

Gemini Program Platform

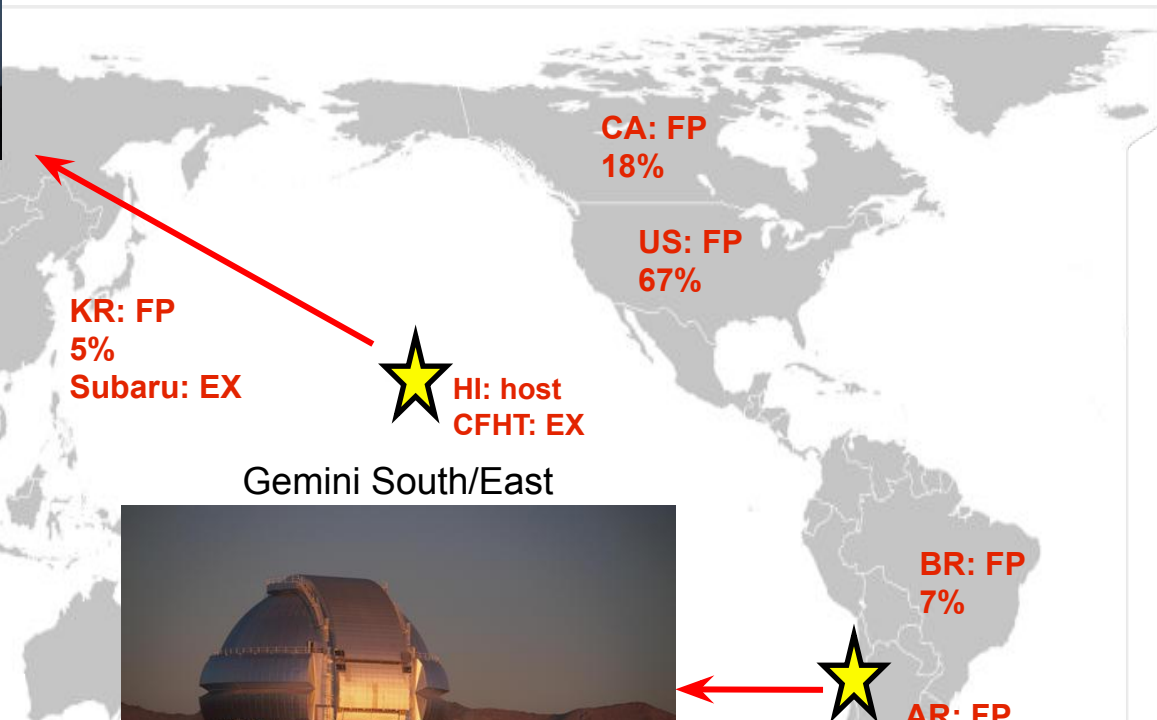
Bryan Miller, Andy Stephens, and Arturo Núñez

NSF's NOIRLab

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



Gemini North/West



Gemini South/East



FP: Full Participant (NGO)
Host: Access to local site (NGO)
EX: Exchange Partner

Gemini supports four facility instruments + AO at each site. Up to three + AO at a time in *queue*.

Gemini North

Optical

GMOS-N

GNIRS

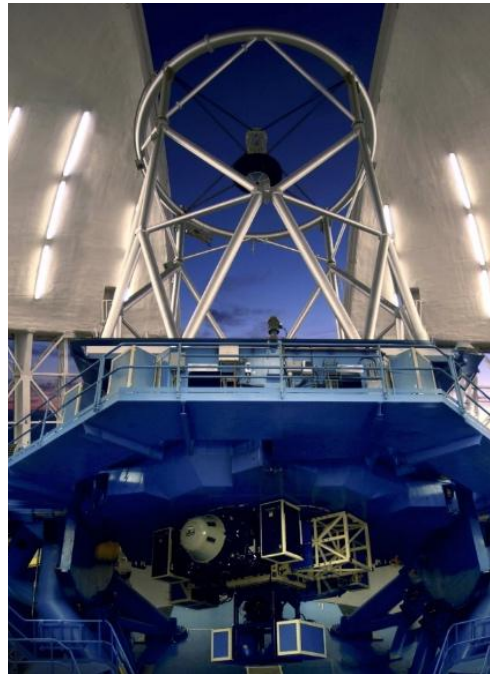
Near-IR

NIFS

NIRI

AO

ALTAIR
NGS & LGS



Gemini South

GMOS-S

FLAMINGOS-2

GSAOI

GeMS (MCAO)

LGS (5)

Visitor instruments

`Alopeke/Zorro, IGRINS, MAROON-X

Proposal idea? We accept all sizes on a variety of timescales.

