THEMIS solar telescope
A new era begins

Laboratoire de Physique des Plasmas

Seminarios de física solar del IAC ; Nov 20th 2025

FSLAC International Research Lab.

Étienne Pariat[1,2], B. Gelly[1], R. Douet[1], D. Laforgue[1], J. Touresse[2]

[1] French-Spanish Laboratory for Astrophysics in Canarias (FSLAC), CNRS, IAC, La Laguna, Tenerife, Spain

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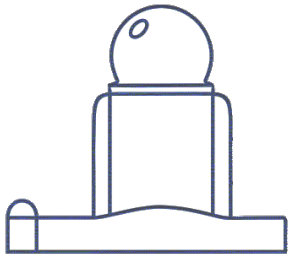

Seminario n°1:
3D MHD modelling of the generation of coronal jets & their propagation toward the inner heliosphere.

LPP
Laboratoire de Physique des Plasmas

Seminarios de física solar del IAC ; Sept. 25th 2024

FSLAC
International
Research Lab.

Étienne Pariat[1,2], J. Touresse[2], C. Froment[3], V. Aslanyan[4], P. Wyper[5], L. Seyfritz[2]

[1] French-Spanish Laboratory for Astrophysics in Canarias (FSLAC), CNRS, IAC, La Laguna, Tenerife, Spain

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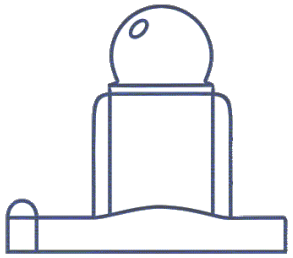
[3] LPC2E, France; [4] University of Dundee, UK; [5] Durham University, UK.



Seminario n°2:
What's new about MAGNETIC HELICITY ?

Laboratoire de Physique des Plasmas

Seminarios de física solar del IAC ; Nov. 15th 2025

FSLAC International Research Lab.

Étienne Pariat[1,2], G. Valori[3], L. Linan[4] , K Moraitis[5], J. Thalmann[6], J.L. Leake[7], X. Sun[8]

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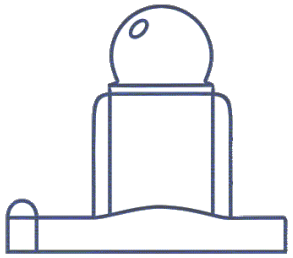
[3] MPS, Germany ; [4] KU Leuven, Belgium, [5] Univ Ioannina, Greece, [6] Univ. Graz, Austria, [7] NASA GFSC, USA, [8] Univ. Hawaii, USA



Seminario n°3:
THEMIS solar telescope
A new era begins

Laboratoire de Physique des Plasmas

Seminarios de física solar del IAC ; Nov 20th 2025

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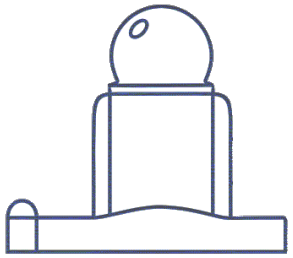
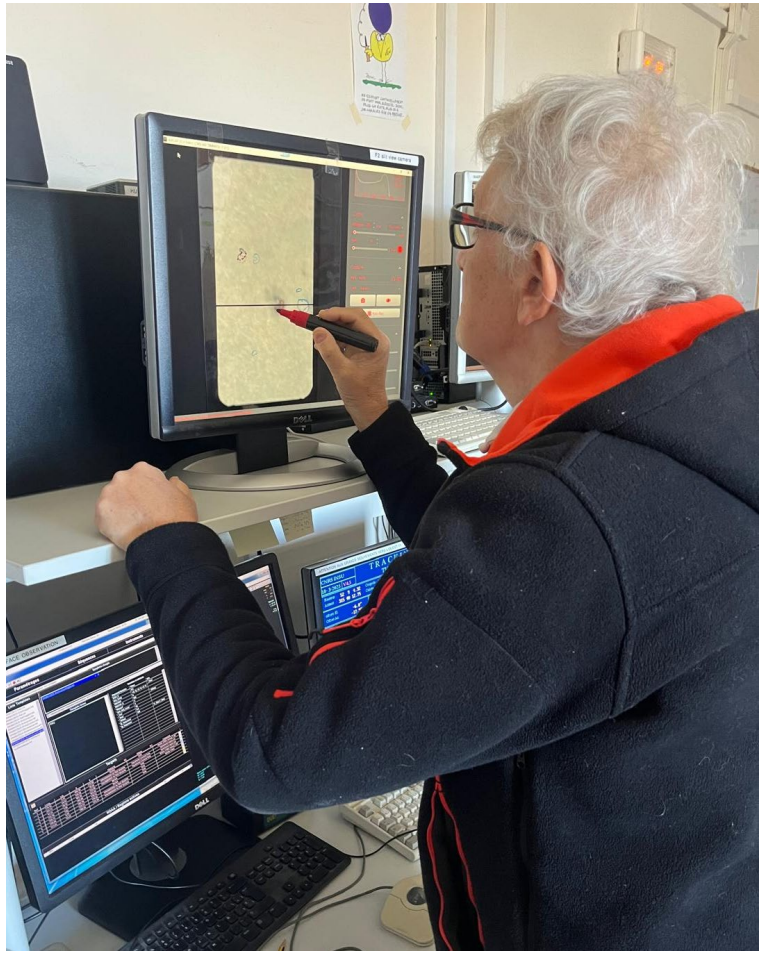
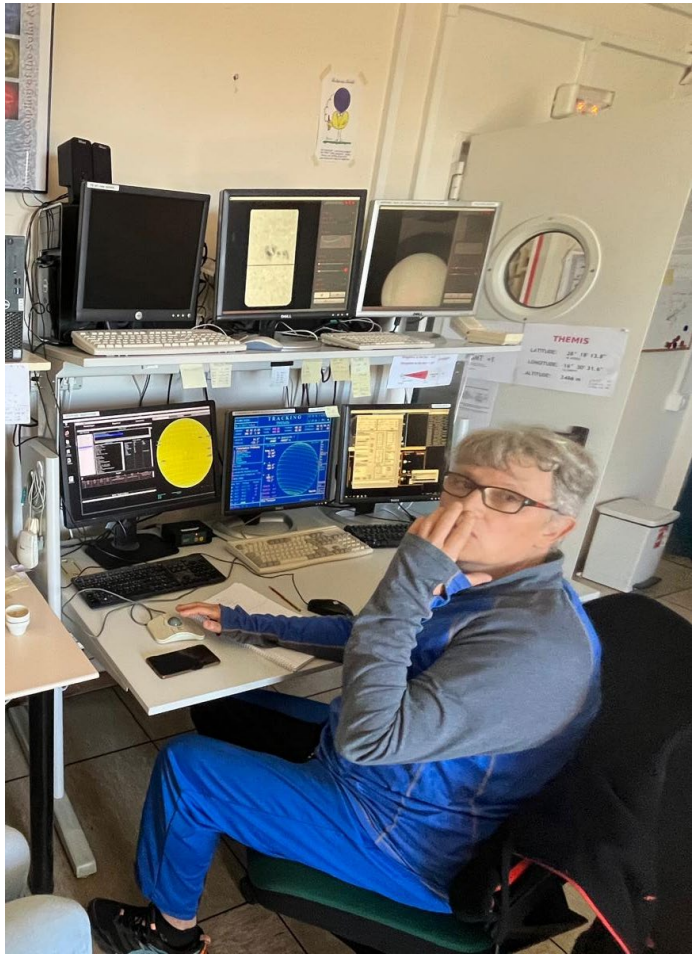
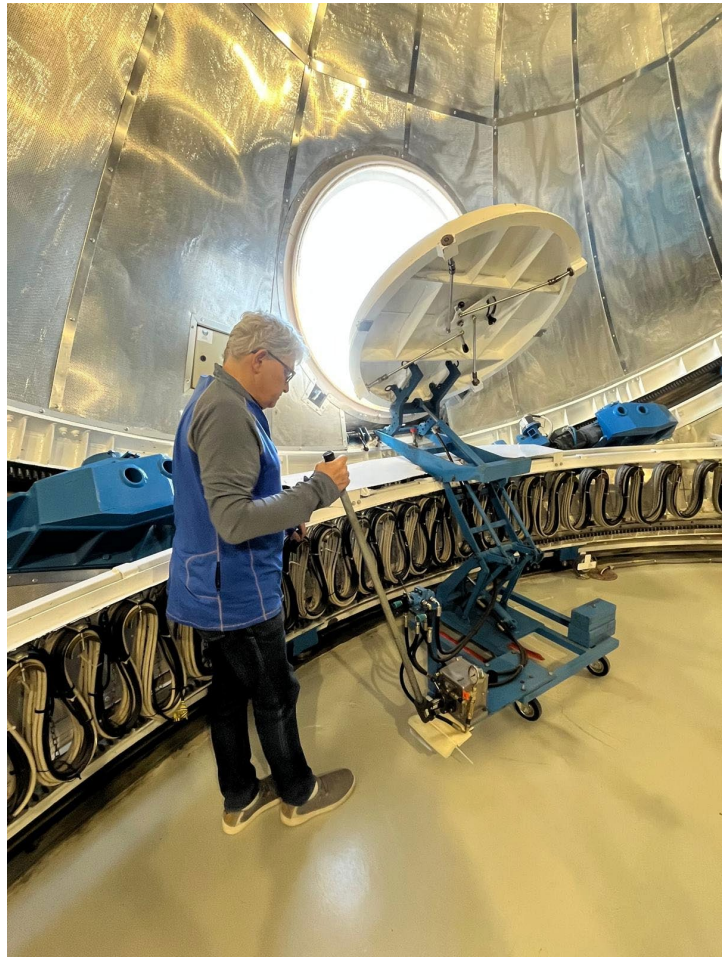


In memoria of Didier Laforgue

- Didier Laforgue passed away on June 20th 20205, after 23 years working at THEMIS as a system-instrument research engineer, and as a very appreciated observation operator.

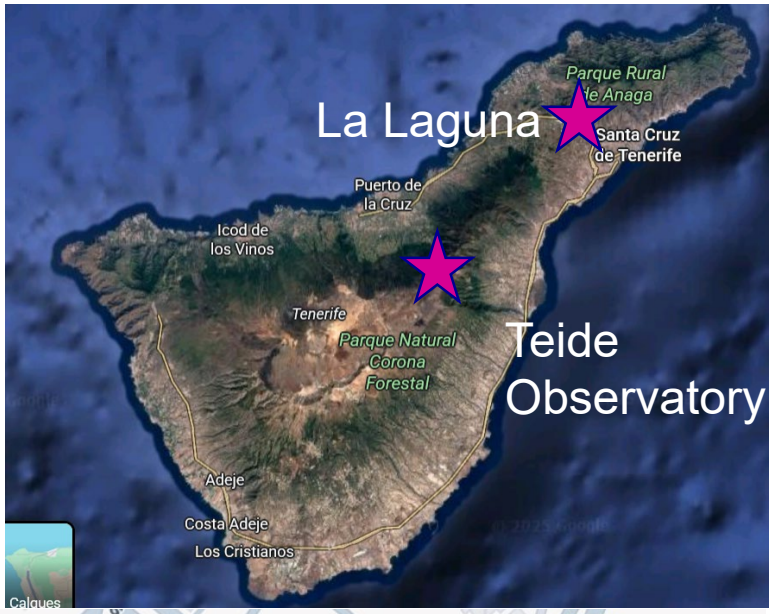


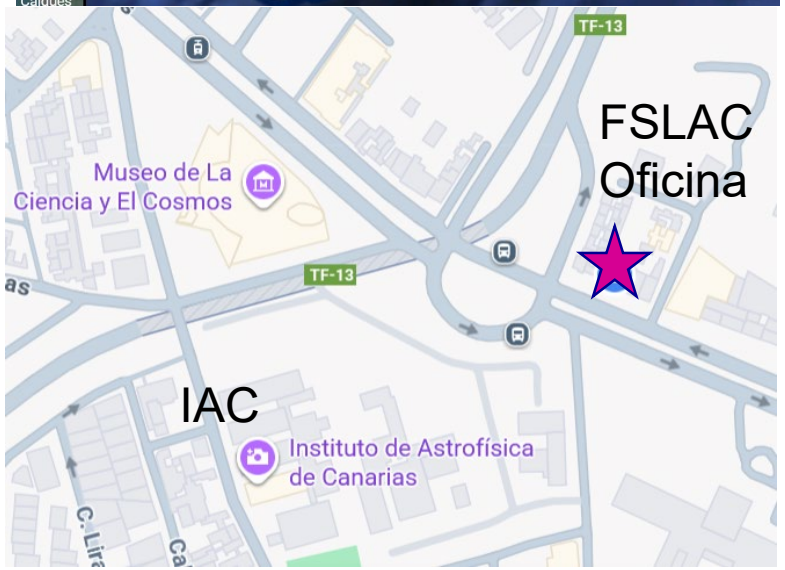




French-Spanish Laboratory for Astrophysics in Canarias

- THEMIS team is part of the **French-Spanish Laboratory for Astrophysics in Canarias (FSLAC), joint international research laboratory of CNRS & IAC.**
  - FSLAC office located in front of IAC main campus
  - FSLAC spearhead of French-Spanish collaboration
- FSLAC renewed for 5 years: 2026-2030
  - 5 research themes: high energy astrophysics (CTAO), Solar physics (THEMIS, EST), CMB (QUIJOTE), Exoplanets & adaptive optics, Galactic Archaeology (WEAVE)
  - **IAC researchers welcomed to participate to FSLAC activities**
- Present FSLAC team members:
  - Ramon Garcia Lopez, IAC/ULL professor, FSLAC director
  - Bernard Gelly, CNRS professor, THEMIS director, FSLAC deputy director
  - Fabio Acero, CNRS assistant professor
  - Étienne Pariat, CNRS assistant professor
  - Richard Douet, CNRS opto-mechanics engineer, THEMIS technical director
  - ~~Didier Laforgues,~~ CNRS control-command informatician → ✊ position filled in 2026
  - Jeronimo Foronda, THEMIS administrator
  - + 01/2026 : PhD student Jorge Romero Castañeda
  - + 02/2026 : postdoctoral researcher: Saida Diaz Castillo

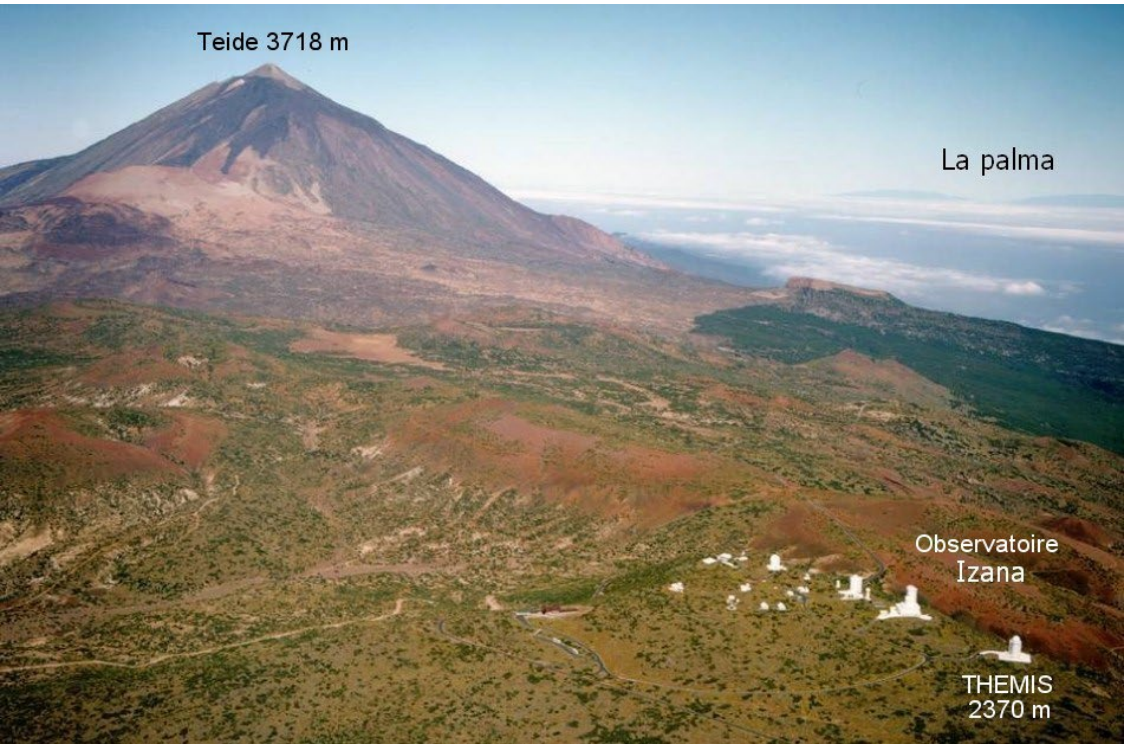


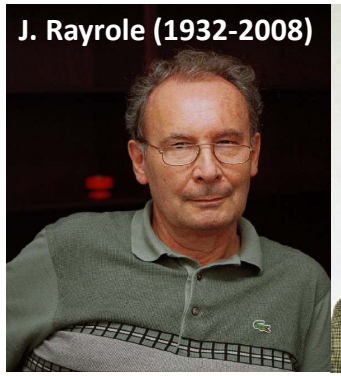


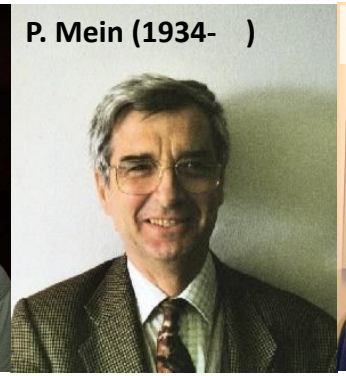
Outline

- **Introduction: THEMIS time line & characteristics**
- THEMIS overhaul
- THEMIS adaptive optics
- Spectropolarimetry with THEMIS 2.0
- Some 2025 campaign highlights
- Prospectives & conclusions

THEMIS timeline







1970's : European JOSO search & test observatory sites for optimum sky quality: selection of Tenerife and La Palma

1975 : First presentation of the THEMIS project by **J. Rayrole** at the Institut National d'Astronomie et de Géophysique.

1980's : Telescope design & instruments development at Paris Observatory, lead by **J. Rayrole, P. Mein & M. Semel**.

1992 : French INSU/CNRS, Spanish CSIS & IAC, & Italian INAF/CNR sign international cooperation agreements

1993 : Start of the construction of the THEMIS building

First light of the THEMIS telescope on March 16th 1996

1996-1999: THEMIS Commissioning

1999-2014: 1st phase of scientific exploitation

2009 : Withdrawal of the Italian partner.

2015-2018: Closure to observation for optical design overhaul.

2019- now : 2nd phase of THEMIS scientific exploitation.

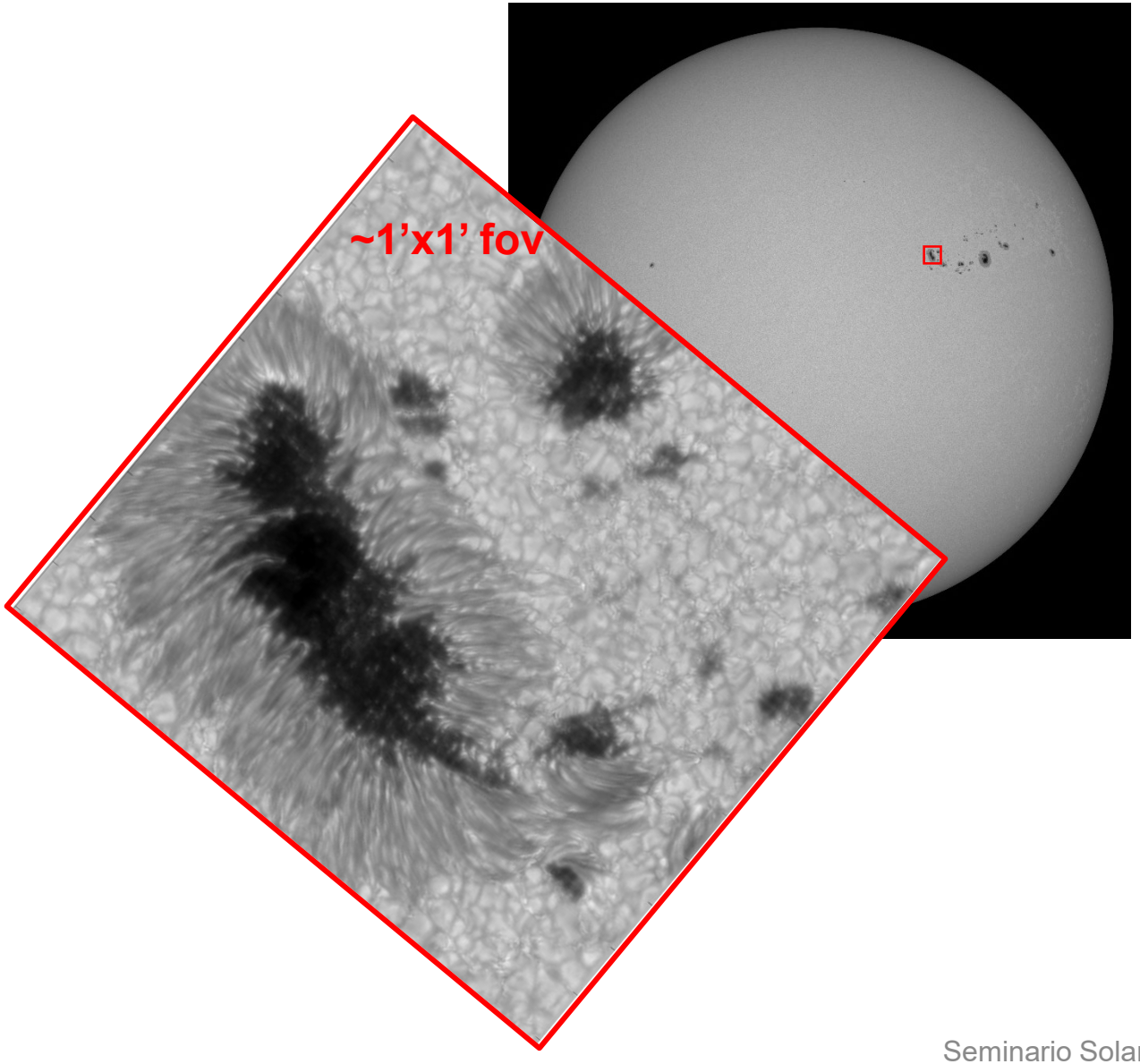
Dec. 2020 : 1st light of THEMIS Adaptive Optics in closed-loop.

June 2021 : Creation of FSLAC, joint international laboratory of INSU & IAC, overlooking THEMIS activities.

