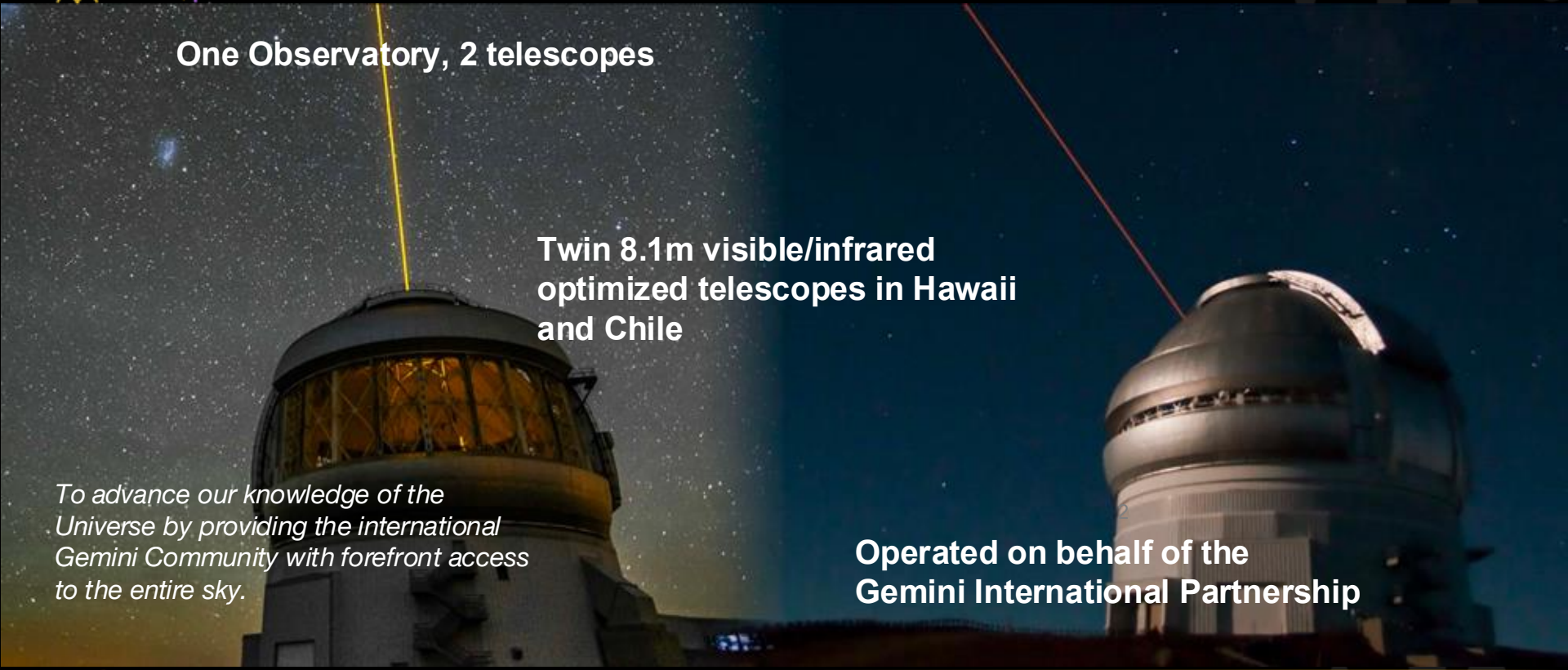

Gemini Observatory Update
Subaru Users Meeting 2026
Scott Dahm, Director, Gemini Observatory
18 June 2026

International Gemini Observatory



One Observatory, 2 telescopes

Twin 8.1m visible/infrared optimized telescopes in Hawaii and Chile

To advance our knowledge of the Universe by providing the international Gemini Community with forefront access to the entire sky.

