Interferometric BIdimensional Spectrometer 2.0

Enabling new observations of small scale plasma processes in the solar atmosphere

Ermolli, R. Cirami, G. Calderone, D. Del Moro, P. Romano, G. Viavattene,
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S. Guglielmino, M. Murabito, L. Oggioni, M. Oliviero, R. Piazzesi, E. Redaelli
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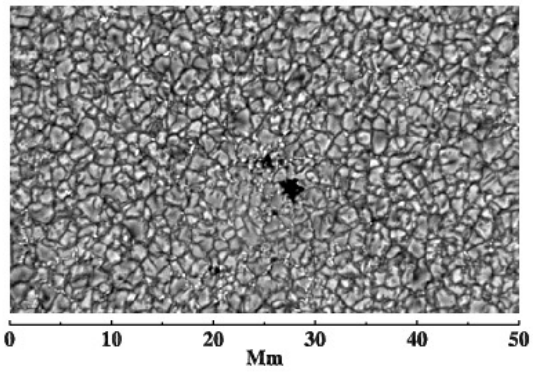
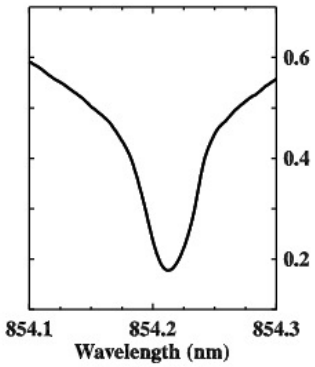
IBIS

Post-focus Instrument for High-Res Solar 2D Spectropolarimetry (580-860 nm) installed at the DST (USA) from **2003** to **2019**

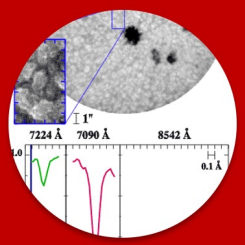
DST, 29 June 2019

IBIS POTENTIAL



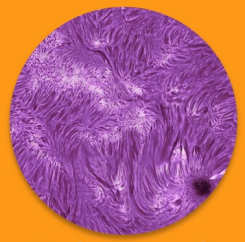


Cavallini 2006, Solar Physics
Reardon and Cavallini 2008, A&A
Righini et al. 2010, A&A

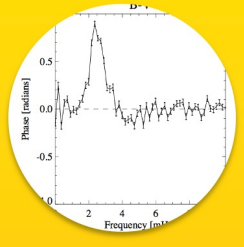


Extremely high spectral resolution:

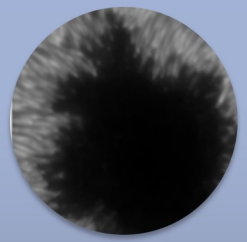
R > 200,000



High spatial resolution: <0.2" (routinely operated with AO)



