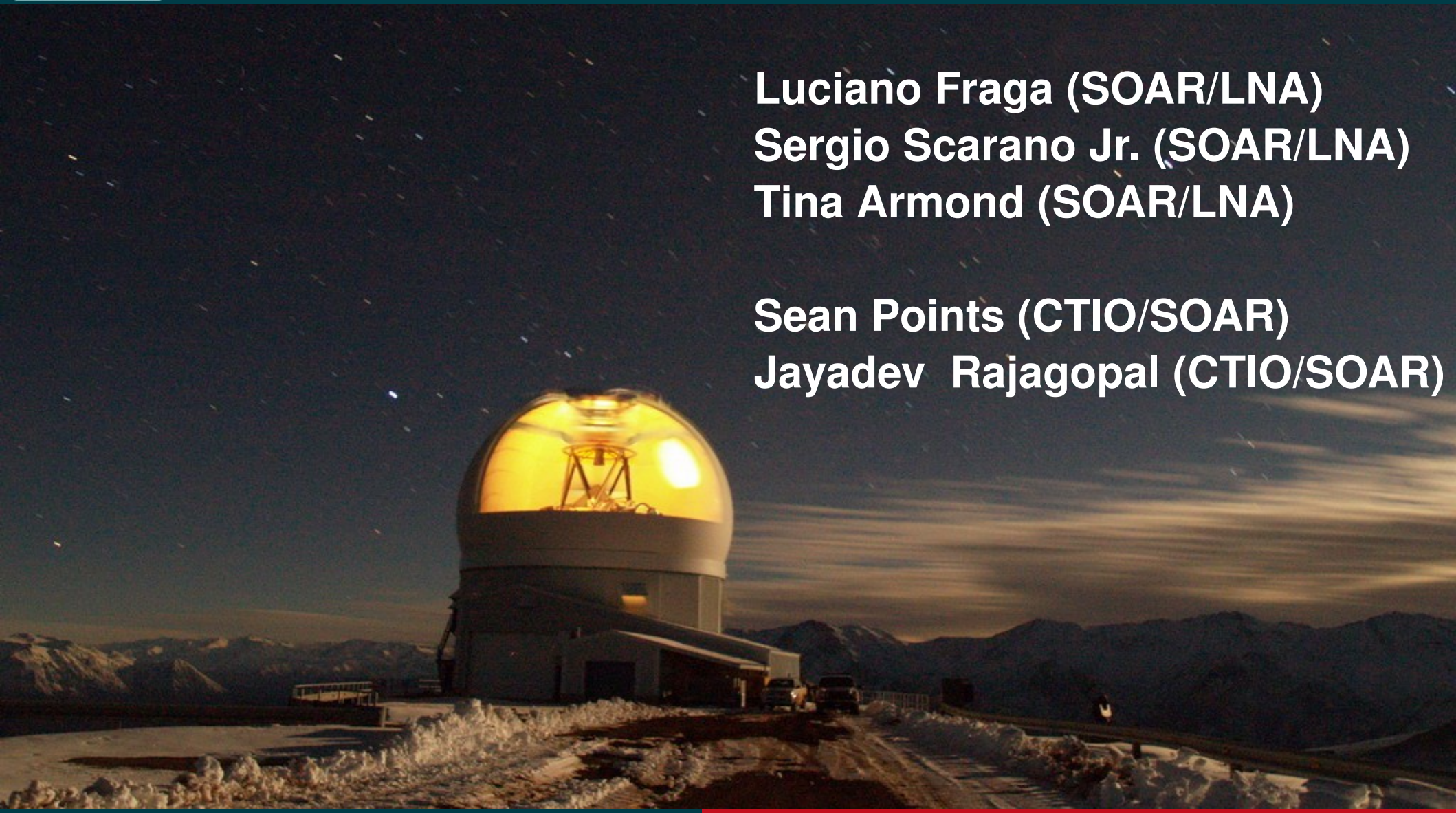
A instrumentação atual do SOAR

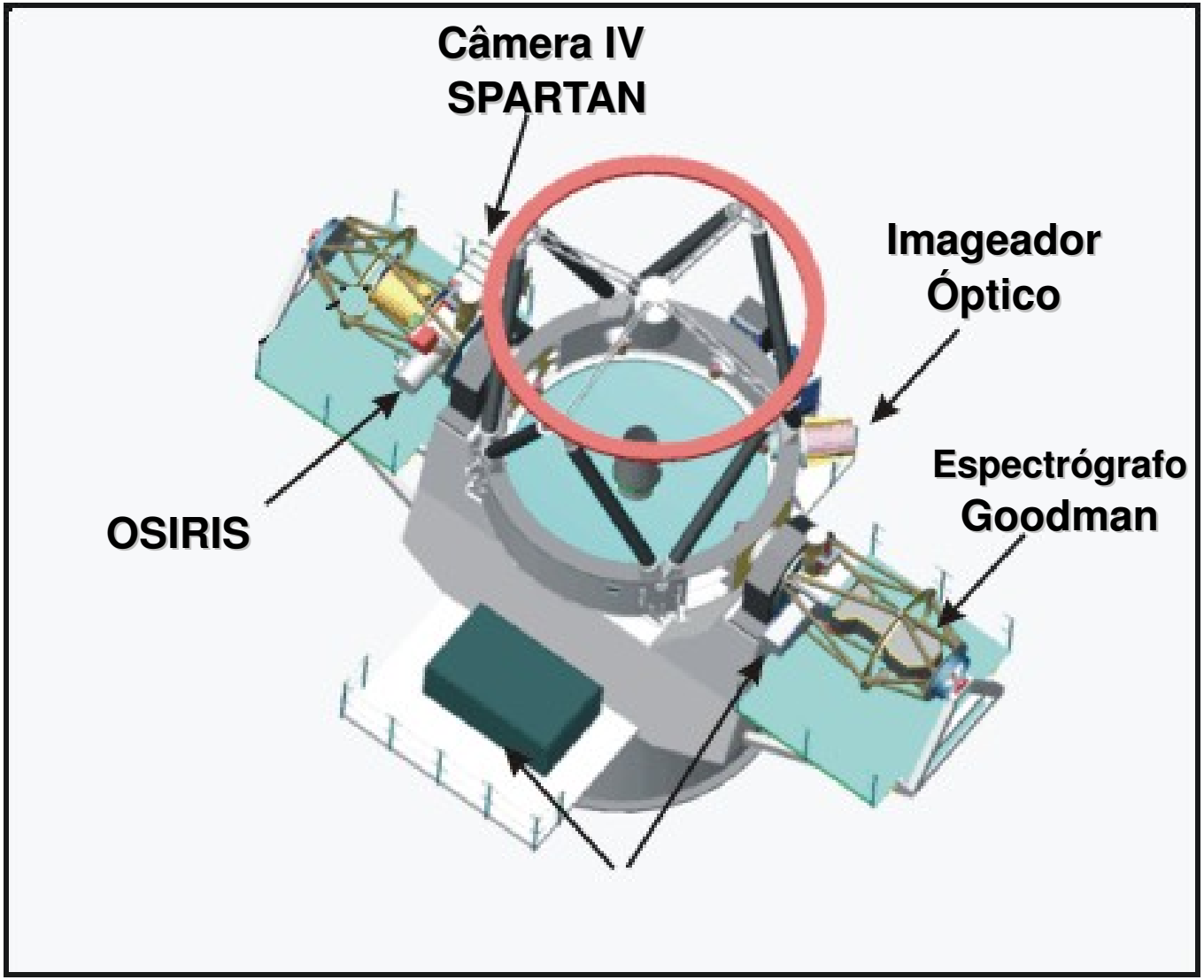


Luciano Fraga (SOAR/LNA)
Sergio Scarano Jr. (SOAR/LNA)
Tina Armond (SOAR/LNA)

Sean Points (CTIO/SOAR)
Jayadev Rajagopal (CTIO/SOAR)

