

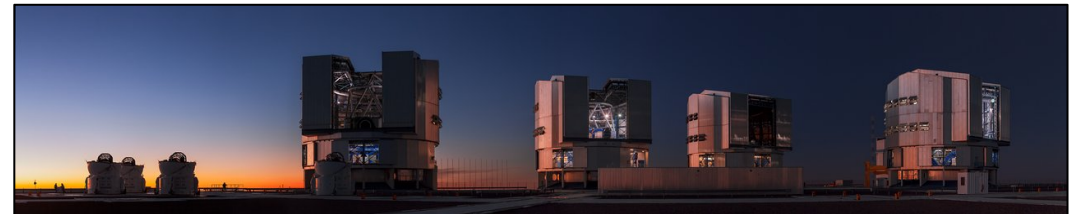
Nordic Optical Telescope



Introduction
Status
NOT Strategy

Discussion
(can ask other NOT staff members as well)

Petri Väisänen
FINCA/UTU/NOT



Nordic Optical Telescope (NOT)

2.56-m telescope. Primary mirror made in Tuorla/Turku.
Start of operations 1990.

Excellent image quality, great site, and a very positive international **reputation**

An influential and popular **NOT Student program**

→ *Extremely important for Nordic astronomy: both scientific and technological, and crucial role in skills development of the local community since the 90's*

Access to **Northern sky**. Pilot programs.
Monitoring, and programs with moving or transient targets,
very well served



Governance / Funding / Observing time



Co-owners since 2020: (earlier: NOTSA)

* Telescope & Infrastructure: **University of Turku** (FI)

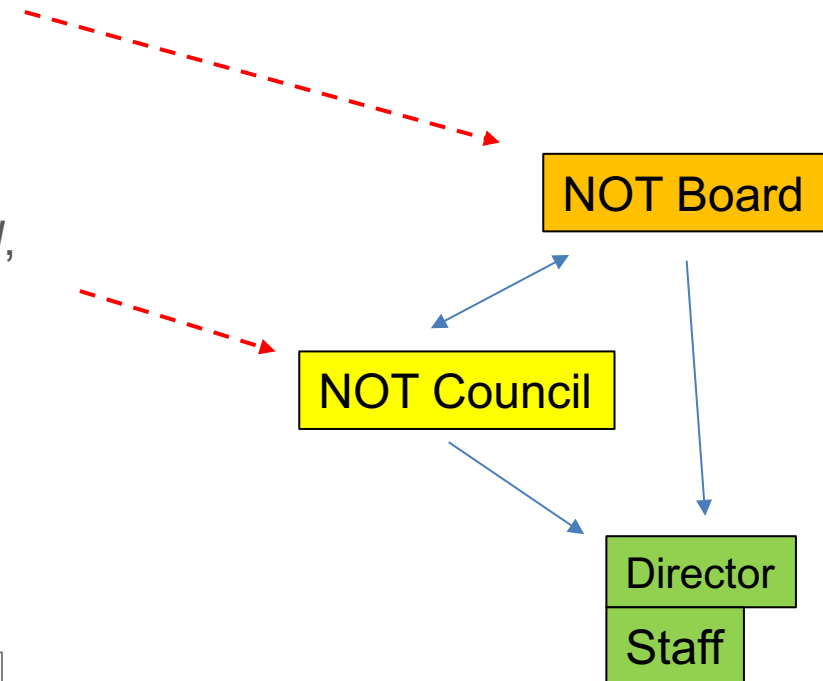
* Staff & Operations: **Aarhus University** (DK)

Jointly funded and operated by *Denmark, Finland, Iceland, Norway, and the University of Stockholm* (with a mixture of university and government funding)

Total annual budget ~1.7 Meur
(approx 3/4 of that HR costs)

New Partners are welcome!

NOT Charter



Governance / Funding / Observing time



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* Telescope & Infrastructure: **University of Turku** (FI)

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Observing time is split according to contributions – currently
~50% DK, ~40% FIN, most of the rest of *Nordic time*, for Norway

Also: 20% of total time to **Spain**, and 5% to **ITP** (*International time on all Canary Island telescopes* – check it out!)

In addition time purchased by **External** parties, ~ 4-6% of total

- EU-programs (e.g. ORP), individual groups and projects, e.g. LSST, ESA-S2P
- Currently, ~5600eur per night.

This is also welcomed!

Oversubscription factors:

Typically in the range 1.5-2 for Nordic time. Higher for International time

Could be higher! .. On the other hand, many groups get ample data for large programs.

Latest P74: 41 Nordic proposals received (15 of them Large Prop)

