

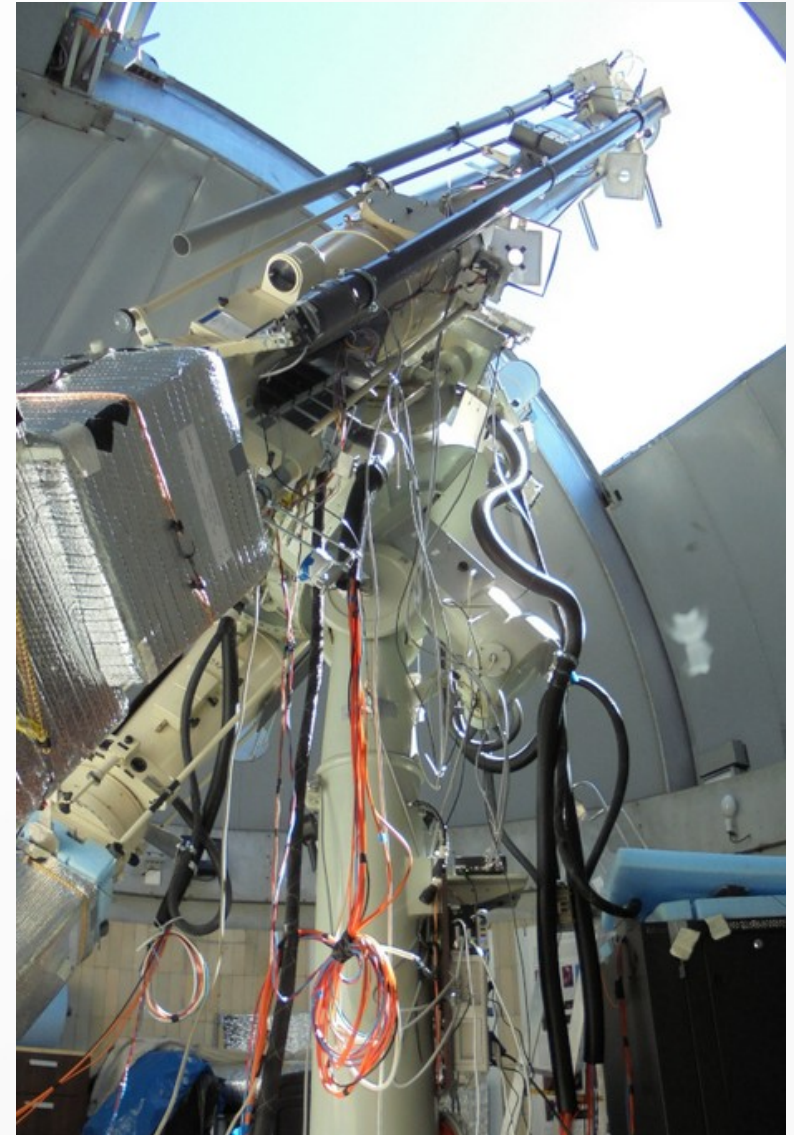
# Lomnický štít Observatory: last two years - 2022-2023

J. Rybák on behalf of the LSO group



# Content:

- Introduction
- LSO specialties
- new highlights
- other new things
- regular tasks
- instruments/projects
- observations
- public relations
- plans for next two years and for later
- how to follow us
- (a virtual guided tour)



# Introduction:

- Why such talk?
- Previous talks:
  - 2022/02/23 'LSO: last two years - 2020-2021'
  - 2020/02/05 'LSO: last two years (2018-2019)'
- About the last two years, not a general information about the LSO
- Presenting of behalf of the LSO group: J. Ambroz jr., J. Ambroz, F. Budzak, P. Gomory, M. Hutar, J. Rybak, P. Schwartz, M. Trembac, Z. Vashalomidze
- With direct support of other AISAS staff: Z. Petrova, R. Komzik, J. Klein, S. Irha, D. Jendrejcek, V. Dubjel, and some others...

# LSO: specialties

- Separation: no road, cable car only
- Weather: limitations for observations as well as transportation
- Extreme conditions → security + prophylactics:
  - observers also as security officers
  - "own" handyman
- High altitude:
  - air pressure: ~72% of the nominal value
  - saturation level of oxygen in blood: 95+ % → LSO: 1<sup>st</sup> day ~85% → ~90%
- Two owners: AISAS + IEP
- TMR advertisement of the Lomnický štít

# LSO: last 2 years + actual status

- **Last 2 years:**

- January 2022 - December 2023: **period of regular observations**
- few days of maintenance periods
- several days without duty stays (3 instead of 4 observers)

- **Actual status:**

- in regular service, full time coverage (since 2024/01/01)
- Instruments in action: CoMP-S + UJ2P: 3 chromospheric and 1 coronal line
- instrumental projects in progress: CoMP-S, UJ2P, SCMP, AISAS Mechs, SLED, dome rotation, LSO pipeline, LSO archive
- other projects in plan: testing diffraction grating spectrograph, SCD, dome “a la THEMIS”

LSO: last two years - 2022-2023

**Highlights & new things**

# LSO: 2022-2023 highlights

- **Dome:** slit brushes, automatic dome rotation, webcams
- **Instruments:** new version of the UJ2P pointing system
- **Observations:** operation from office for (almost) whole day
- **Building:** repairs of NW wall, water ingress into the building
- **Heating:** optimization
- **New observers:** Jakub Ambroz, Zurab Vashalomidze

# LSO: other new things

- **Diesel generator:** air ducting, electronics improvements, insulation
- **Workshop:** welding hanger, iron rod, lathe and milling machine OK
- **Server room:** new double floor, air flow improvement, data arrays to SL
- **Internet link:** mechanical improvements, new location at the LSO
  
- **New AISAS Mechanisms:** development → the first test at the LSO
- **CoMP-S instrument:** maintenance, improvements, 'speaking', CoMP-S~UJ2P cooperation, chip correction + the polarimetric calibration in development
- **LSO data handling system:** sw + hw, LSO data archive in development



# LSO: regular tasks

- **Prophylactics:** dome and its slit, building roof and walls, windows, mount, server room air ducting, diesel generator, water tanks, server room cooling external unit
- **Public relations:** Open house days, TMR apartments guests, excursions, guests for night, media, dome open and coronagraphs following the Sun (when possible)
- **Education:** student stays, school, TVT (Science and Technology Week)

# LSO: dome

- **Problem of the snow entering the dome:**
  - consequence of solving the problem when the slit motion was damaging the dome outer metal sheets



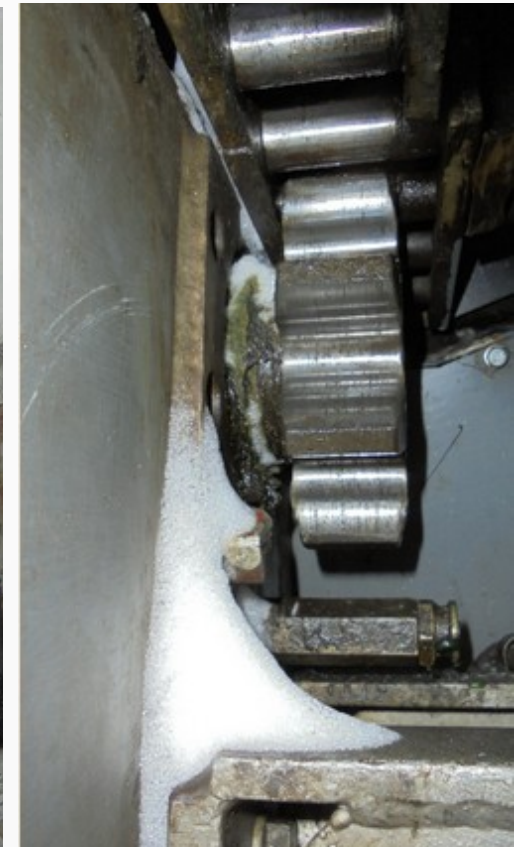
# LSO: dome

- **Problem of the snow entering the dome:**
  - consequence of solving the problem when the slit motion was damaging the dome outer metal sheets
  - previous solution: temporal cloth filling the slit/dome interface from inside



# LSO: dome

- **Problem of the snow entering the dome:**
  - consequence of solving the problem when the slit motion was damaging the dome outer metal sheets
  - new solution: permanently fixed brushes from outside



# LSO: dome

- **Problem of the snow entering the dome:**
  - consequence of solving the problem when the slit motion was damaging the dome outer metal sheets
  - new solution: permanently fixed brushes from outside + 2 additions → ?



# LSO: dome

- **Automatic dome rotation:**

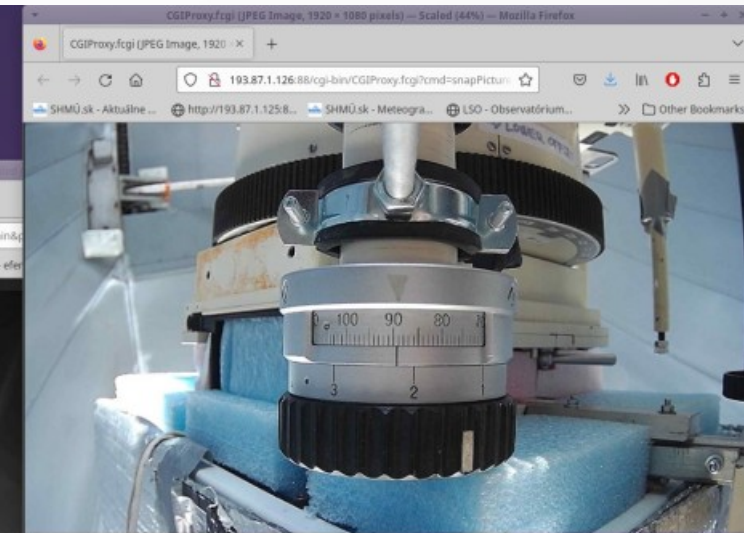
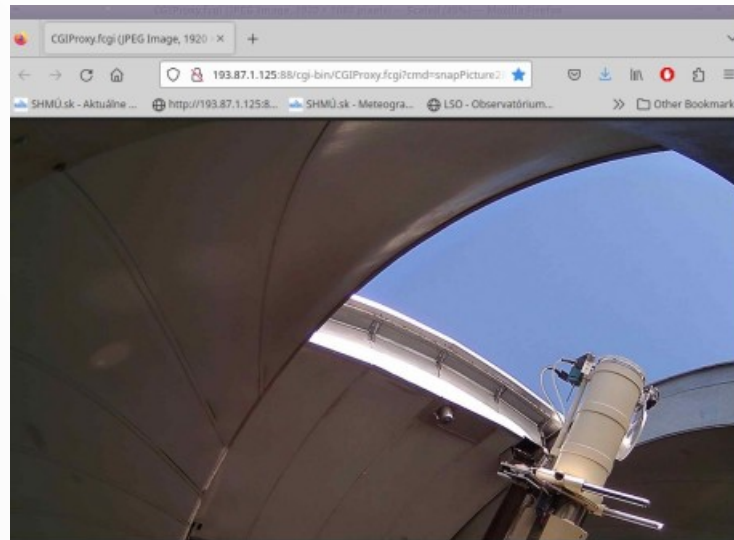
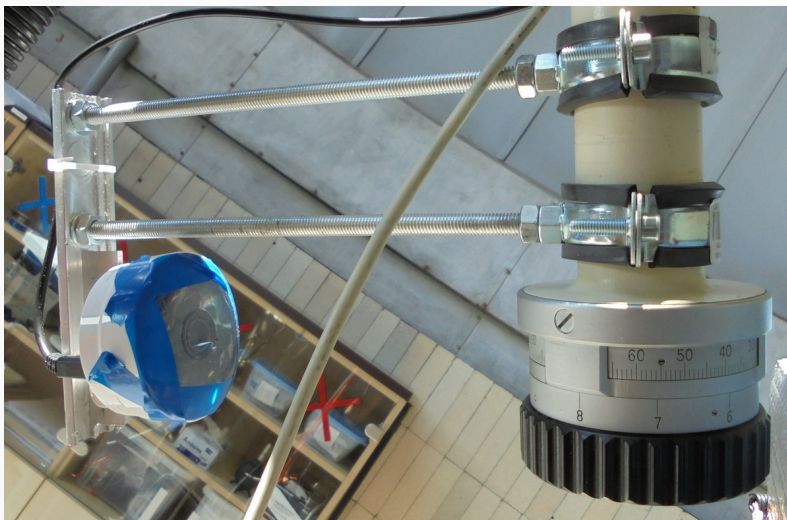
- Version 1 finished: the coronagraphs pointed to the Sun, hour drive (uhrgang) started -> the slit position in azimuth adjusted and the automatic dome rotation switched on, step-by-step revolution
- The original el. motor + frequency converter + ARDUINO based electronics + programming
- 1 coronagraph for the whole day: OK
- Version 2 in preparation: adding precise control of the dome revolution → 2 coronagraphs for the whole day



# LSO: dome

- **Webcams in the dome:**

- Online control of the critical things from the heated office: clouds + the AISAS Mechanisms – focus and diffuser



# LSO: UJ2P pointing system

- UJ2P system = Uhrgang + Jahrgang + Positioning + Pointing system: pointing of coronagraph to the disk center correcting for imperfections of the hour-drive and for the coronagraph tube structure deformation changing during the day





