



# HW&SW Strumentale (Monitoring & Control)

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# Previous projects

## TNG

- Tracking Control Az, Alt, Rot (x2)
- M3 Control
- Software, Servo Control, Electronics, Integration and Commissioning

## VIMOS

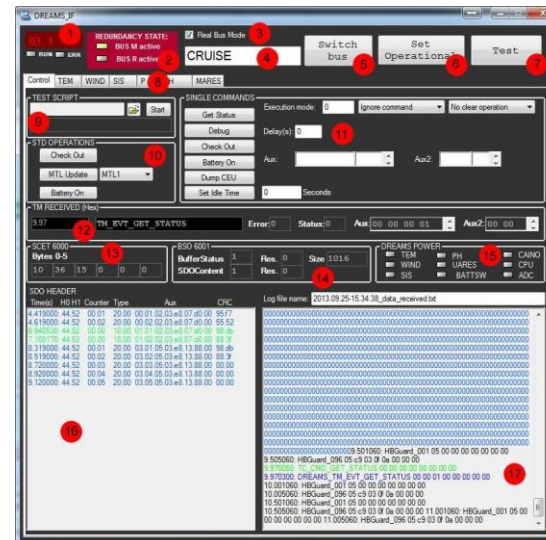
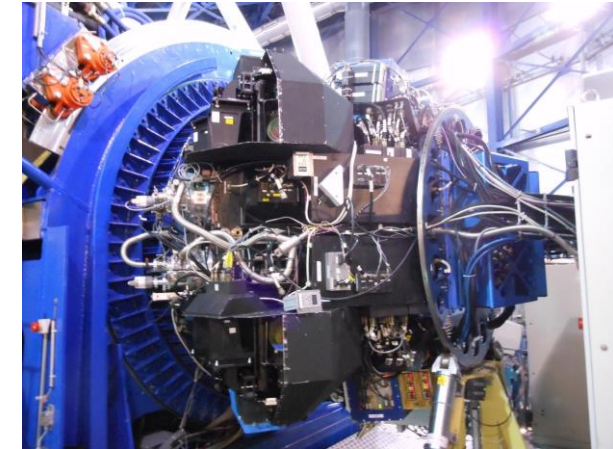
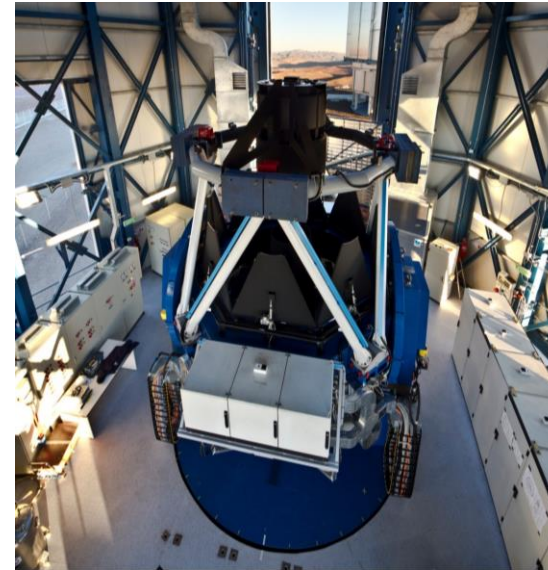
- Real-time control sw of hw functions
- OS, Control Electronics

## VST

- Point&Track (Az, Alt, Rot, AG) SW
- AO (WFS, M1, M2), ADC, Probe SW
- Etc...

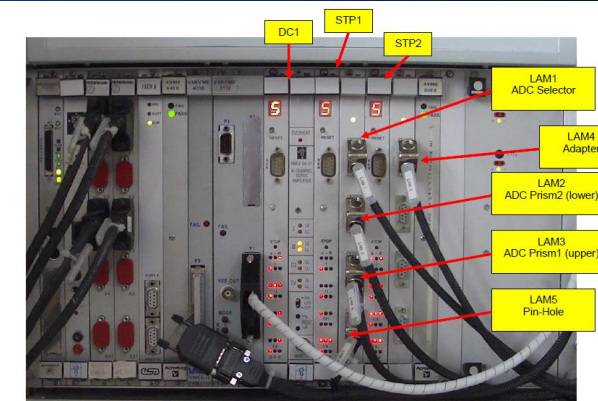
## ExoMARS DREAMS

- Space EGSE, Data Handling & Archiving



## From the (old) ESO standards

- VME bus
- Real-time VxWorks
- Etc...