High temporal resolution: 6-12 frames per second

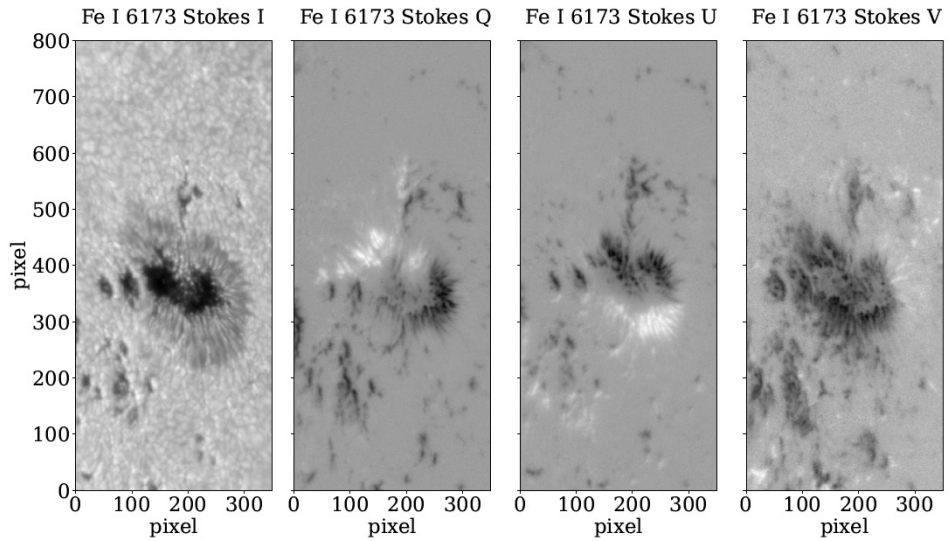


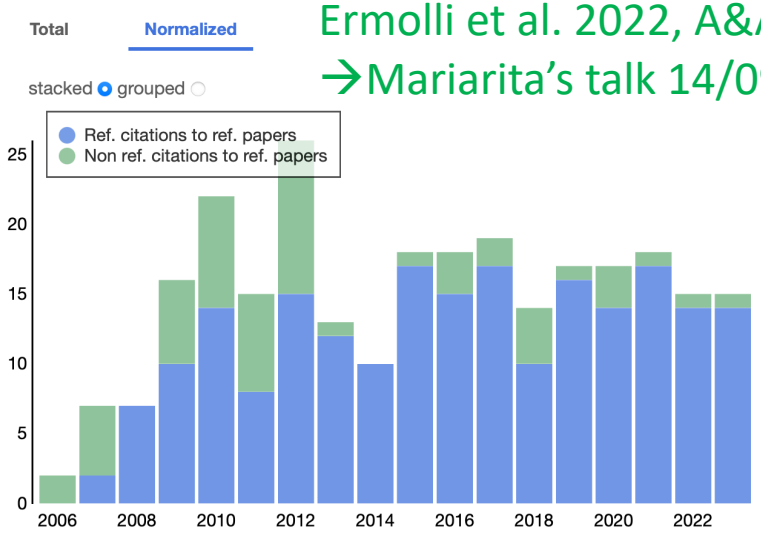
Large FOV:

Circ: 80 arcsec

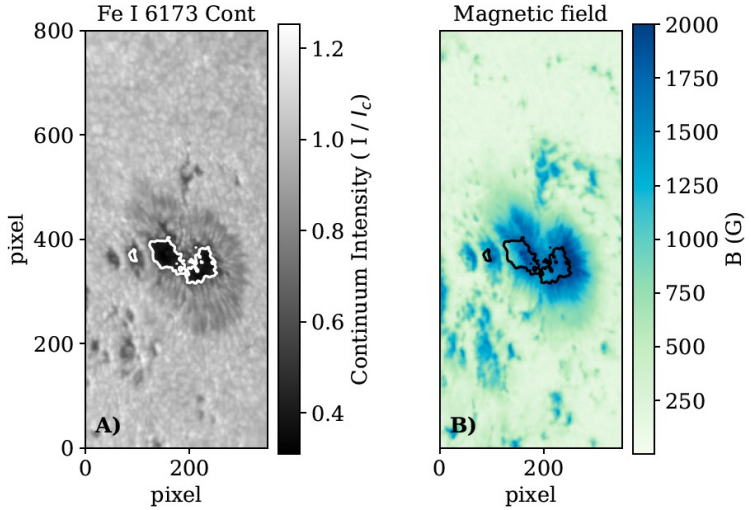
Rett: 80x40 arcsec^2

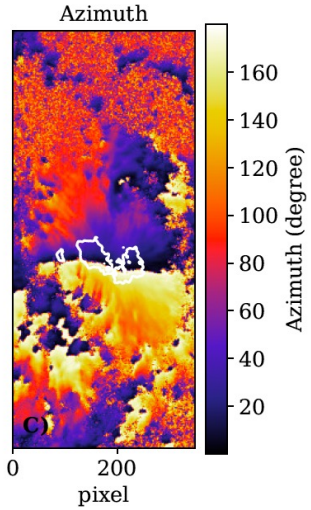
IBIS POTENTIAL

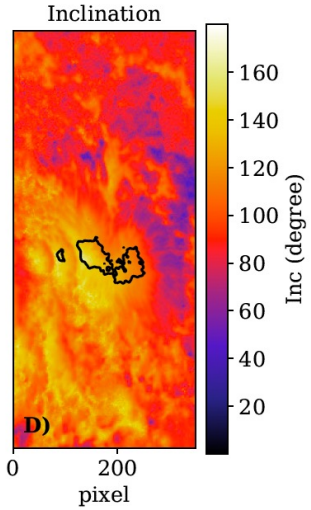


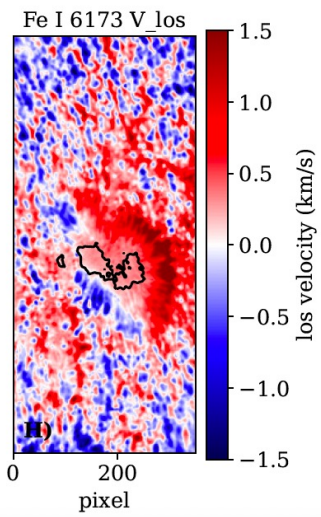


Ermolli et al. 2022, A&A
→Mariarita's talk 14/09







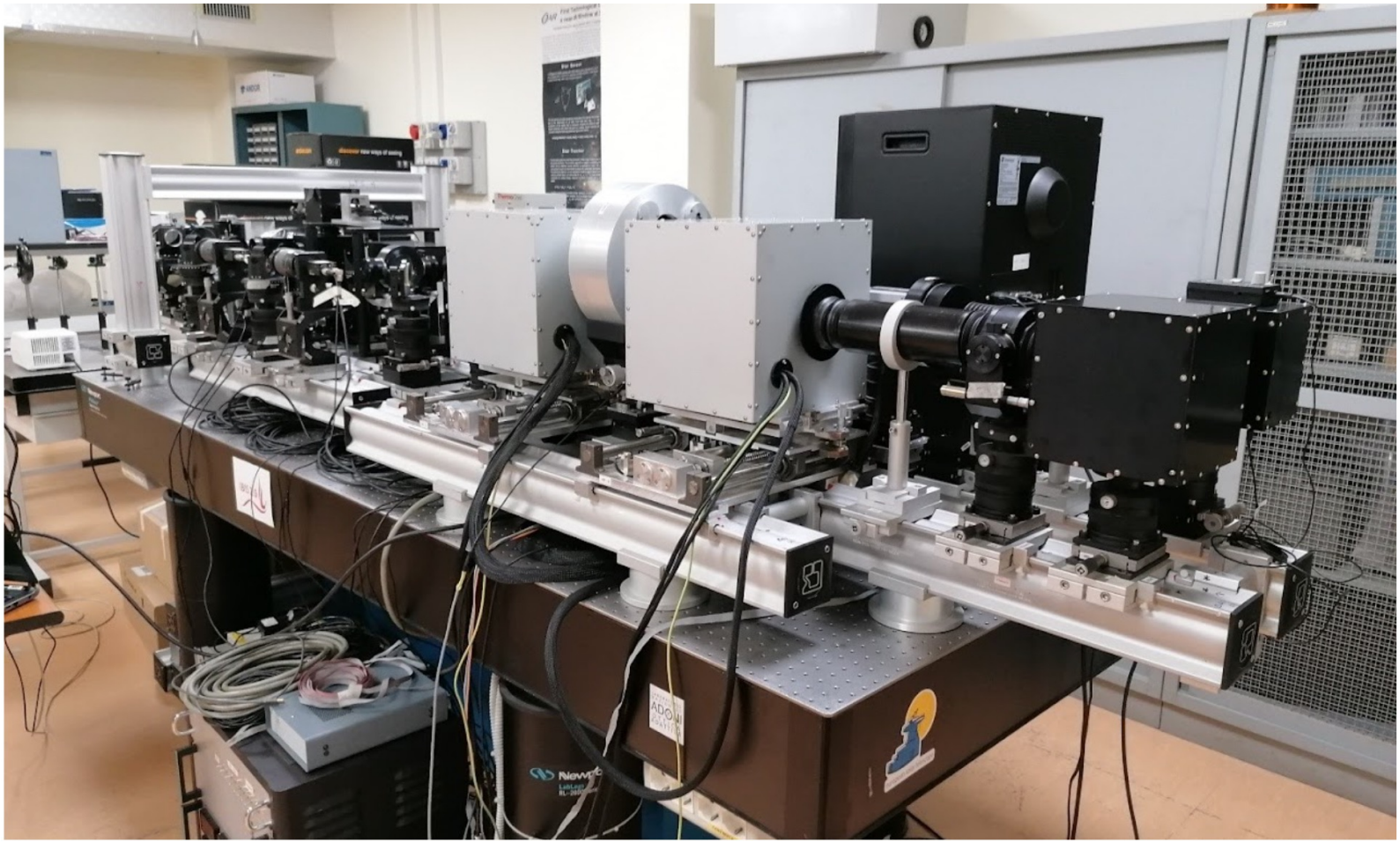


IBIS → IBIS 2.0

