

CALERN OBSERVATORY



BASIC FACTS

- ❑ Two DSI observing campaigns: 2015 and 2016
- ❑ Former observing site of **CERGA**
(*Centre d'Etude et de Recherche en Géodynamique et Astrométrie*).
- ❑ Created in 1974.
- ❑ Now part of *Observatoire de la Côte d'Azur* (OCA) since 1988.
- ❑ 400 hectares **karstic** plateau
Latitude: $43^{\circ} 45' 13''$ N
Longitude: $6^{\circ} 55' 23''$ E
Altitude: 1270 m
- ❑ Inside a **protected** natural park.
- ❑ **Semi-open** site
(accessible to hikers, shepherds, ...)



BASIC FACTS

- ☐ Instrumental and fundamental research and R&D in:
 - solar physics,
 - geodesy, seismology,
 - astrometry,
 - fundamental physics (relativity)
 - planetary and exoplanetary science
 - time and space metrology
 - ...
- ☐ Several **industrial partners** (Airbus, Onera, Thalès)
- ☐ Several **scientific collaborations** (SYRTE, LATMOS, IMCCE, CNES, ...)
- ☐ **Training periods for students from** French and foreign universities (C2PU)
- ☐ On-site accommodation capabilities:
~ **20 persons**



STATISTICS

- ❑ 210 night with at least 2 hours clear (70% of which are totally clear)
- ❑ 100 night suitable for stellar interferometry
- ❑ From June to October
 - 50% of clear night have seeing $< 1.25''$
 - 20% of clear night have seeing $< 1''$
 - Strong ground layer contribution (11% in the 8 first meters)

Source: D. Bonneau, *J. Astr. Franç.*, no52, 1996
statistics over the period 1985-1995.

CATS: a new turbulence monitor facility at Calern
(operational since late 2015; no statistics published yet)

FLYING OVER CALERN...



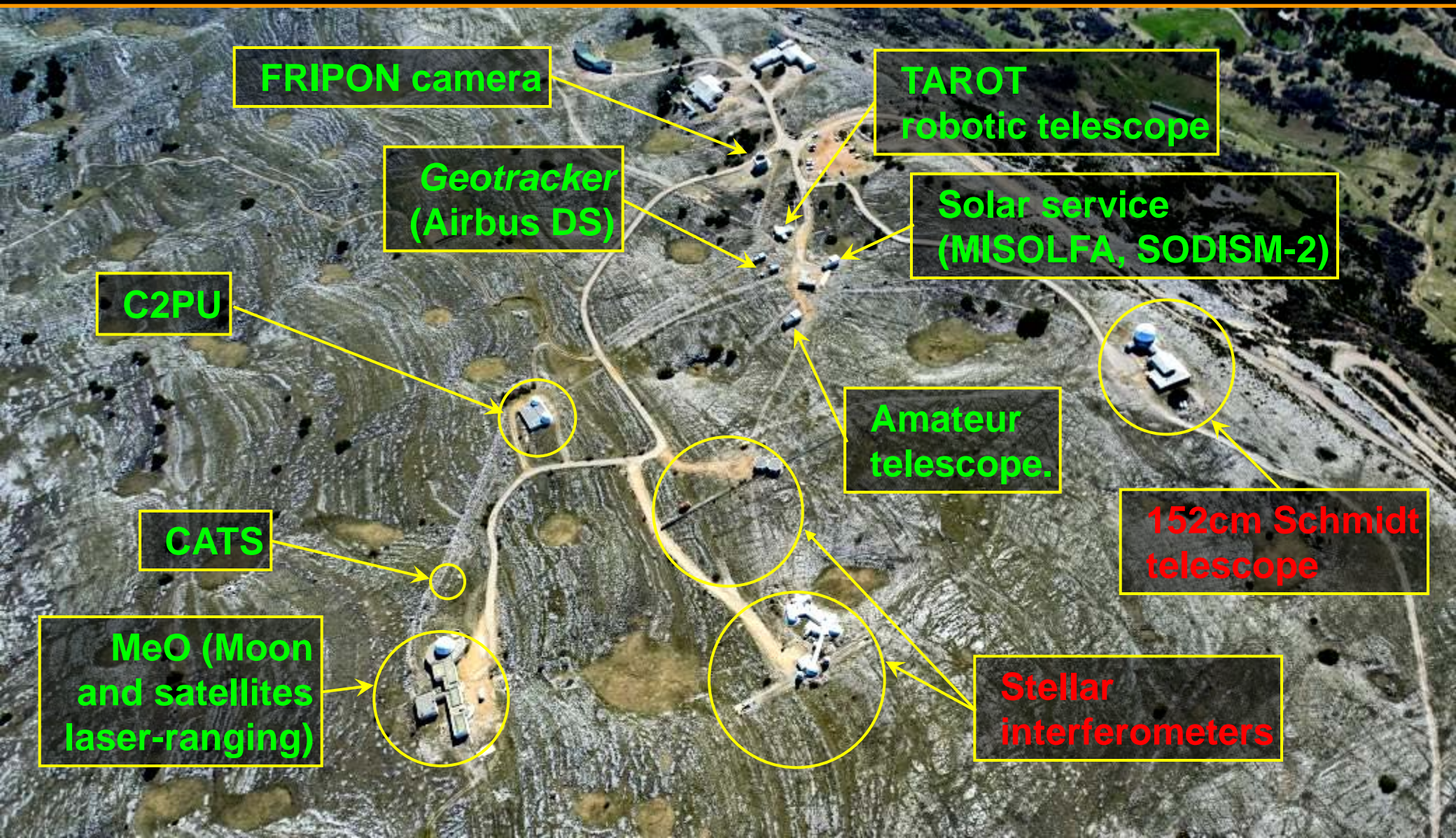
FLYING OVER CALERN...



