The Nordic Optical Telescope

Thomas Augusteijn
Director NOT

ChETEC-INFRA

Kick-off Meeting

Photo: Jacob Clasen, NOT

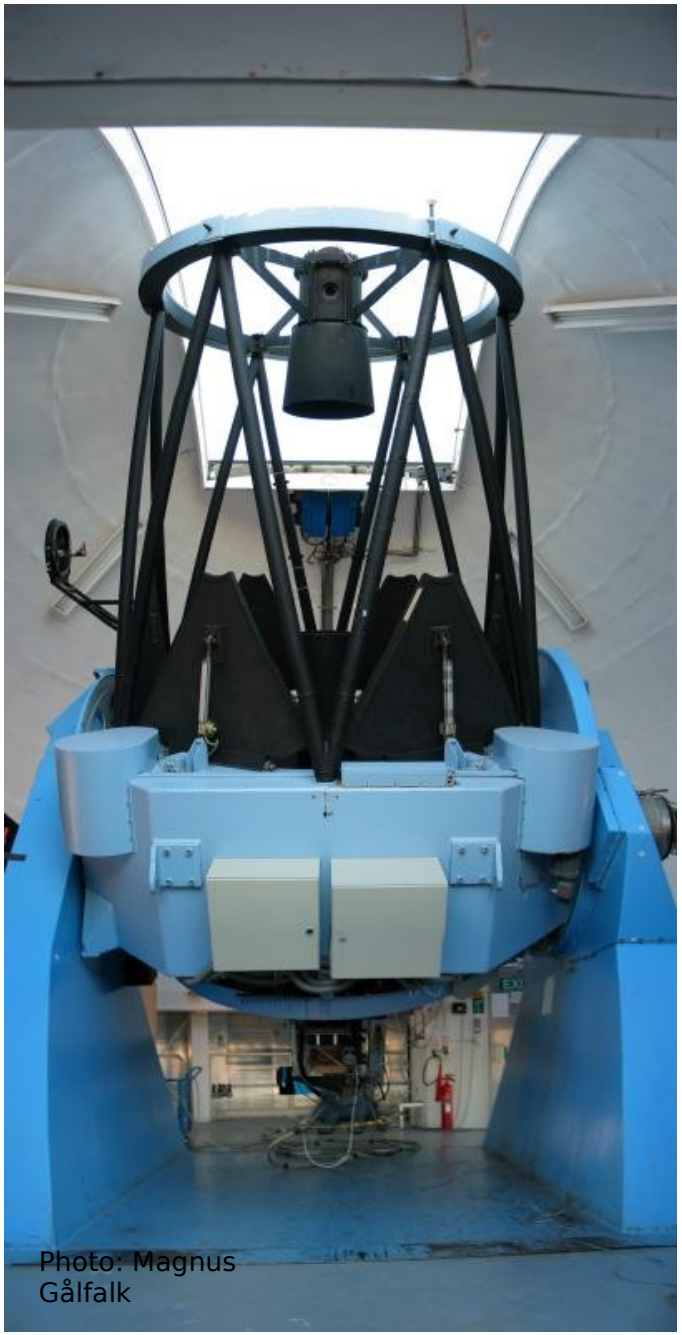


Photo: Magnus Gålfalk

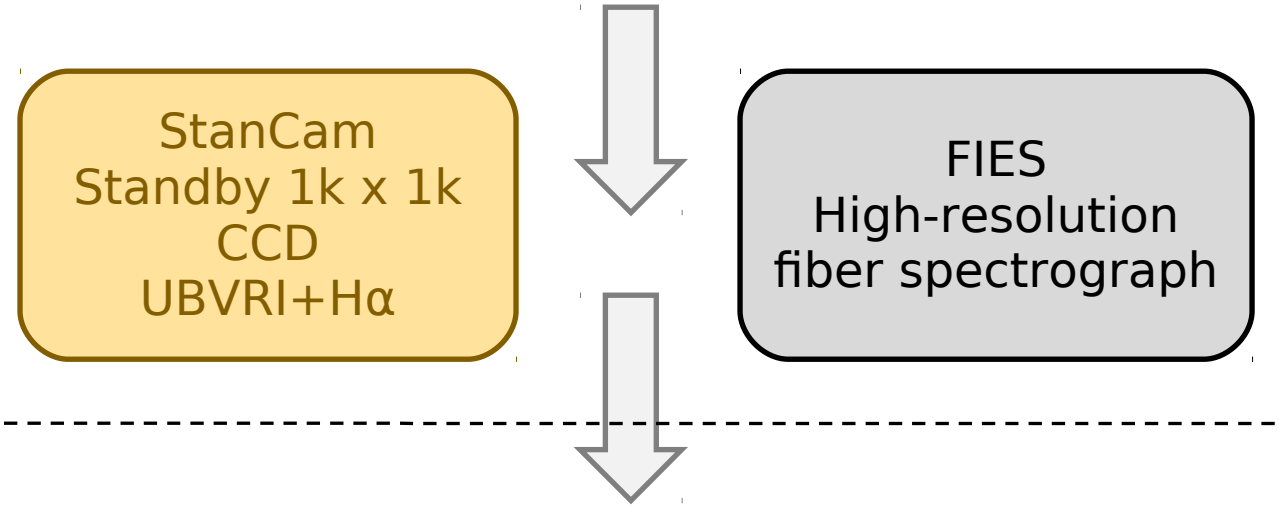
What is NOT?

