

Gemini Observatory Update

Subaru Users' Meeting, 2025Oct29-31

Atsuko Nitta

for Gemini Observatory/NSF's NOIRLab

1. General updates
2. Ops Updates
3. Development news
4. Selected Science Highlights

Gemini Leadership Team Updates

- The Gemini Director **Scott Dahm** is stationed at Gemini North.
- Deputy Director search ongoing.
- Hawaii Culture and Language Resident : **Leilehua Yuen** is a Cultural Practitioner and Kumu Hula. Leading Malalo o ka Lani Maunakea (“Below the Sky of Maunakea”)



General Updates

- ❖ **3I/ATLAS Shadow the Scientists** : StS session observing 3I/ATLAS from GS on Aug 27 with GN (Brian Lemaux) as main moderator. 17K+ viewers so far. UH's Karen Meech along with Bryce Bolin explained to the live audience
- ❖ **Shadow the Scientists** for the successful PIs - assist in phase 2 work
- ❖ Proposal submission brief disruption due to loss of network on 2025sep30
- ❖ **Mask Cutter restored**: Mask cutters **operating at both sites**.
- ❖ Budget Issues : Realigning various activities so we stay w/i budget. Additionally, we keenly are monitoring the US budget (and shutdown) situations.
- ❖ Gemini Science Users Meeting cancelled. (planned for Nov. 2025)
- ❖ **Once-in-a-Rubin GEM DD time** to follow up on Rubin. Separate from the existing ToO Q programs. Community lead, rapid response, data immediately shared to the community
- ❖ Science Users Support Department update - next slide

DRAGONS (DR for Astronomy from Gemini Observatory North and South) & Gemini Archive

- ❖ **April 2024** - Released DRAGONS 3.2, providing support for new GMOS-S CCDs as well as updated GHOST DR software as a native DRAGONS package. With this release DRAGONS supported the following modes/instruments:
 - **All optical and NIR Imagers (GMOS, GSAOI, NIRI, F2, GNIRS Keyhole)**
 - **GMOS LS, including Nod&Shuffle & GHOST**
- ❖ **May 2025 – Released DRAGONS 4.0, to support GNIRS LS mode, with tell. correction**
- ❖ **Oct27 2025 – Releasing DRAGONS 4.1, to support GNIRS XD mode, with tell. correction**
- ❖ **March 2026 – Releasing DRAGONS 4.2, to support F2 LS mode, with tell. correction**
- ❖ **IGRINS-2** - Support development of DR software as a ‘**third-party**’ package compatible with DRAGONS (start work Q2 FY26)
- ❖ **Reduced data from the GHOST instrument** are now stored in the Archive.
- ❖ **Reduced data from IGRINS and IGRINS-2** are also now stored in the Archive.
- ❖ Working to enable DRAGONS to run automatically within the Archive system : **Reduced cal data should appear in GOA shortly after release of DRAGONS 4.1**

Maunakea Engagement

Many are carried out together with other observatories and/or with other community organizations. **New items since Jan2025 Subaru Users mtg in blue.**

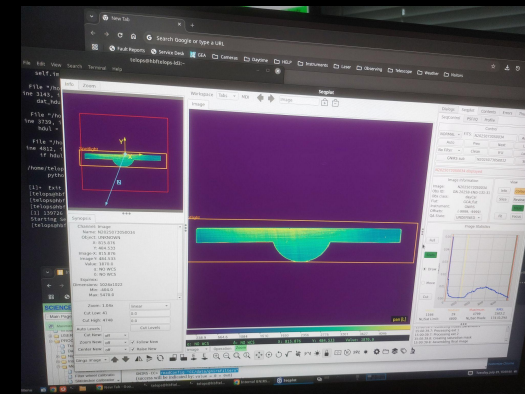
- ❖ **Fall Journey through the Universe (Oct20-24)**
- ❖ **Hawai'i Cultural Residency Leilehua Yuen leading Malalo o ka Lani Maunakea**
- ❖ **Japanese Chamber of Commerce 五時から=Gojikara event on Nov20 Thursday**
- ❖ Kama`aina Observatory Experience
- ❖ Tanabata Block Party
- ❖ Hawai'i Advisory Committee
- ❖ Aloha`Aina Events
- ❖ 'Ohana Stargazing
- ❖ Project Hōkūlani
- ❖ Astronomy on Tap
- ❖ AstroDay
- ❖ Summit day time tour, HBF early evening tour, etc.



Gemini North: Operations Update

Recent Accomplishments:

- ❖ **Annual maintenance engineering shutdown** Oct 14-29. The plan to start onsky check on Oct 29.
- ❖ **IGRINS-2** offered for shared risk science in 2025A successfully.
- ❖ **GNIRS refurbishment** work (May-Sep) completed. All the modes available before the refurbishment work are available now. Short Red camera will become available for science after it is checked out.



Challenges:

- **GMOS-N potentiometer**: It was off sky for 2 weeks for replacement in April.
- **GNIRS** : Locked the camera turret to minimize motion until refurbishment.
- **Maroon-X**: etalon calibrator failed on Mar 30. Andreas Seifahrt came out for repair and it returned to routine ops on Apr03.
- **Maroon-X** : Guider failed Sep22. Expected a new one will be in place by Dec when MrnX is back on the telescope.



Operations Handover Review

22-Apr-2025

Review Group

1. Hwi Hyun Kim - as project lead
2. Hyewon Suh - as instrument science lead
3. Ruben Diaz - as development representative
4. Edo Tapia - engineering operations
5. John White - engineering operations
6. Shane Jacobson - detectors
7. Emma Kurz - software representative
8. Andy Adamson - GN Ops AD (Chair)

Gemini South: Operations Update

Recent Accomplishments:

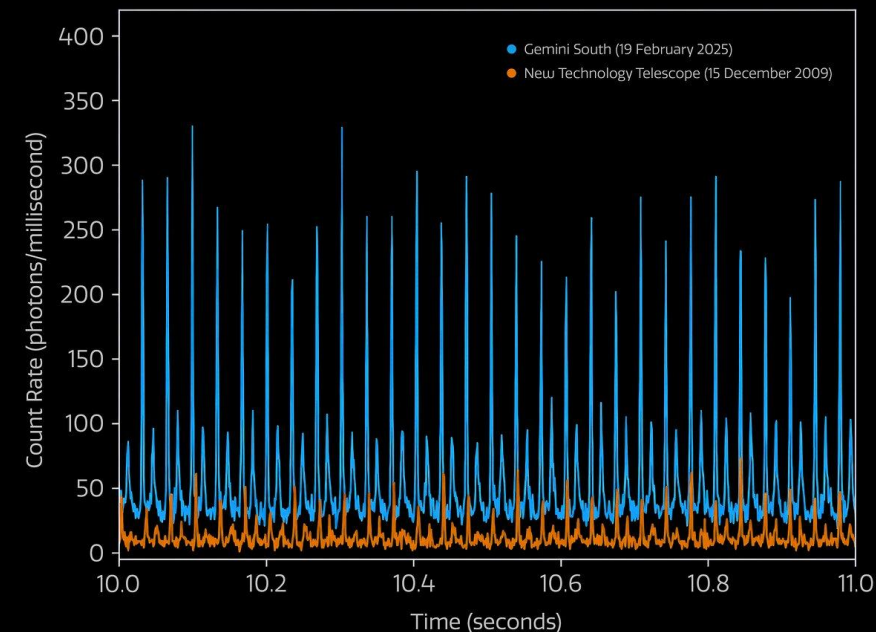
- ❖ Weather has improved (note in 24B we reported a heavy weather loss).
- ❖ GHOST software issues are still being investigated and improved. Fault loss in 25A improved compared to 24B.
- ❖ Combined above resulted in better completion rates for band1/2 programs.
- ❖ Annual shutdown successfully completed.
- ❖ IQUEye (Italian QUantum Eye) : Visiting instrument run completed successfully.

Challenges:

- ❖ Flamingos-2 : Pattern noise show up intermittently. OI is not not working. Investigation is ongoing.
- ❖ GeMS/GSAOI : Due to poor weather during the runs, no programs were completed. GeMS/GSAOI is retired and no longer offered due to low demand and budget/staffing challenges.

CRAB PULSAR
SINGLE OPTICAL PULSES

ITALIAN QUANTUM EYE (IQUEYE)



Statistics

Proposal Routes

Spring (A) & Fall (B) Semester: Regular programs (NTAC, ITAC)

- BI-ANNUAL; queue, classical, ToO, priority visitor eavesdropping

Large & Long Programs: Large allocation and/or multi semester (LLP TAC)

- ANNUAL; queue, ToO, and priority visitor, eavesdropping

Fast-Turnaround: Immediate, short and/or follow up (Peer review)

- MONTHLY; queue, ToO

Director's Discretionary: Special opportunities (DD TAC team – Chief Scientist)

- Open call (worldwide); queue, ToO

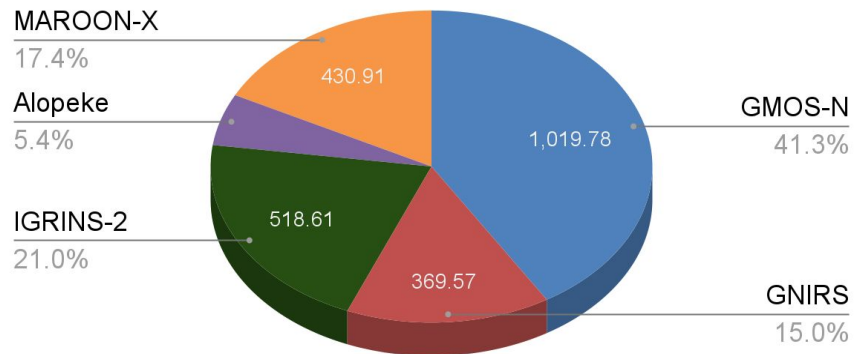
Poor Weather Programs: Bright targets and guide stars (Head of SciOps)

- Open call (Gemini community); queue

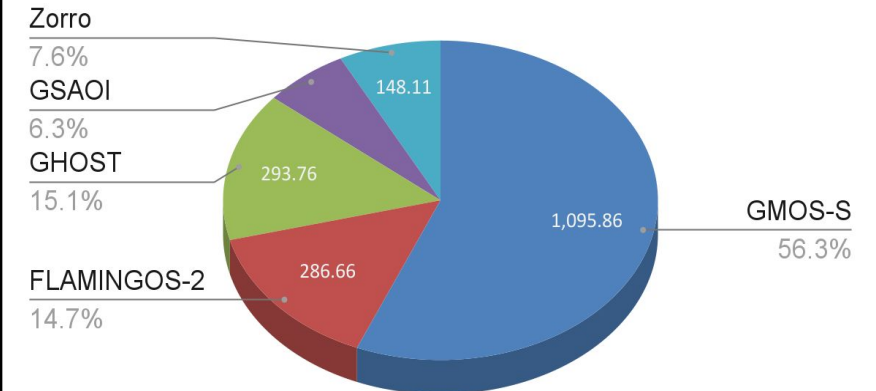
Note - we enable DARP, by Partner choice

Instrument Demand 2025A/2025B

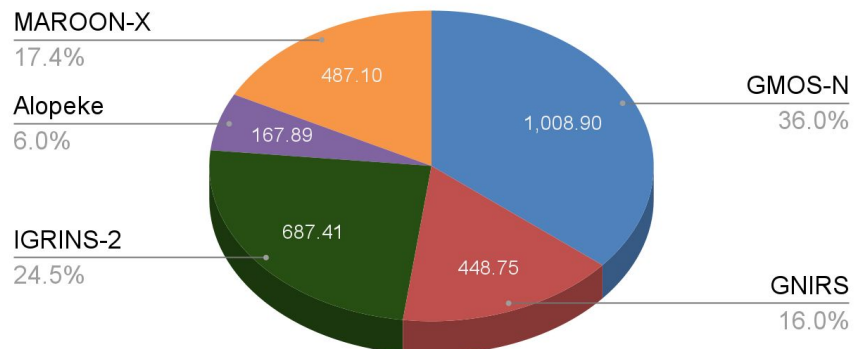
Fraction of Time by Instrument: Gemini North 2025A



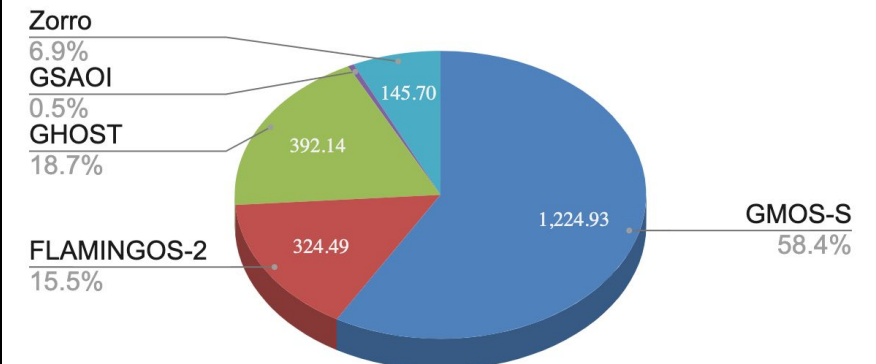
Fraction of Time by Instrument: Gemini South 2025A



