



Projetos de instrumentação SPANet e LNA

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National Laboratory

- LNA is a national institute and part of its mission is to cooperatively develop observational infrastructure. In this sense, the partnership between institutions of São Paulo state, now integrated in SPANet, and LNA in the development of astronomical instrumentation is an example of success.

LNA

- Maintain open observational Vis-IR infrastructure

 **LNA** LABORATÓRIO
NACIONAL DE ASTROFÍSICA

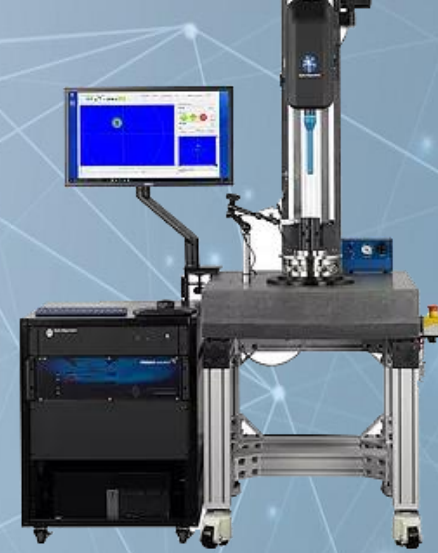
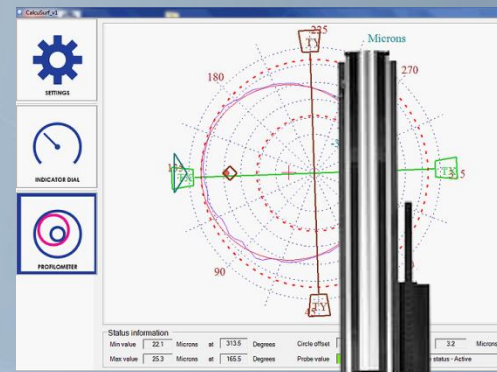
*Infraestrutura Observacional
para a astronomia Brasileira*

- OPD, Gemini, SOAR, CFHT*
- Instrumentation
- Astrophysics
- Outreach



LNA Instrumentation

- Laboratories open to collaborations
 - Optical Fibers
 - Optical Metrology and Alignment
 - Fine Mechanics and metrology
 - Control Systems
 - Prototyping
 - Environmental tests



- Integration & tests
- Coatings*



Projects



Previous




- ...
- SOAR Telescope 1999
- Eucalyptus (OPD P&E) 2003
- SIFS (SOAR) 2009
- BTFI (SOAR) 2010
- STELES (SOAR) 2018

Ongoing

- PFS (Subaru)
- SPARC4 (OPD P&E)
- SAM+ (SOAR)
- CUBES (VLT)
- MOSAIC (ELT)
- GMACS* (GMT)
- Solar Tel (OPD)
- 1,5m Tel (OPD)