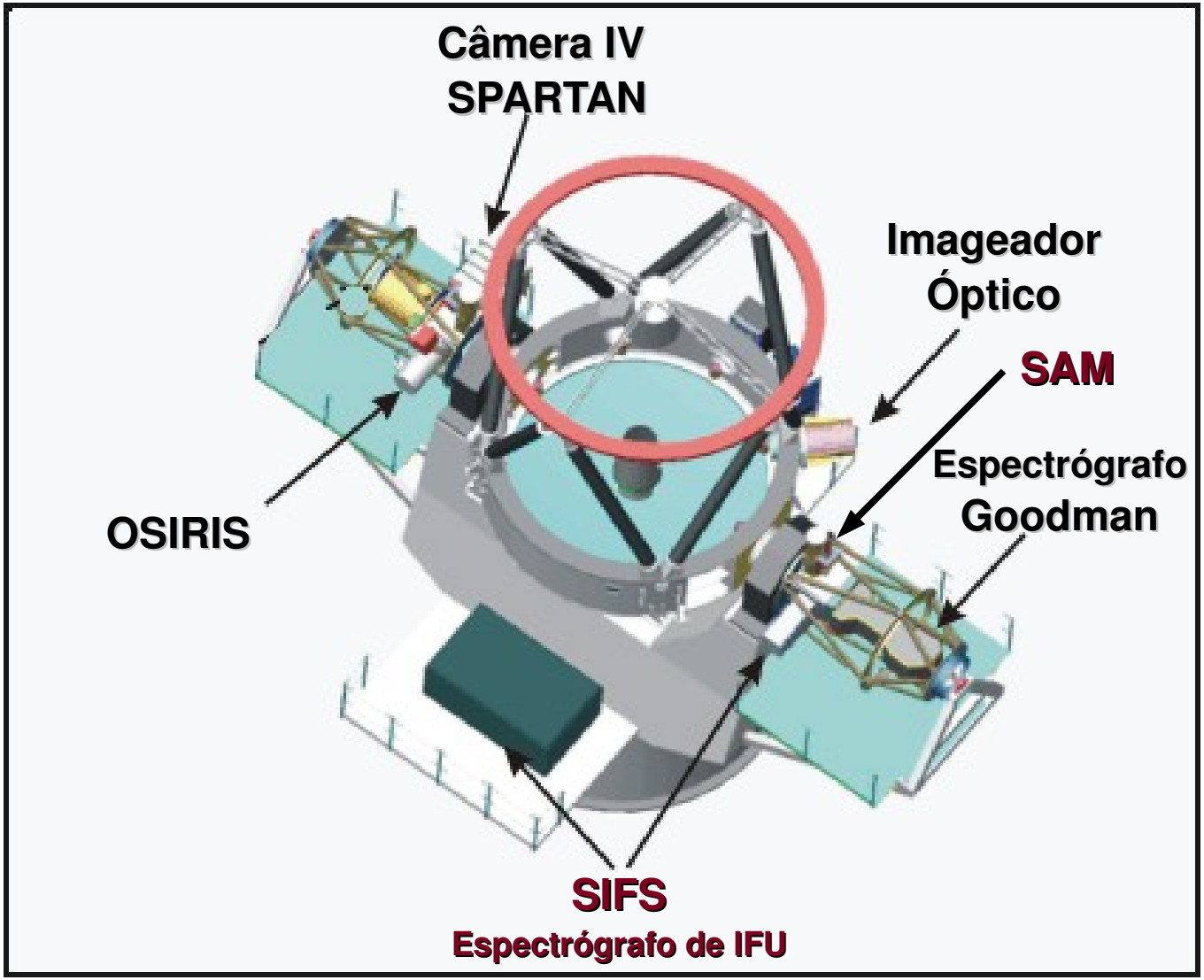
Instrumentos

Instrumentos em serviço



Instrumentos

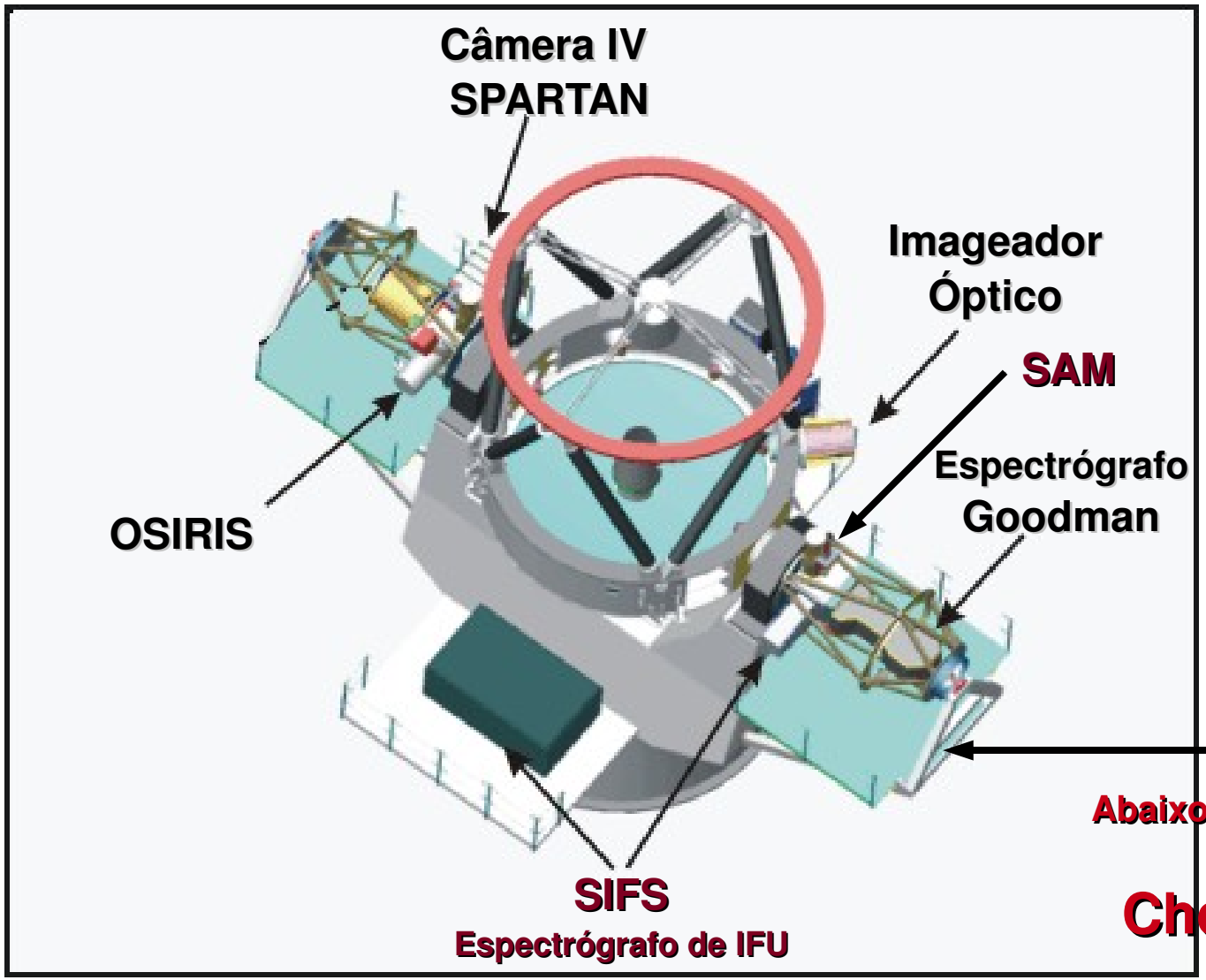
Instrumentos em serviço



Comissionamento em 2010

Instrumentos

Instrumentos em serviço



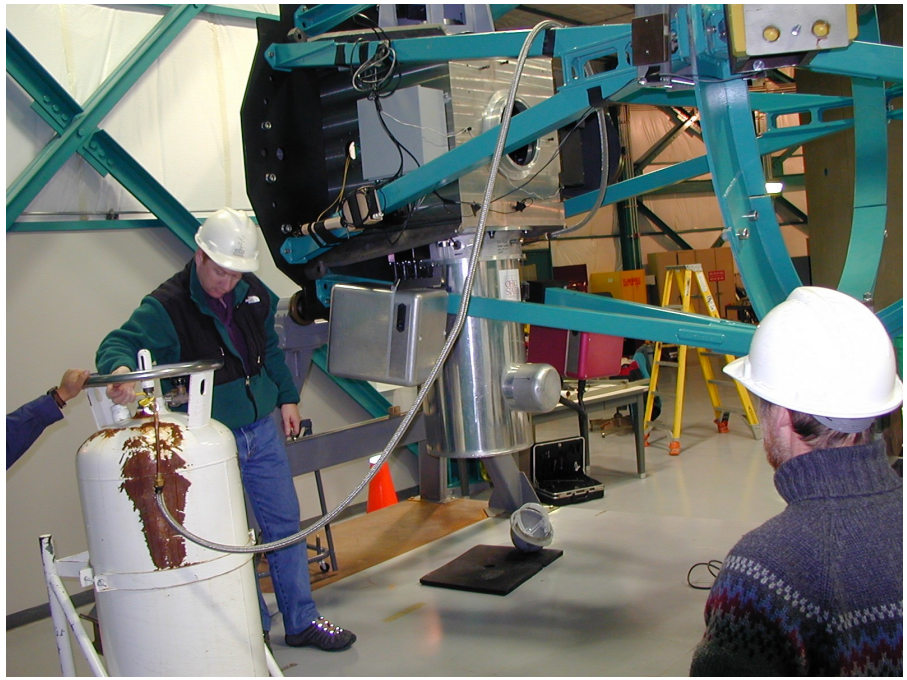
Chegada em 2011?

Comissionamento em 2010

OSIRIS

PI: D. Depoy (R. Blum)

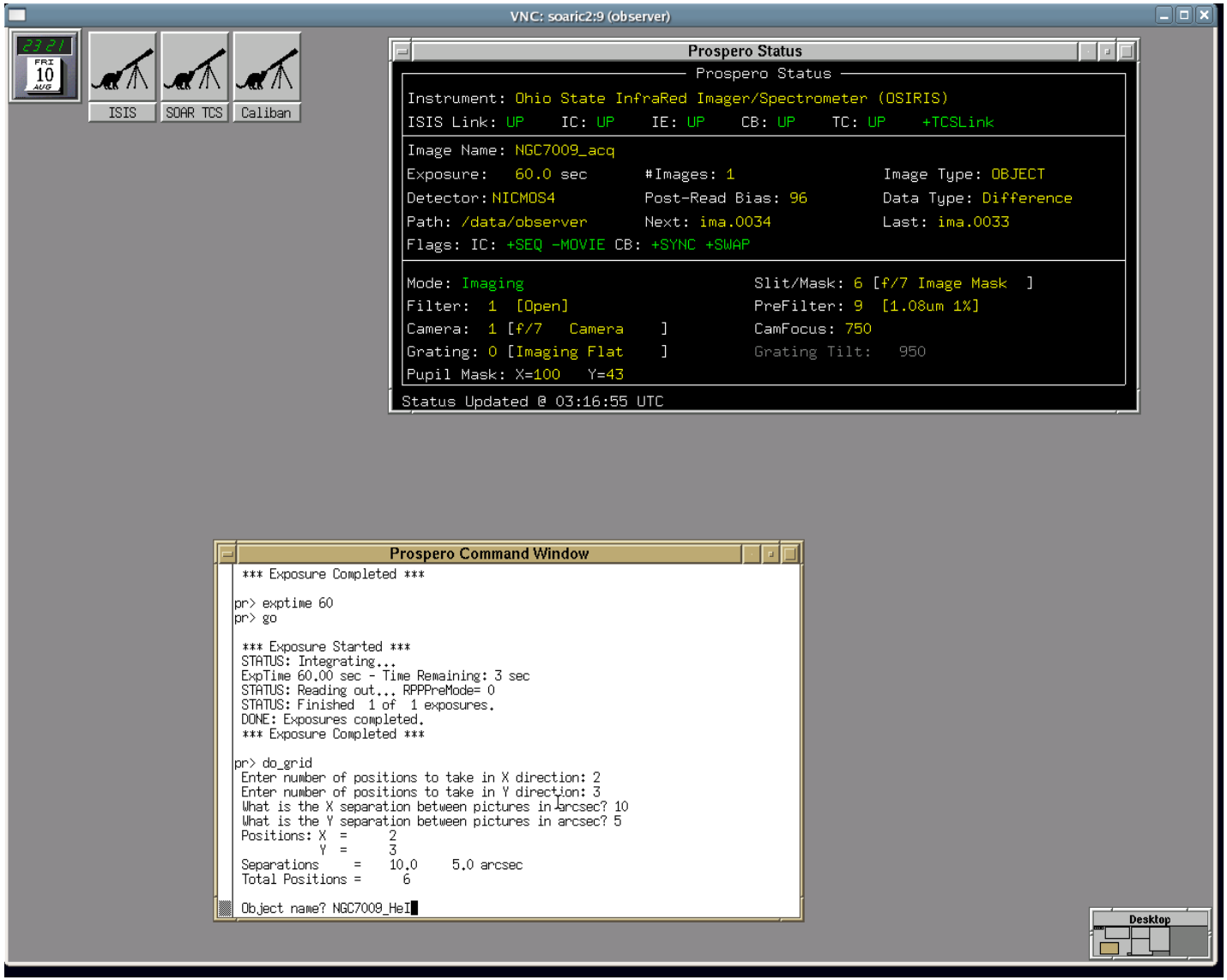
- 1024x1024 HgCdTe array
  - (~ 577 x 577 área útil)
- Modo Imagem (f/7, 0.14”/pix)
  - 1.3 x 1.3 arcmin FOV
- Modos Espectroscópicos
  - Long slit Hi-Re (f/7)
    - R ~ 3000 J, H, ou K band
    - 72” x 0.42” fenda
  - Cross dispersed (f/3)
    - R ~1200 J+H+K
    - 27” x 1” fenda



