

Gemini Program Platform

An Early Look at Gemini / NOIRLab's Next Generation Observing System

AAS 240
Exhibitor Theater
2022-Jun-16 @ 9am

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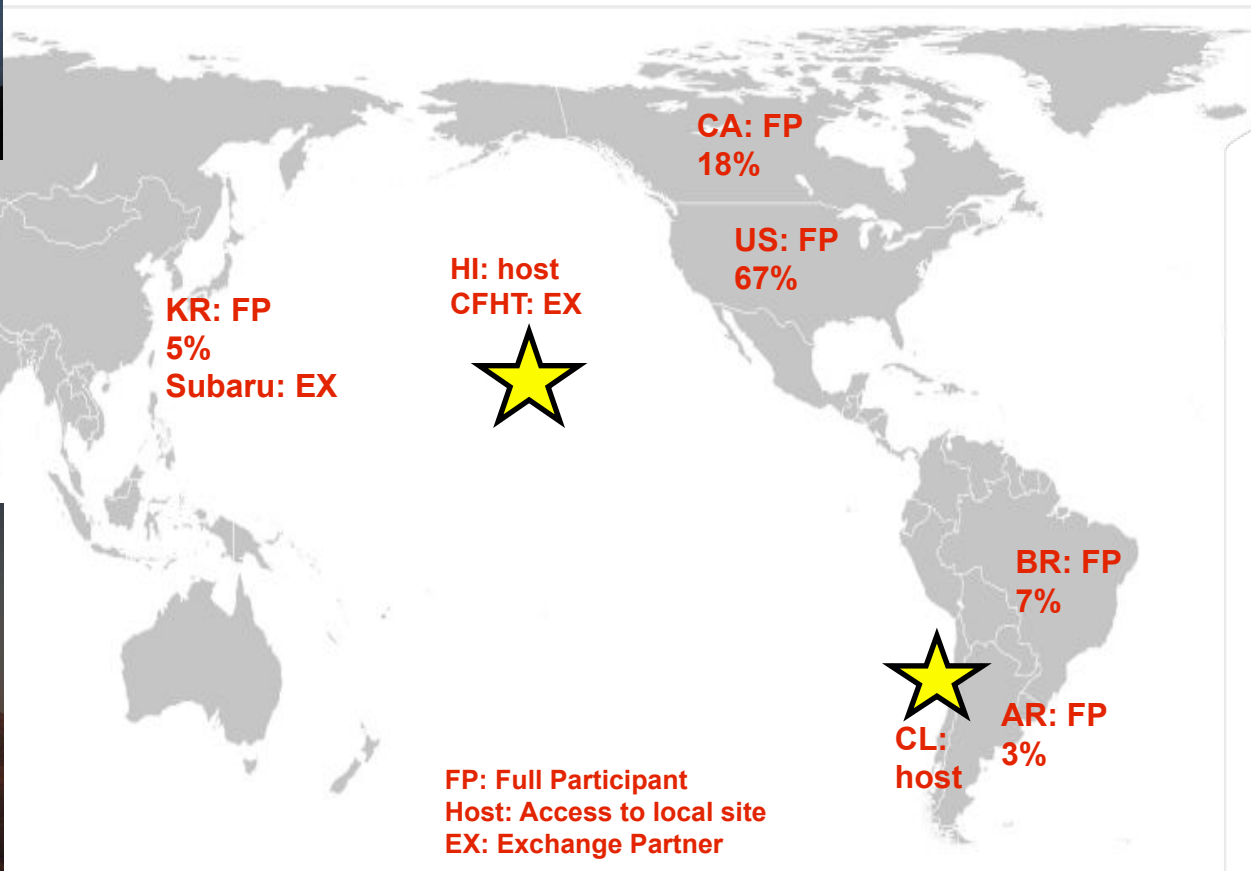
Gemini: twin 8-meter telescopes with coverage of both hemispheres



Gemini North in Hawaii



Gemini South in Chile



Gemini supports four facility instruments + AO at each site.
(three + AO may be installed on the telescope)