# LSO: UJ2P pointing system

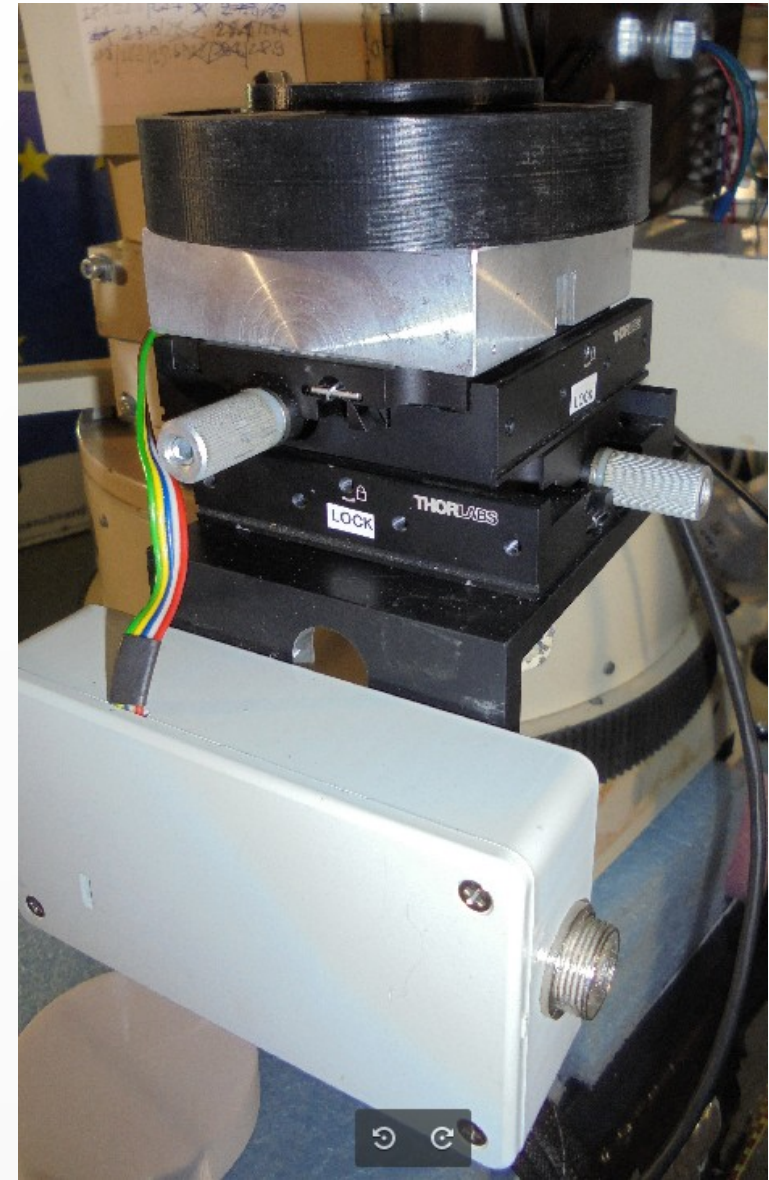
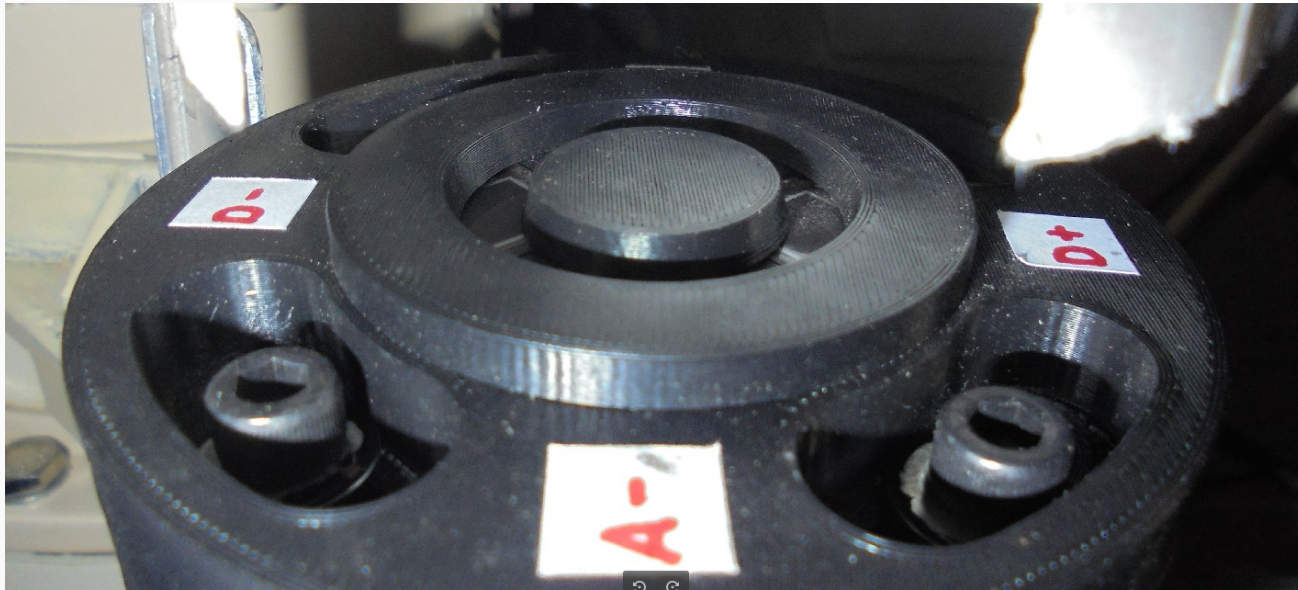
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# LSO: UJ2P pointing system

- **New version developed:** significant HW upgrade!
  - NEW: new photodiodes, new diode head with 2 masks, new ADC, digital signal over the entire transmission channel, electronics prepared for both L+R coronagraphs, new large box for electronics mounted to the mount pillar
  - Photodiodes: type First Sensor PS100-6b – larger detector area, higher sensitivity in a larger wavelength range (400 - 950 nm), very short scanning time (200 ns)
  - ADC: type ADS1015 with 12 bits resolution, voltage range set to  $\pm 1.024$  V, 1 step (1 bit) corresponds to 0.5 mV
  - Data transfer: via an I2C-compatible serial interface
  - Electronics for both L+R coronagraphs in a new large box
  - **Now in the testing already for a month**

# LSO: UJ2P pointing system



# LSO: UJ2P pointing system

The screenshot displays the control software for the LSO UJ2P pointing system. The interface is organized into several functional panels:

- Top Panel:** Includes system status indicators such as 'SOUND' (muted), 'CLOUDS DET.' (active), 'AUTOBALANCE' (active), and 'LOOPBACK' (active). It also shows 'CloudDet Active', 'AutoBal Active', 'Loopback Active', 'Clouds detected', 'R diode cable OFF', 'L diode cable OFF', and 'Alfa limit switch ON'. A 'TOTAL STOP' button is prominently displayed.
- MOVING Panel:** Features a central square with four arrows pointing up, down, left, and right, labeled 'Solar disk to UP side of the image', 'Solar disk to LEFT side of the image', 'Solar disk to RIGHT side of the image', and 'Solar disk to DOWN side of the image'.
- MEASURED VOLTAGES Panel:** Shows four diode voltage readings: 'D- Upper diode' (0.4751 V), 'A- Left diode' (0.479 V), 'A+ Right diode' (0.479 V), and 'D+ Bottom diode' (0.4751 V). A central 'ON' indicator is also present.
- Speed Control Panel:** Contains a horizontal slider for speed control, ranging from 1 to 8, and an 'Auto diode adjustment ADA' button.
- PA Correction Panel:** Displays 'Max. Frozen val. [V]' (0.4824) and 'Threshold val. [V]' (0.4774). It includes 'Sensitivity' settings for 'PA' (-10 [~] 0.005 [V]) and 'PA°' (1 [~] 0.0006 [M]).
- TDMS Panel:** Shows 'Data Logging ON/OFF' status and configuration for the 'Default TDMS path' (c:\Pointer\_logs\_raw\), 'TDMS file name/location' (c:\Pointer\_log...\084551.tdms), and 'VISA port' (COM5).
- Diagrams and Charts:**
  - Difference Chart:** A line graph showing 'Amplitude' vs 'Time' for Delta and Alfa channels.
  - ADC Chart:** Four stacked line graphs showing ADC3 - West - Alfa + 0, +1, +2, and +3 vs 'Time'.
  - Motor Chart:** A scatter plot showing 'Motors in order' vs 'Time'.

# LSO: UJ2P pointing system

- Significant improvement of the performance to the previous versions:
  - Sensitivity: 0.15 "/resolution step (~6 resolution steps / 1")
  - No interferences
  - Doors open for the developments of the on-fly data analysis and the consequent actions of the stepper motors in alpha and delta:
    - "jahrgang" reference
    - cloud detection with an updating reference
    - actions ~ seeing conditions: more advanced algorithms
  - The very first results very promising...

# LSO: observations in action

- **Operation of CoMP-S + UJ2P instruments during observations from the heated office for (almost) whole day:**
  - Automatic dome rotation and webcams
  - Operation of the TARGET and ABSO masks still needs actions in the dome
  - CoMP-S instrument: the CoMP-S operating computer 'speaks' to observer...



[-19°C, +23°C]

→

→



[~20°C]

# LSO: building

- **Repair after repair...**

- Old (except the new windows and the electric central heating boiler)
- Extreme conditions
- A short summer period (June - August only)
- Surprises...

# LSO: building

- **Repair example 1:** a water leakage on the staircase wall





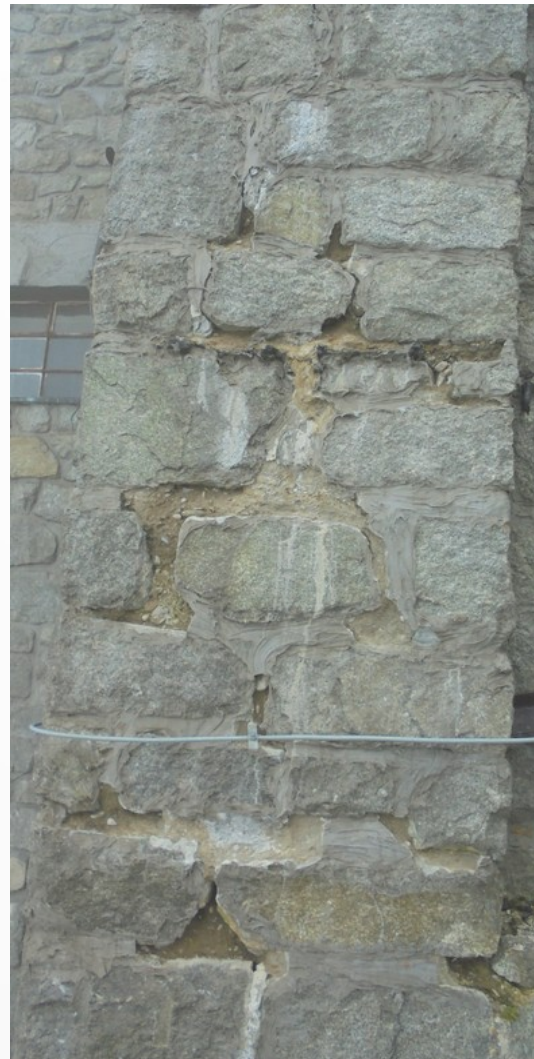
# LSO: building

- **Repair example 1:** the same water leakage again...



# LSO: building

- **Repair example 2:** the NW wall and the N pillar
  - work at height with mountaineering equipment
  - special materials
  - only few days for such work in summer
  - (not sufficiently detail inspection of the walls in previous years...)



# LSO: heating

- **Heating optimization:**

- Own central heating boilers
- No additional costs required, just staff activity needed
- Server room cooling outer unit located inside the building: heat → open staircase
- Manual adjustments of all heaters ~ weather, the staff present @ LSO
- Doors open if possible + windows blinds up
- Actual status:
  - heaters off: all in basement
  - heaters on: kitchen + one bathroom + only the occupied sleeping rooms and offices (+ NW guest room)
  - the typical electrical input of 2 - 11 kW



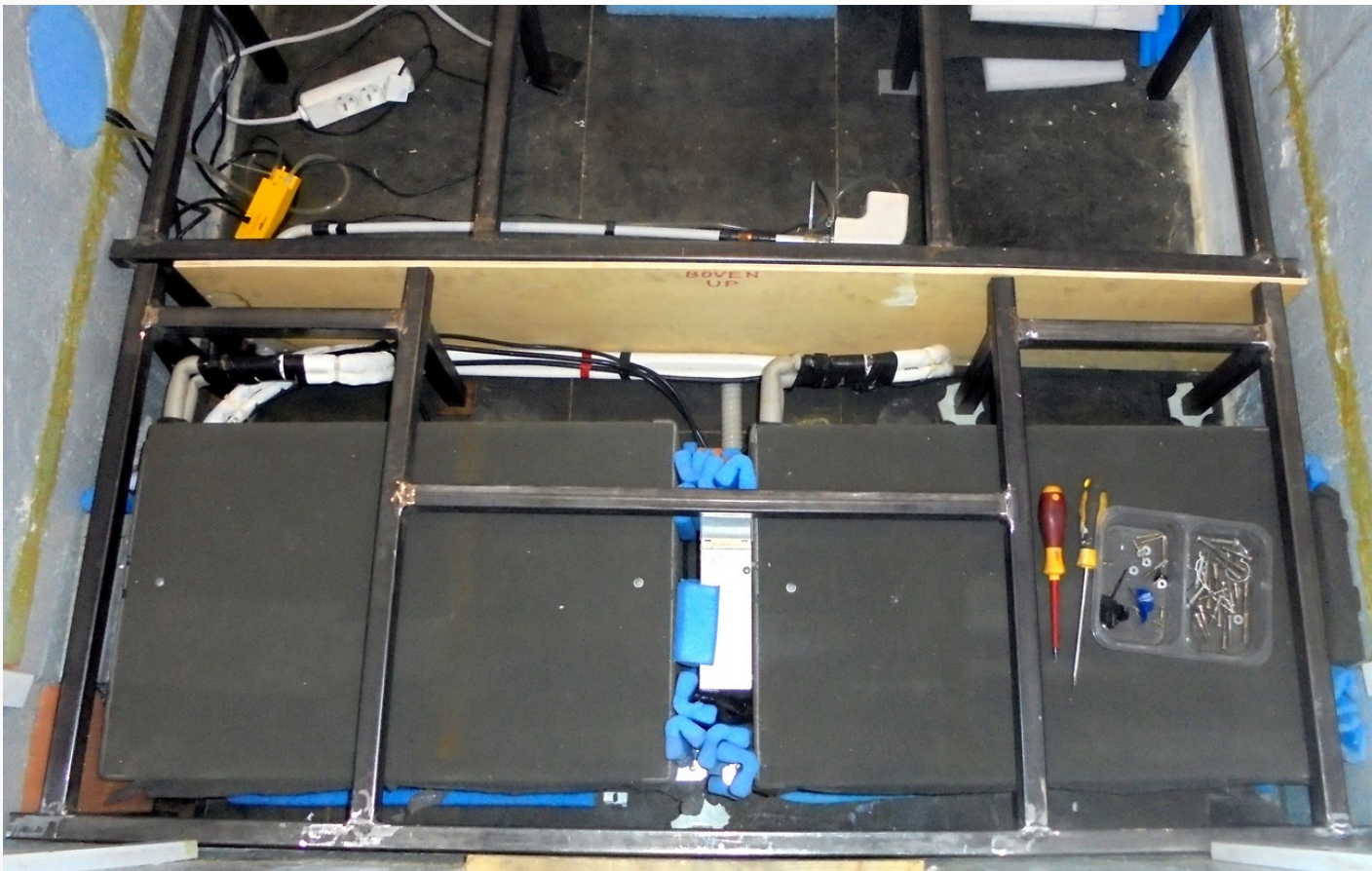
# LSO: server room

- **Server room floor:** fixed → flexible - for control/changes without removal of the whole rack from the server room
  - Floor metal structure welding and installation



