WEAVE overview

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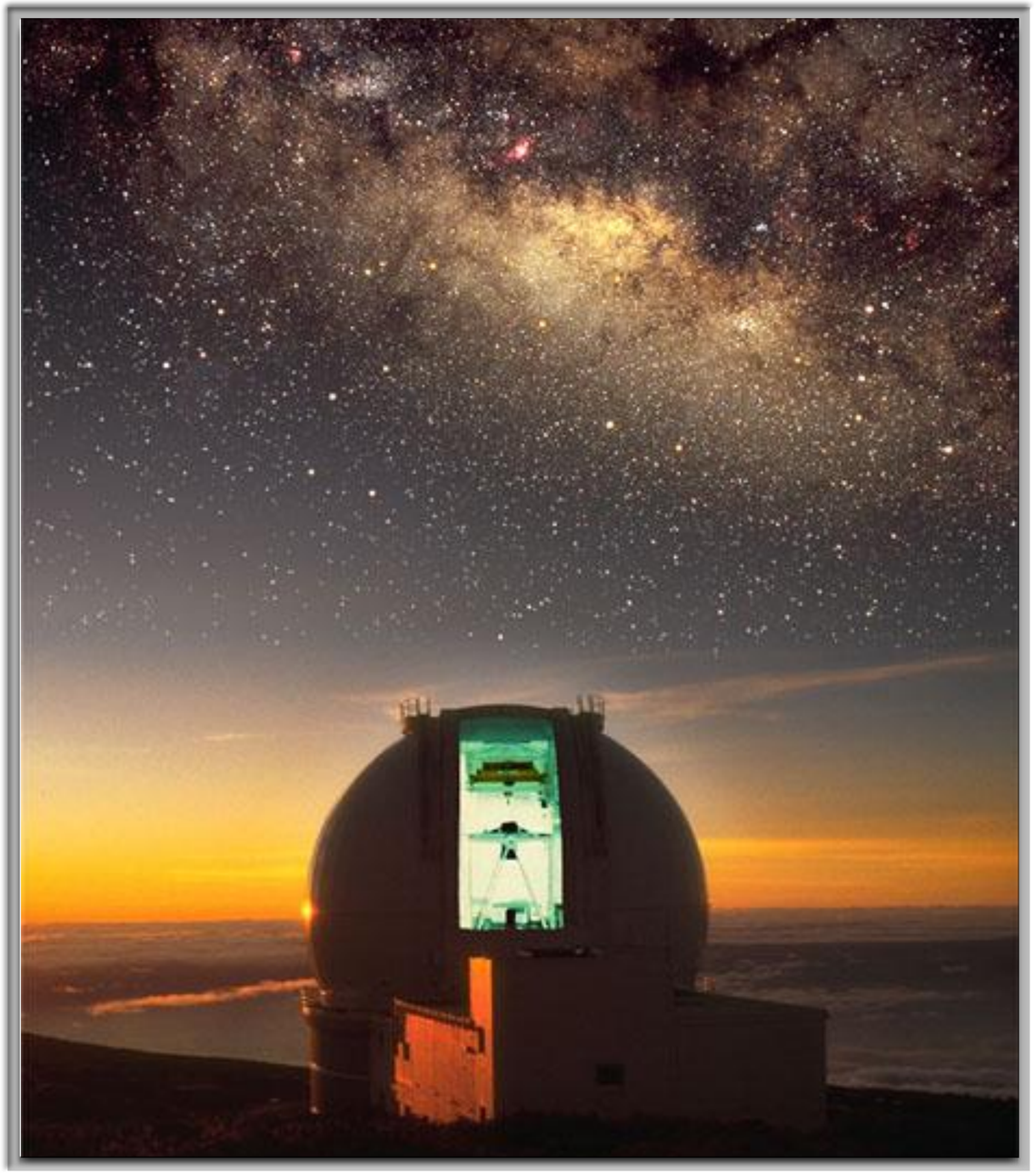
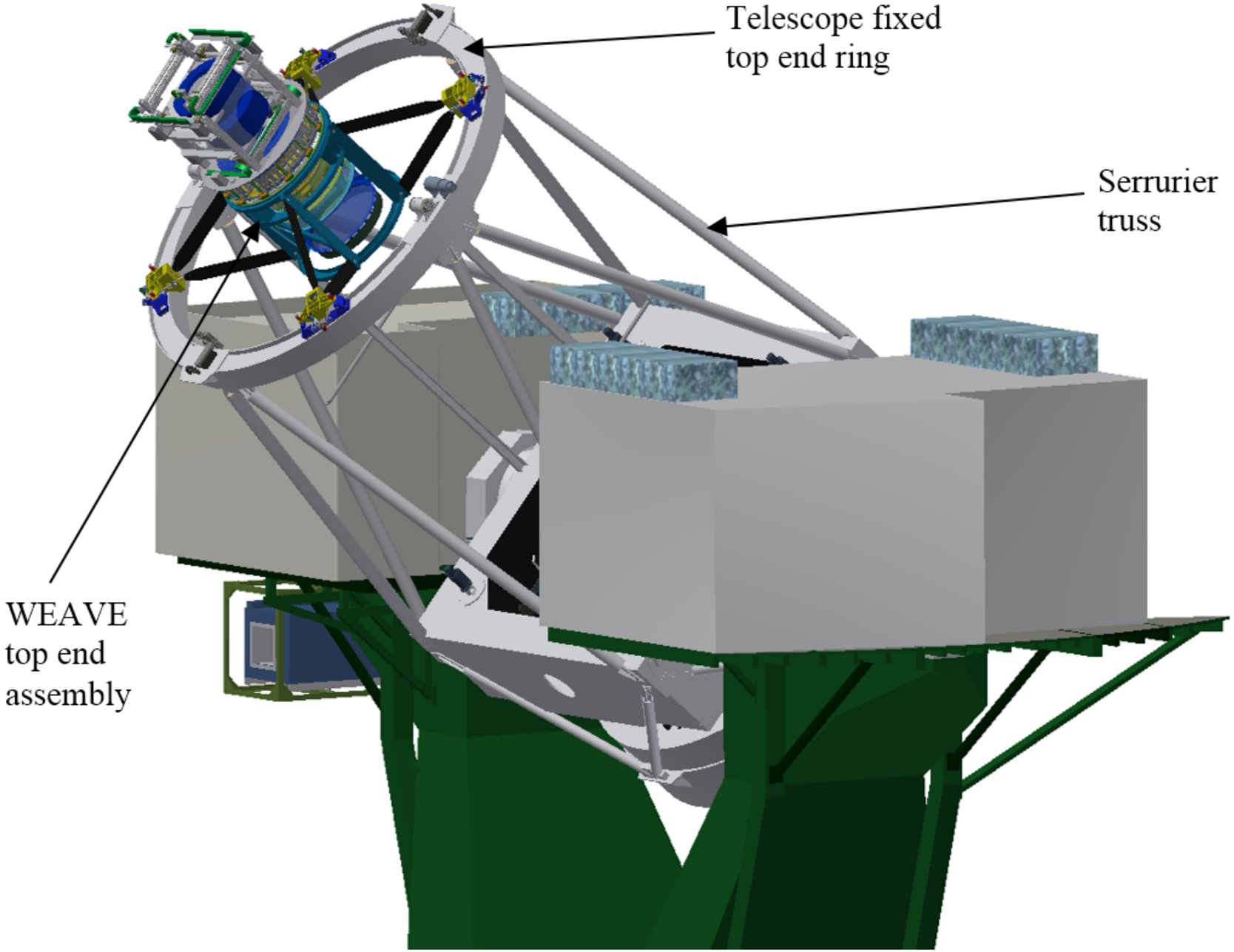
WEAVE design

- WEAVE is a new spectrographic survey facility for the WHT
  - The WHT has a 4.2m primary mirror with a prime focus f/ratio of f/2.8
  - to match the typical observational conditions, we choose MOS fibres with 85 μm diameters (1.3” on the sky)