Status – Ops and Science

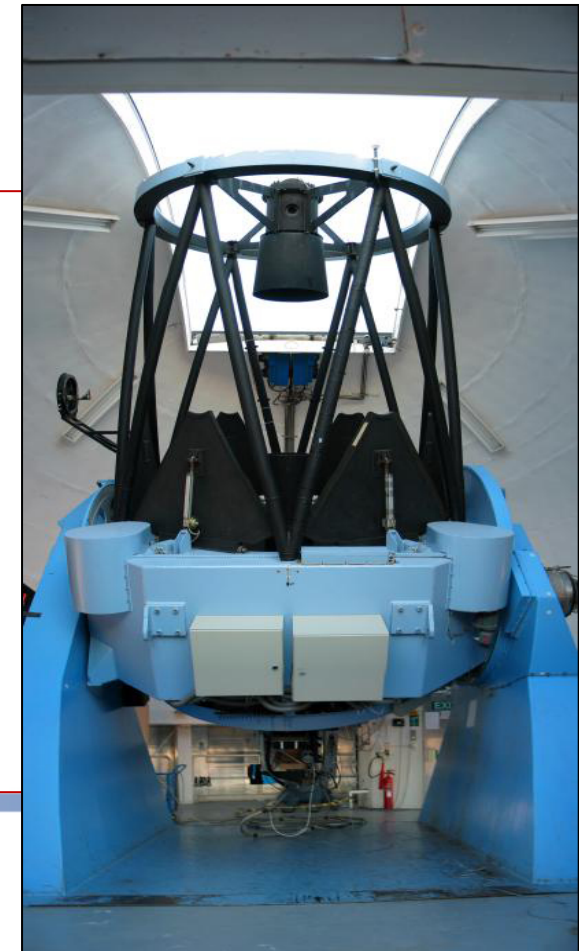


- Instruments

- Always on: **FIES** (*high-resolution spectrograph*) and **StanCam** (basic imager)
- Mounted as needed:
 - ALFOSC** (UV-opt imaging and medium/low-resolution spectroscopy)
 - NOTCam** (near-infrared imaging and low-resolution spectroscopy)
- "Visitor instruments" – **DIPOL** & **SOFIN**

For more details on Operations, Observational modes and capabilities, technological developments and plans, NTE, please follow talks and posters this afternoon, and during the week, by, e.g.

- Tapio Pursimo
- Julia Martikainen
- Joonas Viuho
- Sergio Armas Perez
- Johan Fynbo
- ...



Status – Ops and Science

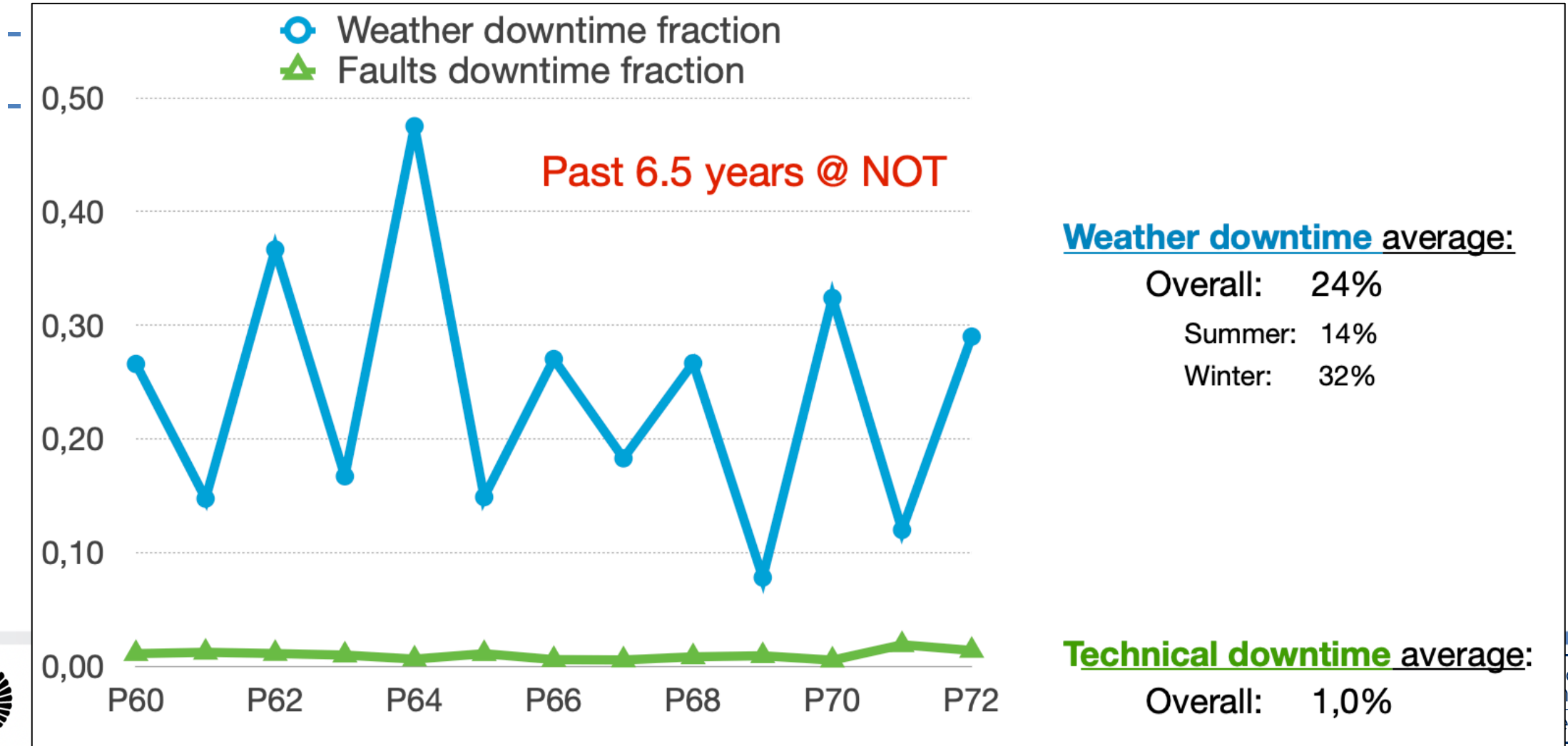


- **An extremely well performing telescope**
 - Very low technical downtime
 - Publications-wise, in fact, at the level of many much larger and more expensive ones.