Fraction of Requested Time by Instrument: GN 2025B

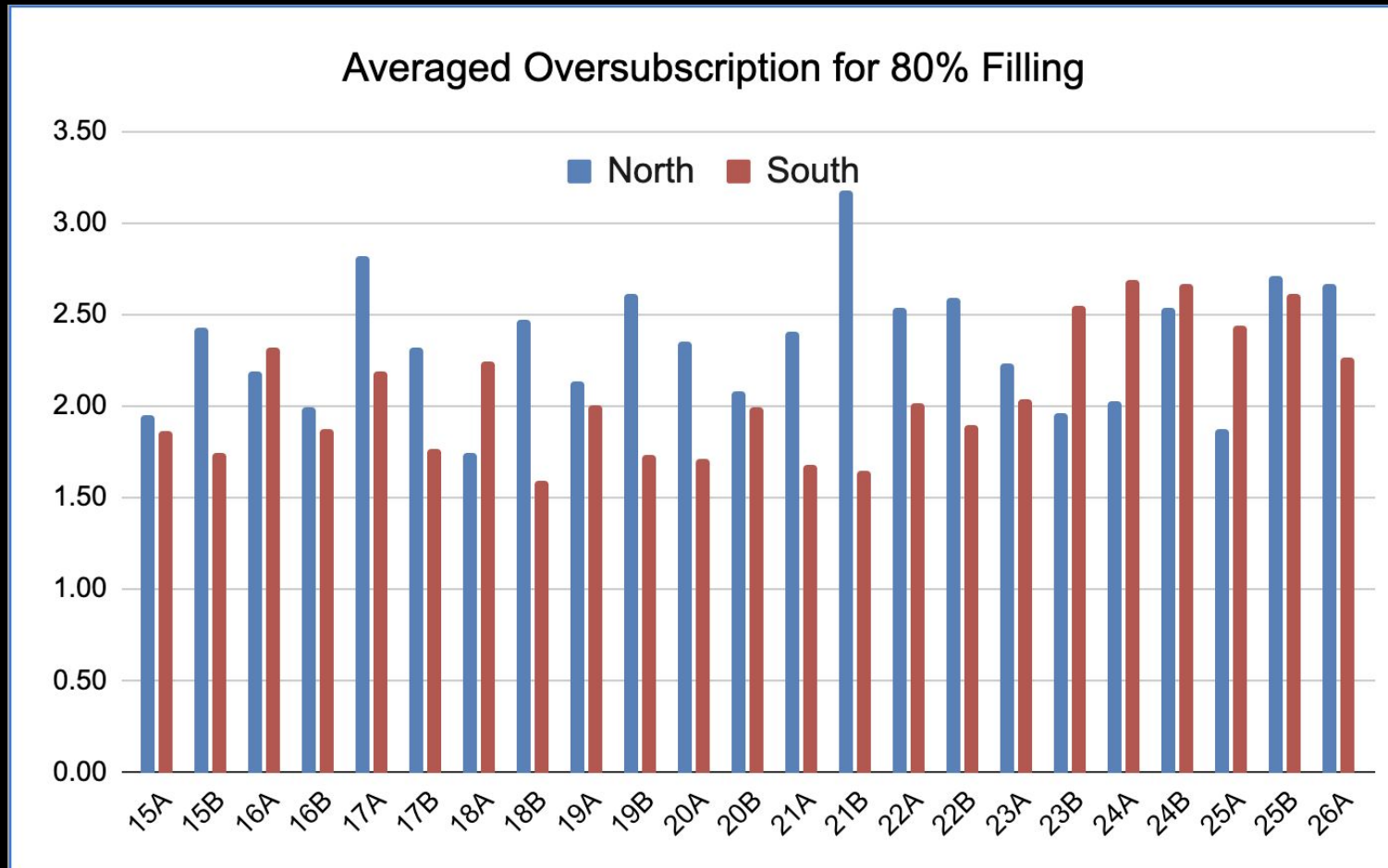


Fraction of Requested Time by Instrument: Gemini South 2025B



Instrument demand in 2025A, B semesters highlighting the impact of new instruments, **GHOST and IGRINS-2.**