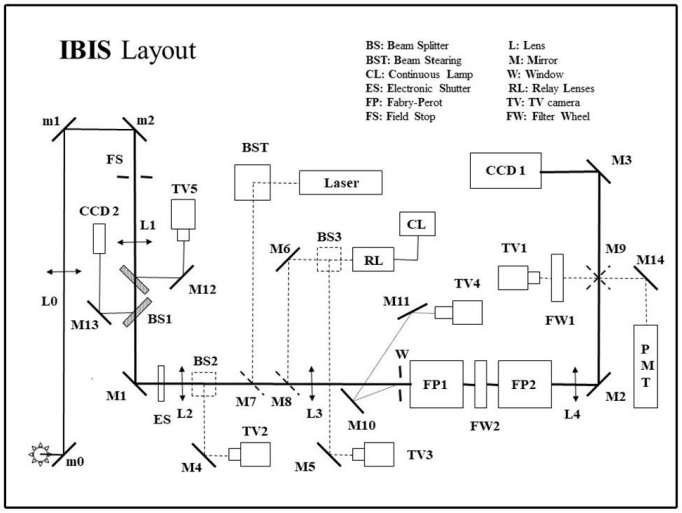
A LONG PATH

NSO announcement DST support	(04/2015)
INAF DS EoI Call for IBIS relocation	(05/2015)
Analysis of the 3 LoIs received	(07/2015)
IBIS 2.0 PROPOSAL submitted to INAF DS	(06/2017)
DISCUSSIONS → Draft MOU	(2017-2018)
PACKED AND SHIPPED TO INAF OAR	(07/2019)
IBIS 2.0 ASSEMBLED in the INAF OAR Lab	(07/2020)