Operated on behalf of the Gemini International Partnership

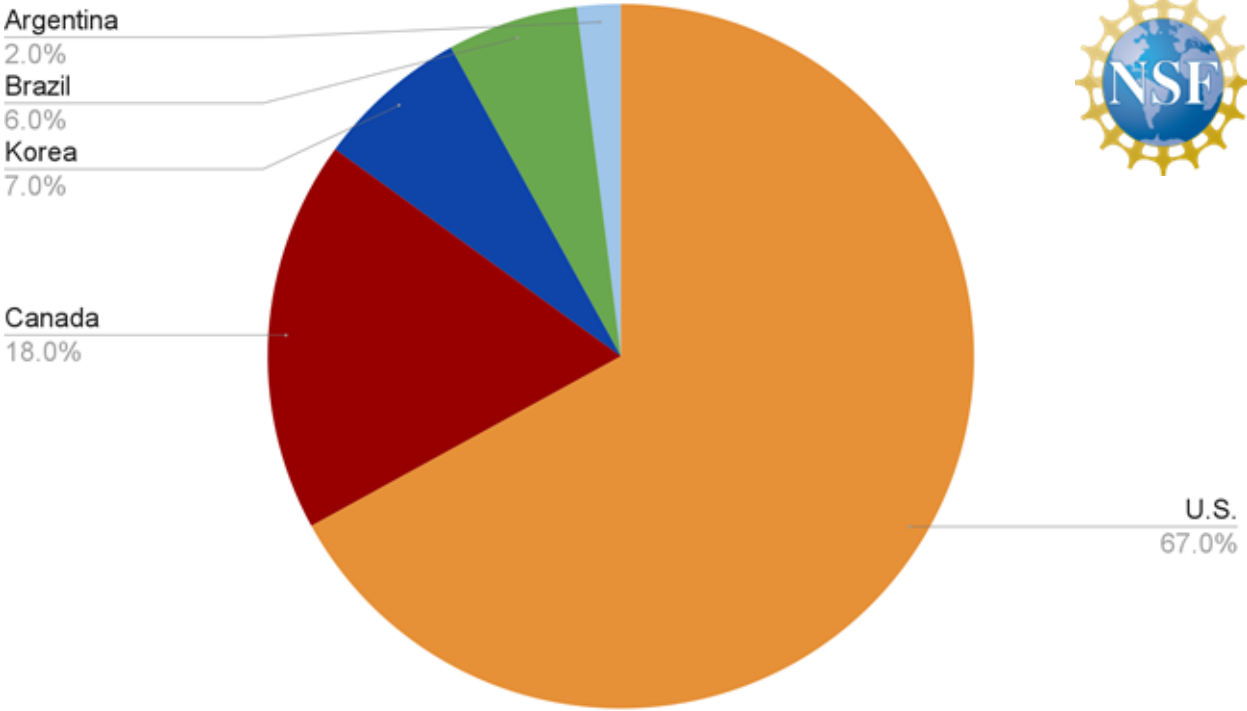
INTERNATIONAL GEMINI OBSERVATORY

NRC·CNRC

Ministerio de Ciencia, Tecnología e Innovación Argentina

Korea Astronomy and Space Science Institute

Gemini International Partnership 2022-2027



National Science Foundation

NRC·CNRC

한국천문연구원
Korea Astronomy & Space Science Institute

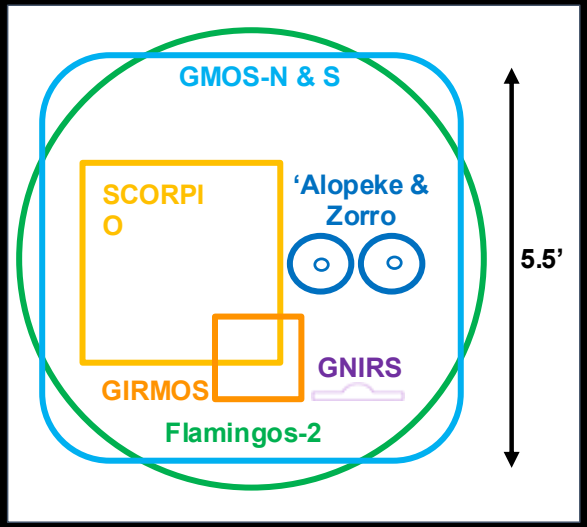
Ministerio de Ciencia, Tecnología e Innovación
Argentina

Agencia Nacional de Investigación y Desarrollo
Ministerio de Ciencia, Tecnología, Conocimiento e Innovación
Gobierno de Chile

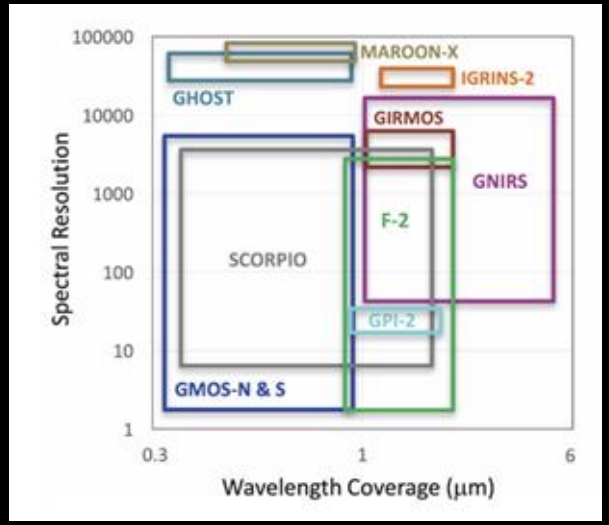
LNA LABORATÓRIO NACIONAL DE ASTROFÍSICA
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO
GOVERNO FEDERAL
BRASIL
UNIÃO E RECONSTRUÇÃO