Gemini North

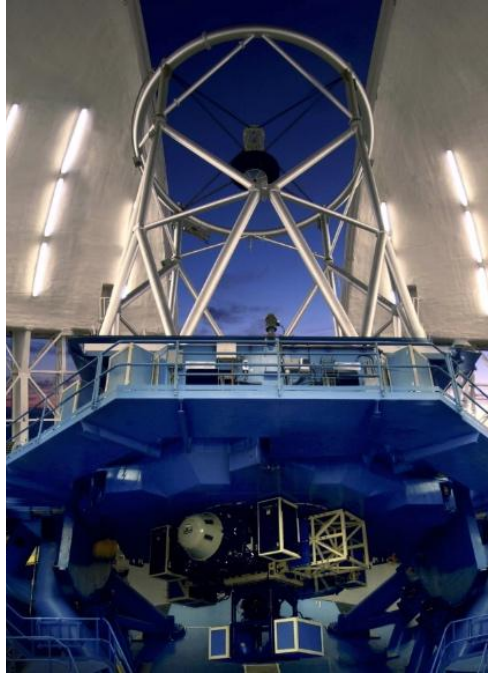
GMOS-N

GNIRS

NIFS

NIRI

ALTAIR (NGS & LGS)



Gemini South

GMOS-S

FLAMINGOS-2

GSAOI

GeMS (MCAO) LGS (5)

+Visitor instruments: `Alopeke & Zorro, GRACES, IGRINS, MAROON-X

Proposal Types

Regular Semester: (*once per semester*)

Through the National Time Allocation Committees (NTACs)

For regular proposals

(oversubscription: ~2)

~70%

Large & Long Programs: (*once per year*)

Through the Large Program TAC

For large and/or long **ambitious** proposals (up to 6 sem)

(oversubscription: >5)

20%

Fast Turnaround: (*once per month*)

Peer reviewed

For short, immediate, trial, and/or follow-up proposals

(oversubscription: ~2)

10%

Director's Time: (*any time*)

Chief scientist/Director approval

For short, urgent projects

<5%

Poor Weather: (*any time*)

Head of Science Operations approval

For the worst conditions, bright targets

Observing modes

Queue: (time domain, special conditions)

You submit your observations, we observe for you

You can look over our shoulders by *eavesdropping!*

95%

Classical/Visitor: (special configurations, real-time decisions)

You visit the observatory and conduct your observations

5%

Priority Visitor Observing:

Come during a block, pick & choose the best time for your observations! Queue backup

Base Facility Operations:

Most observing is from the sea level facilities.

Remote observing by PIs is not currently offered

The current PIT and OT have been in use for nearly 20 yrs

- Phase I Tool (PIT) - proposal submission
 - Observing Tool (OT) - Observation preparation, execution, time accounting
 - Many needed usability and infrastructure changes cannot be done with the current software.
- ⇒ Time to start fresh!

PIT

File Edit View Catalog Help

Overview

Title: Molecular Hydrogen Excitation in Actively Star-forming Dwarf Galaxies

Abstract: We propose to observe a small sample of weak-continuum, dwarf galaxies to investigate the excitation of molecular hydrogen in massive star-forming complexes. In the usable fraction of our previous allocation we were able to observe one of our targets, NGC5461. This dataset unambiguously shows that the gas is excited in low density photo-dissociation regions, contrary to the widespread assumption in the literature that the H2 in galaxies is Galaxy evolution

Category: Galaxy evolution

Keywords: 3 Selected: Dwarf galaxies; Emission lines; Starburst galaxies

Attachment: GeminiDemo_14B.pdf (in folder proposal_example)

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Observations

Group by:	Conditions	Resources	Targets	Time	Guiding	Vis	GOA
CC 50%/Clear, IQ 70%/Good, SB Any/Bright, ...							
GMRS Spectroscopy 0.15"/pix 111 /mm...							
Haro2				2.50 HR	100%		
Haro3				3.75 HR	100%		
IZw40				10.00 HR	100%		
CC 70%/Cirrus, IQ 85%/Poor, SB 50%/Dark, W...							
GMOS-N LongSlit R831 OGS15 (> 520 n...				2.20 HR	94%		
ICZ574							

Sum observation times: 18.45 hr

Observations Band 3 Targets

Problems

Description	Section

OT

Gemini OT - [GS-2017A-SV-999] Test Proposal

File Edit View Go Tools

Open Prev Back Forward Next Cut Copy Paste Plot Image Libraries Apply Reapply Queue Conflict Sync

Observation

Test Proposal

COMPLETING PHASE II

Templates

Group

Note

Component

Iterator

Observe

Target Environment

Use this component to enter the base position and wave front sensor targets for this observation.

