



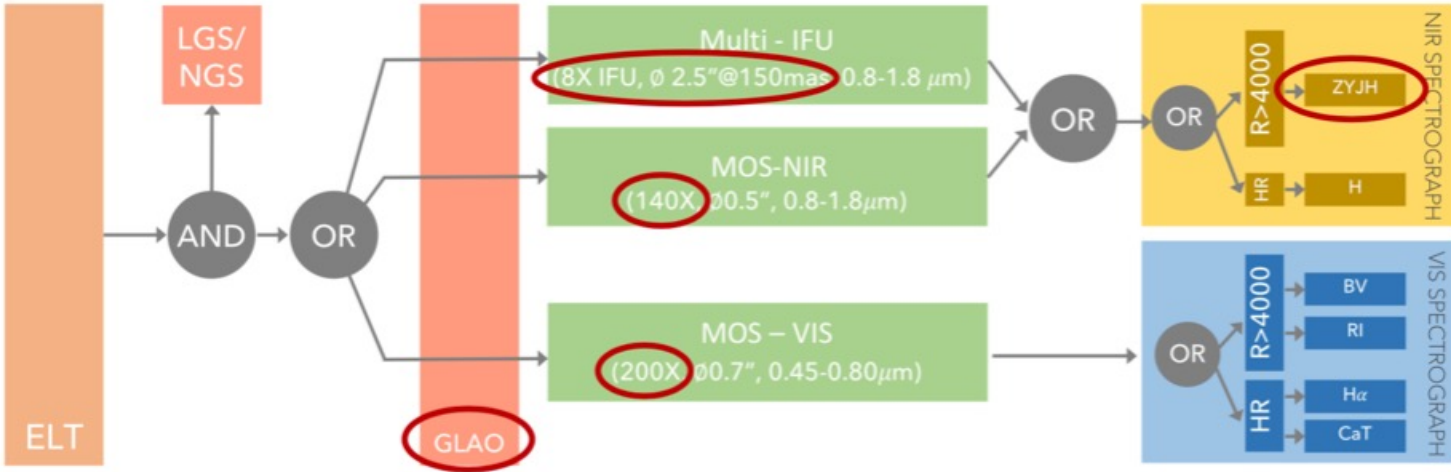
MOSAIC Instrument

ELT Instruments Day 2022

April, 7th



MOSAIC Architecture overview





MOSAIC Implementation overview

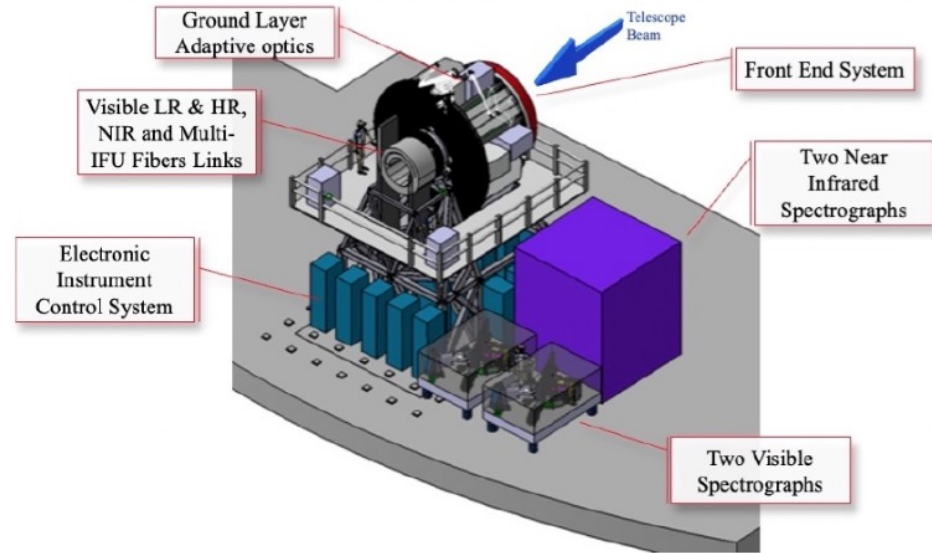
Implementation on platform A

Some Milestones:

- Phase B starts now
- MAIT starts 2027 (LLI)
- On Sky 2033

Contact points:

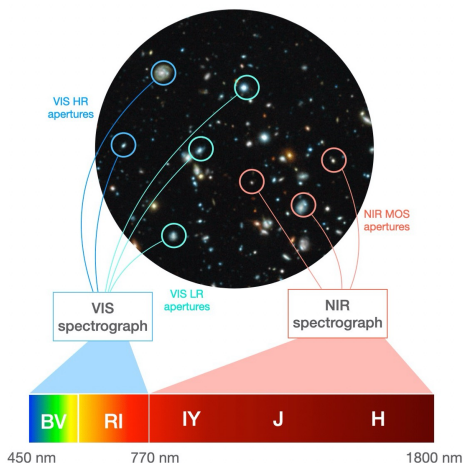
- PI: Lidia Tasca (LAM)
- PM: Eric Prieto (LAM)



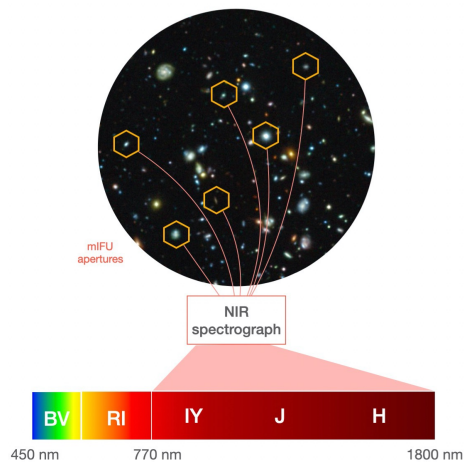


Focal Plane Overview

300 positioners hosting a total of 500 fibre feeds

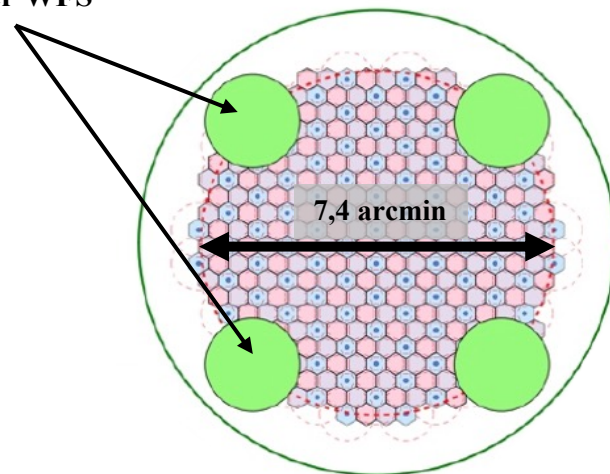


Multi-Object Modes
(up to 200 Objects)



Multi-IFU Mode
(8 IFUs)

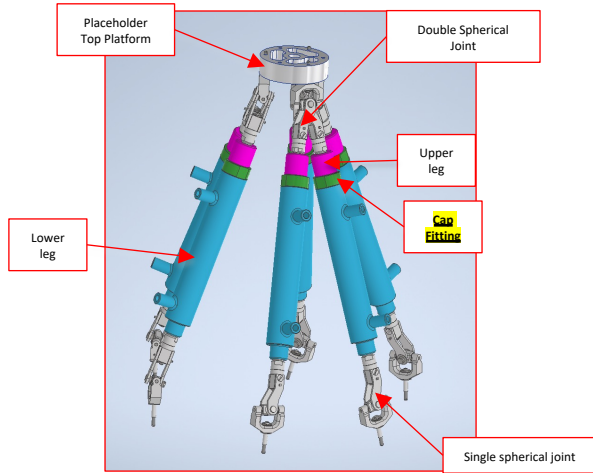
Laser WFS



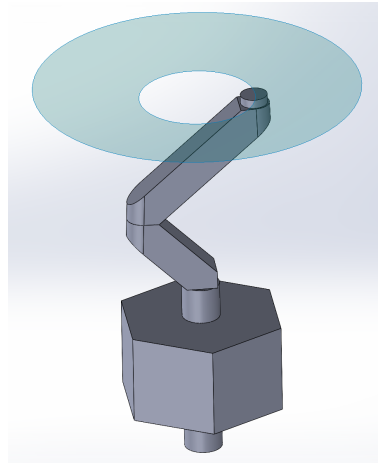
1 pick-off mirror on each tile
for NGS/mIFU feeds