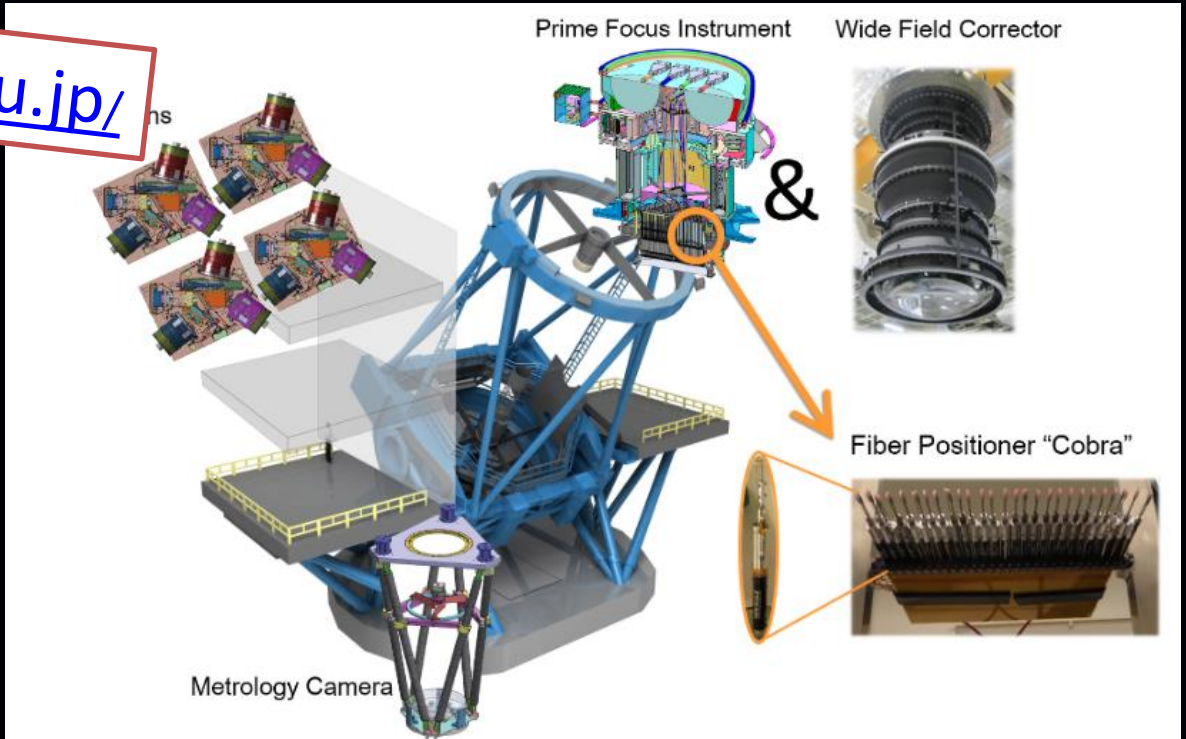


<p>Dark Matter</p>  <p>The nature of Dark Matter and its role in galaxy formation will be addressed by the PFS survey of stars in the Milky Way and in the Andromeda Galaxy.</p> <p>Read More</p>	<p>Dark Energy</p>  <p>The PFS measures the large scale galaxy distribution in both position and velocity to reveal the nature of the expansion of the Universe and nature of Dark Energy.</p> <p>Read More</p>	<p>History of Galaxies</p>  <p>The PFS Galaxy Evolution Survey will follow the growth of the full panoply of modern-day galaxies from cosmic dawn to the present day.</p> <p>Read More</p>
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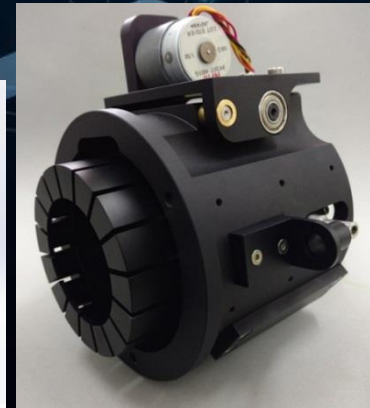
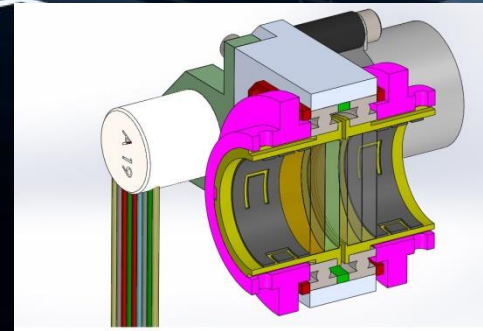
- Subaru – Prime Focus spectrograph
- *Laerte – Ligia's talks this morning*

- USP/LNA
 - Fiber Cable
 - Slit
 - Connectors
 - Cable ...

pfs.ipmu.jp/

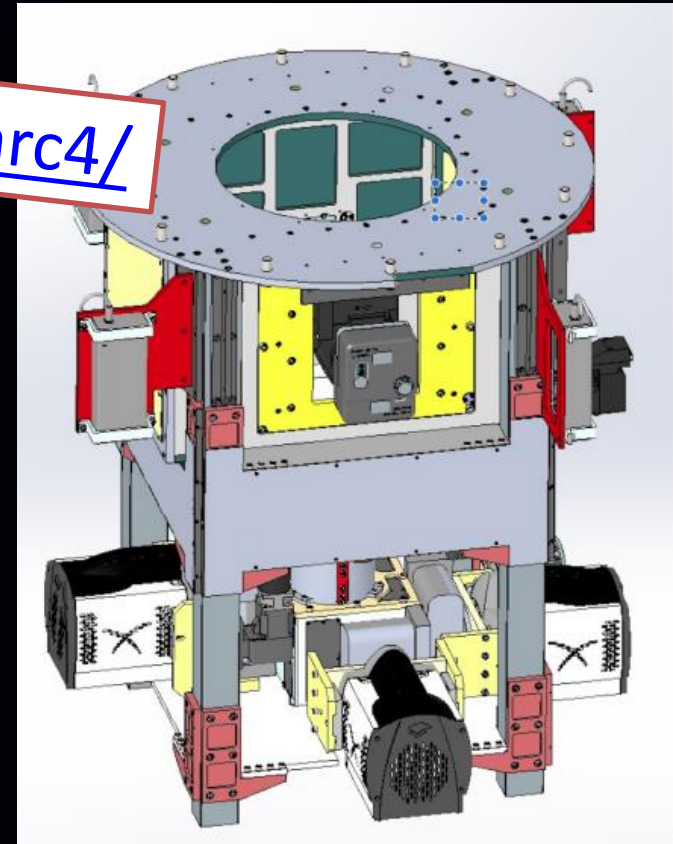
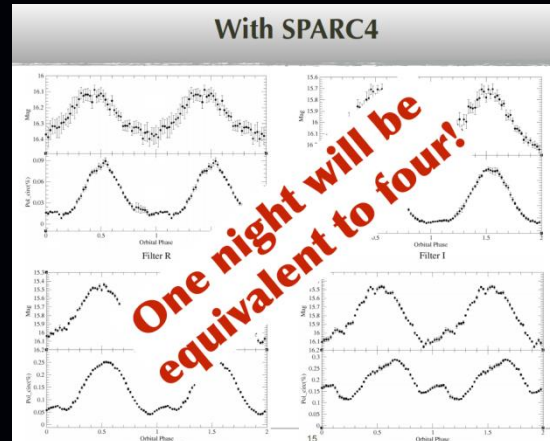
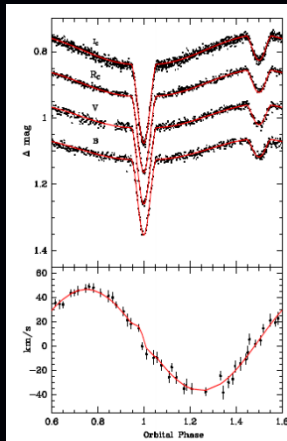


