Giacomo Beccari

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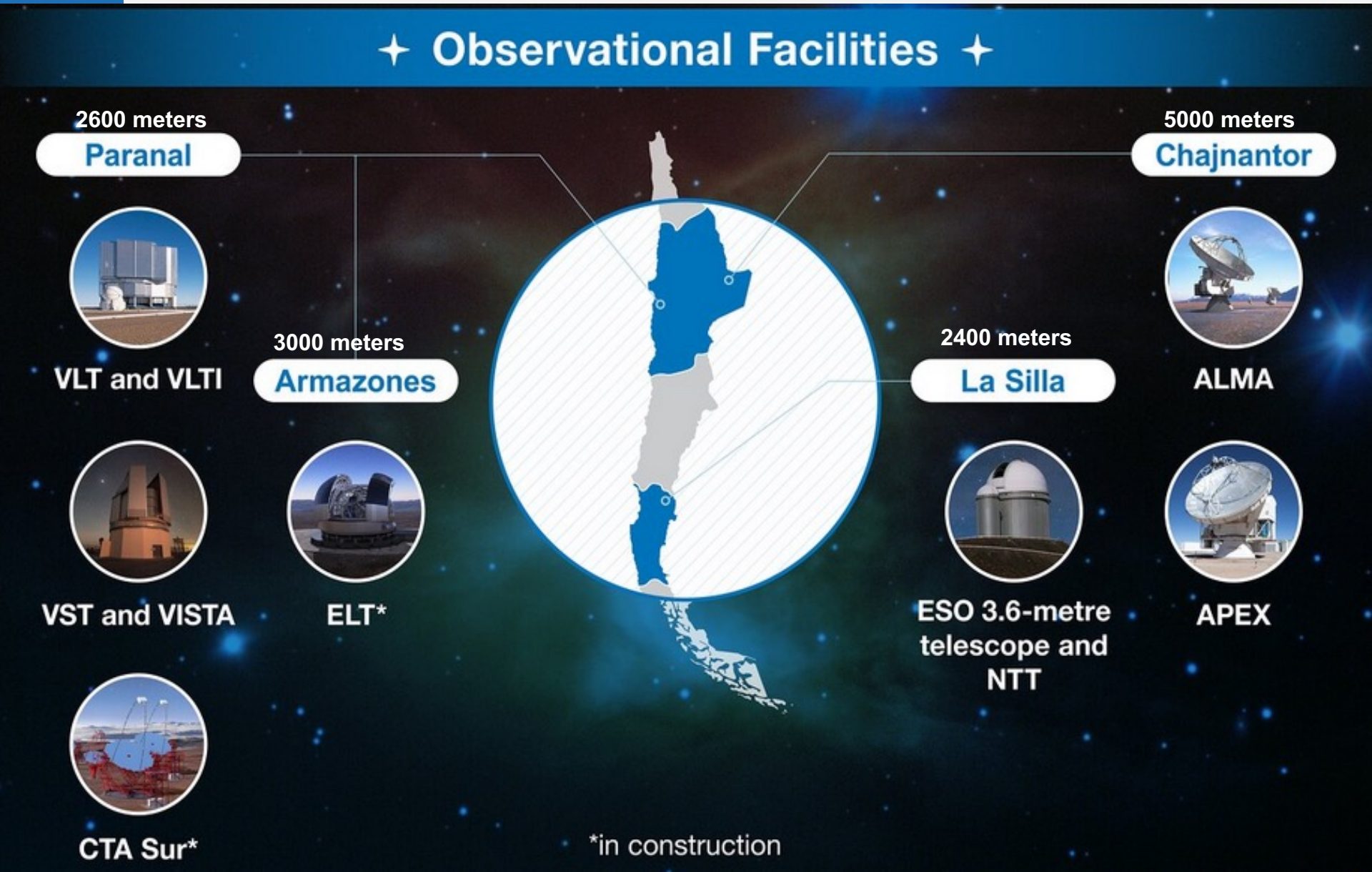
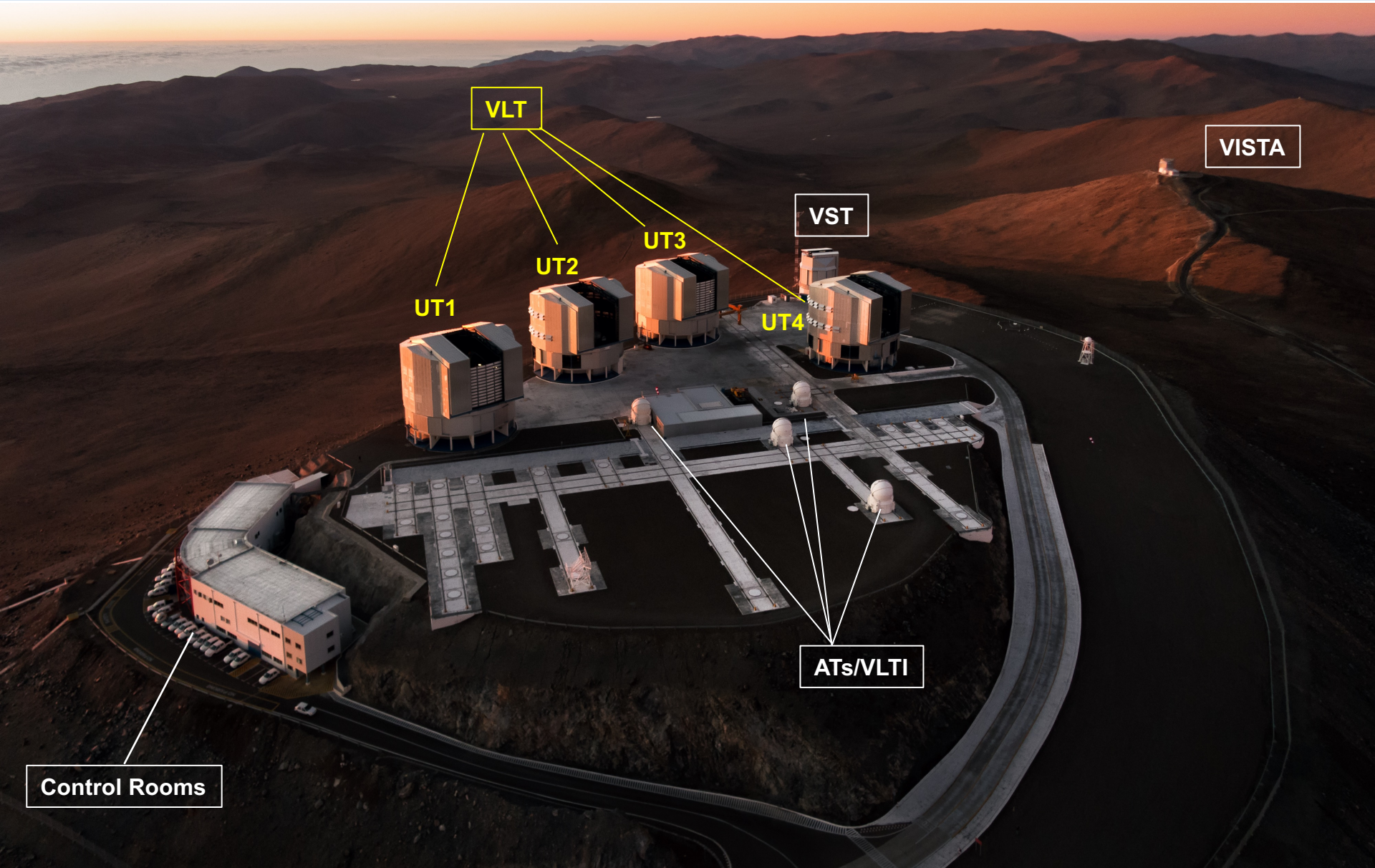
This presentation is extensively based on the slides prepared by Elena Valenti for the AASS – Cycle XXXVII, VLT & ELT, Rome 07.12.2021

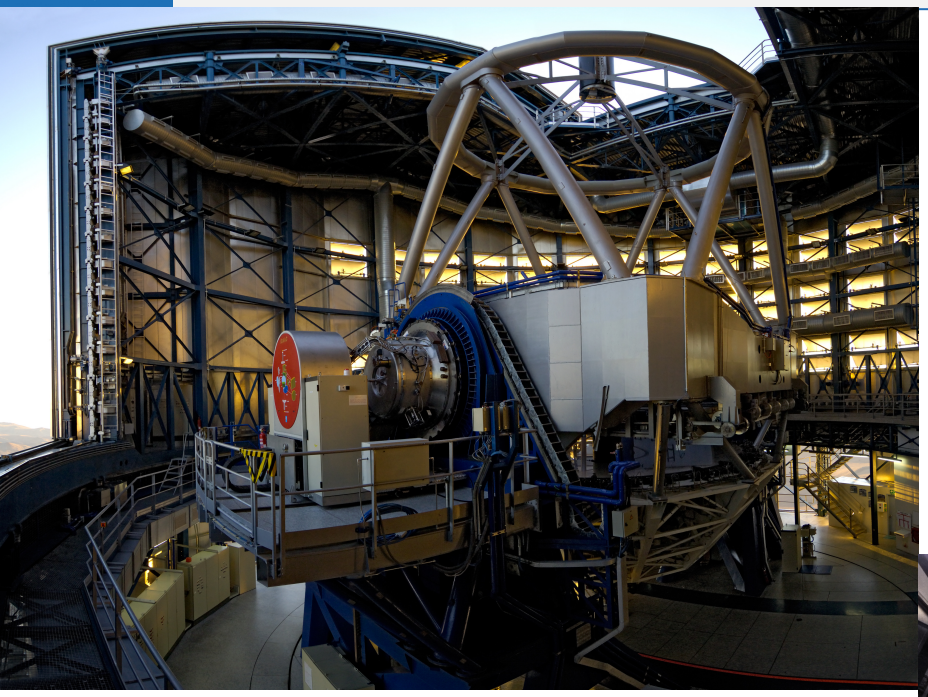
ABOUT ESO


Observational Facilities
2600 meters
Paranal
VLT and VLTI
VST and VISTA
CTA Sur*
3000 meters
Armazones
ELT*
2400 meters
La Silla
ESO 3.6-metre telescope and NTT
5000 meters
Chajnantor
ALMA
APEX
*in construction