Red tiles: ≈ 100 NIR
Blue-dotted tiles: ≈ 100 VIS + VIS_HR
Purples tiles: ≈ 100 VIS + NIR

Positioners Overview



Hexapod concept
(Pneumatic or Electromagnetic actuators)



SCARA concept

On Going Trade-off Drivers:

- Line of sight Angular Precision
- Power consumption
- Field Of view Coverage
- Mass Production (300 units)
- Fiber Path
- Gravity Variation

Contact points:

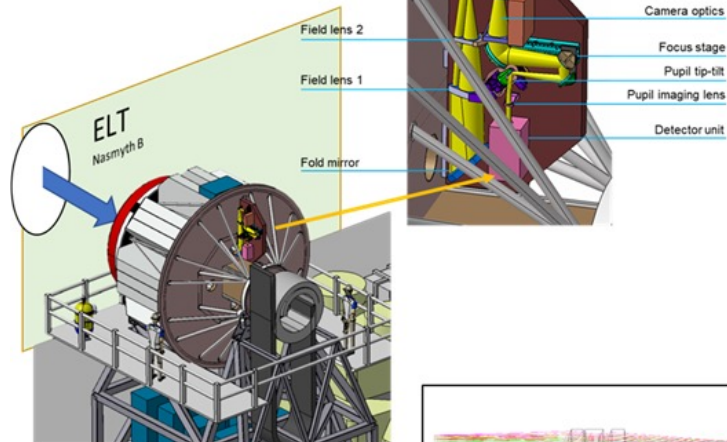
- Gavin Dalton (Oxford University)
- Markus Thurneysen (EPFL)



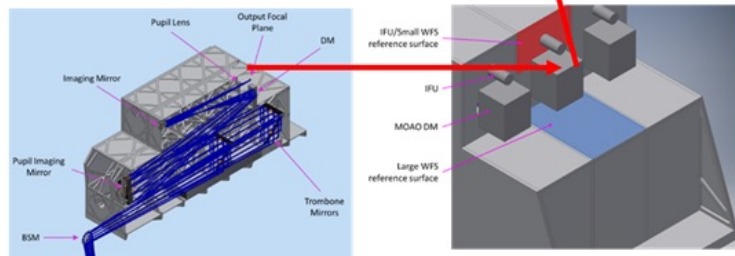
GLAO Overview

- Ground Layer Adaptive Optics system corrects for atmospheric distortions that degrade image quality
- Two sets of wavefront sensing systems:
 - 4 x Natural Guide Star
 - 4 x Laser Guide Star
- Real-time AO control System
- Contact point:
 - Tim Morris (Durham University)

Laser Guide Star wavefront sensors

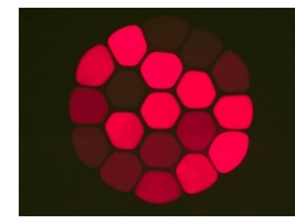
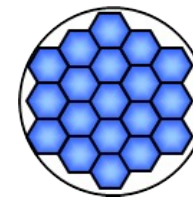
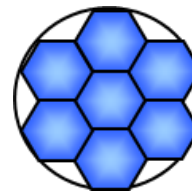