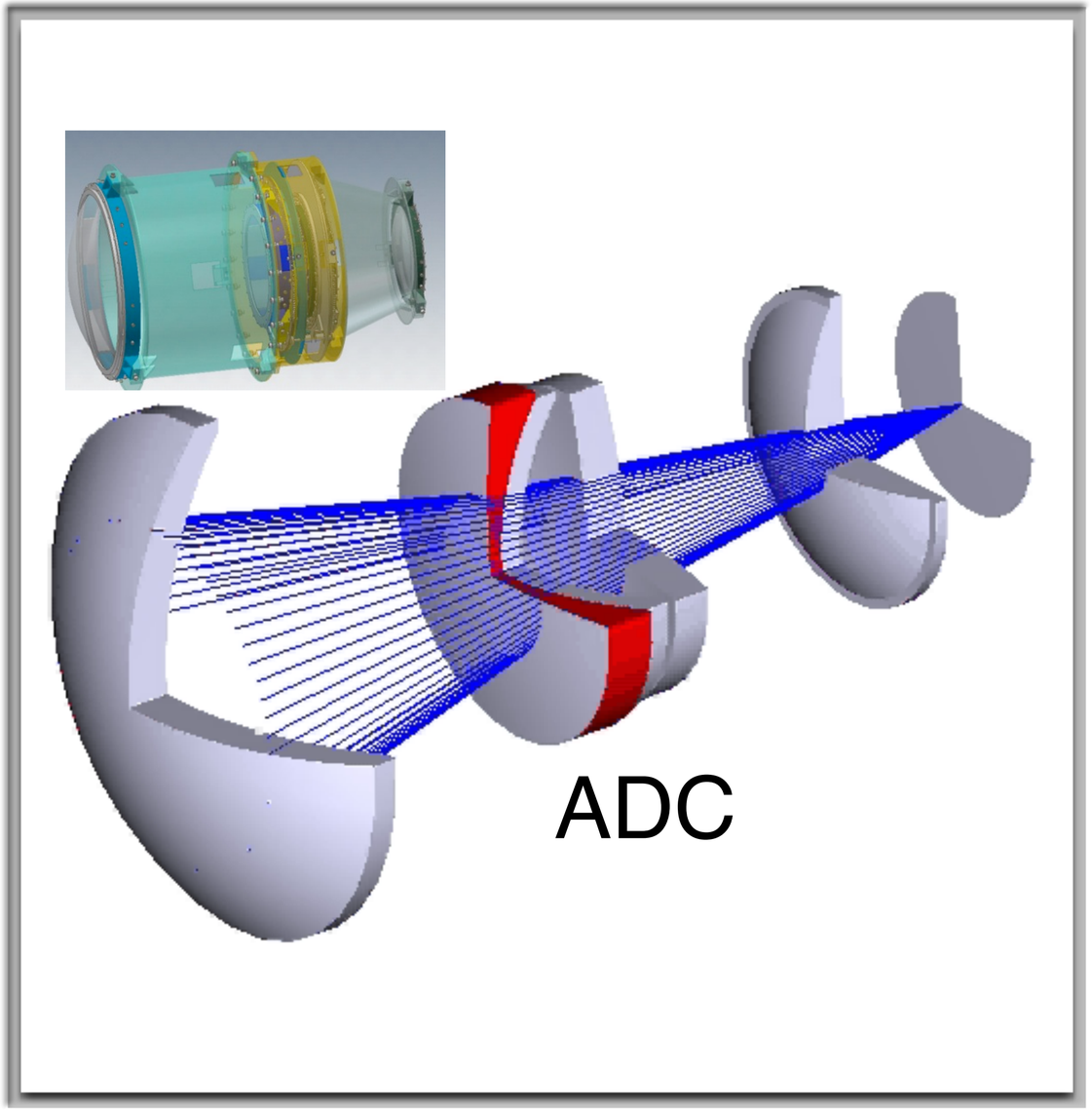



Telescope fixed
top end ring
Serrurier
truss
WEAVE
top end
assembly

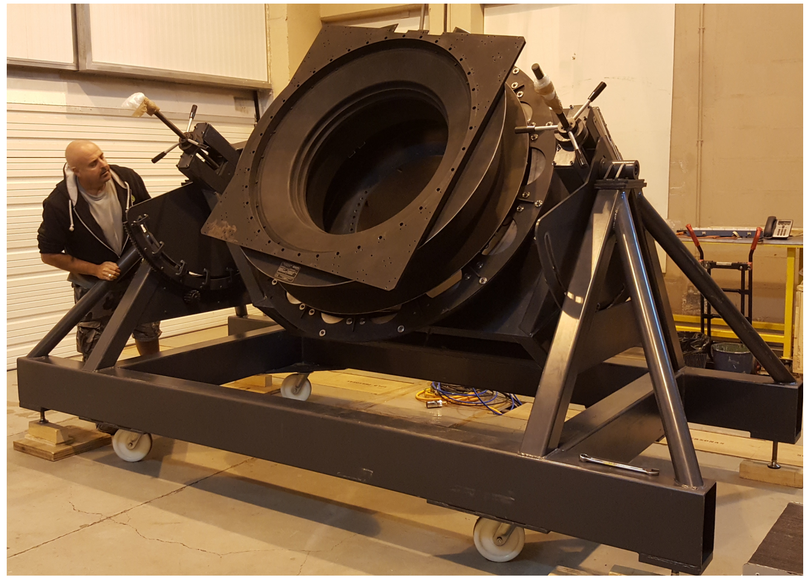
Prime focus corrector

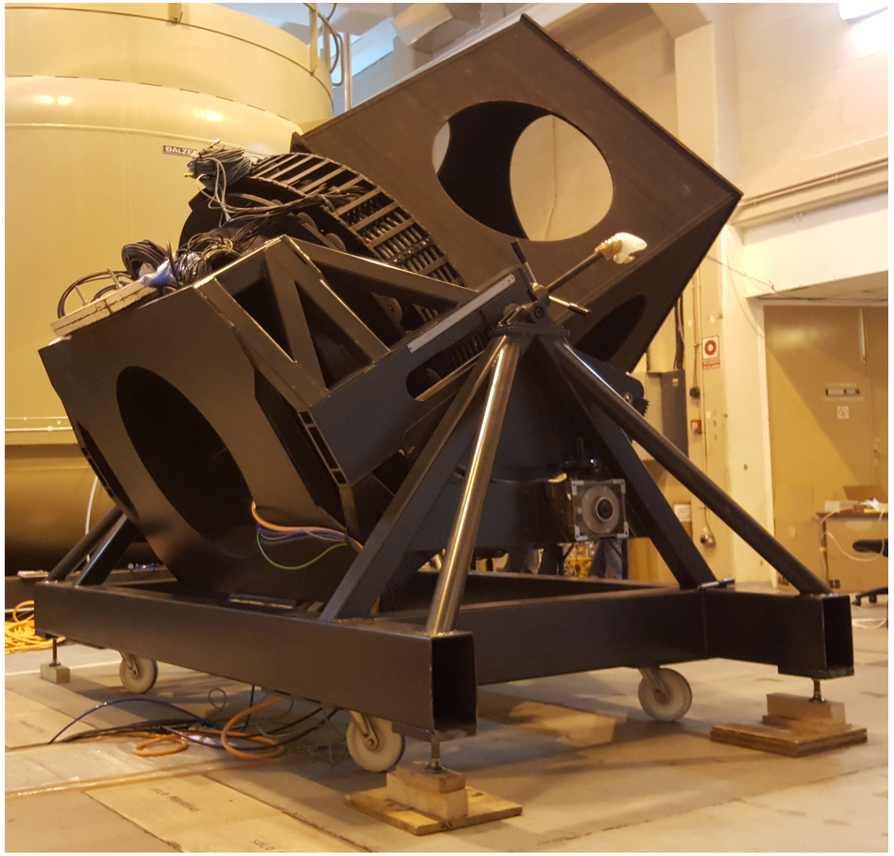
with ADC (L2–L5)