Regular Queue Demand



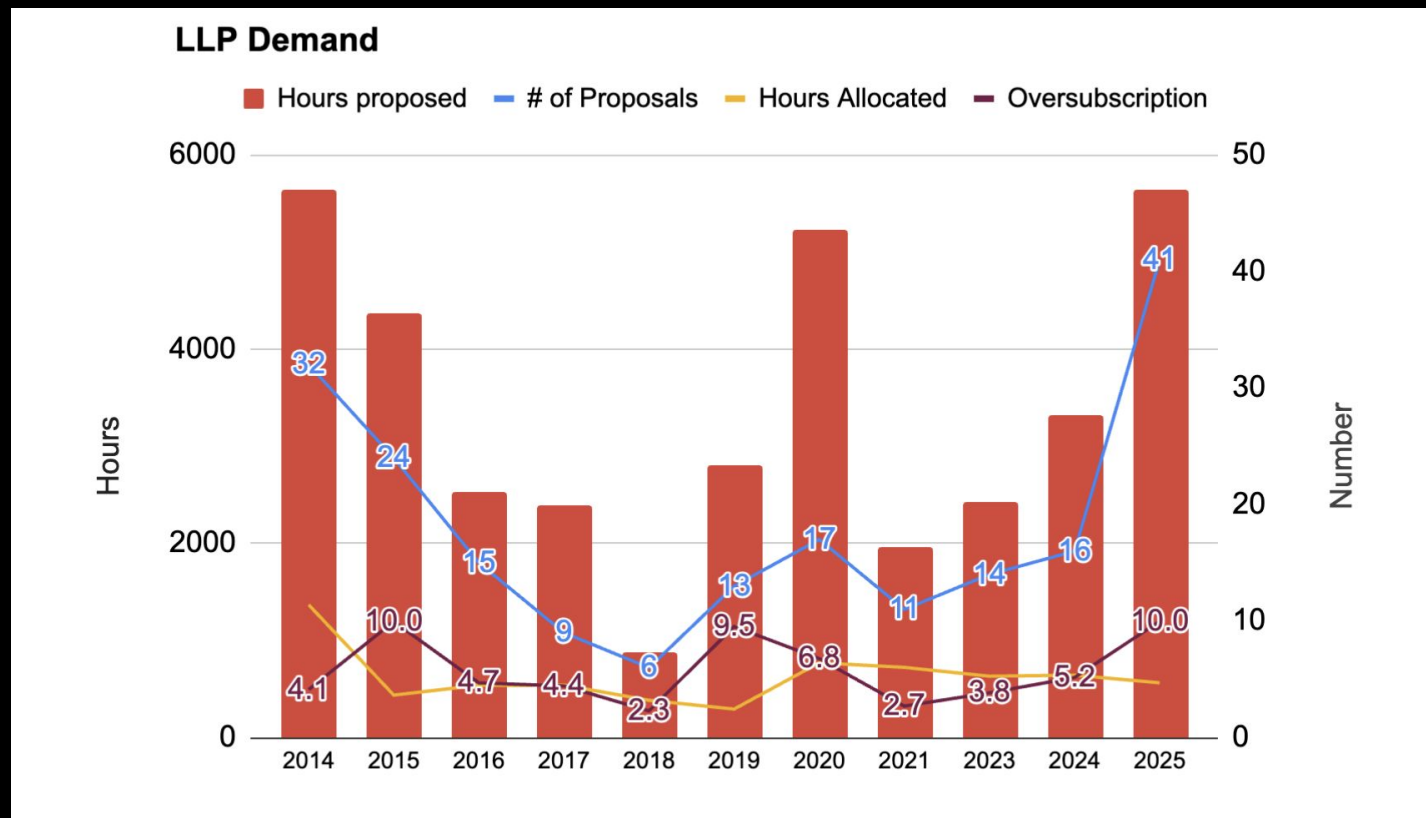
Long & Large (LLP)

Gemini - Subaru Exchange time allows

ONE LLP and
ONE Subaru Intensive program

at the same time.

IGRINS-2 was not offered this cycle. We anticipate possible strong interest the coming cycle. (Feb: letter of intent and Mar: deadline)



Notes

2021 - offered **Band 2 only**

2022 - **no call**

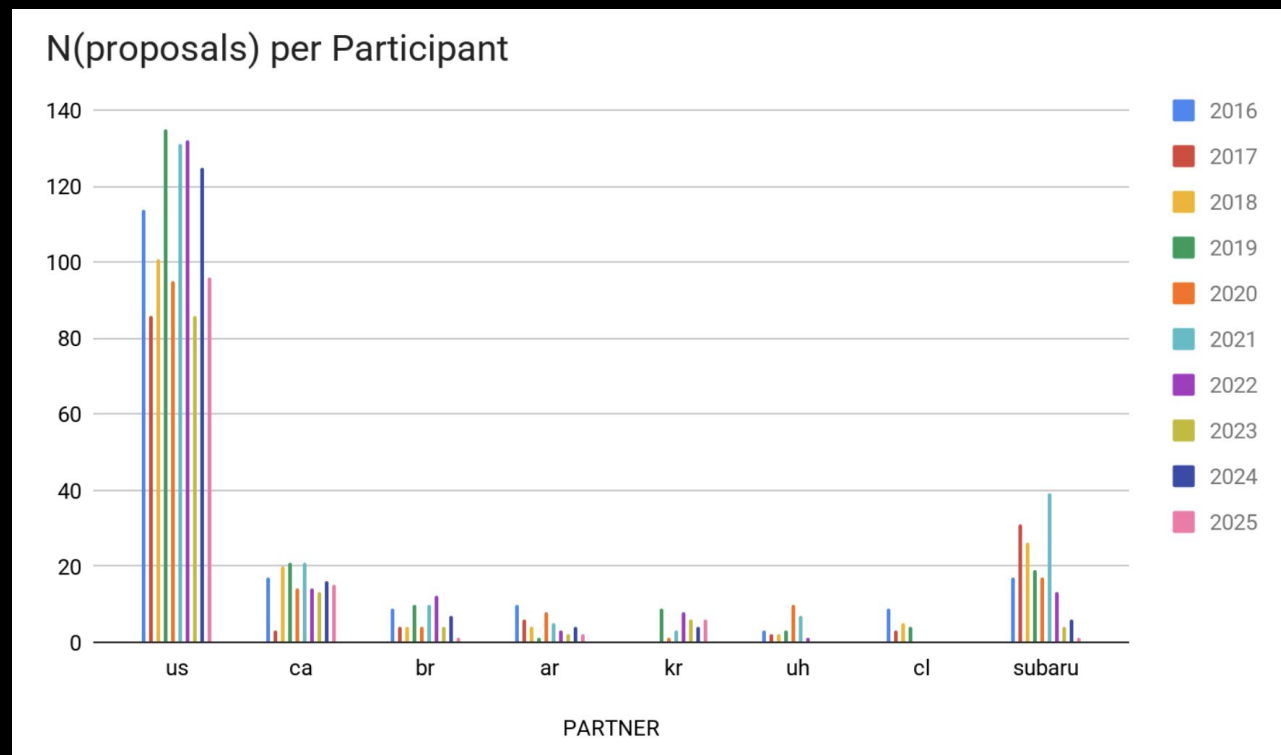
2025 - Band2 only for GS

LLP Coordinator : **Jennifer Andrews**

Fast Turnaround (FT)

2020, 2023 : less time available
in 2020 and 2023 due to the
pandemic and to the
mirror/cyber incidents.