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

Fast Turnaround: *once per month*

Peer reviewed, no fixed TAC

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

(oversubscription: ~2)

10%

Semester Process: *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%

Gemini offers a variety of observing modes

Queue mode: (time domain, special conditions)

You submit your observations, we observe for you

You can look over our shoulders by *Eavesdropping!*

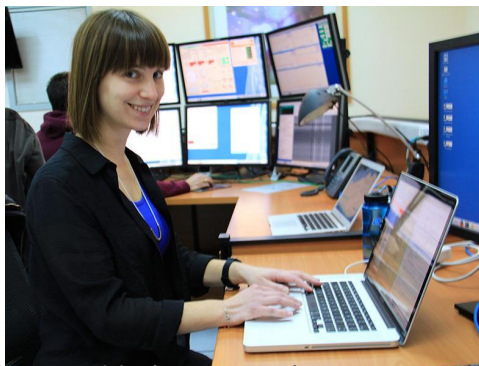


95%

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

You visit the observatory and conduct your observations

5%



Allison Noble (U.Toronto) at Gemini South

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 proposal and program preparation tools have been in use for nearly 20 years

While many improvements have been made, e.g.

- Automatic guide star selection
- smartGCAL
- Phase 2 templates
- ITC integration

many changes that we want/need cannot be done with the current software.

The screenshot displays the Gemini OT software interface for a test proposal. The main window is titled "Gemini OT - [GS-2017A-SV-999] Test Proposal". It features a menu bar (File, Edit, View, Go, Tools) and a toolbar with icons for file operations, navigation, and application. The interface is divided into several panels:

- Observation Panel:** A tree view showing the proposal structure, including "COMPLETING PHASE II", "Templates", "Baseline: GMOS-S MOS B600_G", "NCGS5 - [1] GMOS-S MOS B600", and various observation sequences for GMOS-S at different wavelengths (520nm, 530nm, 540nm) and configurations (Observe (1X), Flat, Arc).
- Target Environment Panel:** A table for entering base position and wave front sensor targets. The table has columns: Type, Tag, Name, RA, Dec, Dist, B. The target "NGCS5" is listed with RA 00:14:53.602 and Dec -39:11:47.86.
- Scheduling Panel:** A section for setting observation parameters, including "Auto Guide Search: Default".
- Gene Panel:** A panel for proposal details, including "Overview" and "Observations".

The "Overview" section contains the following text:

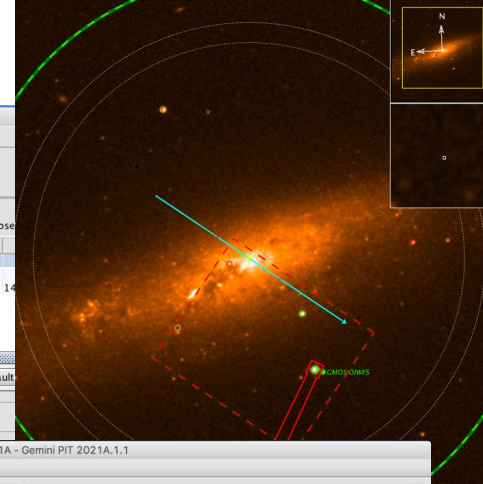
Title: Molecular Hydrogen Excitation in Actively Star-forming Dwarf Galaxies
Abstract: We propose to observe a small sample of weak-continuum, dwarf galaxies to investigate the excitation of molecular hydrogen in massive star-forming complexes. In the usable fraction of our previous allocation we were able to observe one of our targets, NGCS461. 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...