L1 is 1100 mm



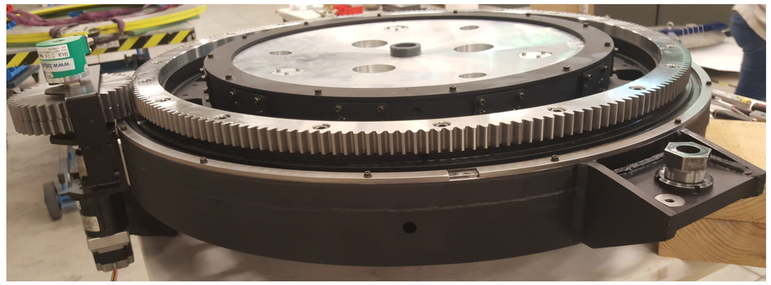
PFC: rotator and mass dummy



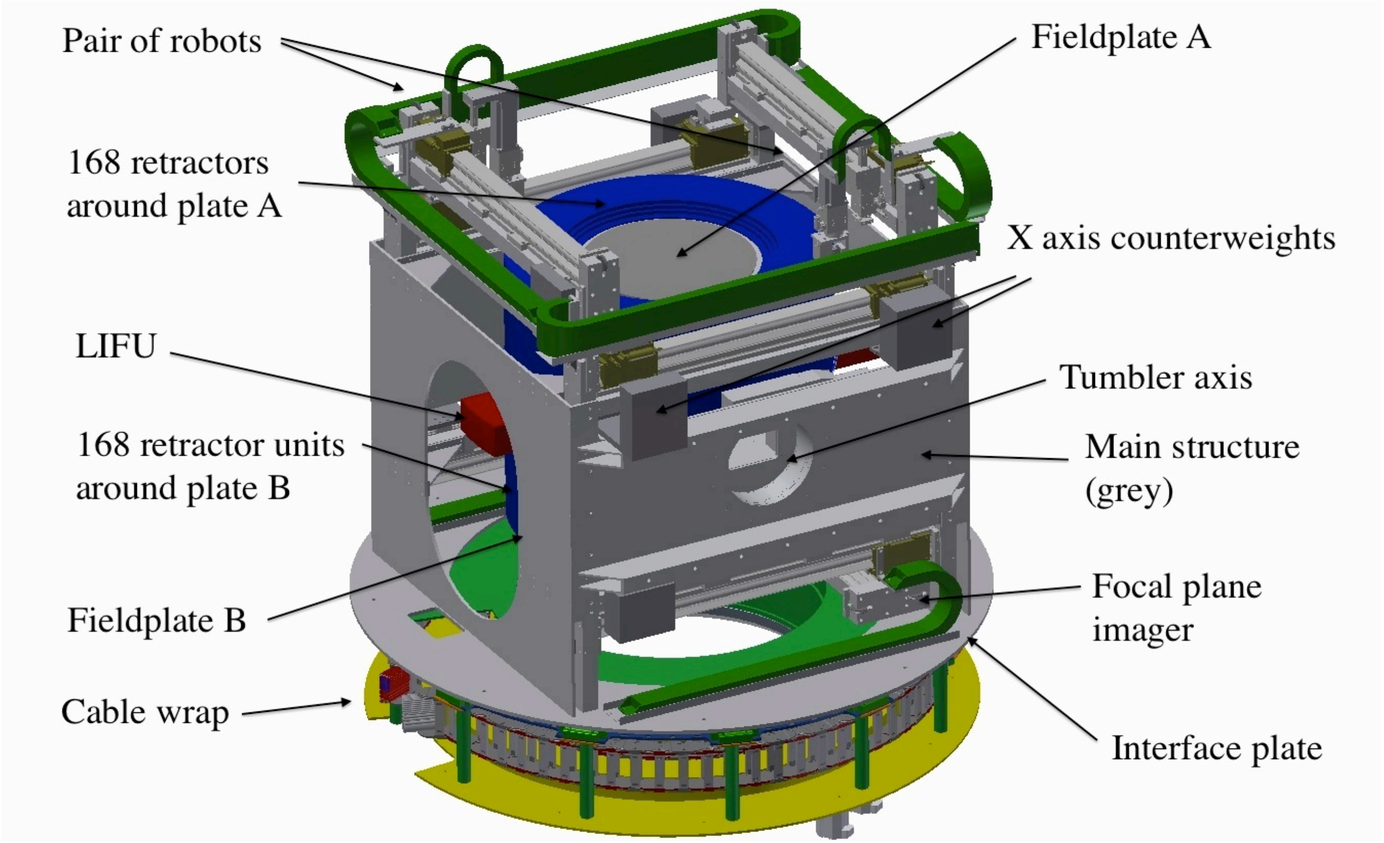


PFC: prime focus + dummy lenses

L2/L3 ADC element

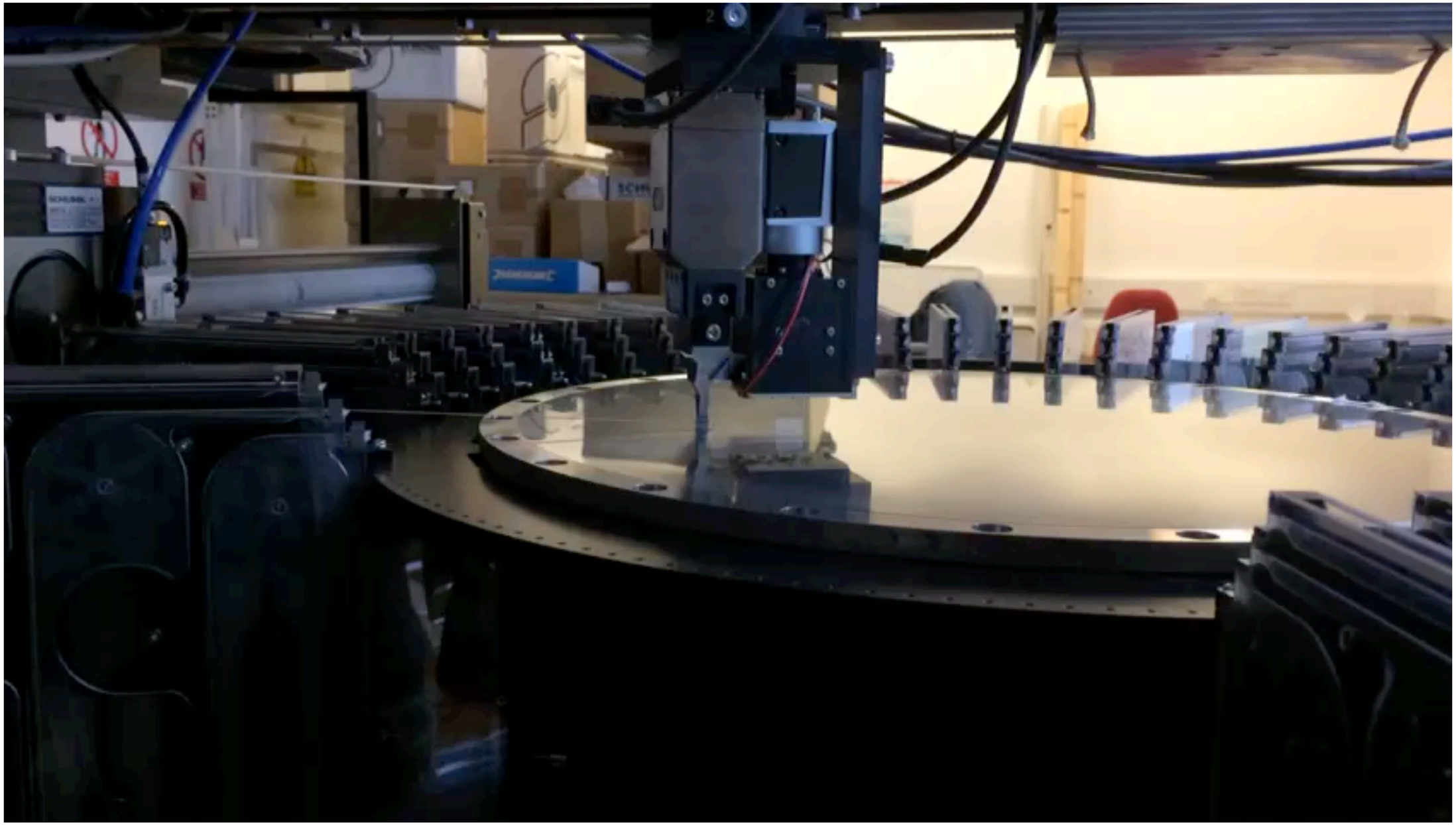


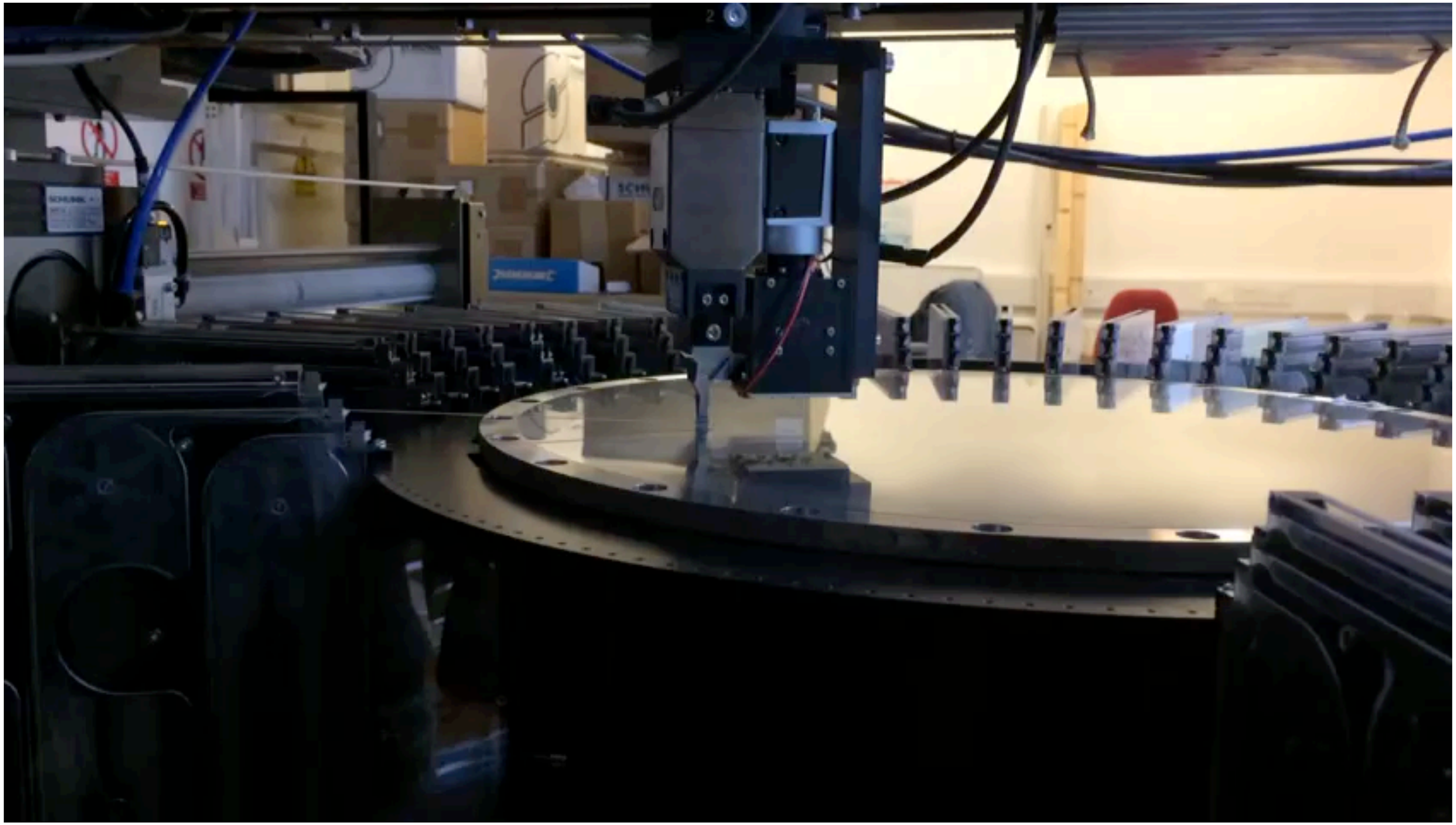
Full corrector assembly now
validated for assembly tolerances