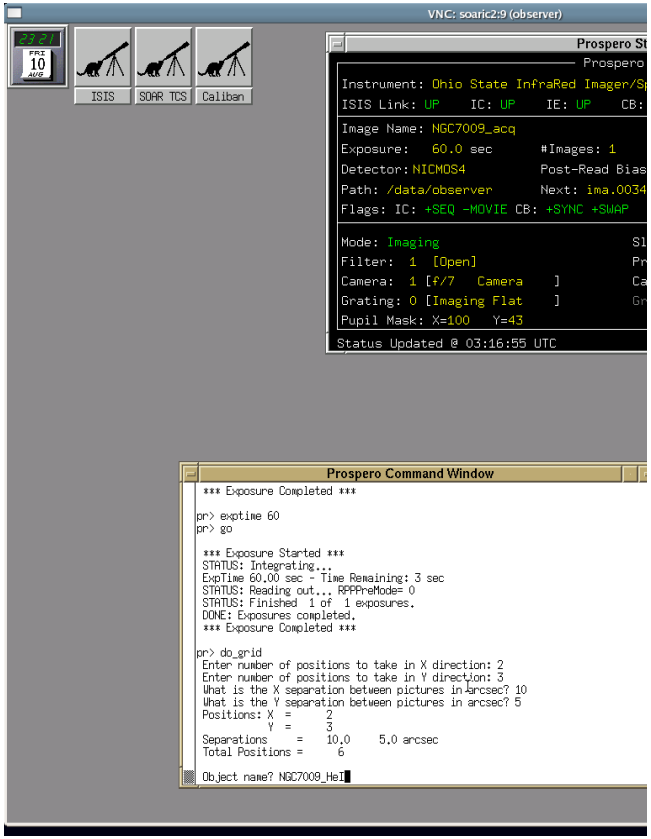
Em operação @ SOAR desde 2005B

... @ CTIO por muitos anos antes disto

Interface de usuário



Interface de usuário



Prospero Quick Reference Card for OSIRIS

(2005 September 8)

Typewriter font denotes command verbs and keywords.
Italics denote user-supplied arguments (numbers or strings).

Command Syntax

commands, keywords, & options	`command keyword=value option`
commands with numerical arguments	`command arg1 arg2 ...`
commands with string arguments	`command 'an argument string ...'`

General Commands

start Prospero	`prospero`
quit Prospero	`quit`
read help for commands	`help command`
find command by keyword search	`apropos keyword`
show the last few commands	`history`
repeat the last command	`%`
repeat last command matching *pattern*	`%pattern`

Observing Session Startup

connect to the data-taking PCs	`startup`
nightly observing run initialization	`runinit`

Instrument Control

OSIRIS Modes:

Direct Imaging Mode	`immode`
Spectroscopic Mode	`spmode`
Acquisition Mode (from spmode)	`acqmode`

Filter & Pre-Filter Selection:

select a filter	`filter filter#`
select a prefilter	`prefilter filter#`
print the filter/prefilter table	`print filter`

Slit/Aperture Mask Selection:

select a slit	`slit slit#`
print the slit/aperture ID table	`print slit`

Camera Select & Focus:

select the camera lens	`camera cam#`
set the reimaging camera lens focus to *f*	`camfocus f`
set camera & focus	`setcamera camera=n camfocus=f`
print the camera ID table	`print camera`

Pupil Mask:

set pupil mask X position	`xpupil xpos` (default=0 4m ,-50 1.5m)
set pupil mask Y position	`ypupil ypos` (default=45 4m , 49 1.5m)

Grating Tilt:

tilt grating (encoder units)	`grating tilt`

Motor Resets:

to reset motor	`ie 'motor reset'`
example:	`ie 'camfocus reset'`
for all motors:	`ie 'reset'`

Data Acquisition

Instrument and exposure status are continuously displayed in the status window. Green flags are OK, Red flags signal error or non-default state.

Take Integration(s):

start a single integration	`go`
take multiple integrations	`go #imgs`
coadd a number of integrations	`avego #coadds`
take multiple coadded integrations	`mavego #imgs #coadds`

Integtration Setup:

set integration time to *t* seconds	`exptime t`
set integration time to *t* minutes	`exptime t minutes`
this is an object named *xxx*	`object xxx`
this is a flat field named *xxx*	`flat xxx`
this is a dark frame named *xxx*	`dark xxx`
this is a sky image named *xxx*	`sky xxx`
this is a zero image named *xxx*	`bias xxx`
this is a bias image named *xxx*	`bias xxx`
enable/disable exposure bell	`exbell`
put a comment in the image header	`comment 'comment text'`

Image File Management:

change the image filename	`filename filename`
change the filename extension number	`newext nnn`
print the name of the last file written	`lastfile`
print the name of the next file	`nextfile`
change the image directory path	`imdir path`
enable/disable disk storage	`±disk`

Detector Control

start continous readout mode	`movie`
stop continous readout mode	`-movie`
set IC real-time display scale	`icscale min= max= sat=`

Telescope Control

print telescope pointing info	`tcstatus`
find the best telescope secondary focus	`focus npics step foc`
set the telescope secondary focus	`change_focus foc`
send a raw TCS command	`tcs 'raw command' twait=t`

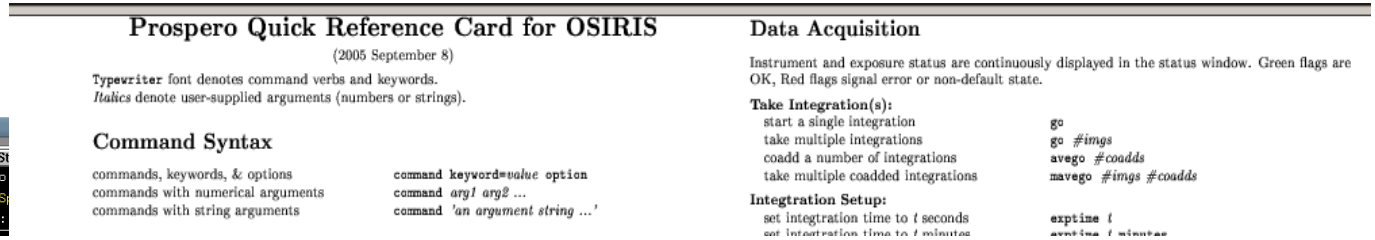
Move the telescope...

x arcsec E/W & *y* arcsec N/S	`offset ra=x dec=y`
x arcsec north	`north x`
x arcsec south	`south x`
x arcsec east	`east x`
x arcsec west	`west x`

Guider Control (4m only)

enable guider	`+guider`
disable guider	`-guider`
position guide probe	`guider ra=hh:mm:ss.s dec=dd:mm:ss`

Interface de usuário



Prospero Quick Reference Card for OSIRIS

(2005 September 8)

Typewriter font denotes command verbs and keywords.
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commands with numerical arguments	**command** *arg1 arg2 ...*
commands with string arguments	**command** *'an argument string ...'*

Data Acquisition

Instrument and exposure status are continuously displayed in the status window. Green flags are OK, Red flags signal error or non-default state.

Take Integration(s):

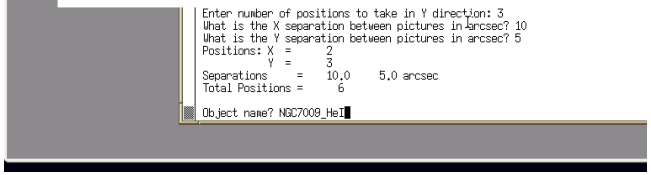
start a single integration	**go**
take multiple integrations	**go** *#imgs*
coadd a number of integrations	**avego** *#coadds*
take multiple coadded integrations	**mavego** *#imgs #coadds*

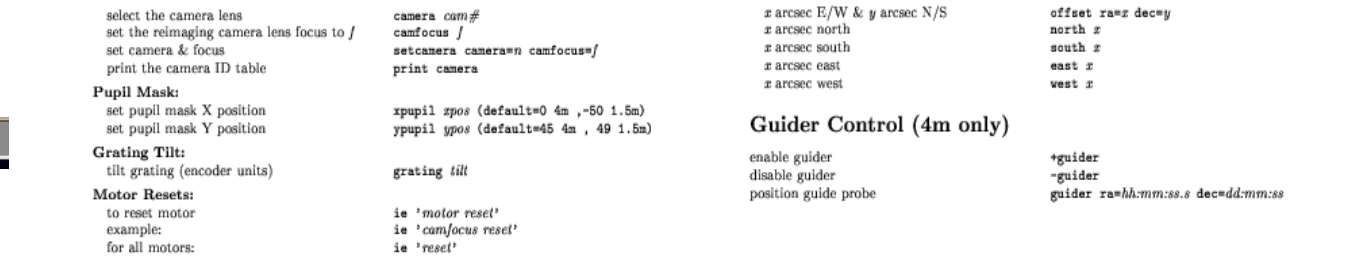
Integtration Setup:

set integtration time to *t* seconds	**exptime** *t*

Nota: Para economizar tempo de observação e evitar erros ao longo da noite, é extremamente útil aprender a definir aliases e scripts em linguagem *Prospero* e/ou utilizar os scripts já existentes.

ver: Prospero Observer's Guide for OSIRIS na página de documentação do OSIRIS





select the camera lens	**camera** *cam#*
set the reimaging camera lens focus to *f*	**camfocus** *f*
set camera & focus	**setcamera camera=***n* **camfocus=***f*
print the camera ID table	**print camera**

Pupil Mask:

set pupil mask X position	**xpupil** *xpos* **(default=0 4m ,-50 1.5m)**
set pupil mask Y position	**ypupil** *ypos* **(default=45 4m , 49 1.5m)**

Grating Tilt:

tilt grating (encoder units)	**grating** *tilt*

Motor Resets:

to reset motor	**ie** *'motor reset'*
example:	**ie** *'camfocus reset'*
for all motors:	**ie** *'reset'*

x arcsec E/W & *y* arcsec N/S	**offset ra=***x* **dec=***y*
x arcsec north	**north** *x*
x arcsec south	**south** *x*
x arcsec east	**east** *x*
x arcsec west	**west** *x*

Guider Control (4m only)

enable guider	**+guider**
disable guider	**-guider**
position guide probe	**guider ra=***hh:mm:ss.s* **dec=***dd:mm:ss*

Dicas para o planejamento das observações

- **O céu varia e satura em minutos!**
  - Tempos de exposição individuais devem ser relativamente curtos.
    - < 4 min para espectroscopia e < 0.5 min para imageamento
    - S/N requerido deve ser atingido por uma combinação de ***n*** imagens
    - Diferentes posições de *dithering* combinadas para construir *o* céu
  - Linhas do céu variam de intensidade em minutos e com a massa de ar
    - Padrões telúricas devem ser observadas imediatamente antes e /ou após o objeto de ciência e com massa de ar similar.
    - Para observações longas, a melhor estratégia será intercalar as padrões telúricas com o objeto de ciência.