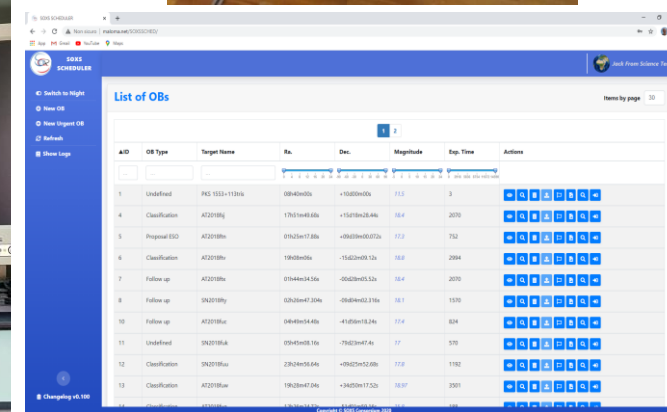
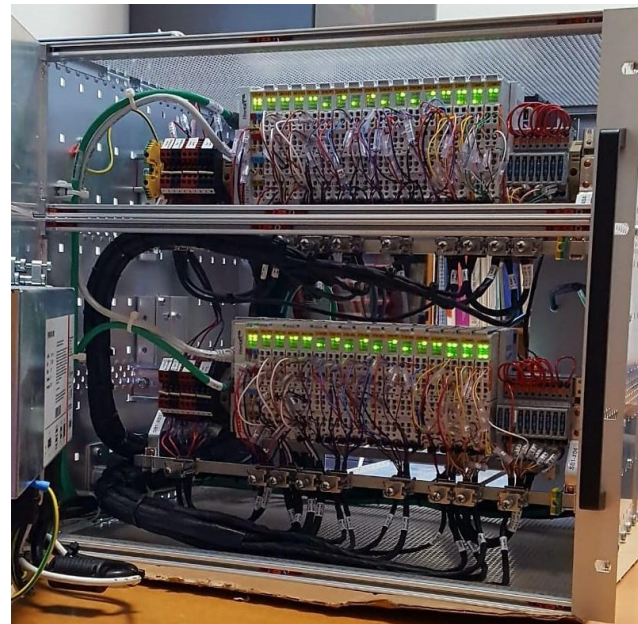
## To the new Beckhoff PLC architecture

- EtherCAT fieldbus
- TwinCAT software
- NC PTP axis positioning software
- OPC-Unified Architecture (OPC-UA) communication protocol