Gemini's Instrument Capabilities

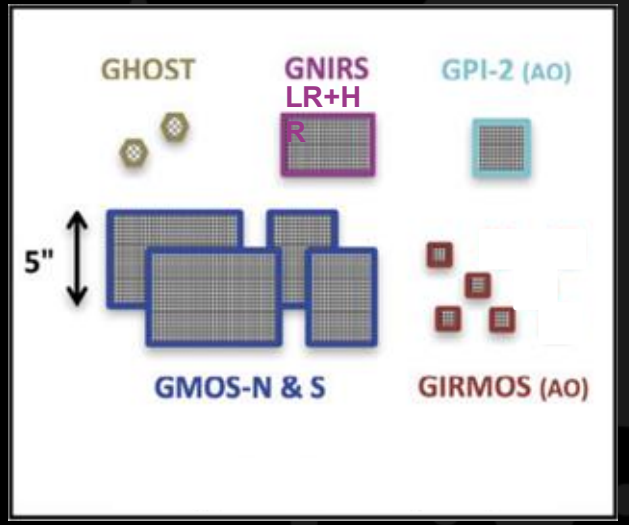
Imaging



Spectroscopy

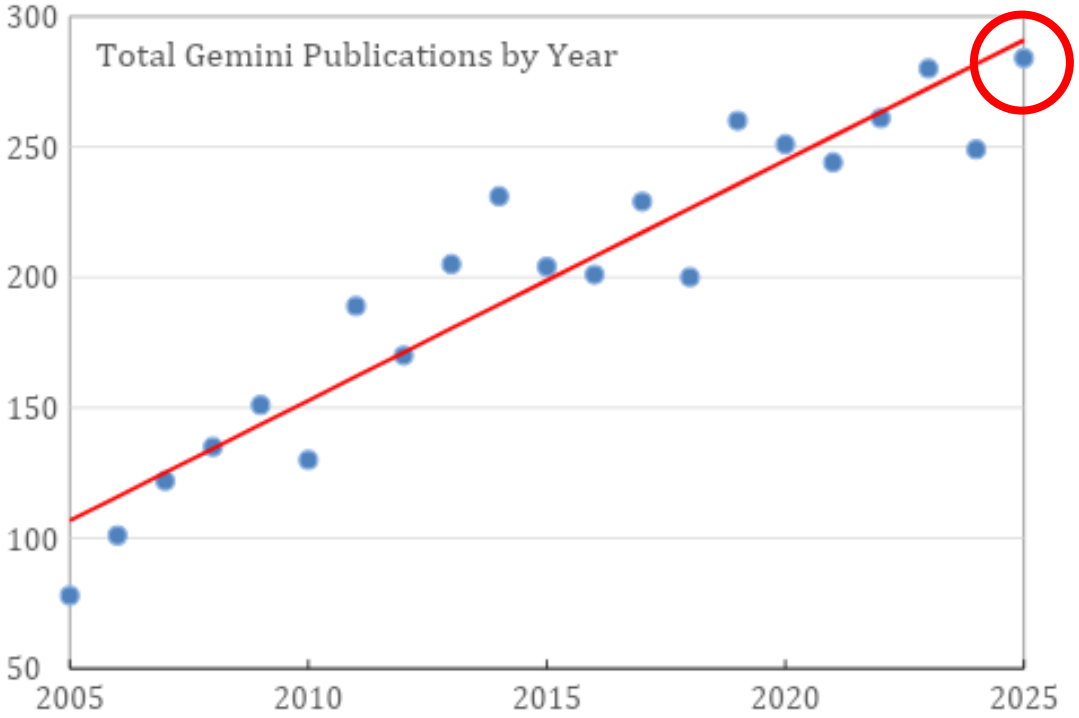


IFU



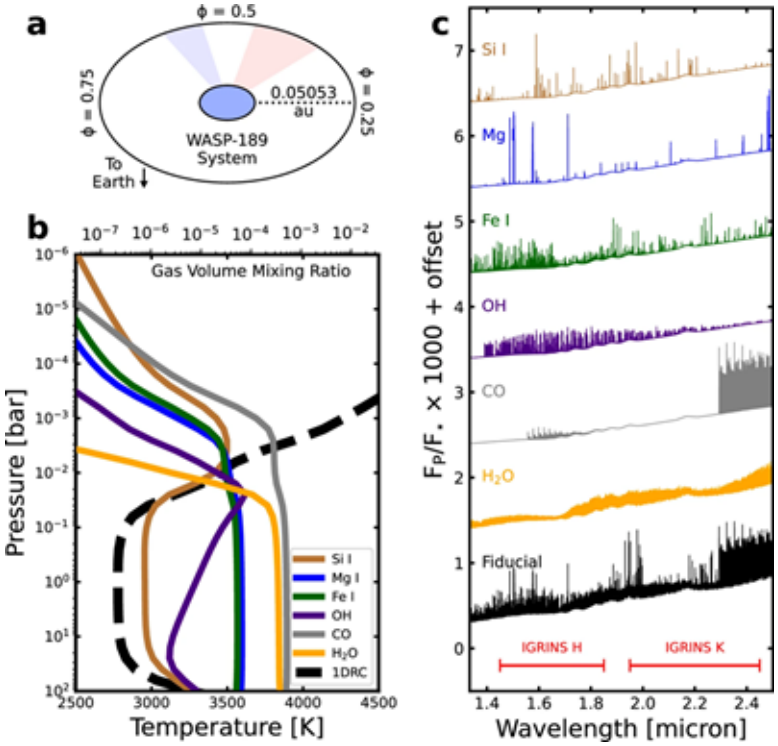
Gemini's Annual Publication Rate

- CY2025 closed with an all-time record of 284 refereed publications!
- Publication rate continues to increase an average of 9.2 papers per year.
- CY2026 is off to a record start with 139 refereed publications to date with more in press.

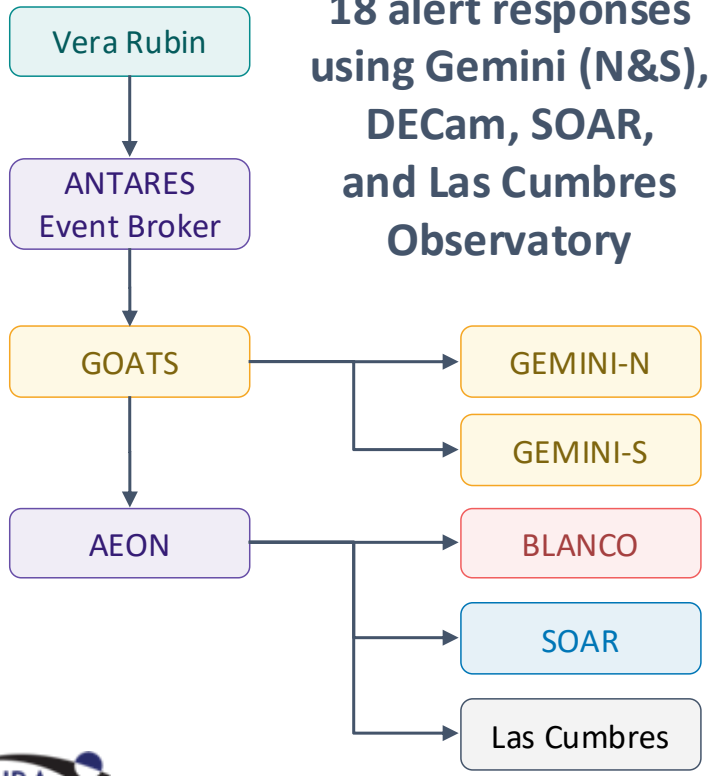