Key THEMIS optical design

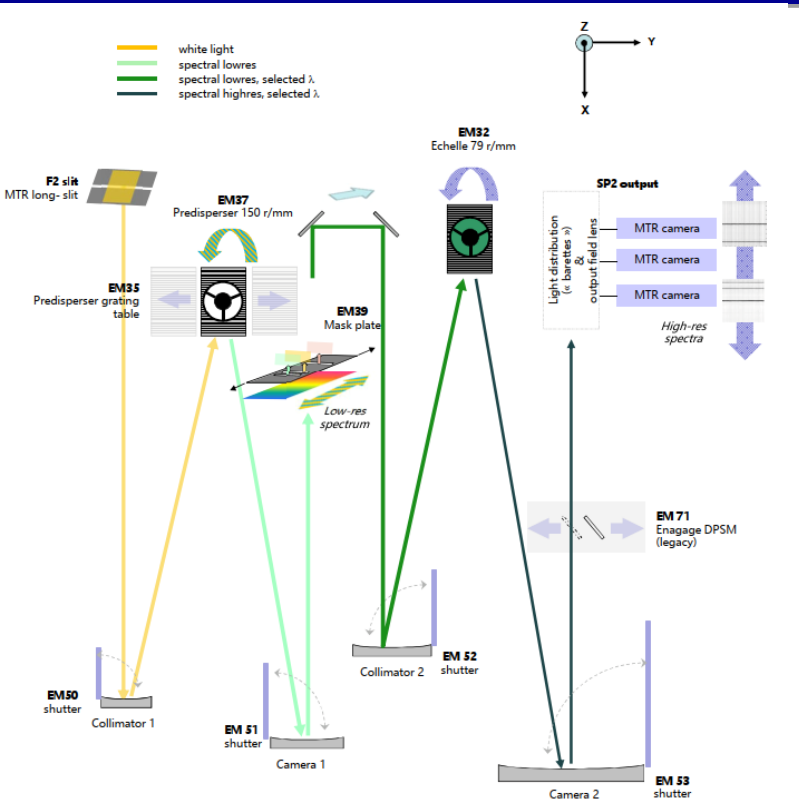
- 92cm Ritchey-Chrétien on alt-azimuthal mount.
  - ~6th largest solar telescope in the world
- **Very high effective focal length (57m) and focal ratio (f/62)**
  - High magnification capacity
  - **One of the world « slowest » optical telescope**
    - High loss of light, compensated by large solar flux
    - Less optical aberations
- **Polarization analyser at first optical focus**
  - Polarization fixed further along optical path
  - **→ unique polarization calibration free telescope : ideal for spectropolarimetry**
  - Pre adaptive-optic design : not ideal for imagery

THEMIS observation capabilities



- Small field-of-view: 1'x1' to 2'x2'
  - ~human eye resolution
  - Tennis ball at ~250m
  - ~1/215-900th of the solar surface
- 0.15" theoretical (diffusion) spatial resolution (@ ~600 nm)
  - Tennis ball at ~100 km
- Teide Observatory seeing:
  - Can reach down 0.3" at night
  - Typical solar condition are closer to 1"

THEMIS Spectrograph



- **As of today the main THEMIS instrument is the MTR2 slit-spectrograph**
  - Tunable slit or 0.5” slit-jaw
  - Visible & near IR spectral domain: 4000-11000 nm
- **Ultra-high spectral resolving power**
  - R ~ 200 000 to 300 000
- **User-defined simultaneous multi-spectral lines observations**
  - No-instrument determined spectral ranges
  - Spectral ranges defined by user
    - fixed set-up for a given campaign
  - Up to 6 spectral range (3-4 in general)
  - ~ 6-7 Å spectral range/camera
  - Spectral resolution down to ~20-30mÅ (@6000 Å)

THEMIS Factsheet

Very well-maintained but,
be at that it may,
a 20th century instrument !

THEMIS @ OT in June 2025

- **Main French solar telescope** designed by J. Rayrole, P. Mein & M. Semel
  - Located at Teide Observatory, Tenerife, Spain
  - 1st light in March 1996, & commissioned in 1999
- 1m-class solar telescope, with **one the world "slowest" optical design:**
  - Aperture: 92 cm
  - Effective focal length: 57m
  - Effective focal ratio: f/62
  - 2'x2' square field-of-view
- **Ideal for high resolution spectropolarimetry:**
  - Spectrum range: 4000 - 11000 Å
  - Polarization calibration free
  - Ultra-high spectral resolving power: R ~ 200 000 to 300 000
  - Simultaneous observations of user-defined set of up to 6 spectral lines: 6-7 Å spectral range with ~30 mÅ resolution

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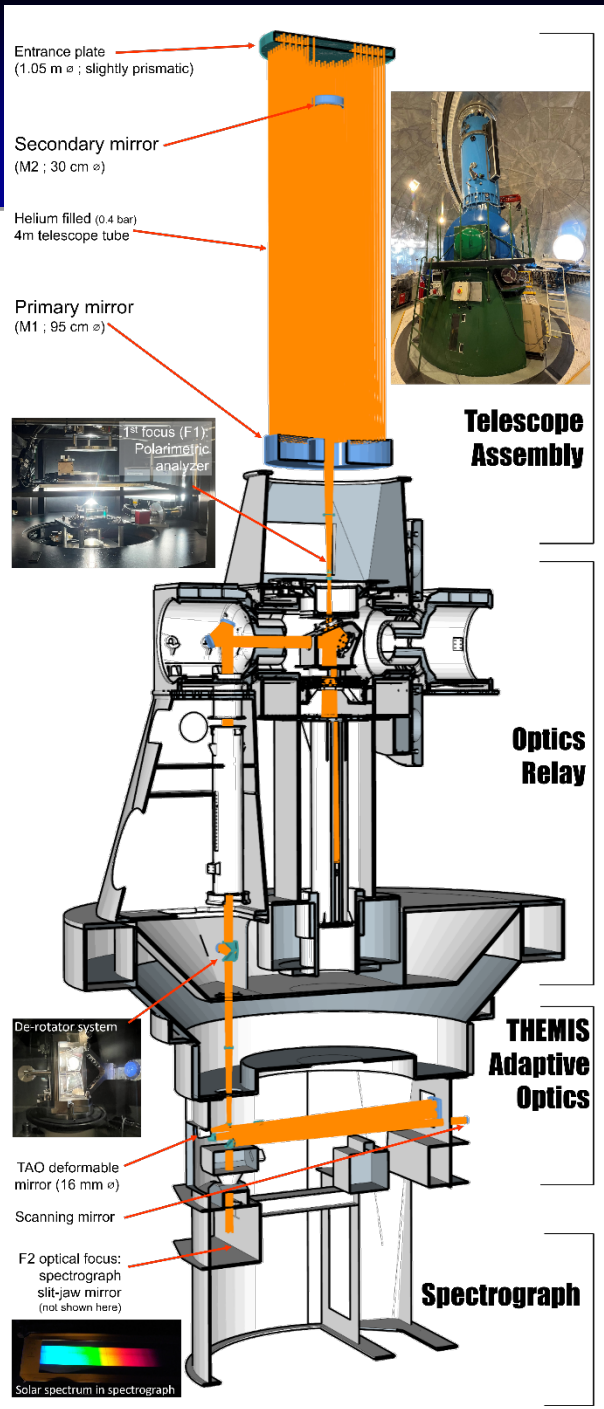
“Total makeover”: 2016 → 2020



- **THEMIS has been widely renewed and redesigned**
  - Thanks to EU funding: ~1M€ from 2 IAC-led SOLARNET programs
  - **Successful renovation thanks to several French teams**

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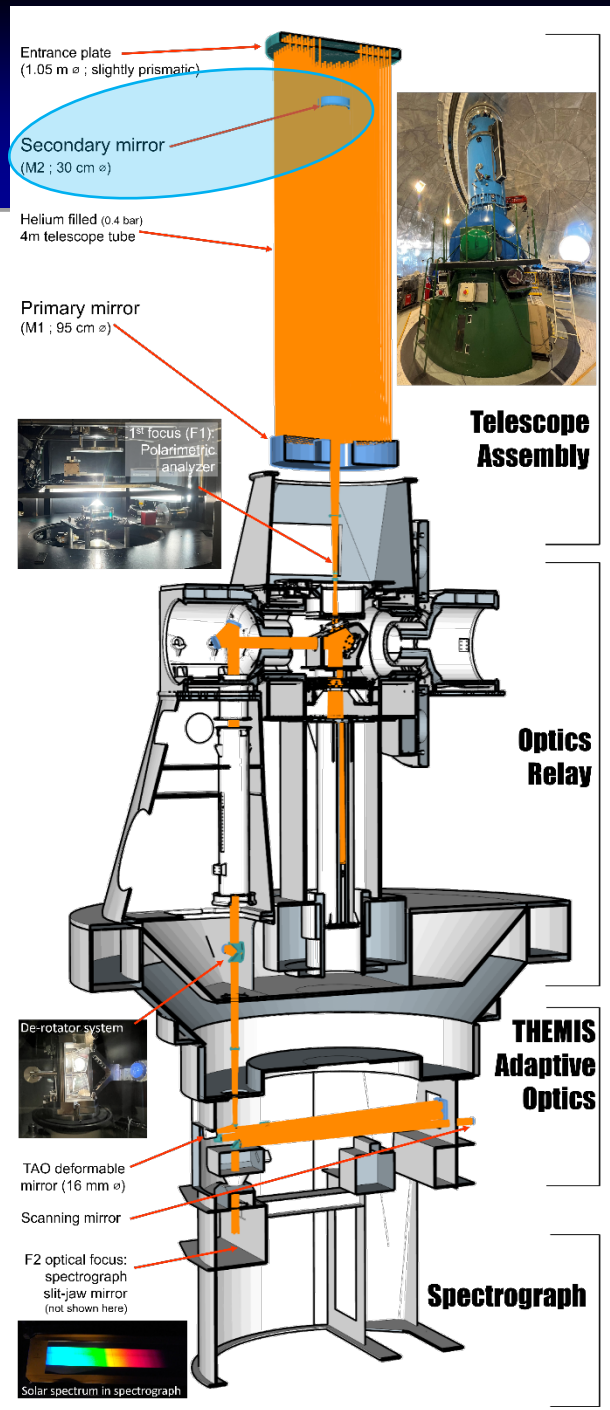

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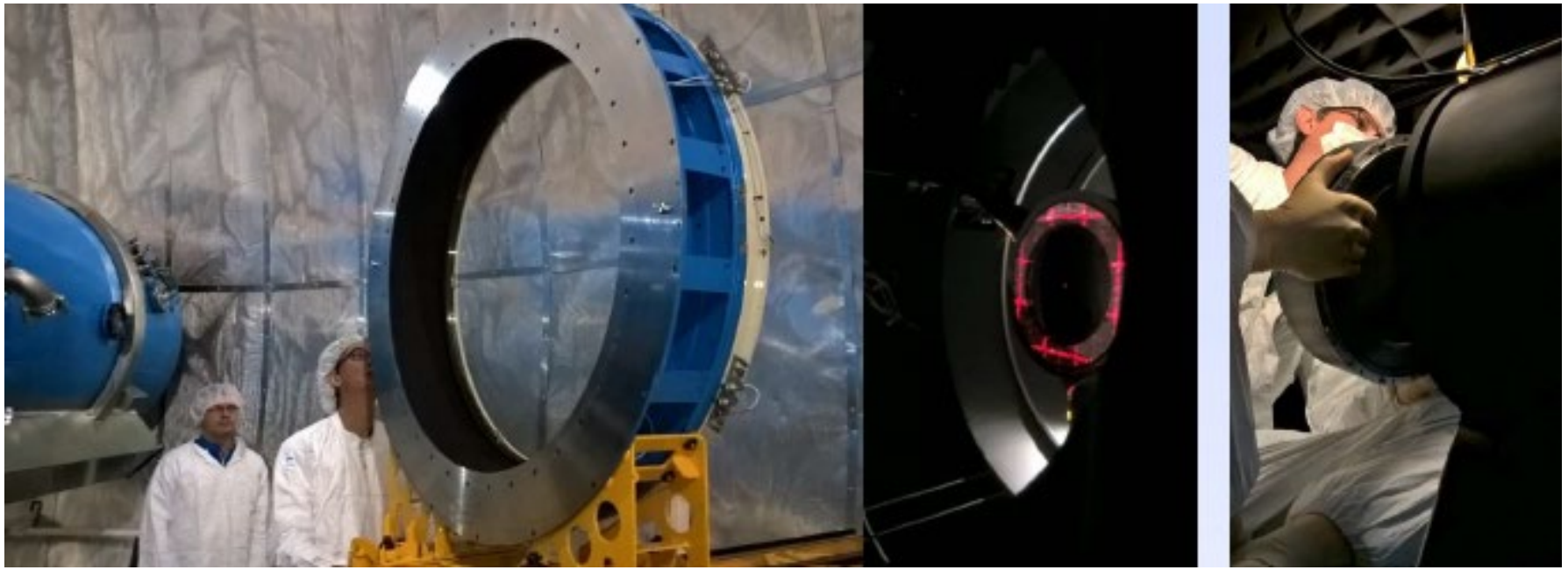
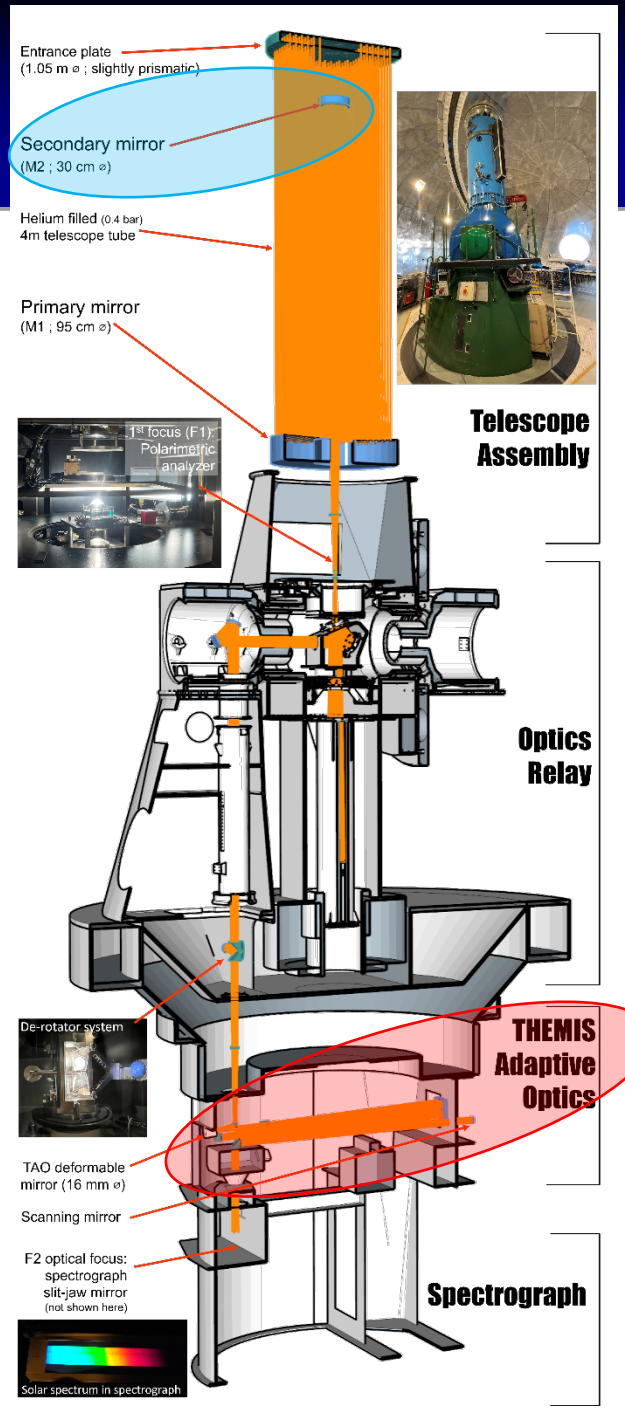
- **M2 mirror re-aluminising** (William Hershel Telescope & THEMIS teams)



"Total makeover": 2016 → 2020

FSLAC International Research Lab.



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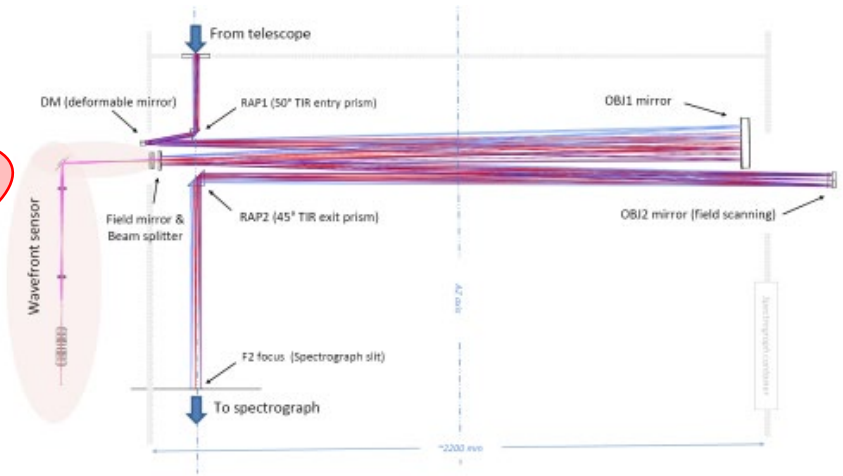
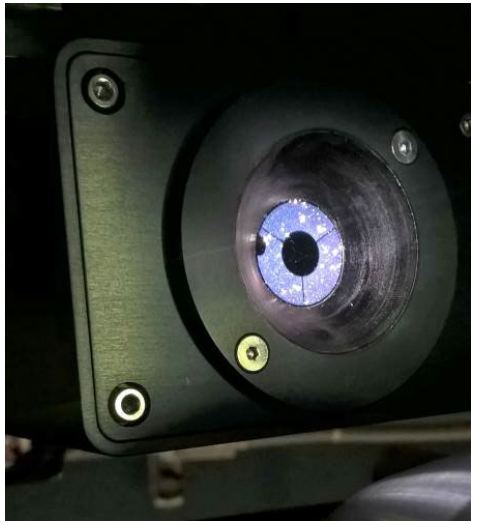
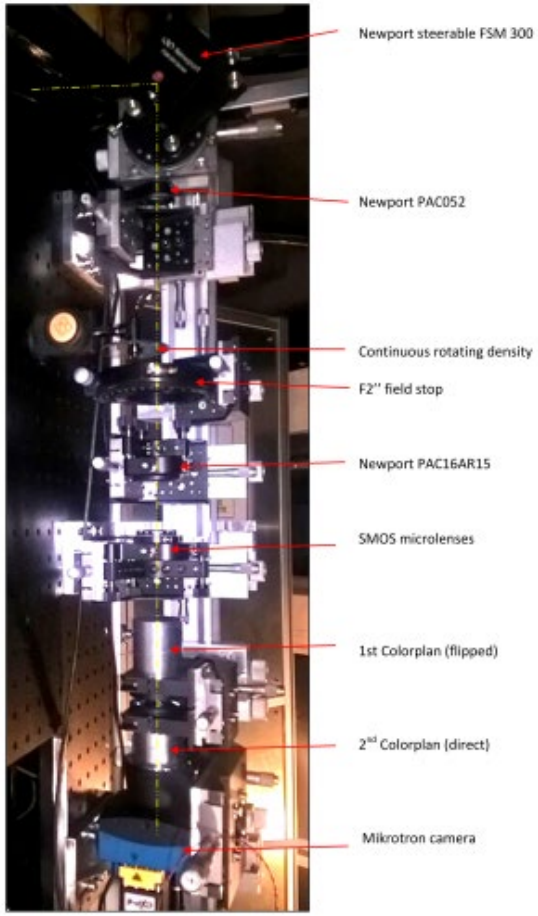
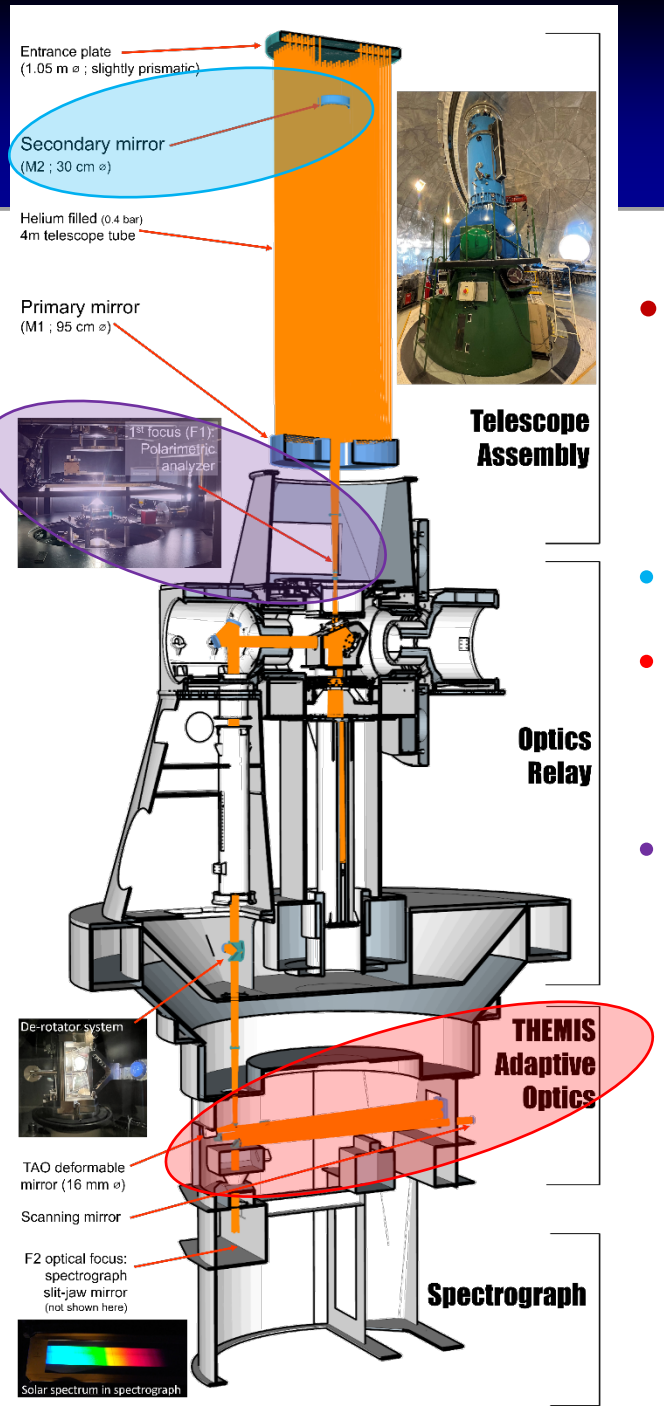