## SOXS

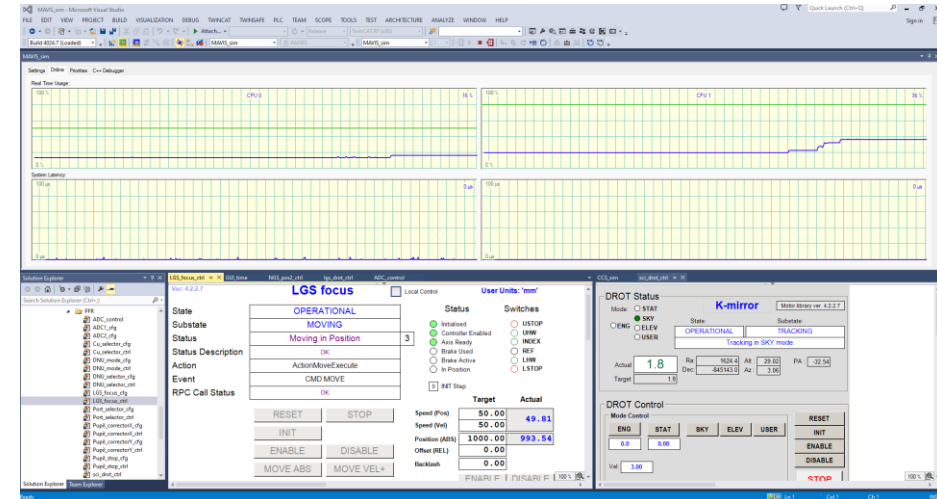
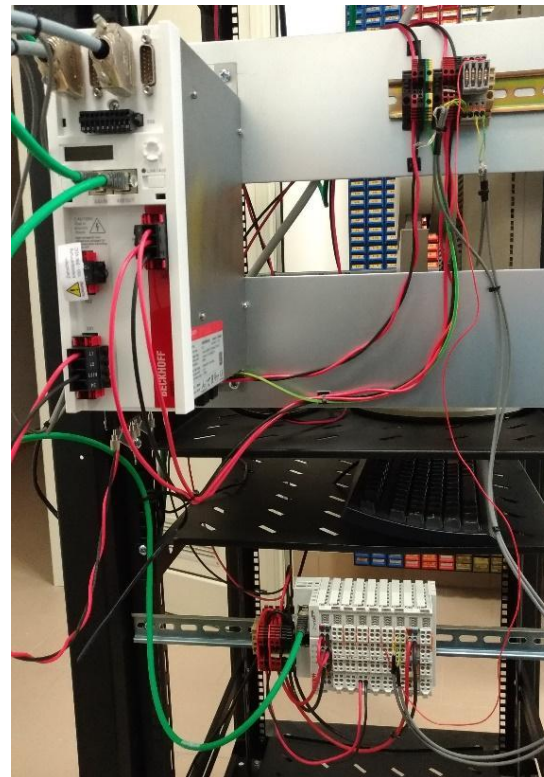
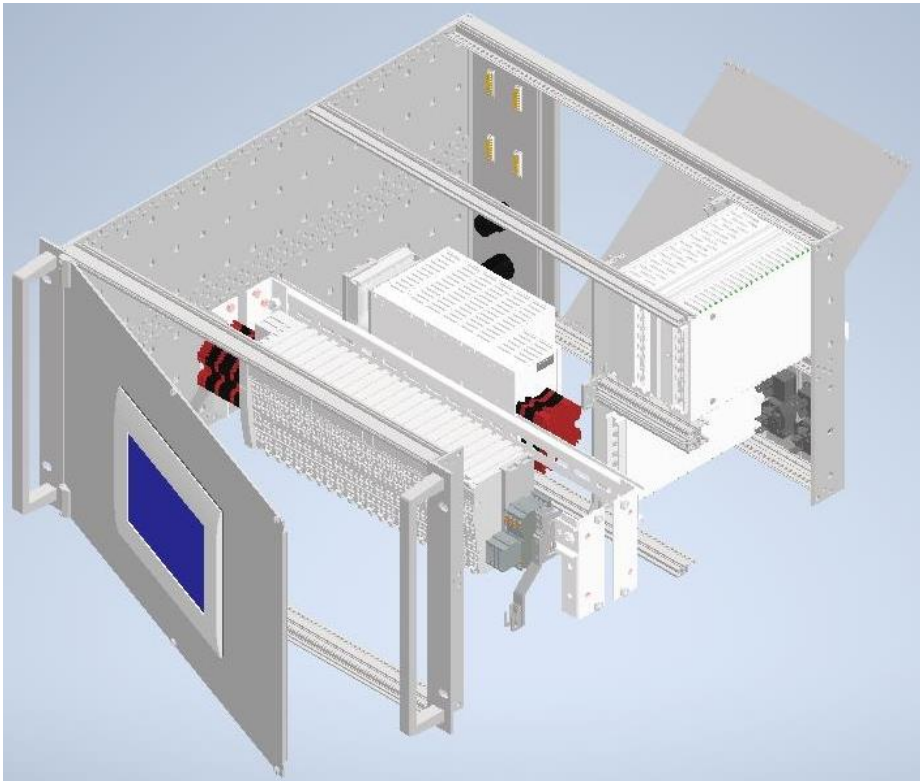
- Control Electronics
- Integration and future commissioning
- OB Scheduler - led by M. Landoni (INAF Brera)
  - Control of the telescope operations
  - Remote scheduling