Nature: *A Stellar magnesium to silicon ratio in the atmosphere of an exoplanet*

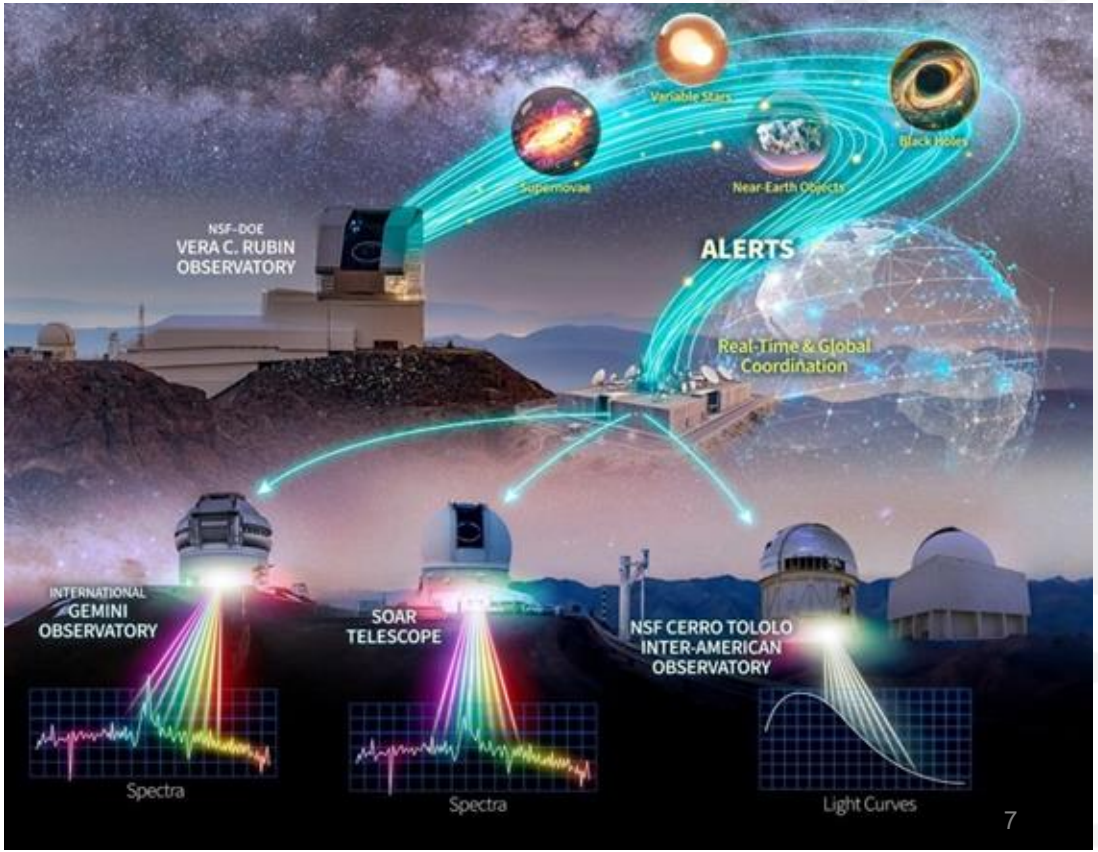
- Sanchez et al. (2026) used IGRINS on Gemini South to determine abundance estimates for O, C, Fe, Mg, and Si in WASP-189b relative to the host star.
- The abundances of O and C are slightly substellar while the refractory species are stellar within uncertainty.
- The refractory to volatile ratio is enhanced by a factor of two.
- Findings demonstrate that giant-planet atmospheres can preserve stellar-like rock-forming ratios.