"Total makeover" : 2016 → 2020



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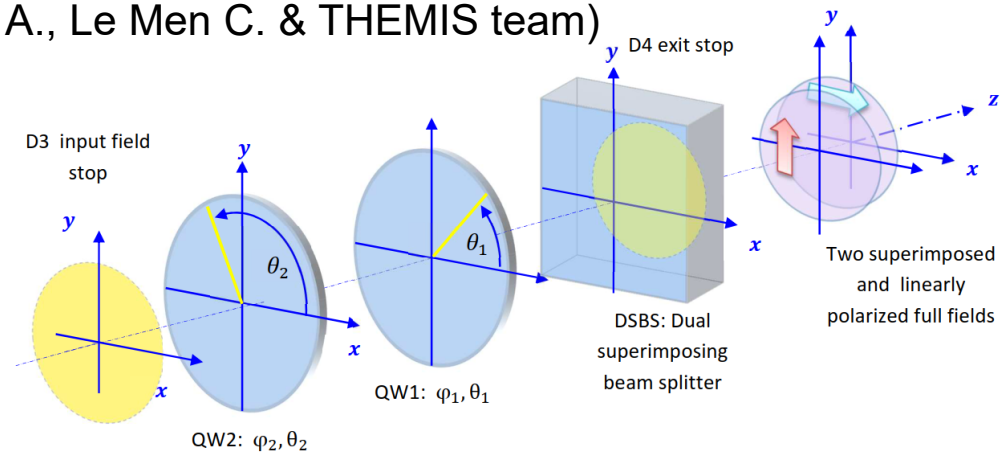
- **Superimposed dual-beam polarimetric analysis** without field limitation (Semel M., Lopez A., Le Men C. & THEMIS team)



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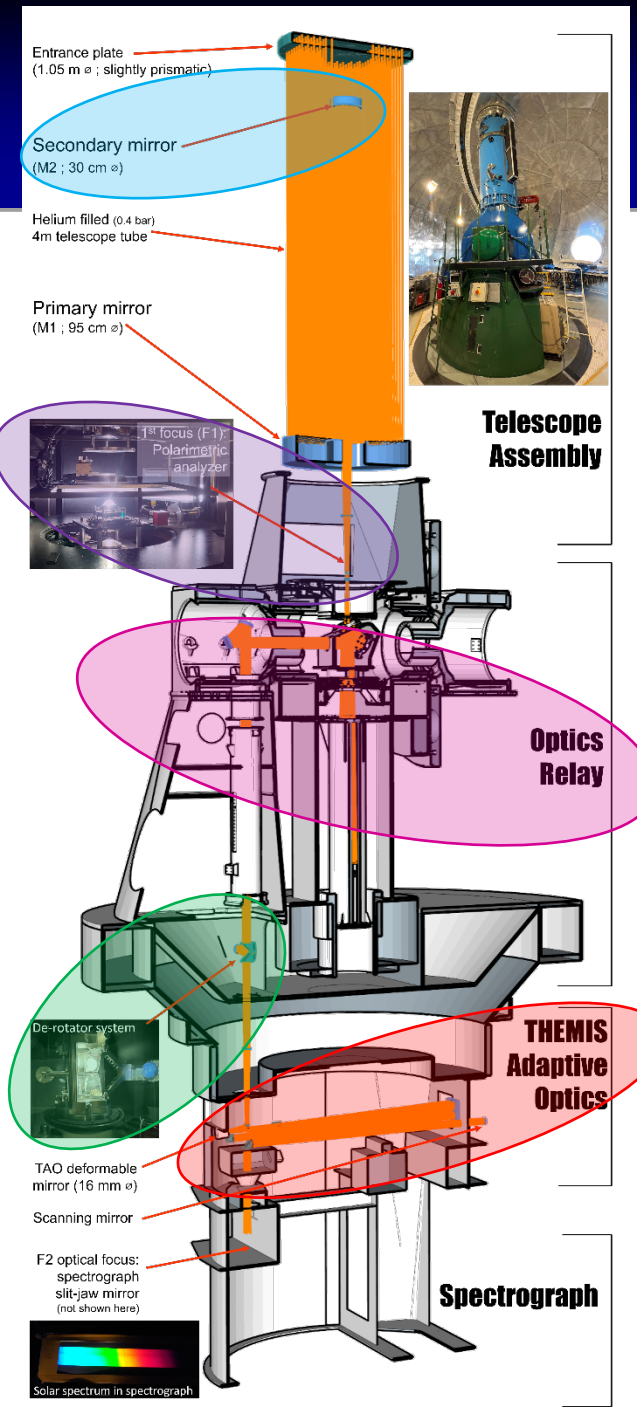

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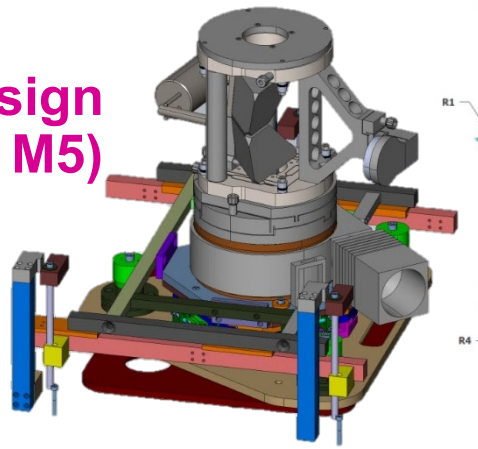
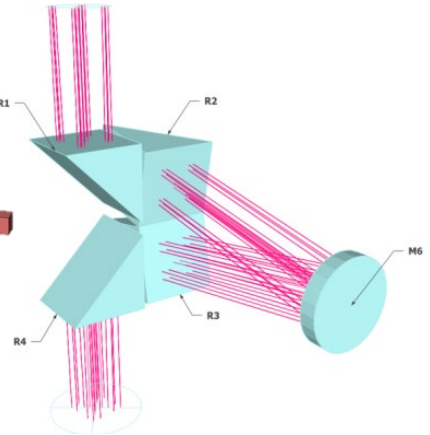
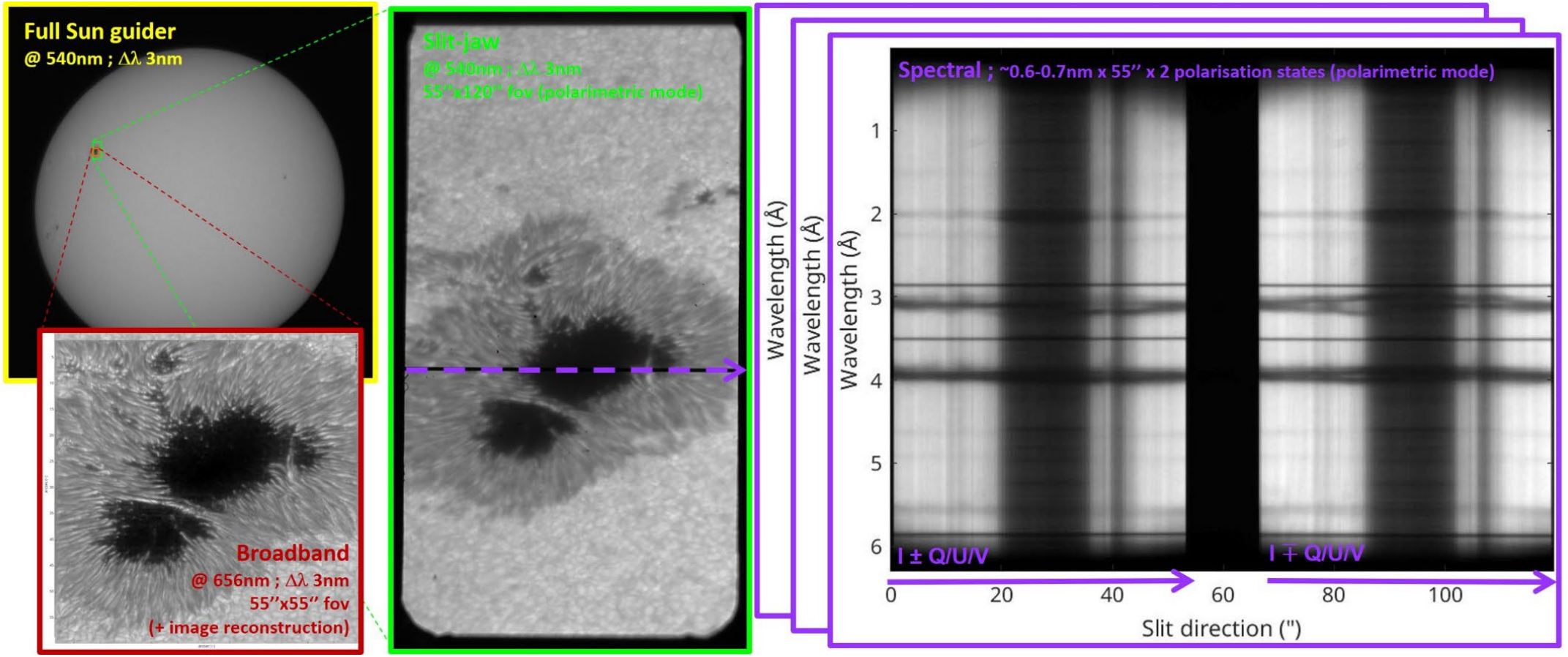
- **"Polarization- friendly" complete redesign of the whole transfer optics (M3, M4 & M5)** (Le Men, C. & THEMIS team)
- **New de-rotator system** (THEMIS team)
- + New context, broadband and spectral cameras.





THEMIS primary data products

- **Full sun guider** & **spectrograph Slit-jaw** context images
- **BroadBand images (BBI)**
- Main science products: **MTR2 spectrograph spectral images**



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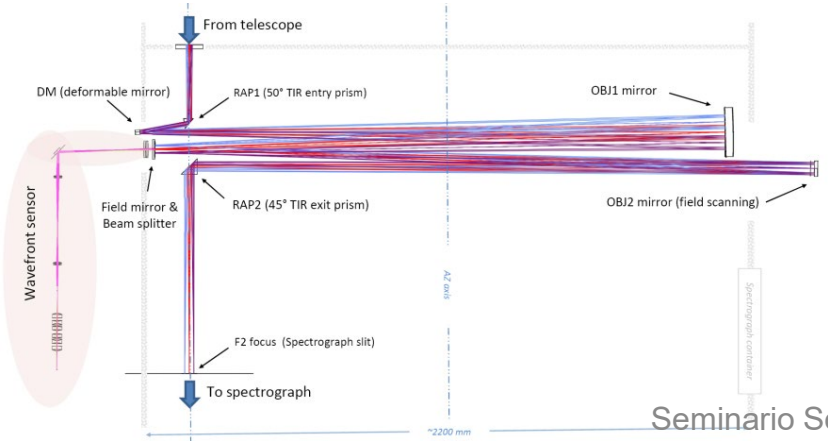
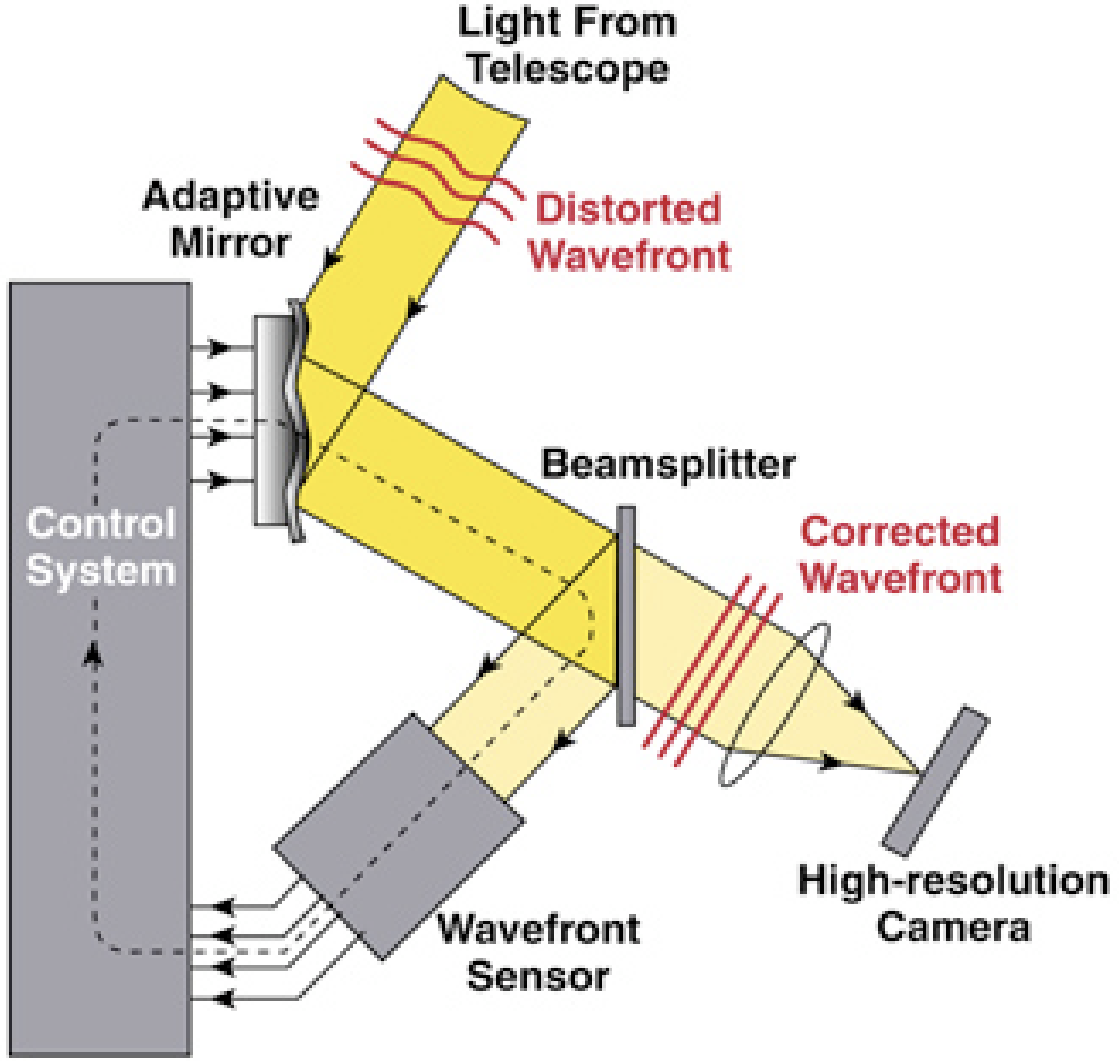
THEMIS Adaptive optics : principles

- Adaptive optics (AO) technology : correct distortions in light wavefronts due to turbulence or imperfections
  - Measures the incoming distorted wavefront thanks to wavefront sensor (WFS).
  - Very dynamically reshapes a deformable mirror in real-time thanks to actuators
  - corrections must be faster turbulence timescales : use of real-time control computer equipped with extremely fast processor

- **THEMIS had a pre-AO era design**
  - **Adapting an AO has been particularly challenging**





Crédit: *Lawrence Livermore National Laboratory and NSF Center for Adaptive Optics*

TAO linearized model of wavefront sensor data and DM commands in the THEMIS system

WFS data — Actual wavefront — Actuator commands — … some noise

$$\boldsymbol{d}_t = \boldsymbol{S}.(\boldsymbol{w}_t + \boldsymbol{M}.\boldsymbol{a}_t) + \boldsymbol{z}_t$$

Sensor linear response — Mirror influence matrix

- Wavefront is represented in the basis of influence functions of the DM

➔ **Requires to solve an inverse problem (*argmin*…) at each step (all terms may change with time), in real-time (~1kHz)**

Thiebaut, E., Tallon, M. et al, SPIE proceedings 2022

$$\boldsymbol{a}_{t+\delta t} = argmin\{\ \|\boldsymbol{y}_t + \boldsymbol{G}\,.\,\boldsymbol{a}\|^2_{Cov(\boldsymbol{z_t})^{-1}} + \mu_t \|\boldsymbol{a}\|^2_{\boldsymbol{W}} + \rho_t \|\boldsymbol{a} - \boldsymbol{a}_t\|^2\ \}$$

$\boldsymbol{G} = \boldsymbol{S}\,.\,\boldsymbol{M}$ is the **interaction matrix**

$\boldsymbol{y}_t = \boldsymbol{d}_t - \boldsymbol{G}.\boldsymbol{a}_t$ are ≈ open loop data

$\boldsymbol{\mu_t} > 0$ and $\boldsymbol{W} \approx Cov(w_t)$ are loop parameters to enforce spatial regularization

$\boldsymbol{\rho_t} > 0$ is a loop parameter to impose temporal continuity

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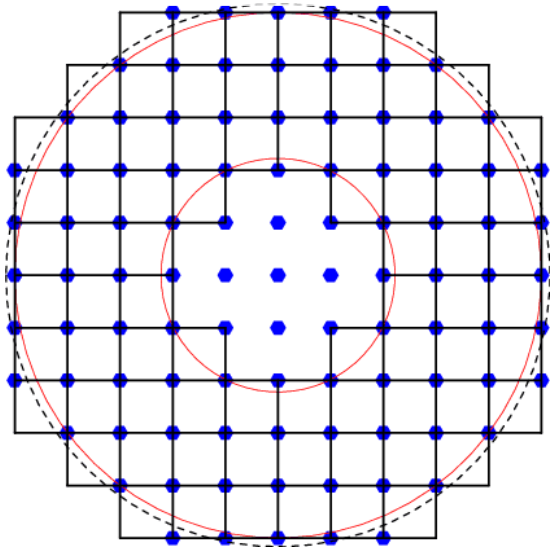
THEMIS Adaptive Optics (TAO): specifications & objectives

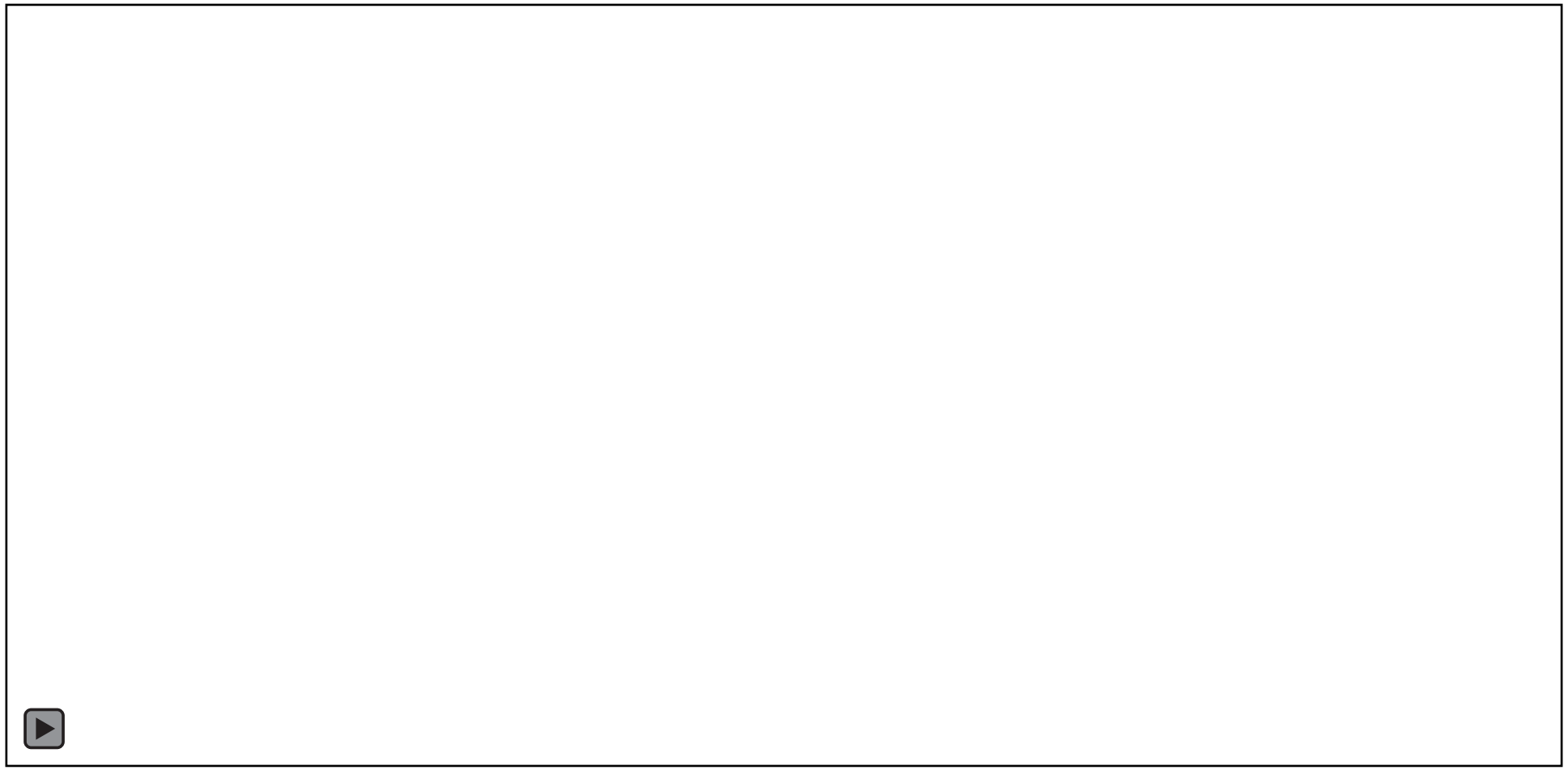
- Specifications
  - **76 sub-aperture Shack-Hartmann wavefront sensor** (10×10);
    - 380×380 pixel WFS images, Mikrotron EoSens 4CXP detector
  - **THEMIS-optical-path-compatible 16 mm deformable mirror**
  - **97 actuators** on ALPAO deformable mirror (11×11 config.)
  - Real time correction (RTC)
    - Computer: CPU i7-4790K (Q2'14) at 4.2 GHz, 4 cores, up to 50 Gflops/core with AVX2 + FMA instructions.
- Objectives:
  - **✓ Closed AO loop on the Sun**
    - started from scratch mid-2016 → operative in December 2020
  - **✓ RTC software running in CPU @1250 Hz** (no GPU)
    - flexible RTC software to implement and experiment new algorithms
  - **Next objective (December 2025): unsupervised AO system** (optimal correction whatever the conditions)

TAO geometry with a combination of DM/wavefront sensor set up in 'Fried configuration' with a spacing number of 10