Type	Tag	Name	RA	Dec	Dist	B	g	V	UC	r
Base		NGC55	00:14:53.602	-39:11:47.86						21.5
Auto		GMOS OWFS (1)	255-000256	00:15:03.765	-39:08:04.07	4.22	15.461	14.973	14.609	14.578

Scheduling

General

Type: Sidereal Target

Name: NGC55

RA: 00:14:53.602 J2000

Dec: -39:11:47.86

Motion

μ RA: 0 mas/year

μ Dec: 0 mas/year

Epoch: 2000 years

Parallax: 0 mas

z: 0.00043

Magnitudes

21.5 r AB

21.0 l Vega

Source

Spatial Profile: Point Source

Spectral Distribution: Library Star

K0III

What is the Gemini Program Platform (GPP)?

- A suite of web-based applications for proposal submission, observation editing, observation execution, and logging. They are oriented toward science goals and automation rather than low-level instrument configurations.
- An automated real-time scheduler for both telescopes.
- A single observing database in the cloud.
- A collection of secure web APIs to all services to facilitate advanced user tasks, reporting, and automation.
- “Explore” is the primary application - it will be used for capability discovery, proposal preparation & submission, and observation preparation

Today (without Explore)	With Explore
Read web pages to investigate instruments and their capabilities	Enter what you need for your science (wavelength, spectral resolution, etc)
Use the ITC web-form to calculate how much time you will need.	Enter your desired S/N
Download the Phase-I Tool to write and submit your proposal	No download required. Enter your abstract, attach your PDFs, and click “submit”
Download the Observing Tool and use templates and follow examples to construct your observations	No download required and your observations are automatically generated.

Today (without Explore)	With Explore
You will have separate programs for Gemini North and Gemini South	One program will include observations for both telescopes
Iterate with your contact scientist to check every change	Simple changes require no human checking
You must keep your acquisitions and calibrations synchronized with your science observations	Acquisitions and calibrations are integrated and will always have the correct configuration
Include a note about any relative scheduling of your observations	Use a logical scheduling group
Make sure your standard stars are a good match	Standard stars are automatically selected to yield the optimal match

Explore

Capability discovery, proposal & observation preparation

- On-source constraints
- Built-in ITC
- Automatic sequence generation
- Embedded calibrations
- Logical AND / OR groups
- North & South in same program
- Bulk editing, undo, built-in help
- Proposal resubmission

The screenshot shows the 'Explore' web interface for proposal preparation. The top navigation bar includes 'Explore', 'Create Proposal', and a user profile 'anonymous'. The left sidebar has tabs for 'Overview', 'Observations', 'Targets', 'Constraints', and 'Configurations'. The main content area is divided into several sections:

- Overview:** Shows 5 Observations and 7.73 hrs. Includes a search bar and an 'Observations Summary' section with a list of targets: 1: NGC 1055 (GMOS-N R831 1x300", <0.8" <0.3 mag Dark, 2.30 hrs), 2: NGC 7752 (GMOS-N R831 1x300", <0.8" <0.3 mag Dark, 1.2 hrs), 3: NGC 1068 (GNIRS SXD 0.6", <0.8" <0.3 mag Bright, 2.4 hrs), 4: NGC 1087 (GMOS-N R831 1x300", <1.0" <0.5 mag Gray, 1.83 hrs), and 5: NGC 1087 (GMOS-S R831 1x300", <1.0" <0.5 mag Gray, 1.83 hrs).
- Note for Observer:** Target: NGC 1055. Type: Sidereal. Name: NGC 1055. Coord: 02:41:45.233 +00:26:35.45. Profile: Point Source. SED: nova.sed. Magnitudes: 22.8 B Vega, 22.0 V Vega, 21.5 R Vega. Includes a night elevation graph and a target image.
- Constraints:** IQ<0.8" CC<0.3mag. Image Quality: < 0.8 arcsec. Sky Background: Dark. Elevation: None. Contrast: None. Cloud Cover: < 0.3 mag. Water Vapor: Any. Strehl: None. Includes a 'Set Timing Windows' button.
- Configuration:** Mode: Spectroscopy. Wavelength: 650 nm. S/N: 33 at 656.28 nm. Focal Plane: Single Slit 60 arcsec. Capabilities: None. Includes a table of 'Matching Configurations' and an 'Advanced Configuration' button.
- ITC:** Target: NGC 1055. Wavelength: 650 nm. S/N / exposure: 13.5. S/N Total: 33.5. Includes a 'Signal in 1-pixel' graph showing signal and noise levels.

Demo

Target List

Observing Requirements

Possible instrument configurations

Signal-to-Noise

Target Visibility

Observations & Calibrations

ORCID authentication

Sci & Tech Justification

Proposal Submission

Observatory Schedule & Status

Observation Status & Logs

Night Logs