SOI (Imageador Óptico)

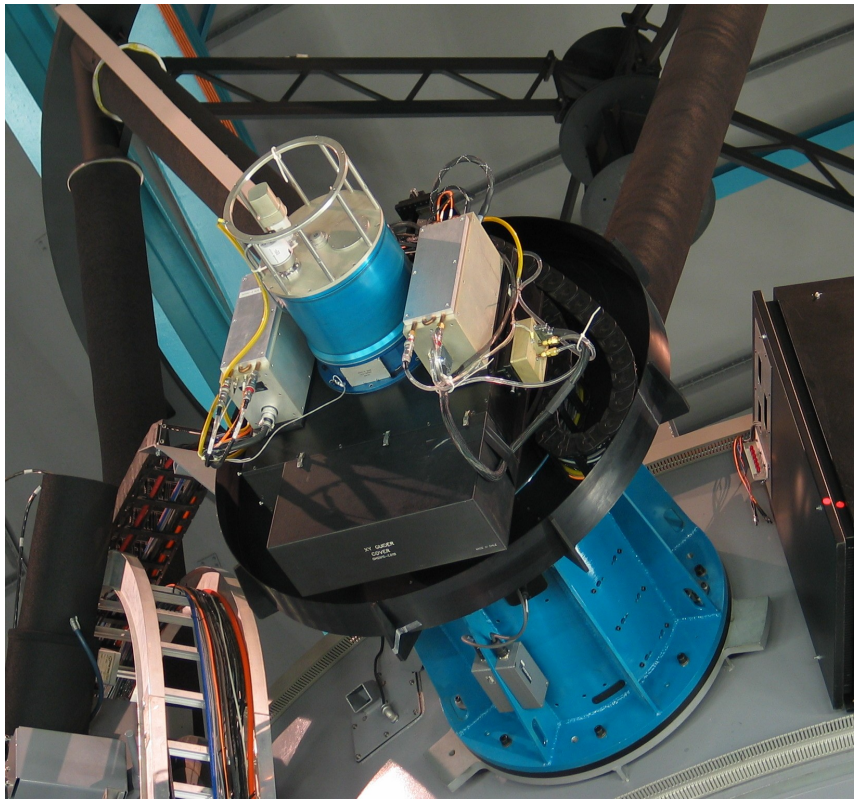
PI: A. Walker, H. Schwarz

- 5.5 x 5.5 arcmin FOV, 0.08”/pix
- Óptica otimizada para o azul e UV
  - 320 – 1100 nm
  - ADC do tipo trombone
  - f/16 → f/9 redutor focal

- Duas rodas de filtro (4 + clear, cada)
  - Johnson-Cousins UBVRI
  - SDSS uvgri
  - Strömgren uvby filter sets
  - Narrow band shared with CTIO
  - Tamanho padrão 4x4”

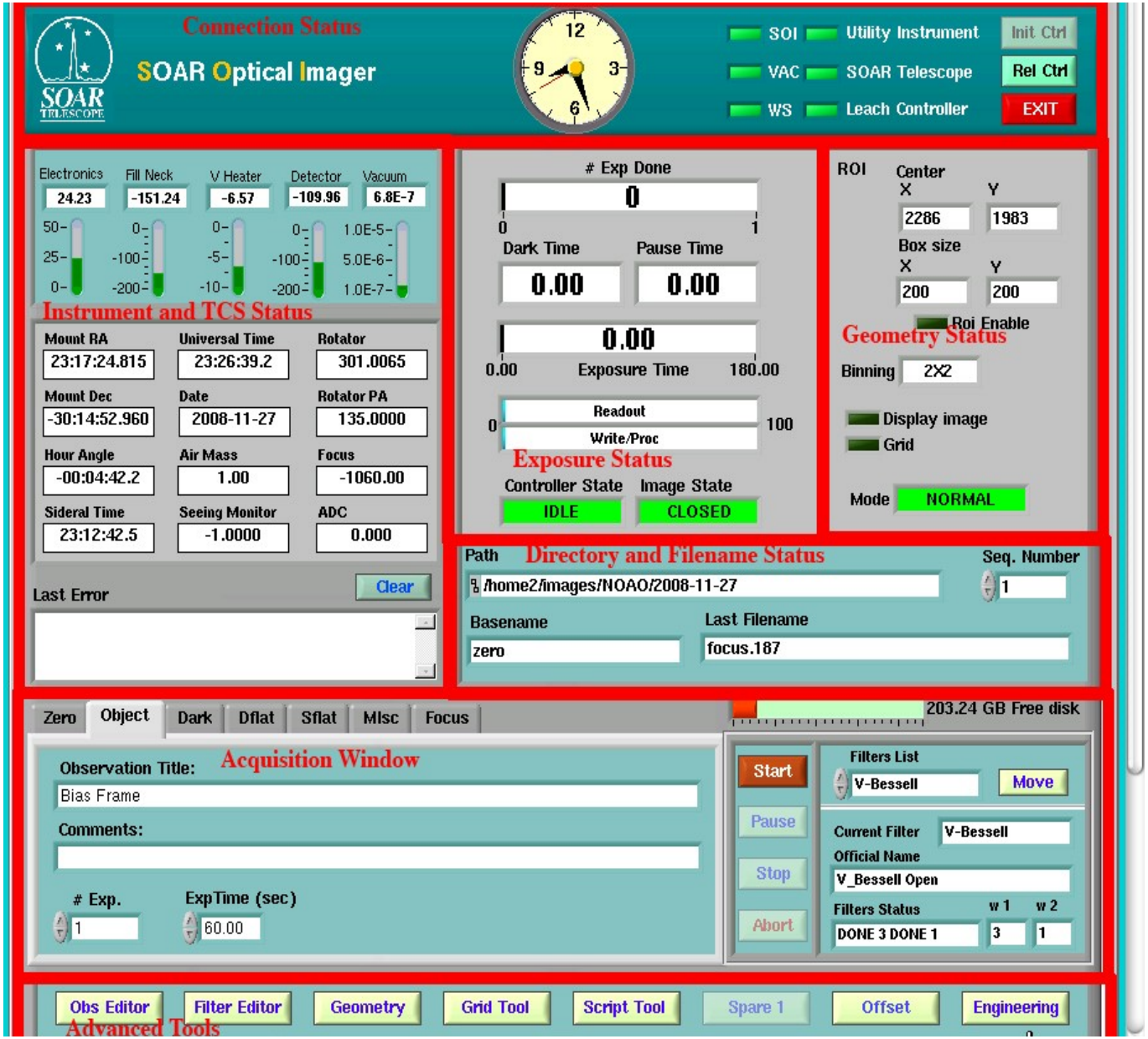
- Detector
  - 4k x 4k Mini-Mosaic of E2V CCDs
    - Logo será substituído por um único 4kx4k E2V CCD

em operação desde 2004



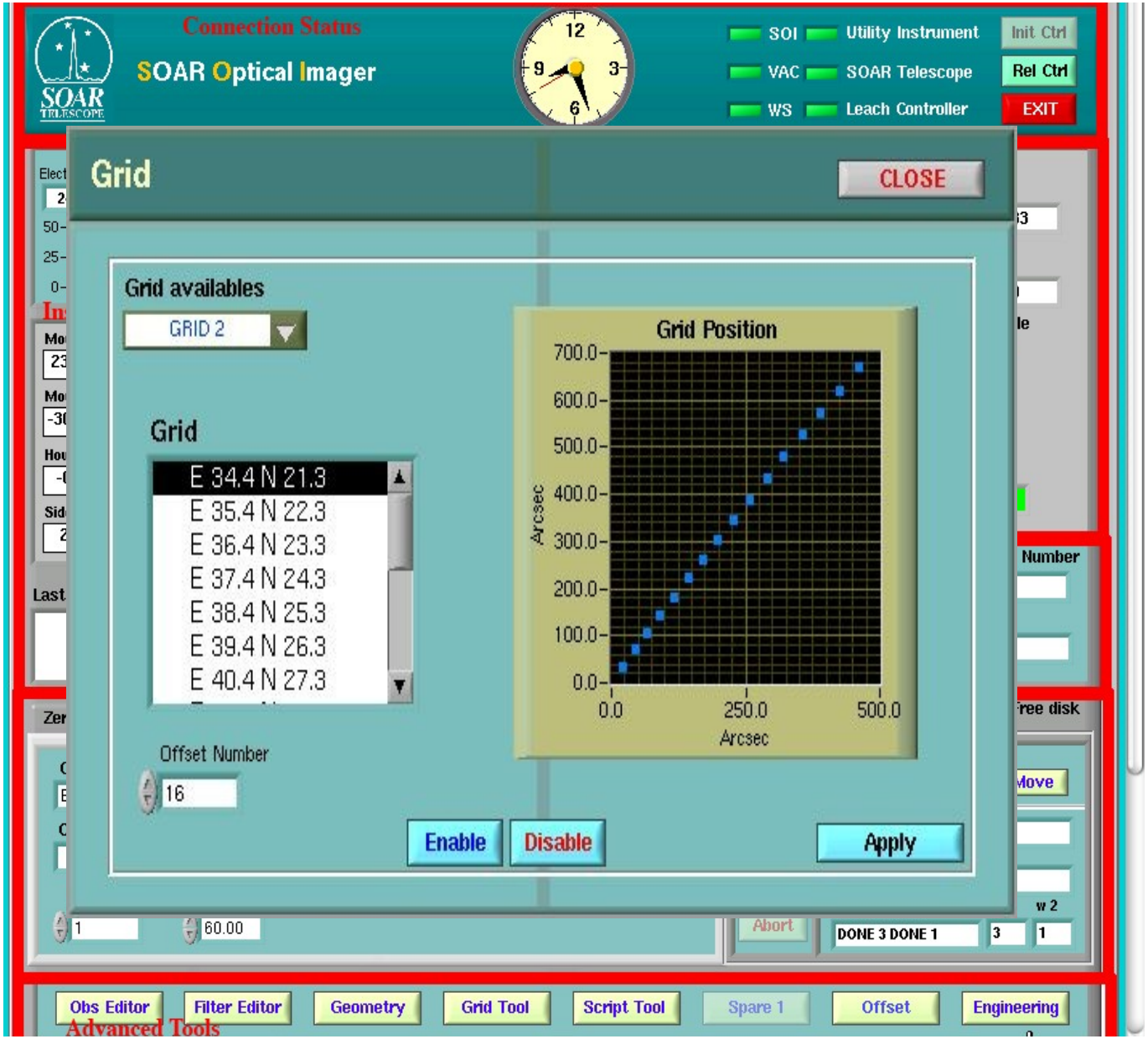
SOI (Imageador Óptico)