AID	OB Type	Target Name	Ra.	Dec.	Magnitude	Exp. Time	Actions
1	Undefined	PGC 1551-1131a	09h45m00s	+15d02m00s	15.5	3	[Buttons]
4	Classification	AZ2018q	17h51m41.60s	+15d01m28.46s	16.4	2070	[Buttons]
5	Proposed STD	AZ2018m	01h23m17.80s	+08d01m05.070s	17.0	750	[Buttons]
6	Classification	AZ2018m	19h03m00s	+15d02m10.13s	16.9	2894	[Buttons]
7	Follow-up	AZ2018m	01h44m44.56s	+05d02m05.53s	16.4	2070	[Buttons]
8	Follow-up	SN2018by	08h20m47.320s	+08d04m03.370s	16.1	1070	[Buttons]
10	Follow-up	AZ2018m	04h48m54.60s	+15d01m18.13s	17.4	624	[Buttons]
11	Undefined	SN2018ba	09h54m08.10s	+79d02m47.46s	17	570	[Buttons]
12	Classification	SN2018m	23h24m16.64s	+08d07m52.08s	17.9	1762	[Buttons]
13	Classification	AZ2018m	19h23m47.20s	+34d02m17.52s	16.97	2070	[Buttons]

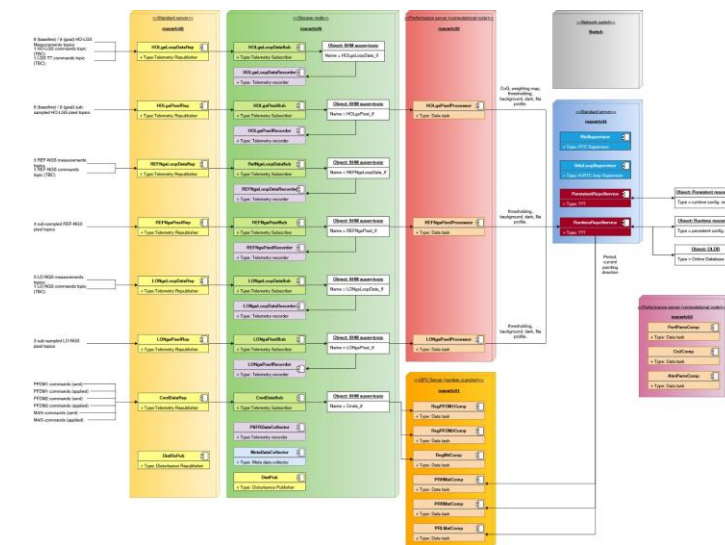
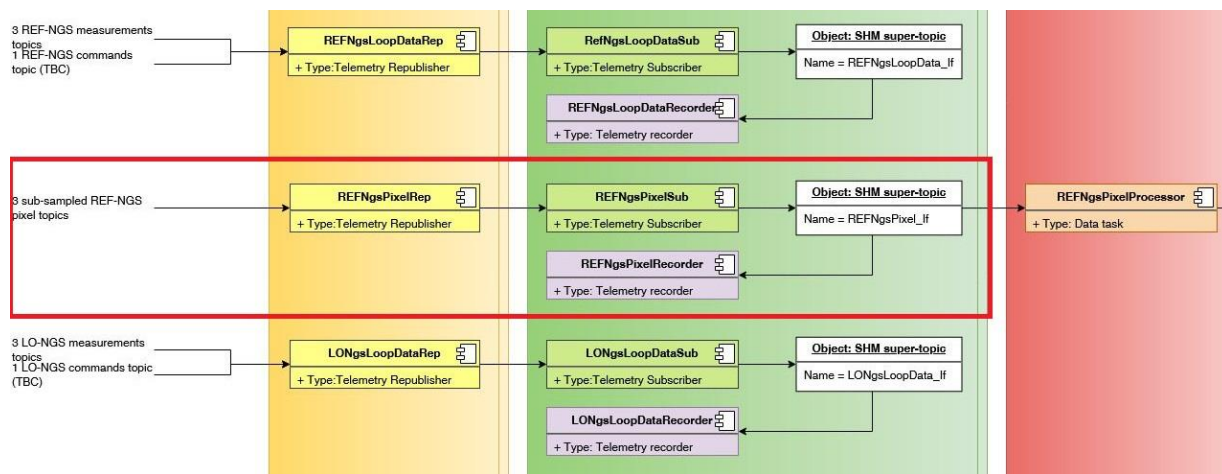
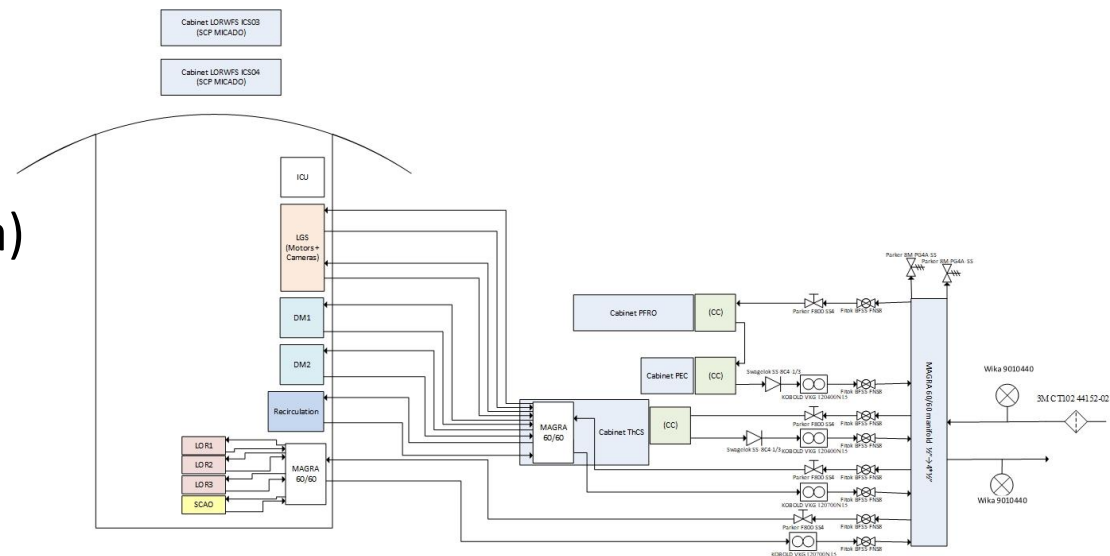
## MAVIS