First Real-Time Rubin Alert Stream Test



18 alert responses using Gemini (N&S), DECam, SOAR, and Las Cumbres Observatory



mm:ss

00:00 Rubin Shutter Closes

00:20 Image Ingest at USDF at SLAC

02:00 Prompt Processing Complete

02:00 Alerts Sent to Antares

04:00 Alerts Processed by Antares

06:00 PI Selects Targets

07:00 GOATS Generates Observing T

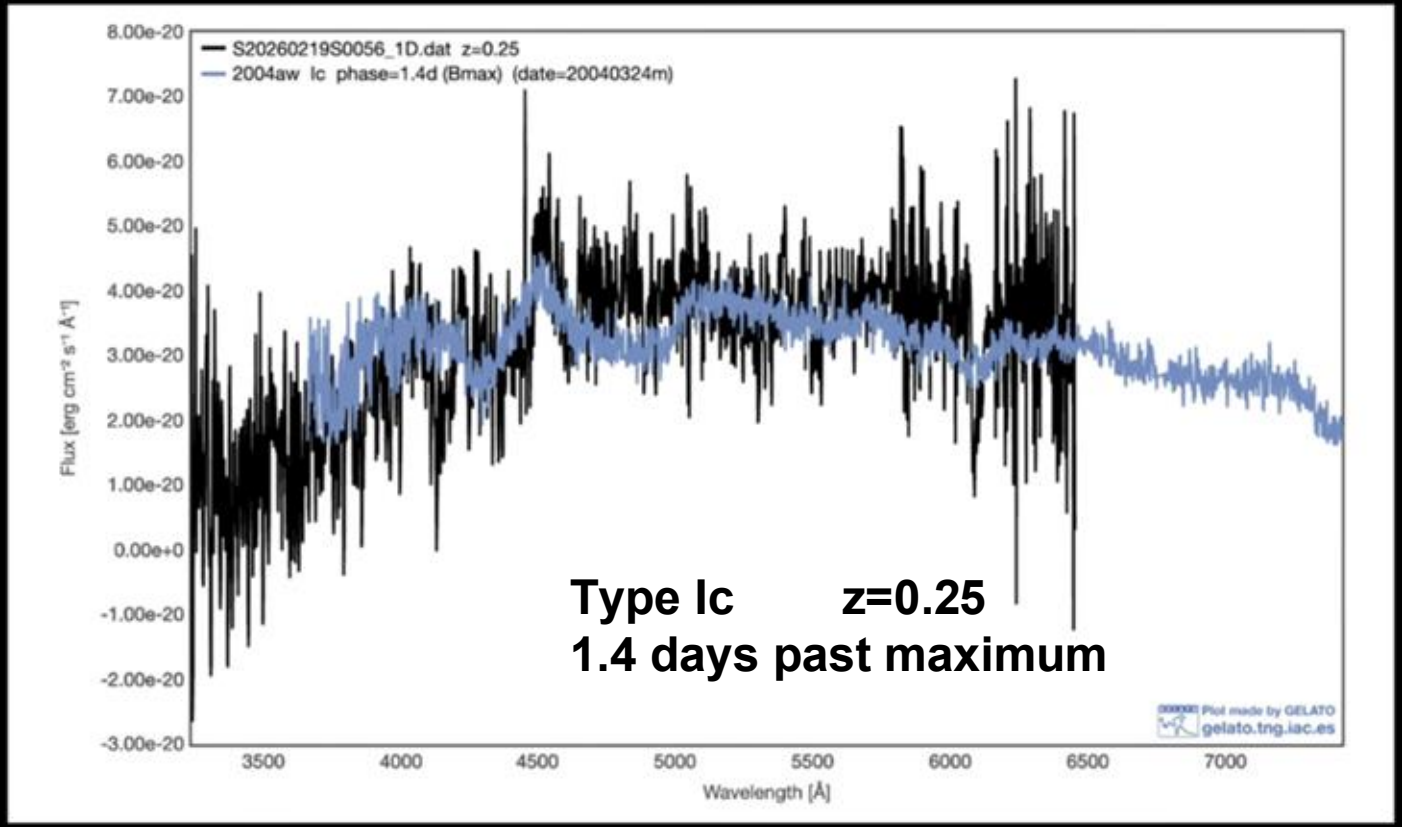
08:00 Gemini Executes Observing Template