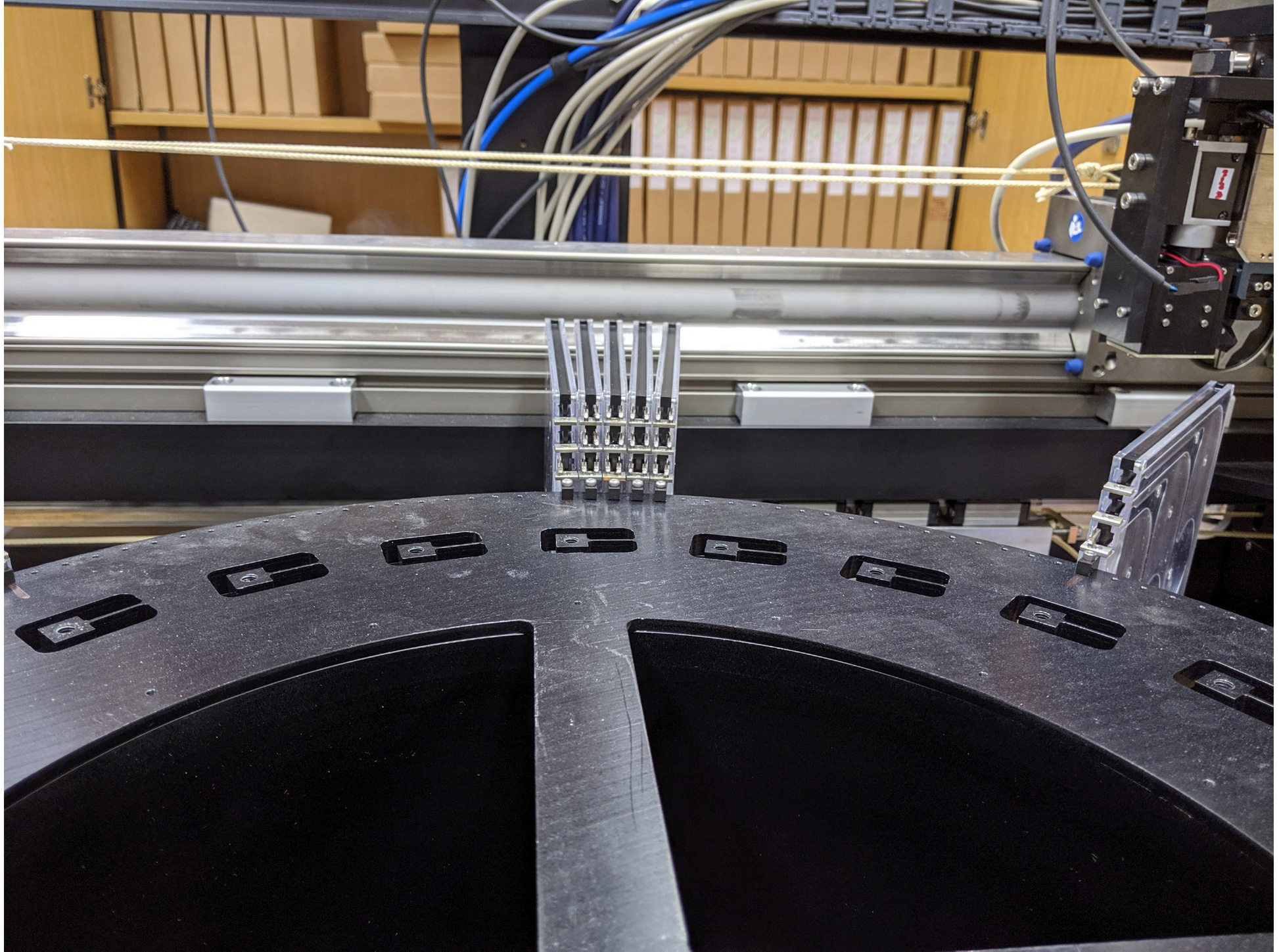


Fibre positioner system

2dF-style tumbler, two robots, ~1000 fibres/plate (plus 20 miniIFUs on one plate)
Large IFU in red box



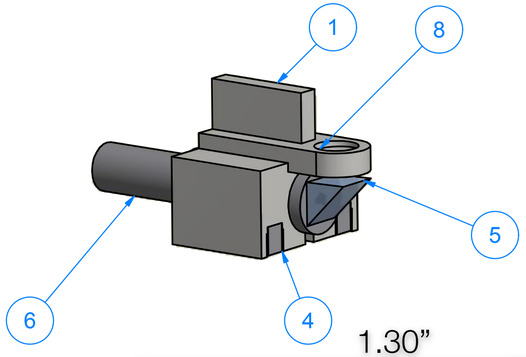


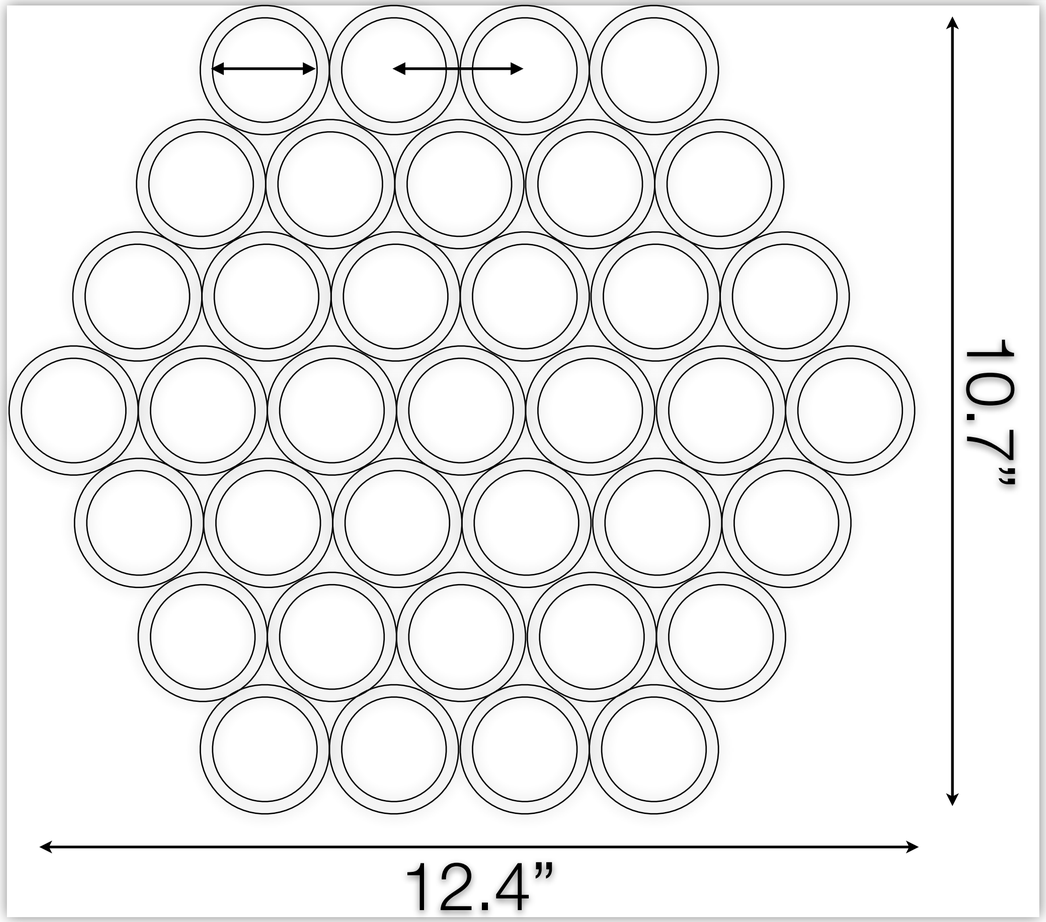


kapteyn astronomical institute

IFUs

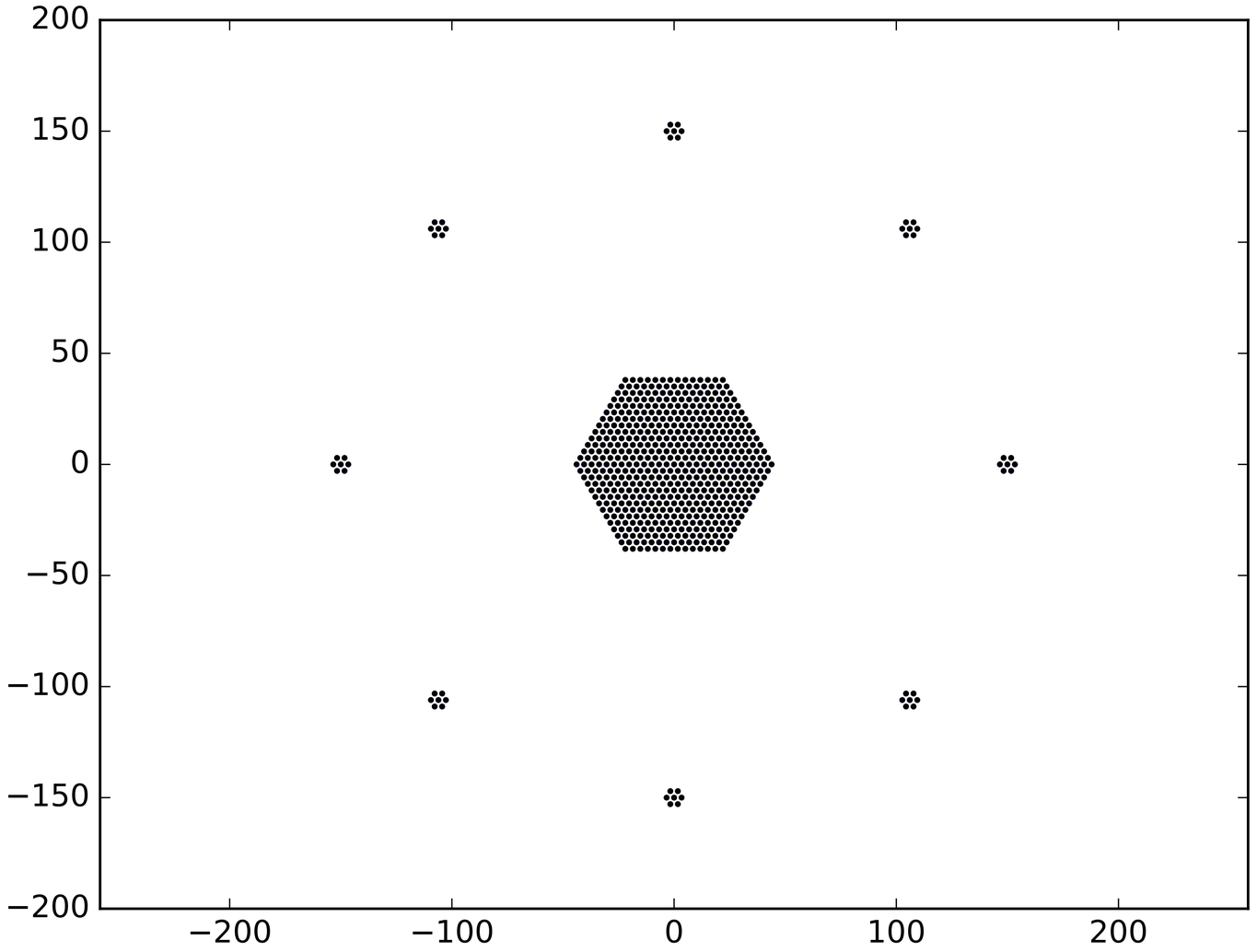
- 20 miniIFUs on one positioner plate
  - ~11″×12″