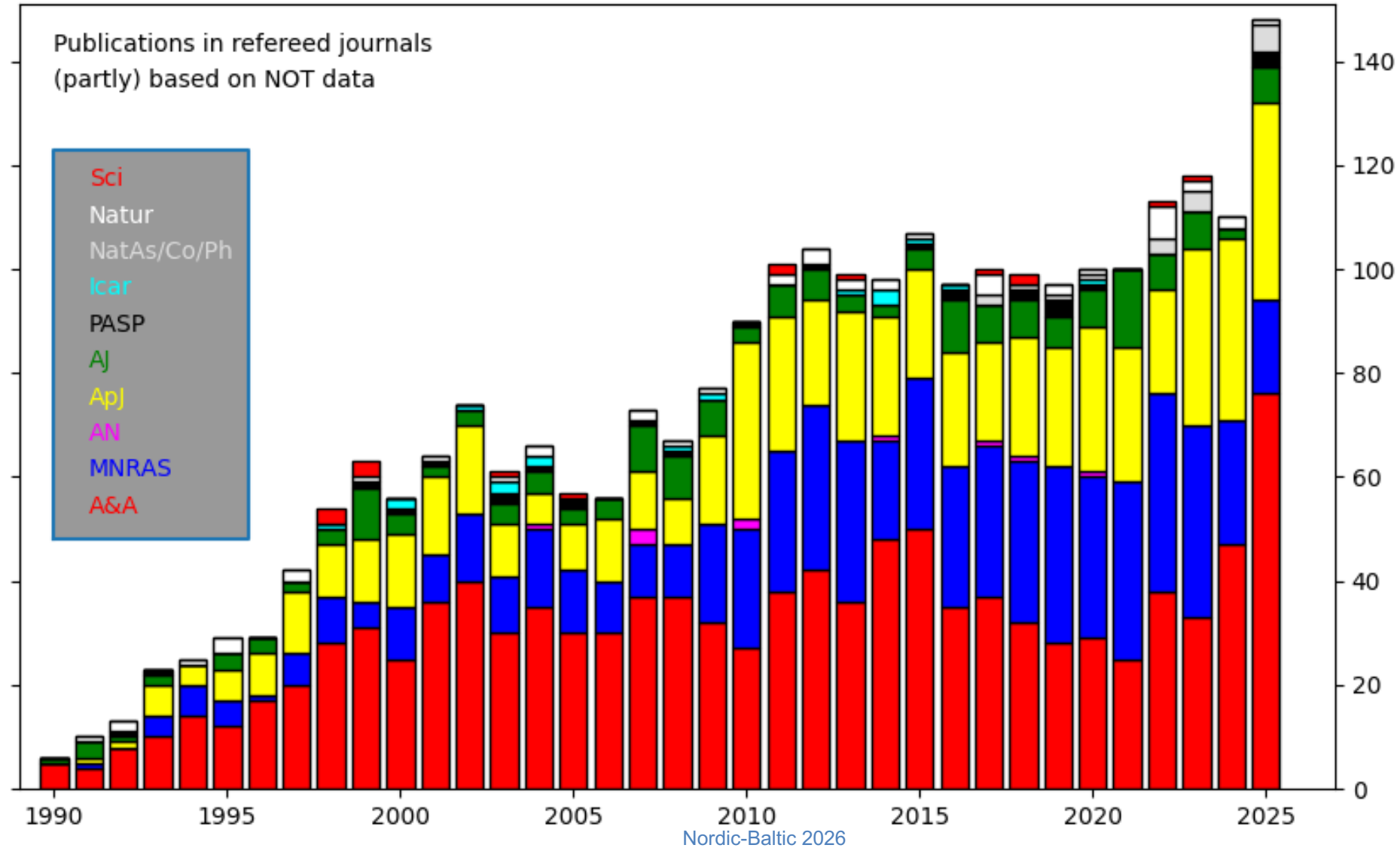
Status – Ops and Science



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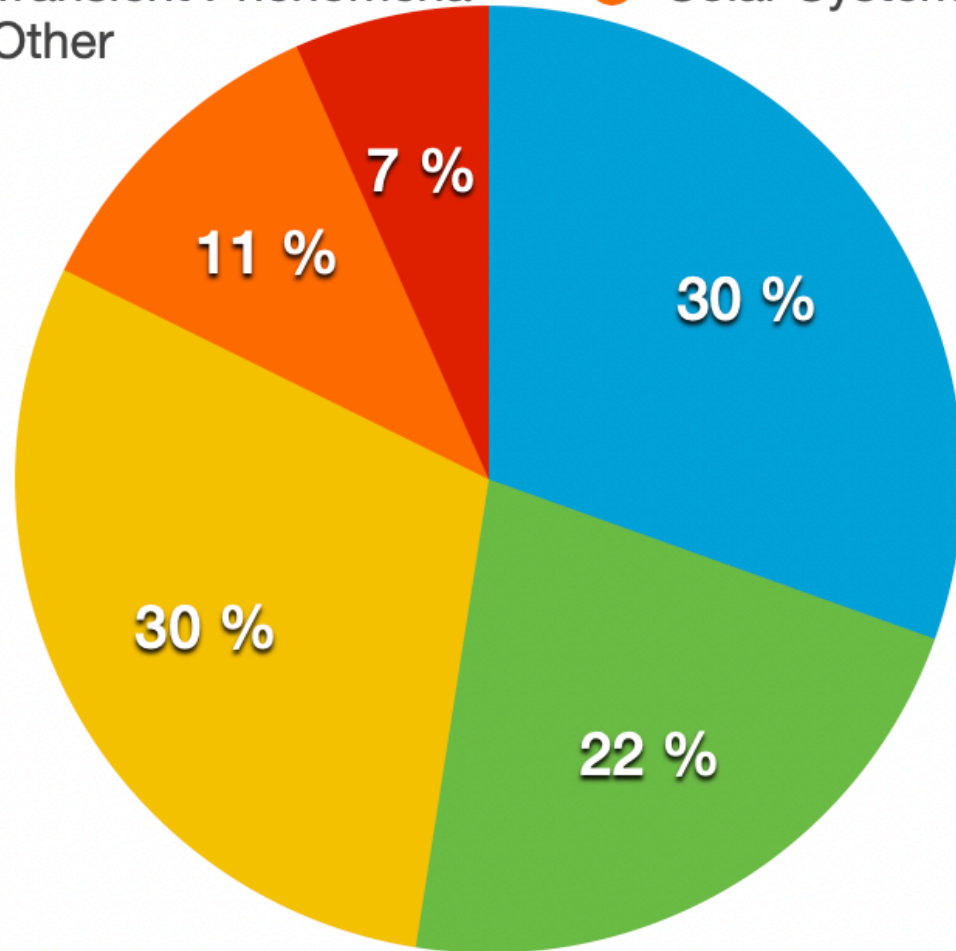
NOT Publications