Natural Guide Star wavefront sensors



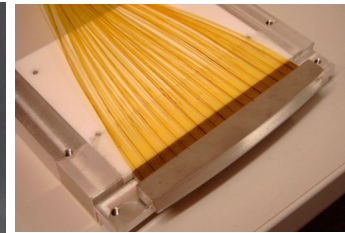
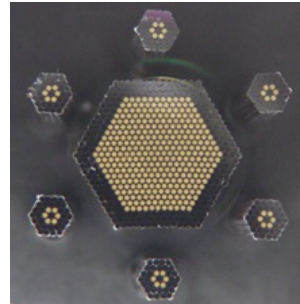
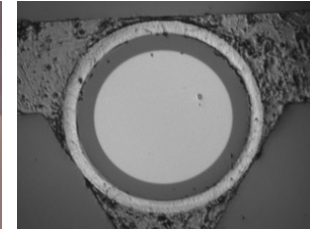
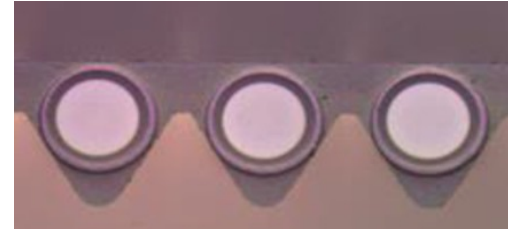


Fiber-Link Overview



Required technologies

- High-performance fiber cables:
 - With custom-diameters (and evtl. shapes)
 - Hex-packed bundles with 7 and 19 fibers
 - Fiber precision arrays with hundreds of fibers
 - Optimized for VIS and NIR transmission
 - Quality surface finish
- Micro-lens arrays coupled to fibers
- Custom-made multi-fiber connectors
- Fiber vacuum feed-throughs
- Fiber conduits & protection tubings
- Energy chains for fiber movements
- Fiber v-groove arrays
- Mechanical precision assemblies & mounts



Contact points:

- Andreas Kelz (AIP)
- François Wildi (Univ. de Genève)
- Isabelle Guinouard (GEPI)

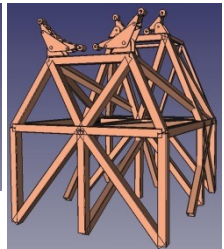
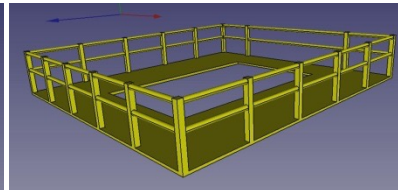
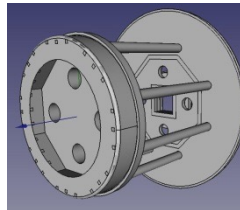
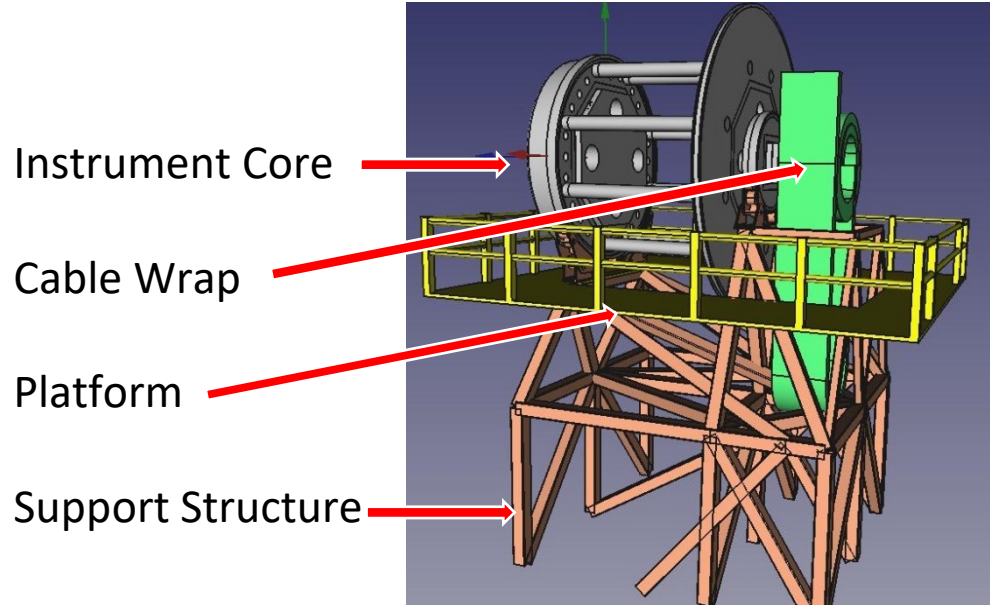