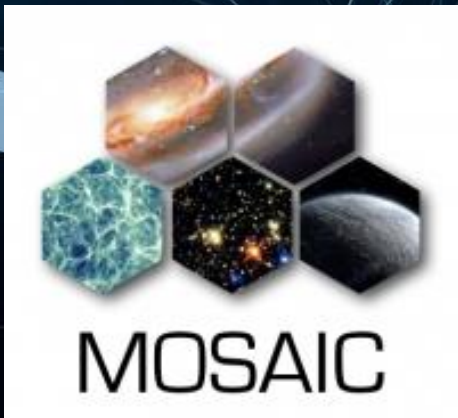
SPARC4



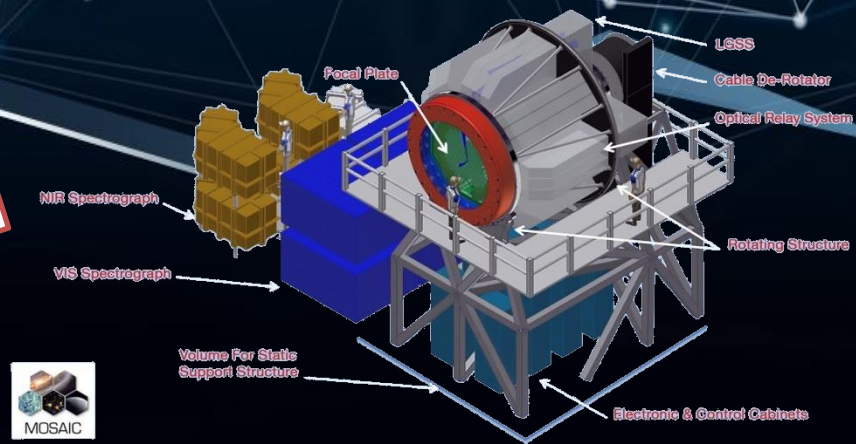
- Sparc4 - Simultaneous Polarimeter and Rapid Camera in Four Bands
 - INPE/LNA
 - 1,6m P&E (OPD)
- *Cláudia's talks this morning*

das.inpe.br/sparc4/



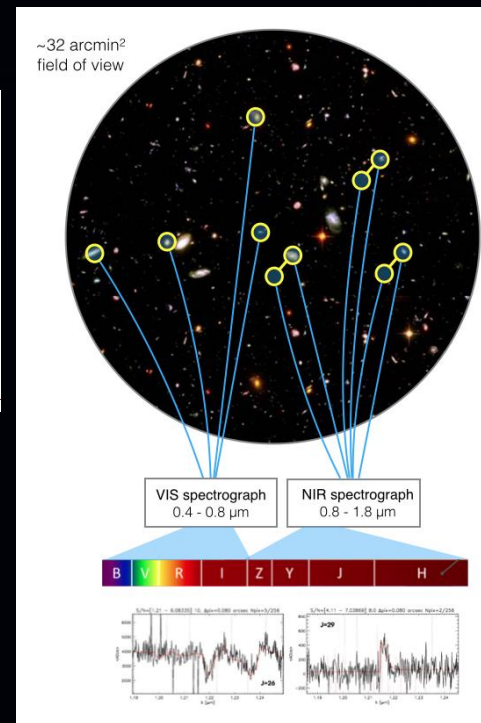
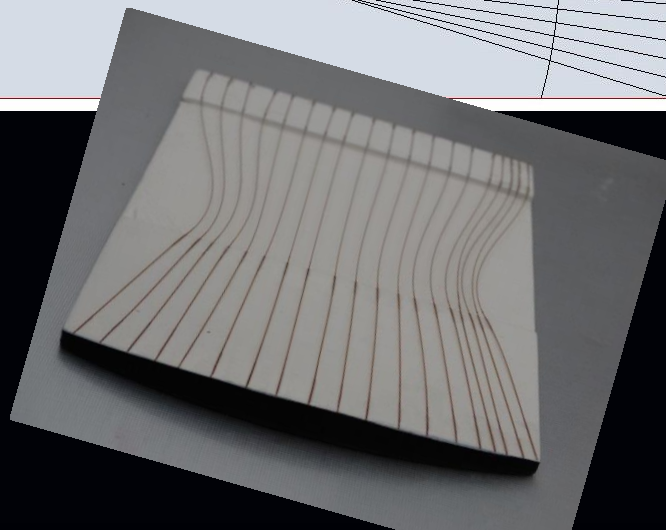
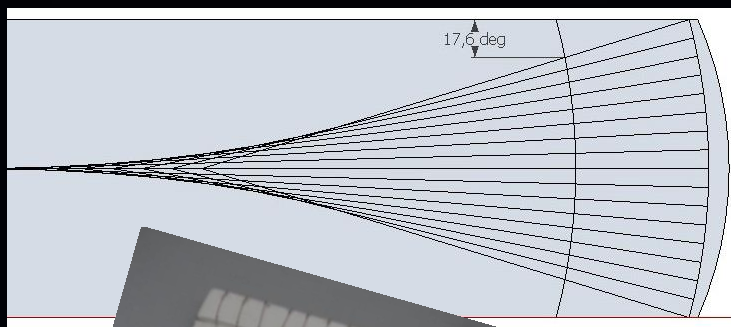


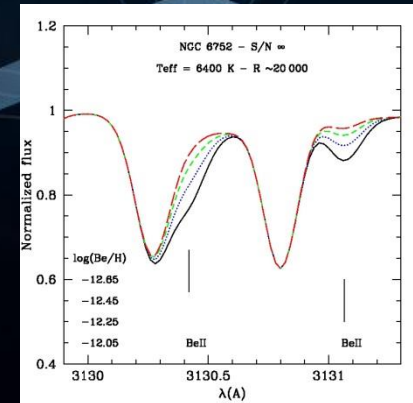
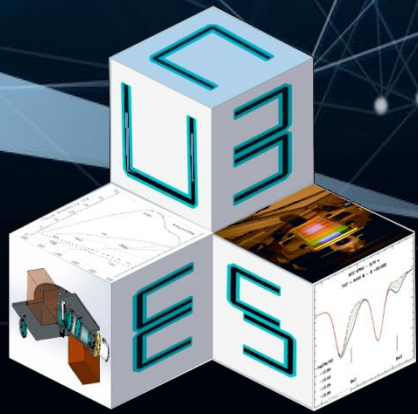
www.mosaic-elt.eu