12:00 Gemini Slews to Target, Sets up

12:00 GMOS Shutter Opens

Early SNe i < 23.0

Spectrum with Redshift & Classification!



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12:00 GMOS Shutter Opens

10-20 Minutes from Rubin Exposure to Follow-up Shutter Open

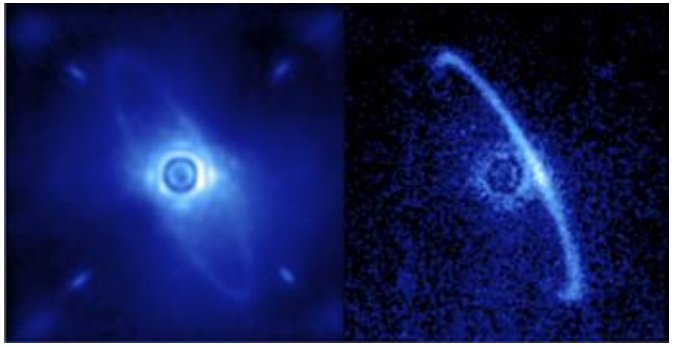
Quick Look Reduction Immediately Follows

As fast as *30-40 Minutes* from Rubin Exposure to reduced Gemini spectrum!

GPI-2

Science Cases:

- Lower mass planets around younger stars
- Higher mass planets around older stars
- Characterization of the distribution peak of giant planets around solar-type stars
- Differentiate between cold-start (core accretion) and hot-start (disk collapse) formation models
- Very young stars and transitional disks



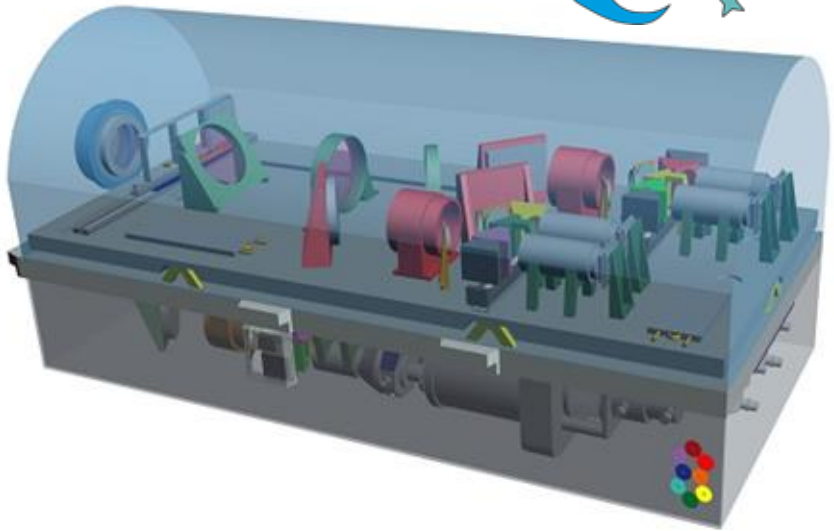
Capability:

- AO operable 0-14th mag, with a graceful degradation after 13th mag
- Strehl ratio 0.9 for stars brighter than H=12
- Contrast ratio 107 at separations 0.2-1.0"
- Wavelength range 0.97-2.4μm
- Options
  - coronagraphy (APLC)
  - direct (no APLC)
  - non-redundant mask (NRM)
- IFU spectroscopy
  - 2.7" square field of view
  - 0.014" per lenslet spatial sampling
- Polarimetry

SCORPIO

Primary Instrument for Rubin Follow-up

- LSST Transients
- Gravitational Wave Sources
- Gamma-Ray Bursts
- Supernovae
- Black Hole Sources
  - X-Ray Binaries
  - Active Galactic Nuclei
  - Tidal Disruption Events
- Neutron Stars & White Dwarfs
- Extrasolar Planets
- Small Solar System Bodies
- Pulsating Variable Stars
- Low-Mass Binaries
- Brown Dwarfs
- Massive Stars
- Supernova Remnants
- Microlensing