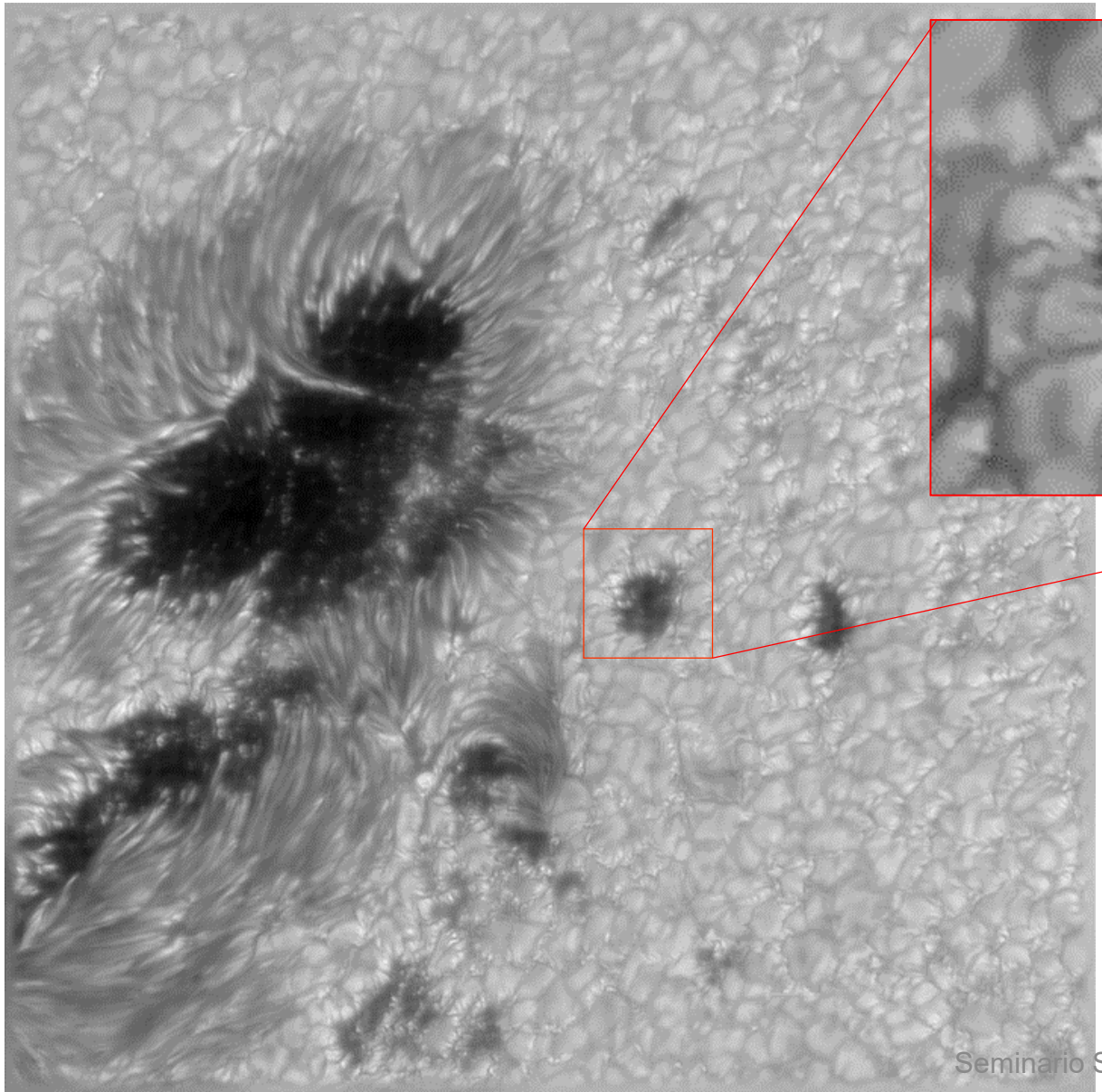


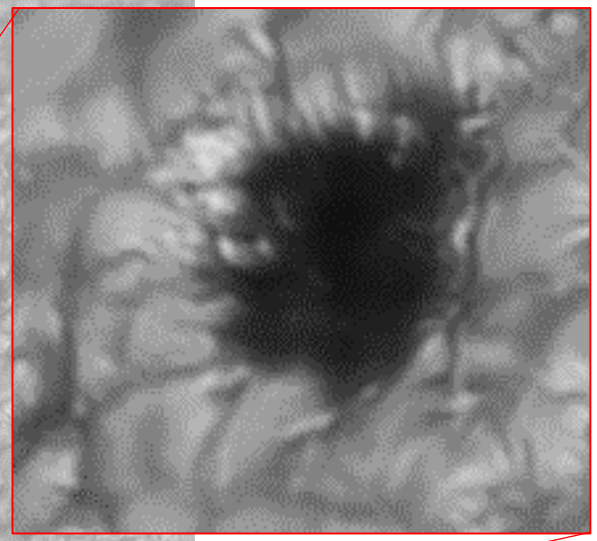
TAO going live on NOAA 12975

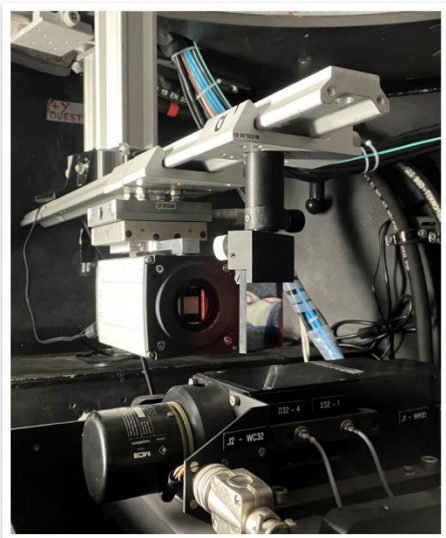
- Successive recordings in equivalent seeing conditions
- 55” square field, 20 image/s (0.3 ms), 2k x 2k (0.03” /px) on Broadband Imaging Camera

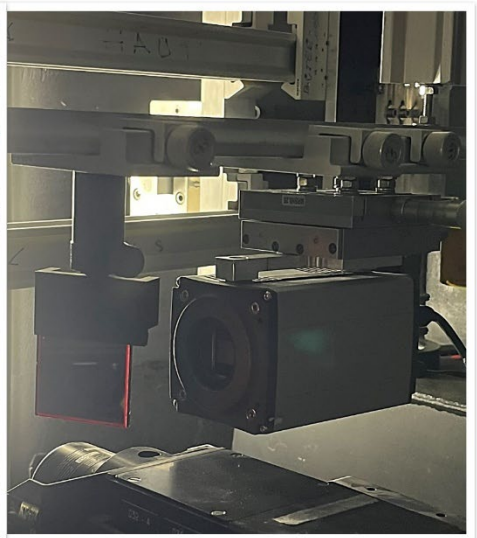


THEMIS at diffraction limit: NOAA 12975







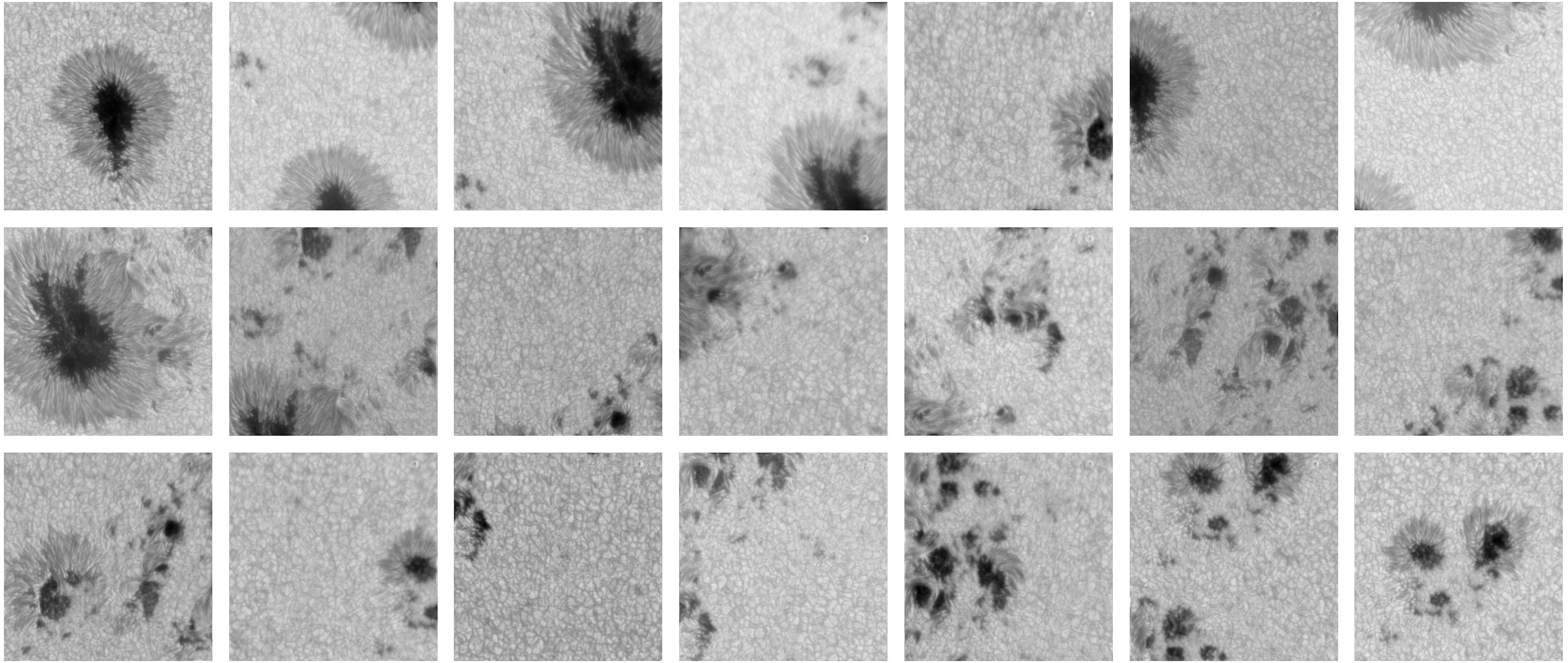


THEMIS Broadband Imaging (BBI)

- NOAA 12975 on 2022/03/31
- Observed @ 630nm ; 1nm broadband red filter
- 55”x55” FOV
- 100 BBI acquisition @ 40 images/s
- Knox-Thompson image post processing
- **➔ 0.17’’ resolution (0.035”/pixel) near THEMIS theoretical diffraction limit of 0.15”**

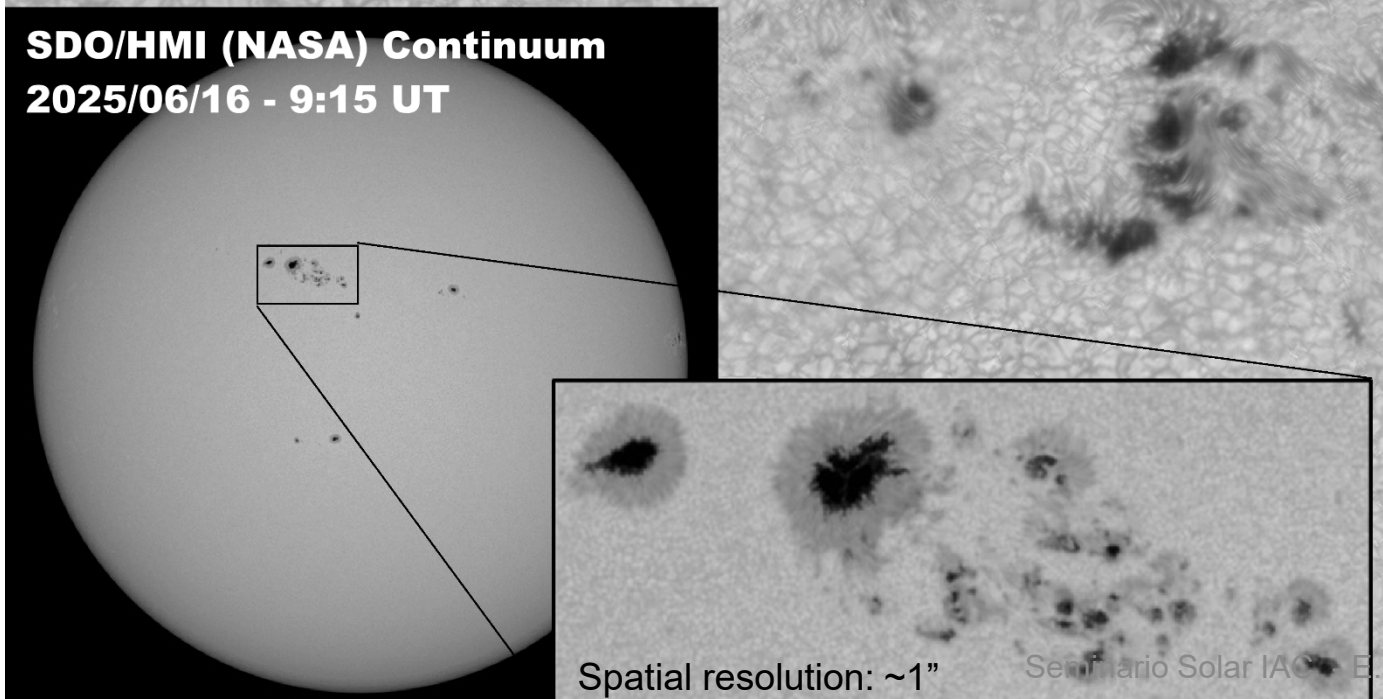
THEMIS large FOV reconstruction: NOAA 14114

- Acquisition of sequential 21 BBI bursts (55x55” FOV) of NOAA 14114

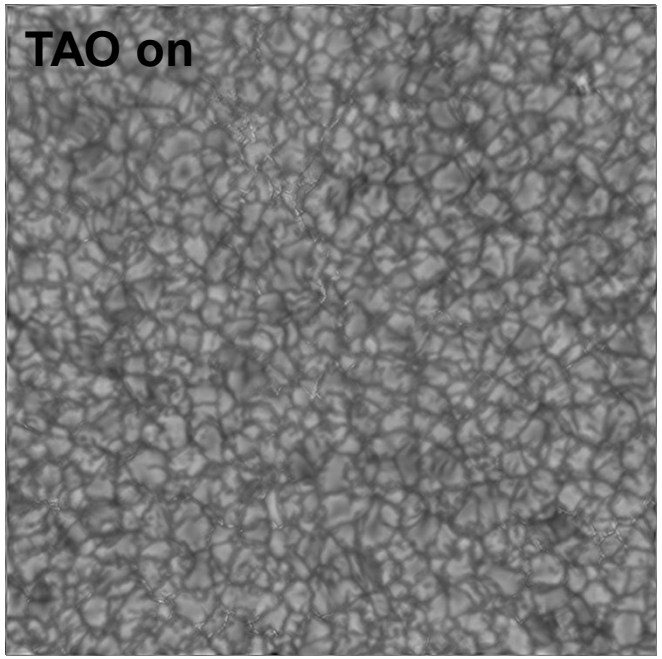


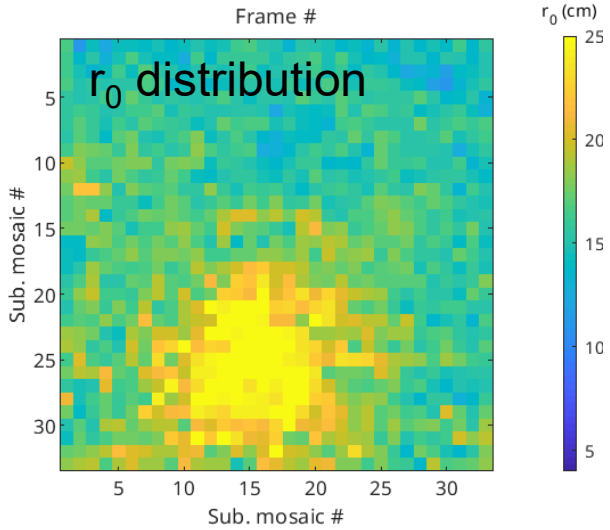
THEMIS composite Broadband Image (BBI) + Knox Thompson reconstruction of active region NOAA 14114 on June 16th 2025 at 9:08-9:22 UT

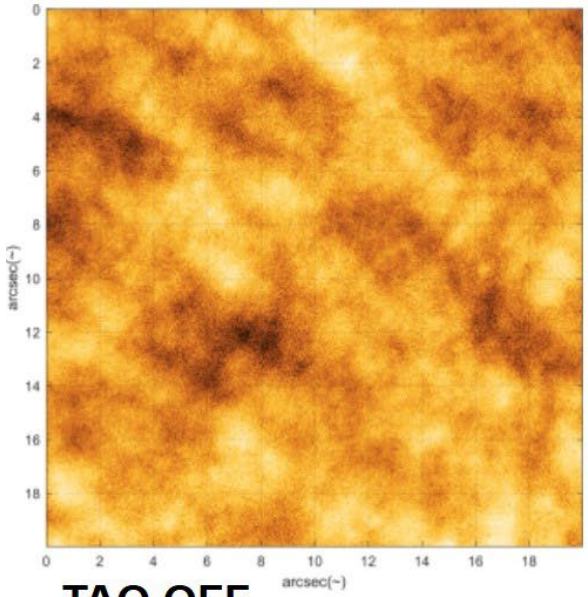
- Average seeing conditions
- **Several 55”x55” FOV acquisition by BBI camera in burst mode (40 images/s) + image restoration from residual seeing ➔ Routine operation with pipeline !**
- Images stitched together with Hugin software
- ~250”x140” composite FOV
- Spatial resolution: ~0.2”



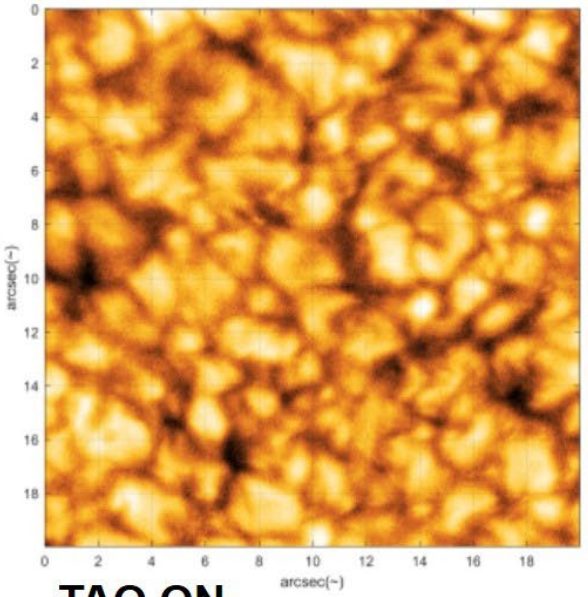
THEMIS Adaptive Optics (TAO): results on granulation



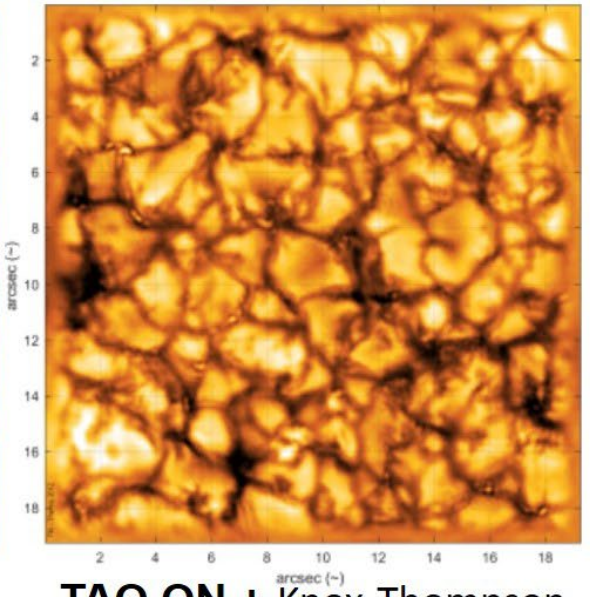




TAO OFF
- seeing "daytime bad" : r_0≈ 3-4 cm
- granulation contrast: 1.6 %



TAO ON
- seeing "daytime bad" : r_0≈ 3-4 cm
- granulation contrast: 4.2 %



TAO ON + Knox-Thompson reconstruction (100 frames)
- granulation contrast: 9.6 %

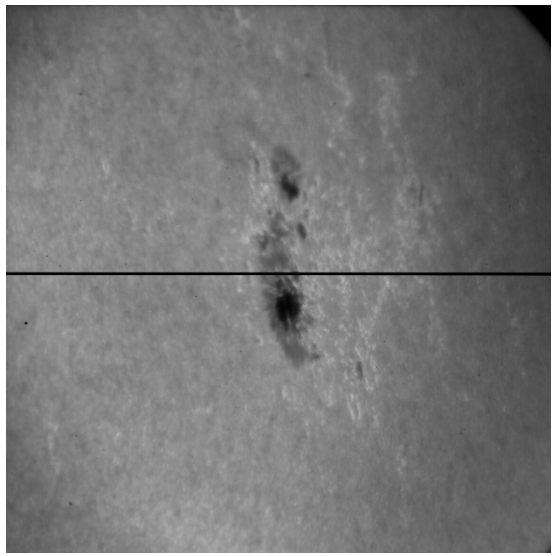
- **TAO permits significant quantitative image quality gain:**
  - **in effective seeing**: Fried's coherence length from r_0~7cm (ave. seeing)
    - ~25cm at TAO focus
    - ~17cm on rest of FOV, away from isoplanatic patch
  - **in granulation contrast**: from ~1-2% (bad seeing)
    - to ~10% (with image reconstruction)

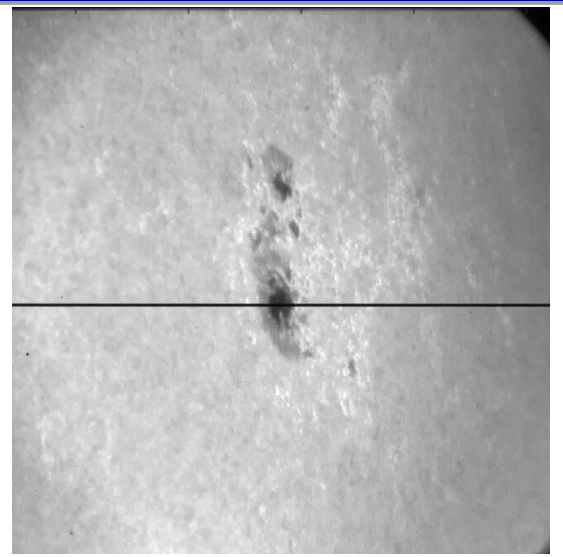
TAO for spectroscopy

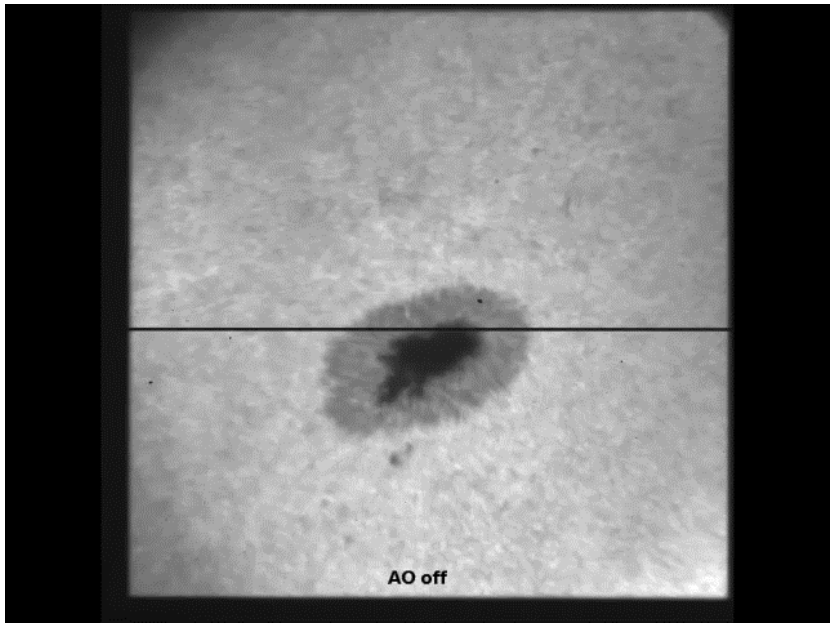
- Main strength and raison-d'être of THEMIS is spectropolarimetry!