- ELT multi-object and multi-integral field spectrograph
- *C.Evans's talk this morning*

- USP/LNA
 - Positioning
 - Fibers
 - IR Mechanics
 - Platform

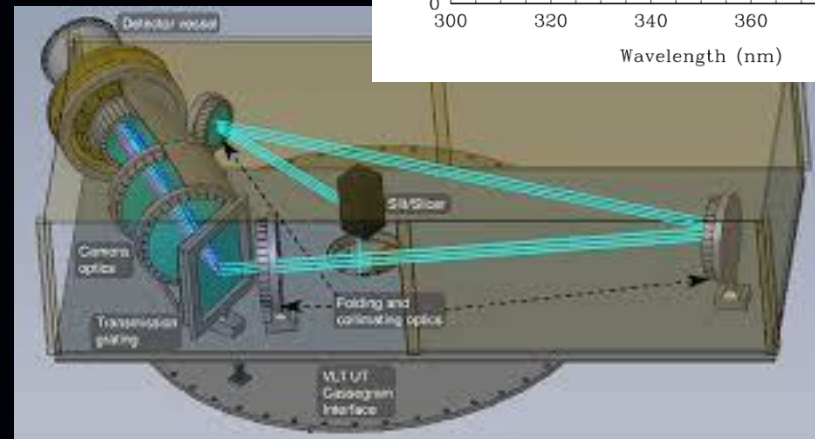
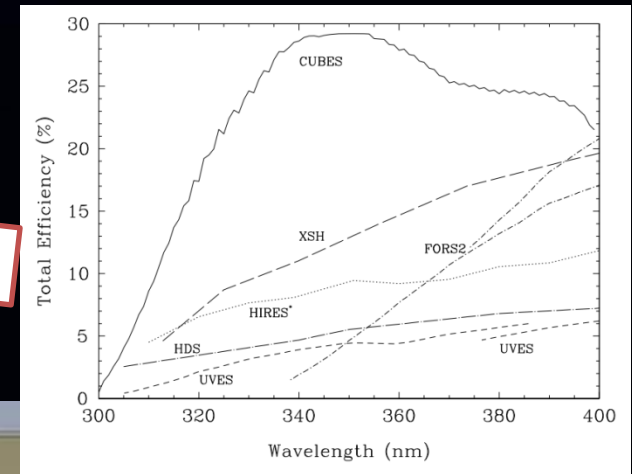




- VLT - Cassegrain U Band Efficient Spectrograph
- *C.Evans's talk this morning*

eso.org/~hkuntsch/papers/ApSS_279.pdf

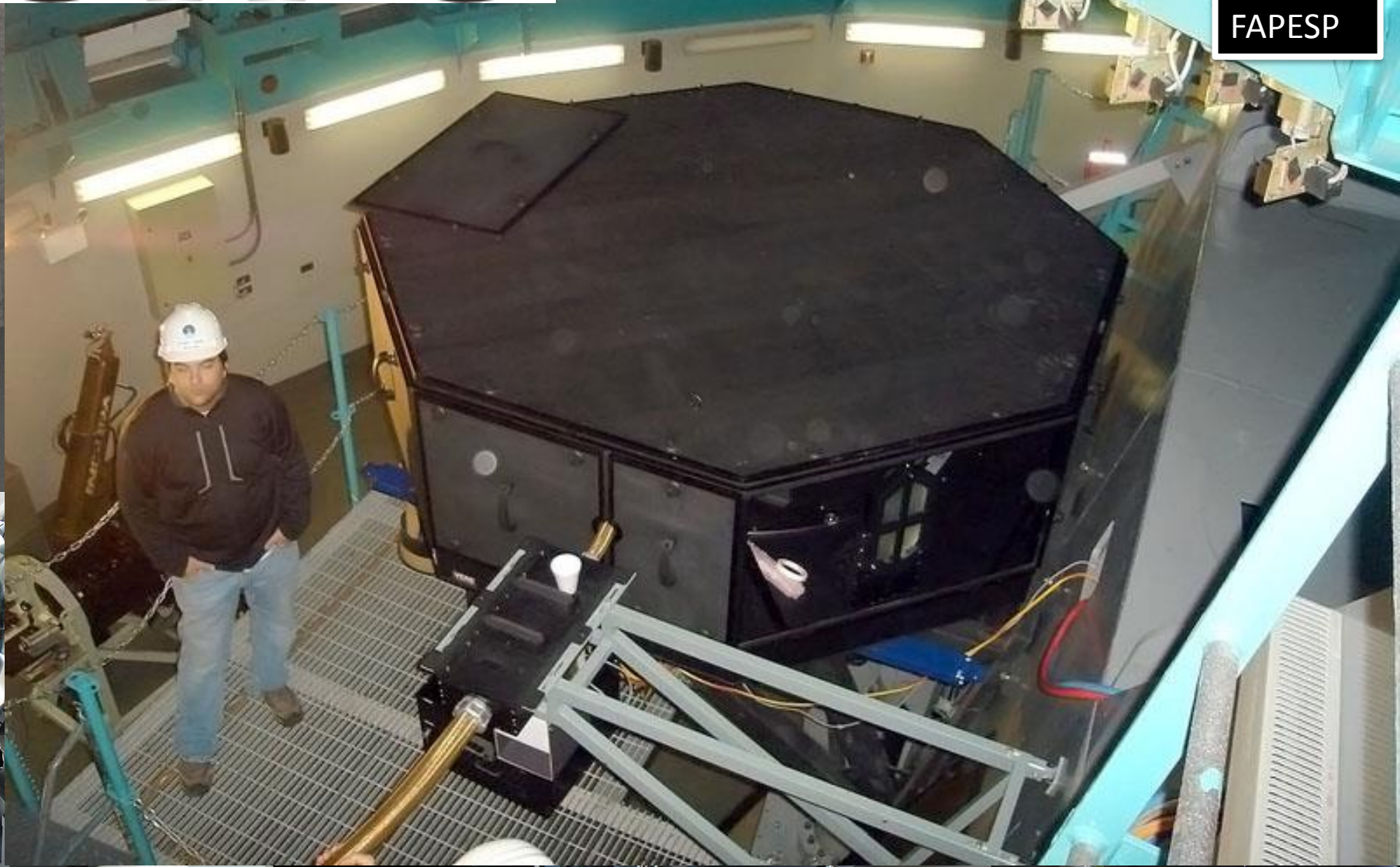
- USP/LNA
 - Grating
 - Mechanics
 - Control
 - Simulations