**For 2025, the proposal
count includes only the 25A
semester but is at levels
usually seen over a full year.**

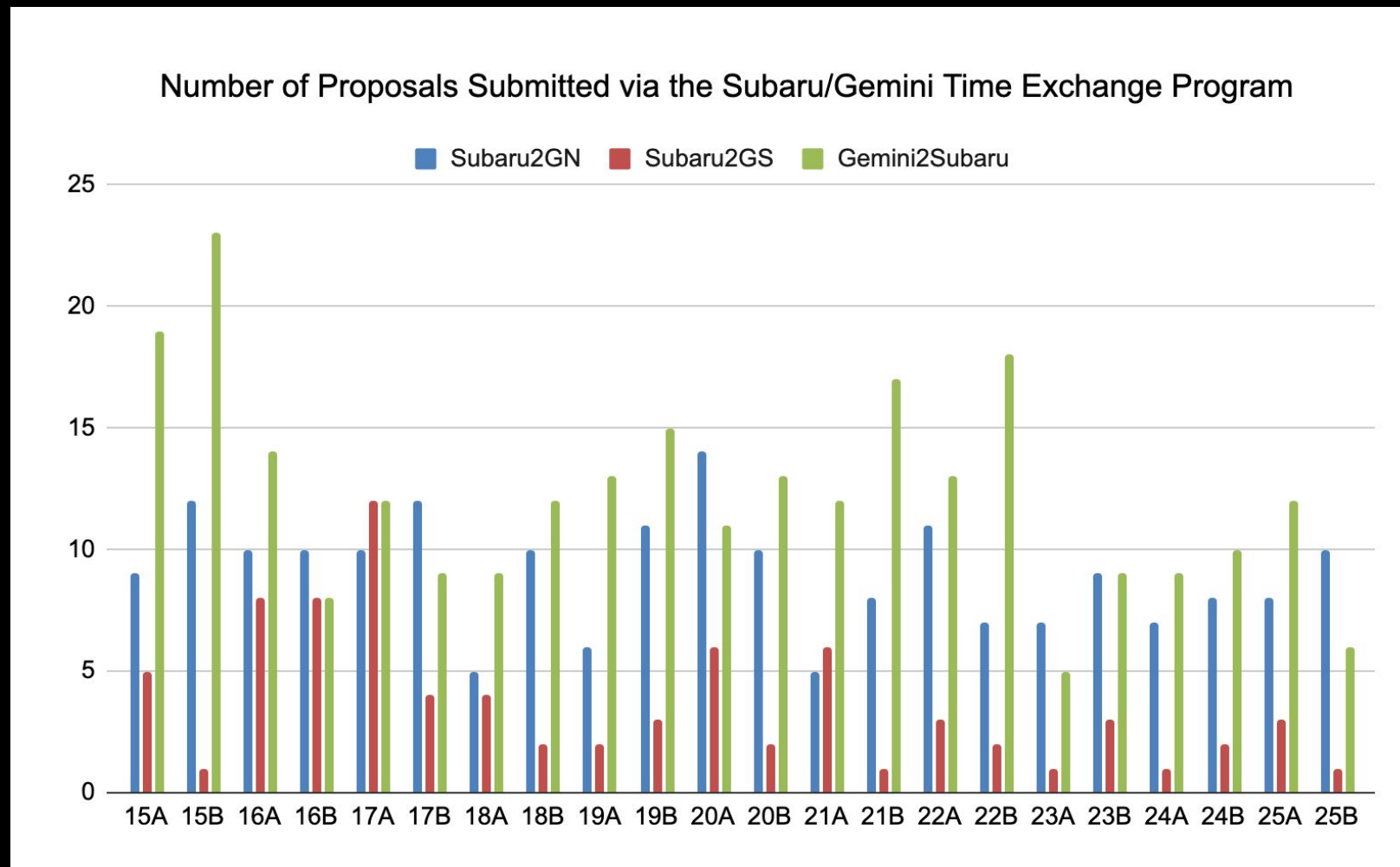


Kristin Chiboucas (FT Lead, GN FT Team Lead)
Aleksandar Cikota GS FT Team Lead

Completion rate of FT programs remains very good.

Subaru/Gemini Exchange Time

Requested hours, proposals number dipped in 2025B after a trend of recent steady increase.

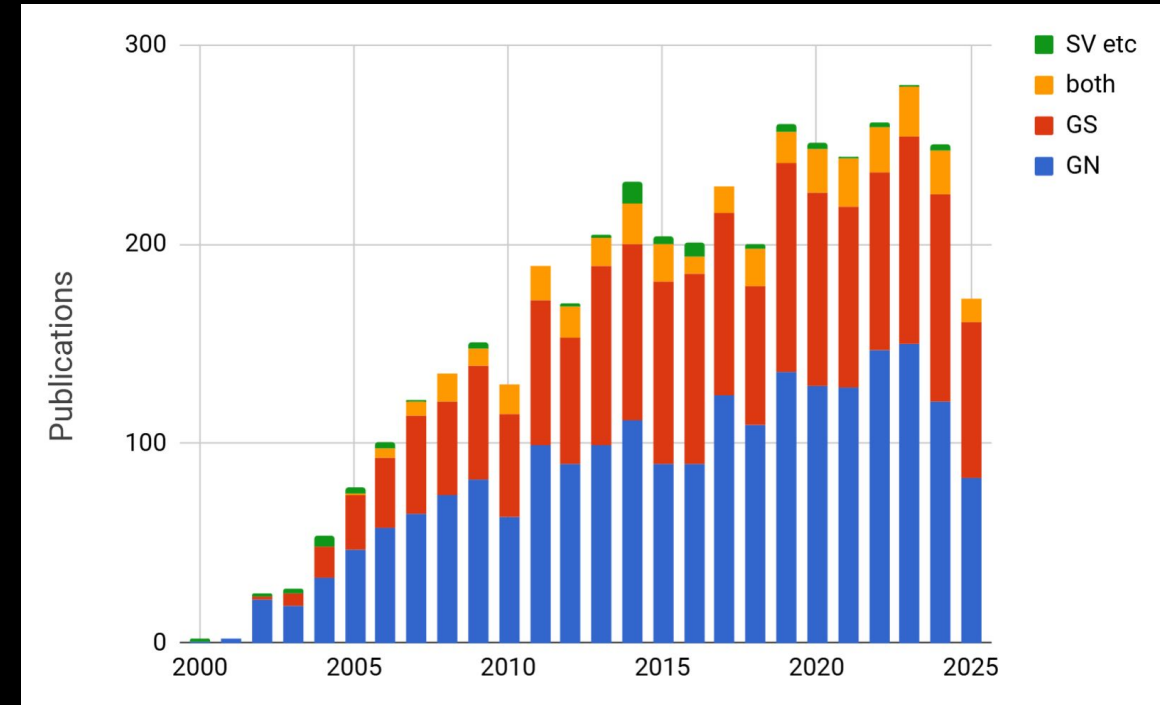


Publications

- **If we assume 2025 record is $\frac{3}{4}$ of the total year, it will be not that different from previous years.**
- GN publication decline is real, it might be due to combo of several factors - COVID, 2022-2023 GN extended shutdown due to M1 damage, 2024 Cyber incident, 2022 start of JWST operations - assuming the typical data-to-publication timeline of 2, 3yrs.