NOT Publications

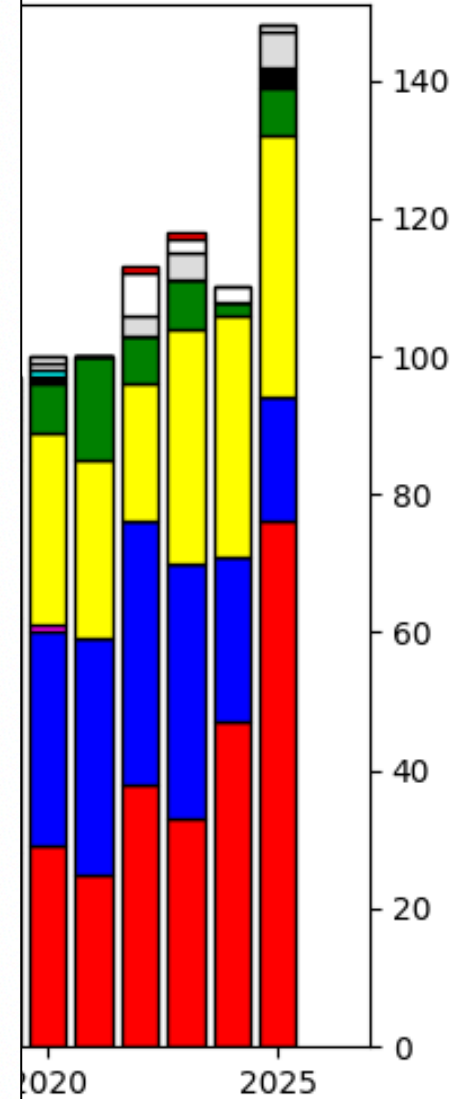


- Stellar Astrophysics
- Galaxies & Cosmology
- Transient Phenomena
- Solar System
- Other



NOT papers
2019-2024
(640)