Paranal



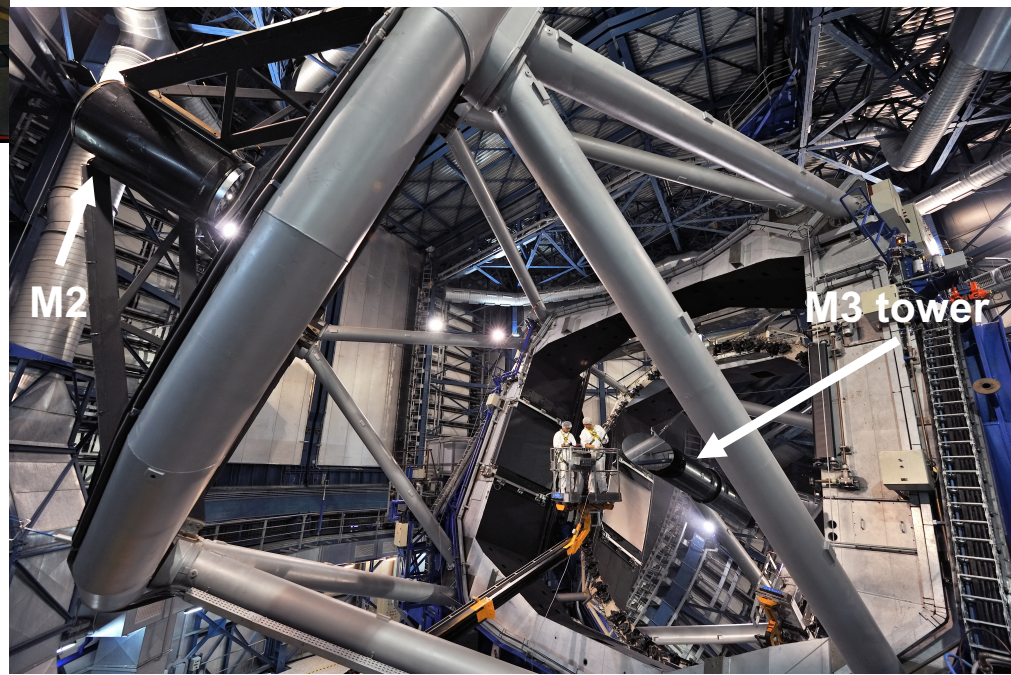
The Unit Telescope (UT)



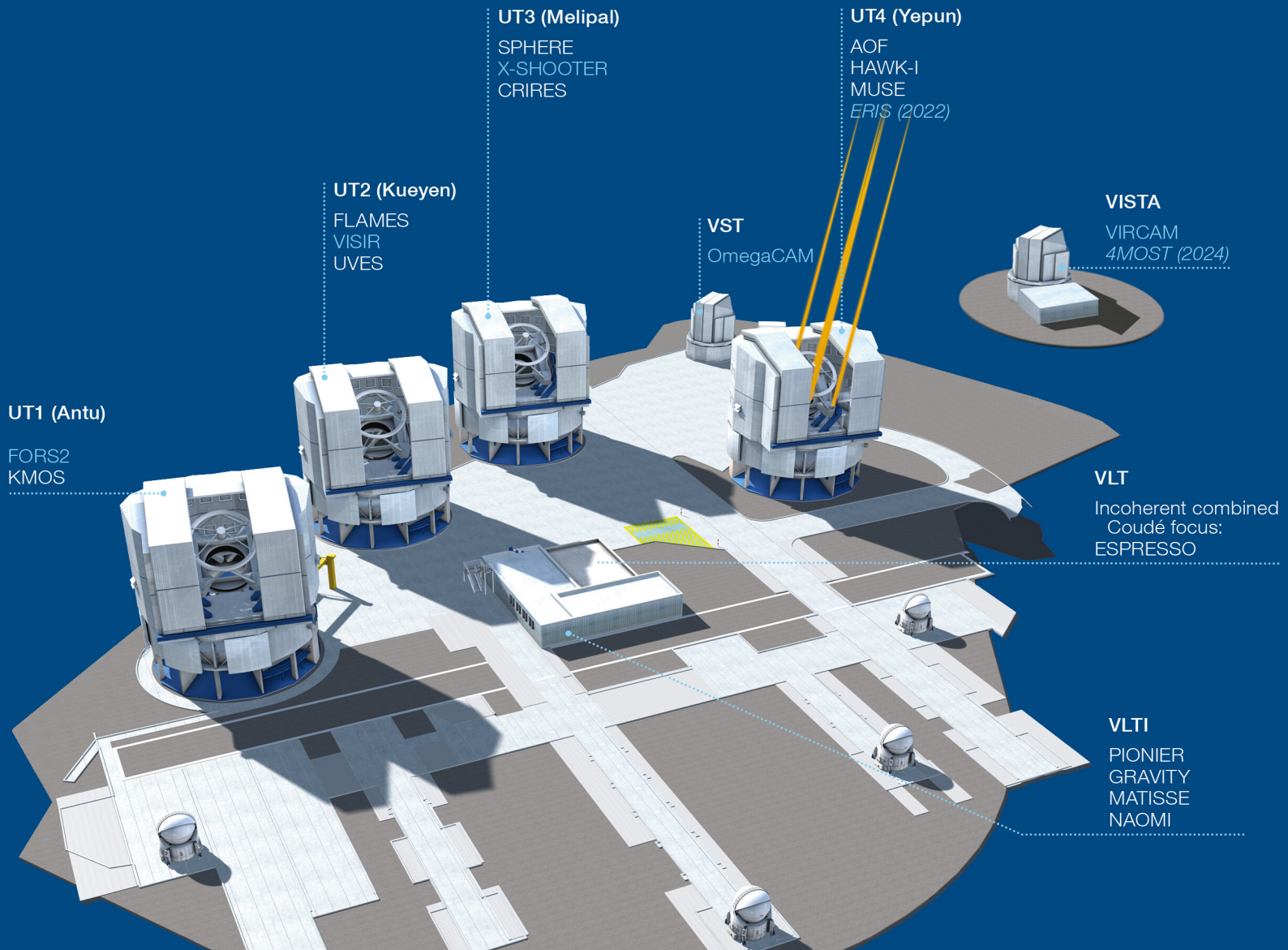
M1: 8.2m diameter (175mm thick), actively controlled by 150 actuators

M2: 0.94m diameter

M3: 1.2x0.86m (elliptical flat)



The VLT in 2021



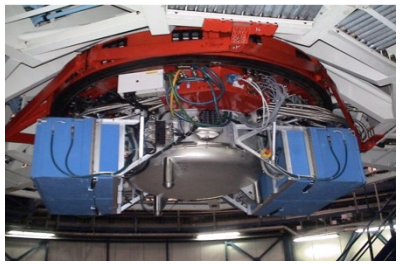
The VLT instruments in 2021

UT1 UT2 UT3 UT4

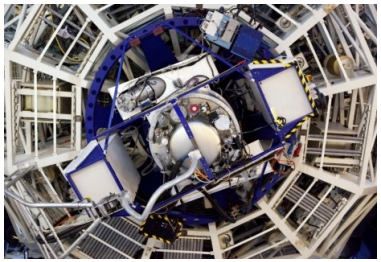
Cassegrain focus

FORS2

VISIR



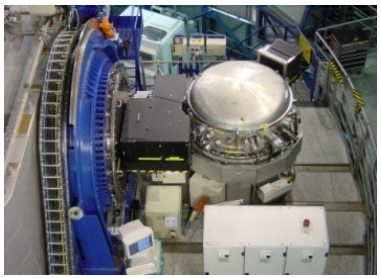
XSHOOTER



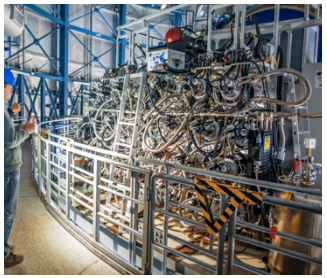
Nasmyth foci

UVES

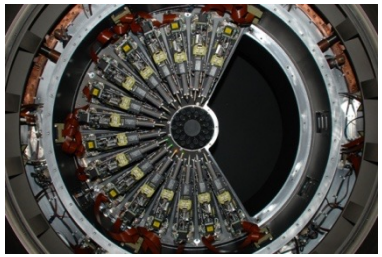
CRIRES+



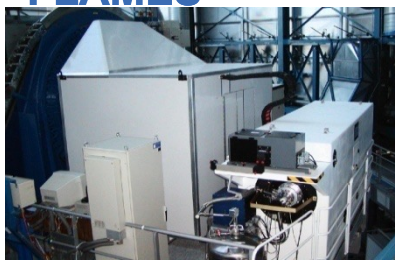
MUSE



KMOS



FLAMES



SPHERE

HAWKI

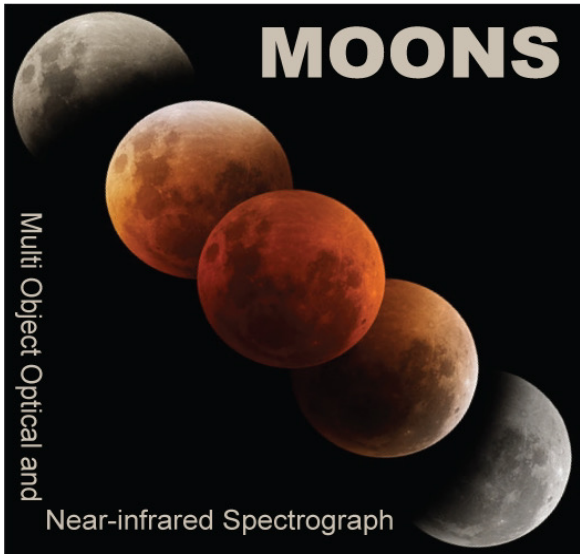
Incoherent Combined Coude focus

Coherent combined focus

Coming next .....

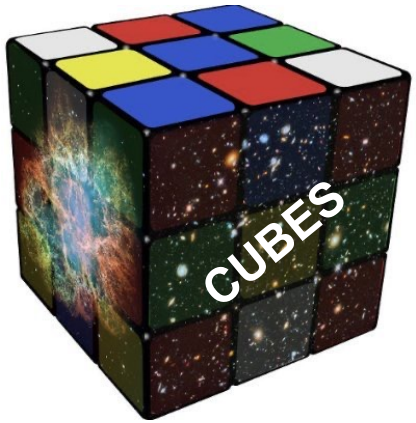
FORS upgrade

ERIS



MAVIS

GRAVITY+



BLUE MUSE
multi unit spectroscopic explorer

Coming next …..