Interface Gráfica do Usuário



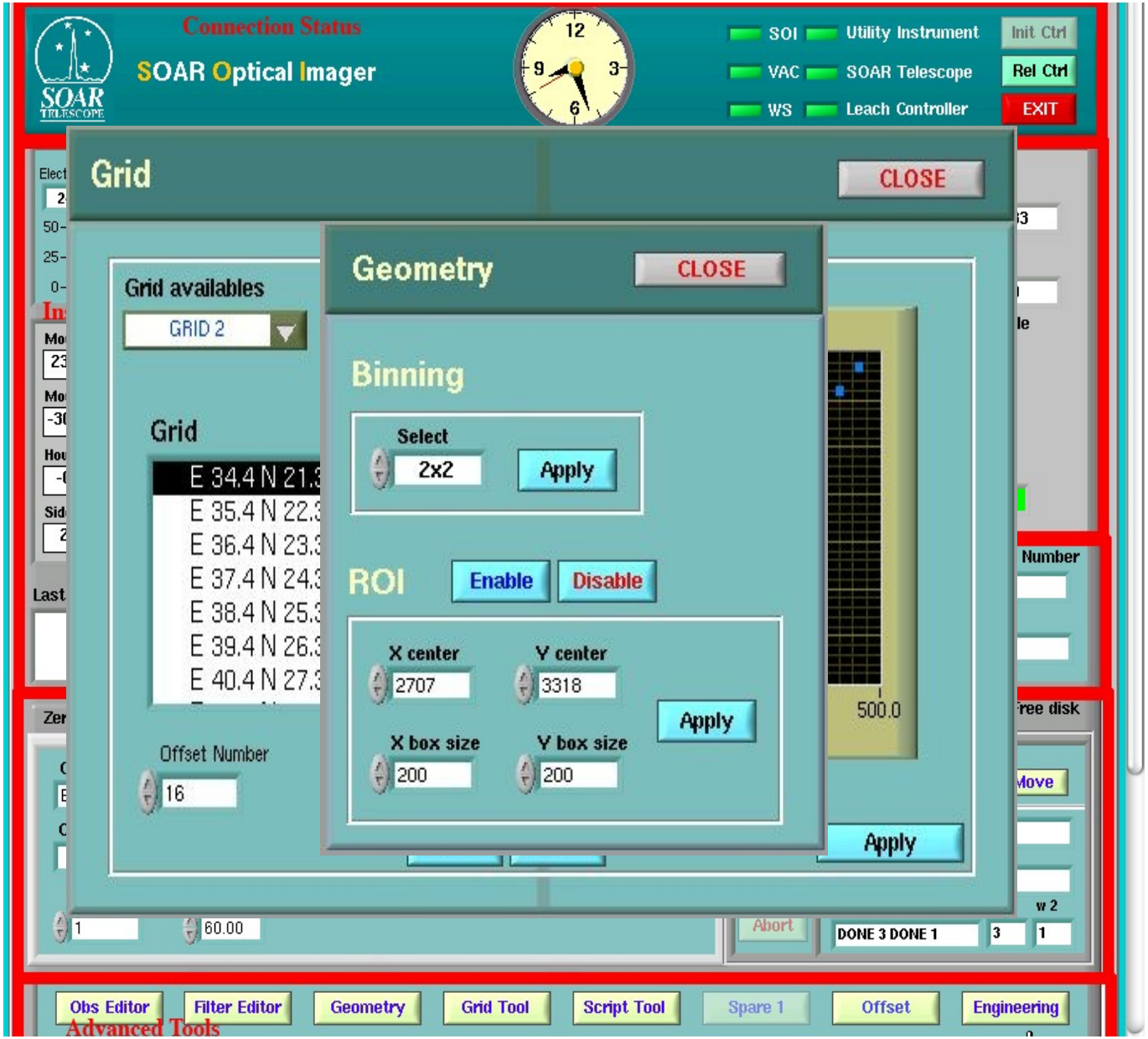
SOI (Imageador Óptico)

Interface Gráfica do Usuário



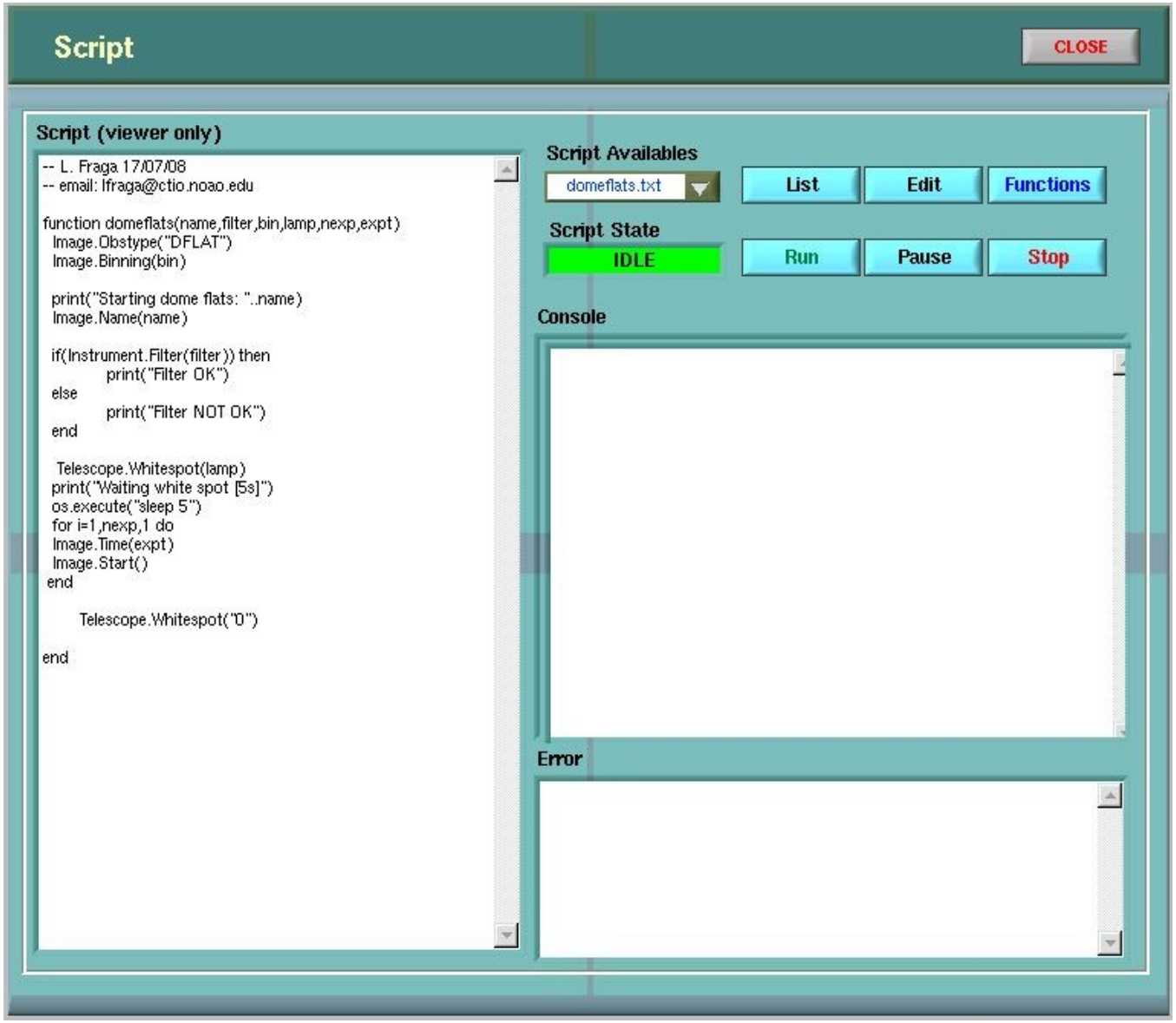
SOI (Imageador Óptico)