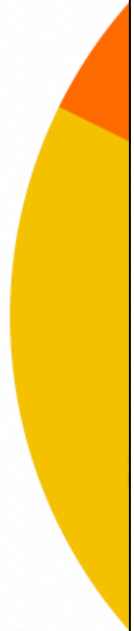
Nordic-Baltic 2026



NOT Publications

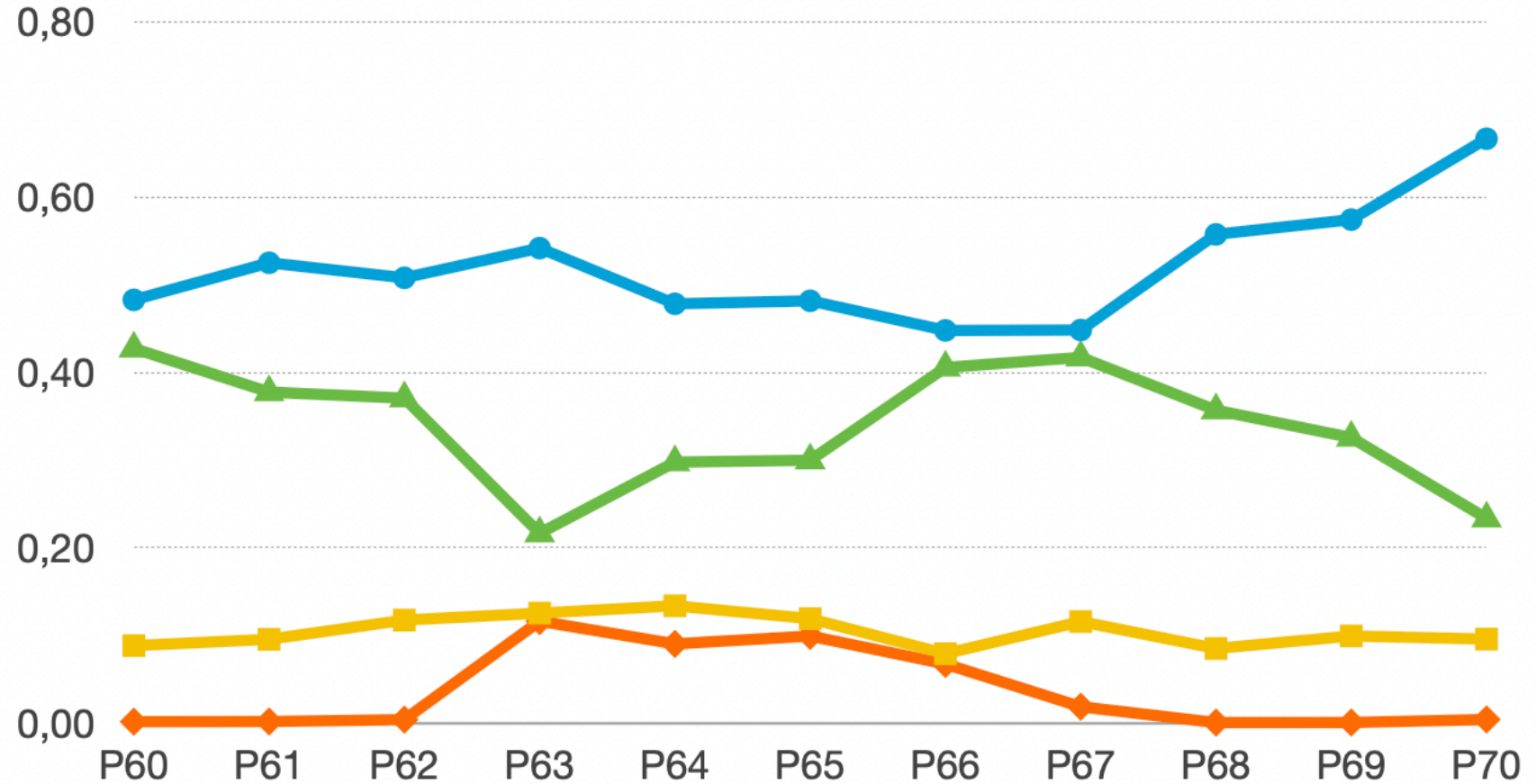


- Stellar
- Transie
- Other

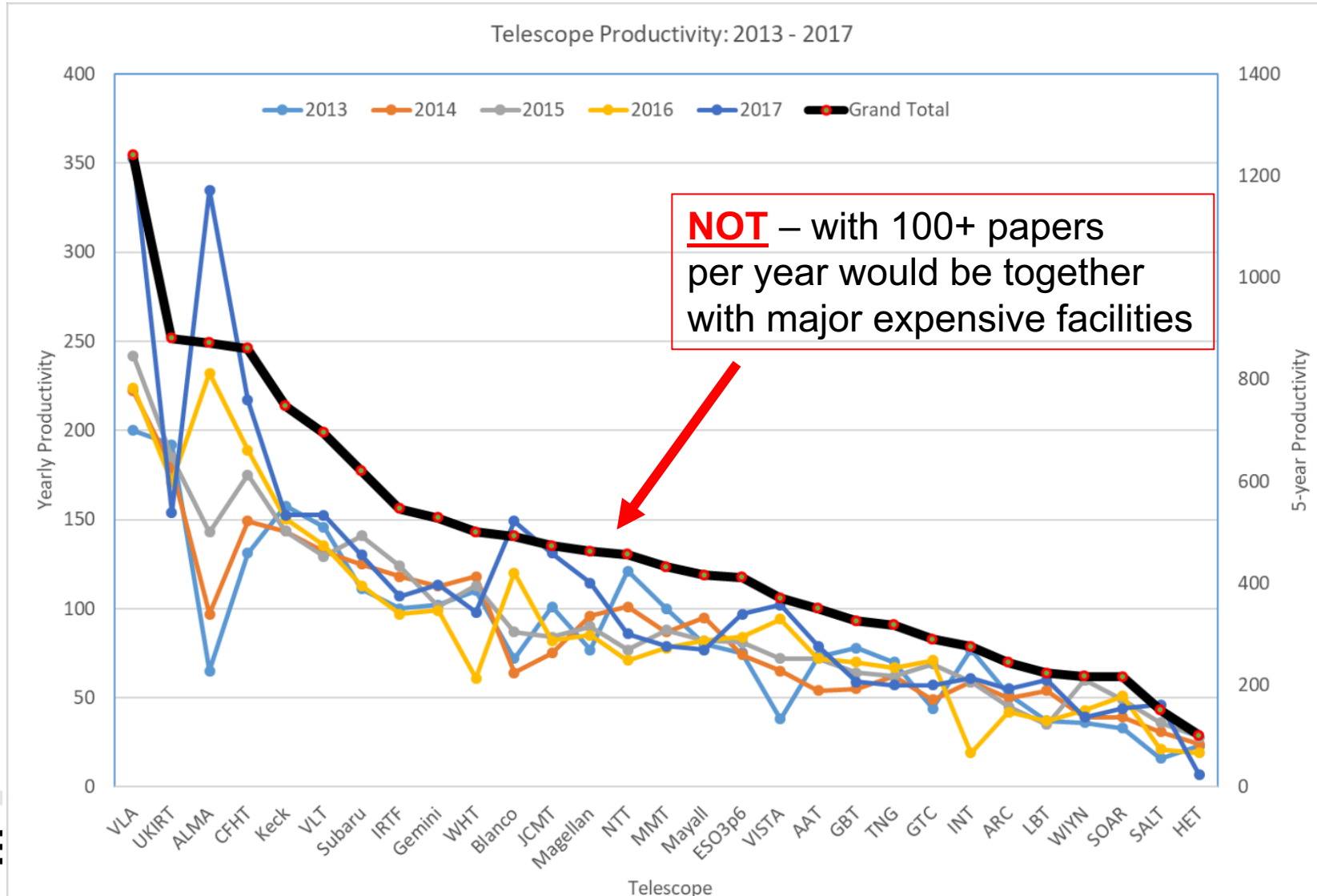


Instrument usage

- ALFOSC
- △ FIES
- NOTCAM
- ◇ STANCAM



NOT Publications – in the context of global large observatories (3 to 10m -class)



[Crabtree 2017]



New (long-term) NOT strategy

- **Danish (and Finnish) national science strategy docs on research infrastructure:**

- “The overall objective is to continue to find a competent astrophysical research community in Denmark in the coming years that can **take advantage of the opportunities** offered by **ESO, NOT** and **ESA's Science Program.**”
- “.. it is a Danish priority that ESO, NOT and ESA's mandatory program is developed so that the member states' researchers have even greater opportunities ...”
- “Experience from building NOT, as well as ESO's VLT telescope, shows that **active participation in instrument development** has a number of advantages in relation to subsequent usage.“
- “The ambition is to increase the number of students participating in courses relevant to the facilities in question.”

Key themes coming through these, relevant to NOT:

- **ESO (and ESA) membership** is central in the national science strategy concerning important international research infrastructures.

- **(Instrument) development**

- **Education and training**

best technology



best science



New (long-term) NOT strategy



NOT MISSION STATEMENT and GOALS (2025)

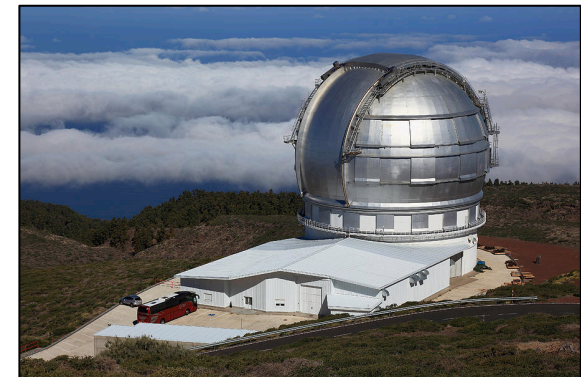
- The NOT will provide world-class optical/near-infrared observing facilities for the Nordic astronomy community, through excellence and efficiency of operations.
- The NOT **aims** to:
 - be the go-to observing facility for the *Nordic community*;
 - lead Nordic *hands-on astronomy education & training*;
 - promote scientific *collaboration* and produce excellent scientific research;
 - intentionally enhance Nordic *ESO- and ESA-related science* and programs;
 - serve as a *platform for technology*, including observing methodology, testing and *development*;