# LSO: server room

- **Server room floor:** fixed → flexible - for control/changes without removal of the whole rack from the server room
  - 2 Toshiba cooling systems, floor installed, rack & computer back



# LSO: server room

- **Server room air conditioning:** improvement by an “amateur” ducting system - the coolest air in the building used for cooling ( $dT \sim 3^{\circ}\text{C}$ )



# LSO: AISAS mechanisms

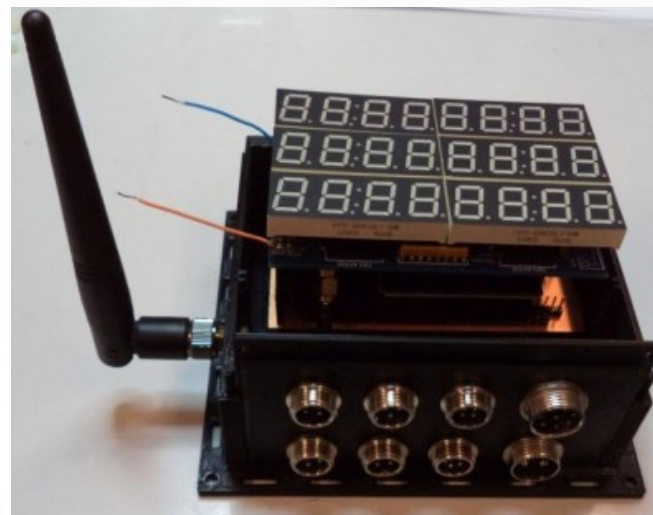
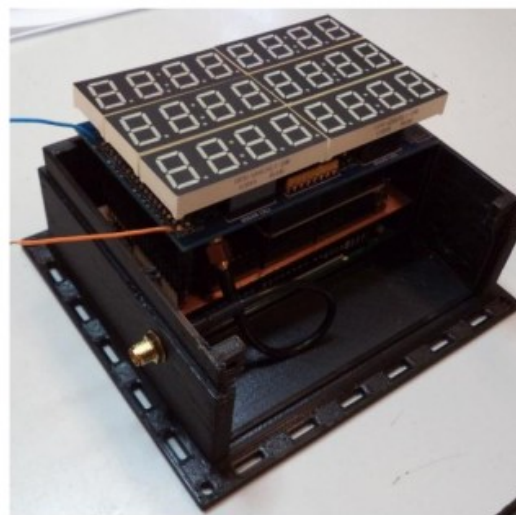
- **AISAS mechanisms = diffuser + coronagraph focusing + post-focus instrument rotation:** operated during observations
  - Old system: unreliable operation
  - New system: HW upgrade for securely reliable operation
  - NEW: ARDUINOs, wifi communication, handshaking, 3D printing, professional el. board production
  - extended also for the TARGET and ABSO masks
  - a lot of HW and SW developments on the experience gained
  - first tests in the LSO dome - March 2024



Status of 2022/01

# LSO: AISAS mechanisms

- **AISAS mechanisms:** new electronics box with layers of el. components



Status of 2023/12



# LSO: new observers

- two new observers on duty: Jakub Ambroz and Zurab Vashalomidze
- One observer leaving the duty stays: Pavol Schwartz



LSO: last two years - 2022-2023

# CoMP-S instrument project

# LSO instruments/projects: CoMP-S

- 4-stage Lyot filter + polarimeter, 2 VIS + 2 IR detectors + inevitable optics + mechanics + electronics
- Wavelength range: 500-1100 nm & passband FWHM: 0.03 – 0.13 nm
- 2D spectropolarimetry for coronagraphy, FoV:  $\sim 500'' * \sim 350''$

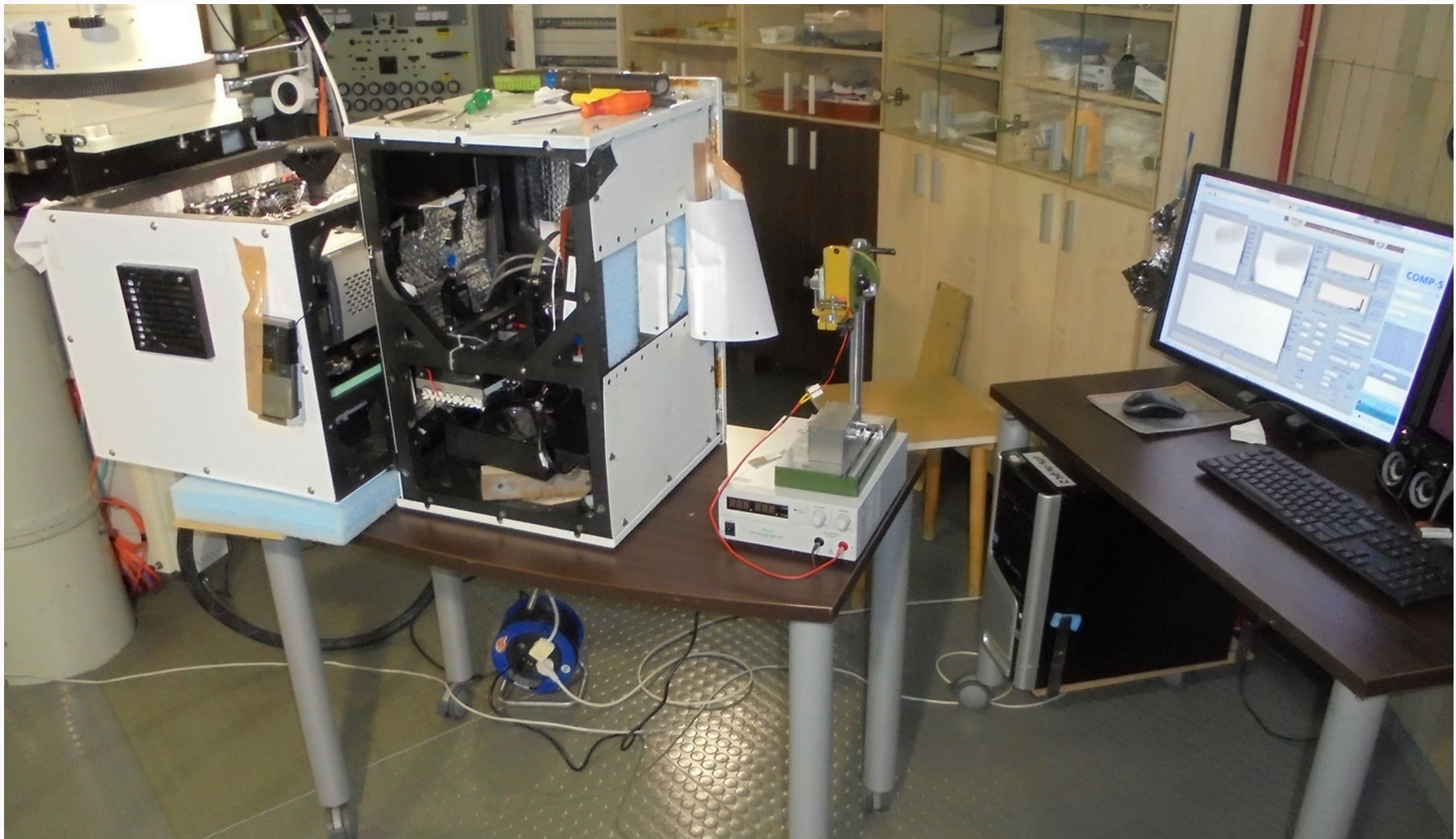


# LSO instruments/projects: CoMP-S

- Improved mechanical holders of the tertiary optics
- Warm air outflow from camera cooling: new parts
- Target: development and motorization
- Absolute intensity calibration mask: development and motorization
- Webcams to follow performance of instruments in an office
- Computer 'speaking' to the observer
- CoMP-S~UJ2P cooperation
- A manual for CoMP-S+UJ2P observations: SK → EN
- CoMP-S obs\_prog\_007, 008, 009, 010: procedures and itineraries
- AISAS Mechanisms: new system in development

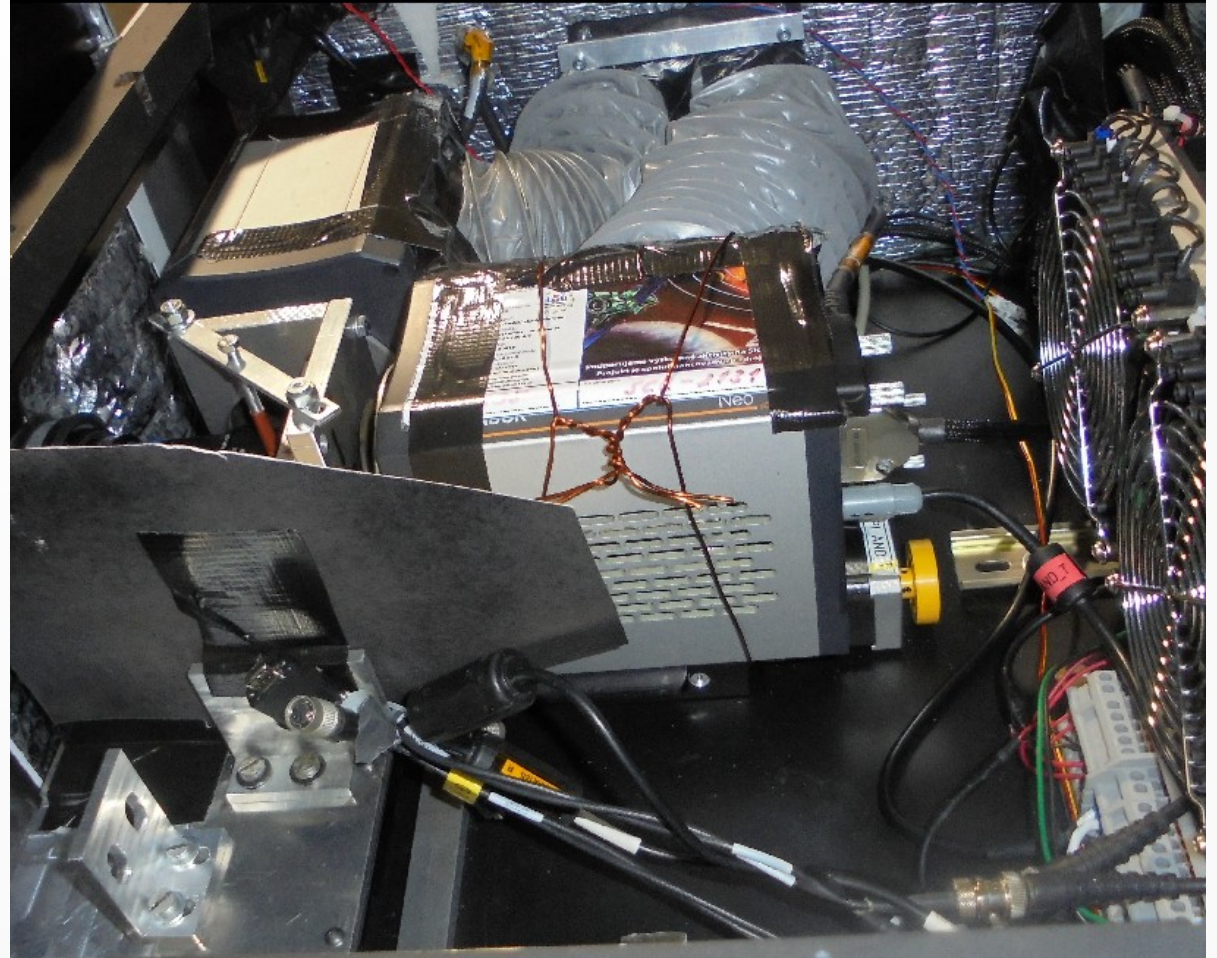
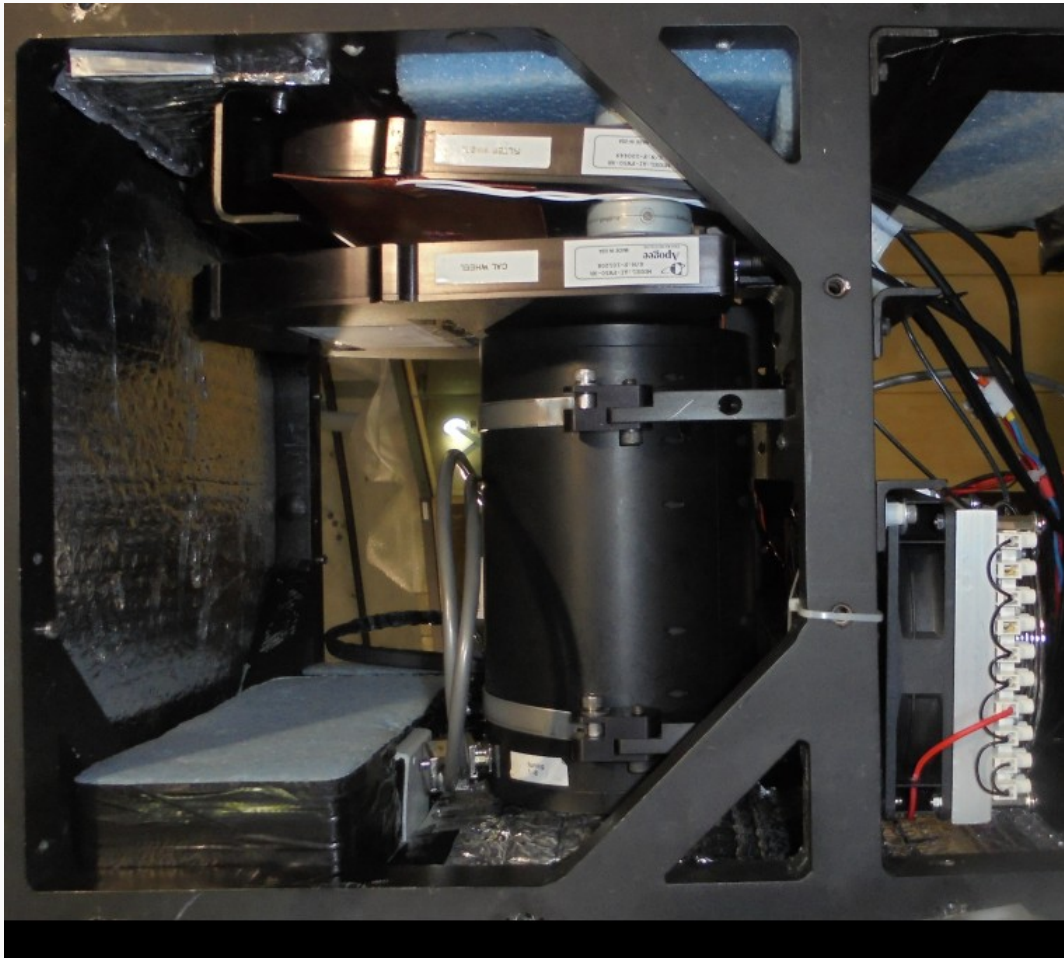
# LSO instruments/projects: CoMP-S