C2PU

MeO (Moon
and satellites
laser-ranging)

FLYING OVER CALERN...



THE « MeO » FACILITY

MeO = « **M**é**tr**ologie **O**ptique »
(Optical Metrology)

❑ Instruments:

- 1.54 m F/20 refractor on alt-az mount
- **FTLRS**: French **T**ransportable **L**aser **R**anging **S**tation

❑ Main science cases:

- Moon and satellite laser ranging
- Geodesy
- Fundamental physics (relativity)
- Space situational awareness
- Space and time metrology
- Adaptive optics for moving targets
- R&D in Optical Telecommunications
- ...

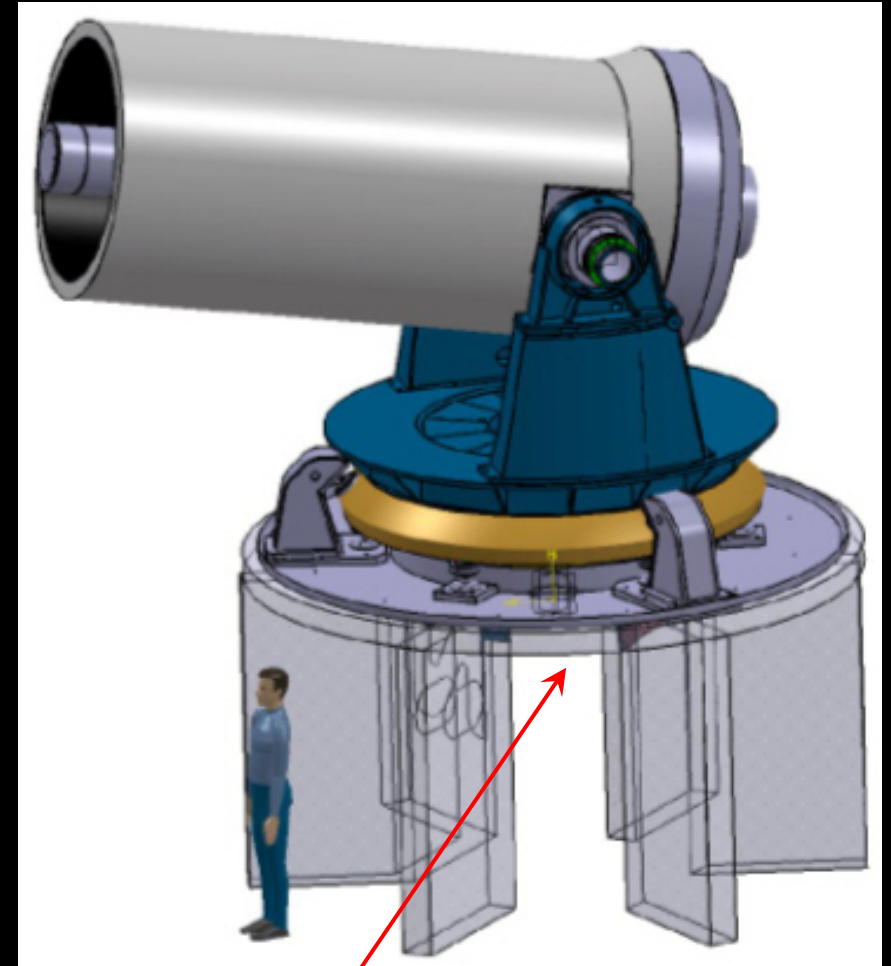
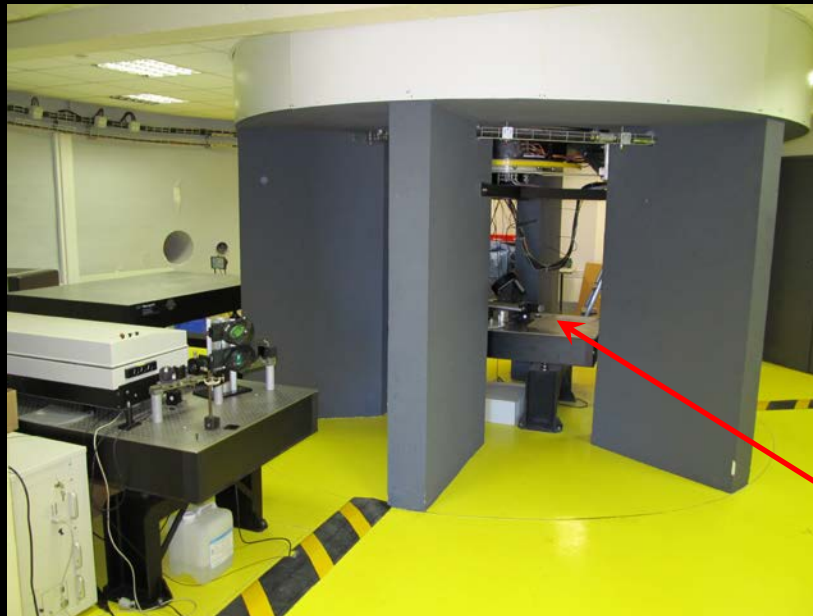
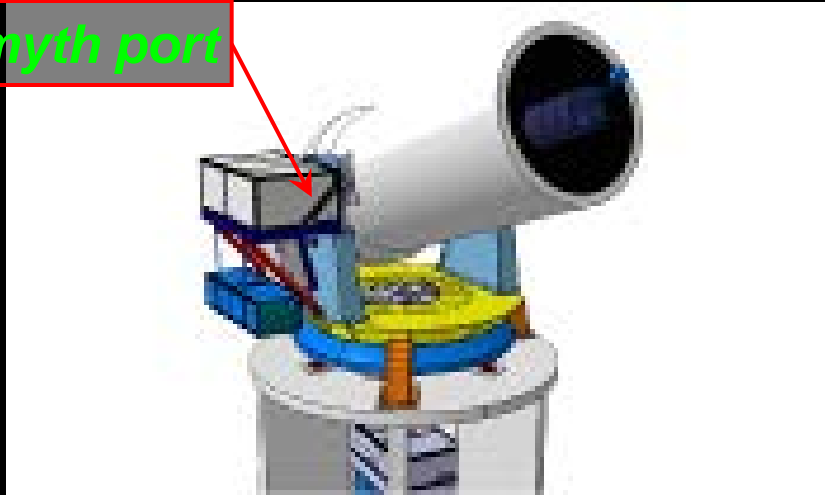