- 2.56 m mirror (T. Korhonen, Tuorla)
- High optical quality, negligible dome seeing
- Located at "Roque de los Muchachos" Observatory, La Palma, Canarias, Spain
- Operational since 1989
- Consortium of Nordic Universities (2020)
- Hosting organizations:
  - * Telescope: University of Turku (FI)
  - * Operations: Aarhus University (DK)
- National funding (DK,FI,IS,NO) through Nordic Universities + Stockholm University
- External funding...
- Annual budget ~1.5M€
- Share of observing time according to contribution

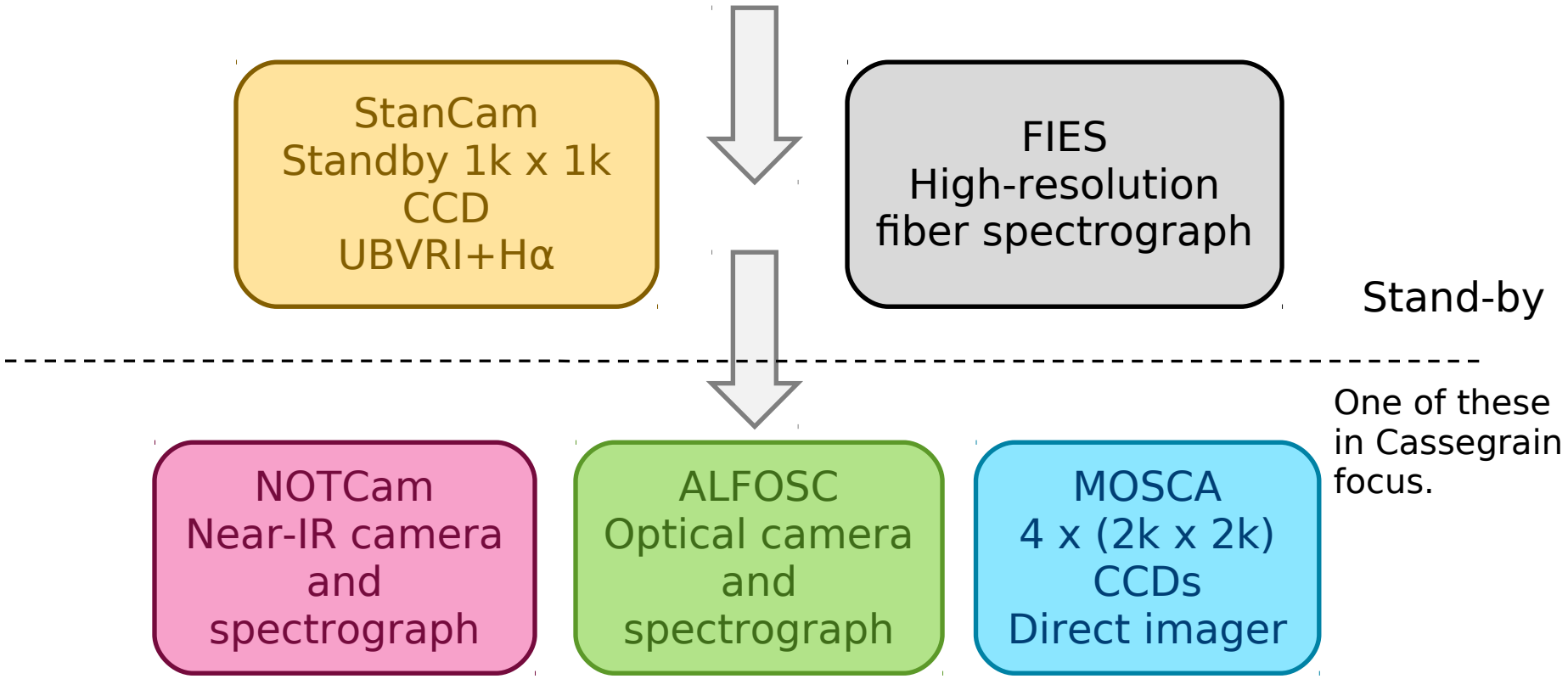
Down time:

Weather (summer)	~10 %
(winter)	~35 %
Technical problems:	~0.5-1 %

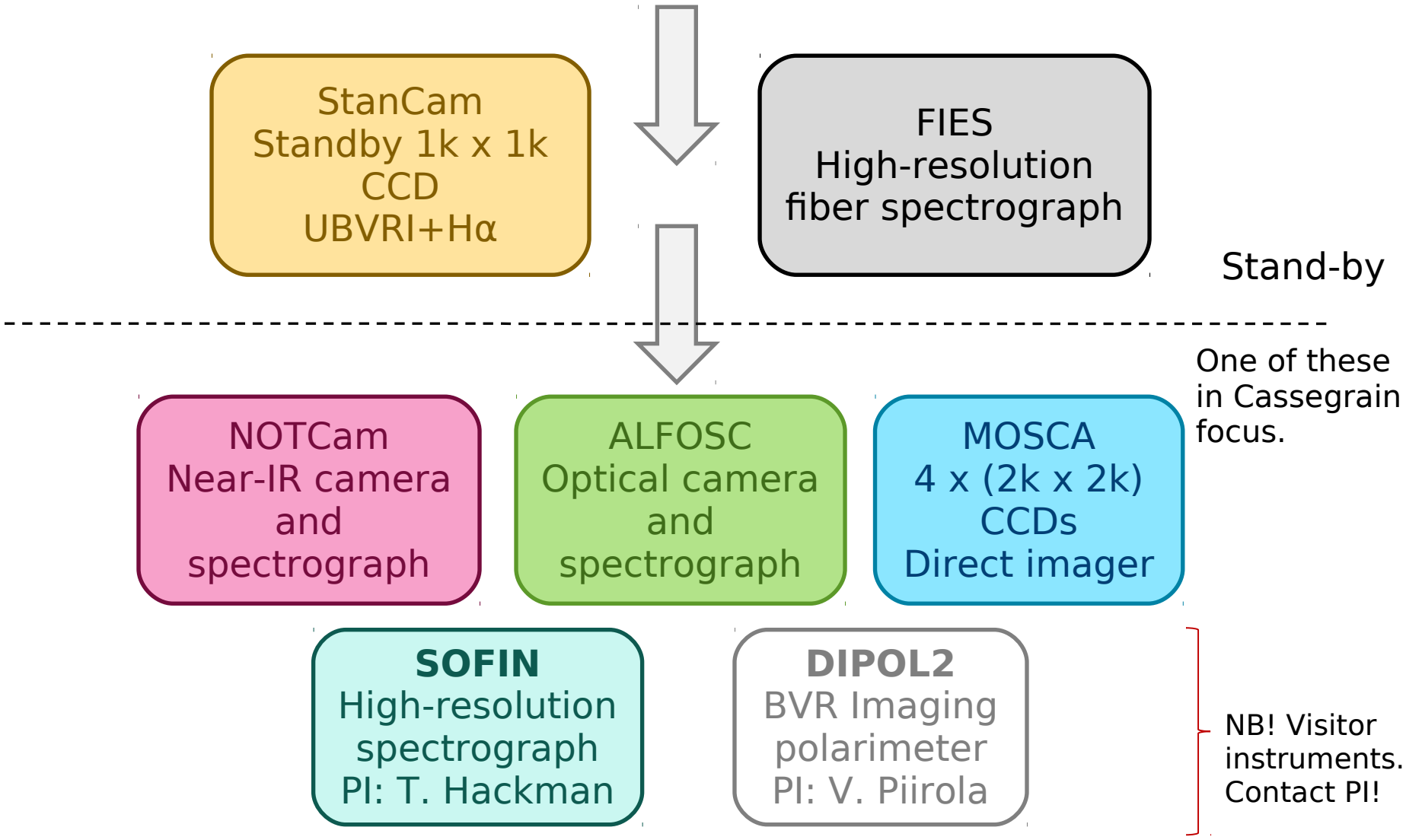
Instrumentation



Instrumentation



Instrumentation



ALFOSC – Andalucia FOSC

Commissioned 1996

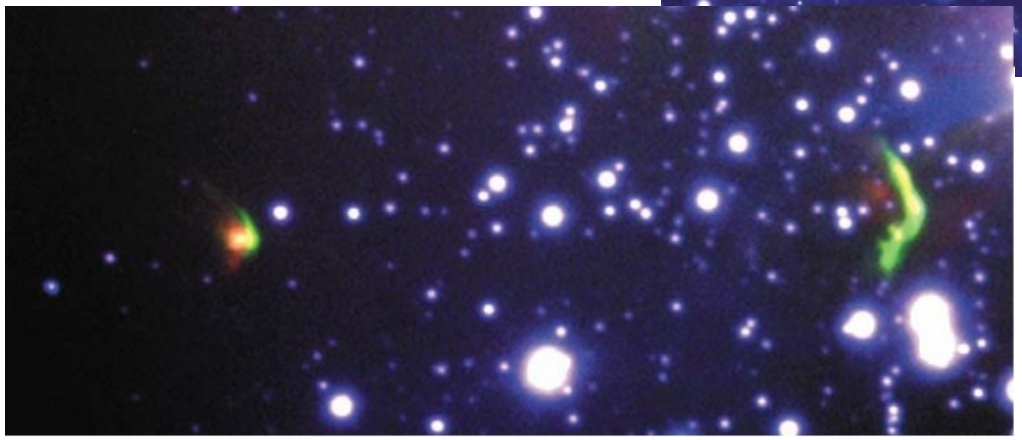
Owner: IAA

ALFOSC + FASU + FAPOL:
Imaging (UBVRi + 2 filters + 12 additional in FASU)
Linear polarimetry (calcite plate + λ/2 retarder)
Circular polarimetry (calcite plate + λ/4 retarder)

Zeropoint mag (for 1 e/sec)

U	B	V	R	i
24.0	25.7	25.6	25.4	24.6

0.19”/pix, 6.5’ x 6.5’ FOV
E2V CCD, 13.5µm x 2k x 2k



B335, 14 hours
R, Hα (green),
[S II] (red), 5’ x 4’

M. Gålfalk, 2005