The "Observations" table lists the following data:

Group by:	Conditions	Resources	Targets	Item	Time	Guiding	Vis	GOA
CC 50%/Clear, IQ 70%/Good, SB Any/Bright, ...				GNIRS Spectroscopy 0.15"/pix 111 l/mm...				
				Haro2				
				Observation	2.50 HR	100%		
				Haro3				
				Observation	3.75 HR	100%		
				lizw40				
				Observation	10.00 HR	100%		
CC 70%/Cirrus, IQ 85%/Poor, SB 50%/Dark, W...				GMOS-N LongSlit R831 OGS15 (> 520 n...				
				IC2574				
				Observation	2.20 HR	94%		

The "Gene" panel shows an "Overview" section with a table of contact information:

Name	Institution	Phone	Email
Jennifer Lotz	Gemini Observatory ...	+1 520 555-9...	jlotz@gemini.edu
Phil Puxley	Gemini Observatory ...	+56 51 555555	ppuxley@gemini...
Matt Mountain	Gemini Observatory ...	+56 51 555556	mmountain@gem...
Jean-René Roy	Gemini Observatory ...	+56 51 255 55...	jroy@gemini.edu
Doug Simons	Gemini Observatory ...	1 808 974 5556	dsimons@gemini...



The Gemini Program Platform (GPP) is the core project of the OCS Upgrades Program that will replace the Phase I Tool (PIT) and Observing Tool (OT).

It will consist of several web applications connecting to a central database:

Dashboard: access to all of a user's proposals & programs; notifications, telescope status; possibly a communications center.

Explore: Proposal/observation preparation and nighttime observing

Chronicle: Nightlog, Obslog, Quality Assessment, Time Accounting

Observe: Updated web seqexec (main observer tool, executes observations)

Browse: Advanced program browser

Schedule: Web interface to the automated queue scheduler

OCS Upgrades/GPP address the current limitations

Main Limitations	Solutions
Phase 2 is difficult - large learning curve	Automatically create full, executable observations
ITC not well integrated	ITC fully integrated
Calibrations disjoint from science	Calibrations created automatically based on science
Cannot easily move observations between sites	Single ODB, programs can contain observations for GN and GS
Heavy staff workloads - Phase 2 checking and queue planning	No checking needed for automatically-generated sequences
Limited efficiency if lots of changes during the night (e.g. ToOs, unstable weather, faults)	Automatic real-time scheduling
Limited programmatic access (APIs)	More capable suite of APIs, AEON compatible
Difficult to make changes, fix bugs, slow release cycle	Continuous integration and deployment, common database infrastructure (PostgreSQL)
Limited by existing libraries, need to produce desktop apps	Web-based apps, independent of user OS