 - extend the excitement of astronomy to the *public*.



... moving to some practicalities



- Be conscious of our different but complementary roles:
 - **NOT as a Nordic Facility** – in both excellent science, and the education aspects
 - **NOT as a Facility on the ORM** – enhance collaboration
 - **Serving ESO-science** – strategically important
- To continue top-notch end-results need to:
 - Develop **even more flexibility and nimbleness**.
 - Make sure NOT is **technically viable at least through the 2030's** with a long-term *sustainability plan*,
 - Capitalise on, e.g.
 - *ESO-synergies – Hands-on training – Tech Development*





... moving to some practicalities

Totally new NOT data archive

see Poster!!

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Rapid Response Mode commissioned

see
Julia M's talk!

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Tech.upgrade plans being (J.Viuho et al.)



**UNIVERSITY
OF TURKU**

Nordic-Baltic 2026



Finnish Centre for
Astronomy with ESO
Suomen ESO-keskus

... moving to some practicalities



Totally new NOT data archive

see Poster!!

Search The NOT FITS Header Archive

Files

From Archive to Discovery:

Enabling New Science with the NOT Data Archive

P. M. Sagredo Torres^{1,2}, P. M. Sørensen^{1,2}, H. Kjeldsen², S. Armas Pérez^{1,2},
M. S. Fredslund², C. M. Moreno Saldaña^{1,2}, J. L. Rørsted²

<https://notarchive.phys.au.dk>



Show more headers

Latest public data: 2025-05-24 (one-year proprietary period)

Number, comparison (>=, <=), or rang

The platform enables comprehensive FITS-level filtering, allowing researchers worldwide to query observations starting from 2007 up to the one-year proprietary limit.

The system supports both simple and advanced queries, including filtering by file and target name substrings, wavelength range, resolving power, and additional observational metadata. This flexible search capability significantly optimizes data discovery and retrieval.

... moving to some practicalities



Totally new NOT data archive

see Poster!!