Spectroscopy (R=200-10000, with a set of 20 grisms)
Multi Object Spectroscopy (since 2002, pre-imaging needed for MOS mask production)
New detector controller (`fast'-photometry: small window readout less than 4 sec)

NOTCam - NIR camera & spectrograph

Commissioned 2001

0.8 – 2.5 μm HgCdTe 1k x 1k
WF: 0.234”/pix (4’ x 4’)
HR: 0.078”/pix (80” x 80”)
Cold shutter + small cold stops

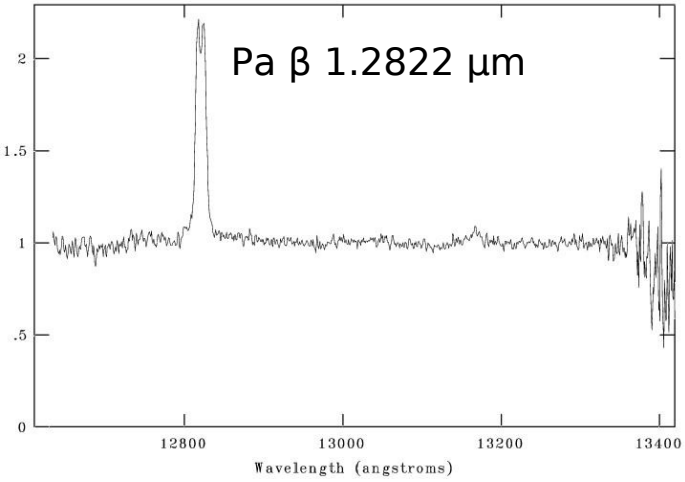
Spectroscopy:
R=2500 WF, in (ZY)JHK, 2-4 Å/pix
R=5500 HR, 0.9 – 1.4 Å/pix
1.26-1.34 μm (Pa β)
1.57-1.67 μm
2.07-2.20 μm (Br γ)

M57 in J, H, and the 2.122 μm v=1-0 S(1) H2 line. WF-Cam. Quick-look reductions.