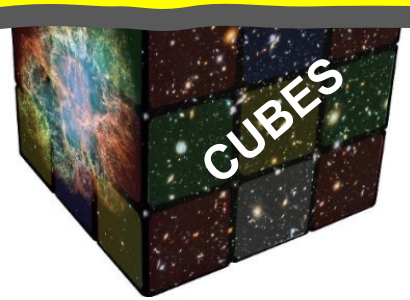
12+7 VLT instruments !!

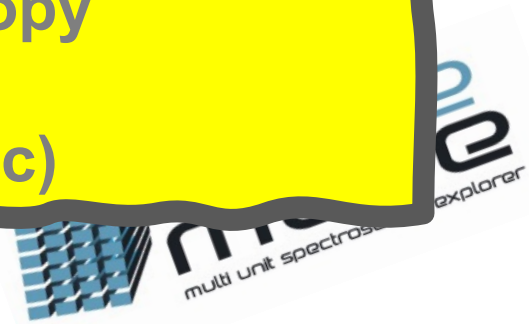
Several working wavelength range!!

Tenths of different modes !!

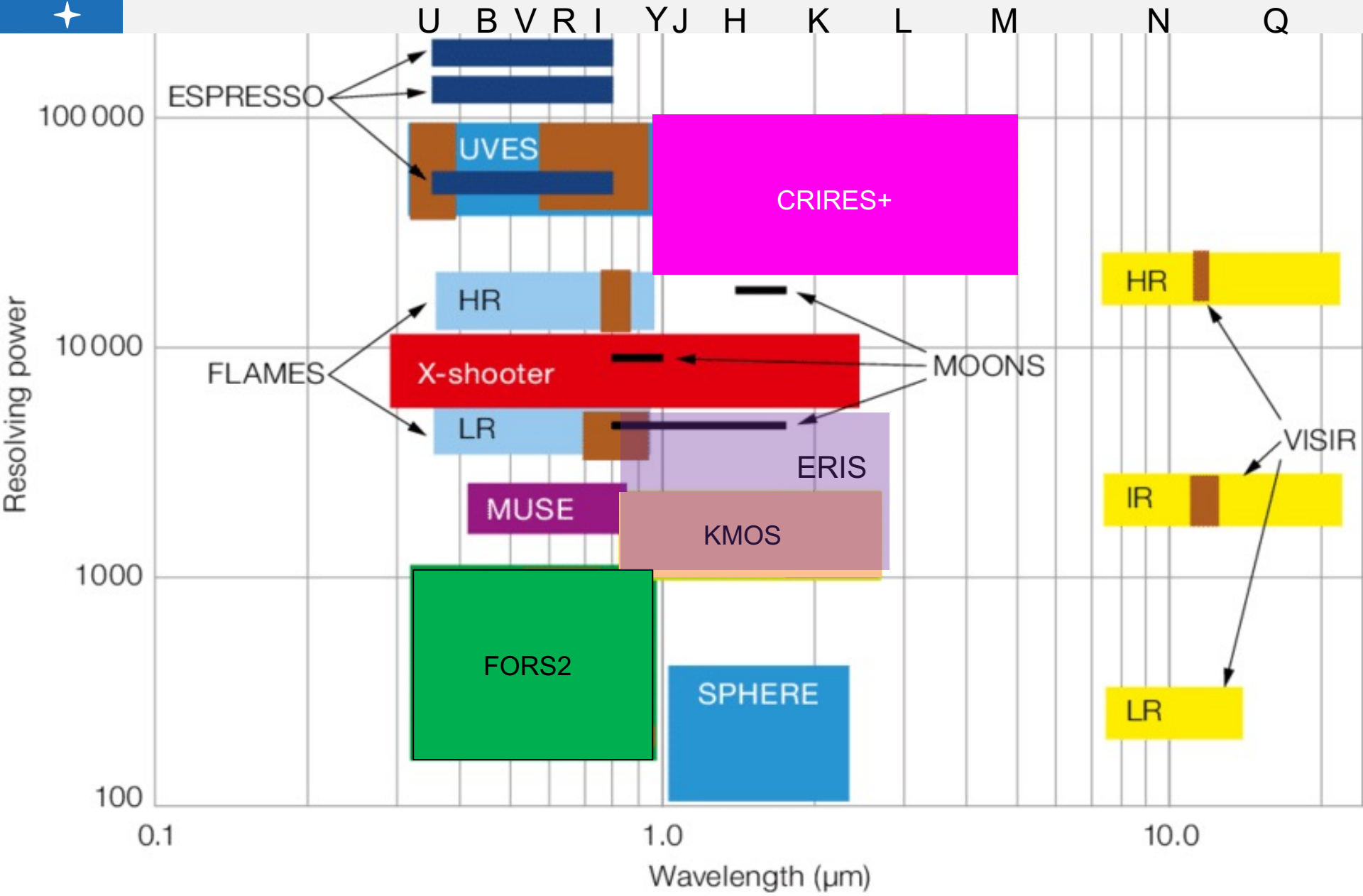
Seeing and/or diffraction limited

- Imaging
- Coronagraphy (HCI, ADI)
- Single-object slit spectroscopy
- Multi-object spectroscopy
- IFU
- Polarimetry (Ima & Spec)