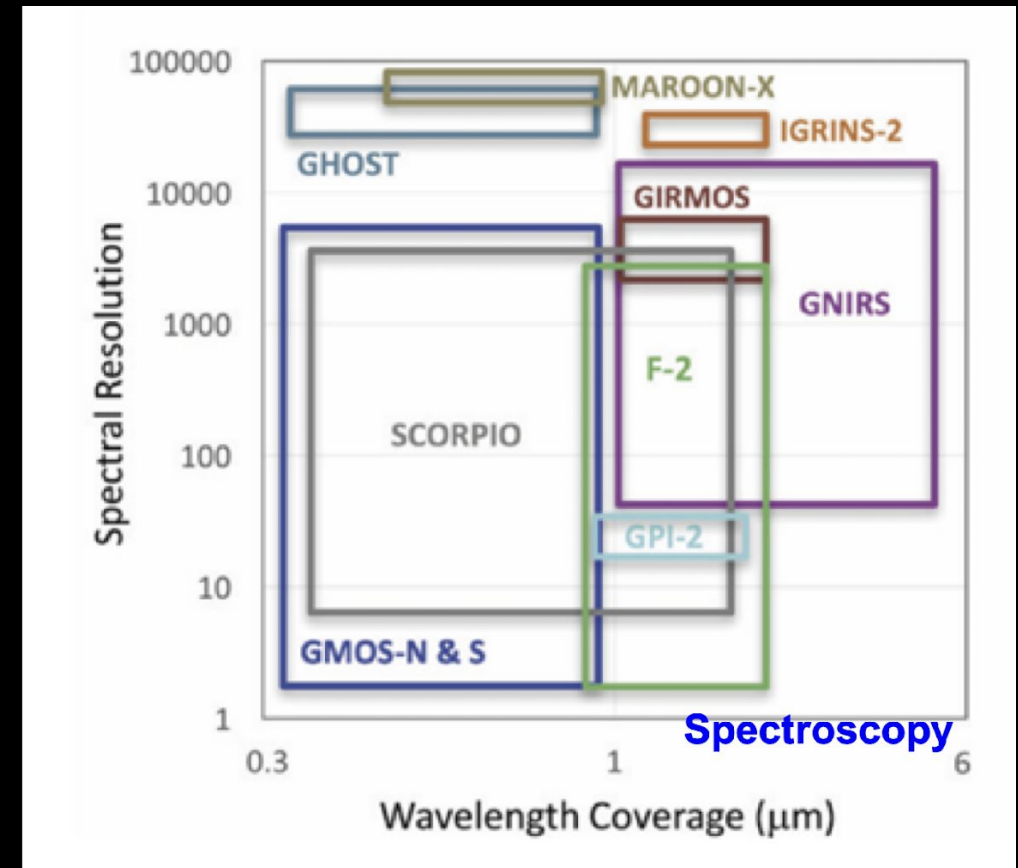
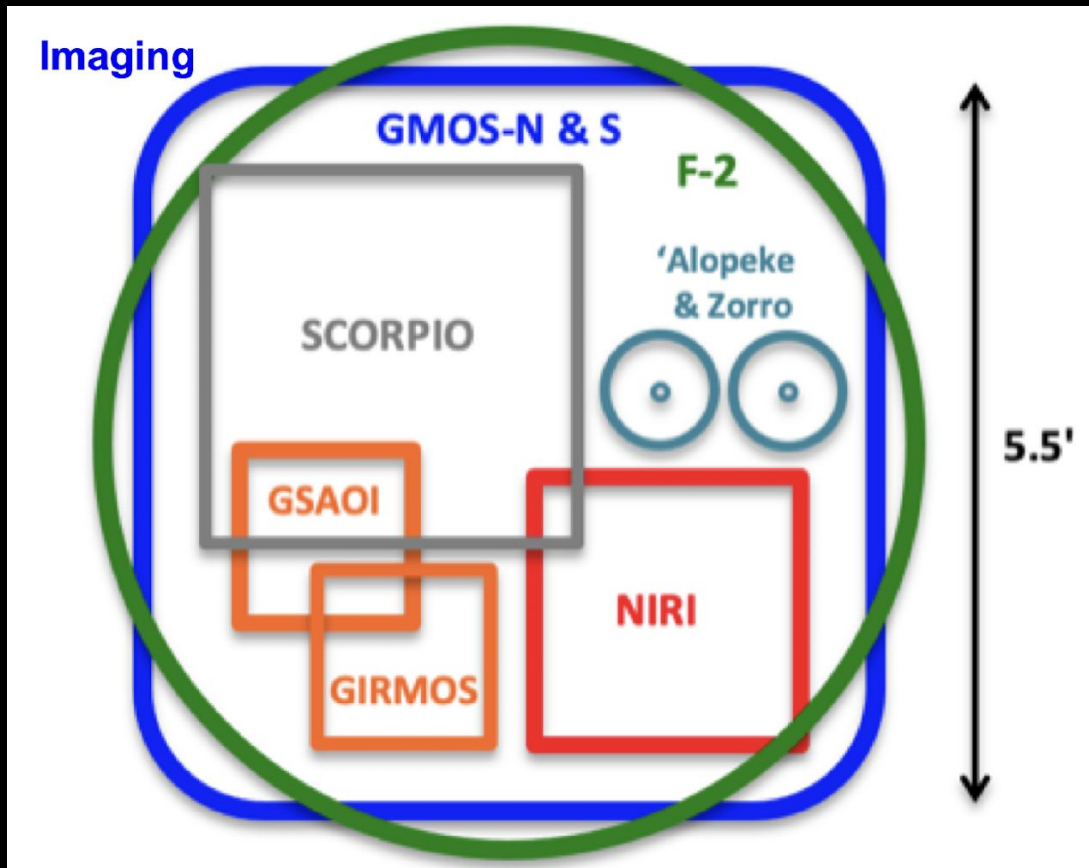
Publications from Subaru-Gemini Exchange Time (incl FT, DD)

- 2023: Total 9 papers [3 from Gemini community and 6 from Subaru community.]
- 2024 : Total 8 papers [4 from Gemini community and 4 from Subaru community].
- 2025: Total 5 papers. [2 from Gemini community, 3 from Subaru community]
- 2026: Total 6 to be published! [3 using HSC, 3 using GMOS-N, GMOS-S]