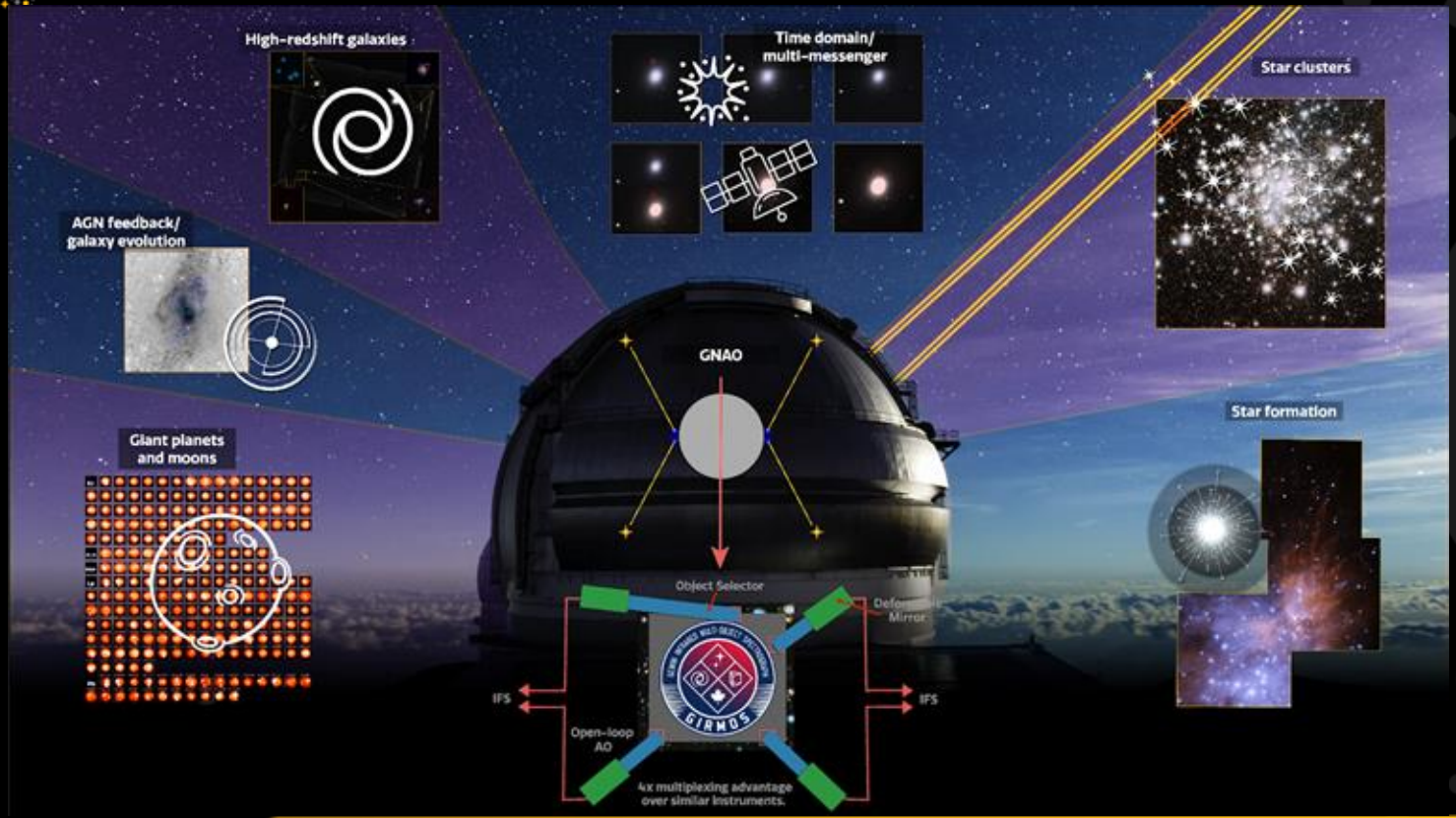
Imaging mode

- 8-channel imager
- g, r, i, z, Y, J, H, and K_S bands
- 3'x3' field of view
- 0.18" pixel same for all cameras

Spectroscopic mode

- 8-channel spectrograph
- simultaneous 0.385-2.35 um
- R ~ 4,000 @ 3 pixel sampling
- 3' long slits

Gemini North Adaptive Optics System



Gemini North Adaptive Optics System

LGSF CDR - Sep 2025 ✅
GNAO AOB CDR - Apr 2026 ✅
AOS CDR - Sep 2026
GNAO Facility CDR - Nov 2026
GNAO Integration Readiness Review - Dec 2028
GNAO First Light - Jan 2029