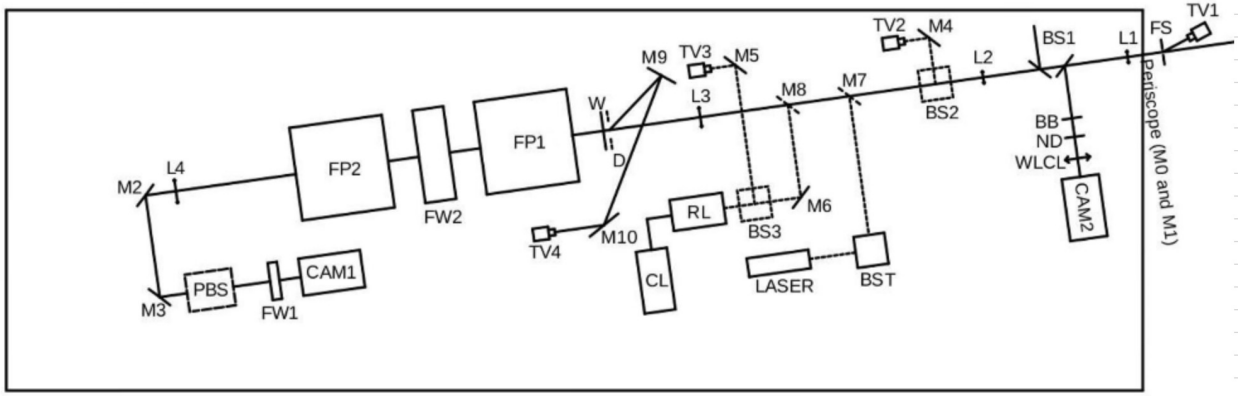
IBIS 2.0 in the INAF OAR Lab



IBIS 2.0 ENABLING NEW OBSERVATIONS



Cavallini 2006, Solar Physics



Ermolli et al. 2020, SPIE
Viavattene et al. 2022, SPIE

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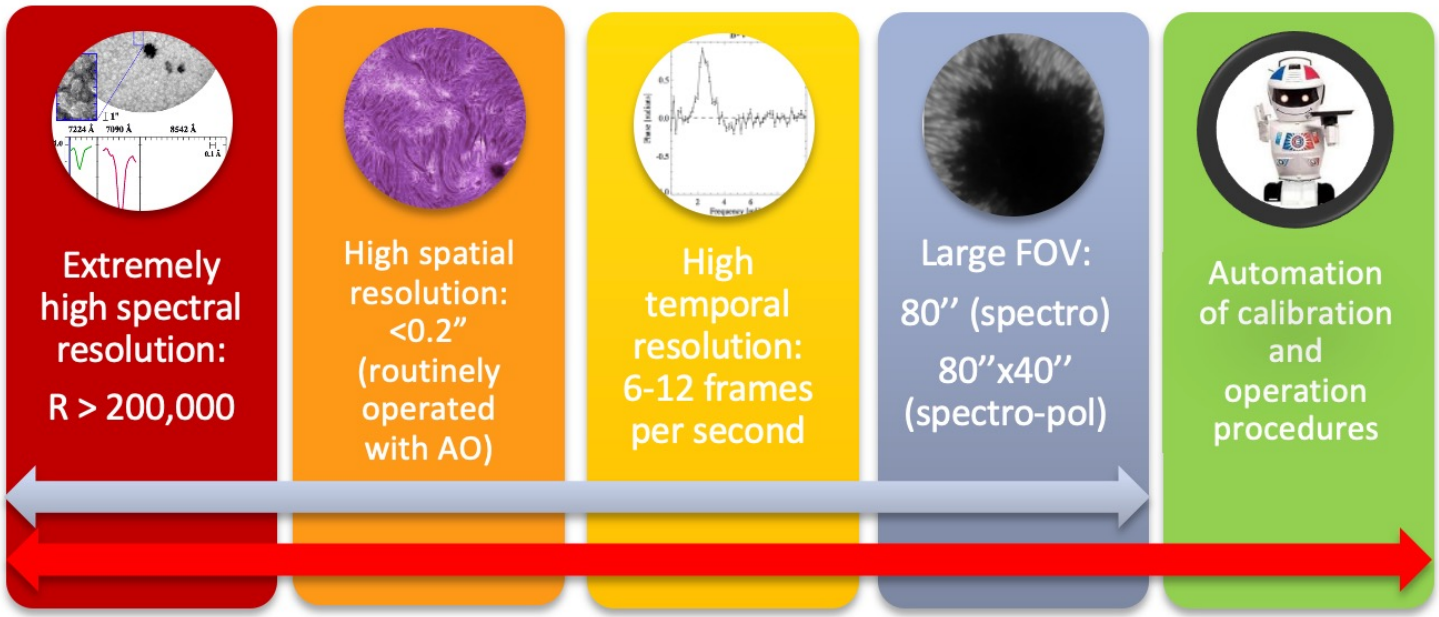


IBIS 2.0 ENABLING NEW OBSERVATIONS

PROJECT SCHEDULE 12/2021

Final design	(02/2022)
Hardware procurement	(08/2022)
System integration and Tests	(01/2023)
Installation and Commissioning	(03/2023)
Operations	(04/2023)
PI- and service-mode campaigns	(12/2023)

IBIS 2.0 ENABLING NEW OBSERVATIONS

PROJECT SCHEDULE 09/2022

- **Final design (including validation tests) (02/2022)**
- **Hardware procured (08/2022)**
- **Testing and advancing ADS100 controller (2022)**

- **New design(s) (03/2023)**

IBIS 2.0 ENABLING NEW OBSERVATIONS

Item/Telescope	DST	VTT	Design #1	Design #2
Spectral Range [nm]	580-860	580-860	580-860	580-860
Angular resolution [arcsec]	0.17-0.25	0.17-0.25	0.13-0.19	0.2-0.3
FoV [arcsec^2]	80x40	80x80	60x60	120x120
Wave setting time [ms]	20	20	20	20
Polarimetric setting time [ms]	20	10	10	10
Exposure Time [ms]	60-80	60-80	40-60	40-80
Polarimetric sensitivity	10^{-3}	10^{-3}	10^{-3}	
Control	Manual	Automated	Automated	Automated
Folding mirrors	Yes	Yes	Yes	Yes (few)
AO	30 arcsec corrected 190 arcsec useful	>12 arcsec corrected > 60 arcsec useful		

IBIS 2.0 ENABLING NEW OBSERVATIONS

Final design (02/2022)