- Requires scans of the region of interest by the spectrograph slit:
  - Scan duration of a 90" domain with 0.3" steps & 0.1 s spectral camera acquisition time
    - 3 min without polarimetry
    - 25 min with polarimetry

- **Spectroscopic measurement requires that TAO must hold and stabilize wavefront over FOV during extended periods of time.**

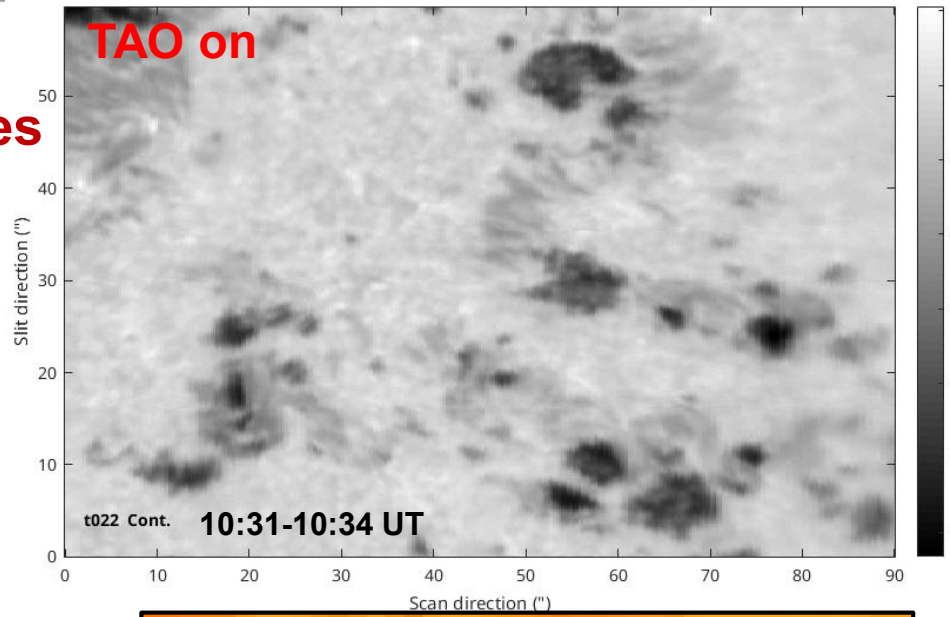


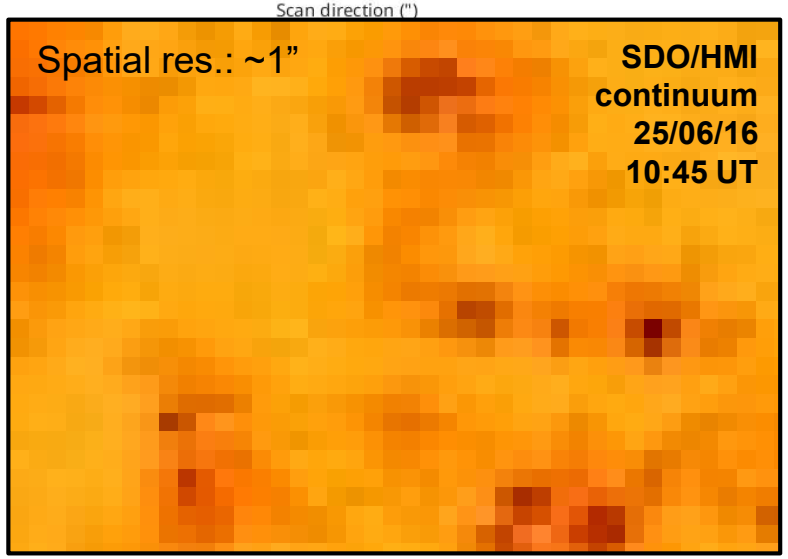


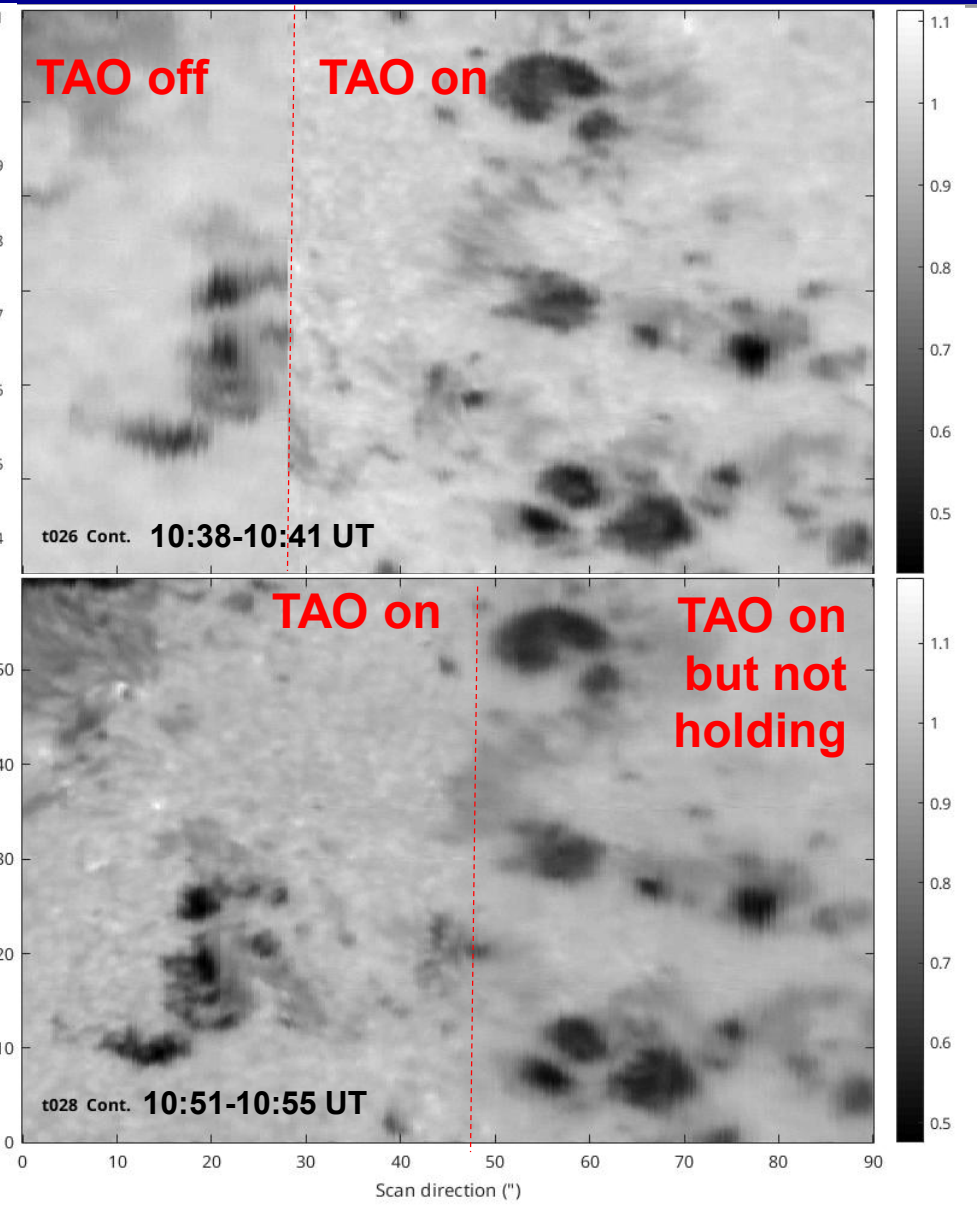


TAO for spectroscopy

- **Spectroscopic measurement requires that TAO must hold and stabilize wavefront over FOV during extended periods of time.**
- Challenging
- Isoplanatic patch away from spectrograph slit in long scan
- Stable seeing over extended period of time remains needed

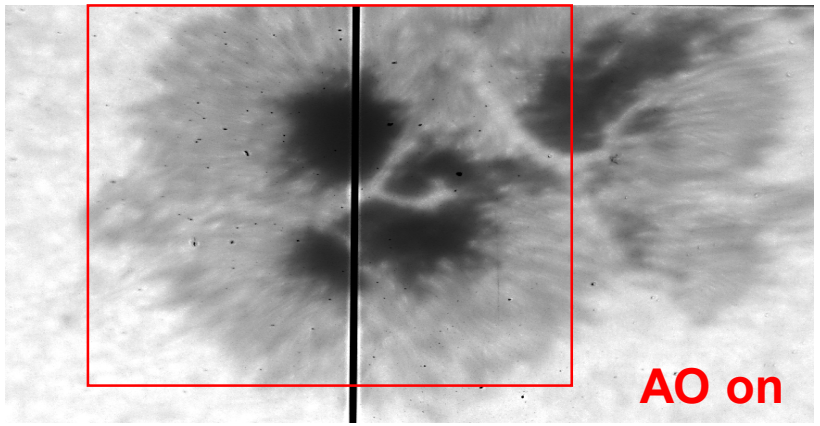


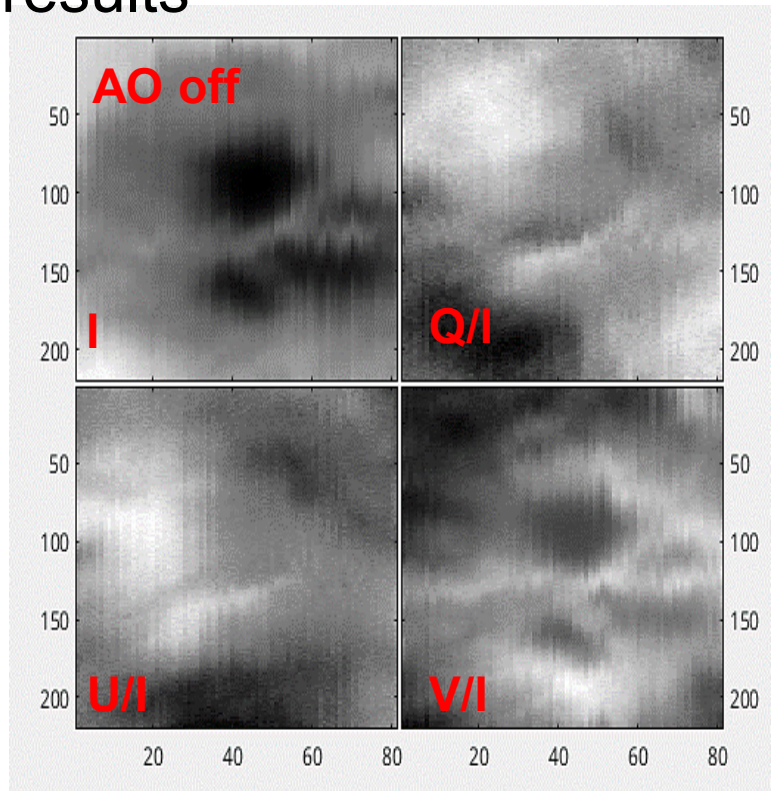


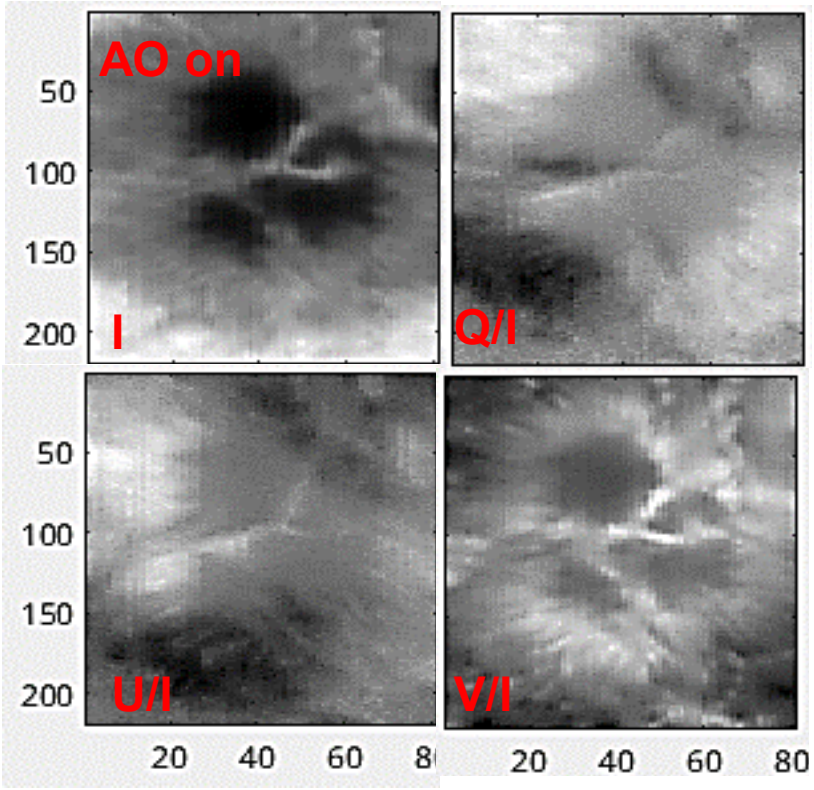


TAO for spectro-polarimetry

- TAO can also give good results on long spectropolarimetric scans
- **THEMIS goals : B maps with spatial resolution better than 0.5” arcsec**
  - x3 better resolution than before (~1 order magnitude better in area resolution)
  - equivalent to HINODE results







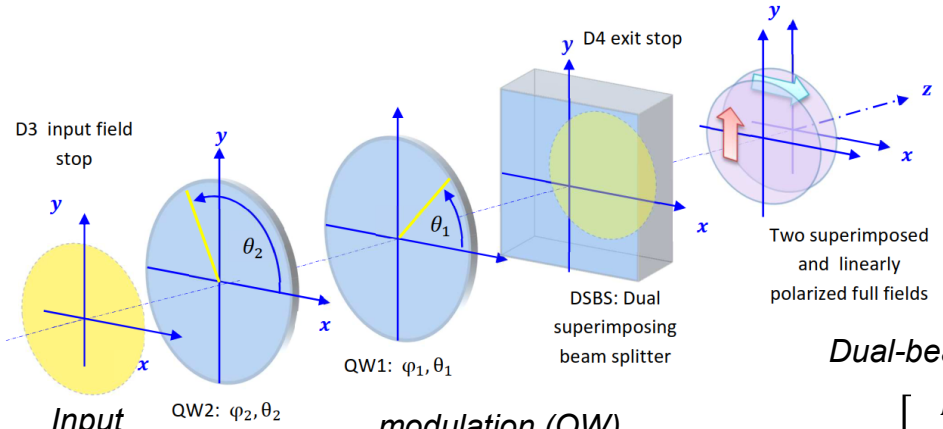
Stokes maps

Outline

- Introduction: THEMIS time line & characteristics
- THEMIS overhaul
- THEMIS adaptive optics
- **Spectropolarimetry with THEMIS 2.0**
- Some 2025 campaign highlights
- Prospectives & conclusions

THEMIS new polarimetric analysis scheme - 1

Full-Stokes analyzer (An4) located at the F1 prime focus, delivering dual-beam polarimetry with beam exchange.



Input *modulation (QW)*

$$S = \begin{bmatrix} I \\ Q \\ U \\ V \end{bmatrix} \quad S_Q = \begin{bmatrix} I \\ Q \\ U \\ V \end{bmatrix} \quad S_V = \begin{bmatrix} I \\ V \\ Q \\ U \end{bmatrix} \quad S_U = \begin{bmatrix} I \\ U \\ V \\ Q \end{bmatrix}$$

Dual-beam (single Savart plate)

$$S_{+Q} = \begin{bmatrix} I \\ +Q \\ 0 \\ 0 \end{bmatrix} \quad S_{-Q} = \begin{bmatrix} I \\ -Q \\ 0 \\ 0 \end{bmatrix}$$

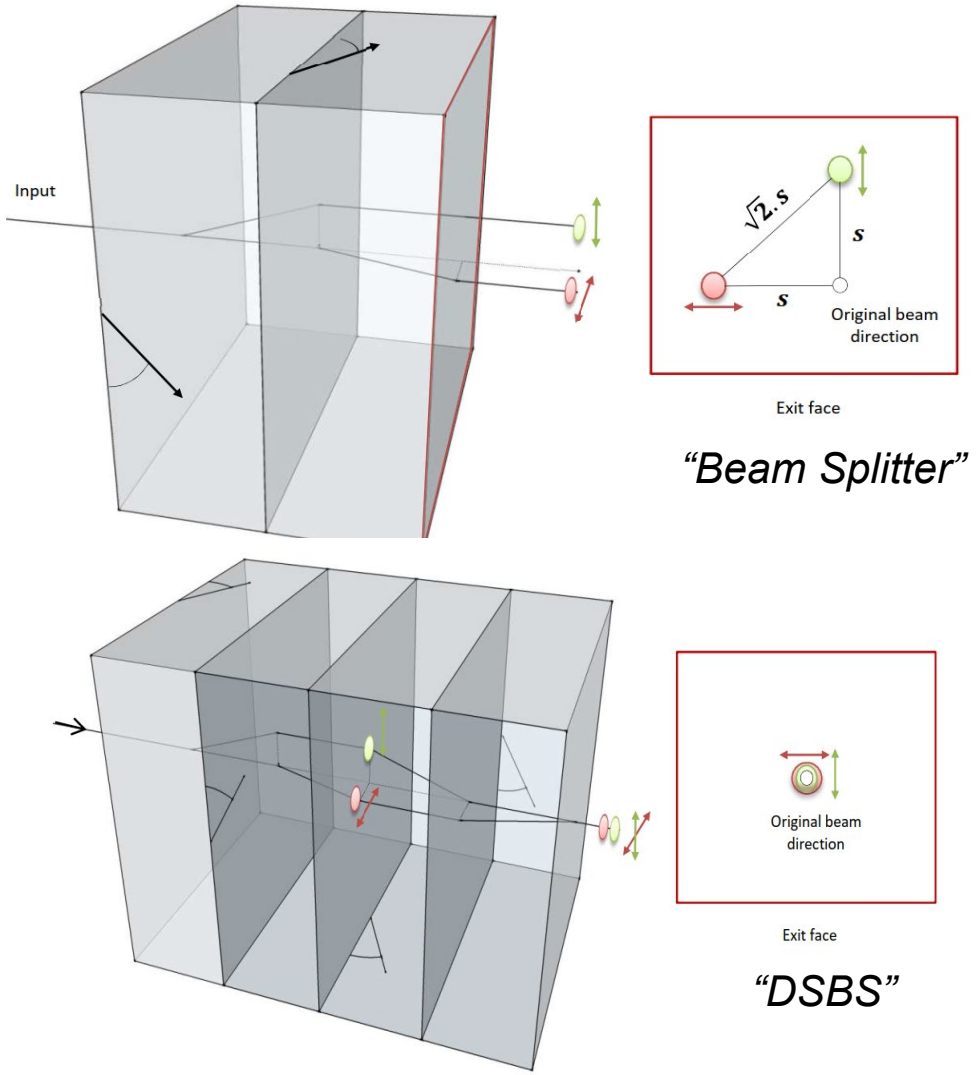
$$S_{+V} = \begin{bmatrix} I \\ +V \\ 0 \\ 0 \end{bmatrix} \quad S_{-V} = \begin{bmatrix} I \\ -V \\ 0 \\ 0 \end{bmatrix}$$

$$S_{+U} = \begin{bmatrix} I \\ +U \\ 0 \\ 0 \end{bmatrix} \quad S_{-U} = \begin{bmatrix} I \\ -U \\ 0 \\ 0 \end{bmatrix}$$

Beam exchange

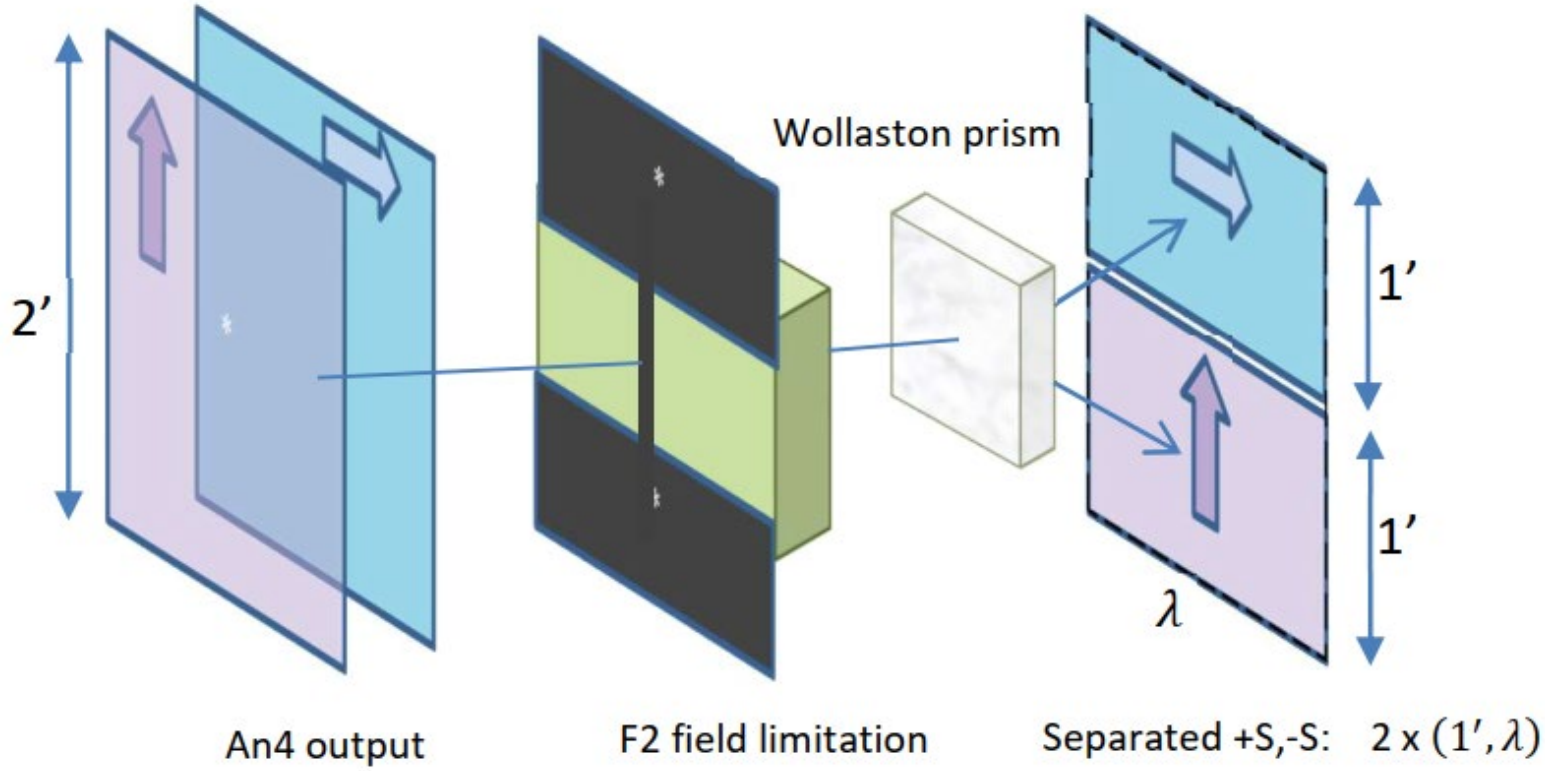
Double Savart plates:

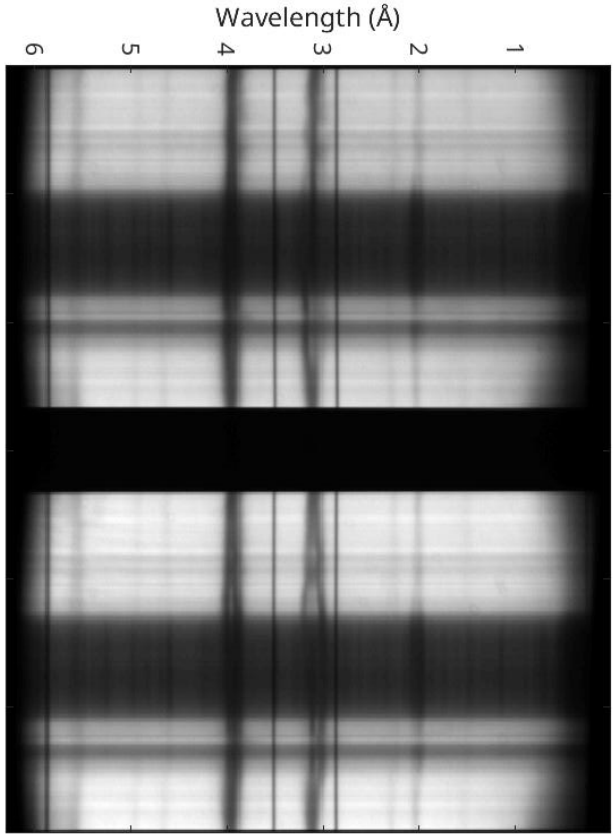
- generate the dual beam feature
- then superimpose both beams: behave as one, differing only by their linear polarization state.