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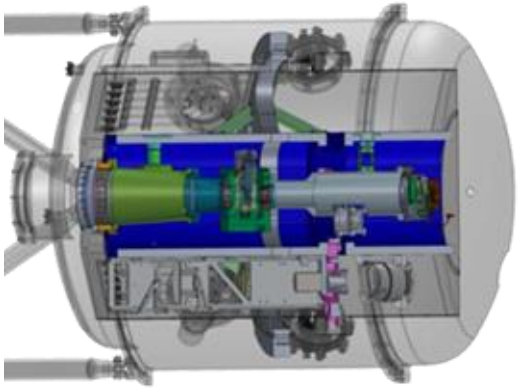
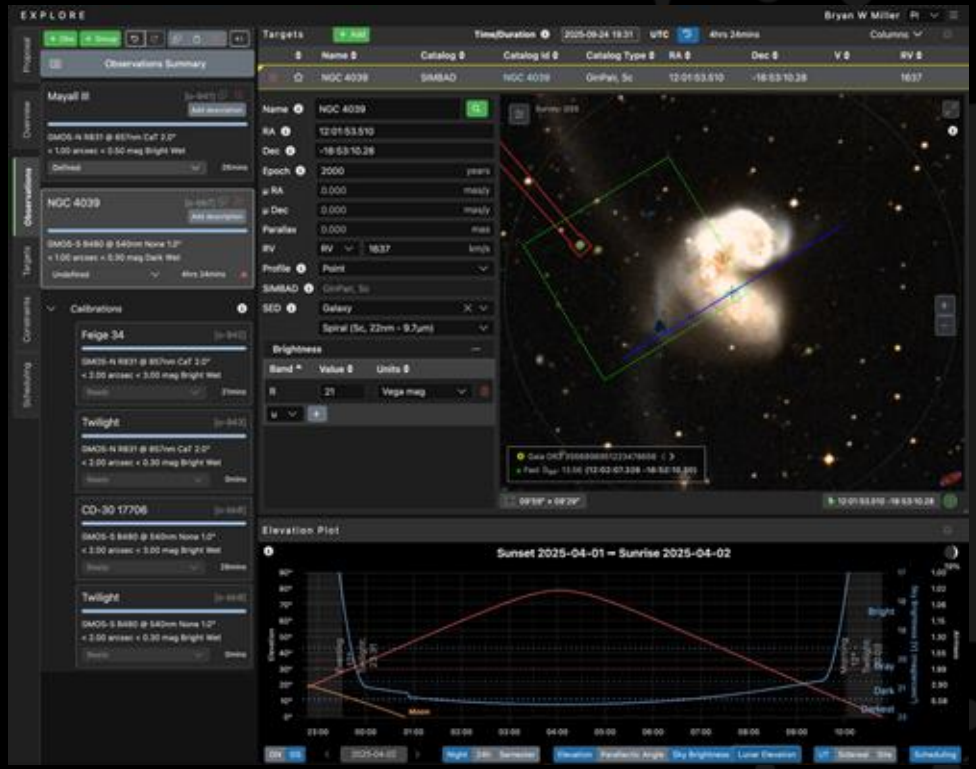
GIRMOS

- The Gemini Infrared Multi-Object Spectrograph (GIRMOS) is an adaptive optics-fed multi-object integral field spectrograph with a parallel imaging capability. GIRMOS offers the ability to observe up to four objects simultaneously at high angular resolution.
- The project is being led by the University of Toronto (UofT) and is being funded through a Canadian Foundation for Innovation award.
- Gemini remains committed to the success of GIRMOS as the primary instrument for GNAO.



Gemini Program Platform (GPP)

- For more than two decades, the Gemini Observatory Control System (OCS) has supported proposal preparation, observation definition, queue planning, and nighttime operations.
- The Gemini Program Platform (GPP) is a next-generation, web-based operational platform that will replace the current OCS. GPP modernizes the user experience and fundamentally improves the flexibility and efficiency of Gemini.
- https://explore.gemini.edu
- An automated real-time scheduler for both telescopes, and a single observing database.



DRAGONS

Data Reduction for Astronomy from Gemini Observatory North and South

- **01 April 2026** - Released **DRAGONS 4.2**, which supports the following modes:
  - All optical and NIR imager: GMOS, GSAOI, NIRI, F2, GNIRS Keyhole
  - All optical spectrographs: GMOS LS including nod and shuffle, GHOST
  - NIR spectrographs: GNIRS LS, GNIRS XD, F2 LS
  - The only modes on facility instruments not supported by DRAGONS are MOS and IFU modes

- Developing pipelines for IGRINS-2 and SCORPIO

- **Archive**: Reduced data products available for GHOST, GMOS LS and GMOS imaging in the archive

Outreach & Community Engagement

- **Journey Through the Universe**

- **Shadow the Scientist**

July 8 – a dedicated session to new Gemini users.

Questions?