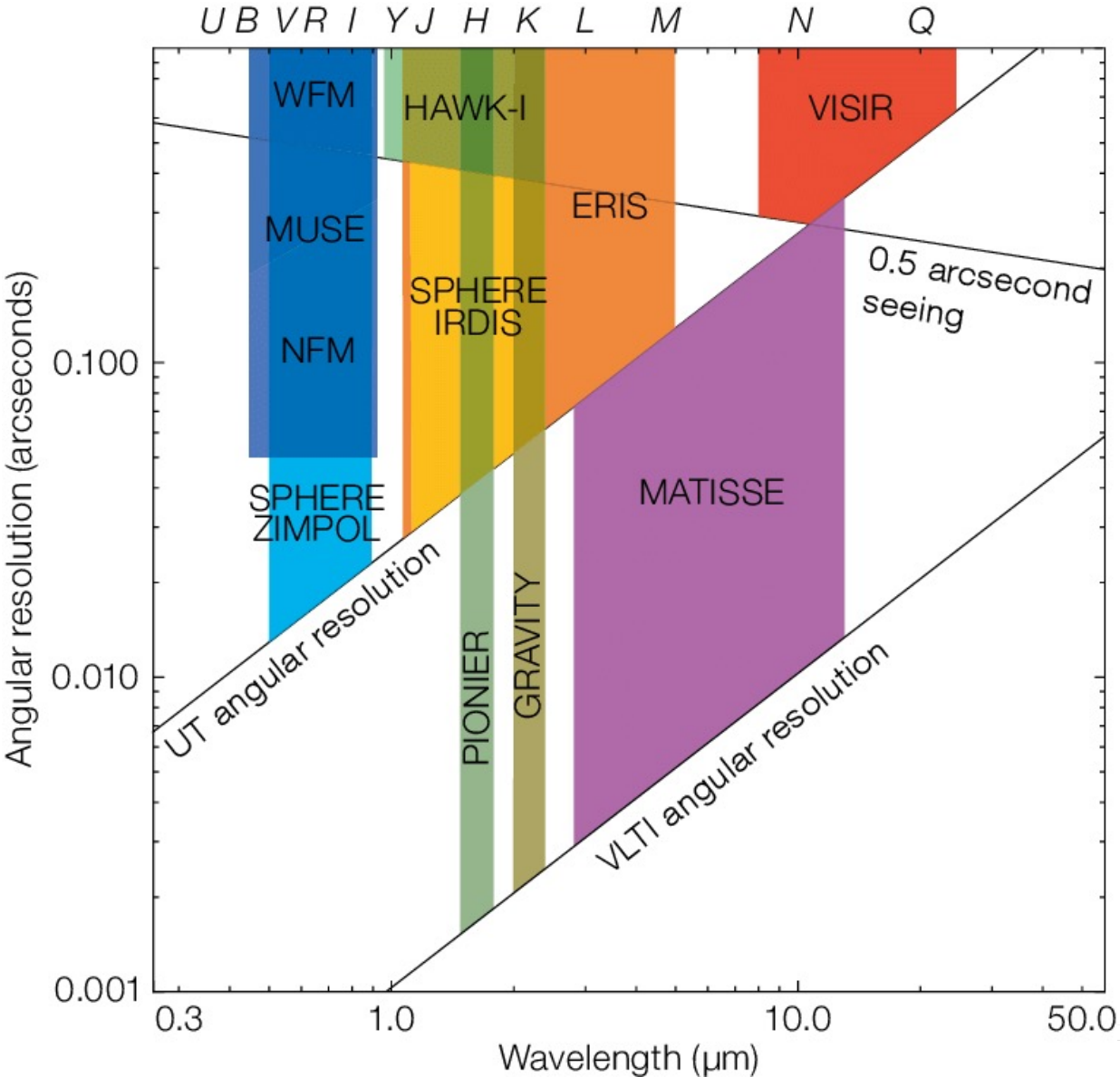




VLT instruments in a nutshell

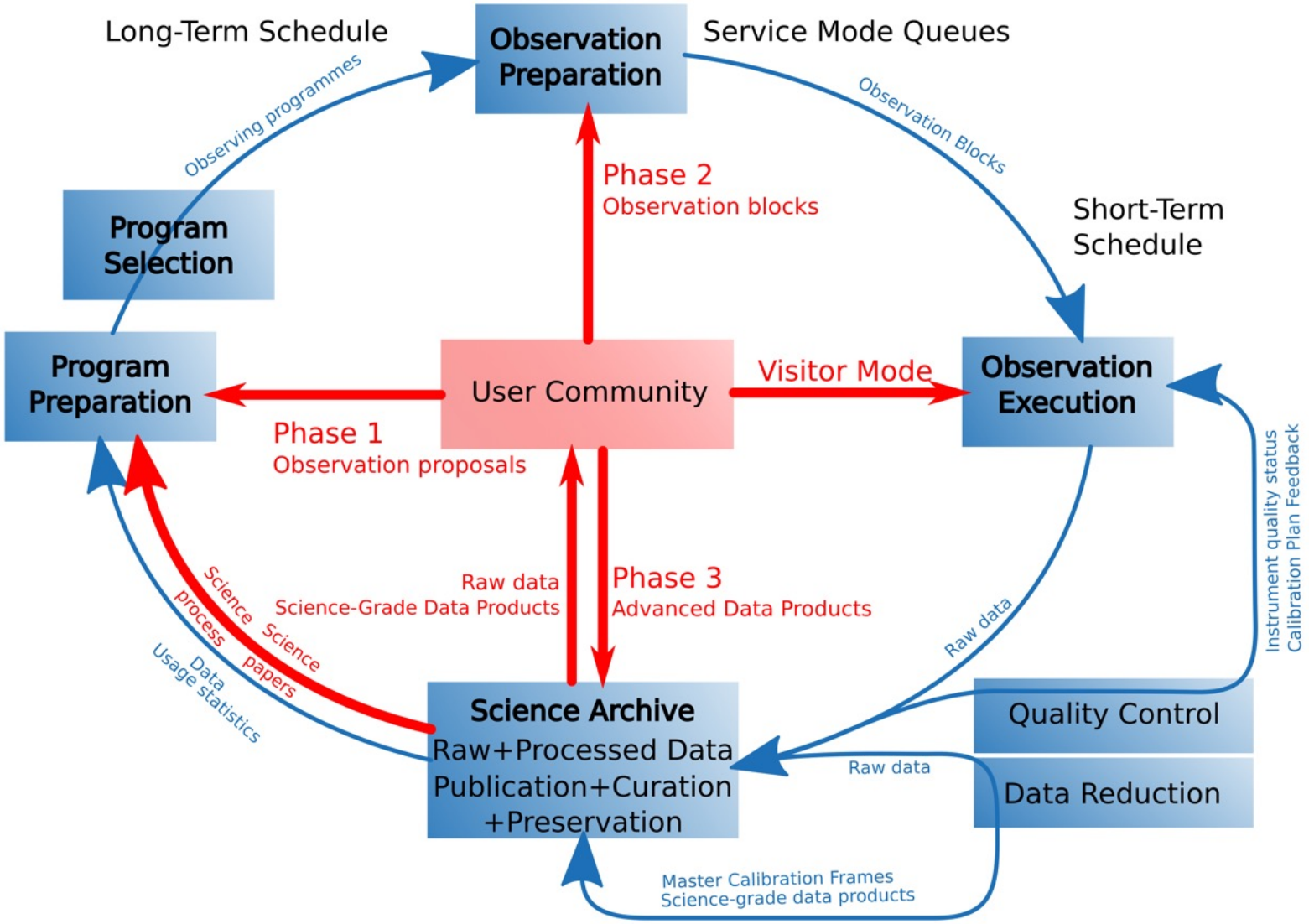


VLT instruments in a nutshell

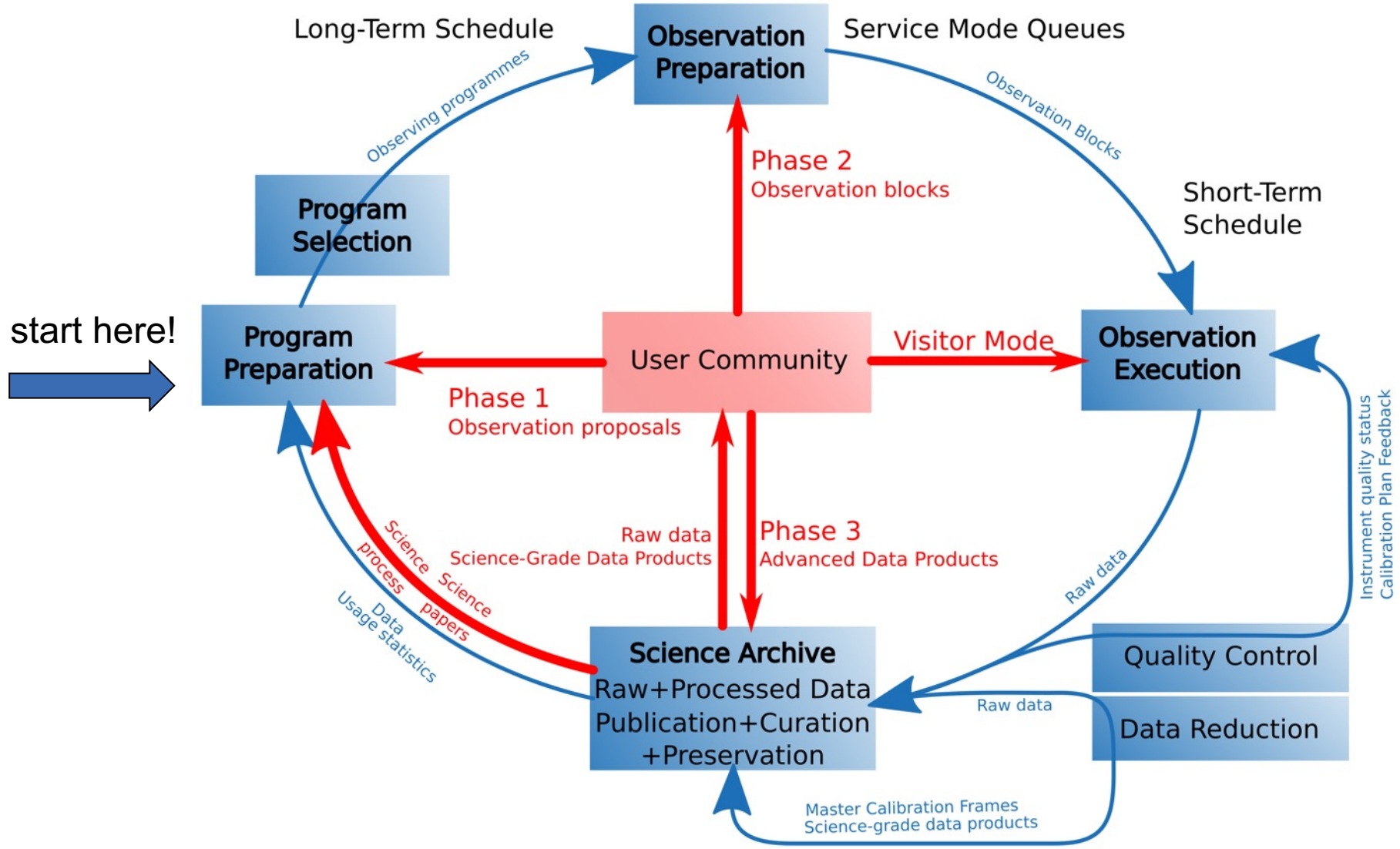


How can I get observing time at ESO?

The ESO operational model



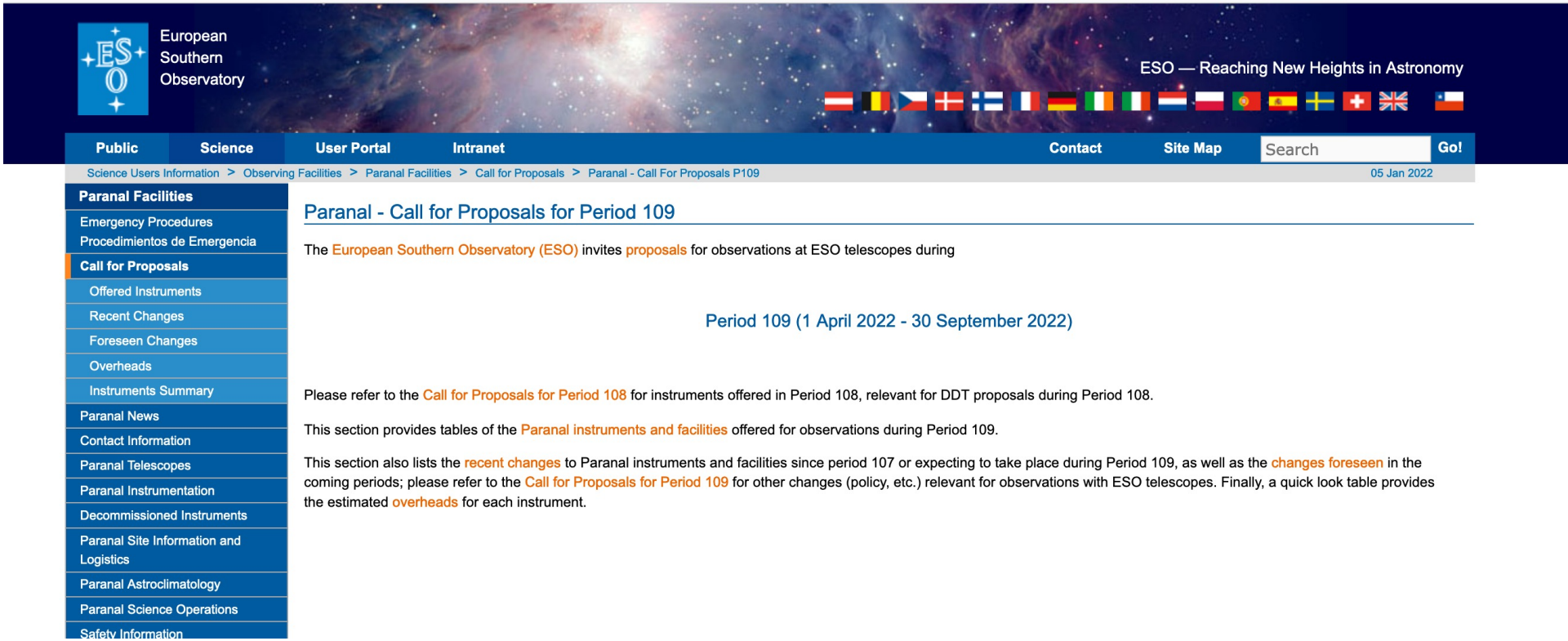
The ESO operational model



The ESO tools!

Phase 1: Read the ESO Call for Proposal….