Imaging:
Z,Y,J,H,K,Ks,K’ and 18 narrow-band filters

Limiting magnitudes
S/N=3, 3600s, 0.5”-0.6”:

J = 23.3 mag
H = 22.4 mag
Ks = 21.8 mag
(Vega magnitudes!)



B2Ve star 66 Oph, V=4.6 mag

2005: R=5500 spectroscopic mode commissioned
2006: MEF data format, WCS header keywords
2007: Quick-look reduction package in IRAF for imaging
2008: New Science Array (60% more sensitive)
New data acquisition software
2011: Z&Y filters
Future: New detector controller

FIES – FIber Echelle Spectrograph

Commissioned 2006

λ-range:	370 – 830 nm (without gaps)
Detector:	2kx2k E2V CCD (deep depletion)
Resolution/efficiency:	R = **25000** (6%), **45000** (6%), **65000** (4%)
Fibers:	2.5” (low-res), 1.3” (med & high-res)
Goal :	High-precision radial velocities
Advantage:	Permanently available and ready for use

Wavelength/velocity stability

Problems:
Mechanical stability (star image and spectrograph)
Temperature and pressure stability (change of
0.01 K or 0.01 mbar →1 m/s drift)

Solutions:
Insulated building (mechanical and thermal control)
Octagonal fibers (scramble light)
Pressurized grating chamber (pressure control)
Exposure time meter (effective time of exposure)
Fabry-Pérot Etalon (zero-point stability)

Status:

~8-10 m/s →**~2-4 m/s** →**~1 m/s**

Proposal system

Regular proposals

- Call for proposals every semester
- Integrated proposal system
  - Data-base driven: Instrument setup, Contact and instruction emails, Observing Blocks, End-of-night reports, data distribution and archiving

Large proposals

- Extended programs (up to 3 years/6 semesters)

Fast-track proposals

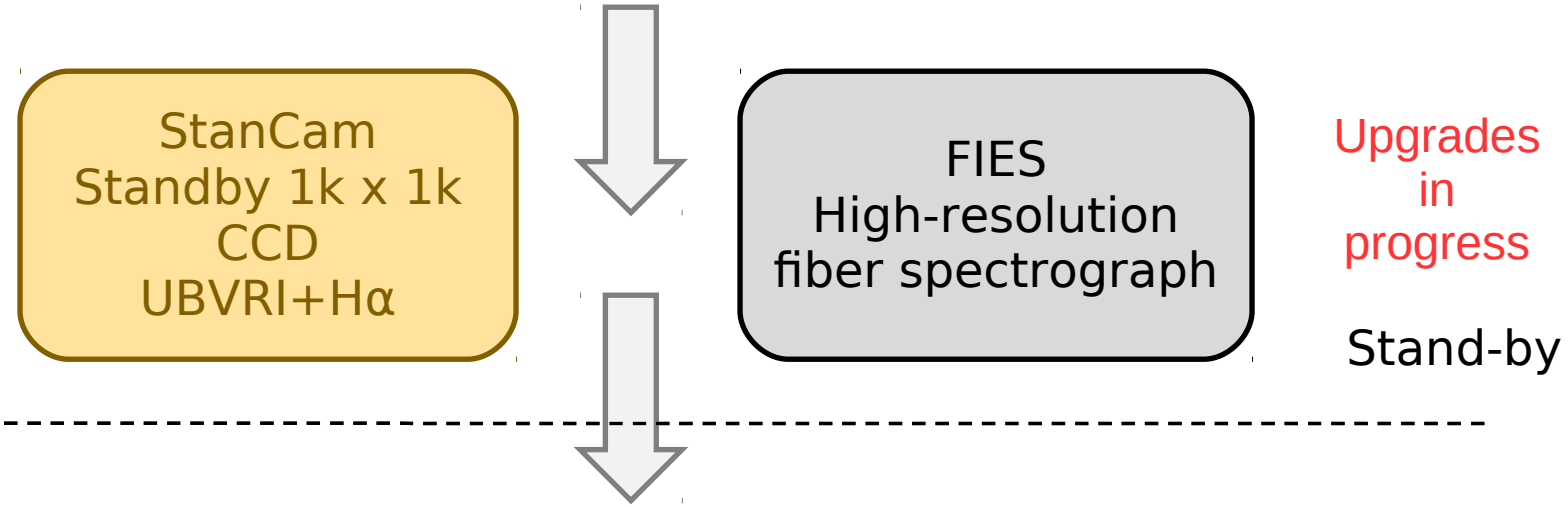
- Short programs (4hr max)
  - Submit proposal at any time
  - Data-base proposal processing