- The maintenance period: mechanical and optical improvements



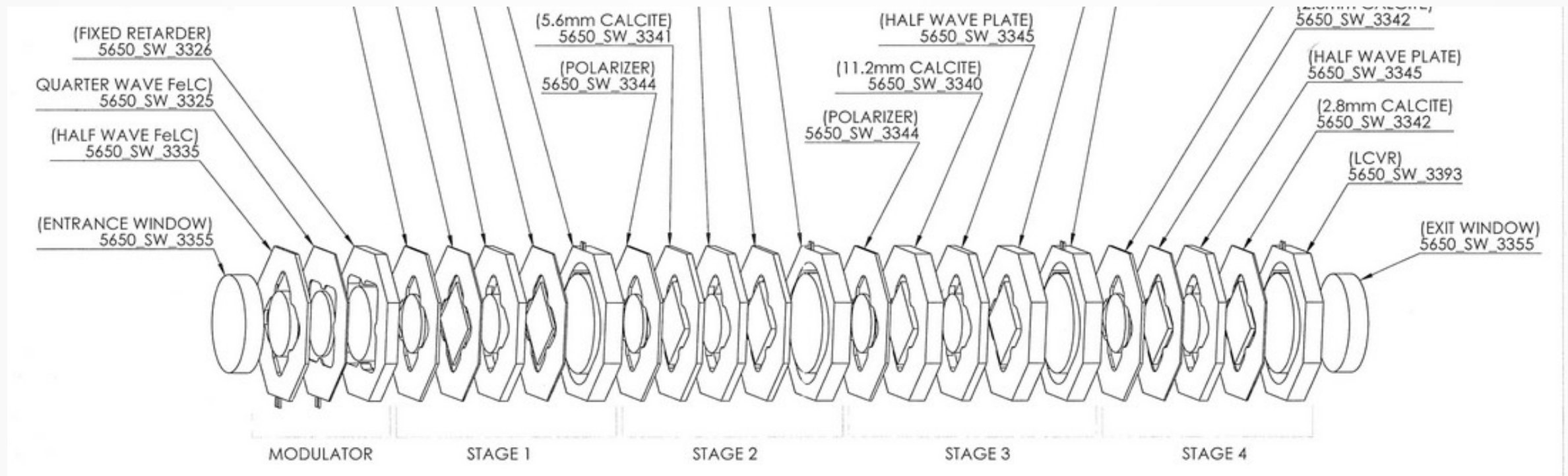
# LSO instruments/projects: CoMP-S

- The CoMP-S actual status: filter module and camera module - the optical compartment



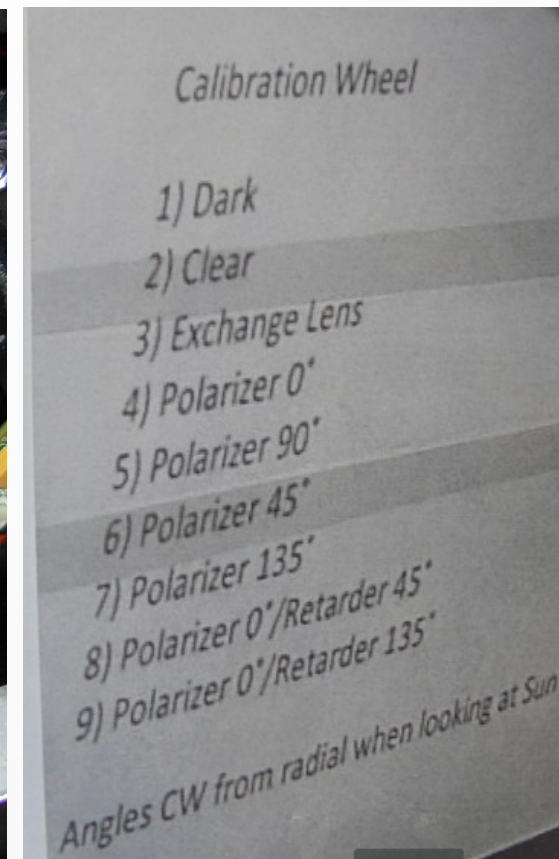
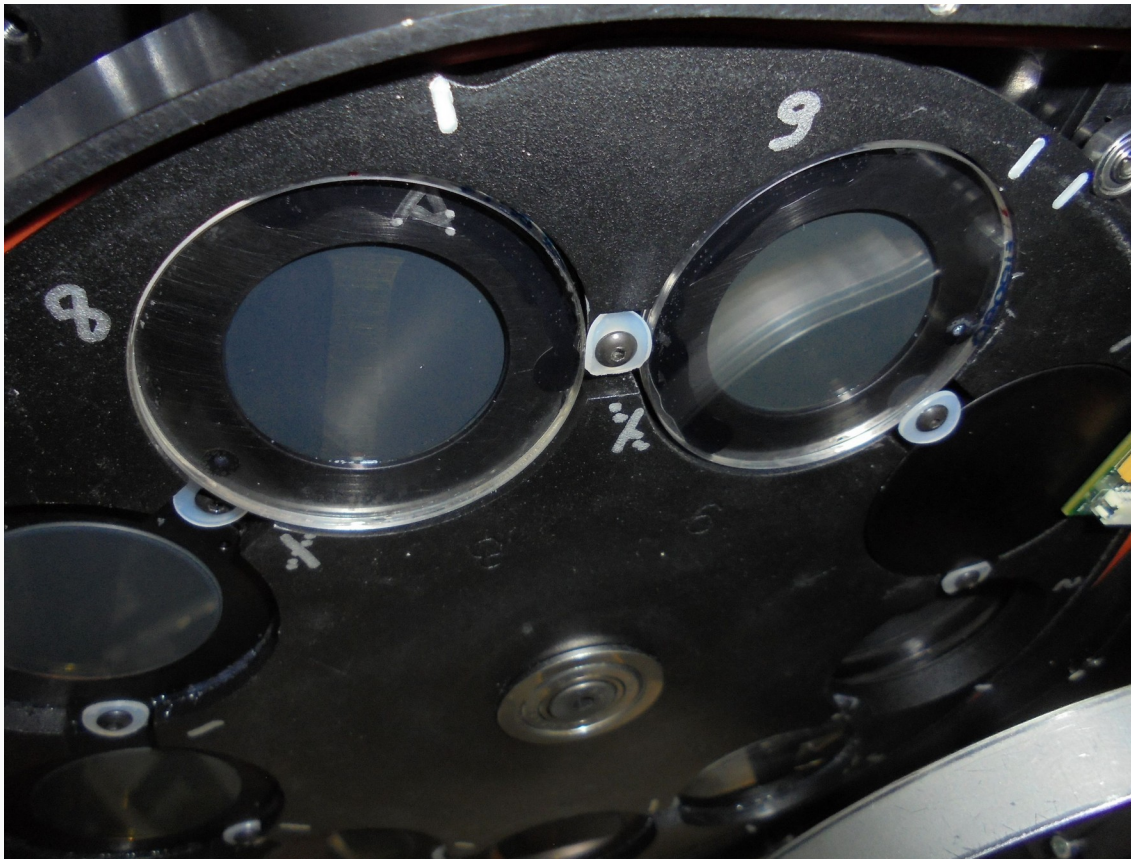
# LSO instruments/projects: CoMP-S

- CoMP-S: Lyot filter + polarimeter
  - Polarimeter: a half-wave plate + a quarter-wave plate + a fixed retarder
  - Polarimetric calibration: response of instrument to light of different polarization states



# LSO instruments/projects: CoMP-S

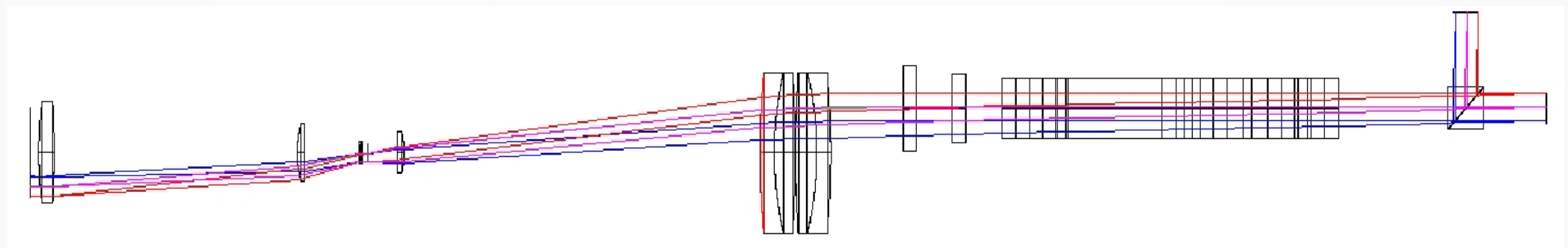
- CoMP-S: Lyot filter + polarimeter
  - polarimetric optics in the calibration wheel: lin. polarizer @  $0^\circ$ ,  $90^\circ$ ,  $45^\circ$ ,  $135^\circ$ ; lin. polarizer @  $0^\circ$  +  $\frac{1}{4}$  wave retarder @  $45^\circ$ ; lin. polarizer  $0^\circ$  +  $\frac{1}{4}$  wave retarder @  $135^\circ$





# LSO instruments/projects: CoMP-S

- CoMP-S: Lyot filter + polarimeter - work already done:
  - Analysis of pol. calibration results (del Toro Iniesta and Collados, “Optimum modulation and demodulation matrices for solar polarimetry”, 2000, Applied Optics 39, 1637): no consistent results for all realistic models of the polarimeter
  - Testing types, properties, positions and orientation of the pol. calibration optics: the problem remains also after slight changes introduced
  - **A conceptual problem of the instrument:** the complex ZEISS coronagraph secondary optics changes the polarimetric status of the passing light → calibration optics has to be place in front the artificial moon

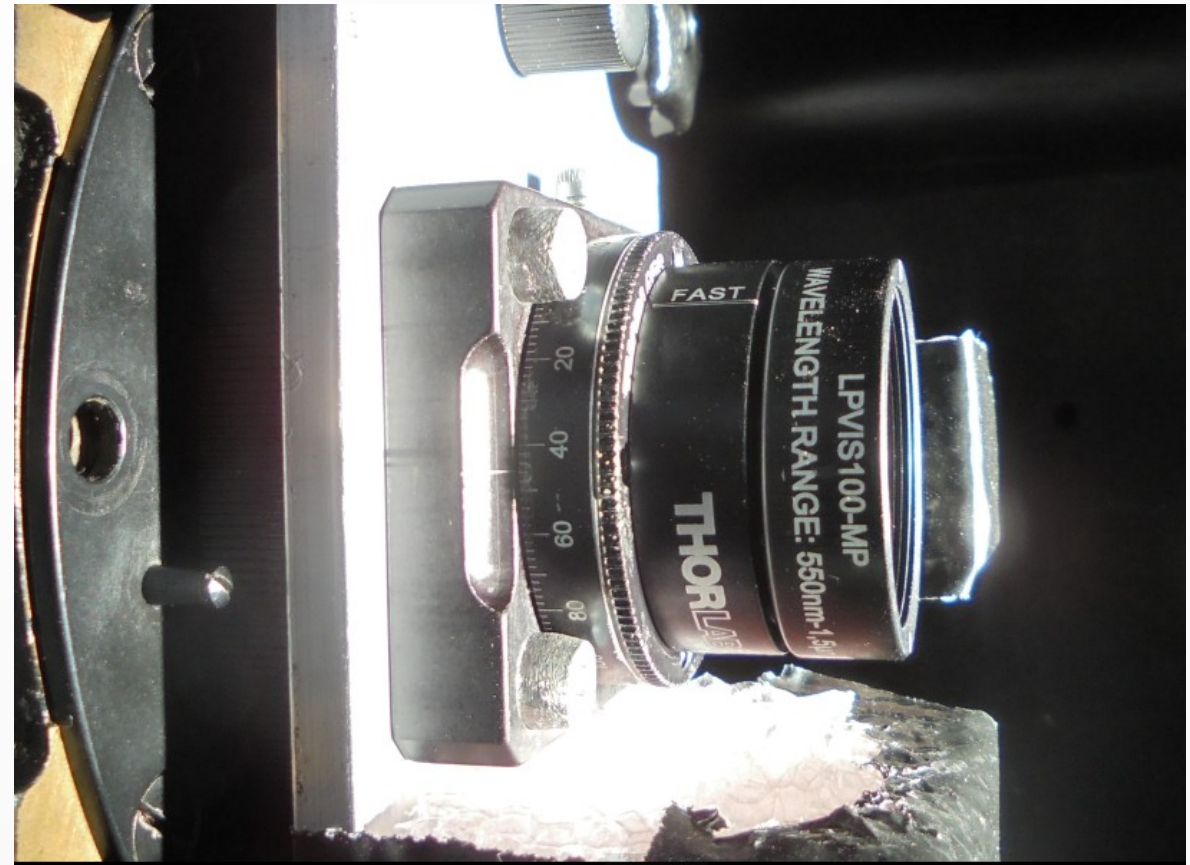


ZEISS field lens    coronagraph 3 lenses    secondary optics 4-lens objective    \*    CoMP-S instrument cal. + filter wheels    Lyot filter    optics

# LSO instruments/projects: CoMP-S

- CoMP-S: Lyot filter + polarimeter - work already done:
  - a preliminary pol. calibration package placed in front of the artificial moon (before the whole ZEISS coronagraph secondary optics)
  - Tests for 2 spectral lines
  - Analysis of results not finished yet
  - More: AISAS colloquium 2024/03/10

The linear polarizer +  $\frac{1}{4}$  wave retarder at the holder placed in the focal plane of the coronagraph