Nasmyth Platform infrastructure

- Support instrument in position
- Compensate telescope movement (sky rotation)
 - Stability
 - Safety
 - Weight (low as possible)
 - Rotation precision (instrument core)

Contacts:

- Bruno Castilho (LNA)
- Décio Ferreira (LNA)



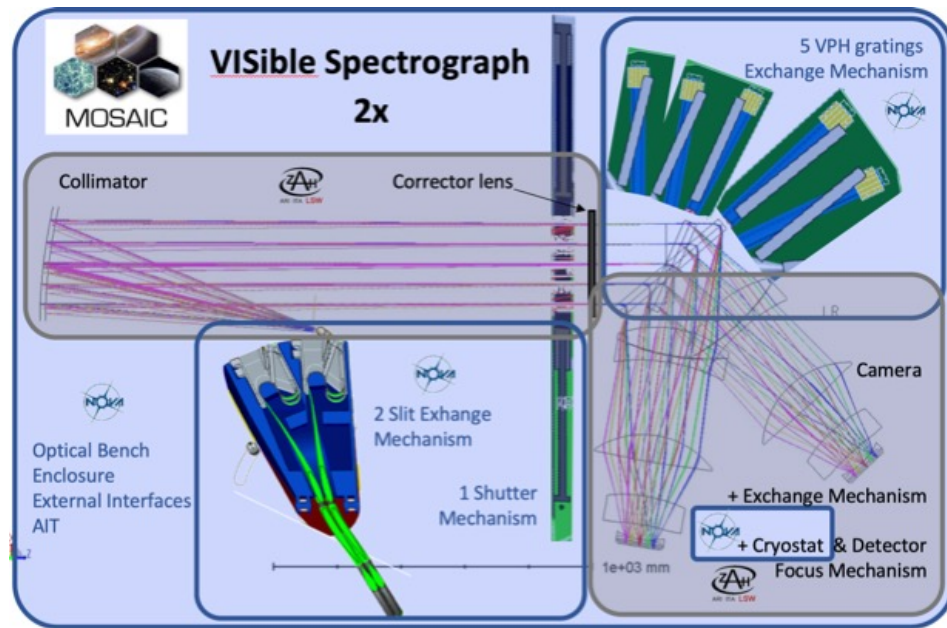


Visible Spectrographs

- 2 spectrographs
- Separate slits for LR (200x7) and HR (100x19) fibres
- No ADC, -> Single camera/ spectrograph, multiple gratings/settings.

Contact points:

- Ramon Navarro (NOVA)
- Walter Seifert (ZAH-LSW)