Interface Gráfica do Usuário

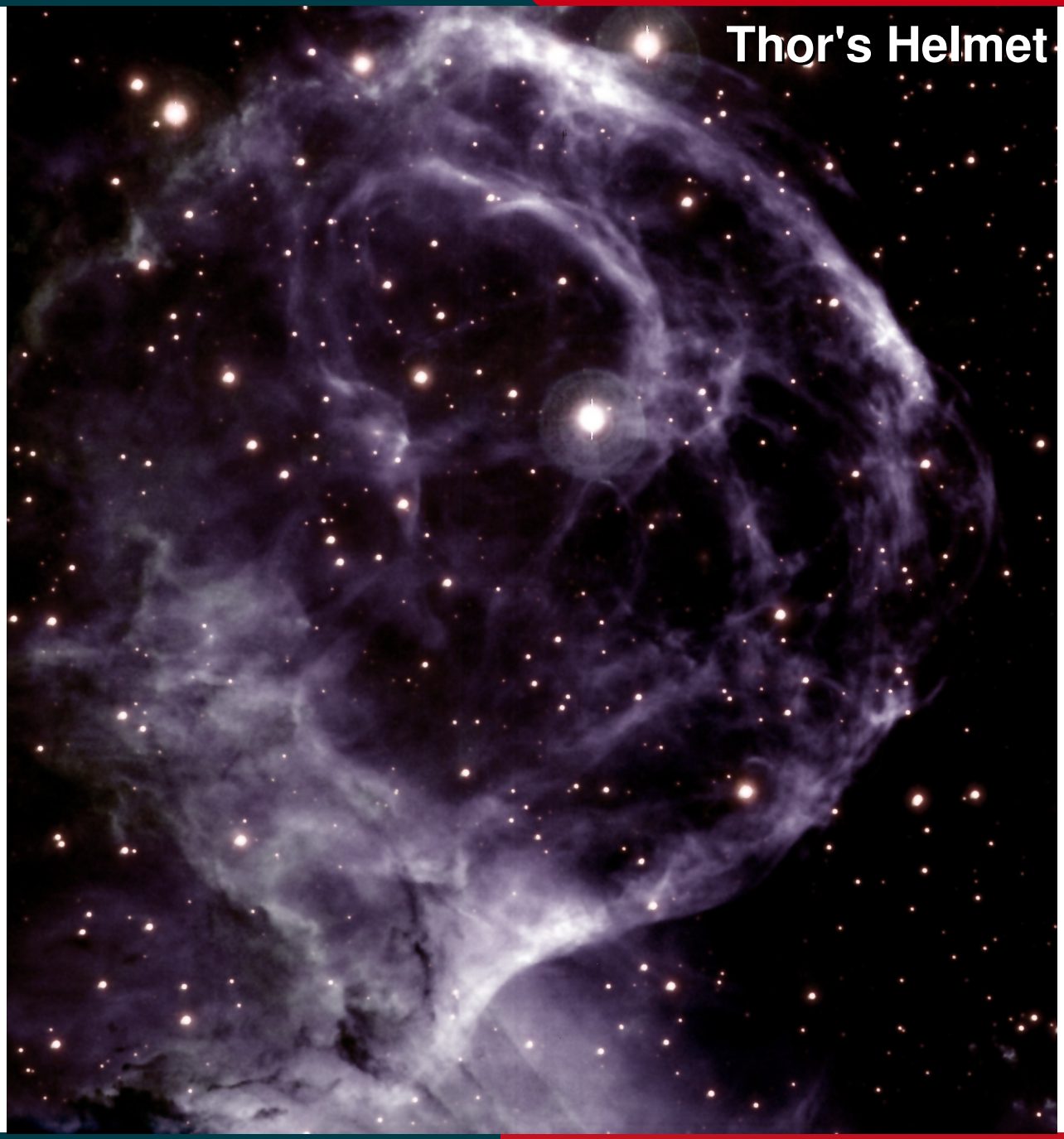


SOI (Imageador Óptico)

Script Tool (Linguagem LuaView)



SOI (Imageador Óptico)



Goodman

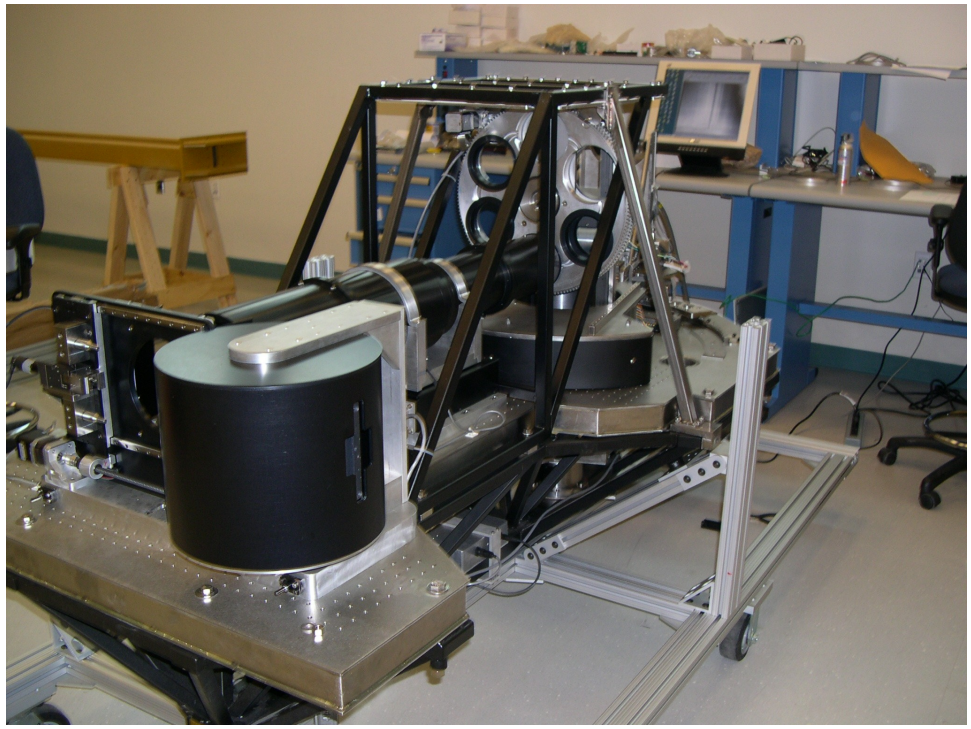
THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

PI: Chris Clemens

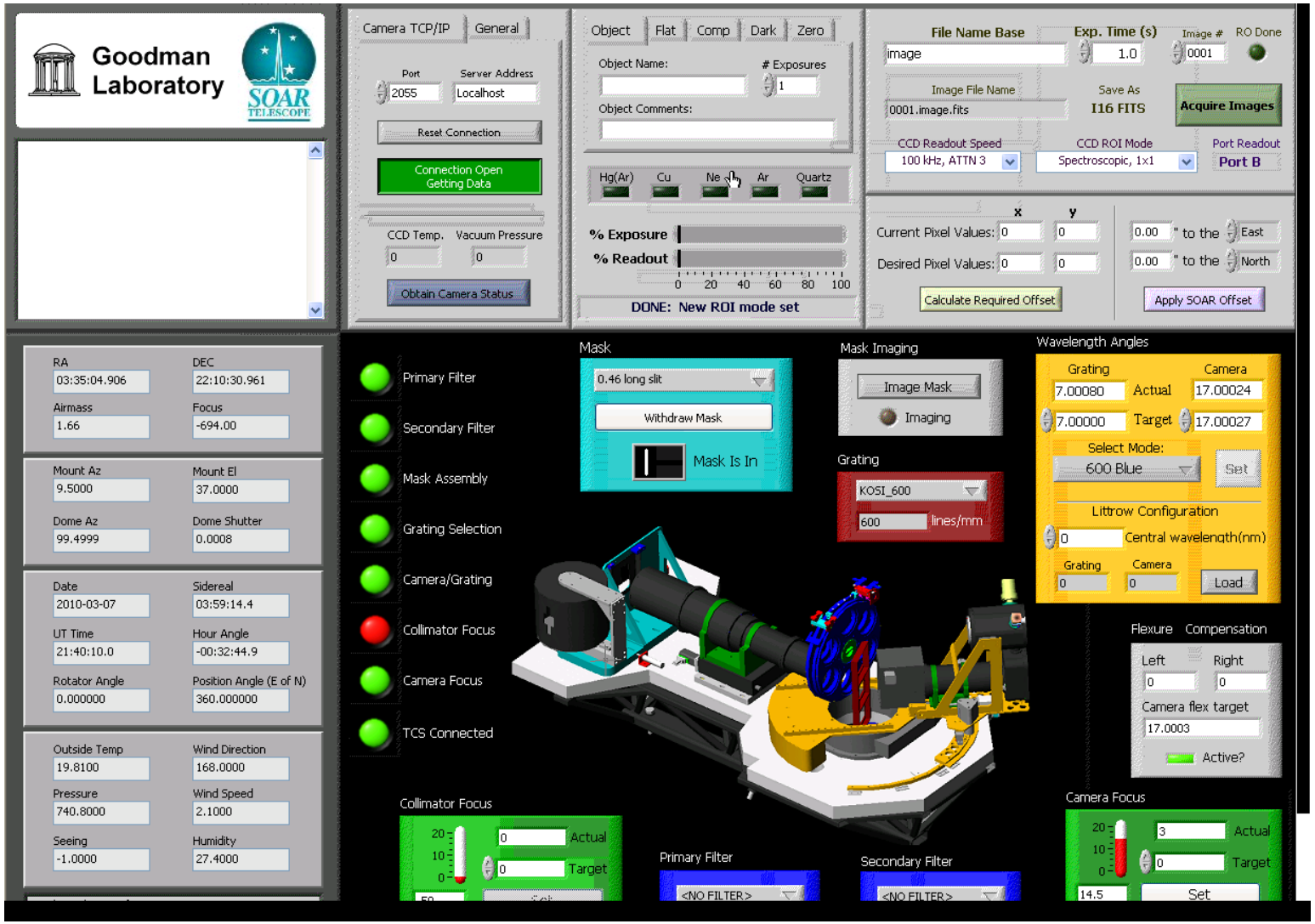
- **Modo Imageamento**
  - FOV 7 arcmin (diâmetro) @ 0.15”/pix
  - Filtros Kron-Cousin: U,B,V, R e Ic.