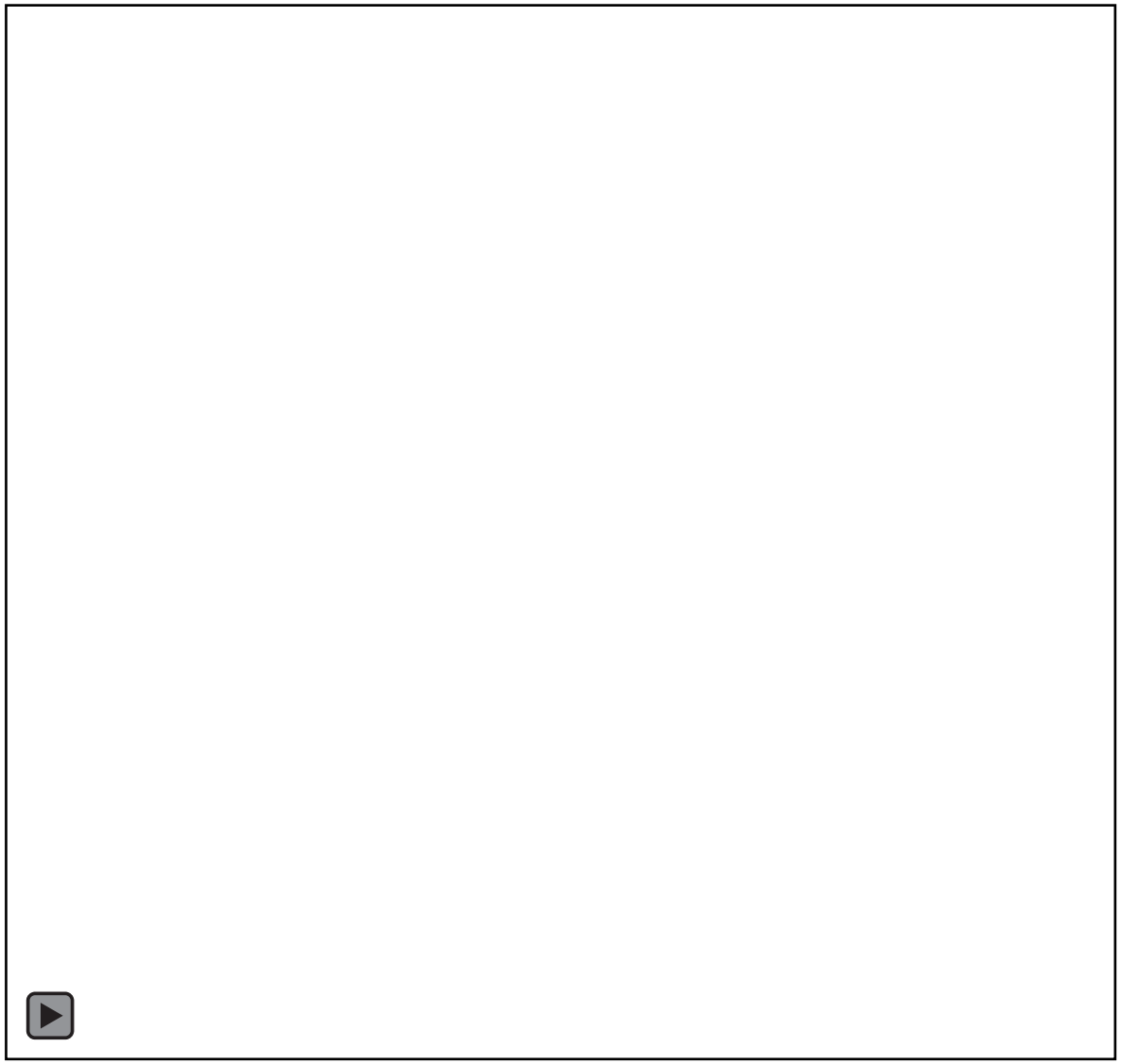
THEMIS new polarimetric analysis scheme - 2

- Thanks to THEMIS "**polarization friendly**" new optical path (**geometry of the elevation axis, field rotator, coatings)**, polarizer output can travel through the telescope and reach the spectrograph cameras "minimally perturbed"
- **Just in front of each of the spectral cameras, a Wollaston prism splitter separates the superimposed beam into complementary Stokes components** to form the spectral focal plane.





THEMIS Mueller matrix@~600nm



- THEMIS Mueller matrix:

$$M_{THEMIS} = \begin{pmatrix} 1.000 & -0.009 & -0.003 & 0.001 \\ -0.008 & 0.885 & 0.016 & -0.033 \\ 0.014 & -0.436 & 0.872 & 0.033 \\ -0.019 & 0.415 & 0.008 & 0.873 \end{pmatrix}$$

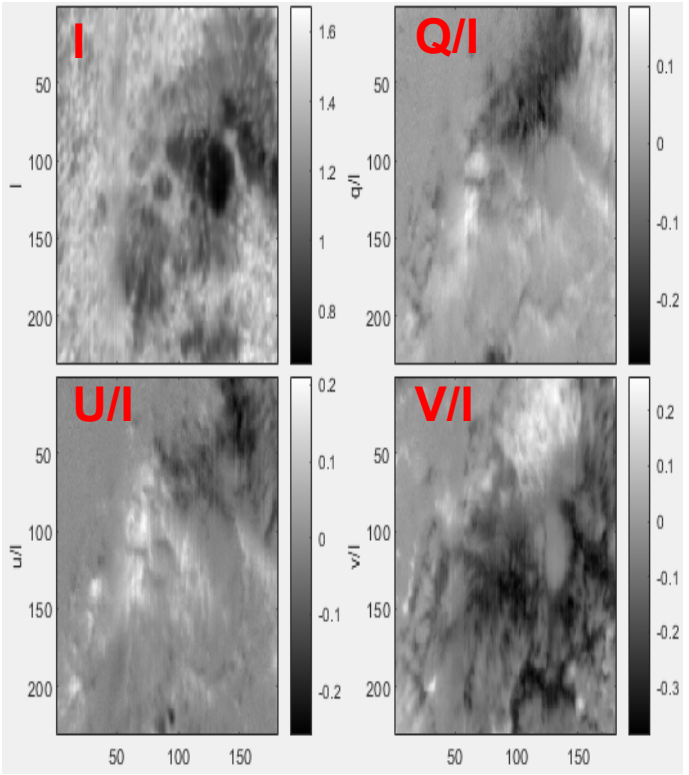
  - Averaged over one full day
  - Includes changing elevation axis and field derotation
  - Quite constant along one day

- **THEMIS remains a strongly polarization-calibration-free telescope, ideal for excellent spectropolarimetric measurements.**

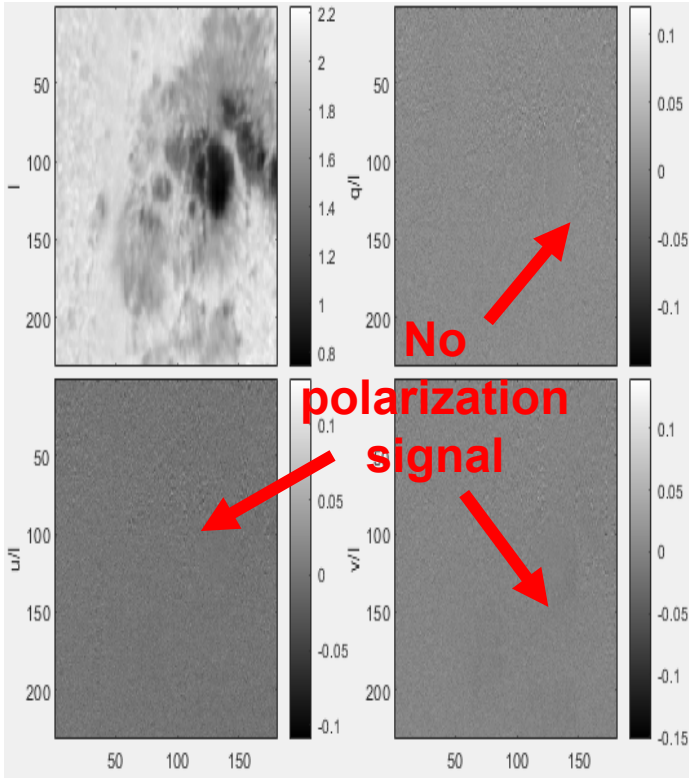
Stokes parameters

- **Complete polarization signal is now routinely outputted**
  - 4D data array of 4 Stokes parameter (x, y, λ, S).
  - User-friendly software in development.
- THEMIS is on the verge of producing vector B maps

In Fe I Line



In continuum



Outline

- Introduction: THEMIS time line & characteristics
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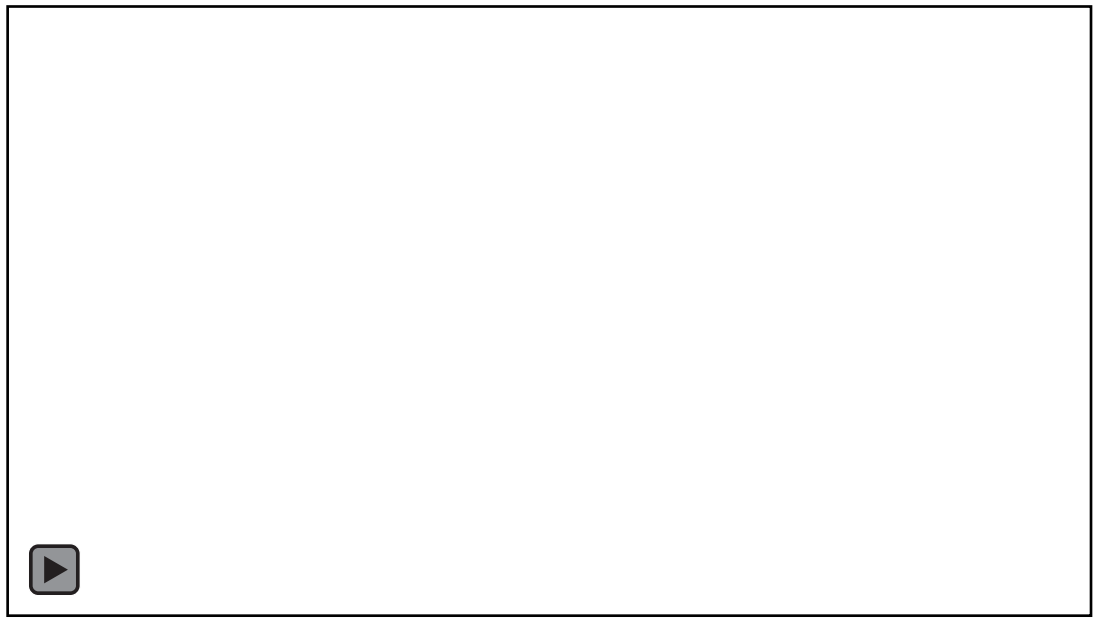
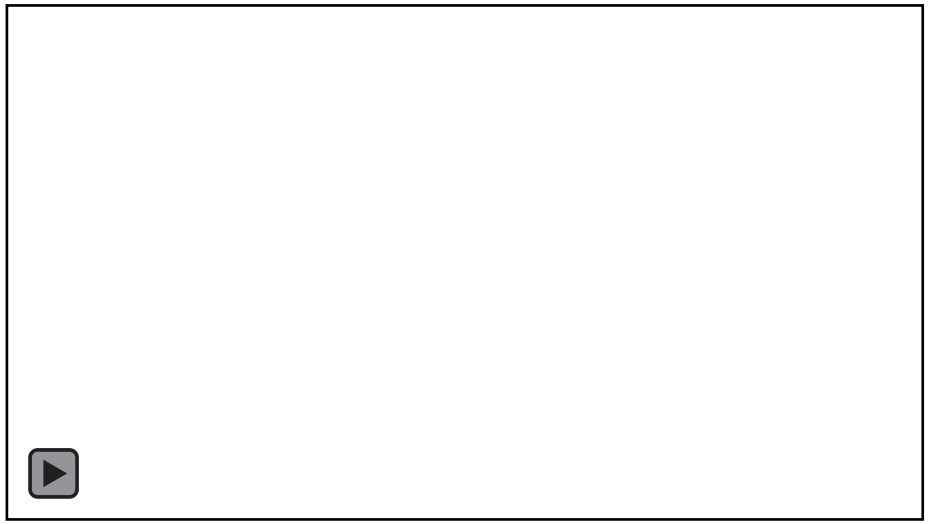
Mercury Observations

- **THEMIS is one of the best-suited telescope for ground based observation of Mercury.**
  - Work in daytime → extended period of observation of Mercury
  - Handle the low contrast of hermian emission relatively to the diffuse sky emission.
  - THEMIS FOV & resolution suited for Mercury
    - Mercury disk: ~6" wide.
- **TAO successfully running for Mercury observations since 2021**
  - Hardware and software identical to solar obs.
  - Requires slowing down AO from 1kHz to 150Hz
- Recurrent campaigns led by F. Leblanc (LATMOS) & V. Mangano (INAF, Rome, IT)

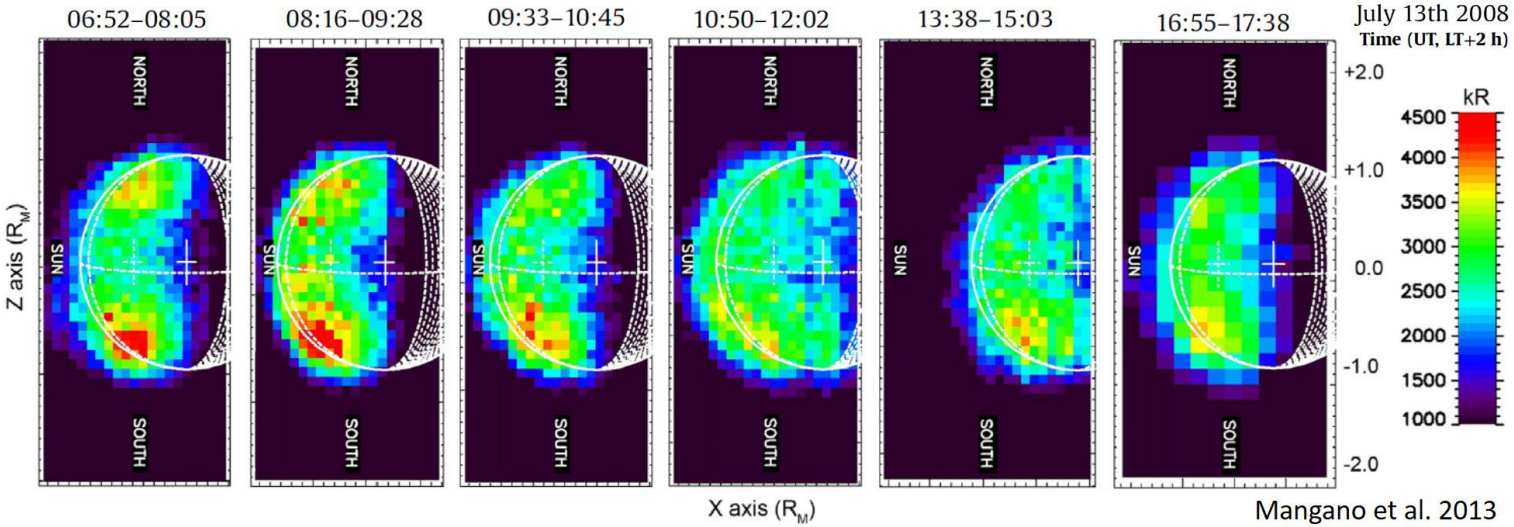




Mercury Observations

- Sub-arcsecond mapping of Mercury Na exospheric emission
  - Must separate reflected solar Na emission from hermian self-emission
  - → Benefit from doppler shift due to Mercury orbital motion.
- **Study hourly dynamics of Na emission distribution due to space weather impact**
  - Peaks of Na emission roughly co-spatial with magnetic footprints.
  - Space weather induced dynamics : varying SW particles penetrating Mercury exosphere and flowing to the surface induces Na emission

Time evolution of the sodium emission in the exosphere of Mercury



Mangano et al. 2013

Sodium emission of Mercury
observed by THEMIS on May 5th, 2025

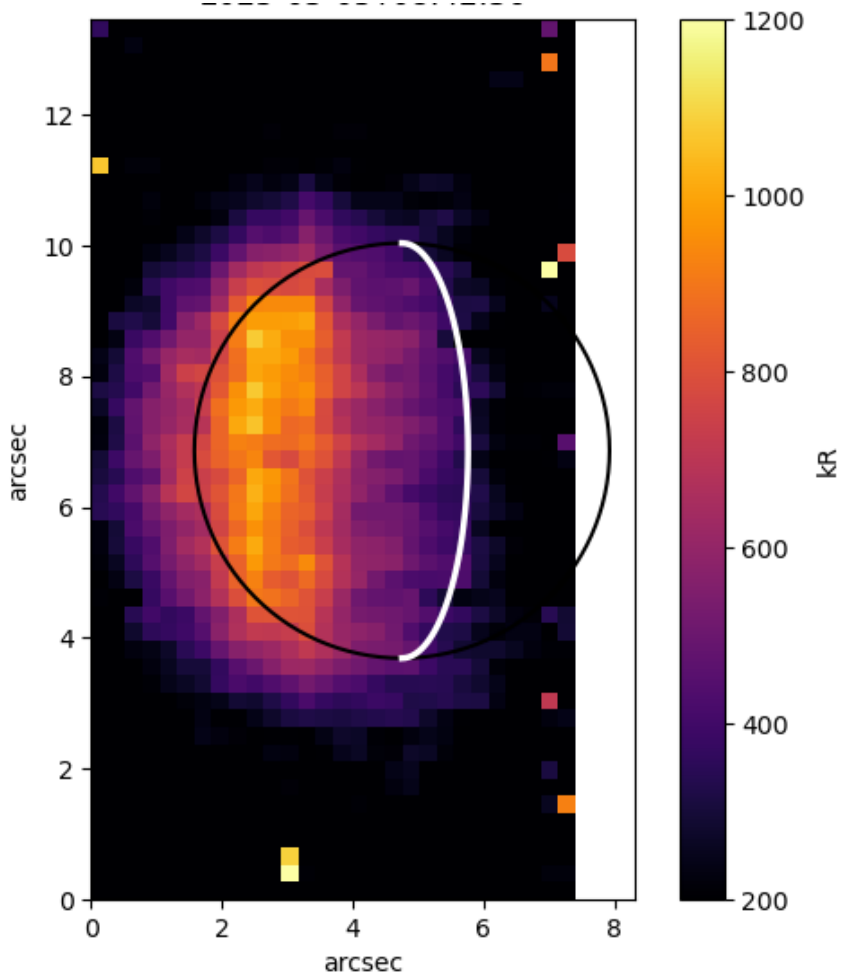
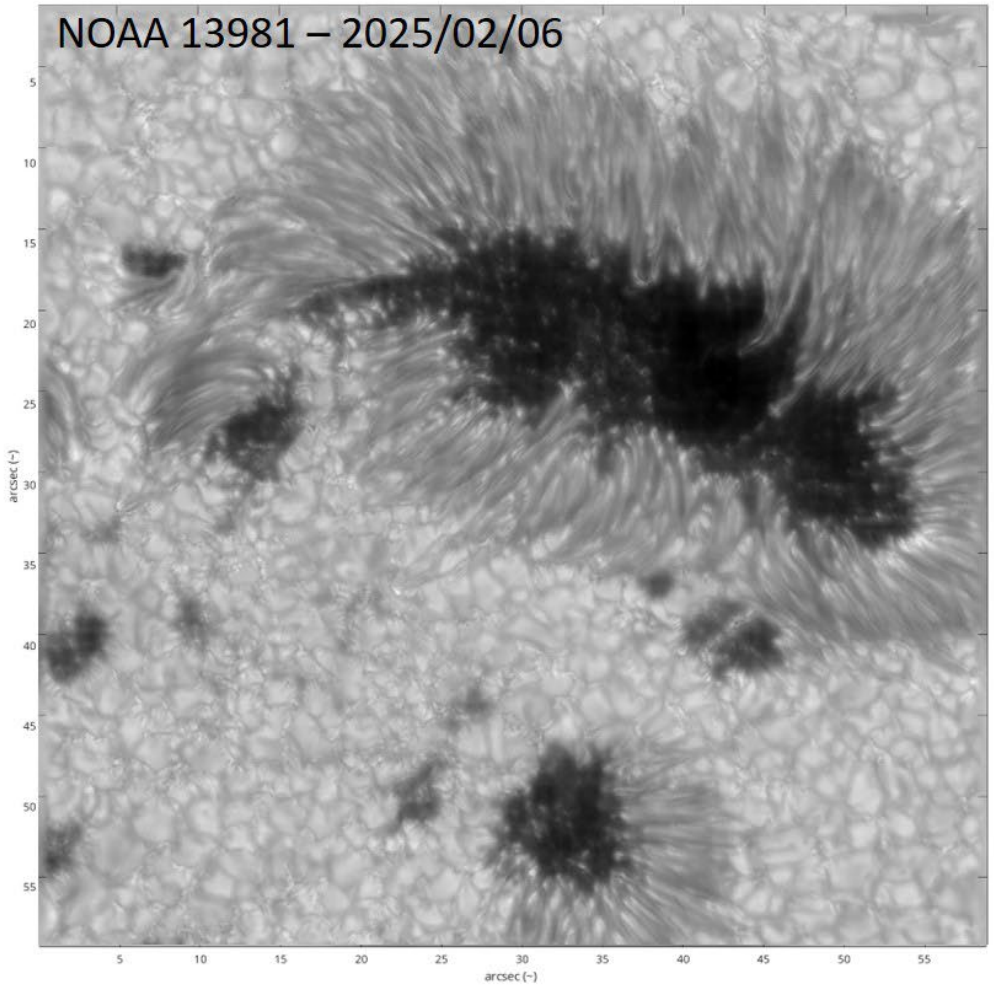