- AOM Control Electronics
- Instrument Control SW - led by B. Salasnich (INAF Padova)



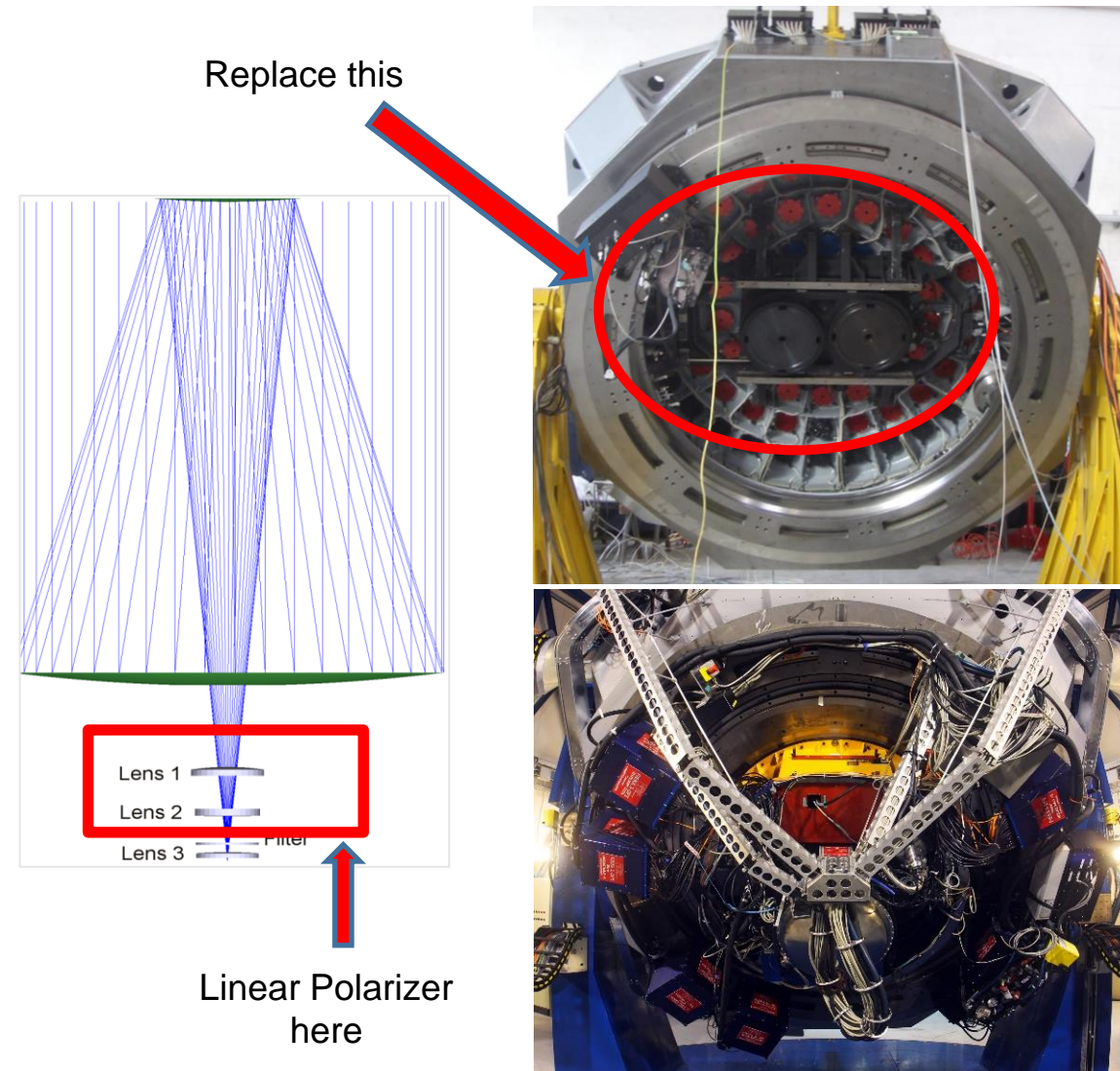
## MAORY

- Instrument Control SW - led by B. Salasnich (INAF Padova)