SIFS

I. Milênio
INCTA
FAPESP



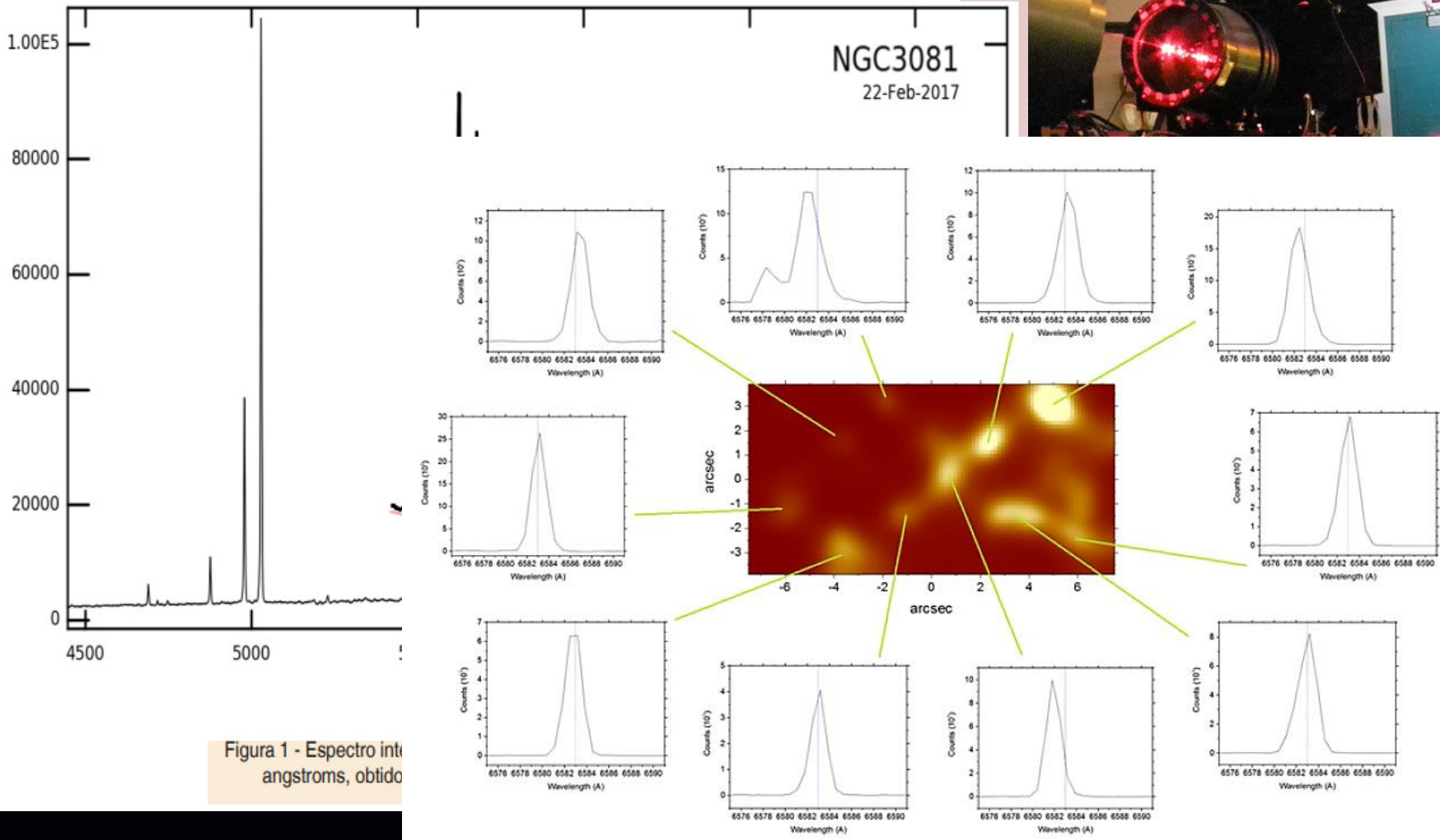
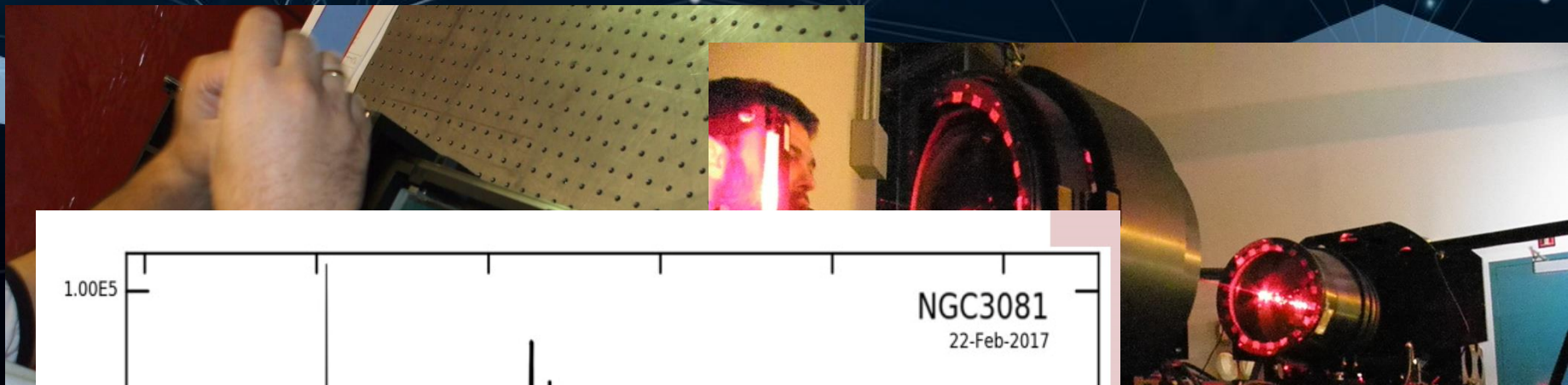