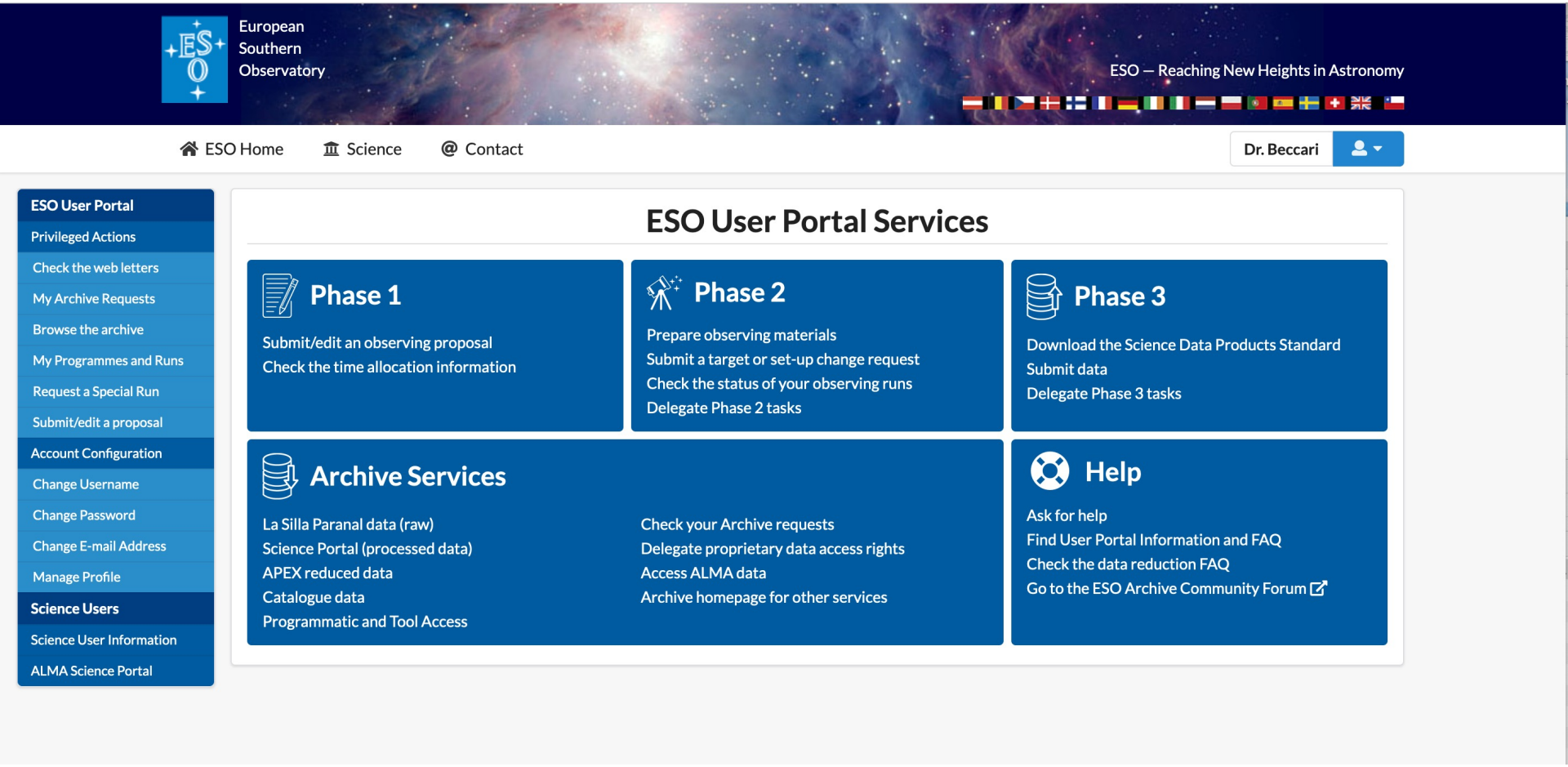
https://www.eso.org/sci/facilities/paranal/cfp/cfp109.html



The ESO tools!

if you don't have it, create an account in the ESO User Portal

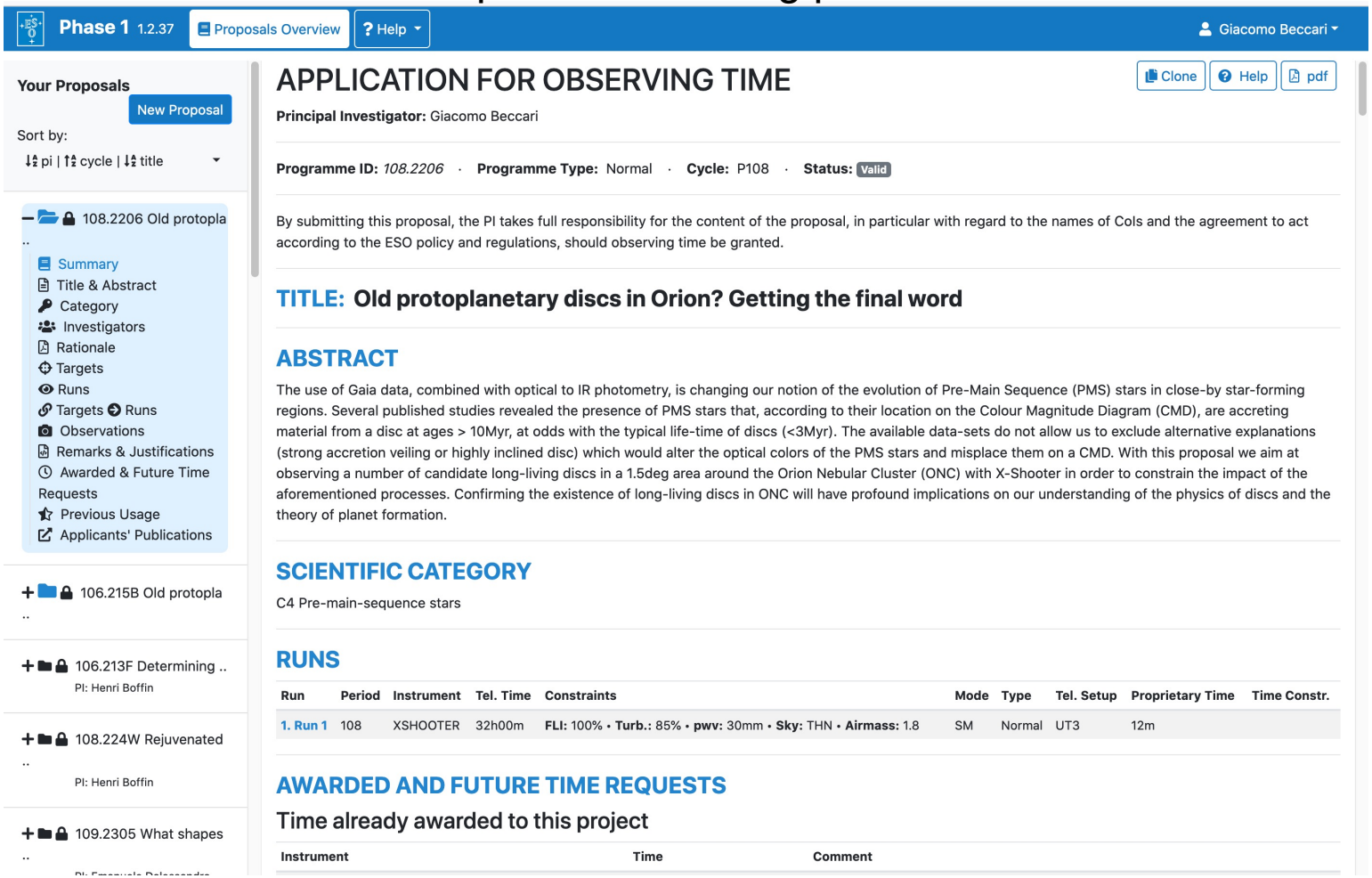
https://www.eso.org/UserPortal/



The ESO tools!

…then prepare and submit your observing proposal

https://www.eso.org/p1



How to select your VLT instrument(s)?

Start with a clear and well-defined scientific goal!!!

How to select your VLT instrument(s)?

Trade-off between:

- FoV vs angular resolution
- Multiplexing vs single-object capability
- Wavelength coverage vs spectral resolution

INST	FORS2	KMOS	VISIR	SPHERE	HAWKI	MUSE	ERIS
FoV	6.8'x6.8' 4.3"x4.3"	2.8"x2.8"	1'x1' 38"x38"	11"x11" 1.7"x1.7" 3.5"x3.5"	7.5'x7.5'	1'x1' 7.5" x 7.5"	1'x1' 30"x30" 8"x8" 3.2x3.2" 0.8"x0.8"

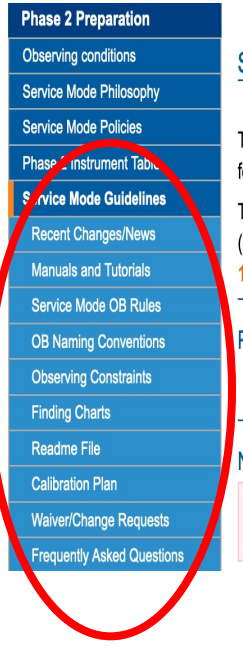
INSTRUMENT	FORS2	KMOS	FLAMES	MOONS
Multiplexing	19 [MOS] ~470 [MXU]	24	8+130	1000