Search The NOT FITS Header Archive

Please choose instrument:

ALFOSC FIES MOSCA NOTCam StanCam

ALFOSC

[Example header with keyword description: ALFOSC](#)

Search criteria

By object name:

Object Resolve name in Simbad

By coordinates:

RA DEC Radius

Whole sky: please use at least 1 FITS-header filter below

Apply additional FITS-header filter

Headers to display:

FILENAME DATE-OBS OBJECT TCSTGT RA DEC EXPTIME
 ALGRNM ALFLTNM ALAPRTNM FAFLTNM FBFLTNM FARETARD CMIRROR

Show more headers



Files

File name

Target Properties

Target name

e.g. Vega, KIC 123456

Right Ascension (sexagesimal hours)

HH:MM:SS or range

Declination (sexagesimal degrees)

DD:MM:SS or range

Enable cone search

Temporal Constraints

From date

YYYY-MM-DD

To date

2025-05-24

Latest public data: 2025-05-24 (one-year proprietary period)

Exposure time

e.g. 10..60 or >=30

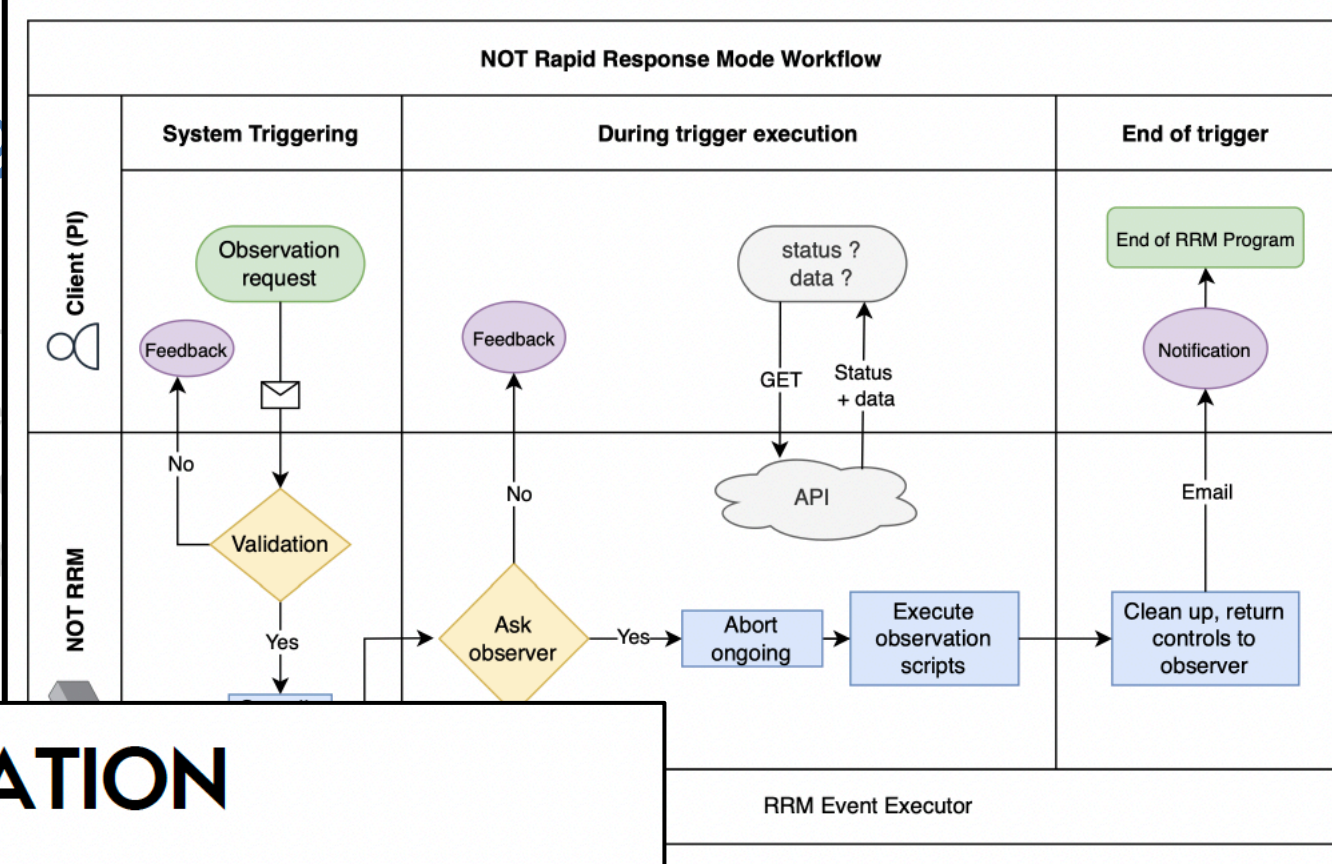
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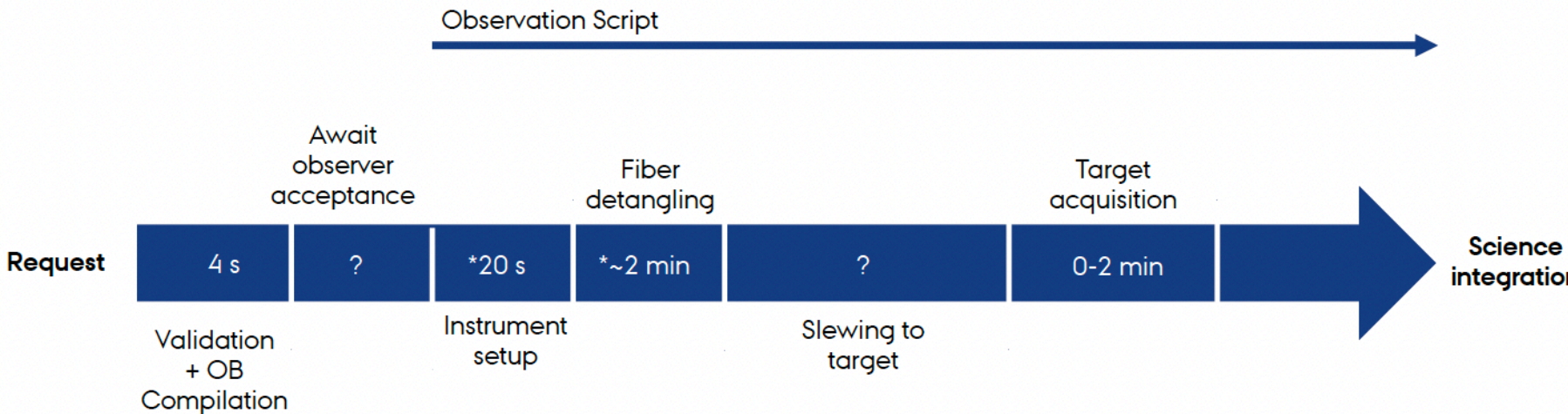
The system supports both simple and advanced queries, including filtering by file and target name substrings, wavelength range, resolving power, and additional observational metadata. This flexible search capability significantly optimizes data discovery and retrieval.