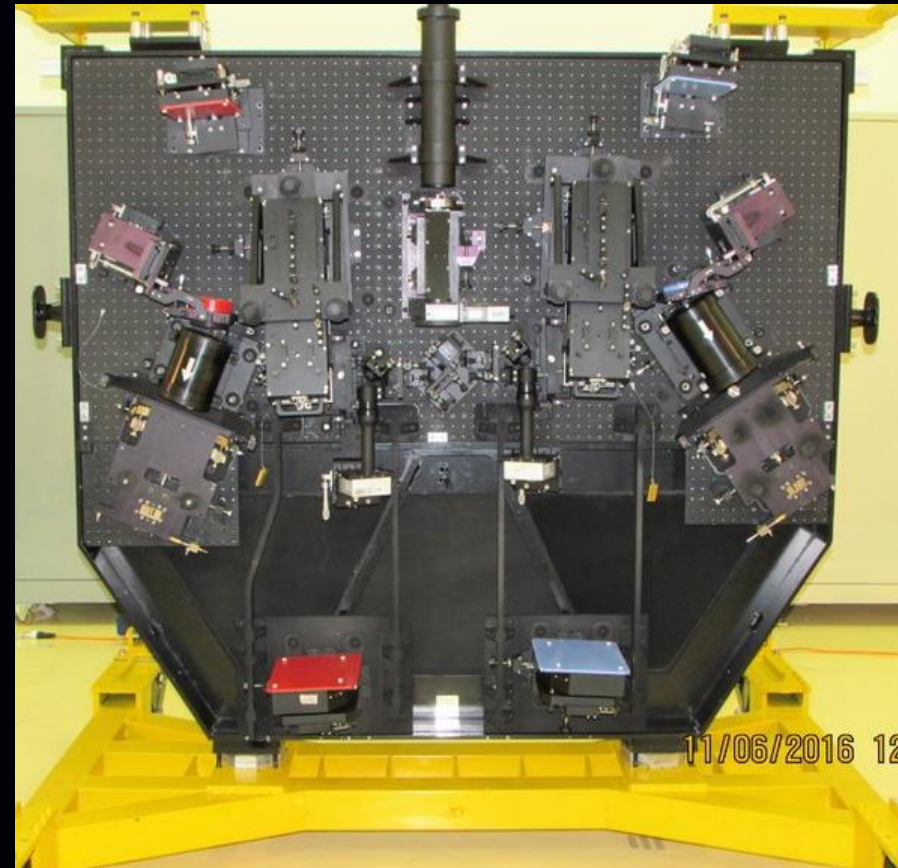
Figura 1 - Espectro integrado en angstroms, obtenido

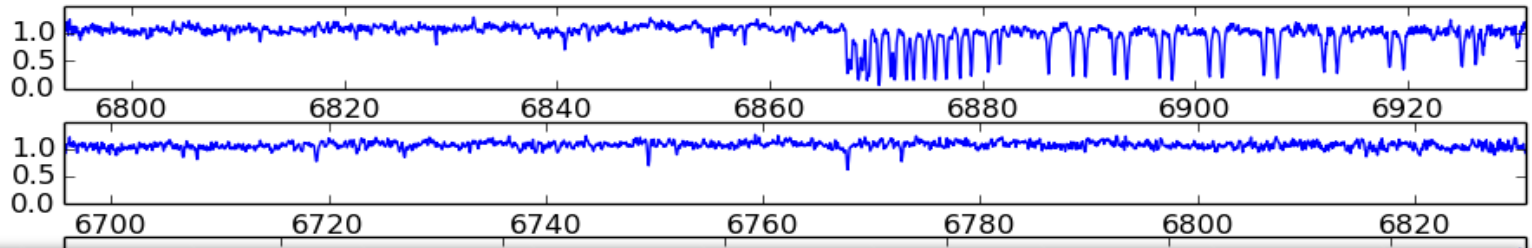
- SOAR Telescope Echelle Spectrograph

- Fully assembled at SOAR basement lab
- Fully aligned
- Calibration unit operational
- Slit mechanisms FAILED
- Image derotator REWORK
- Next mission