THE « MeO » FACILITY



THE 1.5 m TELESCOPE

Nasmyth port

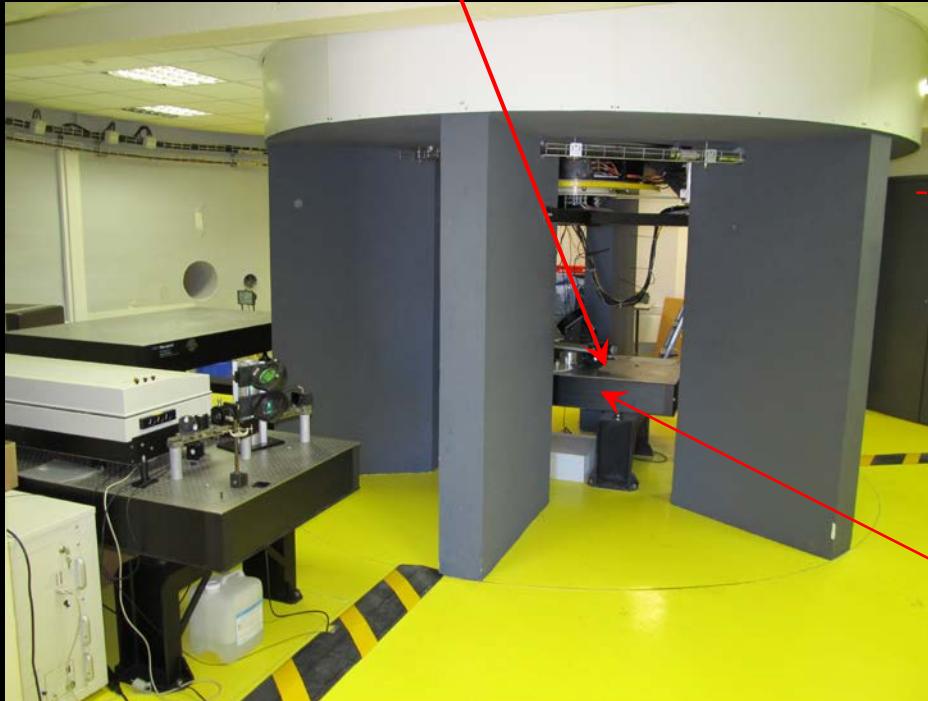


Coudé focus

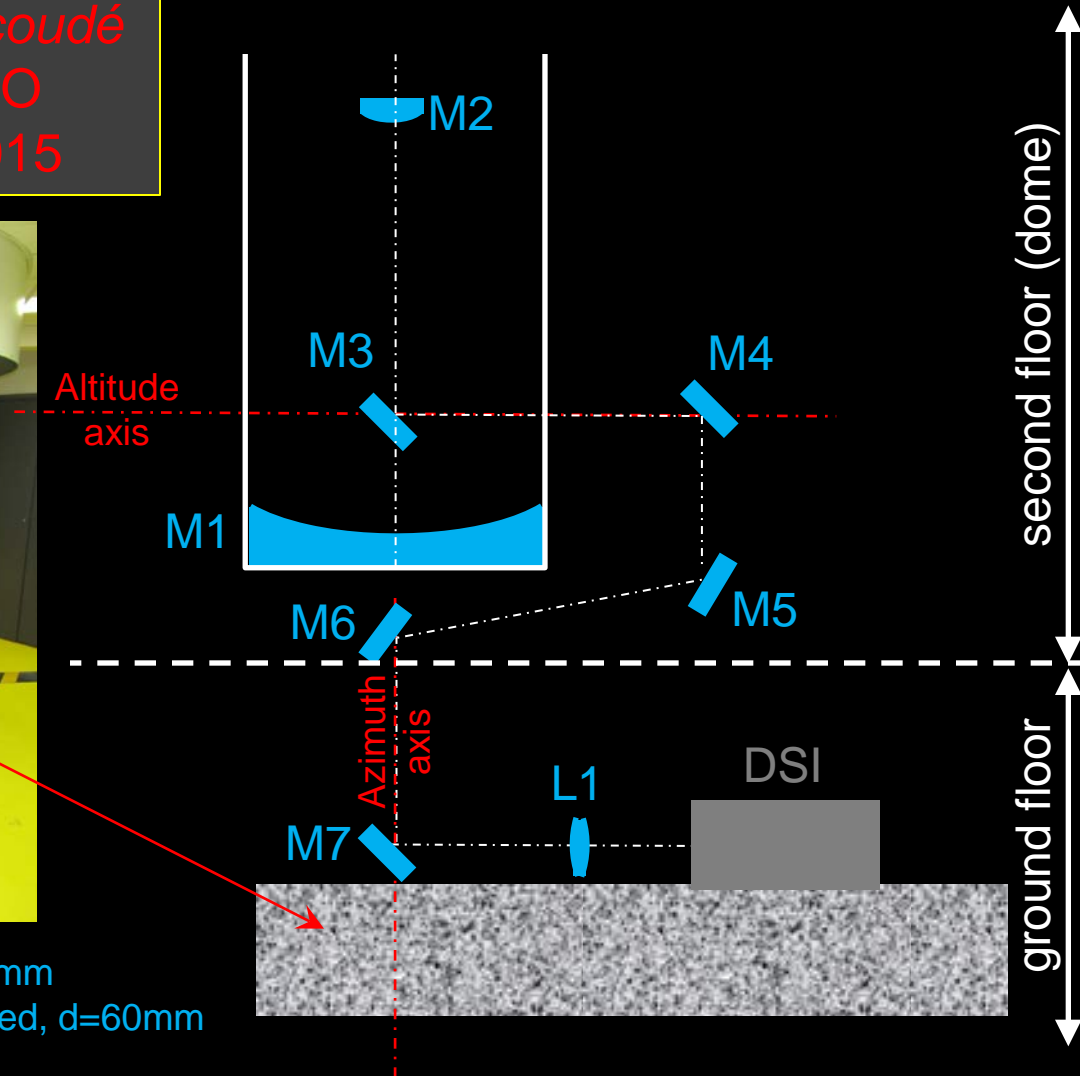
DSI AT THE COUDÉ FOCUS

Coudé focus

DSI at the *coudé*
focus of MeO
in March 2015



L1: Achromat $F=1200\text{mm}$
Output beam: collimated, $d=60\text{mm}$



THE « C2PU » FACILITY

<https://c2pu.oca.eu/>

C2PU = « **C**entre **P**édagogique **P**lanète et **U**nivers »
(Center for planetary science and astronomy teaching)

❑ The goals:

- **Scientific Research** in astrophysics
- University and pre-university teaching

❑ The facility:

- **Two 1 meter telescopes** in yoke mount recently refurbished:
 - 2012 for the West telescope;
 - 2015 for the East telescope.
- **Three optical configurations**

❑ The team:

- Lyu ABE, Philippe BENDJOYA, Jean-Pierre RIVET, Olga SUAREZ (scientists)
- Cécile DIMUR, David VERNET (engineers)



THE « C2PU » FACILITY

<https://c2pu.oca.eu/>

❑ Research programs:

- Asteroids polarimetry
- Speckle interferometry for binary stars (PISCO)
- GAIA targets follow-up
- Exoplanets transits
- Asteroids photometry and light curves inversion.
- **Seismology of Jovian planets (DSI)**

❑ Education:

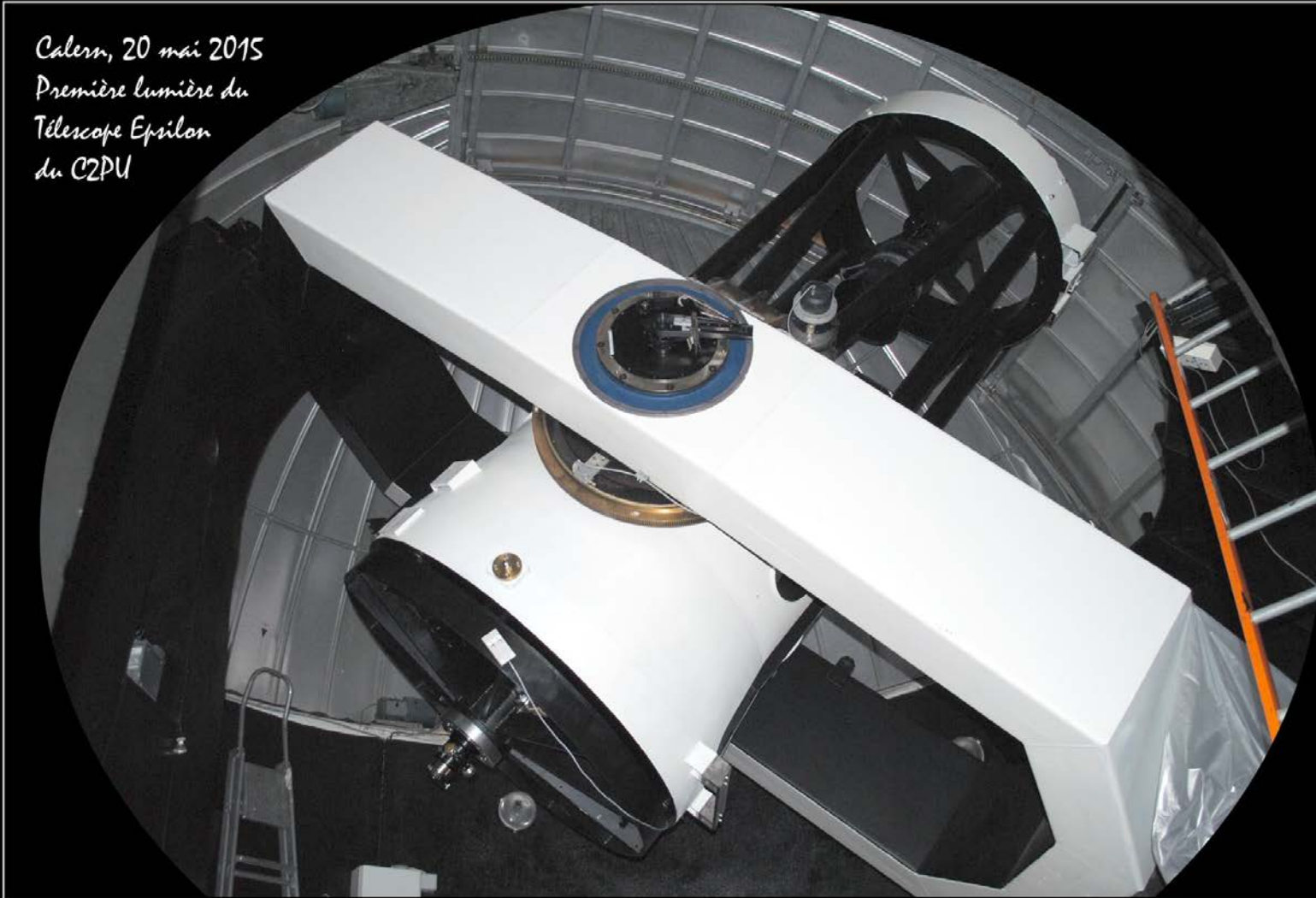
- 1 week training periods for Master students (Cork, Liège, Oldenburg, Nice, ...)
- **Educosmos** program (remote mode observations for school pupils in France and Italy).