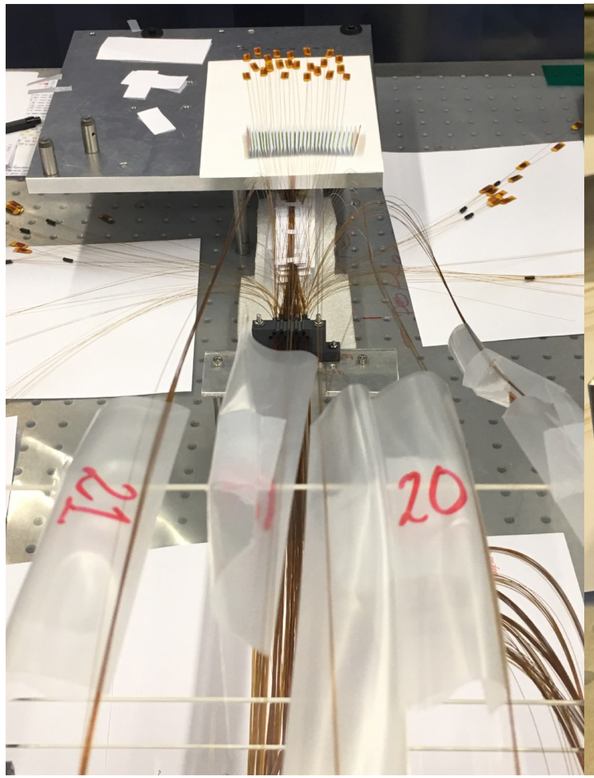


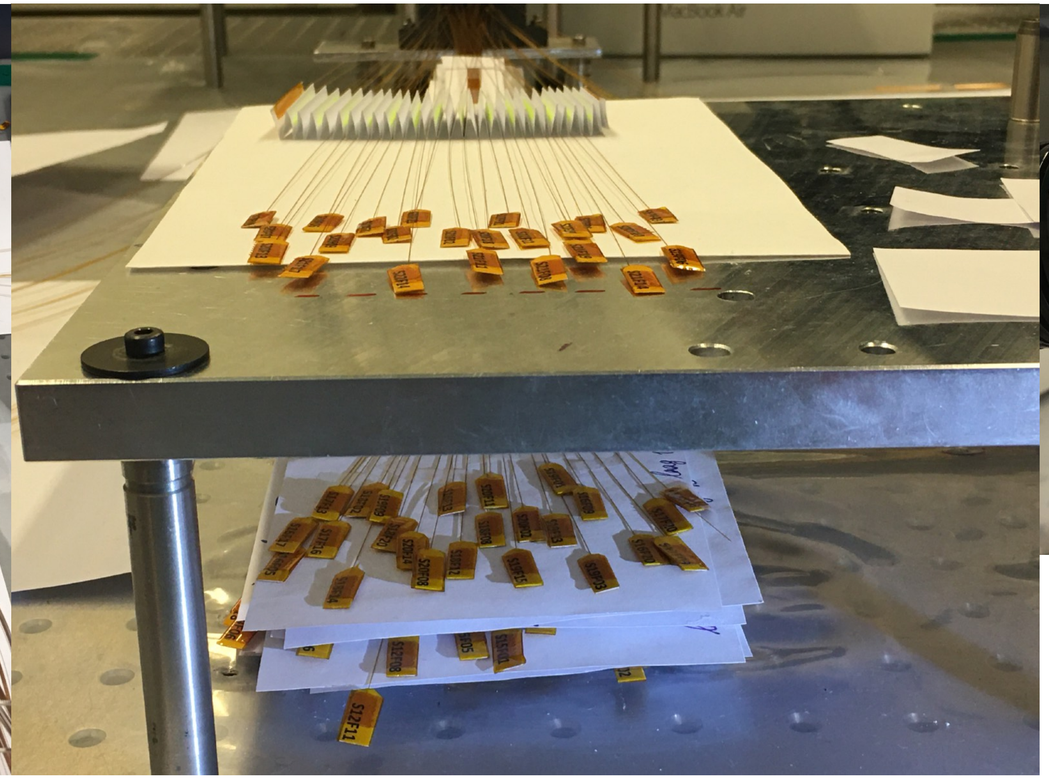
IFUs

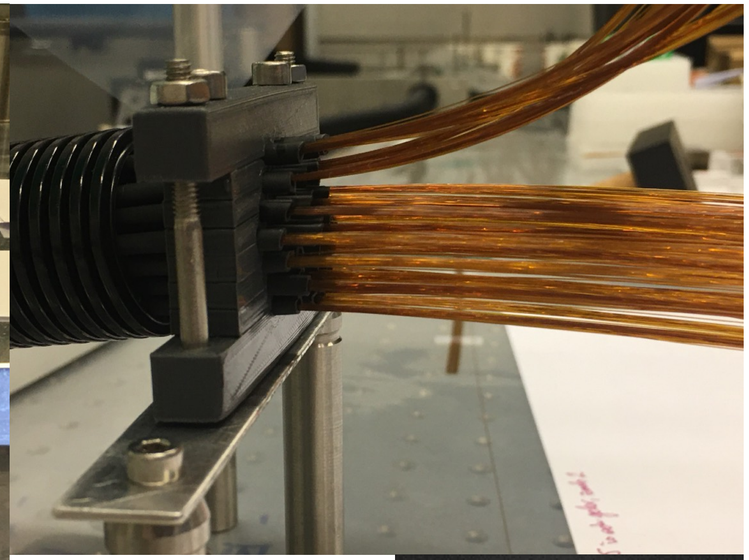
- 20 miniIFUs on one positioner plate
  - ~11″×12″
- Large IFU between plates
  - 1.3′×1.5′
- IFU modes <u>cannot</u> be used simultaneously with MOS fibres