- **Modo Espectroscópico**
  - **Fenda Longa**
    - 3 Redes VPH: 300, 600, 1200 l/mm
    - R ~ 1400 – 6000
    - 355nm - 910nm
    - Fendas: 0.46”,0.84”,1.03”,1.35”,1.68”, 3”, 10” e 40”.
    - Filtros: GG-385, GG-455, GG-485 e OG-570
  - **Modo Multi-Objeto (ainda sem previsão para comissionamento)**
    - **Laser Slit cutting machine compartilhada com Gemini**

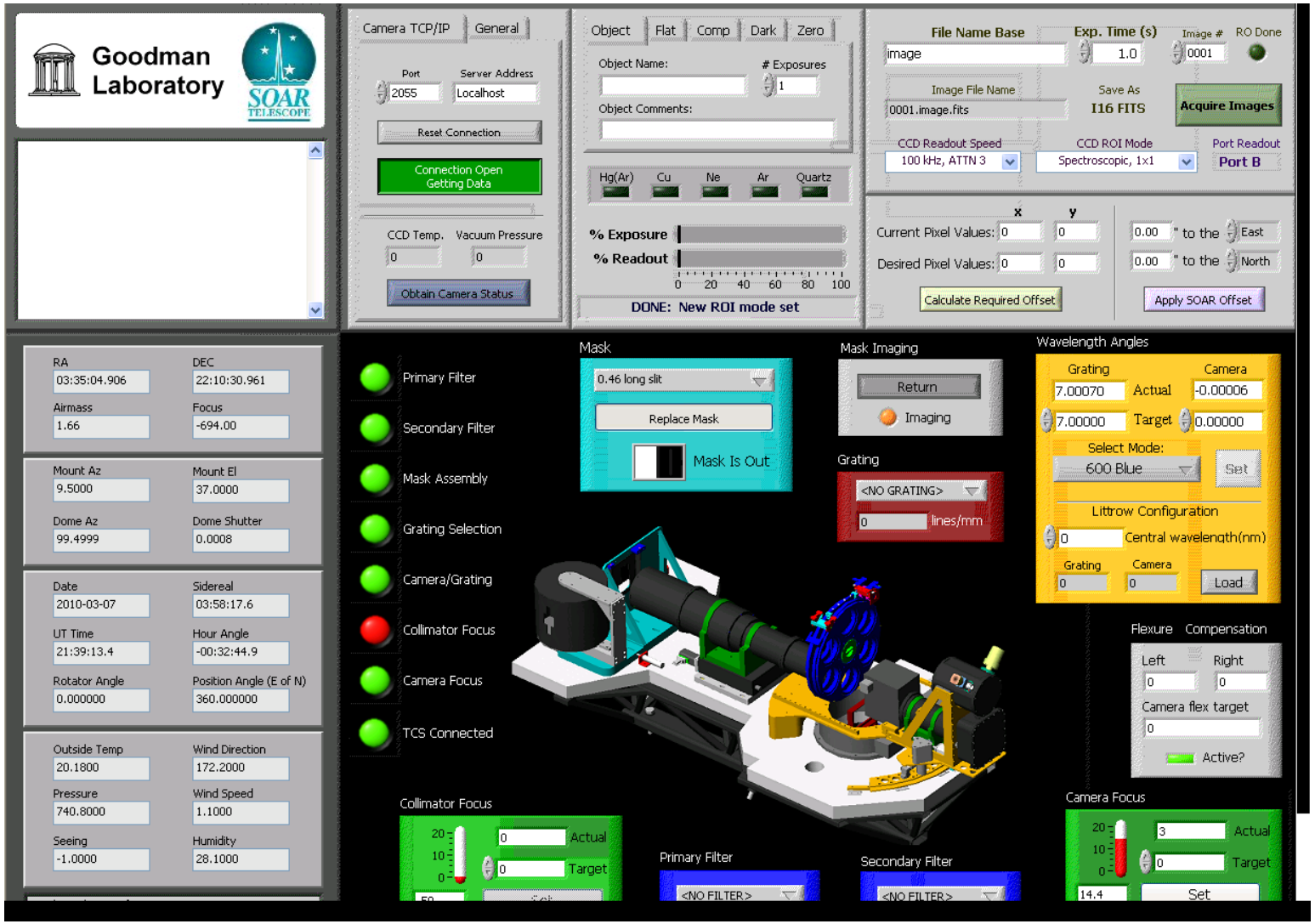
Fenda longa desde 2008B



Interface Gráfica do Goodman



Interface Gráfica do Goodman

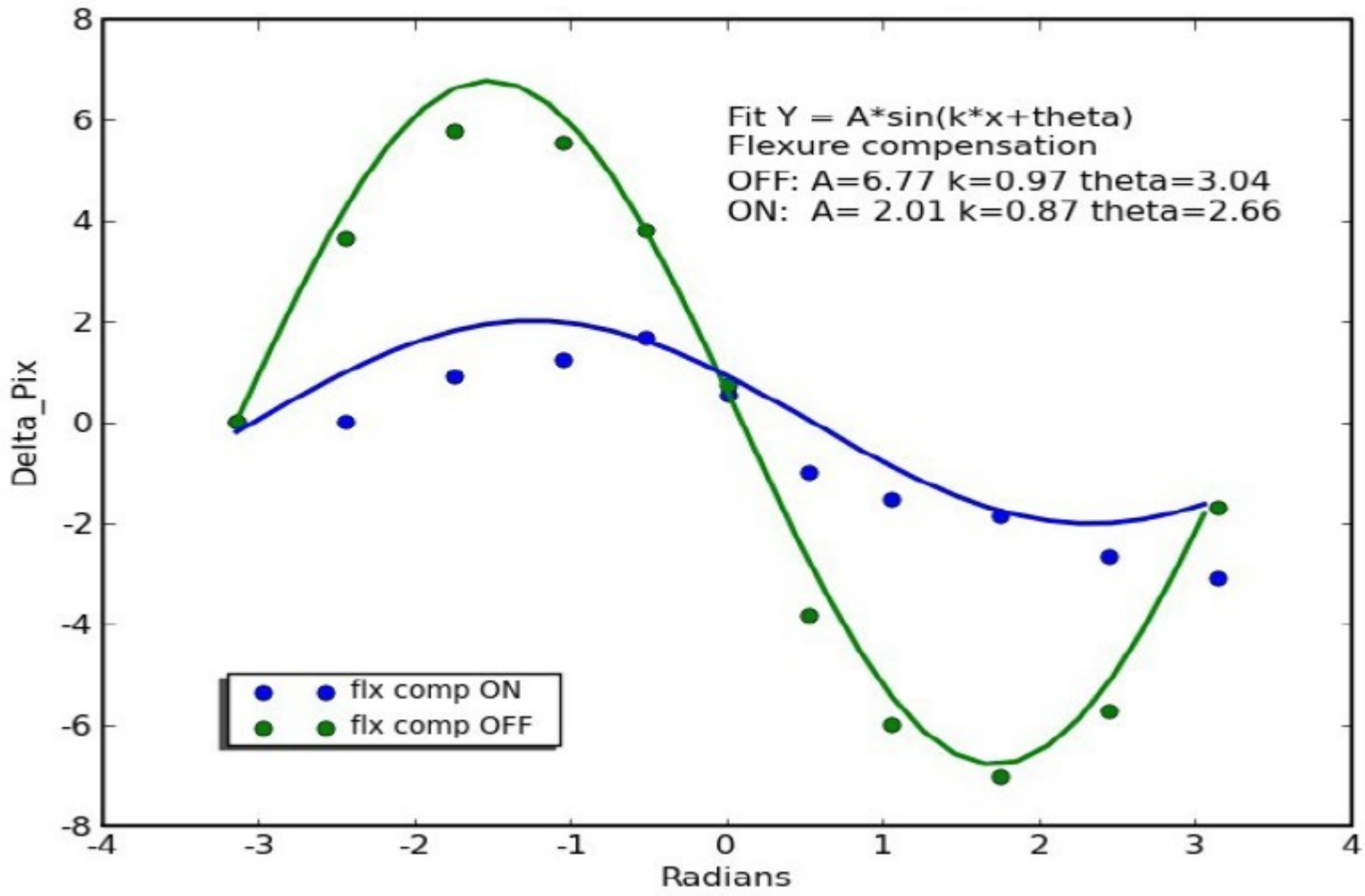


Dicas para o planejamento das observações

- **Ver documento preparado por Sergio Scarano Jr. em:**
  - LNA em Dia #11 e na página do SOAR no LNA.
- **Calibração em comprimento de onda é importante**
  - Intercalar lâmpadas de comparação (ex. HgAr, Cu) sem que a configuração do espectrógrafo seja alterada (ângulo de rede, ângulo de câmera e posição da fenda).

Testes com o compensador de flexão

Lâmpadas de HgAr obtidas em diferentes ângulos do rotator



Dicas para o planejamento das observações

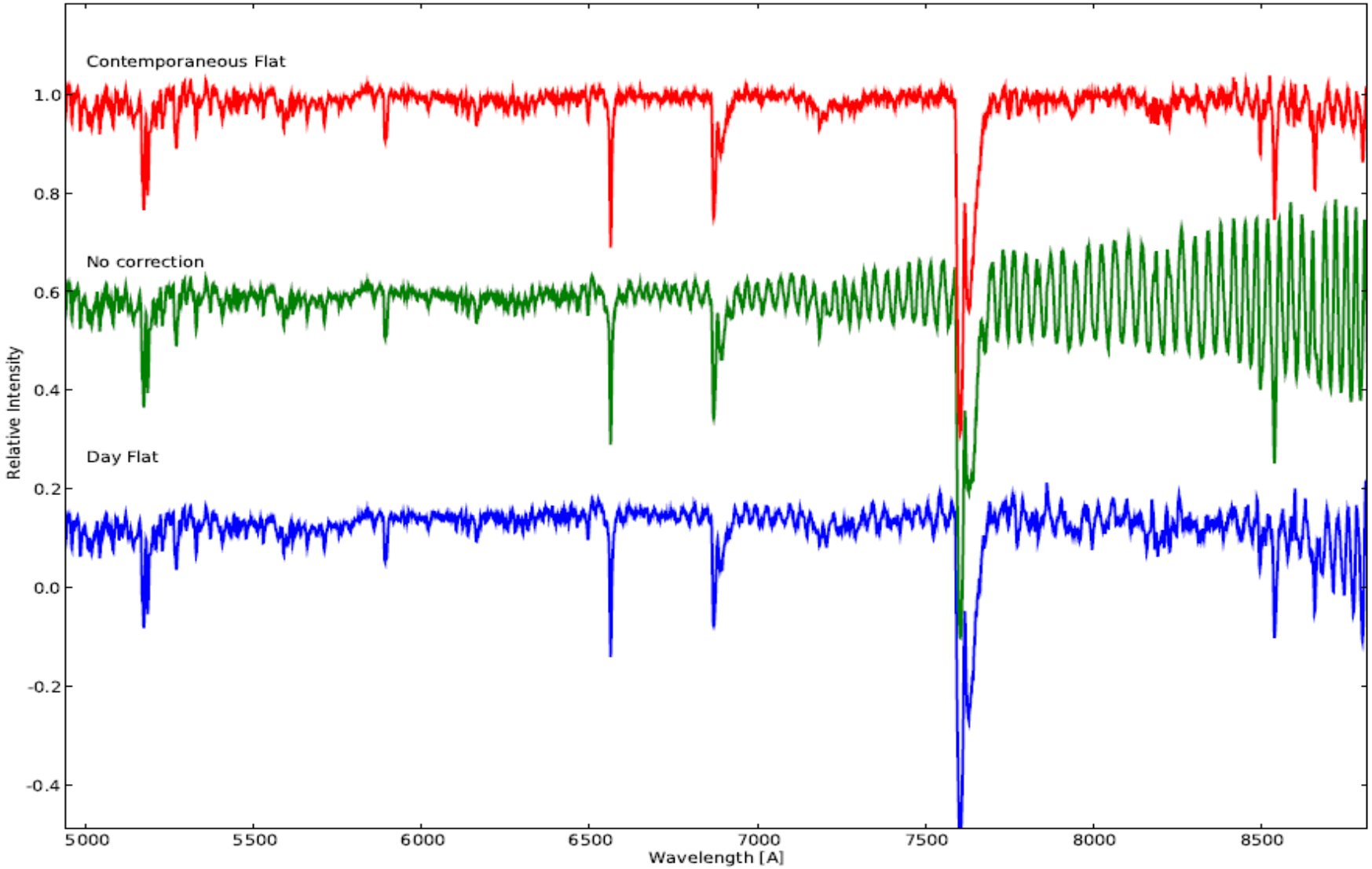
- **Ver documento preparado por Sergio Scarano Jr. em:**
  - LNA em Dia #11 e na página do SOAR no LNA.
- **Calibração em comprimento de onda é importante**

– Obter lâmpadas de comparação (ex. HgAr, Cu) antes e/ou depois do espectro de ciência, sem que haja alteração da configuração do espectrógrafo (ângulo de rede, ângulo de câmera e posição da fenda).