# LSO instruments/projects: archive

- **The LSO data archive:**

- Data arrays problems at the LSO (but no in SL) → archive only in SL
- LSO:
  - data handling - lev0 → lev1: free space for new data at the CoMP-S PC, FITS file keywords according to SOLARNET project recommendations, lossless packing by fpack algorithm, optional binning (typically 2x2), logs + auxiliary images and print screens, metadata for the LSO data archive
- SL:
  - primary and secondary (backup) archive: FITS files and logs + auxiliary images and print screens, metadata for the LSO data archive input
  - Work on the dedicated database for the LSO data archive with the web client

LSO: last two years - 2022-2023

**Observations**

# Observations: statistics

Legend: \_\_\_ away, present, ready, standby, testing, attempt, - real observations

2022	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1		JR/MT	MH/MT	MT	PS	MT	MT	JR	MT	MT	JR/MT	
2		MT	MT	MT	PS	MT	MT	JR	MT		MT	
3		MT	MT	JR	PS	MT	MT	JR	MT		MT	PS
4	JR	MT	MT	JR	PS	MT	MT	JR	MT		MT	PS
5	JR	MT	MT	PS	PS	MT	MT/PS		MT		MT	PS
6	JR	MT	MT	PS		MT	PS		MT		MT	PS
7	JR	MT	MT	PS		MT/PS	PS		MT/JR		MT	PS
8	JR	MT	MT/PS	PS		PS	PS		JR		MT/PS	PS
9	JR	MT/PS	PS	PS	MT	PS	PS	MT	JR		PS	PS
10	JR	PS	PS	PS	MT	PS	PS	MT		JR	PS	PS
11	JR/MT	PS	PS	PS	MT	PS	PS	MT		JR	PS	
12	MT	PS	PS	PS	MT	PS		MT		JR	PS	JR
13	MT	PS	PS		MT	PS		MT	JR		PS/JR	JR
14	MT	PS/JR	PS		MT/JR	PS/JR	JR	MT	JR		JR	JR
15	MT	JR	PS/JR		JR	JR	JR	MT	JR		JR	JR
16	MT	JR	JR		JR	JR	JR	MT	JR		JR	JR
17	MT	JR	JR		JR	JR	JR		JR		JR	JR
18	MT	JR	JR		JR	JR	JR		JR	PS	JR	JR
19	PS	JR	JR	JR	JR	JR	JR		JR	PS	JR	JR
20	PS	JR	JR	JR	JR	JR	JR		JR	PS	JR	JR
21	PS	JR	JR	JR	JR	JR	JR		JR	PS		JR
22	PS	JR	JR	JR		JR	JR		JR	PS		JR
23	PS	JR	JR	JR		JR			JR	PS		
24	PS	JR	JR	JR		JR				PS		
25	PS/JR	JR/MH	JR/MH	JR						PS/JR		
26	JR	MH	MH	JR			JR				JR	
27	JR	MH	MH	JR			JR		MT	JR		
28	JR	MH	MH	JR		MT	JR		MT	JR		
29	JR	X	MH/MT	JR		MT	JR		MT	JR		
30	JR	X	MT	JR/PS		MT	JR	MT	MT	JR		
31	JR	X	MT	X	MT	X	JR	MT	X	JR	X	

Legend: \_\_\_ away, present, ready, standby, testing, attempt, - real observations

2023	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1		PS	PS	PS	PS		MT	T/R/S	JR	PS		JR
2		PS	PS	PS	PS		MT	PS	JR	PS		JR
3		PS	PS	PS	PS		MT	PS/JR	JR	PS		JR/MT
4	PS	PS	PS	PS			MT/JR	PS	JR	PS		MT
5	PS	PS	PS				JR/PS	PS	JR	PS		MT
6	PS	PS	PS			JR	PS	PS	JR	PS		MT
7	PS	PS/JR	PS/JR			JR	PS	PS	JR	PS	MT/JA	MT
8	PS	JR	JR		JR	JR	PS	PS	JR/PS	PS	MT/JA	MT
9	PS	JR	JR		JR	JR	PS		PS	PS/JR	MT/JA	MT
10	PS	JR	JR		JR	JR	PS	JR	PS	JR/JA	MT/JA	JR
11		JR	JR	MT	JR	JR	PS/JR	JR	PS	JR/JA	MT	JR
12		JR	JR	MT/JR	JR	JR	JR		PS/JR	JR/JA		JR
13		JR	JR	MT/JR	JR	JR	JR		JR	JR		JR
14		JR	JR	MT	JR	JR	JR		JR	JR		JR
15		JR	JR	MT	JR	JR	JR	MT	JR	JR		JR
16		JR	JR	MT/JR	JR	JR	JR	MT	JR	JR/JA		JR
17		JR	JR	JR	JR		JR	MT	JR	JR/JA		JR
18				JR	JR		JR	MT	JR	JR/JA		JR
19				JR	JR		JR	MT	JR/PS	JR/JA	JR	JR/JA
20				JR	JR		JR	MT	PS	JR	JR	JR/JA
21				MT	JR		JR	MT	PS	JR	JR	
22		MT	MT	JR		MT		MT/PS	PS	JR	JR	
23		MT	MT	JR	PS			PS	PS			JR
24	MT	MT	MT	JR	PS/MT			PS	PS	MT	JR	
25	MT	MT	MT	JR	MT		MT	PS		MT	JR	
26	MT	MT	MT	JR	MT		MT	PS	MT	MT	JR	
27	MT	MT	MT	JR	MT	MT	MT		MT	MT	JR	
28	MT	MT/PS	MT	JR	MT	MT	MT	JR	MT	MT	JR	
29	MT	X	PS	JR/PS	MT	MT	MT	JR	MT	MT	JR	
30	MT	X	PS	PS	MT	MT/JR	MT	JR	MT	MT	JR	
31		X	PS	PS		X	MT	JR	X		X	

# Observations: statistics

- Real observations: 40+32 days (years 2022 + 2023)
- Attempts only: 30+19 days
- Tests: 6+6 days
- Ready for observations: 267+252 days
- At the LSO: 278+280 days
- 
- Real observations: 12.9 % of days (when at the LSO)
- Attempts only: 8.8 % of days
- Tests: 2.1 % of days
- Ready for observations: 93 % of days
- At the LSO: 76% days of these two years
- 
- A forecast: ~60 days per year with observations

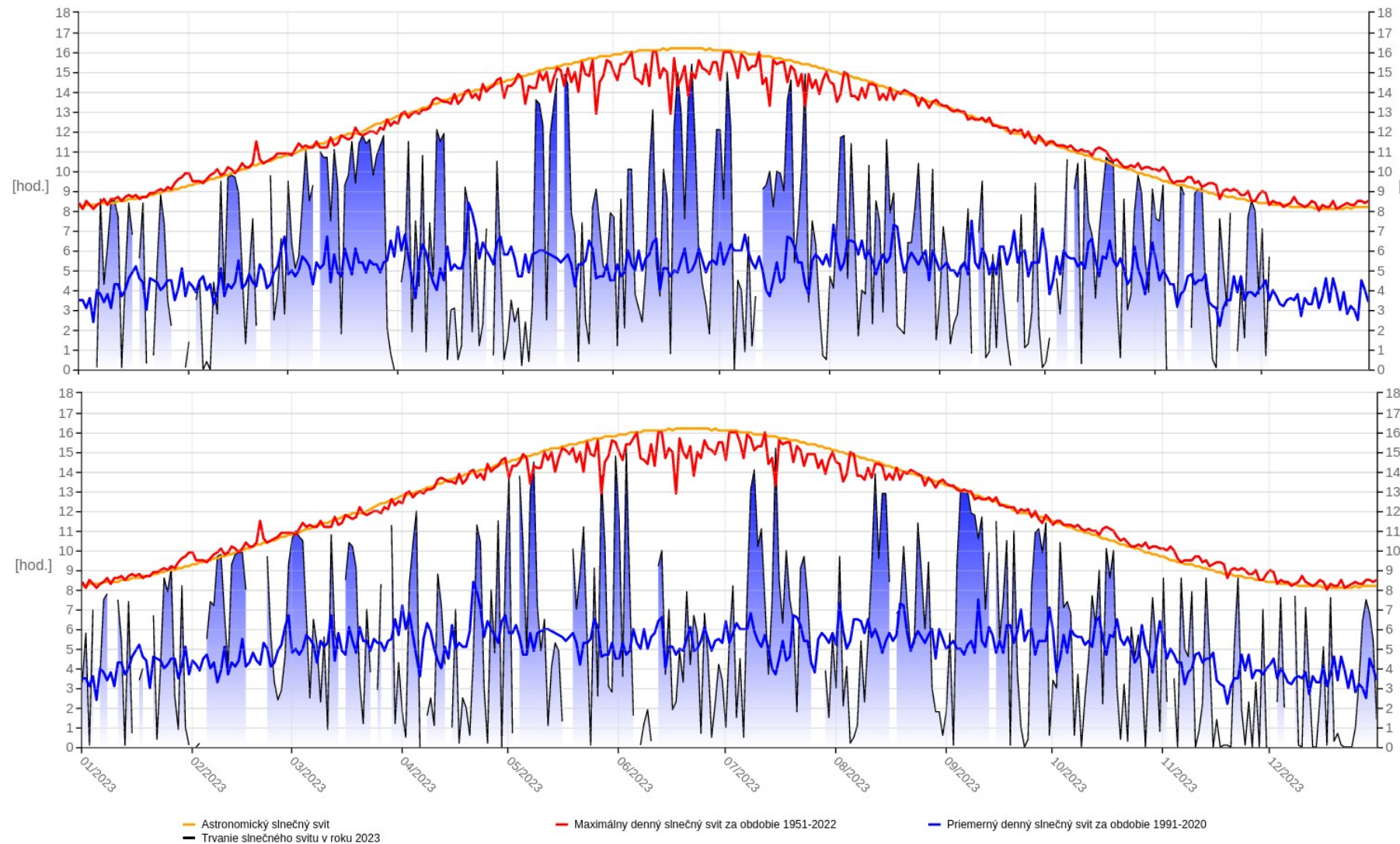
# Observations: statistics

- Limiting factors:
  - 3 instead of 4 observers
  - maintenance periods
  - weather conditions:
    - clouds
    - natural cirrus and “cirrus aviaticus” in many (almost clear sky) days
    - swirling snow
  
- climate change
- airplane corridors changes



# Observations: statistics

- Limiting actors: clouds - SHMU/LSO: duration of sunshine in 2022 and 2023

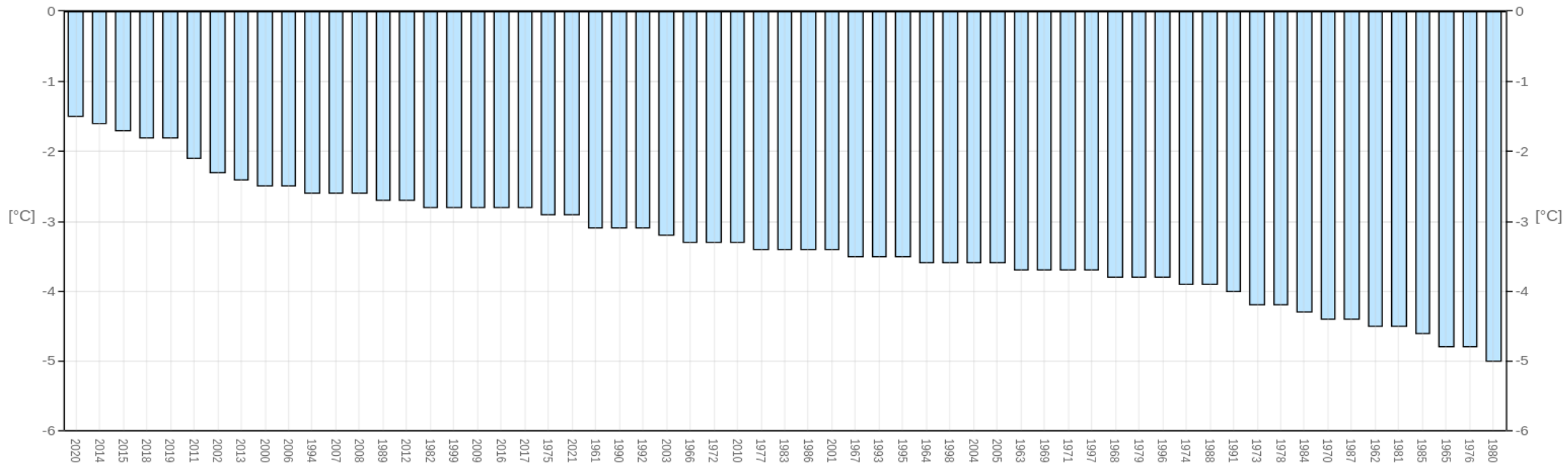




# Observations: statistics

- Limiting actors: climate change?

SHMU/LSO: yearly average temperature plot sorted by the temperature values  
→ the increase for **+3.5° Celsius in 60 years** → altitude of the inversion layer ?