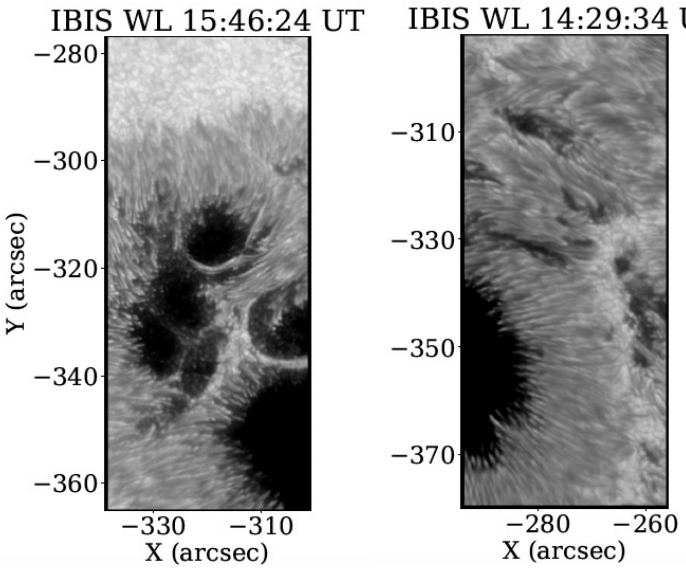
Hardware procured (08/2022)

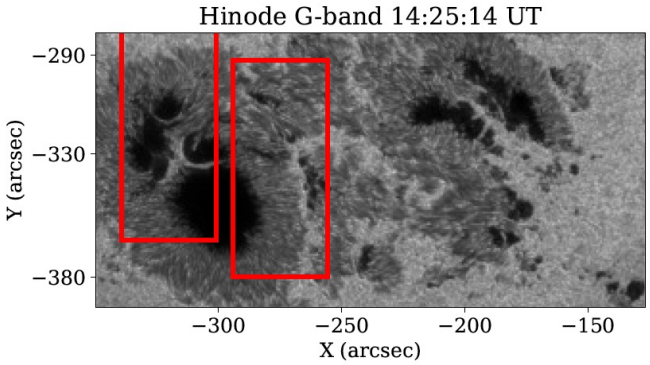
Testing and advancing ADS100 controller (2022)

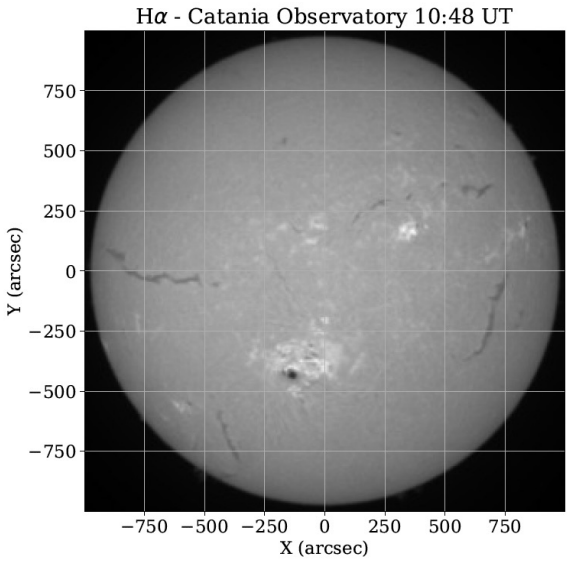
New design(s) (03/2023)