- SoftRTC development - led by A. Baruffolo (INAF Padova)



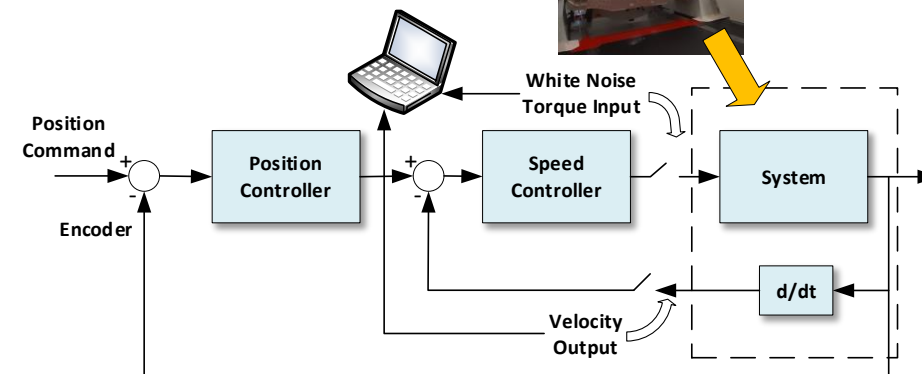
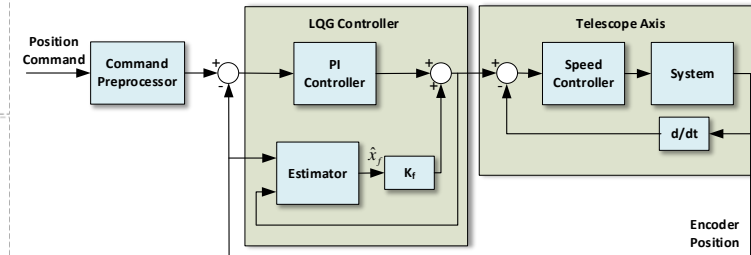
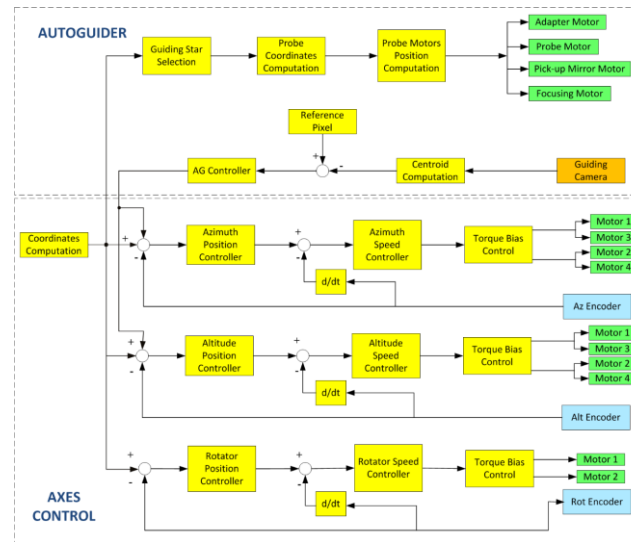
## VST POLARIMETER