Mostly 20XX

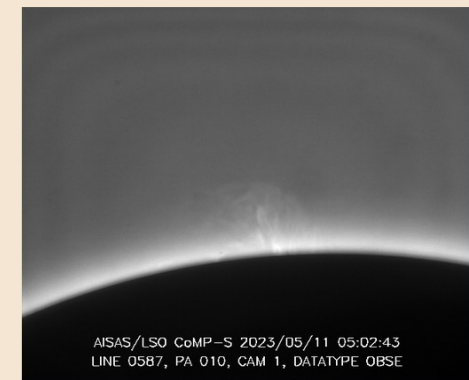
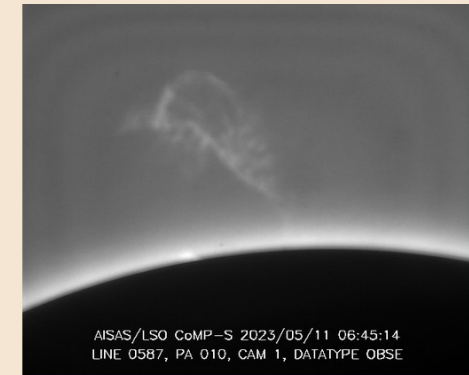
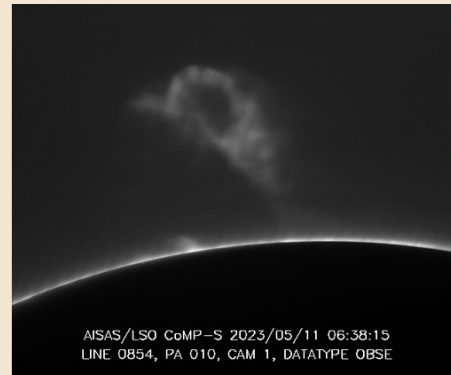
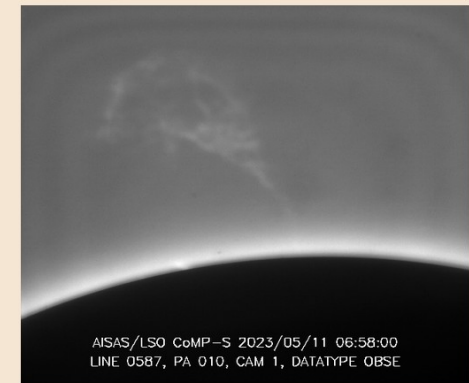
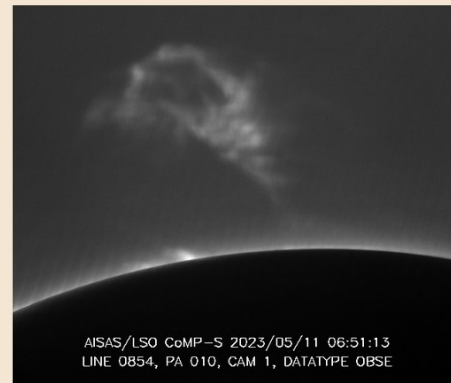
Mostly 19XX

# Observations: more details

- Years 2022-2023:
  - period of regular LSO observations using the coronagraph R + CoMP-S and UJ2P instruments
  - obs\_programs in action: obs\_progs 007, 008, 010:
    - 007: general program - several line combinations
    - 008: He D3 587 + H I 656 - coordination with [HSFA@Ondrejov](mailto:HSFA@Ondrejov):  
He D3 line in eruptive prominences + cross-calibration
    - 010: Ca II 854 + H I 656 - coronal rain
  - Attempts to join the announced coordinated campaigns of Parker Solar Probe, Solar Orbiter
  - Selecting targets also on base of the targets selected by other instruments: PSP, SoHO, IRIS

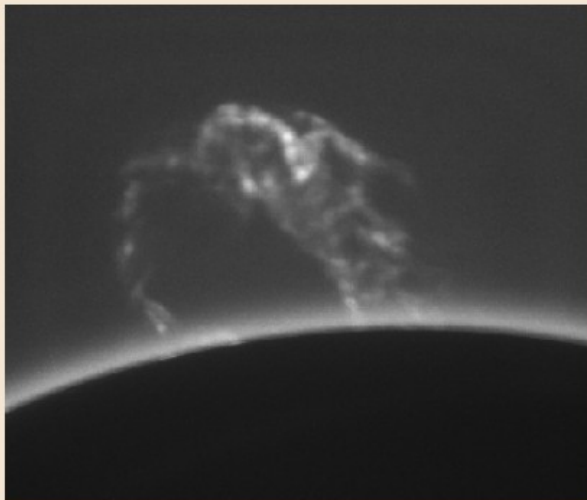
# Observations: example 1

- 2022/05/11: large polar quiescent prominence liftoff
  - Position angle:  $10^\circ$
  - Lines: Ca II 854, H I 656, He D3 587
  - OBSE: 04:46-05:46 and 06:38-07:22 UT  
(raw data, jpegs, binned)

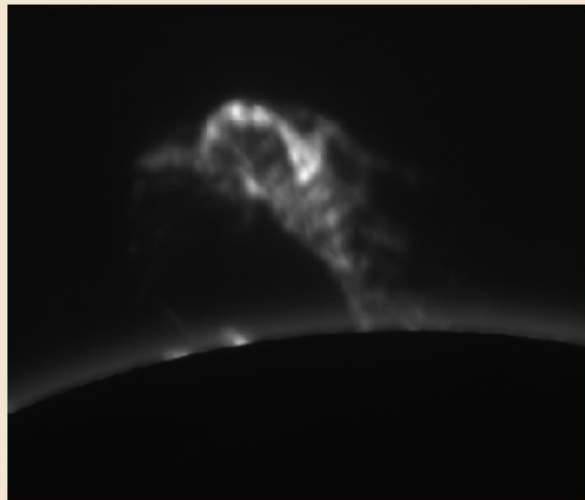


# Observations: example 1

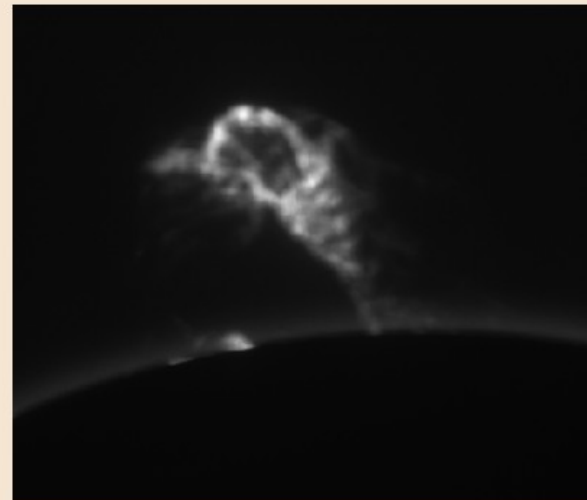
- 2022/05/11: large polar quiescent prominence liftoff
  - Position angle:  $10^\circ$
  - H I 656 line scan
  - OBSE: 04:41:30-04:41:34 UT, 4 seconds
  - Doppler shifts: -32, -14, 0.0, +23 km/s (raw data, jpegs, binned)



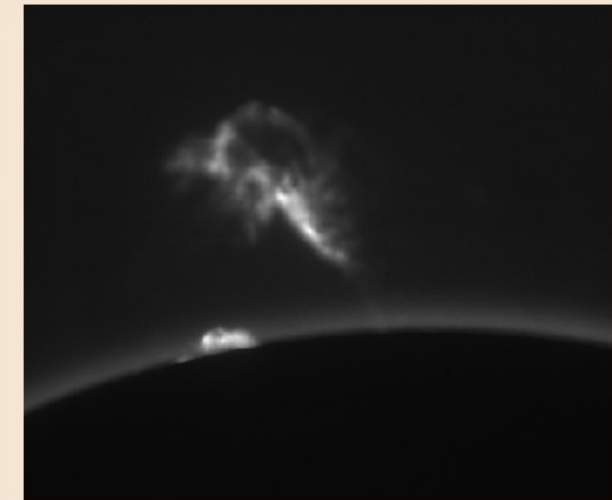
H I 656.21 nm



H I 656.25 nm



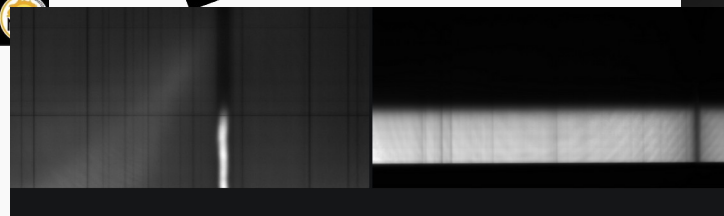
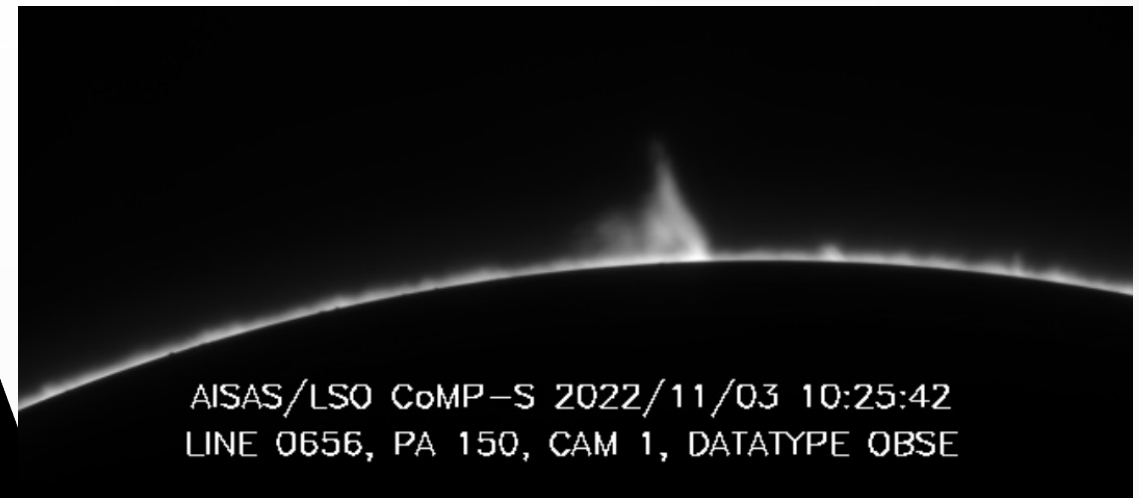
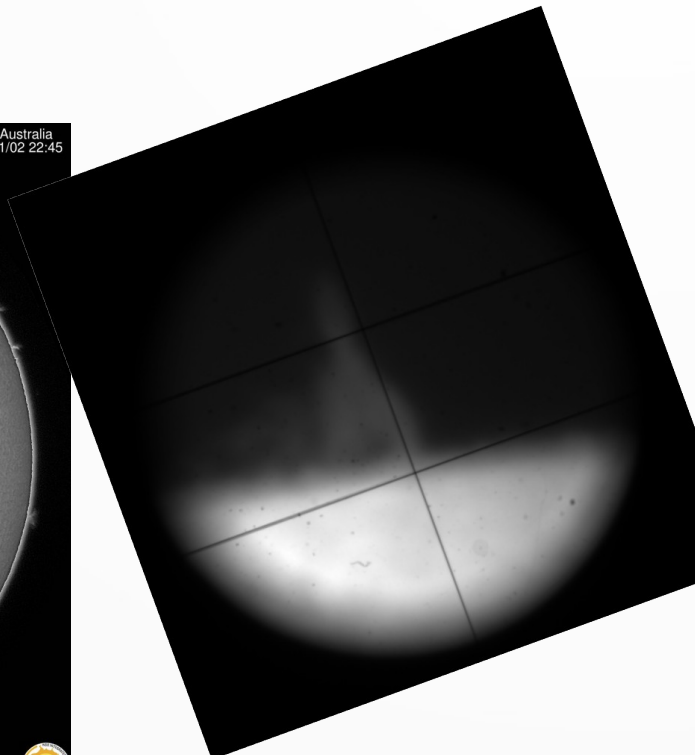
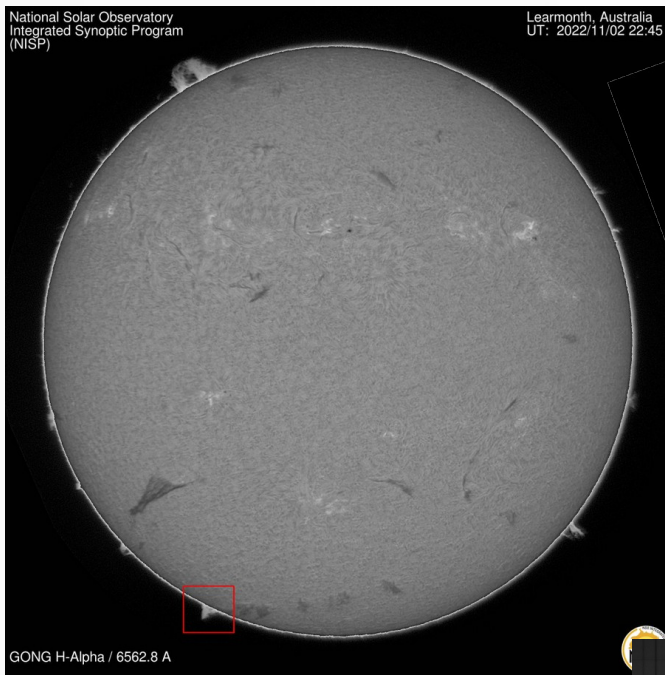
H I 656.28 nm



H I 656.33 nm

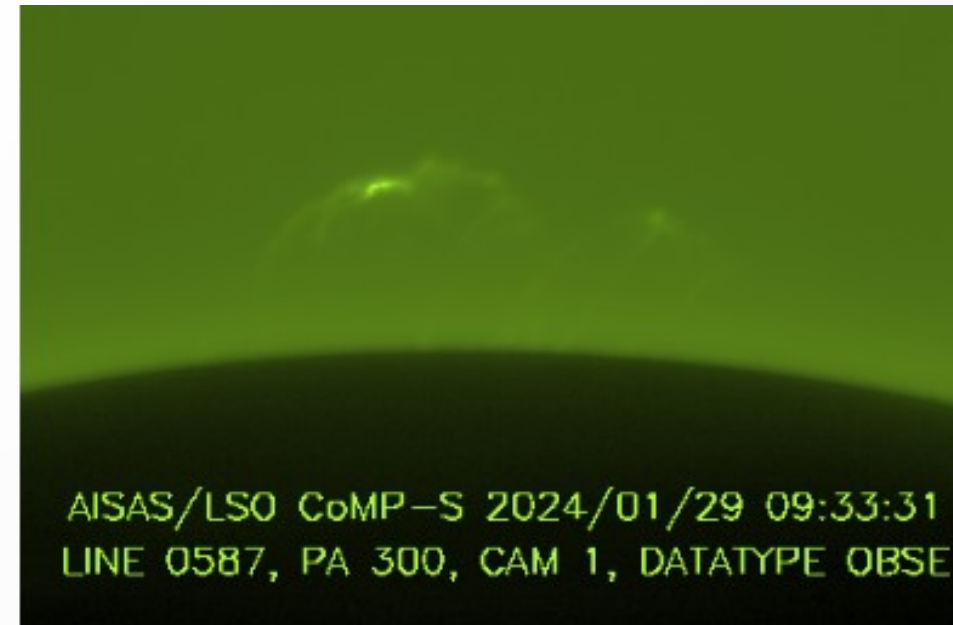
# Observations: example 2

2022/11/02: CoMP-S/LSO: He D3 587 + H I 656 and HSFA@Ondrejov: several lines, the same target and simultaneous measurements (raw data, jpegs, binned)