EPSILON@C2PU

<https://c2pu.oca.eu/>

*Calern, 20 mai 2015
Première lumière du
Télescope Epsilon
du C2PU*



C2PU OPTICAL CONFIGURATIONS

<https://c2pu.oca.eu/>

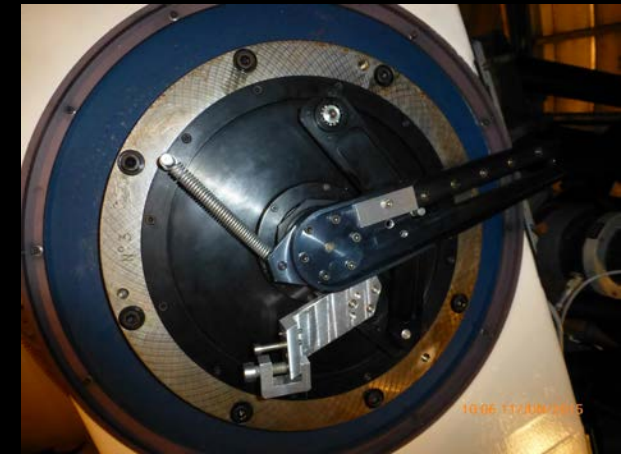
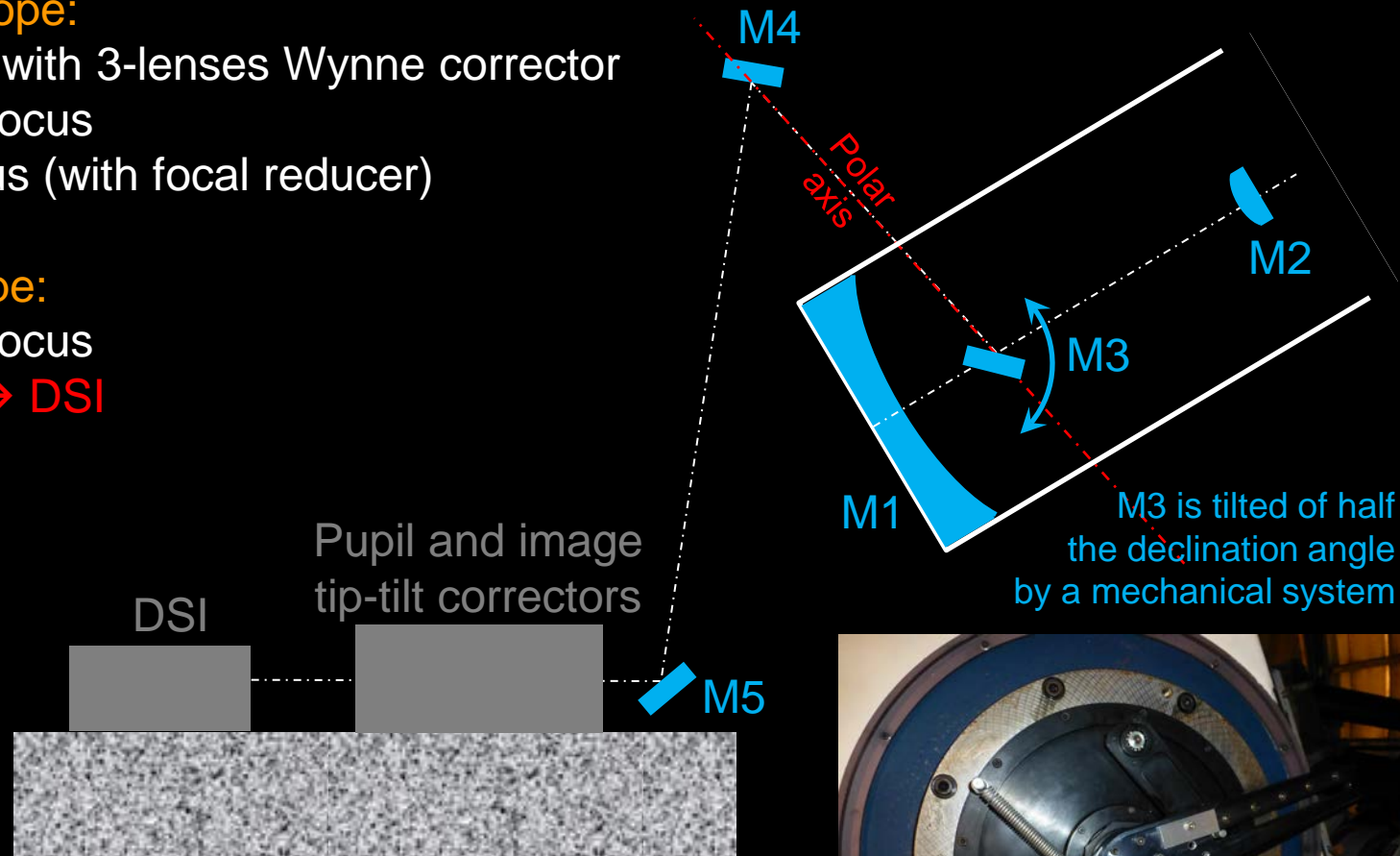
❑ West “Omicron” telescope:

- F/3.2 primary focus with 3-lenses Wynne corrector
- F/12.5 Cassegrain focus
- F/9 Cassegrain focus (with focal reducer)

❑ East “Epsilon” telescope:

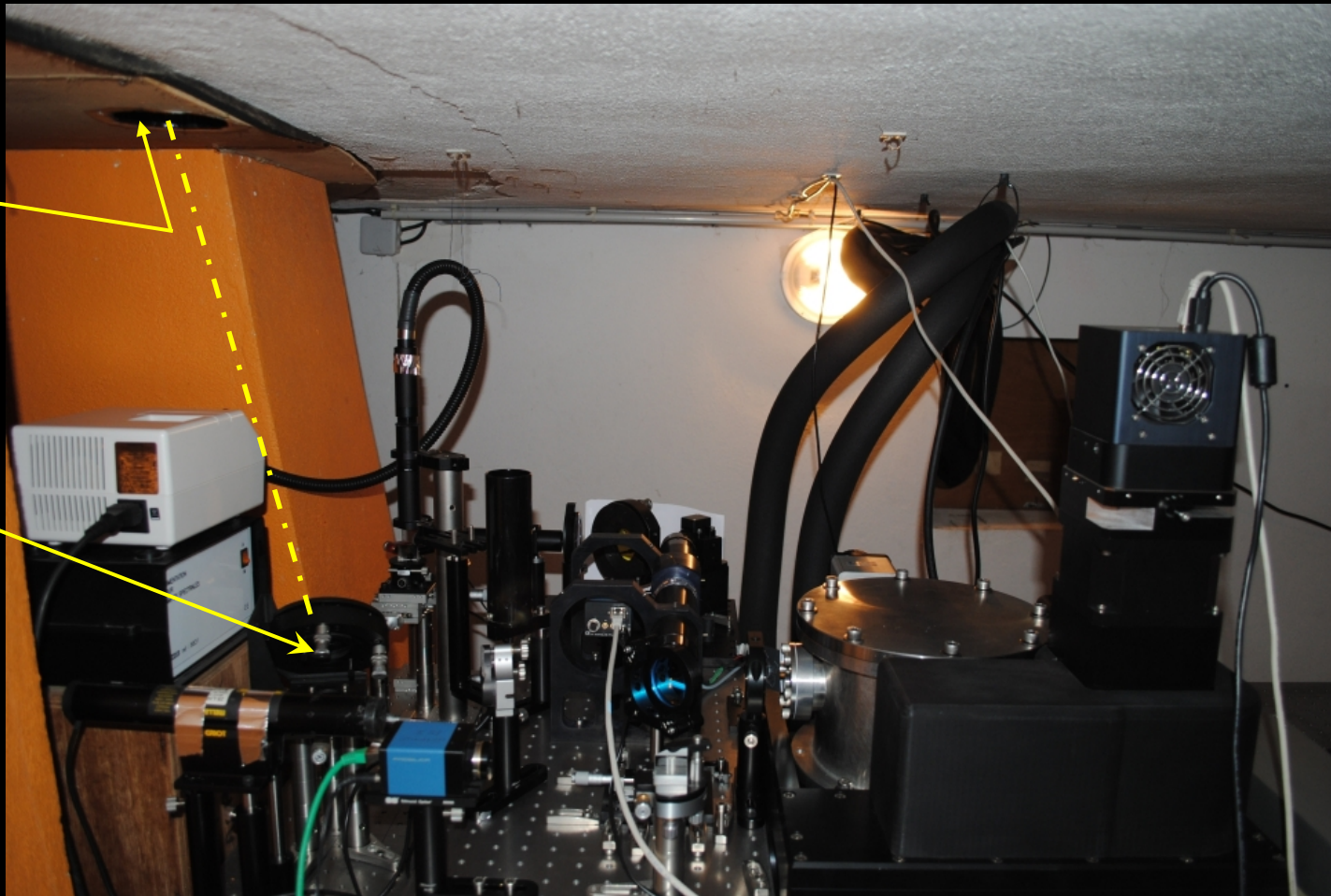
- F/12.5 Cassegrain focus
- F/35 *Coudé* focus → DSI

DSI at the *coudé*
focus of C2PU
in March 2016



DSI AT C2PU

<https://c2pu.oica.eu/>



M20 nebula, C2PU West telescope, August 2012

THANKS FOR YOUR
ATTENTION !