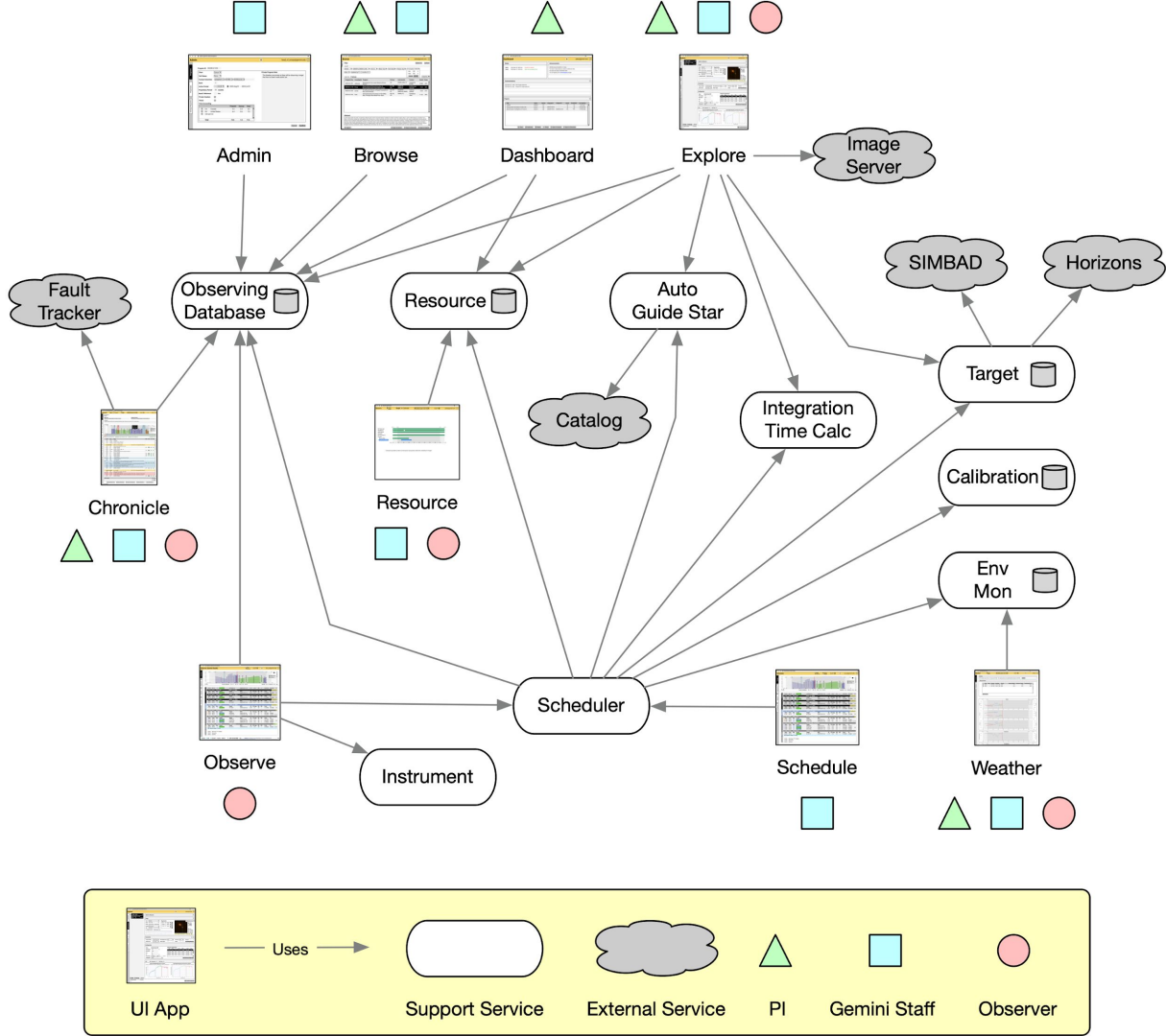
User Interfaces

External:

- Explore
- Dashboard
- Browse
- Chronicle
- Weather

Internal:

- Observe
- Resource
- Schedule
- Admin



Observations View

Lists each observation

Shows important info about each

Create an observation:

1. Enter target
2. Enter (delivered) constraints
3. Enter configuration
4. Select a matching configuration
5. Done!

Explore anonymous

Overview Observations Targets Constraints Configurations

1: NGC 1055
GMOS-N R831 1"x300"
New 1.22 hrs

Note for Observer

Target

Type: Sidereal
Name: NGC 1055
Coord: 02:41:45.233 +00:26:35.45
Profile: Point Source
SED: nova.sed

Magnitudes

14.3 B Vega
12.095 J Vega
11.513 H Vega

Night Elevation Semester Vis

DSS2 Gemini
 OIWFS
 PWFS1
 PWFS2
 FOV
 Guiding
 Catalog
 Offsets

02:41:45.233 +00:26:35.45 15-Oct-2022

Constraints

Image Quality: < 0.8 arcsec
Sky Background: Gray
Elevation: None
Contrast: None
Cloud Cover: < 0.3 mag
Water Vapor: Any
Strehl: None
Set Timing Windows

Configuration

Mode: Spectroscopy

Wavelength: 715 nm
 $\lambda / \Delta\lambda$: 1600
S/N: 40
 λ Range: 200 nm
Focal Plane: Longslit 60 arcsec
Capabilities: None

Matching Configurations

Inst	Disp	R	$\Delta\lambda$	FPU	Avail	Time
GMOS-N	R831	2198	207nm	1"x300"	22A,22B	1:22
GMOS-S	R831	2198	207nm	1"x300"	22A,22B	1:22
GMOS-N	B600	1688	207nm	1"x300"	22A,22B	1:36
GMOS-S	B600	1688	207nm	1"x300"	22A,22B	1:36

Advanced Configuration

ITC S/N / exposure: 16.3 S/N Total: 40

Signal and SQRT(Background) in one pixel

Single Exp S/N BB — Final S/N BB — Signal HSC — SQRT(Background) HSC — Signal SC — SQRT(Background) SC

Intermediate Single Exp and Final S/N in aperture

Single Exp S/N BB — Final S/N BB — Single Exp S/N HSC — Final S/N HSC — Single Exp S/N SC — Final S/N SC

Obs Group 1 Observation 1.22 hrs

Create Proposal

Observations View

We have now defined several observations.