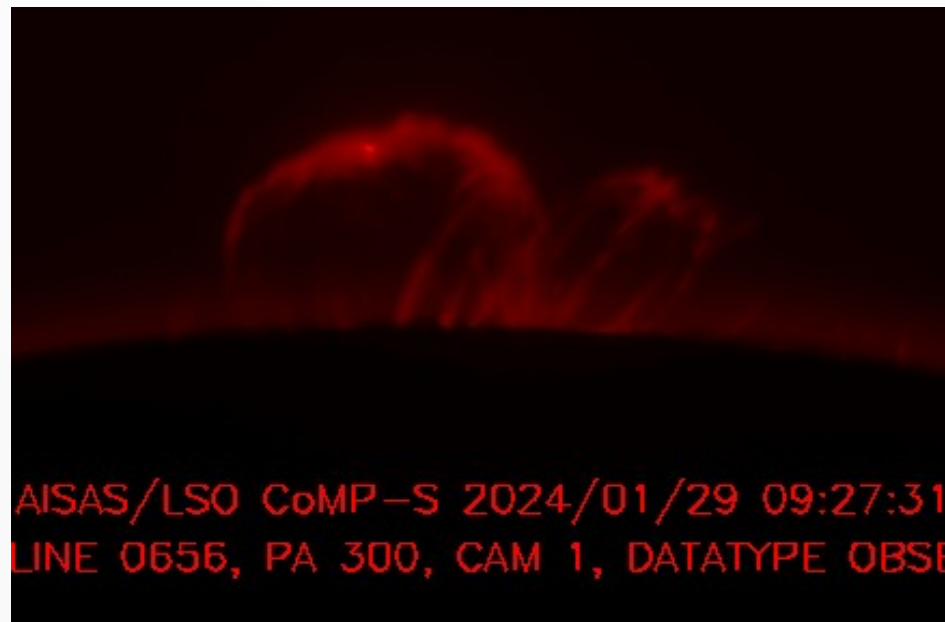
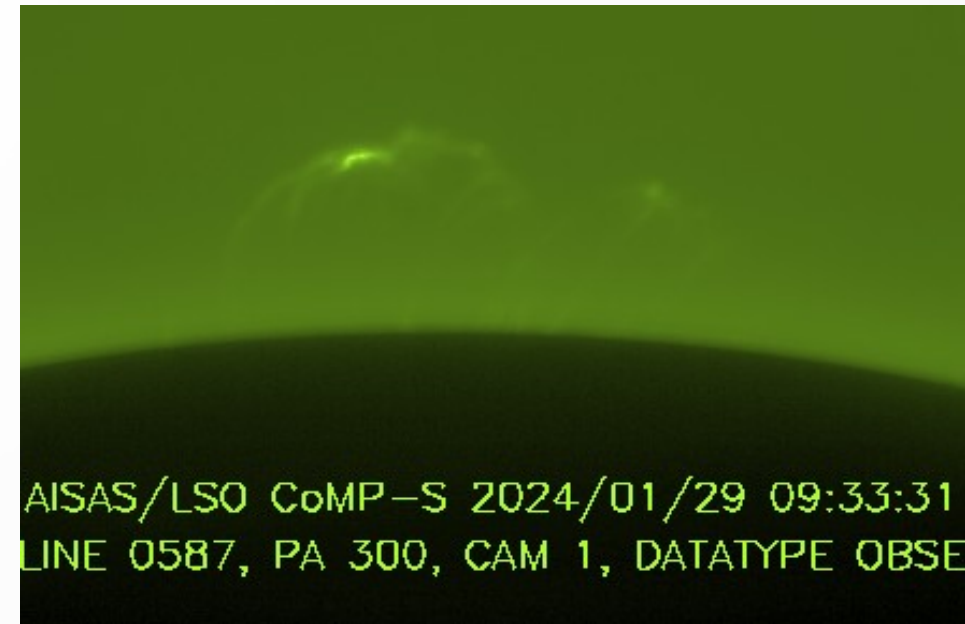
# Observations: example 3

- 2024/01/29: coronal rain in the post-flare loop arcades (AR13559 at limb, after an M-class flare with CME):
  - Ca II 854, H I 656, and He I D3 587 lines
  - OBSE: 09:21 – 10:50 UT(raw data, jpegs, intensity scale adapted, binned)



# Observations: example 3

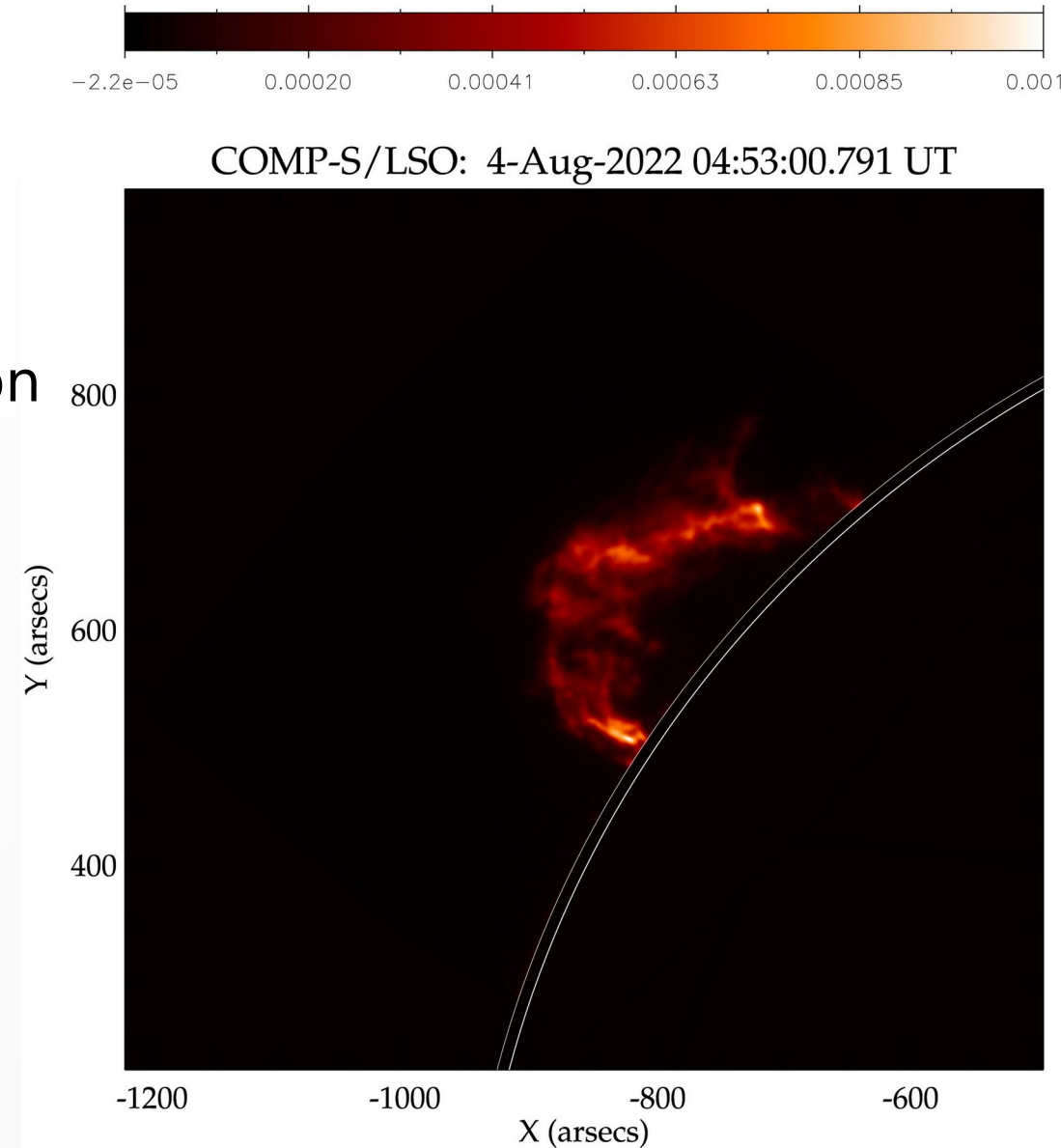
- 2024/01/29: coronal rain in the post-flare loop arcades (AR13559 at limb, after an M-class flare with CME):
  - Ca II 854, H I 656, and He I D3 587 lines
  - OBSE: 09:21 – 10:50 UT(raw data, gifs, intensity scale adapted, binned)



# Observations: data pipeline

- Done in the last two years:
  - CMOS chip correction
  - BKG subtraction
  - Intensity calibration
  - Wavelength + spatial scales calibration
  - Polarimetric calibration: started
- To do:
  - Polarimetric calibration
  - Alignment of line scan images
  - Time series alignment

He D3 587 nm line intensity @  
central wavelength position,  
intensity units: W/ster/m<sup>2</sup>/A





LSO: last two years - 2022-2023

**Public relations**

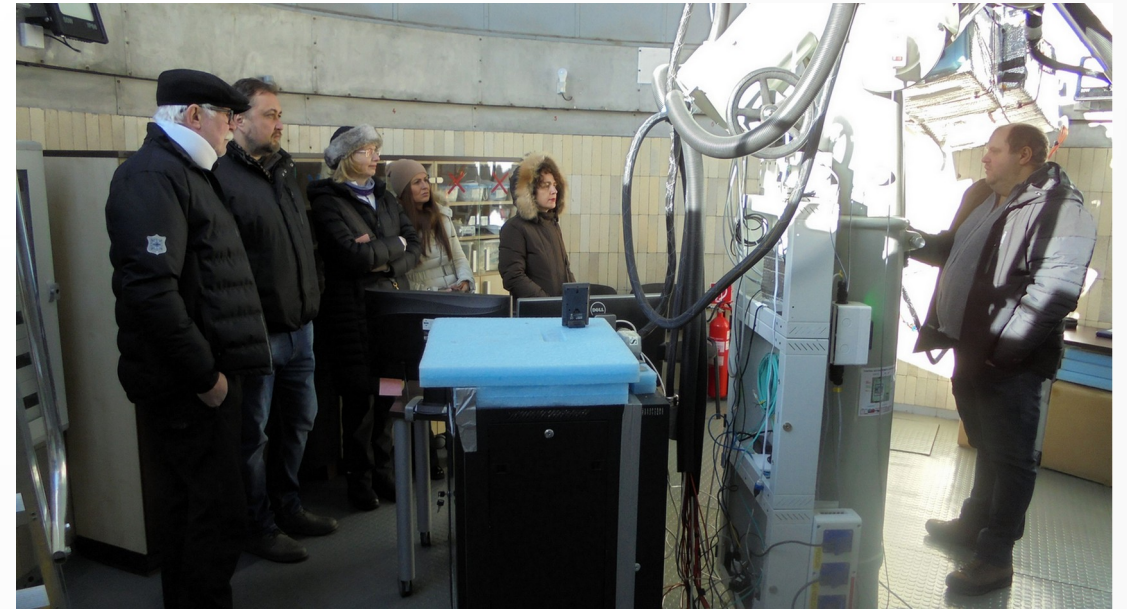
# Public relations: a summary

- Open house days: 0+2 days (198 guests yearly)
- **TMR apartments guests:** staying at the Lomnický štít for night: 40 visits, 158 guests (only in 2023)
- **Official excursions in dome:** 7+25 (~180 guests)
- TV: 1+1 (RTVS)
- Newspapers: 1+0
- Lectures: 0+1 (Týždeň vedy a techniky)
- Students : 2+3 stays for few days
- **Special guests visits:** 7 (some for night at the LSO)
  
- TMR advertisement (“at least once in a lifetime”) → PR for AISAS, SAS, and science in general



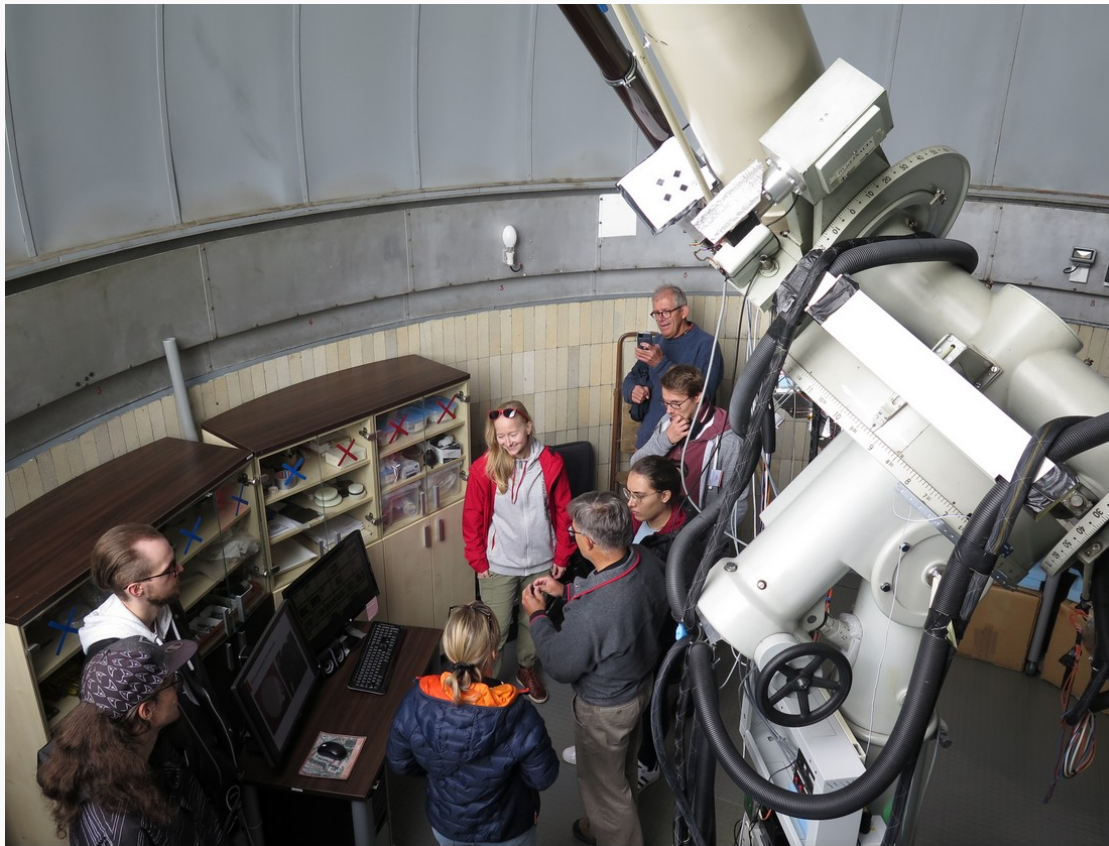
# Public relations: special visits

- 2022/08/08: the PR event "Mierime do ESA": president of SAS, the state secretary of Ministry of education + media @ LSO (also for night)
- 2023/02/14: EST project: the ambassadors of Italy and Spain in SK + president of SAS, the state secretary of Ministry of education @ LSO - EST project



# Public relations: summer school

- 2022/09/08: the SOLARNET Summer School 'Solar corona - complex research from ground-based and space' @ LSO: J. Rybák and LSO group: "Practice at the LSO (in 30 minutes...)"