Development

Current and Future Gemini Instruments



2023: **GHOST**, **GNIRS IFUs**

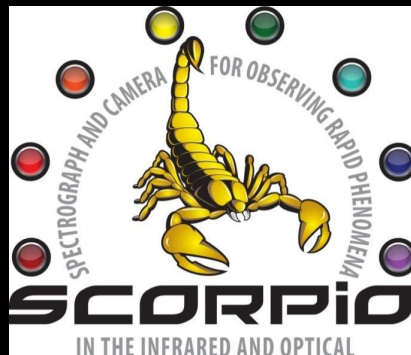
2024: **IGRINS-2**

2026: New M2, **GPI-2** (not for ops until later)

2027: **SCORPIO** (shared risk)

2028: **GNAO + GIRMOS**

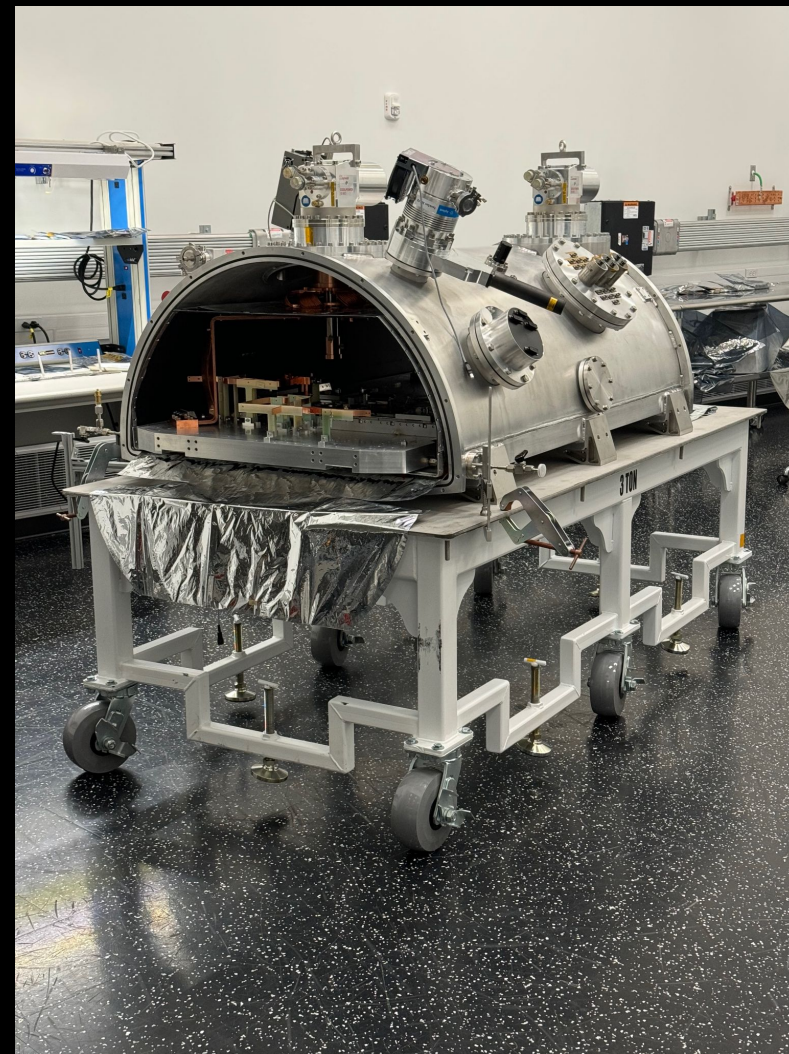
SCORPIO



Work-horse capability for time-domain science

Simultaneous 8-band optical/near-infrared imager and spectrograph built by SwRI , FRACTAL, JHU, STScI.

- All hardware components with the exception of the detector systems shipped to FRACTAL (Madrid, Spain) in late January 2025.
- NIR channel warm alignment close to being finished (September).
- VIS channel alignment planned for October.
- Project has further accumulated significant schedule delays over the last year.
- Re-evaluation of project execution plan underway with a decision point soon.
- **Projected on-sky date at GS is 2027 (best case estimate).**



