix
 - Filter: Ks (2.15 um)
 - Disperser: none
 - Focal Plane Mask: none
- Detector properties:** (more info)
 - Read noise set for
 - ☐ Bright object: CDS and readnoise = 12 e-
 - ☐ Medium object: 4 reads and readnoise = 6 e-
 - ☐ Faint object: 8 reads and readnoise < 5 e-
 - Dark current is 0.3 e-/s
 - Gain is 5.2 e-/ADU

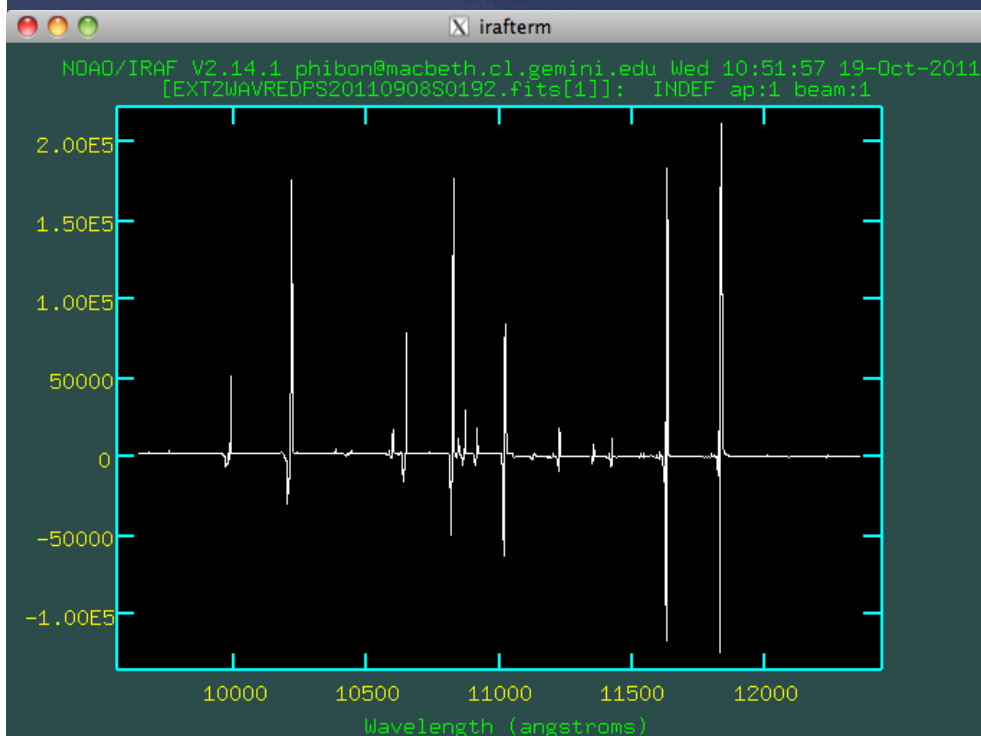
Data Reduction package

```
IRAF
Image Reduction and Analysis Facility

PACKAGE = gnirs
TASK = nsreduce

inimages= 2520110908S0192.fits  Input image(s)
(outimag= ) Output image(s)
(outpref= REDMAN3) Prefix for output image(s)
(fl_nscu= yes) Call nscut (cut data according to MDF)?
(section= SPECSEC1) Alternative section or keyword (blank for MDF)
(fl_corn= yes) Zero corners, if specified in MDF?
(fl_proc= yes) Do processing to cut data (otherwise, use uncut)?
(fl_nsap= no) Call nsappawave?
(nsappwa= ) nsappwave calibration table
(crval = INDEF) Central wavelength
(cdelt = INDEF) Resolution in wavelength per pixel
(fl_dark= no) Do dark subtraction?
(darkima= ) Dark current image to subtract
(fl_save= no) Save dark after calling nscut?
(fl_sky = yes) Do sky subtraction?
(skyimag= ) Sky image(s) from other nod positions
(skysect= ) Level, sample area, or header keyword for sample area
(combtyp= median) Type of combine operation for sky
(rejtype= avsigclip) Type of rejection for combining sky
(masktype= goodvalue) Mask type
(maskval= 0.) Mask value
(scale = none) Image scaling for combining sky (see imcombine.scale)
(zero = median) Image zero-point offset for combining sky (see imcombine.zero)
(weight = none) Image weights for combining sky (see imcombine.weight)
(statsec= [*,*]) Statistics section
(lthresh= INDEF) Lower threshold
(hthresh= INDEF) Upper threshold
(nlow = 1) minmax: Number of low pixels to reject
(nhigh = 1) minmax: Number of high pixels to reject
(nkeep = 0) Minimum to keep or maximum to reject
(mclip = yes) Use median in sigma clipping algorithms?
(lsigma = 3.) Lower sigma clipping factor
(hsigma = 3.) Upper sigma clipping factor
(snoise = 0.0) ccdclip: Sensitivity noise (electrons)
(sigscal= 0.1) Tolerance for sigma clipping scaling correction
(pclip = -0.5) Percentile clipping parameter
(grow = 0.) Radius (pixels) for neighbor rejection
(skyrang= INDEF) Time window for including sky frame (seconds)
(nodsize= 3.) Minimum separation of nod positions in arcsec
(fl_flat= no) Do flat-fielding?
(flatima= ) Spectral flat field image to divide
(flatmin= 0.) Lower limit to flat (avoiding overflows)
(fl_vard= yes) Create variance and data quality frames?
(logfile= ) Logfile
(verbose= yes) Verbose
(debug = no) Very verbose
(force = no) Force use with earlier IRAF versions?
(status = 1) Exit status (0=good)
(scanin1= ) Internal use
(scanin2= ) Internal use
(mode = ql)
```

Ready
Using GNIRS package
Tasks have been tested



SCIENCE CASES

➤ Imaging Applications :

- Galactic Center
- Intermediate redshift clusters
- Local Group galaxies
- Globular Clusters
- Star Formation in dwarf galaxies
- Intergalactic stars
- etc ...

➤ Spectroscopic Applications :

- Galaxies in distant clusters
- Stars and star clusters in nearby galaxies
- Evolution of globular clusters
- High redshift galaxies
- etc ...

Summary

- NIR wide field imager and Multi-Object Spectrometer :
Only NIR MOS instrument mounted on an 8m telescope available to observe the southern sky until VLT /KMOS
- Very versatile instrument able to support many types of science investigations
- Main characteristics : FoV : 6' arcmin diameter
Y, Js, J, H, Ks, + narrowband filters
MOS 6' X 2': 9 MOS masks available
- Compatible with GEMS
- End of Nov. 2011 : Installation on the telescope
- Dec 2011- March 2012 : Commissioning
- Science Verification call of proposals : first half of 2012.

Links : <http://www.gemini.edu/sciops/instruments/flamingos2/?q=sciops/instruments/flamingos2>
<http://www.gemini.edu/sciops/instruments/flamingos2/status-and-availability>