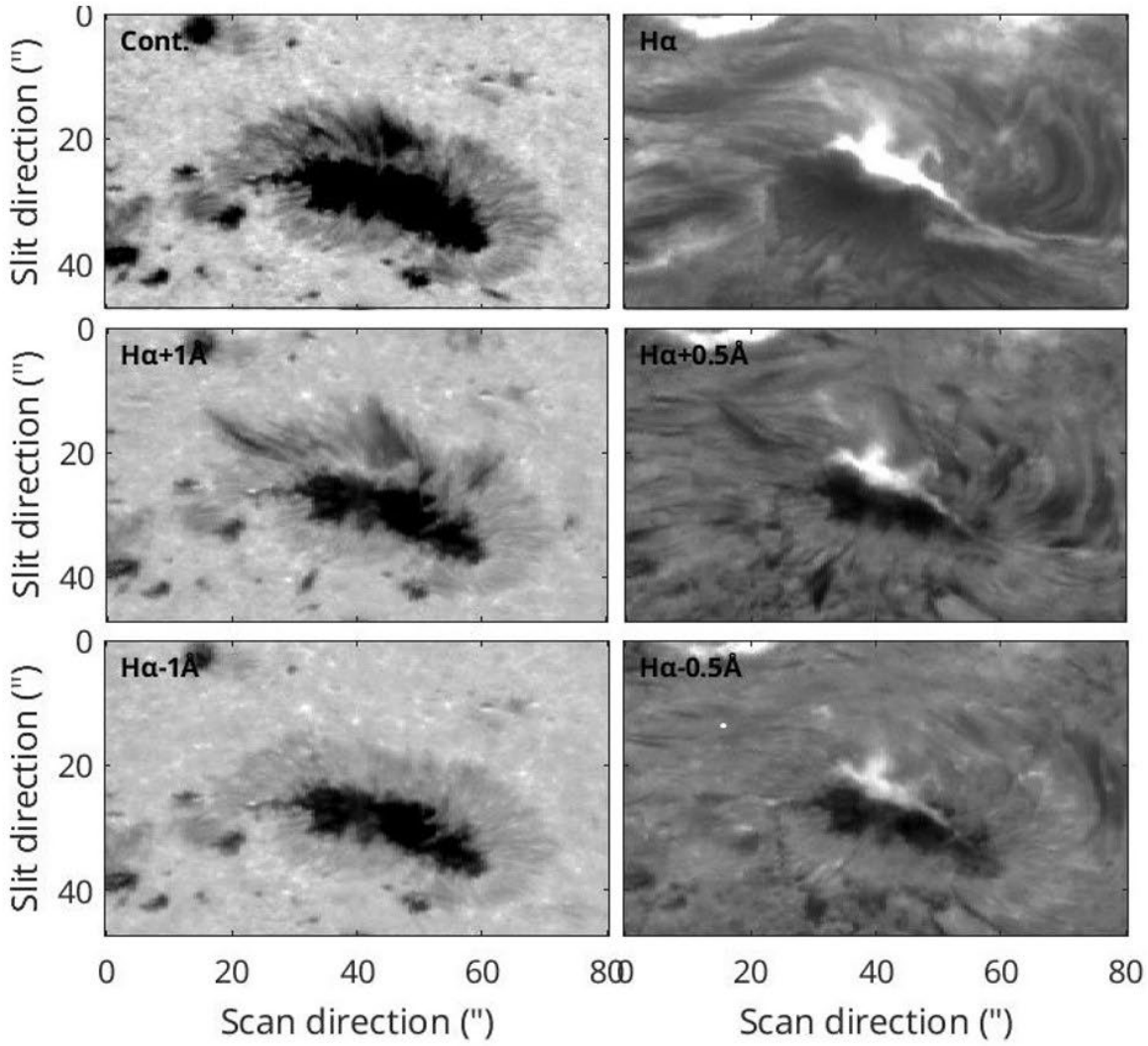
Image Courtesy: Mangano, Leblanc

Solar Flare observations : flare ribbons

Off-campaign observations of Jade Touresse & Etienne Pariat during an M-class flare



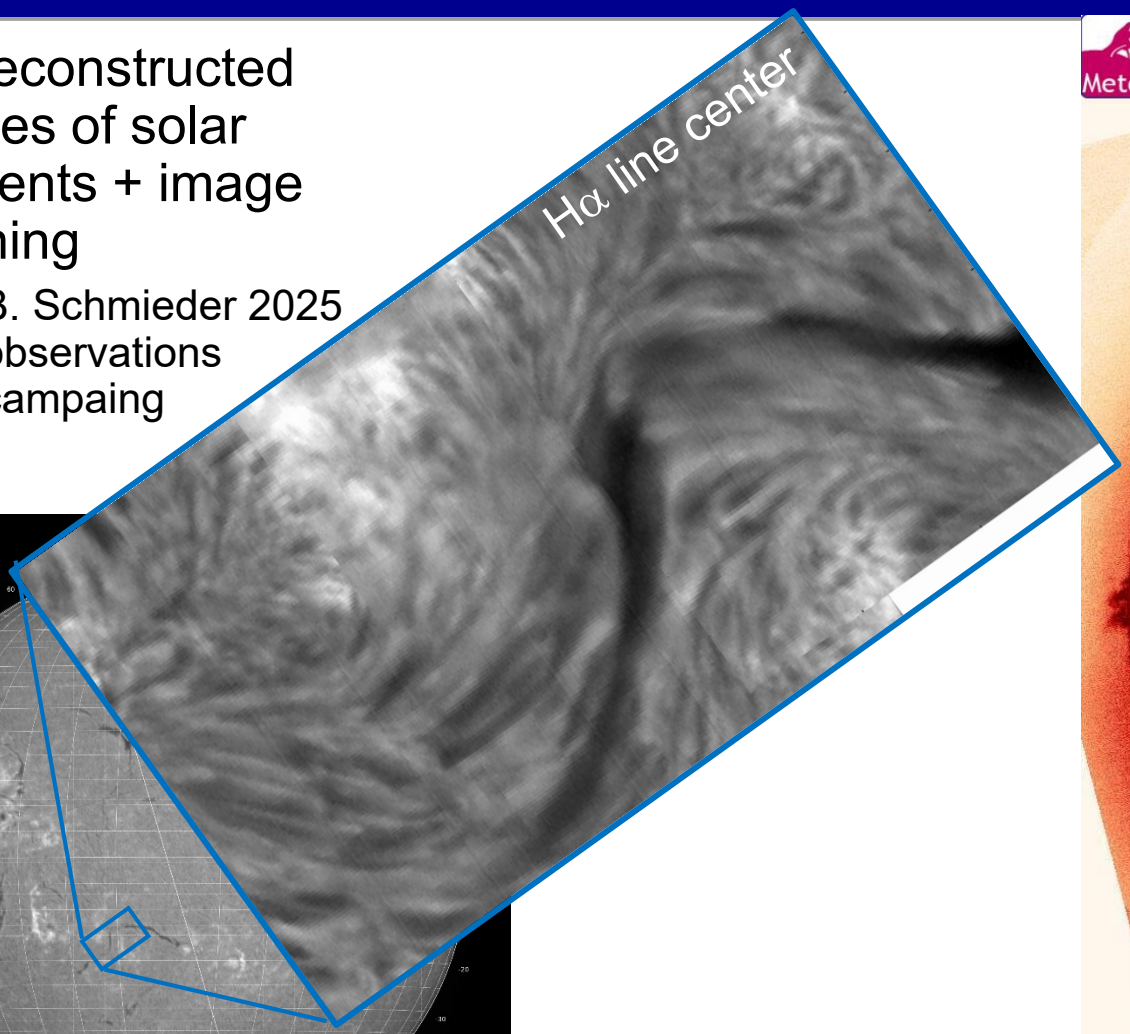
Broadband Image (red continuum)
+ image reconstruction



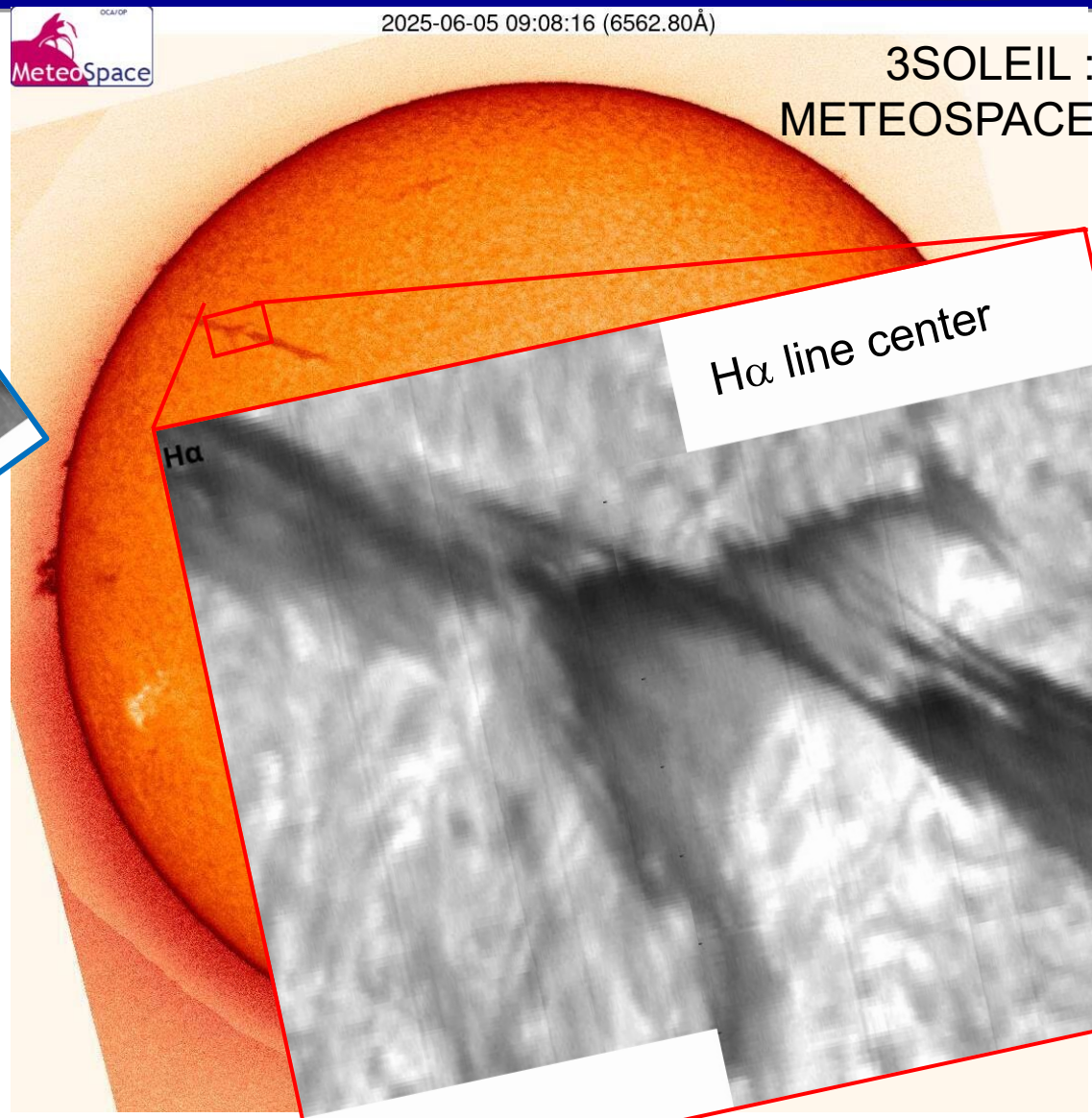
MTR2 spectrograph
reconstructed intensity maps

Solar filaments observations

- Hα reconstructed images of solar filaments + image stitching
  - B. Schmieder 2025 observations campaing



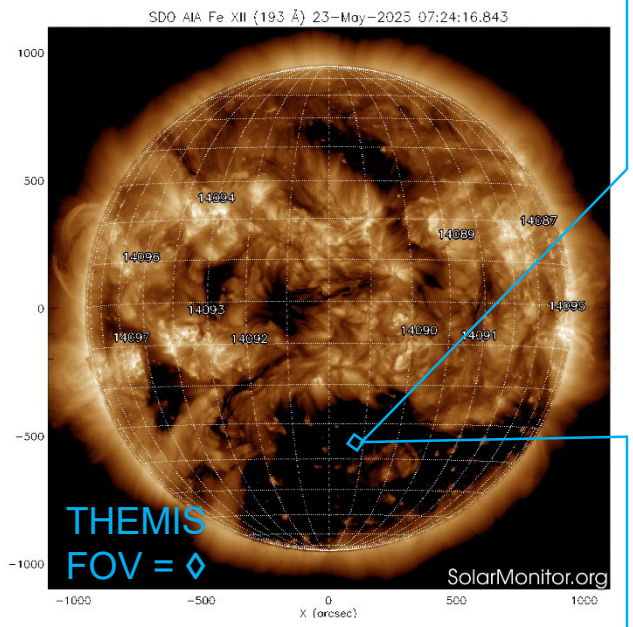
3SOLEIL:
Meudon Spectrohéliographe

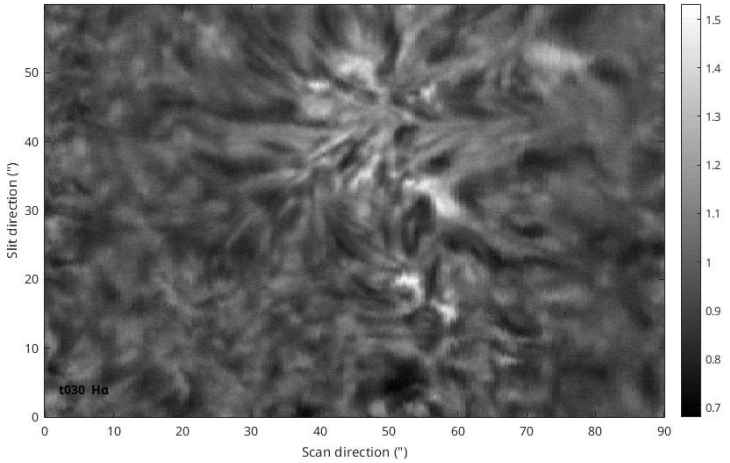


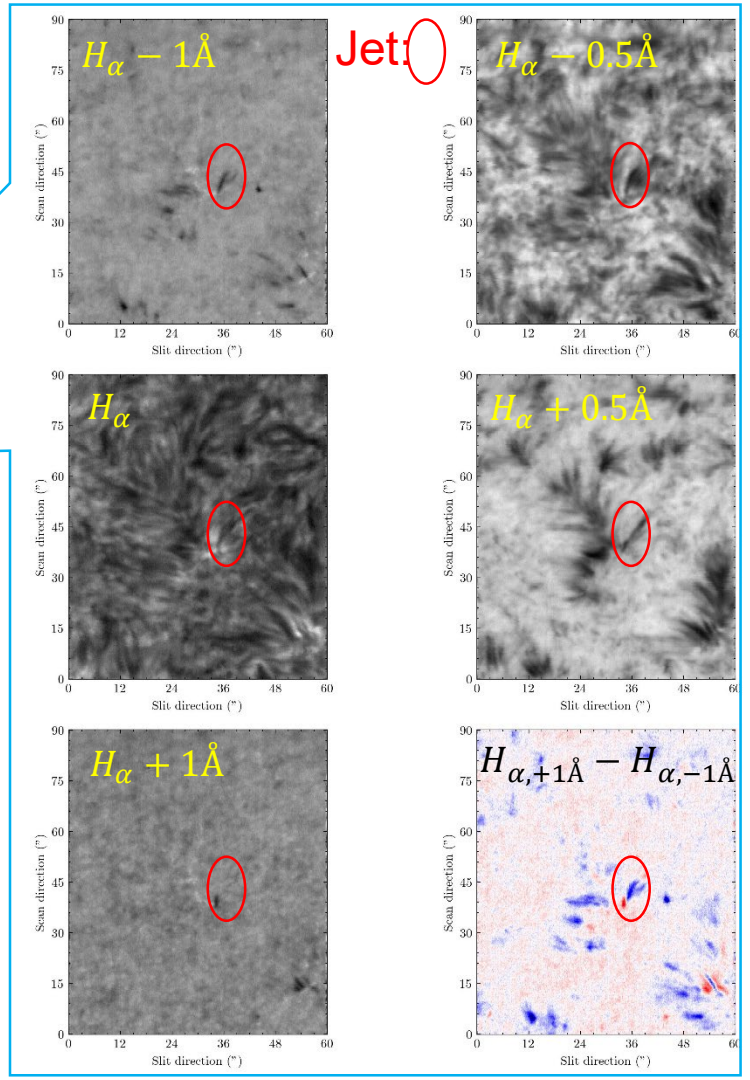
3SOLEIL :
METEOSPACE

Coronal holes and jet observations

- Two campaigns of observations, respectively led by Jade Touresse & Etienne Pariat on analysis of coronal holes regions
  - ~ 3 weeks in May-June 2025
  - Spectroscopic observations in Chromospheric lines: Hα, Ca II (8542 Å)
  - Spectropolarimetric observations of Fe I (6301 Å) → magnetic field maps
- Goals:
  - Understand formation of “anemone” structure, jets source region in CH
  - Estimate rotational speeds and mag topology of coronal jets
- Preliminary analysis: quicklooks of Hα emission : center, wings, doppler-like







10:53’39” ⇒ 10:55’11”

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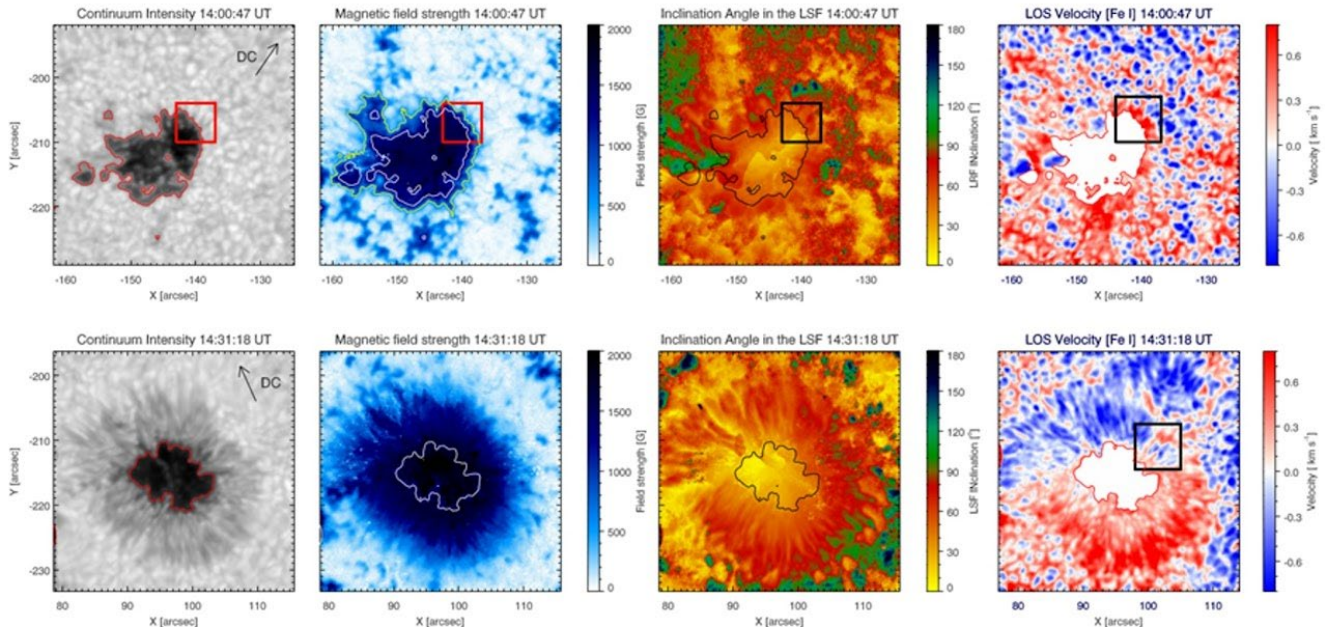
Upcoming : IBIS 2.0 @ THEMIS