Rapid Response Mode (RRM)

now demonstrated successfully in real life!



FROM TRIGGER TO OBSERVATION



Work by, in particular:
Samuel Grund Sørensen (NOT/AU student) & the NOT s/w team, **Peter Meldgaard Sørensen**, et al.



NOT Operations, Instrumentation, etc. Talks and Poster this week, e.g. :

- NOT operations, instruments, and science – Tapio Pursimo
- NOT capabilities and obs.modes – Julia Martikainen
- NOT Technology development and upgrades – Joonas Viuho
- NOT Data Archive – Sergio Armas Perez

- NOT Transient Explorer (NTE) – Johan Fynbo
- Astro Facilities of Canary Islands – Julia Martikainen
- La Palma Quantum Interferometer – Joonas Viuho
- Spectroscopy Pipelines – Kostas Valeckas



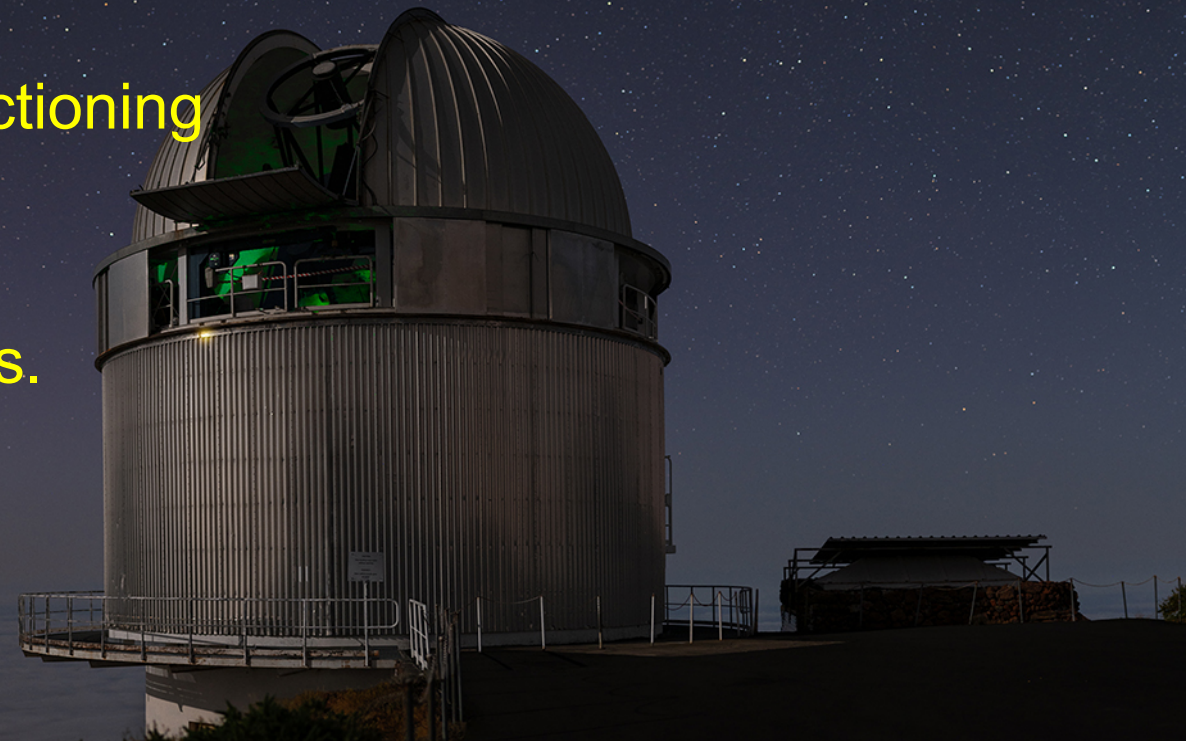
And many, many science talks and posters featuring NOT data, too many to mention here!

Nordic Optical Telescope (NOT)

Please continue using it! And bring new users too, and even partners.

Bottom-line: NOT is a great, well-functioning facility, but in the medium-term it will need more resources to be able to upgrade for viability through the 2030s.

Thank you for your attention



Nordic-Baltic 2026