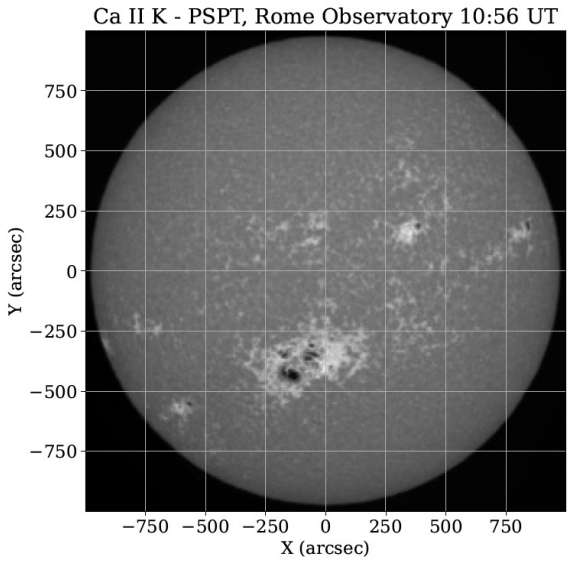
Decisive hour

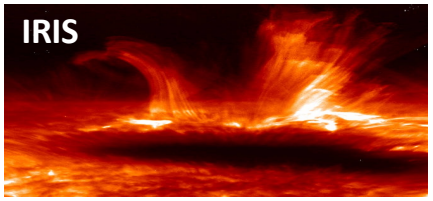
IBIS 2.0 ENABLING NEW OBSERVATIONS

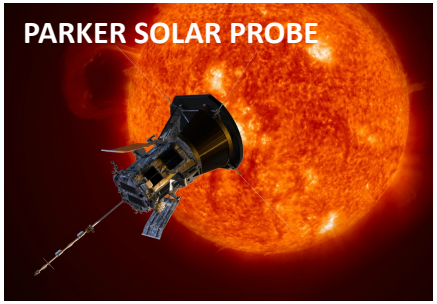


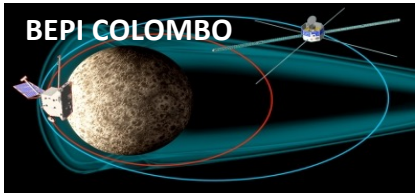


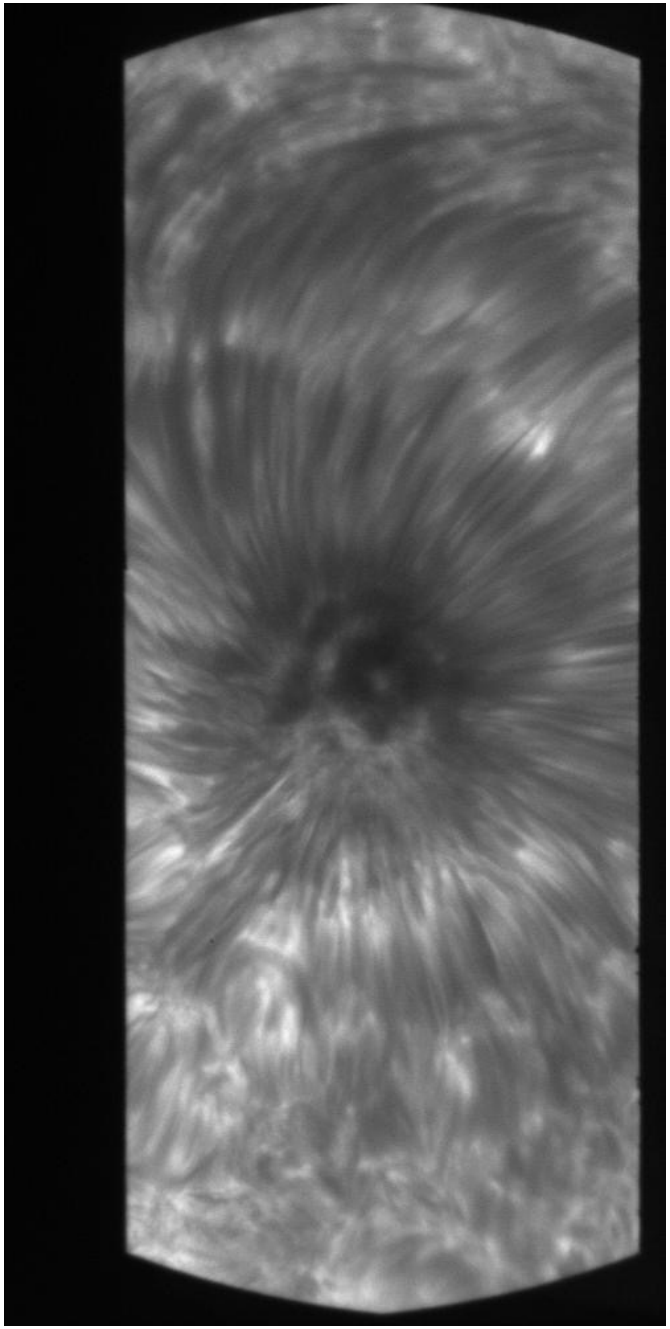












IBIS 2.0

http://www.ibis20.inaf.it

THANKS!

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