

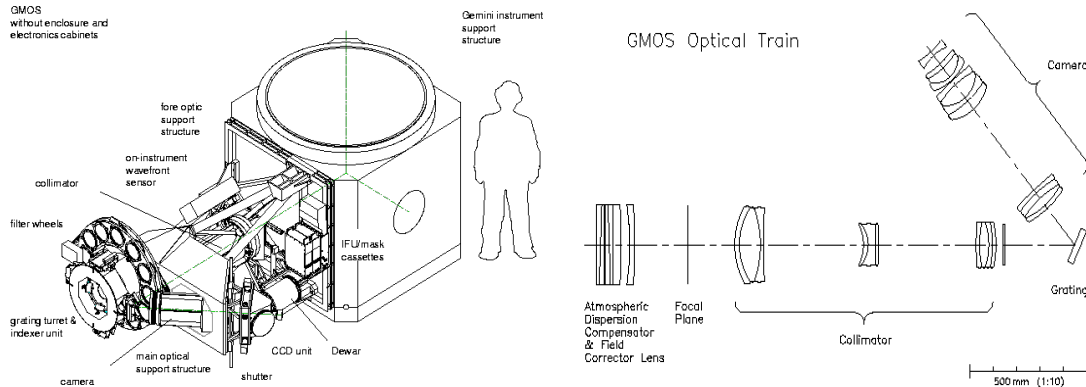
## GMOS-N

### Description

GMOS-N is a multifunction spectrograph and imager, covering a spectral range of 0.36–1.03  $\mu\text{m}$ , with a sampling of 0.0807"/pixel. It is almost identical to GMOS-S.

Core operating modes (4):

- 5.5' square field of view, broad and narrow band imaging.
- 5.5' long slits,
  - Resolution 1260–8800 for 0.25" slit (depending on the used grating).
  - Resolution 210–1460 for 1.5" slit (depending on the used grating).
- 5.5' x 5.5' Multi-Object Spectroscopy.
- Integral Field Unit (IFU), fiber fed, 0.2" sampling.
  - IFU-2, 7" x 5", 1000 spaxels.
  - IFU-R, 3.5" x 5", 500 spaxels.



### Components

On-instrument Wavefront Sensor (OIWFS)

- Visual detector EEV CCD-39, 80x80, 24  $\mu\text{m}$  pixels
- 2x2 lenslet, Shack-Hartmann mask for tip-tilt guiding and telescope astigmatism corrections, limiting magnitude  $r \sim 15$ .

Focal Plane Mask Cassette exchanger (up to 18 installed masks plus the IFU unit):

- 7 Long slits, 330" length: 0.25", 0.5", 0.75", 1", 1.5", 2", 5" widths.
- 5 Nod & Shuffle slits, 108" length: 0.5", 0.75", 1", 1.5", 2" widths.
- IFU cassette, either IFU-R or IFU-2.
- Up to 18 exchangeable custom masks, typically 30–60 slitlets each.
- For imaging mode the mechanism is retracted.

Collimator, multi-element, refractive, with oil interfaces. Collimated beam size: 98 mm.

## GMOS-N

Filter wheels: (2, 12 slots each)

- Open apertures.
- Assorted broad and narrow band filters, plus spectroscopic blocking filters: g, r, I, CaT, z, Z, Y, Hell, HeIIc, OIII, OIIIC, Ha, HaC, SII, DS920, GG455, OG515, RG610.

Grating Turret: (4 slots)

- Mirror (imaging mode).
- List of gratings: B1200, R831, B600, R400, R150, R600.

Camera with multi-element refractive optics, collimator + camera magnification: 0.0331.

Hamamatsu detector mosaic: 3 x 2048 x 4176, QE>80% within the range 0.45–0.93  $\mu\text{m}$ .

### Science operations

GMOS-N started regular queue operations on 2002A.

Semester	Demand (% *)	Inst. allocation (% of total assigned)	Observed hours**	Hours lost to fault
2014B	39	39	620.1	2.9 h
2015A	41	55	625.0	2.8 h
2015B	36	40	593.6	10.6 h
2016A	48	53	908.1	1.6 h

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

\*\* Approximate on-sky use.

### Modes pending commissioning

Atmospheric Dispersion Corrector (unplanned).

Imaging/spectroscopy at super-seeing performance with ALTAIR AO (planned).

### Upgrades

Replacement of EEV detectors by E2V DD detectors (done in 2011).

Replacement of E2V DD detectors by Hamamatsu detectors (done in 2017).

Low-resolution grating with simultaneous coverage of range 0.4–0.8  $\mu\text{m}$  (ongoing).

On-Instrument Wavefront Sensor (under consideration).

Larger Grating Turret (unplanned).

Larger Field IFU (unplanned).

New focal plane mechanism (unplanned).