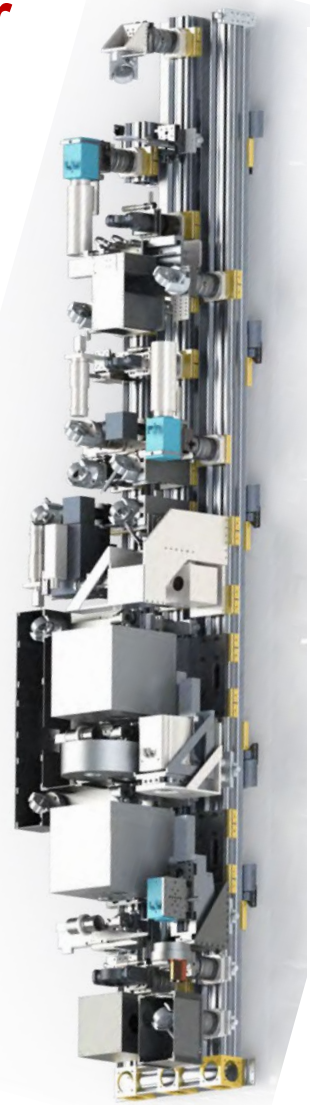
IBIS : Interferometric BIdimensional Spectrometer

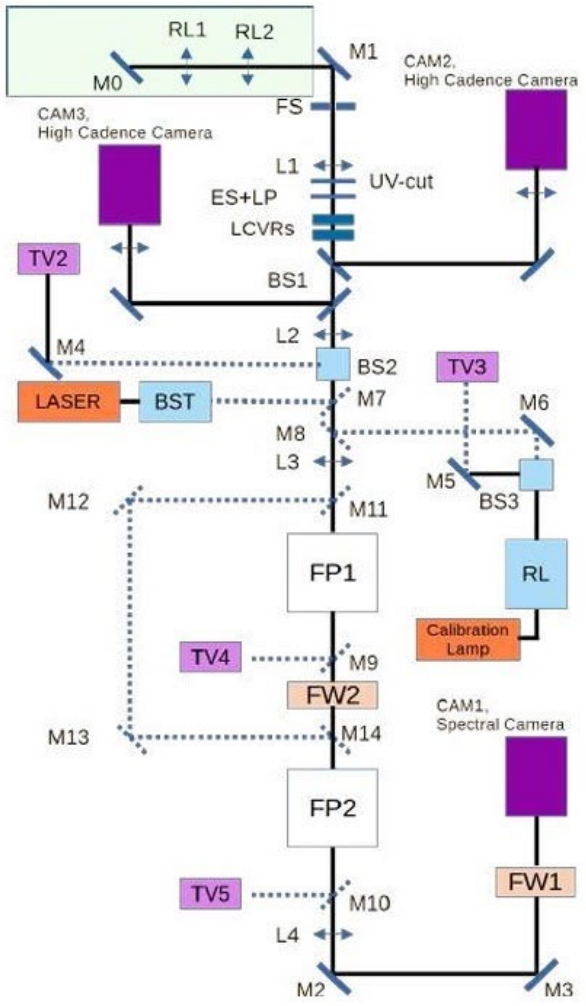
- spectro-imager (x, y, λ) : dual Fabry-Perot & interference filters
- 200 000 spectral resolution
- short exposure times / polarimetric mode

https://www.ibis20.inaf.it



Intensity, magnetic field strength, field inclination angle, and LOS velocities on 2012 May 28 (14:00-14:30 UT): before (top) and after (bottom) penumbra formation. SIR inversion of the Stokes profiles of the Fe I 630.25 nm line acquired by IBIS . **(from Murabito et al. 2016)**





Ermolli et al. 2024

Upcoming : IBIS 2.0 to THEMIS

- 2003-2019: running at the Dunn solar tower (DST) ~100 papers based on IBIS over 15 years
- Upgraded IBIS looking for suitable telescope since 2019
- TAO performance attractive for IBIS
- THEMIS has no equivalent instrumental mode

- ➔ Memorandum of Understanding signed between INAF and CNRS in winter 2024-2025
- **Nov. 25: preparatory installation of optical bench**
- **Spring 2026 : IBIS 2.0 installation & commissioning.**

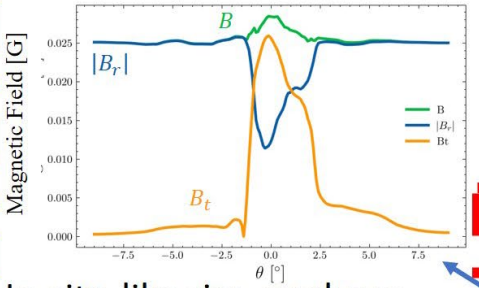
- **IBIS2.0 is an outstanding synergic complement of THEMIS long slit spectrograph**
- **Foster and renew French-Italian scientific collaboration** in high-resolution solar physics, beneficial at large for EU solar physics (e.g. EST)

Nov. 2025

JET2SB Project

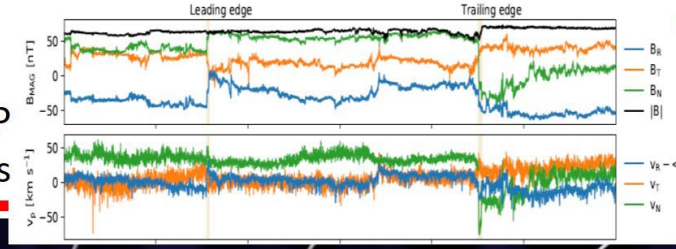
FSLAC International Research Lab.

LPP



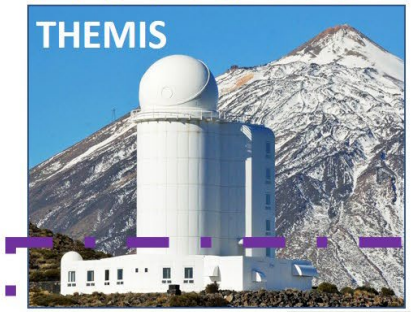
In-situ-like sim. analyses

In-situ PSP measurements

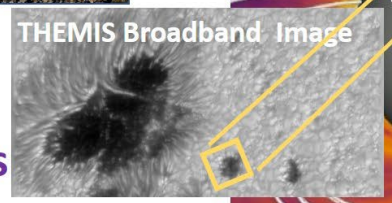


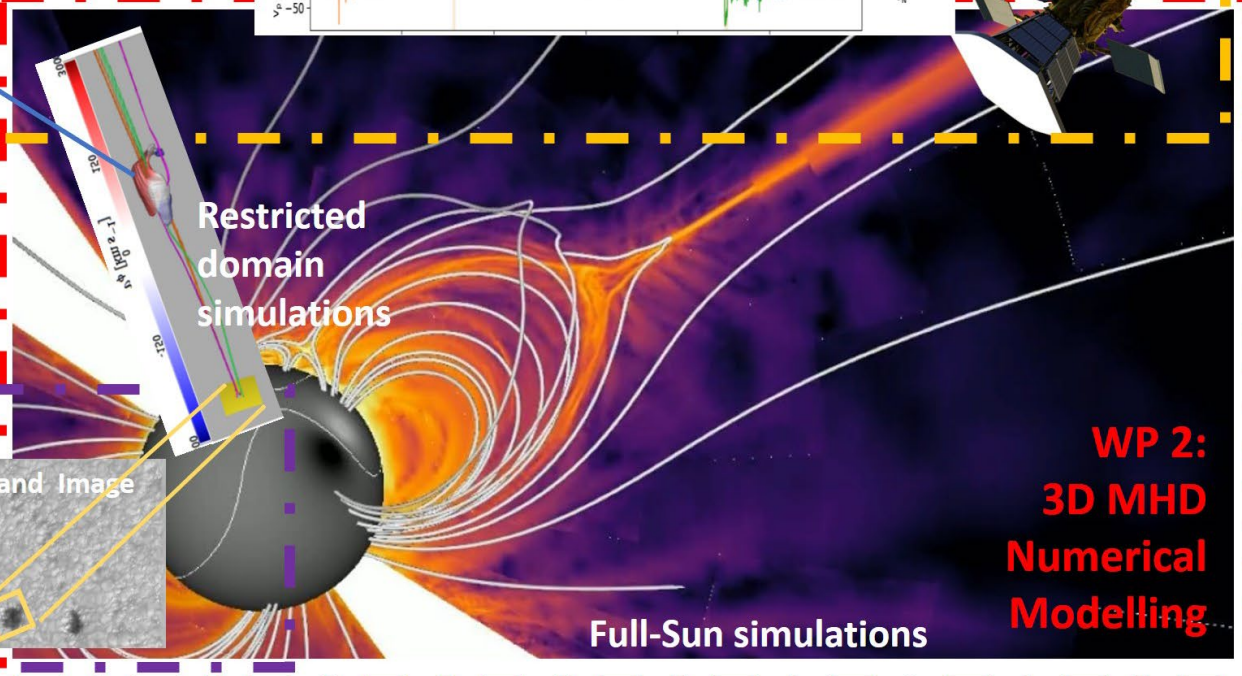
WP 3: In-situ analyses

PSP



WP 1: solar atmosphere observations





Clara Froment
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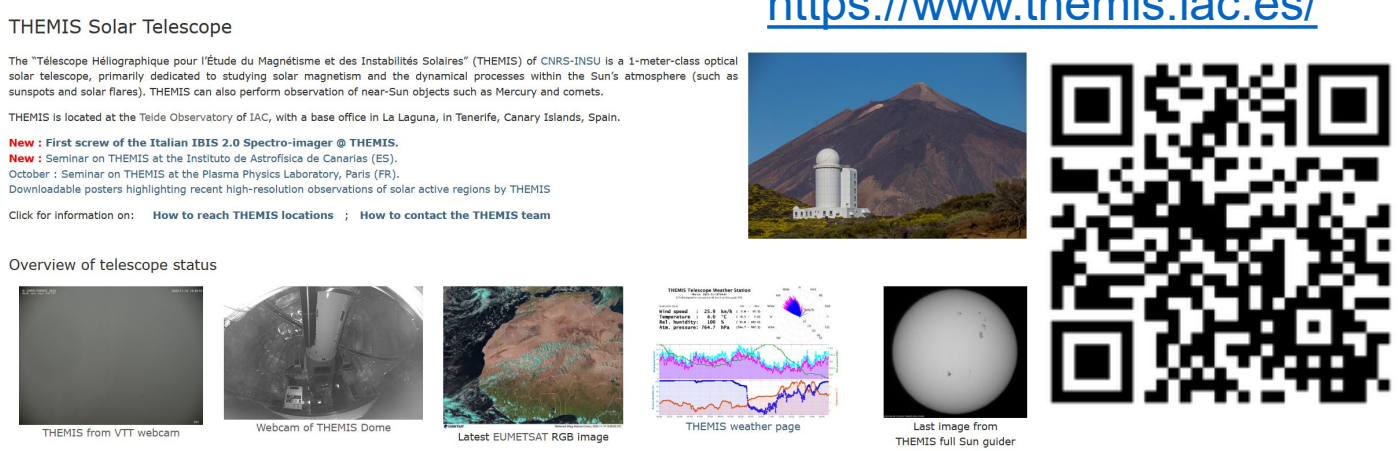
Etienne Pariat
Bernard Gelly
+ 1 post-doc:
Saida Diaz Castillo

- *Do/to which extend, solar jet-like events induce Switchbacks?*
- *How do they contributes to the acceleration of the solar wind?*

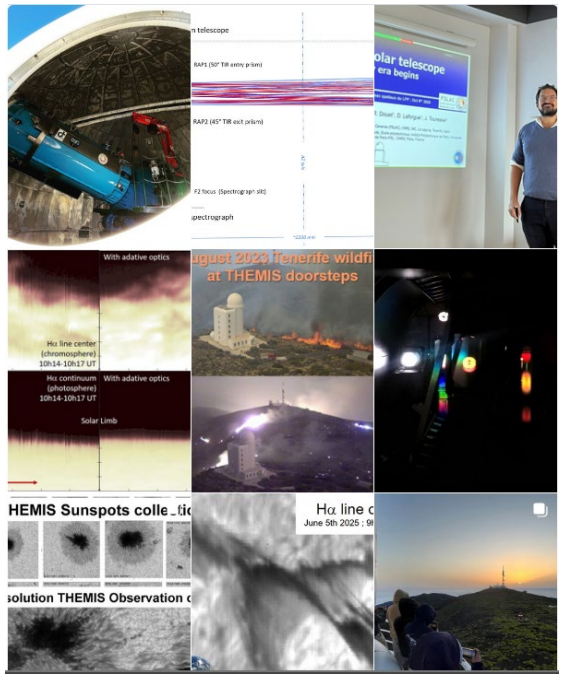
Outreach

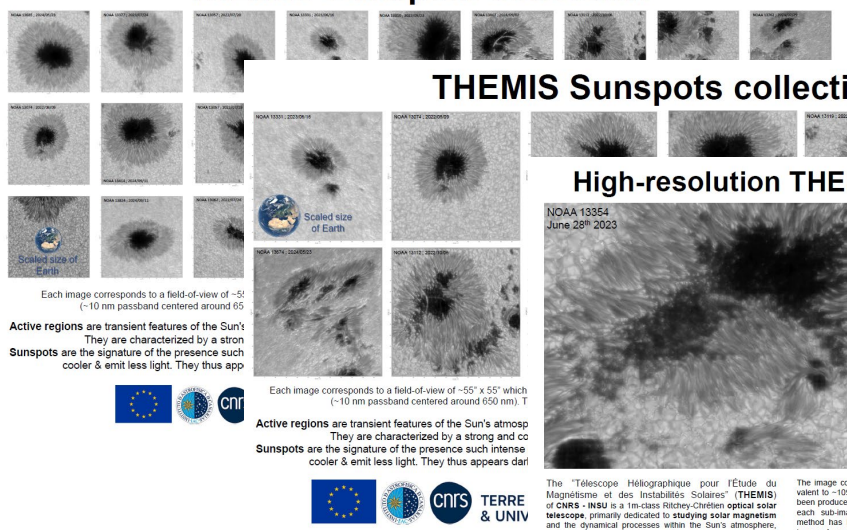
- New THEMIS website:
  - Feedbacks welcomed
- New Instagram account
  - Follow us @themis_solar
- Downloadable posters on THEMIS highlights

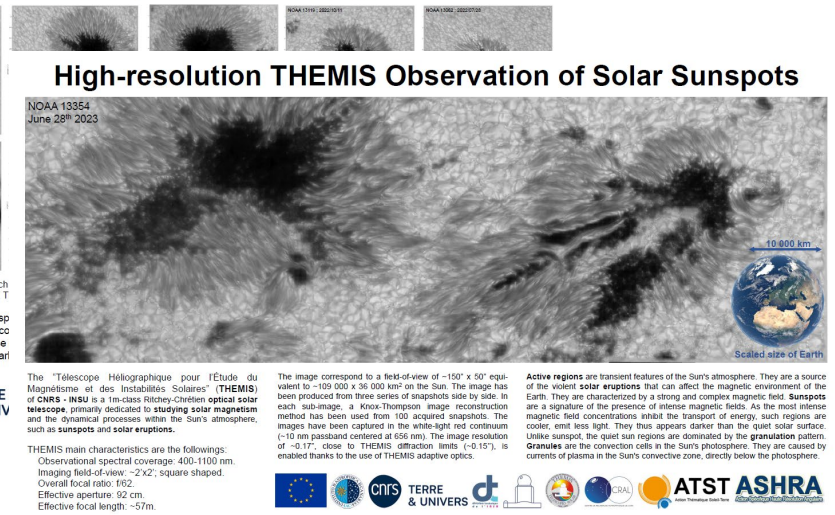
https://www.themis.iac.es/



THEMIS_SOLAR

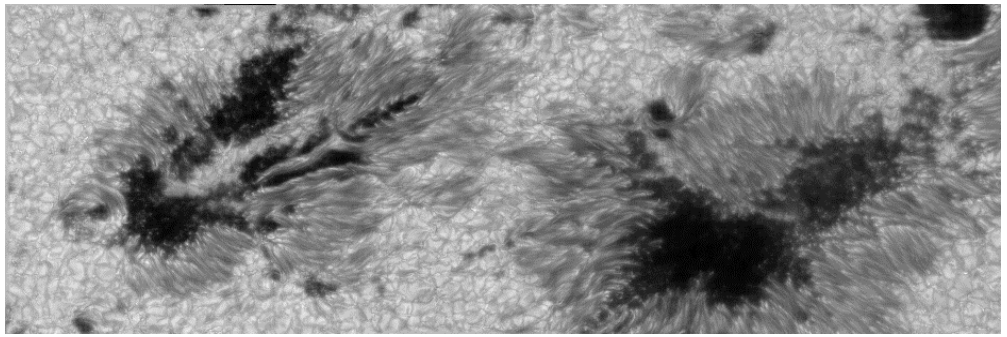


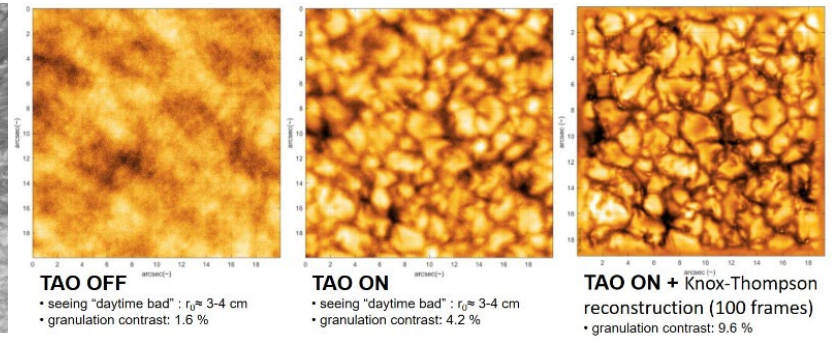




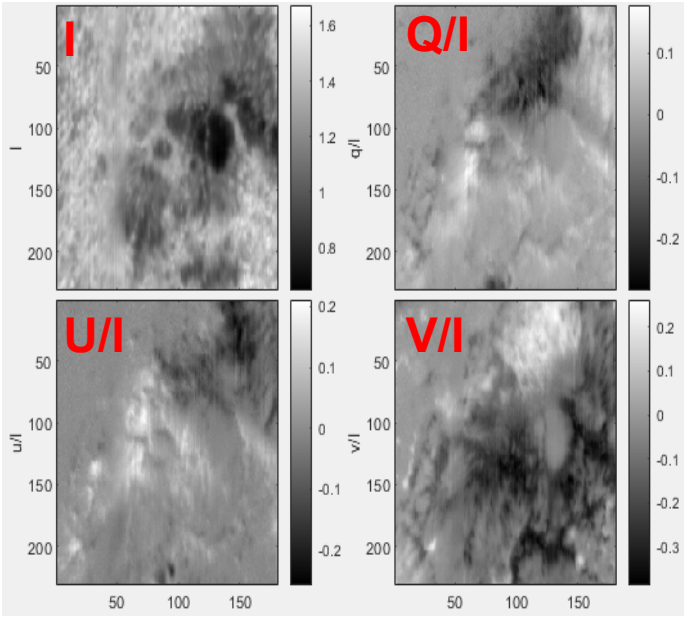
Takeaways ...

- THEMIS is a competitive 21st century telescope with unprecedented capacities
  - THEMIS is a real challenger in the 1m-1.5m class of solar telescopes.





Fe I Line



- Installation of the IBIS 2.0 spectro-imager (spring 2026) trigger an even larger European wide interest.

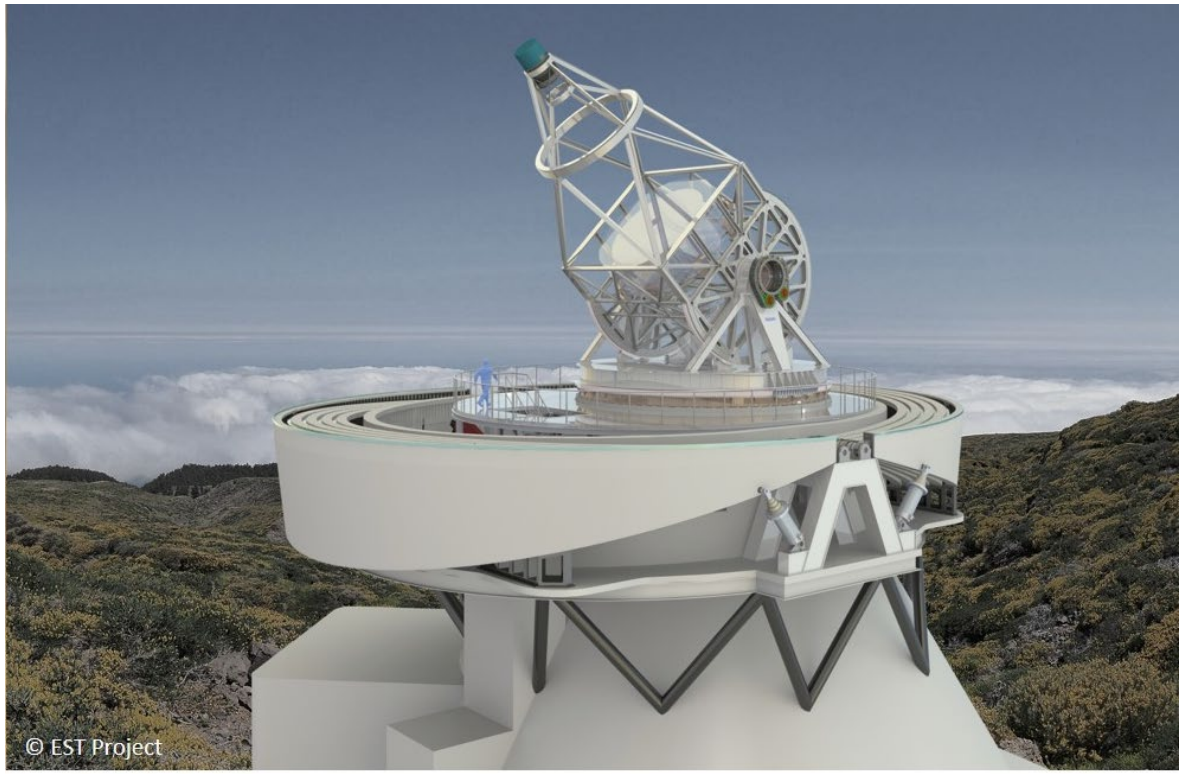
- **Reminder: 20-25% of THEMIS obs. time dedicated to Spanish-lab.-based PIs**
  - THEMIS is highly open to all scientists based in a Spanish laboratory, particularly from IAC
  - The local THEMIS team is dedicated to assist anyone in performing observations with THEMIS
  - Observation at THEMIS is not reserved to an elite of high-resolution spectro-polarimetry expert !
  - **Young-researchers of IAC are highly welcomed to discover/run/follow ground-based solar observations campaigns of THEMIS**

… and nevertheless !

THEMIS **IS NOT** the future of ground-based solar physics because

the European Solar Telescope

IS THIS FUTURE !



White paper on interest, contribution & participation of the French community to the EST project is being written !