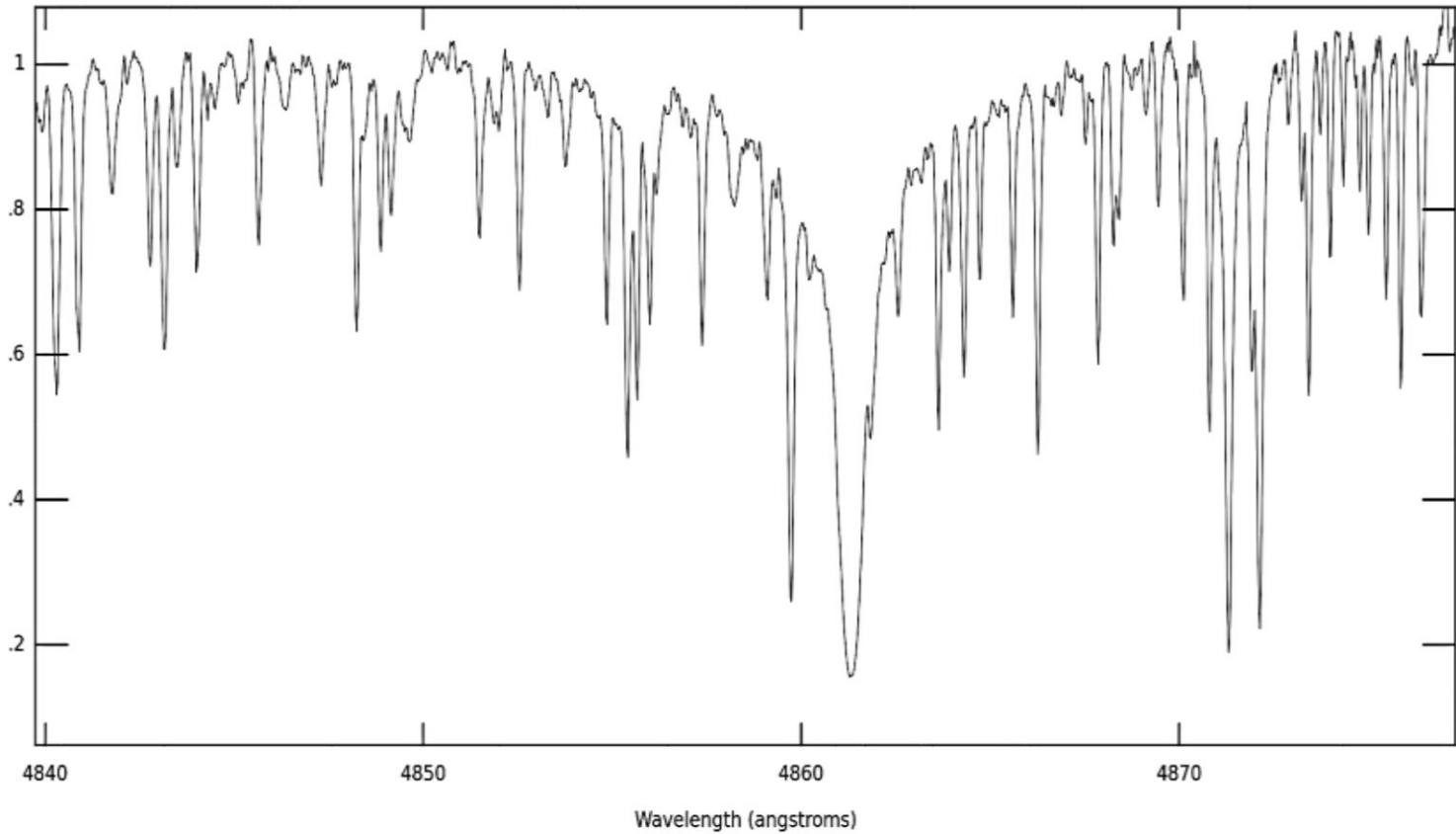
- Early 2020
- Slit, derotator
- ^ telescope

I.Milênio
INCTA
FAPESP

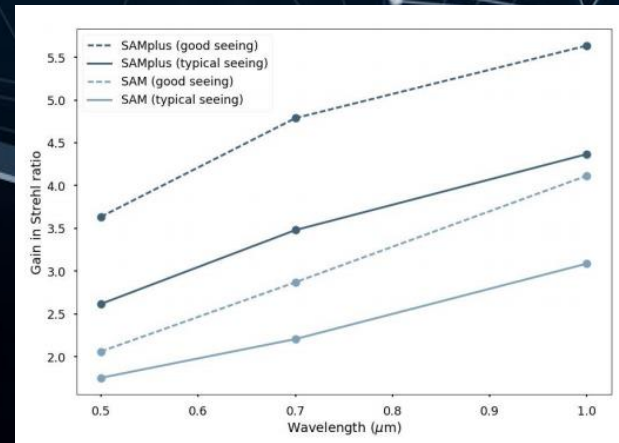




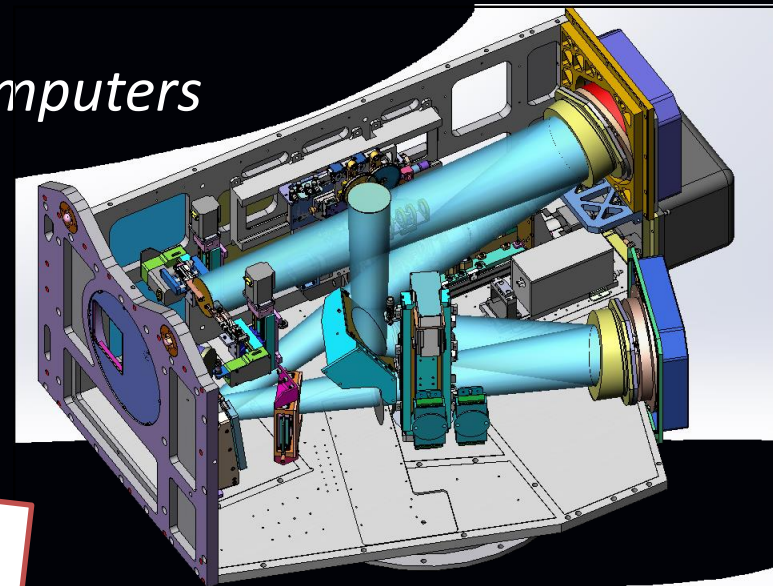
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[dumc.fits[*],34]: 5. ap:13 beam:13