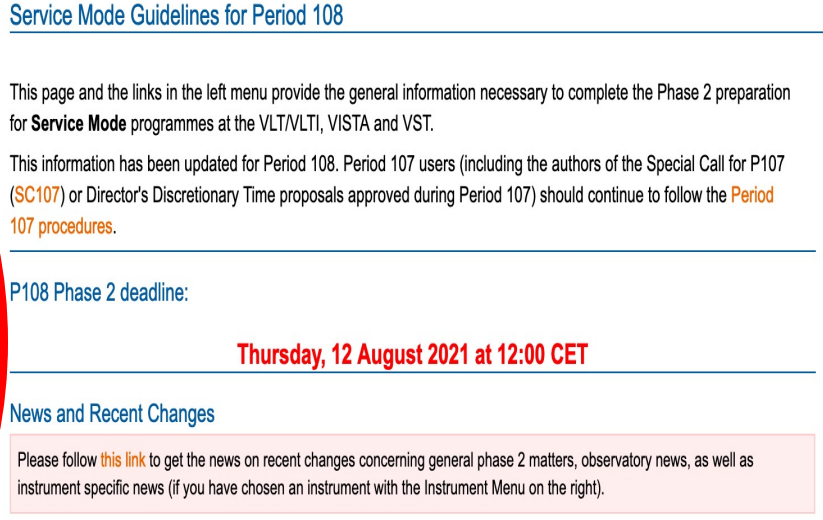
How to quickly get info

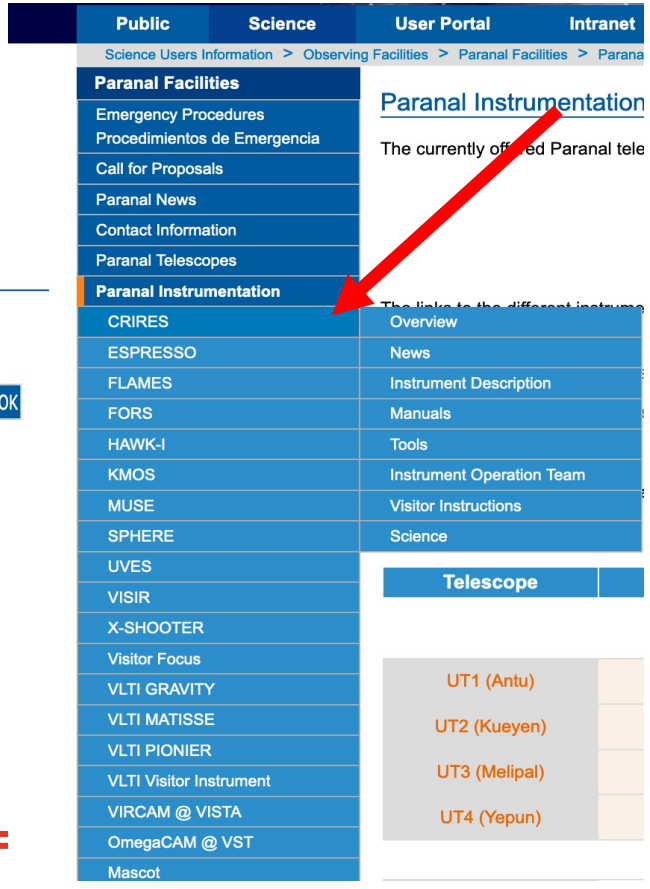
Paranal: Instruments Summary Table:
https://www.eso.org/sci/facilities/paranal/cfp/cfp109/instrument_summary.html

Paranal Instrumentation:
https://www.eso.org/sci/facilities/paranal/instruments.html

Service Mode guidelines:
https://www.eso.org/sci/observing/phase2/SMGuidelines.html
Ask for help: support@eso.org

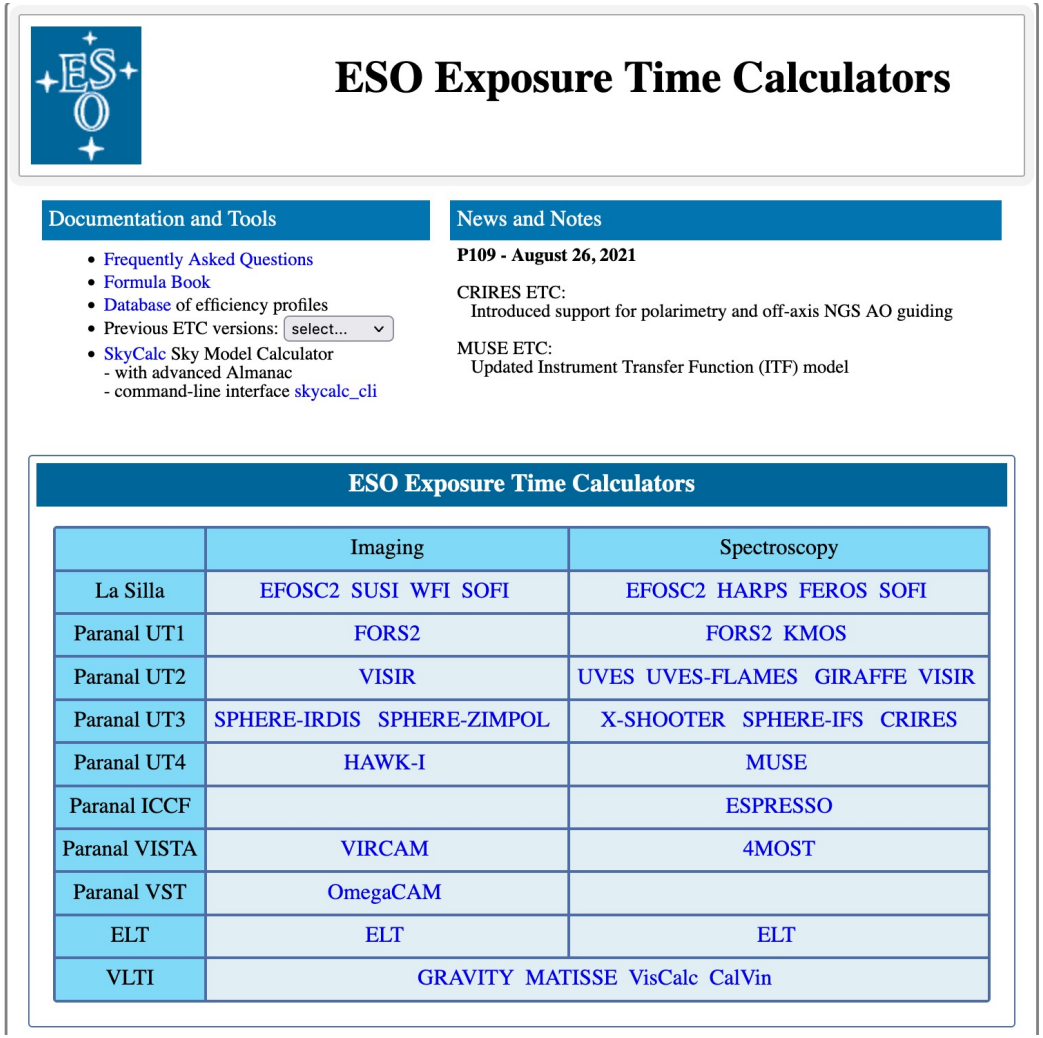






Check the feasibility of your observations

https://www.eso.org/observing/etc/



ESO Exposure Time Calculators

Documentation and Tools

- Frequently Asked Questions
- Formula Book
- Database of efficiency profiles
- Previous ETC versions: select...
- SkyCalc Sky Model Calculator
  - with advanced Almanac
  - command-line interface skycalc_cli

News and Notes

P109 - August 26, 2021

CRIRES ETC:
Introduced support for polarimetry and off-axis NGS AO guiding

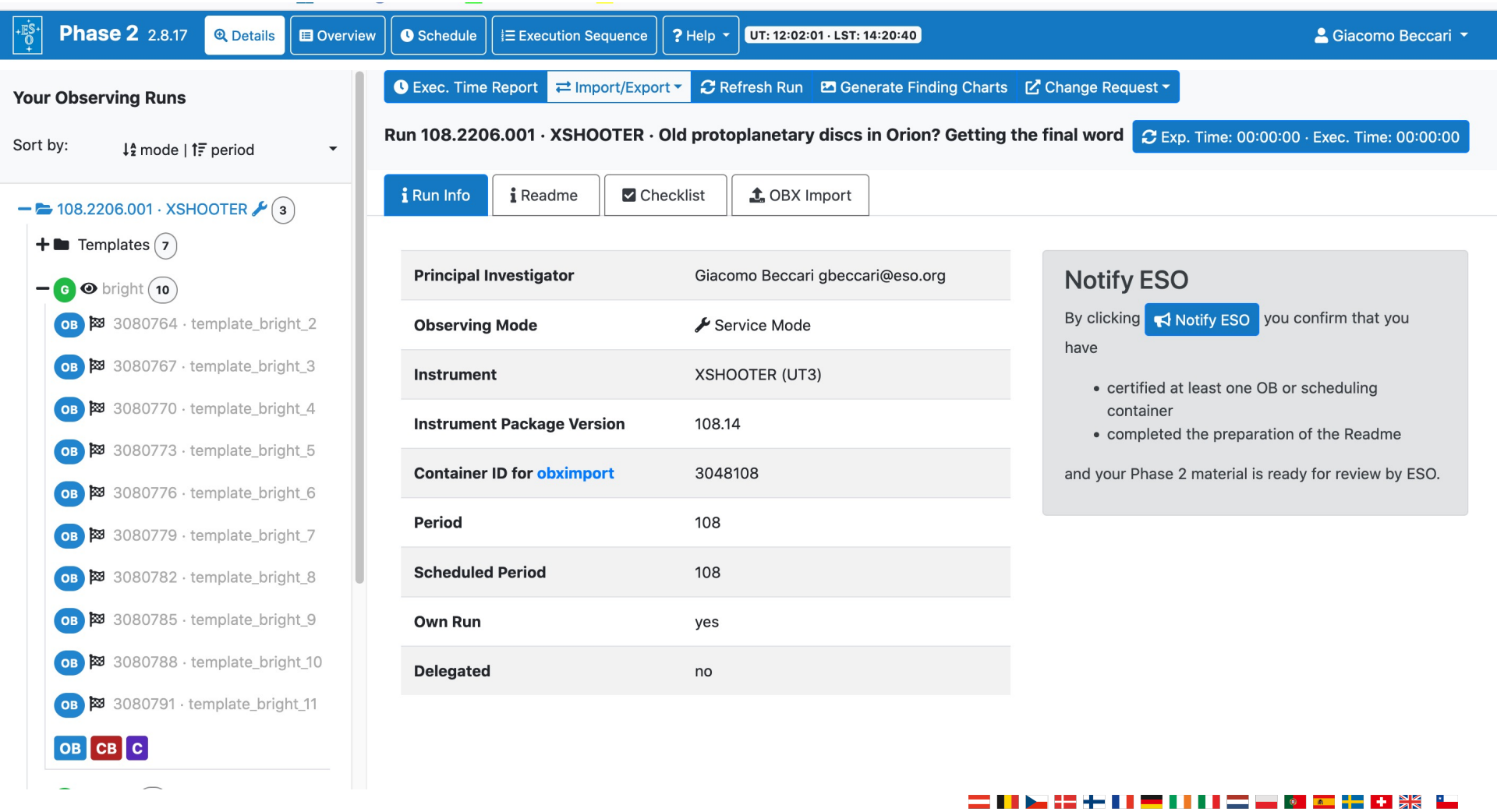
MUSE ETC:
Updated Instrument Transfer Function (ITF) model