Observing

Observing modes

- Regular visitor mode
- Service mode (~60 nights/semester)
- Monitoring programs (~10 programs/semester)
- ToO programs (~10 programs/semester)
  - Soft (dedicated nights)
  - Hard (same night; possible direct override)
- Educational programs
  - On-site courses
  - Remote courses

Future Instrumentation



Future Instrumentation

StanCam
Standby 1k x 1k
CCD
UBVRI+Hα

FIES
High-resolution
fiber spectrograph

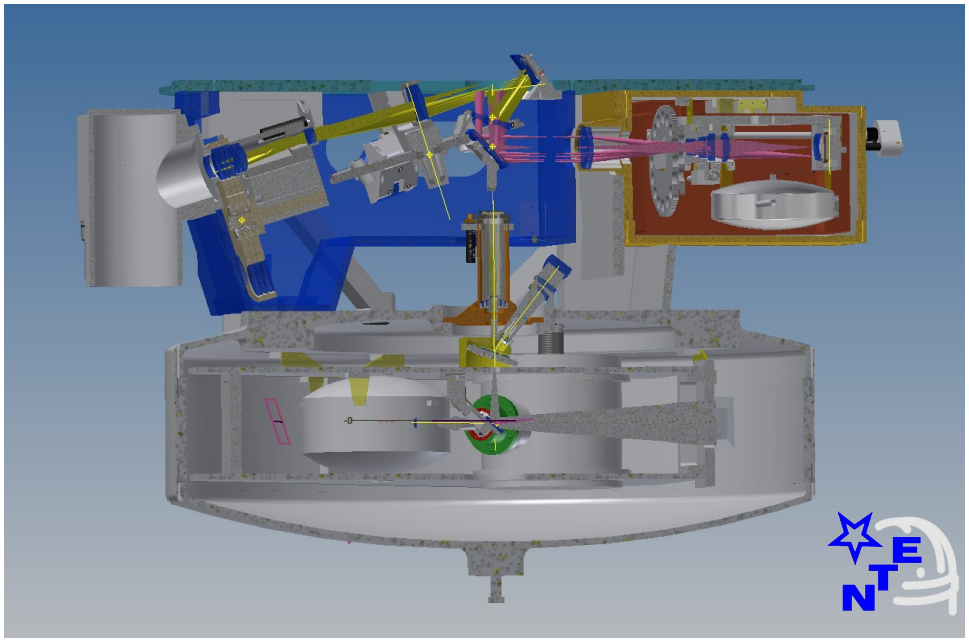
Upgrades
in
progress

Stand-by

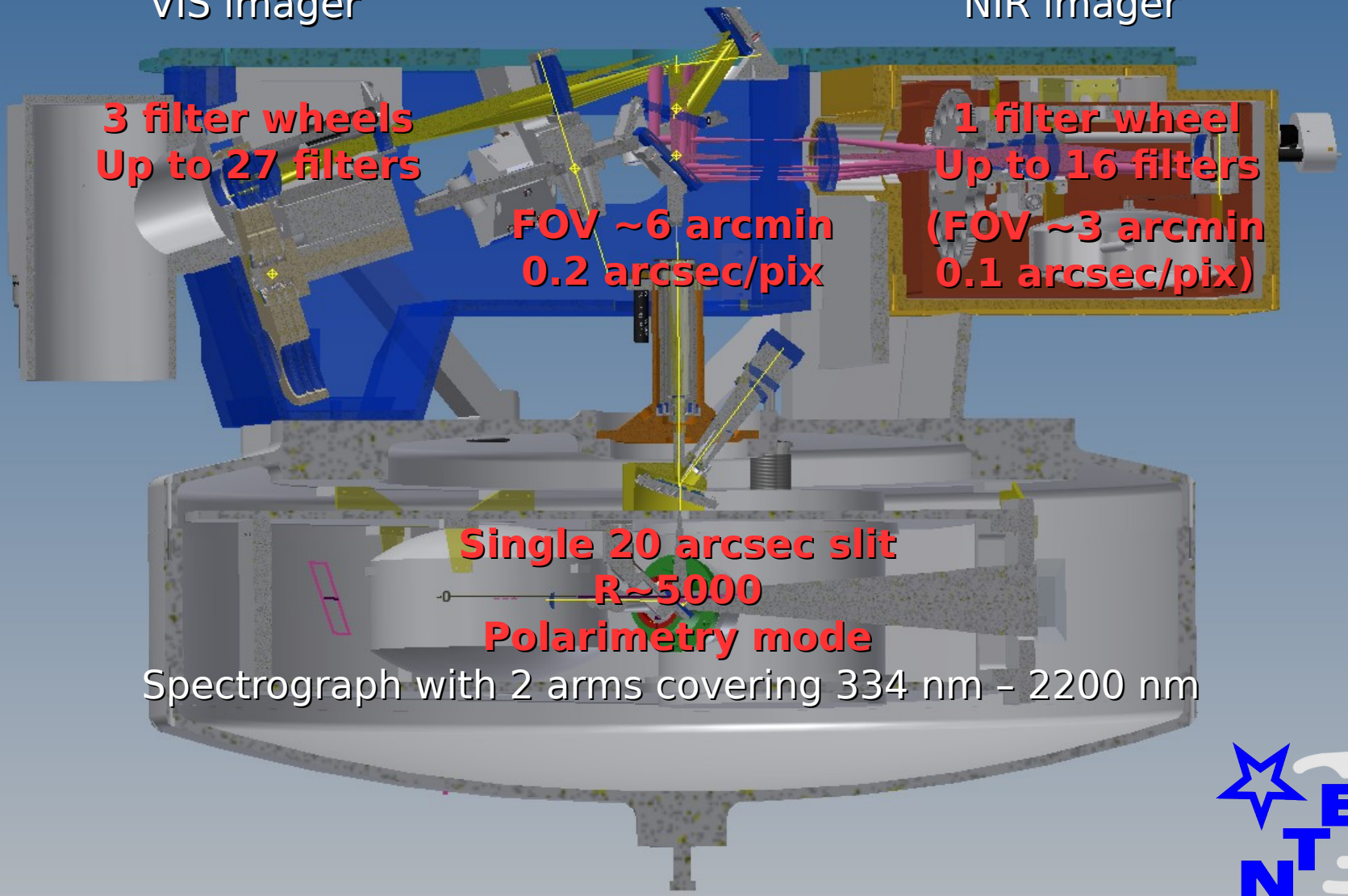
One instrument
in Cassegrain
focus.

Mini (imaging)

X-shooter



NOT Transient Explorer



NOT Transient Explorer

VIS imager

3 filter wheels
Up to 27 filters

FOV ~6 arcmin
0.2 arcsec/pix

NIR imager

1 filter wheel
Up to 16 filters

(FOV ~3 arcmin
0.1 arcsec/pix)

Commissioning in 2022

Single 20 arcsec slit
R~5000
Polarimetry mode

Spectrograph with 2 arms covering 334 nm – 2200 nm

http://www.not.iac.es

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General Info
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Latest News:

- Call for proposals period 64
  Deadline May 24, at 12:00 UT

Nordic Optical Telescope

UNIVERSITY OF TURKU AARHUS UNIVERSITY

General Information

- About the Nordic Optical Telescope, Credit NOT in papers
- Contact Information
- Employment Opportunities
- Visiting the NOT

Telescope & Instruments

- Telescope technical information, TCS
- Instrument overview, ALFOSC, NOTCam, FIES, MOSCA, StanCam
- ExpTimeCalc, Filters, Detectors, Overheads

Observer Information

- Applying for Observing Time
- 'Fast-Track' Service Programme
- Telescope Schedule
- ToO and Monitoring programs

Resources for Observers

- Guide for Visiting Astronomers
- Observers Cookbook, Sequencer
- Observing Tools, Data Retrieval
- Fault Database, EON, ToO/Mon, EOR

Atmospheric Conditions

- NOT Weather Conditions
- Site Conditions
- WebCam I, WebCam II
- Latest Satellite Image

Education & Outreach

- Educational Programme, La Palma activities
- Research staff and their interests
- News Bulletin, Publications, Reports
- Our Image Gallery, Our Video Gallery
- NOT data archive
- Links to other sites

Website search