SAMPlus

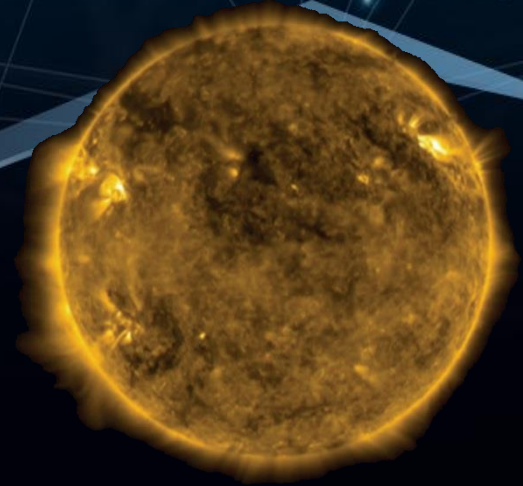
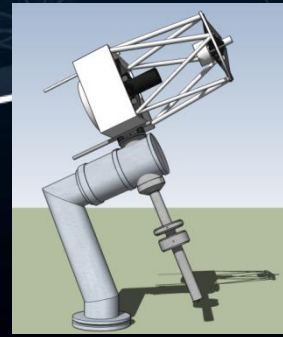


- SAM+ - *SOAR Adaptive Module Upgrade*
 - *Provide SAM with correction in the blue*
 - *New camera*
 - *New deformable mirror*
 - *New controllers, real time computers*
 - *Use with SIFS*

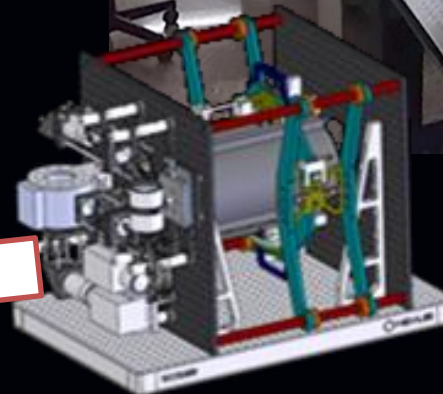
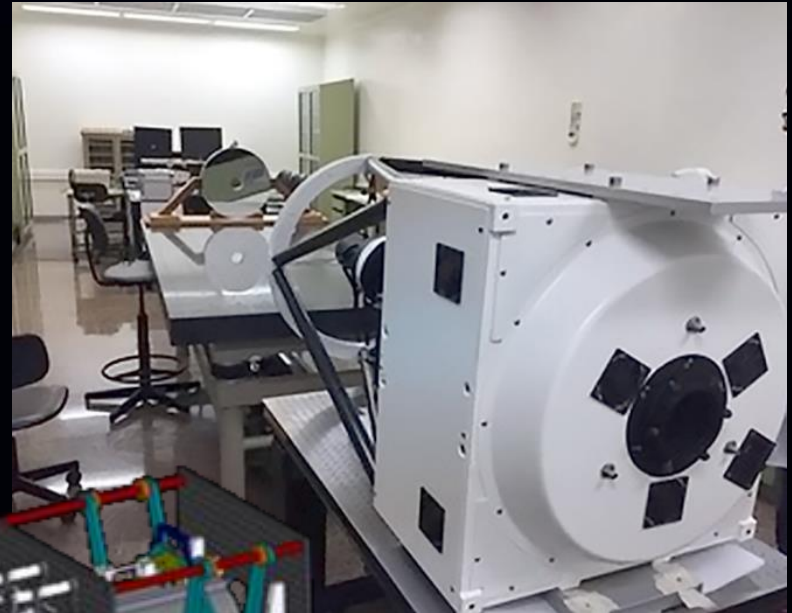


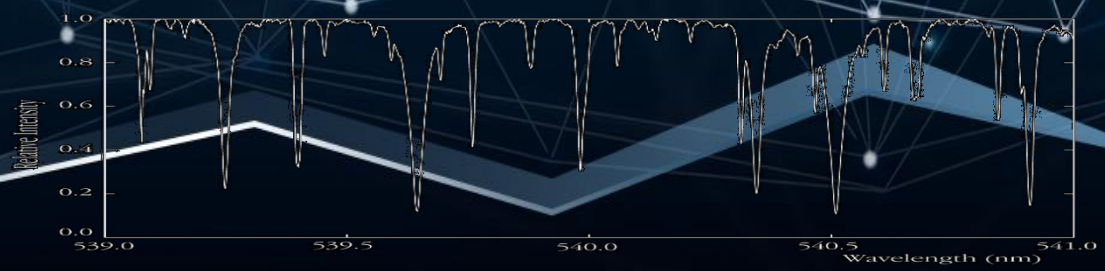
gmt.iag.usp.br/?q=pt-br/samplus/

BEST



- Brazilian Experimental Solar Telescope
 - OPD
- INPE/LNA
 - Fabry-Perot Imager
 - Heliophysics exploration
 - Mechanics
 - Control
 - Operations Setup





- Pico dos Dias 1.5m Spectroscopy Telescope
- *Jorge's talk now*
- USP/LNA
 - Open for Partners
 - 1.5m telescope
 - ECHARPE spectrograph