GNAO, GIRMOS Updates

High-redshift galaxies



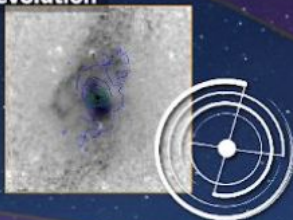
Time domain/
multi-messenger



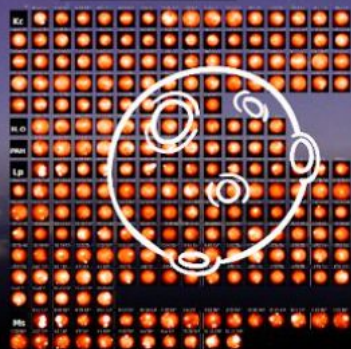
Star clusters



AGN feedback/
galaxy evolution



Giant planets
and moons



Star formation



GNAO Facility PDR - Feb 2025 ✓

GIRMOS CDR - Feb 2025 ✓

LLT delivery to Gemini - Jun 2025 ✓

LGSF CDR - September 2025 ✓

GNAO CDR - March 2026

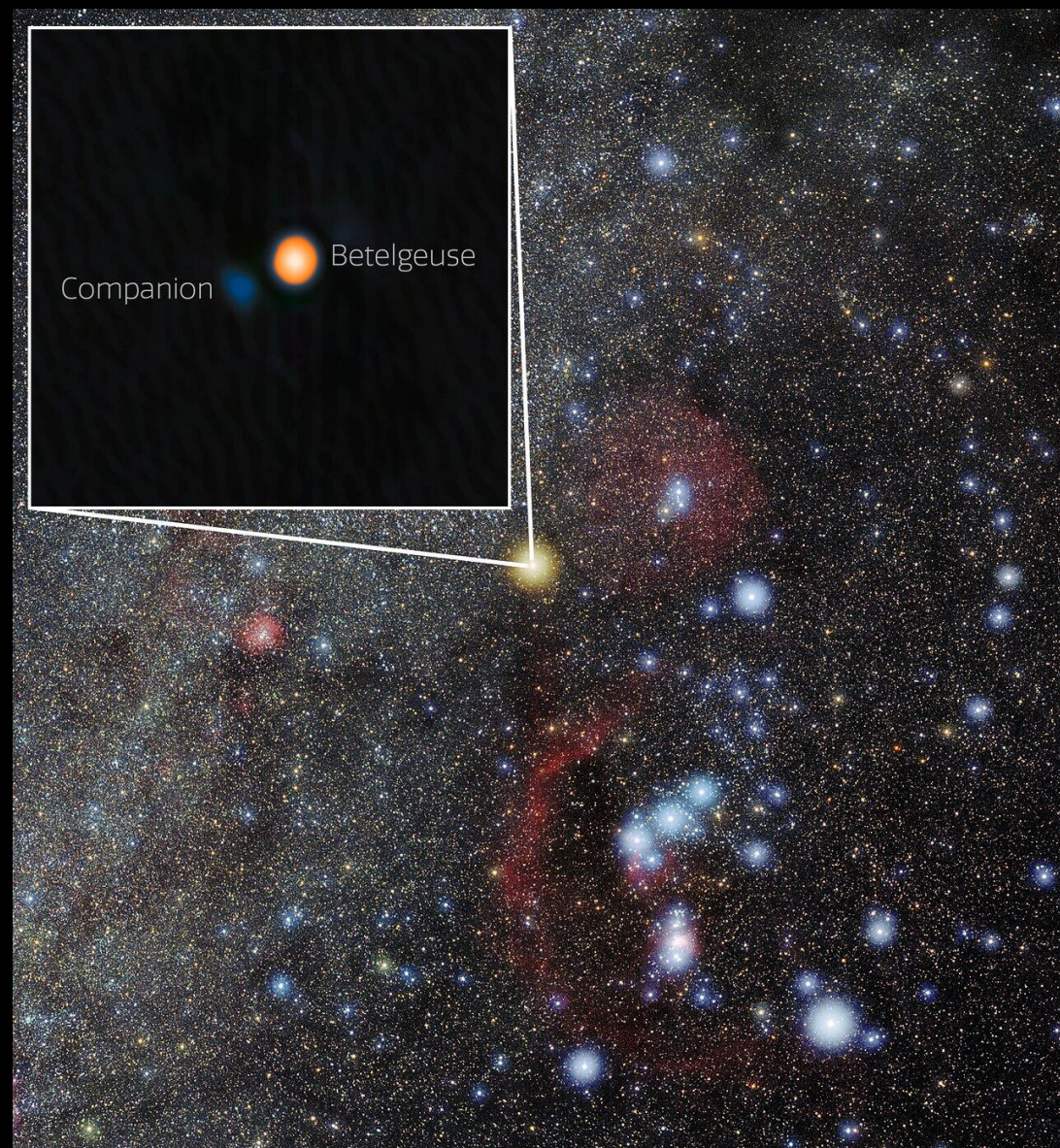


Science Highlights

“Gemini North Discovers Long-Predicted Stellar Companion of Betelgeuse”

A companion was proposed as a way to explanation for the “Great Dimming” of Betelgeuse.

Visiting Instrument, ‘Alopeke, was able to resolve the very close binary companion.
6 mag fainter, 1.5Msun main sequence star

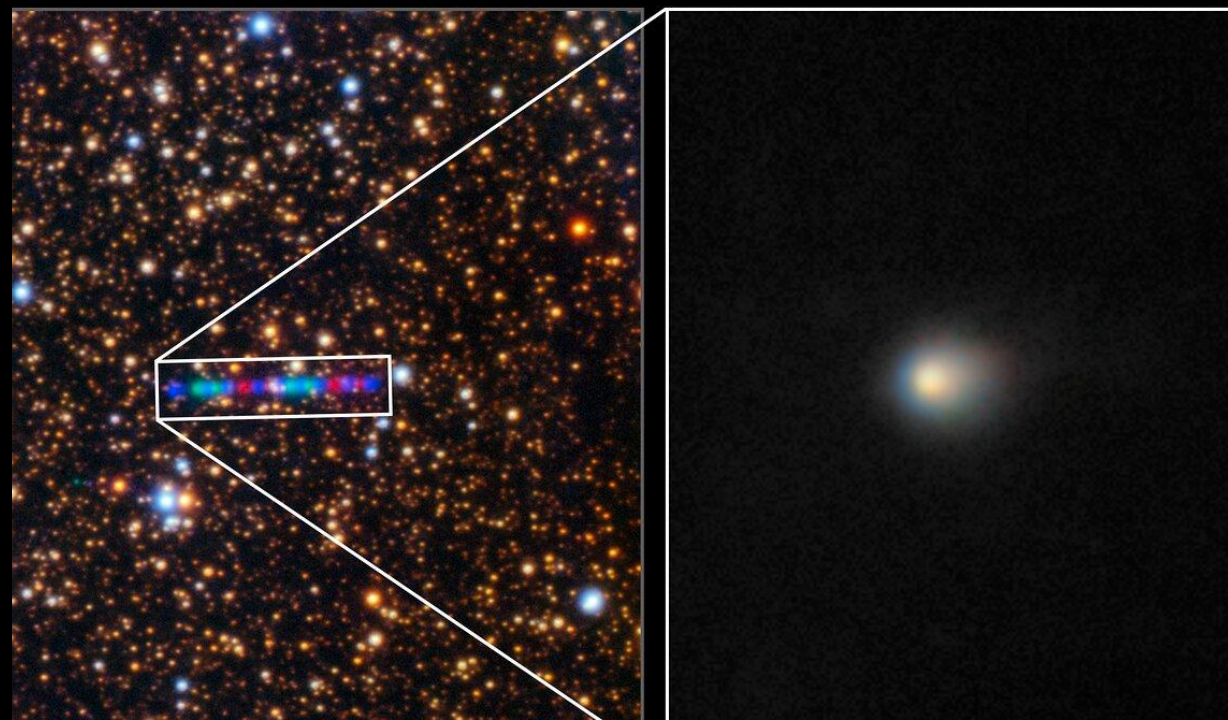


Science Highlights

3I/ATLAS - Taking advantage of having two telescopes, one observatory

Both GN and GS have been used to observe the newest interstellar visitor since its discovery. The last one in Aug. from Gemini South.

Next observations at GN in Nov when it is visible again.



Science Highlights

“Gemini Data Critical to Revealing that Hayabusa2 Target is Tinier and Faster than Thought”

Gemini South, along w/ many telescopes in the world, observed 1998 KY26, an asteroid Hayabusa2 is to study up close to characterize it better. Combined data showed the asteroid is 11m in size and rotation period of 5min.



Thank you!