- **Remoção de franjas**

– Obter uma lâmpada de quartzo antes e/ou depois do espectro de ciência, novamente, sem que haja alteração da configuração do espectrógrafo.

Correcão de franias utilizando uma lâmpada de quartzo



Câmera IV SPARTAN

PI: Ed Loh

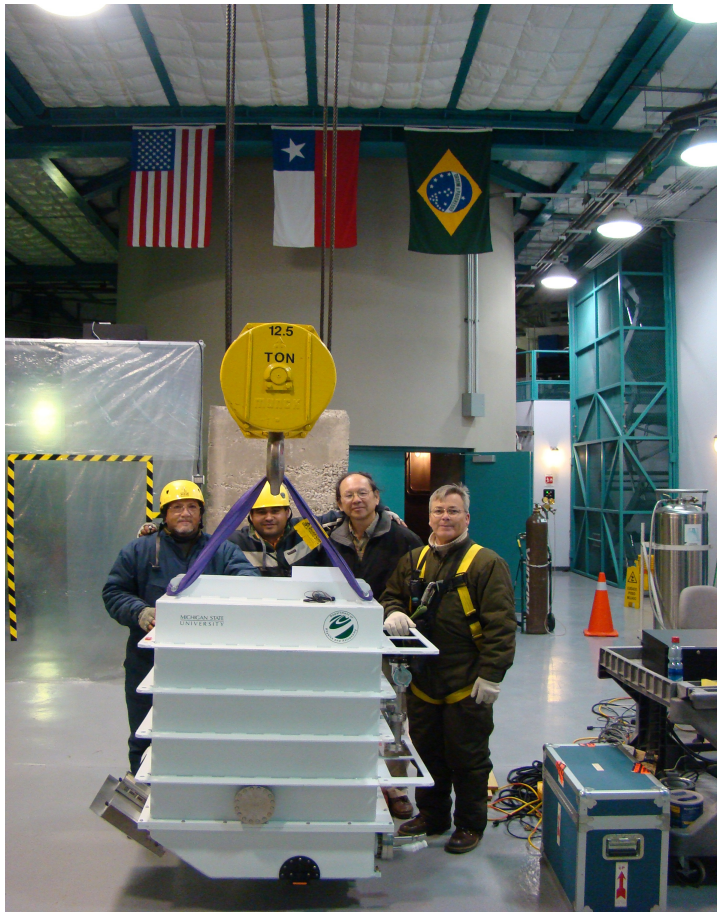
MICHIGAN STATE UNIVERSITY

- **Oferecido em 2010A em modo de "risco compartilhado"**

- Duas escalas de placa:
  - f/21: 3.0'×3.0' with 0.041" pixel (HiRes)
    - Amostra o limite de difração na banda H
  - f/12: 5.0'×5.0' with 0.068" pixel (LoRes)

- Quatro detectores:
  - 4K x 4K HgCdTe Mosaic
  - 1 deles ainda detector de engenharia

- Filters:
  - Y, J, H, K
  - HeI, H_2, [FeII], Bry, CO, CIV, cont.



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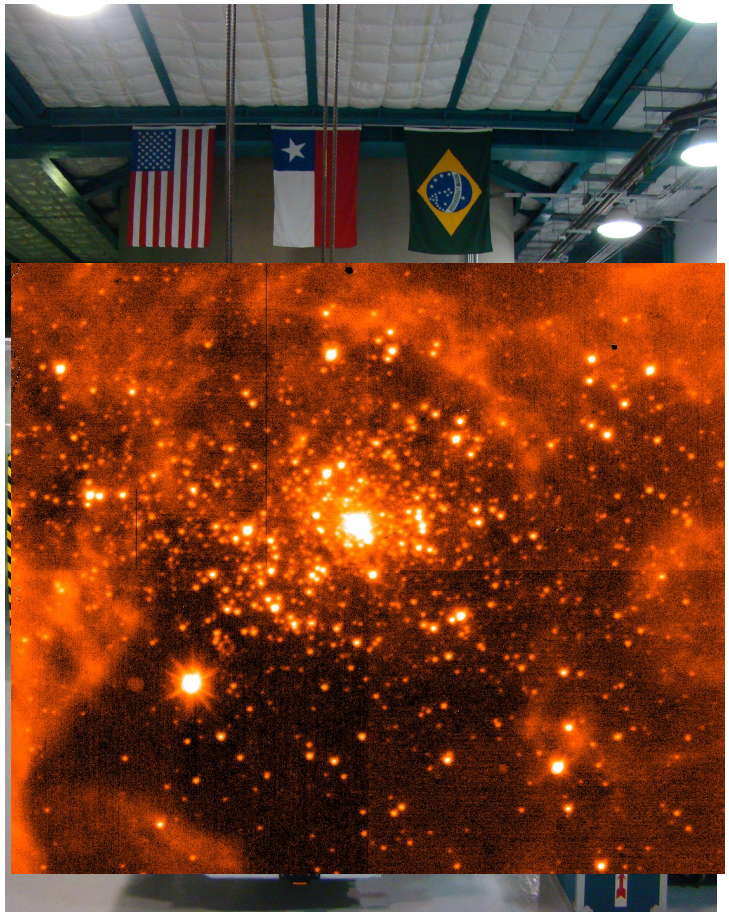
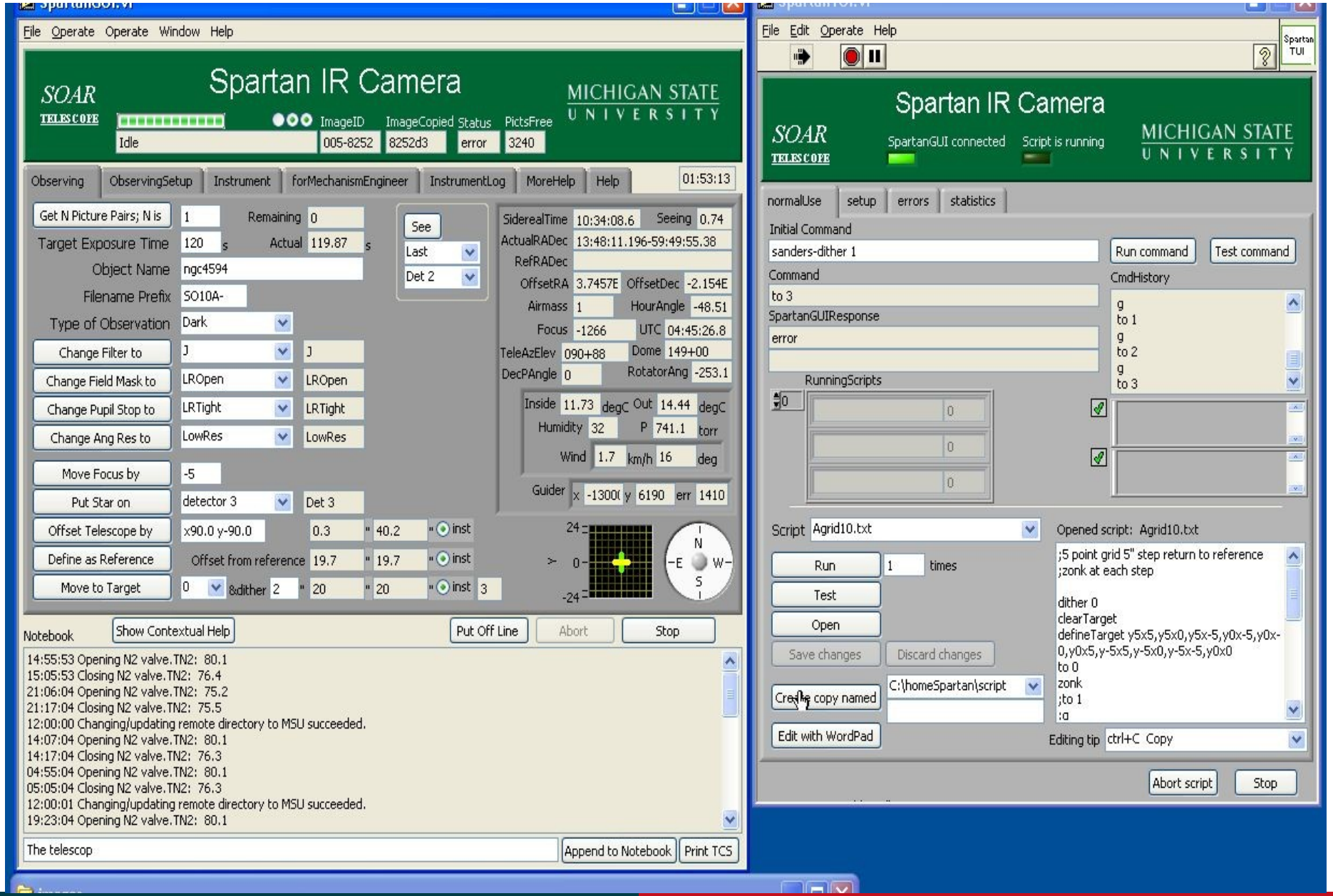


Câmera IV SPARTAN

SPARTAN GUI



Perguntas?

Mais perguntas: soar.suporte@lna.br