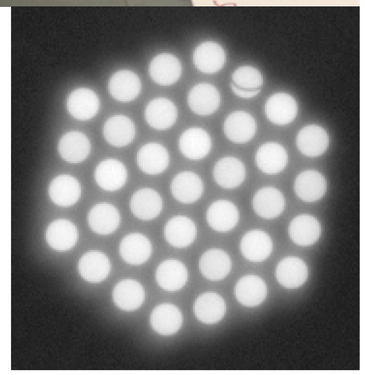


LIFU assembly

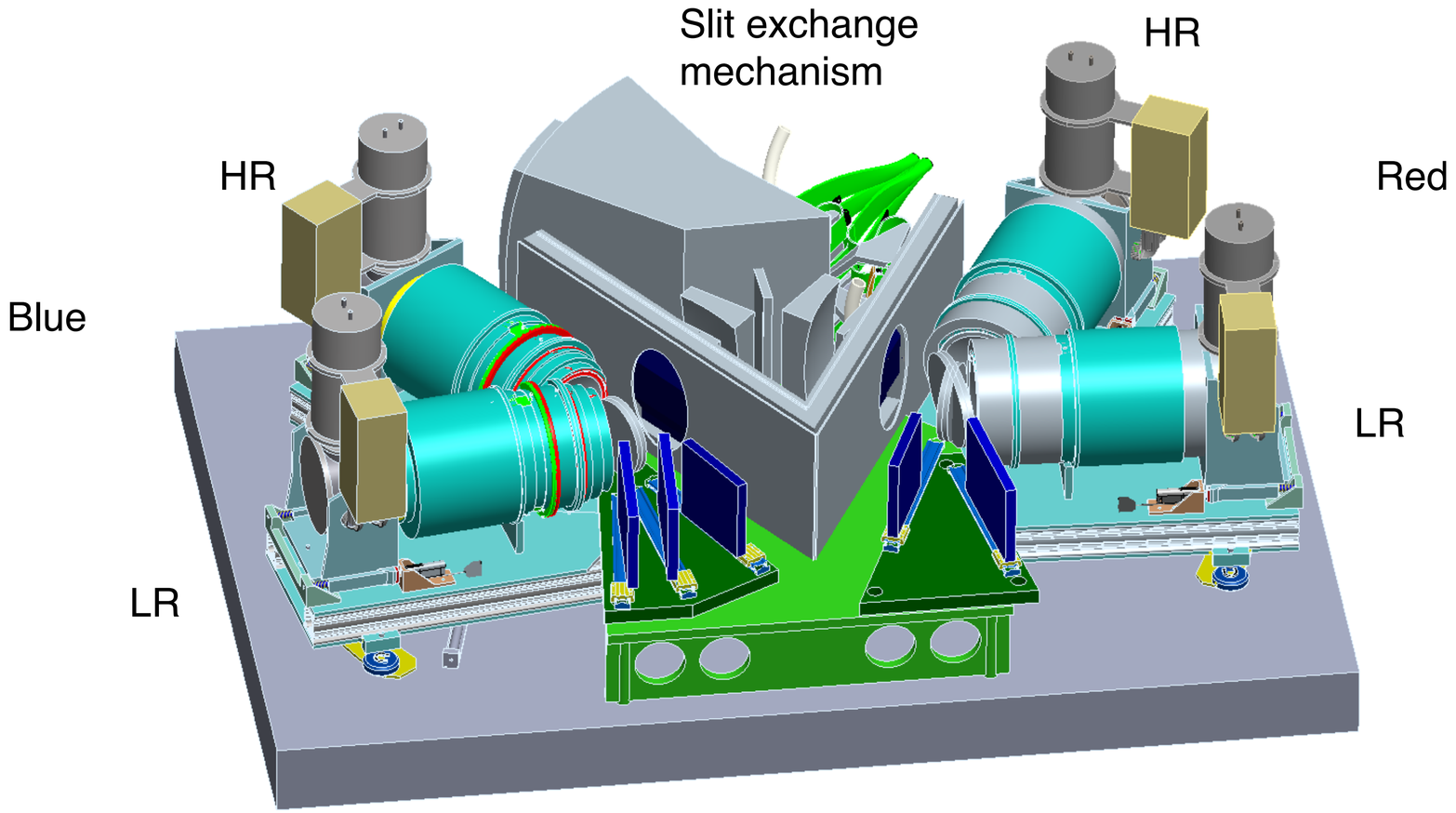








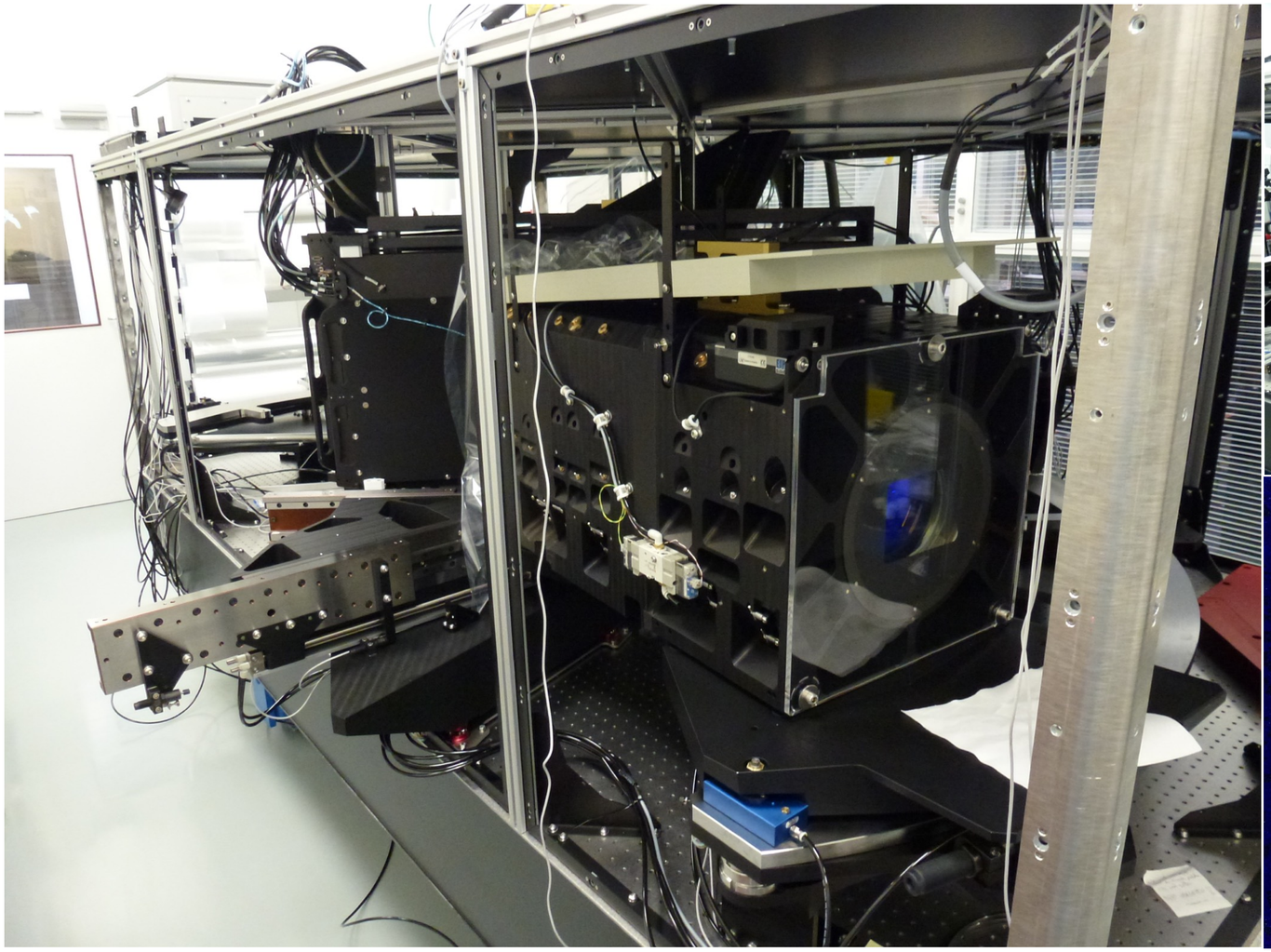
…and the mIFU too!

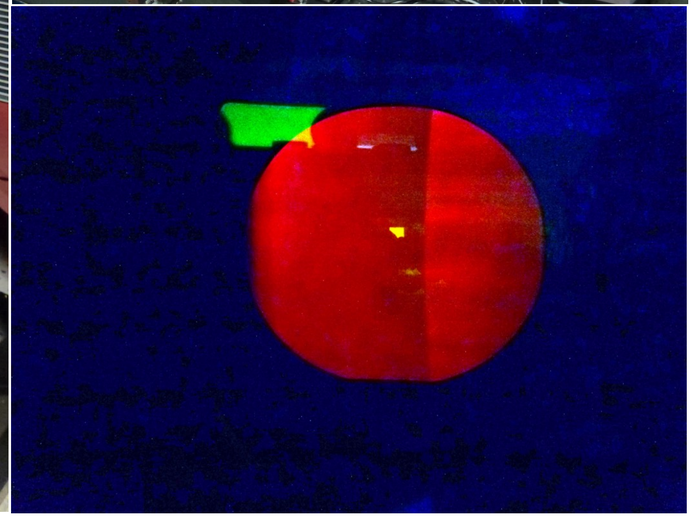


Spectrograph

designed in Dwingeloo by NOVA

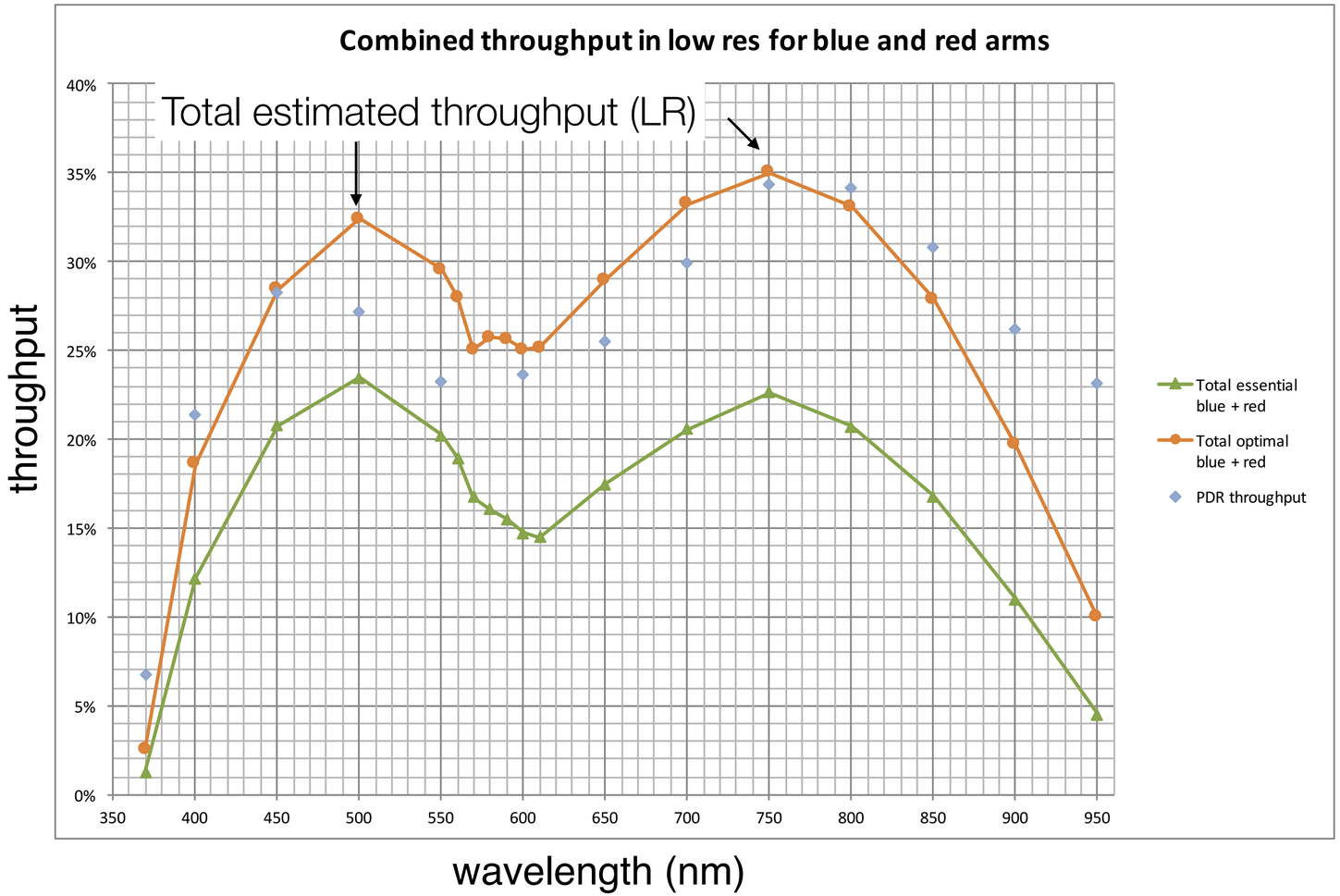
Spectrograph: (almost) current state



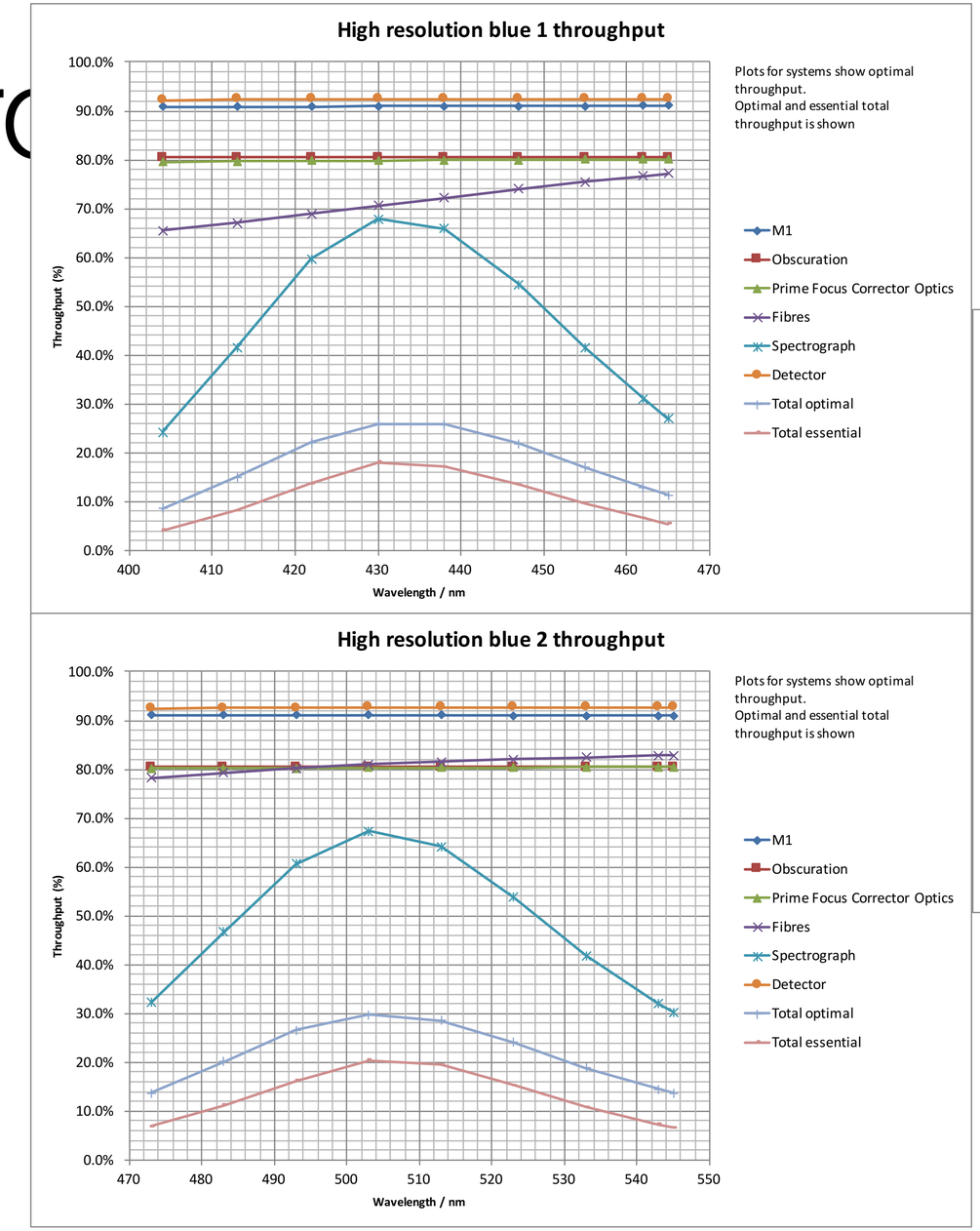


Throughput (LR)