ESO Exposure Time Calculators

	Imaging	Spectroscopy
La Silla	EFOSC2 SUSI WFI SOFI	EFOSC2 HARPS FEROS SOFI
Paranal UT1	FORS2	FORS2 KMOS
Paranal UT2	VISIR	UVES UVES-FLAMES GIRAFFE VISIR
Paranal UT3	SPHERE-IRDIS SPHERE-ZIMPOL	X-SHOOTER SPHERE-IFS CRIRES
Paranal UT4	HAWK-I	MUSE
Paranal ICCF		ESPRESSO
Paranal VISTA	VIRCAM	4MOST
Paranal VST	OmegaCAM	
ELT	ELT	ELT
VLTI	GRAVITY MATISSE VisCalc CalVin	

Prepare your observations

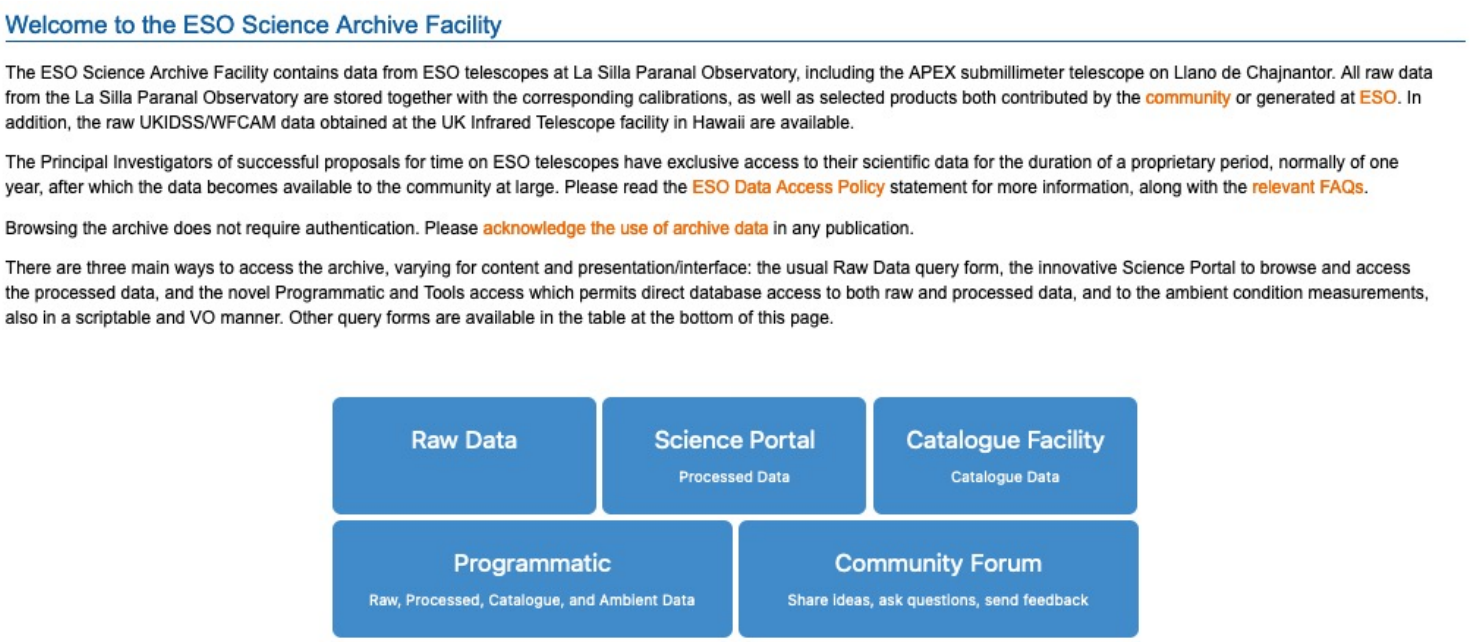
https://www.eso.org/p2/



The ESO Science Archive

- Remember that every photon collected with ESO facilities is stored in the Science Archive
- Upon the proprietary period expiration, access to the data is free to anyone!
- Check the archive before applying for VLT time

http://archive.eso.org/cms.html



Welcome to the ESO Science Archive Facility

The ESO Science Archive Facility contains data from ESO telescopes at La Silla Paranal Observatory, including the APEX submillimeter telescope on Llano de Chajnantor. All raw data from the La Silla Paranal Observatory are stored together with the corresponding calibrations, as well as selected products both contributed by the community or generated at ESO. In addition, the raw UKIDSS/WFCAM data obtained at the UK Infrared Telescope facility in Hawaii are available.

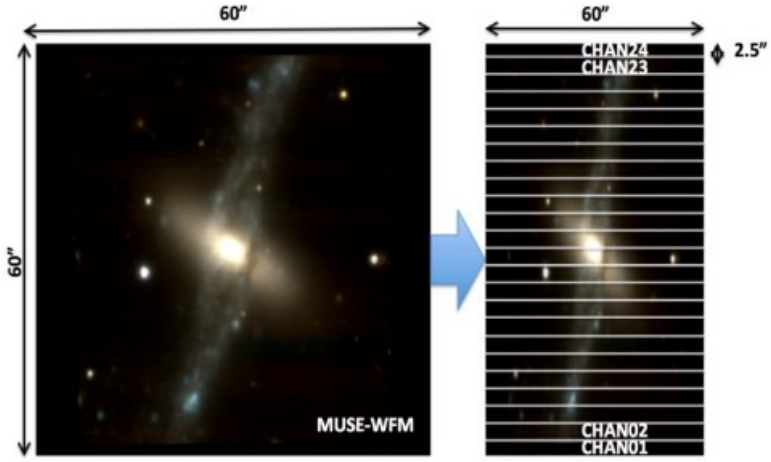
The Principal Investigators of successful proposals for time on ESO telescopes have exclusive access to their scientific data for the duration of a proprietary period, normally of one year, after which the data becomes available to the community at large. Please read the ESO Data Access Policy statement for more information, along with the relevant FAQs.

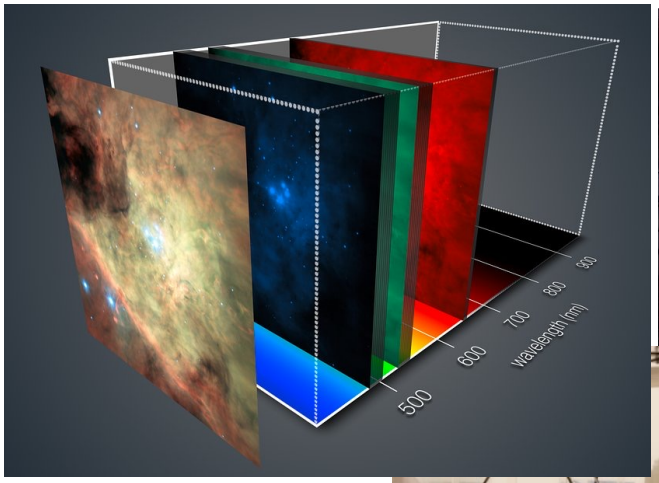
Browsing the archive does not require authentication. Please acknowledge the use of archive data in any publication.

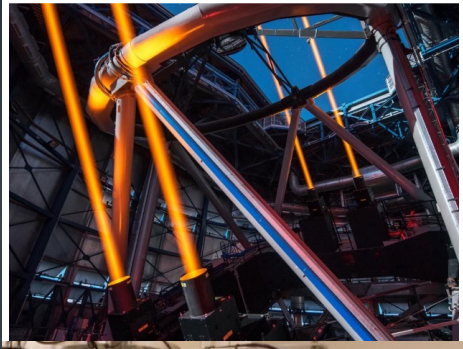
There are three main ways to access the archive, varying for content and presentation/interface: the usual Raw Data query form, the innovative Science Portal to browse and access the processed data, and the novel Programmatic and Tools access which permits direct database access to both raw and processed data, and to the ambient condition measurements, also in a scriptable and VO manner. Other query forms are available in the table at the bottom of this page.

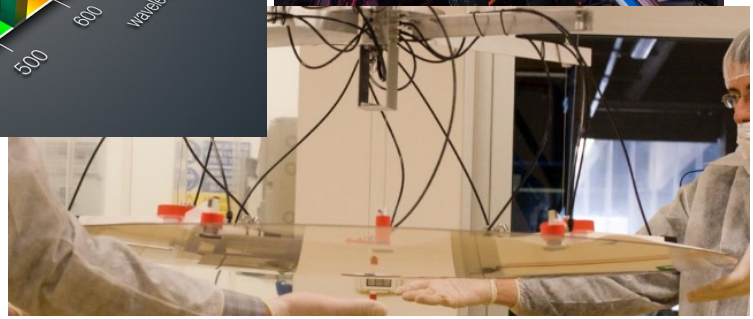
muse multi unit spectroscopic explorer @VLT/UT4

- 24 IFUs
- Wavelength coverage: 480nm - 930nm (N), 465nm – 930 (E)
- Spectral sampling: 0.125 nm/px
- FoV: 59.9” x 60.0” (WFM), 7.42” x 7.42” (NFM)
- Spatial pixel scale: 0.2”/px (WFM), 25mas/px (NFM)
- AOF (4LGSF & DSM) + GALACSI: GLAO (WFM) & LTAO (NFM)