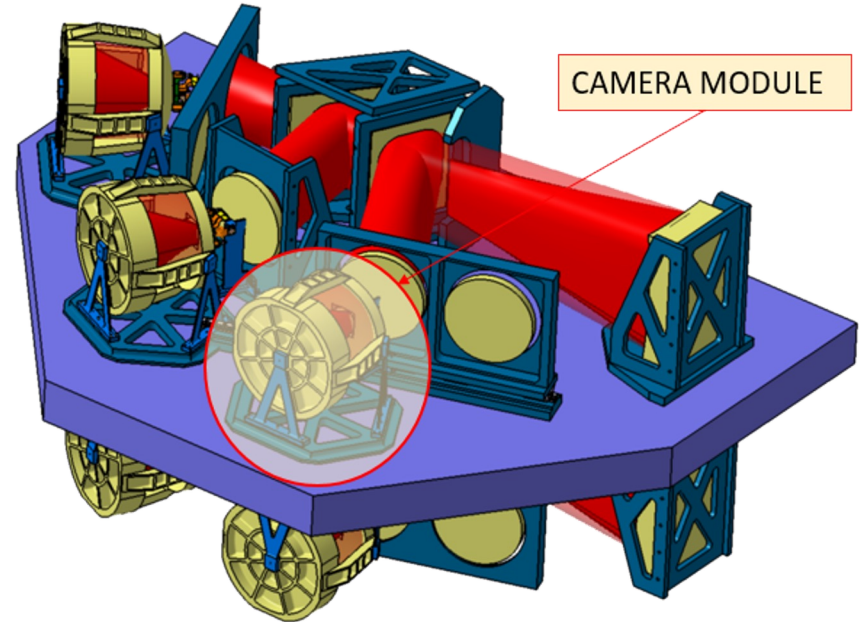
NIR Spectrographs Overview

- 2 spectrographs
- Separate slits for MOS (200x7) and mIFU fibres
- Triple arm – 3 cameras/spectrograph, LR/HR gratings.

Open Points: Cryostats, Cryo-exchange units

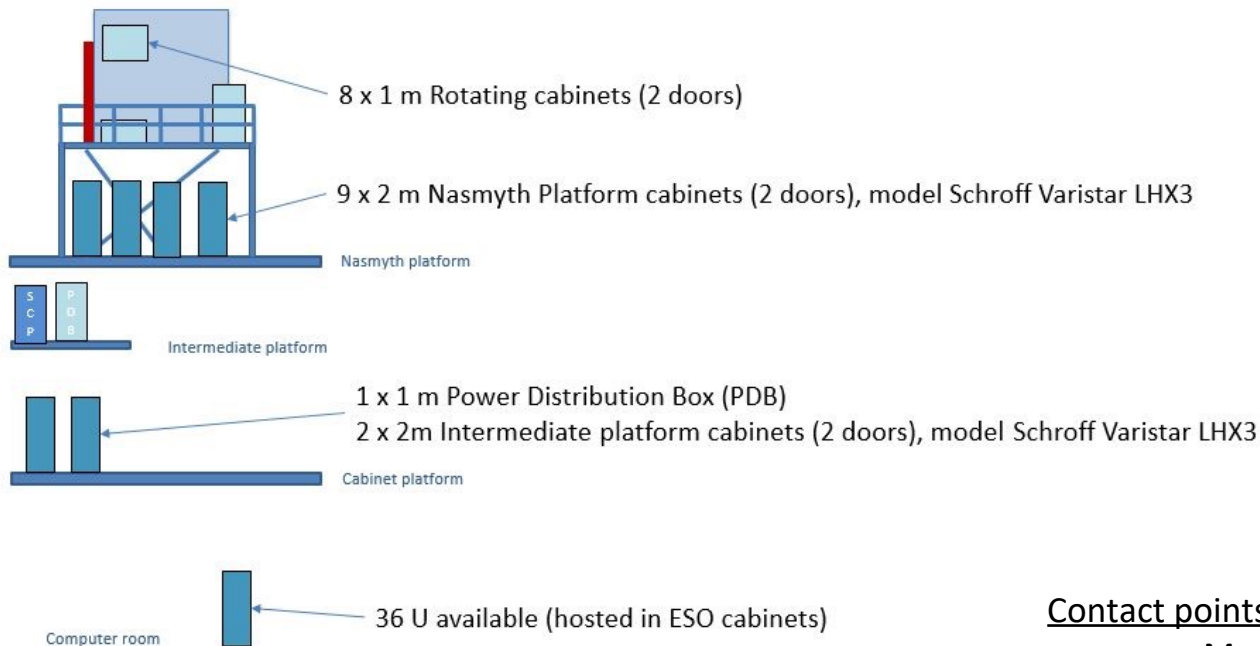
Contact points:

- Laurent Martin (LAM)





Electronics & Instrument Control SW



Type of device	#
Motor	979
Lamp	13
Sensor channel	189

Contact points:

- Marie Larrieu (IRAP)
- Michel Dupieux (IRAP)



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