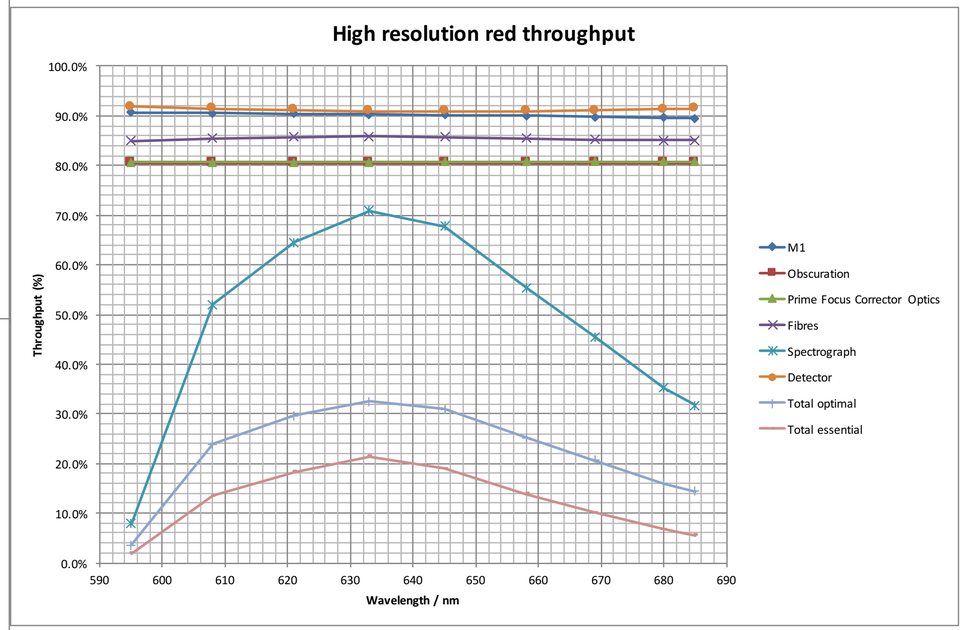
Peaks at 32% at 500 nm
and 35% at 750 nm



Thro



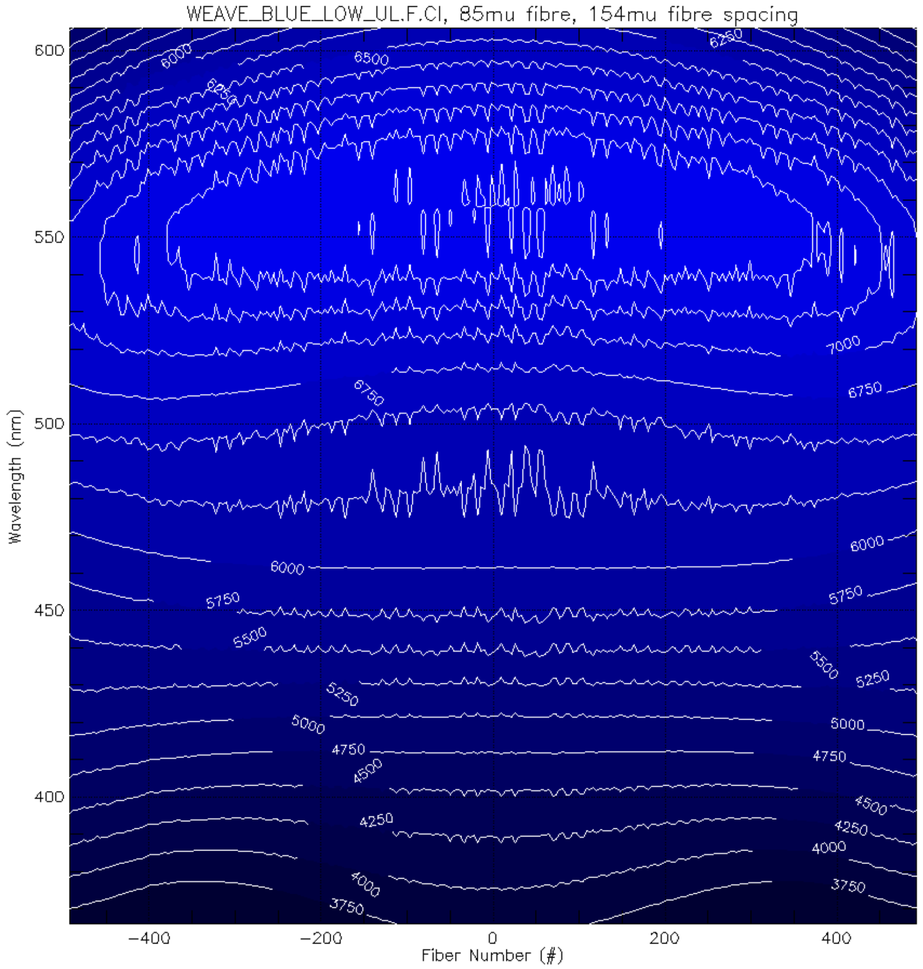
Peaks at 26% at 4350 Å or 30% at 5050 Å and at 32% at 6350 Å

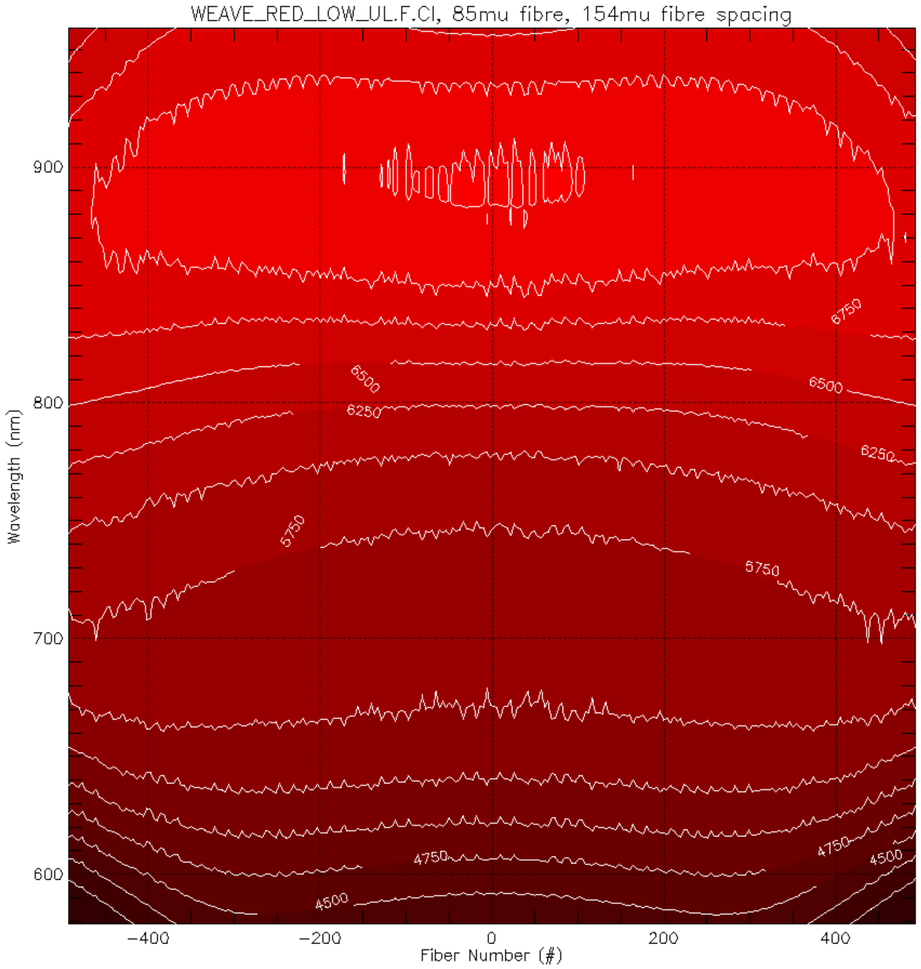


Total estimated throughput (HR)

