

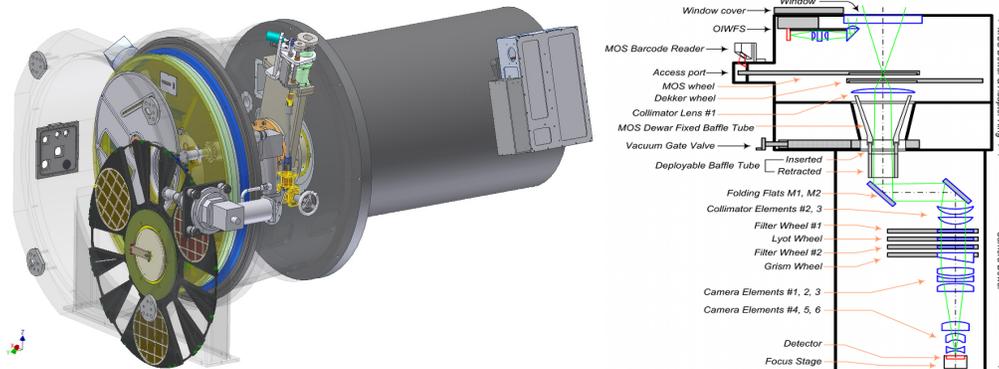
## Flamingos-2 (F2)

### Description

F2 is a multifunction spectrograph and imager, covering a spectral range of 0.9–2.5  $\mu\text{m}$ . Multi-object spectroscopy and use with the GeMS AO system are planned.

Core operating modes: (3)

- 6' Field of View, broadband imaging, spatial sampling of 0.18"/pixel
- 4.4' Long Slit, resolution 1000-3000 for 0.36" slit.
- 6'x2' arcmin Multi-Object Spectroscopy (under commissioning).



### Components

On-instrument Wavefront Sensor (OIWFS)

- Visual detector EEV CCD-39, 80 x 80, 24  $\mu\text{m}$  pixels
- 2x2 lenslet, Shack-Hartmann mask for tip-tilt guiding and telescope astigmatism corrections, limiting magnitude  $r \sim 14.5$ .

Focal Plane Wheel: (aka MOS wheel, located after the cryostat window)

- 6 fixed Long slits: 1, 2, 3, 4, 6, 8 pixel widths.
- 9 exchangeable masks: 8 custom masks 6' x 2' arcmin, plus 1 pixel 6' long slit.
- Open aperture (for imaging), and 2 full field circular masks: sub-pixel and 2-pixel pinholes.

Dekker Wheel (3 apertures): Imaging, long-slit, multi-object.

Collimator: Lens 1 located at the front dewar, beam  $\varnothing$  101 mm. The beam is folded at the camera dewar by two plane mirrors before Lens 2.

Lyot wheel: (5 slots)

- Lyot stops:  $\varnothing$  103.0 mm,  $\varnothing$  54.6 mm,  $\varnothing$  50.7 mm.
- Hartmann A and B (for optical alignment).

## Flamingos-2 (F2)

### Filter wheel A: (5 slots)

- Spectroscopic filters HK (1.4–2.5  $\mu\text{m}$ ), JH (0.9–1.8  $\mu\text{m}$ ), K-long (1.9–2.5  $\mu\text{m}$ ).
- Open aperture and dark plate (this last one to be removed in 2017).

### Filter wheel B: (5 slots)

- Imaging filters J, H, Ks and Y (this last one to be removed in 2017).
- Open aperture. Filters not installed: Kb, Kr (to be commissioned in 2017), J-low.

### Grism Wheel: (5 slots)

- Medium res. grism R3000, Low-res. grisms JH1200 and HK1200.
- Open aperture and dark plate.

Camera multi-element lens system, resulting magnification: 6.21

Hawaii-2 detector: 2048 x 2048, QE~60%.

### Science operations

F2 started regular queue operations on 2013B, after a series of large faults requiring major instrument interventions in the period 2010-2013.

Semester	Demand (% *)	Inst. allocation (% of total assigned)	Observed hours**	Hours lost to fault
2014B	20	12	189.2	0.2
2015A	21	20	310.2	1.8
2015B	23	7	109.9	1.5
2016A	13	9	140.4	1.4

\* Fraction of total hours requested in all proposals received for the semester, per telescope.

\*\* Approximate on-sky use.

### Modes pending commissioning

Multi-object spectroscopy, 6x2 arcmin masks (ongoing).

Imaging/spectroscopy at super-seeing performance with the GeMS AO system (planned).

### Upgrades

Extended K-band spectroscopic filter, K-long (done in 2015).

F2K2, K-band splitting filters (ongoing).

Hawaii-2 detector replacement, improving QE ~30% up (unplanned).

Increasing the filter slots, enlarging the filter wheels or adding one (unplanned).

Camera upgrade, complemented with higher resolution grism, R6000 and detector upgrade, Hawaii-4 (under consideration).