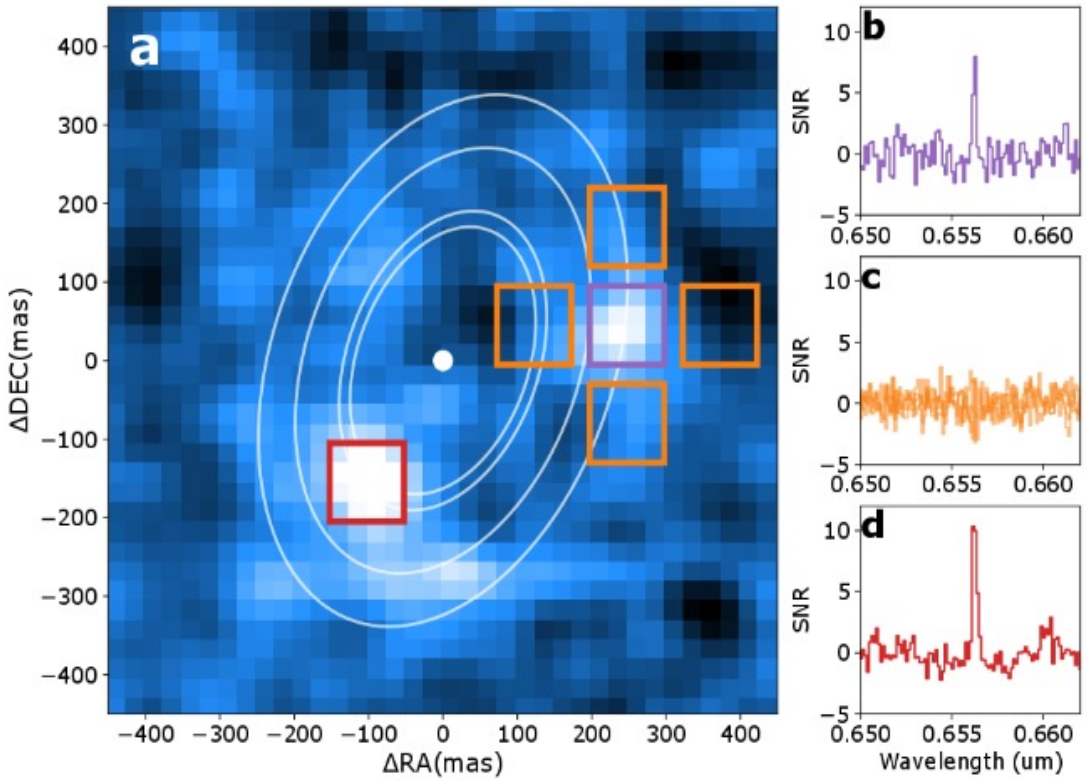


Science with MUSE: Planet formation

- Tracing ongoing planet formation in transitional disks at different stages of their evolution via accretion signature

The case of the young (5.4Myr) T-Tauri star PDS70 (d=113.4pc)

Hα map from MUSE/NFM

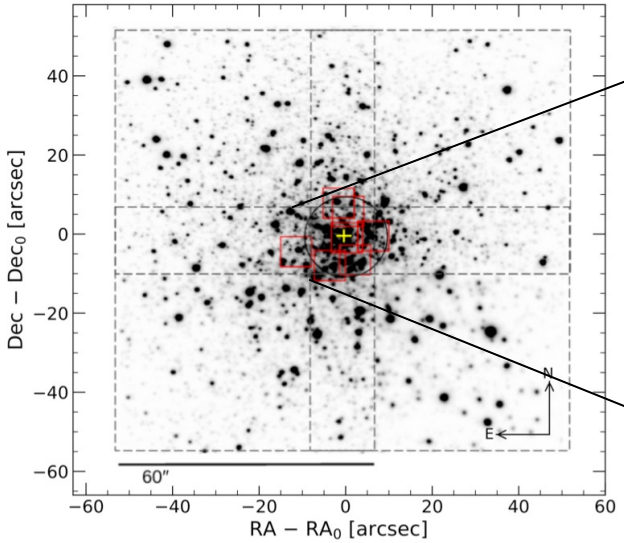


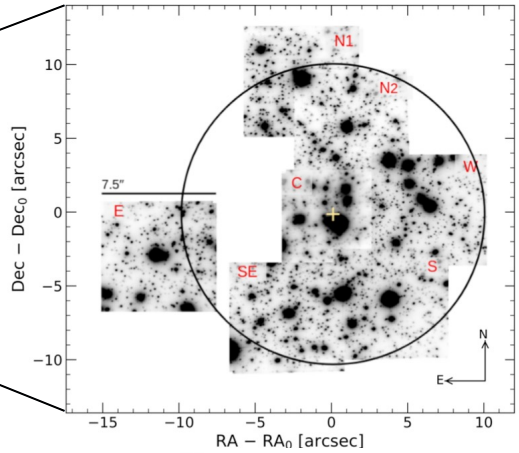
Haffert et al. 2019

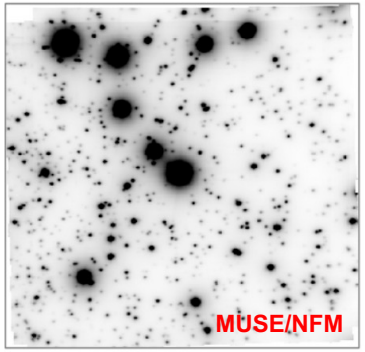
Science with MUSE: Resolved SPs

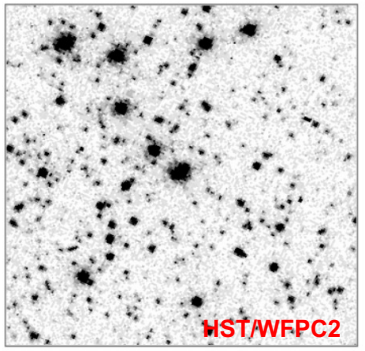
- Kinematics and internal dynamics of Globular Clusters

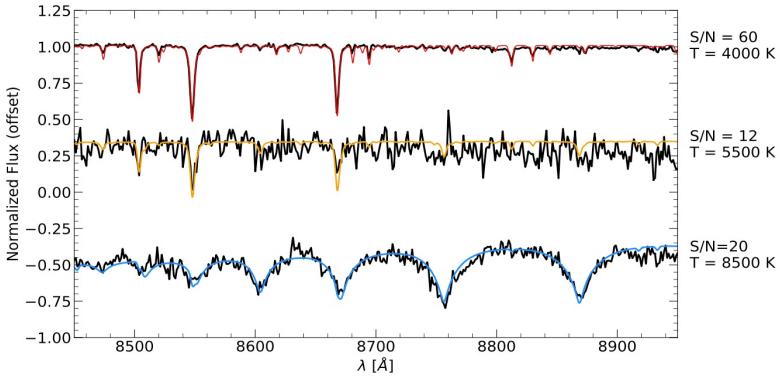
Spectra for more than 1700 individually resolved stars from MUSE+FLAMES+KMOS

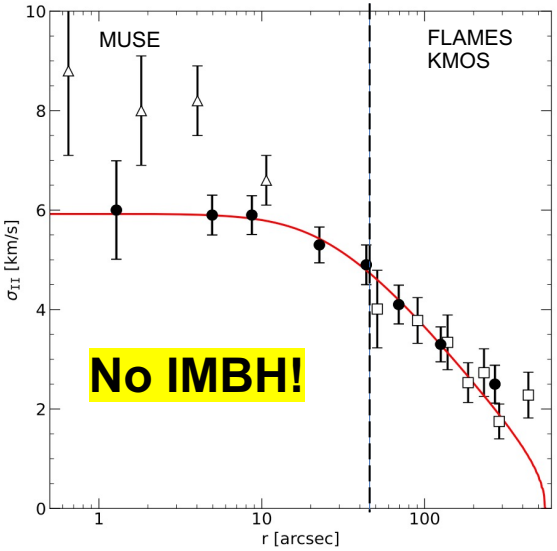










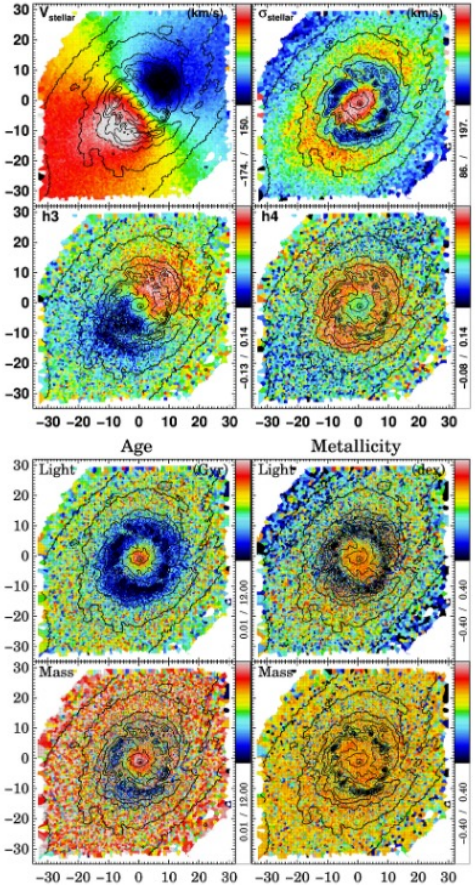


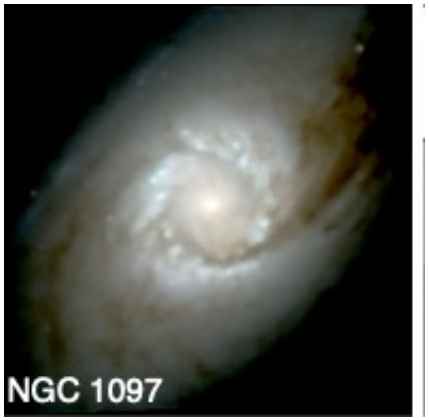
Leanza et al. 2021, sub.

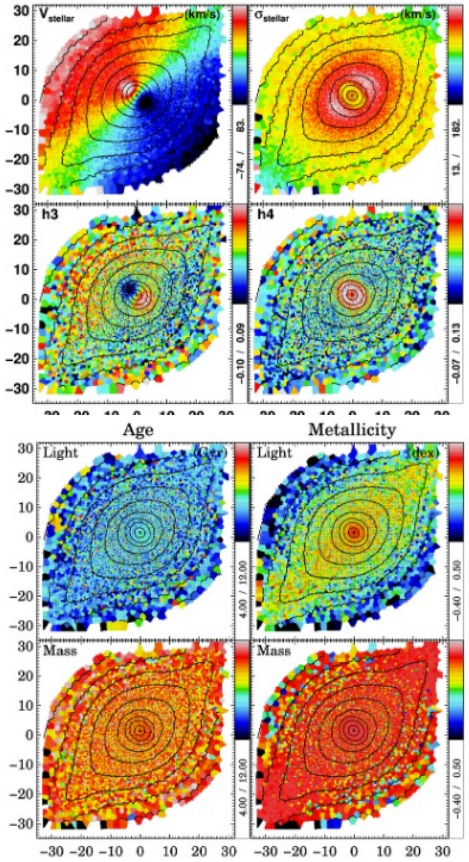
Science with MUSE: Galaxy evolution

- TIMER Survey: cosmic epoch of disk and bar formation

  24 nearby barred galaxies with prominent central structure (i.e., nuclear rings and disk)







Gadotti et al. 2018