Simulated spectral resolution: LR

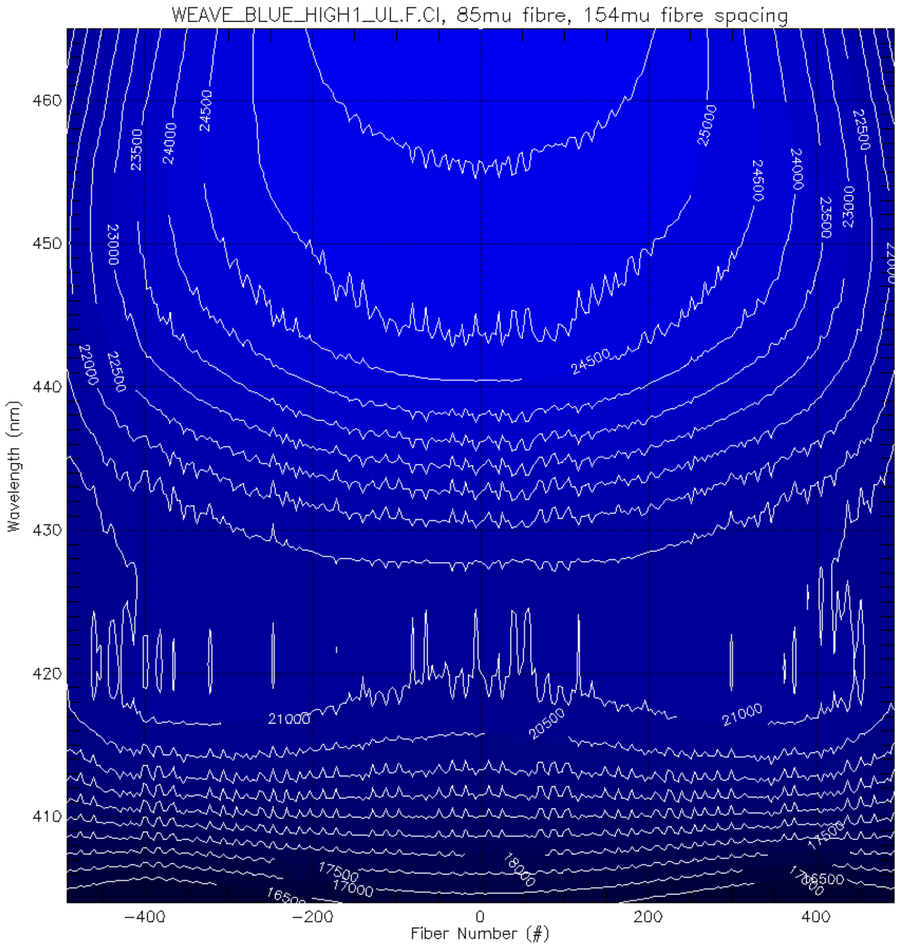
R=λ/FWHM~3750–7500

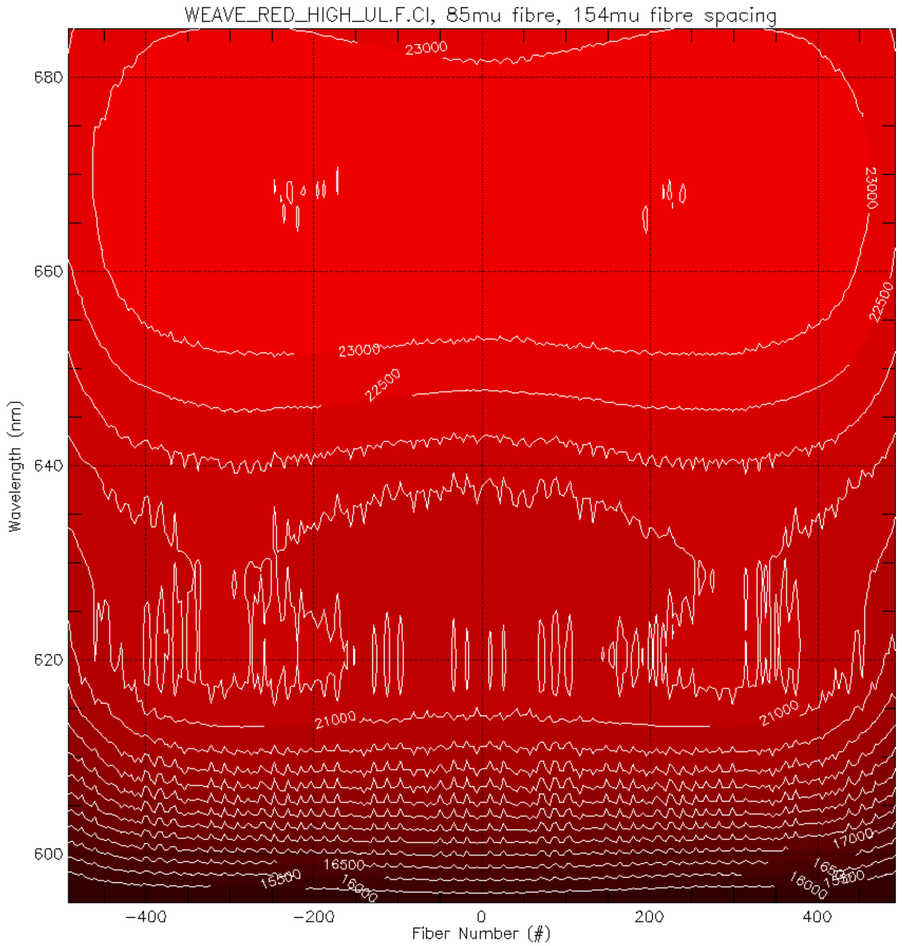




Simulated spectral resolution: HR

R=λ/FWHM~15000–25500



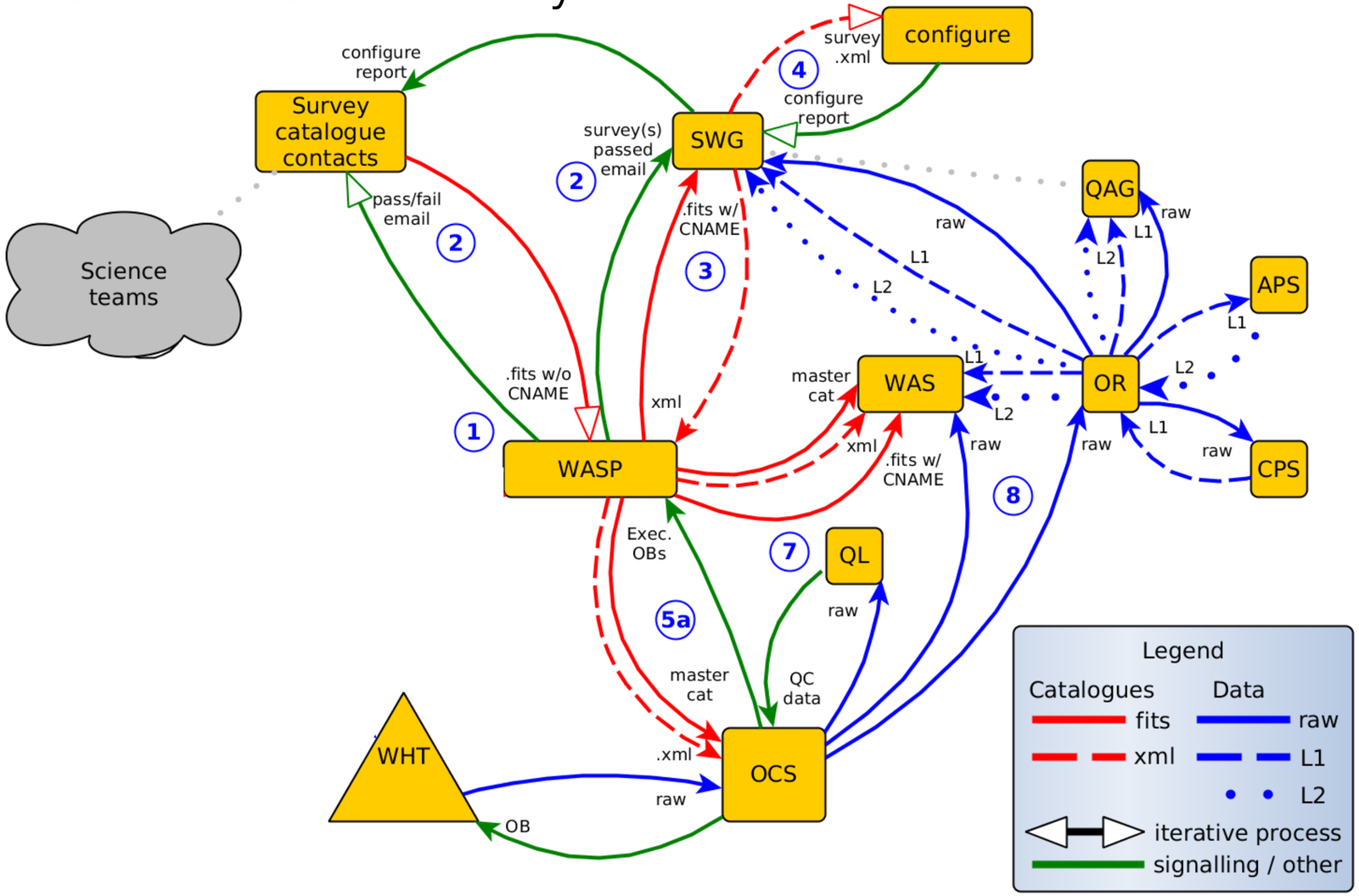


WEAVE characteristics

Telescope, diameter	WHT, 4.2m
Field of view	2° ⌀
Number of fibers	960 (plate A)/940 (plate B)
Fiber size	1.3″
Number of small IFUs, size	20 x 11″x12″ (1.3″ spaxels)
LIFU size	1.3′x1.5′ (2.6″ spaxels)
Low-resolution mode resolution	5750 (3000–7500)
Low-resolution mode wavelength coverage (Å)	3660–9590
High-resolution mode resolution	21000 (13000–25000)
High-resolution mode wavelength coverage (Å)	4040–4650, 4730–5450 5950–6850

WEAVE data flow: a schematic

David will say more about this shortly!



WEAVE data flow

- Most important points for you (more details later):
  - **OBs**: observing blocks, based on XML generated from your **FITS catalogues**
  - **CPS**: Core Processing System — reduces raw data into 1D (sky subtracted, fluxed) spectra
  - **APS**: Advanced Processing System — turns 1D spectra into **data cubes** (for IFU data) and **science-ready data products**

WEAVE data flow

- Most important points for you (more details later):
  - **WAS**: the WEAVE Archive System — how you will access the data
    - **PLEASE NOTE**: you can **only** publish data that has come from the WAS!

The WEAVE Primary Science Surveys

- Galactic Archaeology (STL: V. Hill, OCA)
  - including: LR-halo, LR-disc, HR, Open Cluster surveys
- Stellar, Circumstellar, and Interstellar Physics (STL: J. Drew, UCL)
- White Dwarfs (STL: B. Gänsicke, Warwick)
- Galaxy Clusters (STL: J. A. Aguerri, IAC)
- WEAVE-Apertif (STL: J. Falcón Barroso, IAC)
- StePS (STL: A. Iovino, Milano)
- WEAVE-LOFAR (STL: D. Smith, Herts)
- WEAVE-QSO (STL: M. Pieri, LAM)