- PNRR CTA+
- First large polarimetric optical survey telescope, without affecting the current VST+OmegaCAM system
- Follow-up of CTA sources and transients, polarisation measurements of bright transients

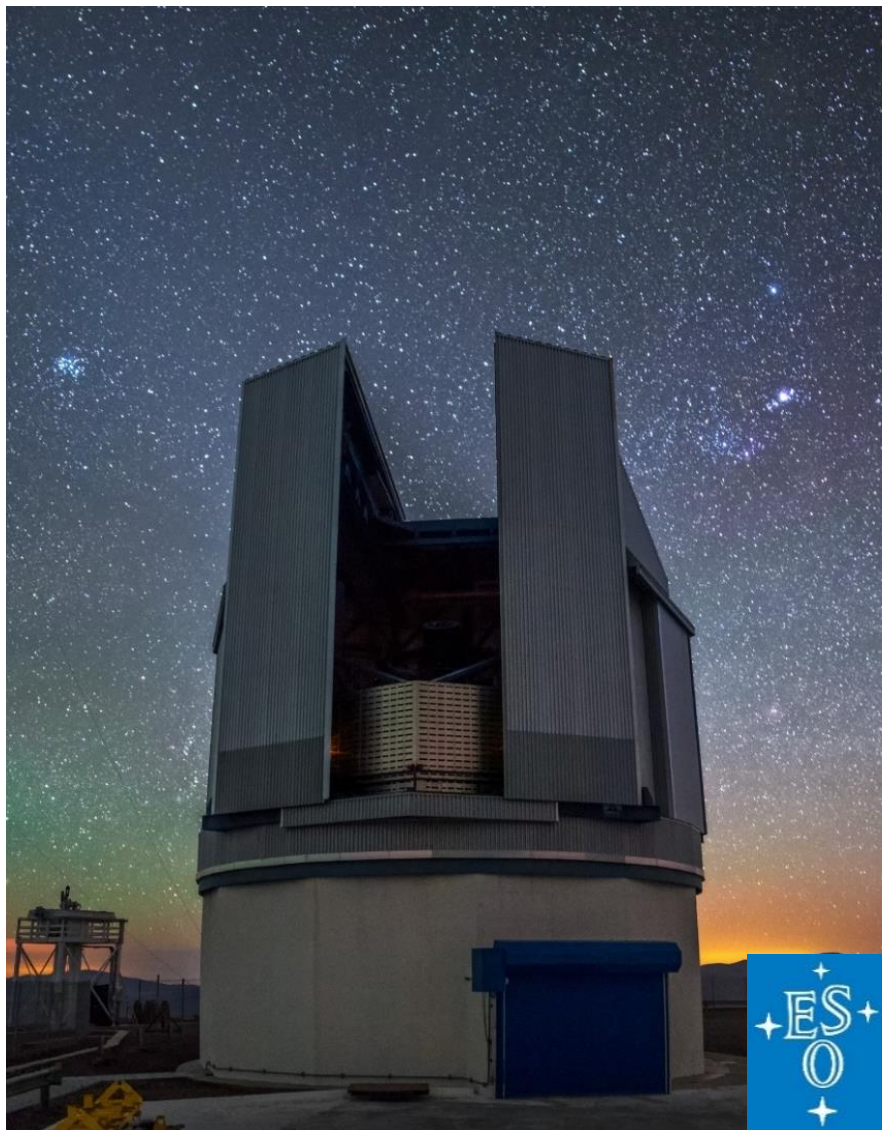


## Control Engineering

- Inside Telescope Control Software
- Uses Telescope Control Electronics
- System Identification
- Control Scheme
- Design and implementation of controllers
- Prototyping new control strategies
  - Command shaper
  - LQG Control
- Tightest requirements for optical telescopes
- Done for major INAF optical telescopes (TNG, VST)
- *Sets the telescope performance*







GRAZIE DELL'ATTENZIONE