LSO: last two years - 2022-2023

**Plans for next two years**

# Plans for next 2 years: building

- LSO handyman:
  - Roof edge insulation
  - Building wall cracks repair
  - water/snow in the IEP office
  - Air ducting system - insulation
  - Dome brushes improvements
  - Dome rotation engine improvements
  - Roof edge metal painting
  - Dome painting (white TiO<sub>2</sub> and gray)
  - Repair of electrical installations
  - Many other small things
- External companies:
  - Significant reconstructions inside

Externý dodávateľ:		predpokl. náklad
Súpis prác		EUR
1	kompletná výmena elektrorozvodov v budove: TNC -> TNS, hliník -> meď	?
2	elektrostatická liata podlaha: elektropracovňa	?
3	výmena starých parkiet za poter: 1 chodba a 3 izby	?
4	nové dvere a zárubne: 3 ks	?
5	nové omietky a vymalovanie: 5 miestností a 1 chodba	?
6	vstup/výstup. ventily na stúpačkách kúrenia	?
7	nové rozvody úžitkovej vody do kúpeľní a kuchyne	?
8	generálna oprava a revízia bleskozvodov	?
9	nové skrine na osobné veci pracovníkov na chodbe	?
10	položenie novej dlážky v dielni	?
11	výmena únikových dverí	?
12	oprava opláštenia a obmurovky vežičky LSO	?
Svojpomocne:		rok
1	izolovanie plechu strechy nad pavlačou terpapierom	2023+2024
2	oprava prasklín a špár v izolácii stien budovy	2023+2024
3	zatekanie/sneženie v pracovni UEF pri vpuste vody zo strechy	2023+2024
4	vzduchotechnika teplého vzduchu z dieselagregátu	2023+2024
5	úprava kefy štrbiny kupoly na jej koncoch pri koncových spínačoch	2023+2024
6	úprava elektroinštalácie motora otáčania kupoly	2023+2024
7	náter plechu na okraji strechy nad pavlačou	2024
8	náter vnútra a vonkajška kupoly sivou a bielou farbou	2024+2025
9	oprava elektroinštalácie ohrevu kupoly a štrbiny	?

# Plans for the next 2 years: science

- regular CoMP-S observations (coronagraph R + UJ2P + CoMP-S)
- (almost) full time coverage
- further development of our instrumental projects: AISAS Mechanisms, automatic dome rotation, CoMP-S, UJ2P, data pipeline, SLED instrument preparations, LSO data archive → VSO  
+  
preparation of the diffraction grating spectrograph at the LSO: testing of the Lyot filter tuning (CoMP-S + SCD instruments)
- Official program of the LSO summer internships for students

# Plans for future:

- The SCD instrument repair
- the SLED testing and hosting @ LSO
- simultaneous eclipse observations using both coronagraphs (pointer H)
  
- dome a la “THEMIS”
- dome heating repair

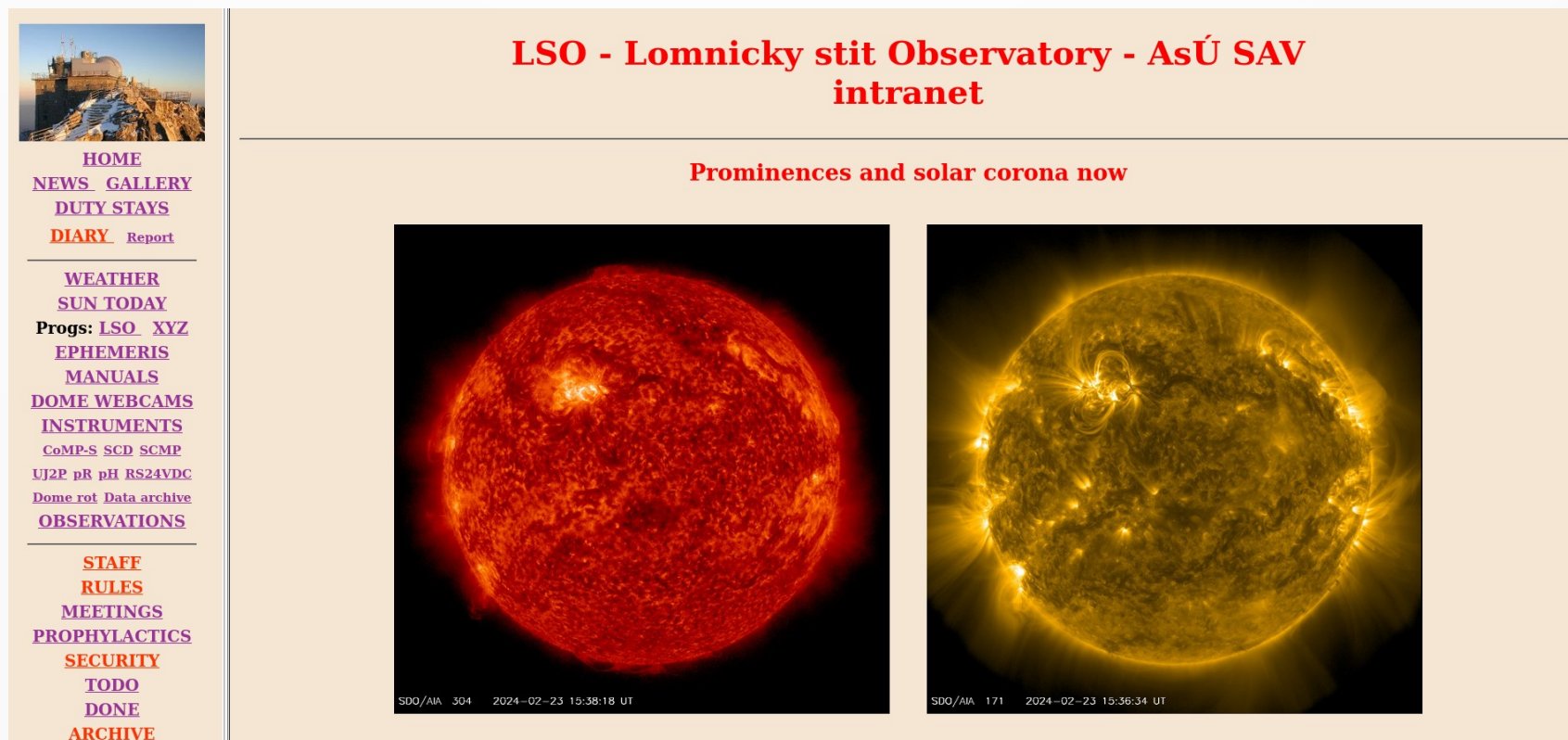


LSO: last two years - 2022-2023

**How to follow us**

# How to follow us:

- The LSO intranet: [https://ofs.astro.sk/~choc/intranet/LS\\_OBSERVATORY/](https://ofs.astro.sk/~choc/intranet/LS_OBSERVATORY/)
- The LSO group meetings: 4 meetings per year in SL
- Meet us @ SL
- Visit us at the LSO – you are welcome!



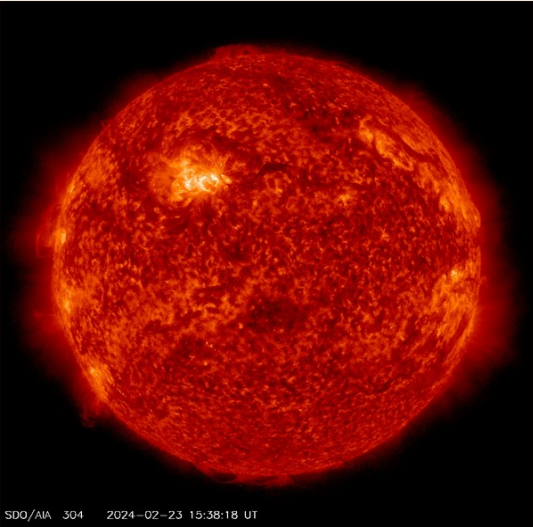
**LSO - Lomnický štít Observatory - AsÚ SAV intranet**

Prominences and solar corona now

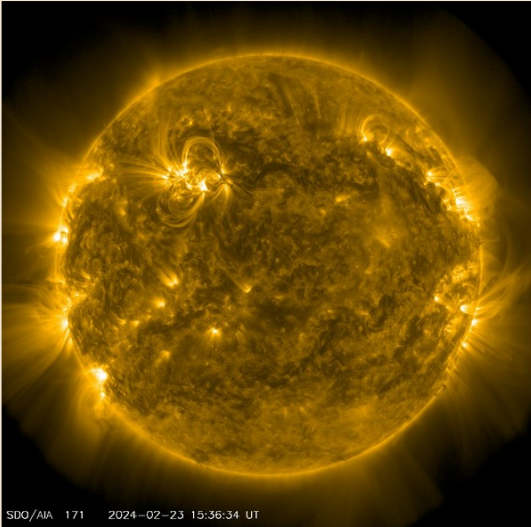
**HOME**  
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[DIARY](#) [Report](#)

**WEATHER**  
[SUN TODAY](#)  
Progs: [LSO](#) [XYZ](#)  
[EPHEMERIS](#)  
[MANUALS](#)  
[DOME WEBCAMS](#)  
[INSTRUMENTS](#)  
[CoMP-S](#) [SCD](#) [SCMP](#)  
[UJ2P](#) [pR](#) [pH](#) [RS24VDC](#)  
[Dome rot](#) [Data archive](#)  
[OBSERVATIONS](#)

**STAFF**  
**RULES**  
**MEETINGS**  
**PROPHYLACTICS**  
**SECURITY**  
**TODO**  
**DONE**  
**ARCHIVE**



SDO/AIA 304 2024-02-23 15:38:18 UT



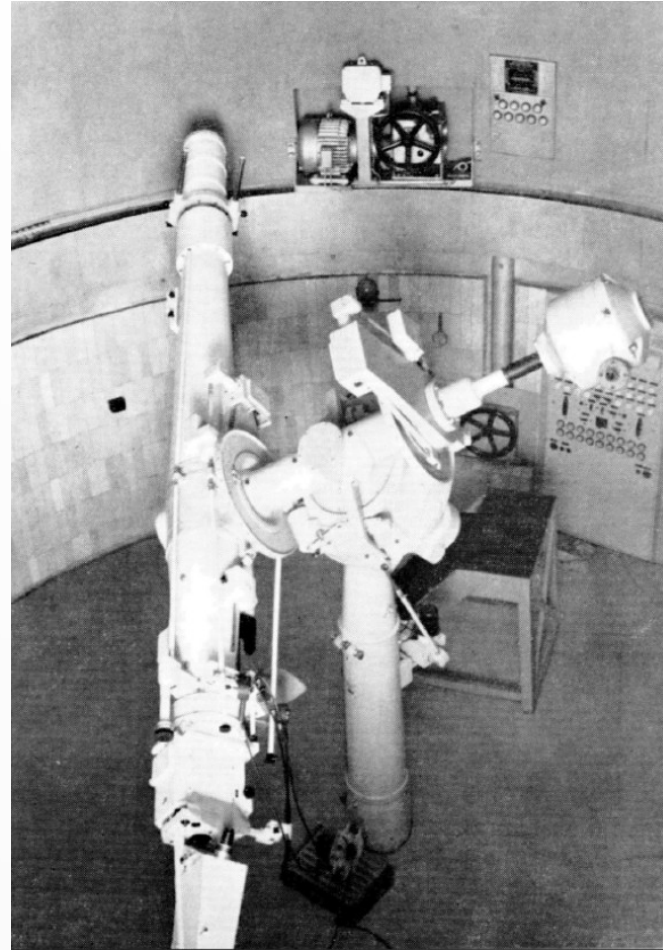
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LSO: last two years - 2022-2023

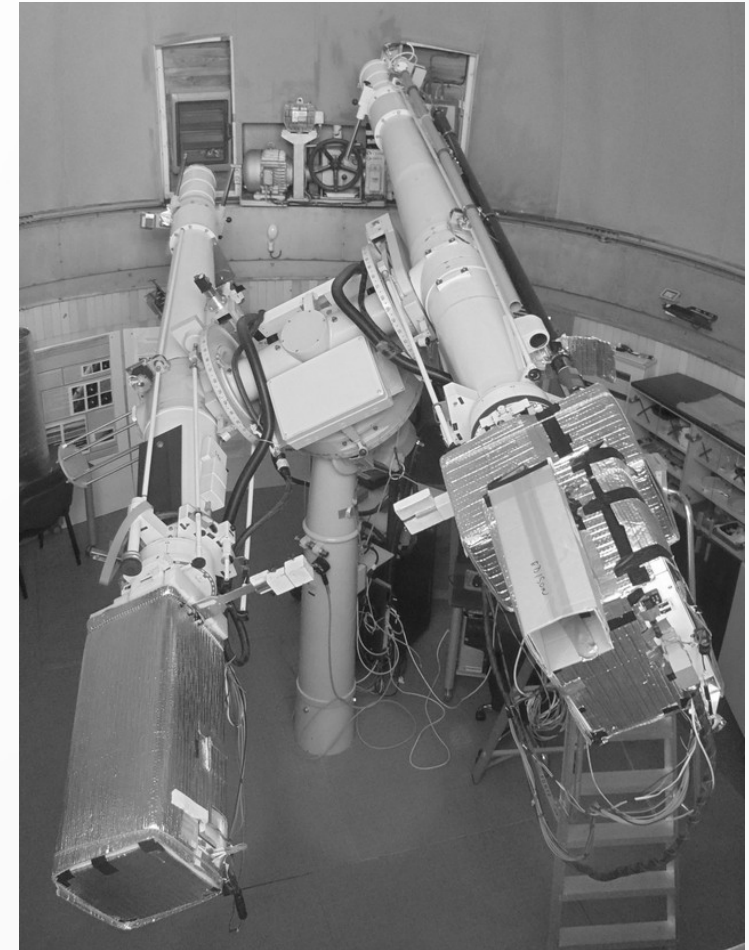
**Concluding notes**

# Concluding notes:

- presenting of behalf of **the LSO group**: J. Ambroz jr., J. Ambroz, F. Budzak, P. Gomory, M. Hutar, J. Rybak, P. Schwartz, M. Trembac, Z. Vashalomidze
- with direct support of **other AISAS staff**: Z. Petrova, R. Komzik, J. Klein, S. Irha, D. Jendre-jcak, V. Dubjel, and some others
- based on work of our predecessors for many years



LSO - 1968  
(Sýkora, 1968, SP 4, 122)



LSO - 2022

# LSO: last two years - 2022-2023



**The LSO group thank you for your attention**