Each includes their calibrations.

OR group

Advanced Configuration

← → ↻ explore.gemini.edu/observations/1

anonymous

Explore

Overview

Observations

Targets

Constraints

Configurations

1: NGC 1055
GMOS-N R831 1x300"
New 1.22 hrs

2: NGC 7752
GMOS-N R831 1x300"
Included 1.2 hrs
Daytime Arcs

3: NGC 1068
GNIRS SXD 0.6"
Included 2.4 hrs
Telluric Standard
Telluric Standard
Daytime Pinhole

OR 1 of 2

4: NGC 1087
GMOS-N R831 1x300"
Included 1.83 hrs

5: NGC 1087
GMOS-S R831 1x300"
Included 1.83 hrs

Obs Group

5 Observations 7.51 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

14.3	B	Vega
12.095	J	Vega
11.513	H	Vega

○ Night Elevation ○ Semester Vis

DSS2 Gemini

OIWS

PWFS1

PWFS2

FOV

Guiding

Catalog

Offsets

02:41:45.233 +00:26:35.45 15-Oct-2022

Constraints

IQ<0.8" CC<0.3mag

Image Quality < 0.8 arcsec

Sky Background Gray

Elevation None

Contrast None

Cloud Cover < 0.3 mag

Water Vapor Any

Strehl None

Set Timing Windows

Configuration (Advanced)

GMOS-N Longslit R831 1x300

Name	GMOS-N R831 1x300"	Binning	2 x 2	λ Dithers	-5, 5	nm
Disperser	R831	Read Mode	Slow, Low Gain	Spatial Offsets	0, 15	arcsec
Filter	None	ROI	Full Frame	Exposure Mode	S/N	
Wavelength	715	nm	λ / Δλ	2198	S/N	40
FPU	1.0" x 300" slit	λ Coverage	612 - 819 nm	Exp Time	600	sec
Nod & Shuffle	No	Read Noise	4.1 electrons	Exp Count	6	
Position Angle	Average Parallactic	168.66 °E of N				

Sequence Editor Simple Configuration

ITC

S/N / exposure: 16.3 S/N Total: 40

Signal and SQRT(Background) in one pixel

Intermediate Single Exp and Final S/N in aperture

Signal / Number per spectral pixel

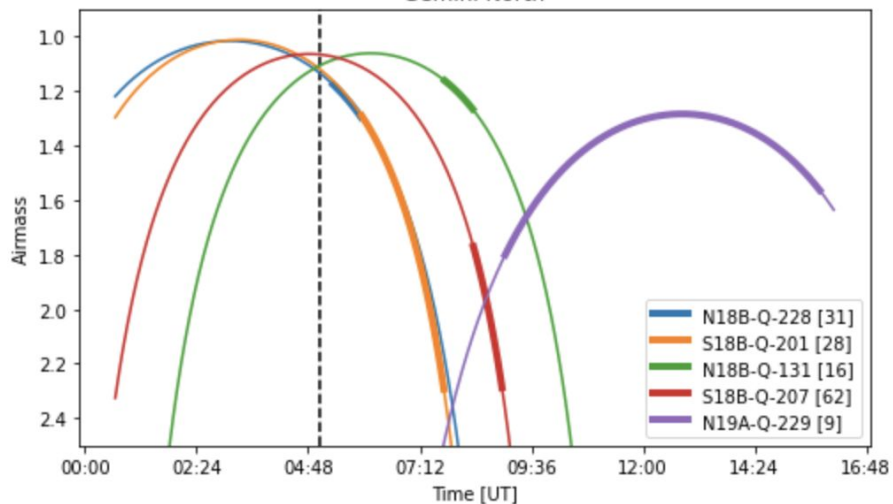
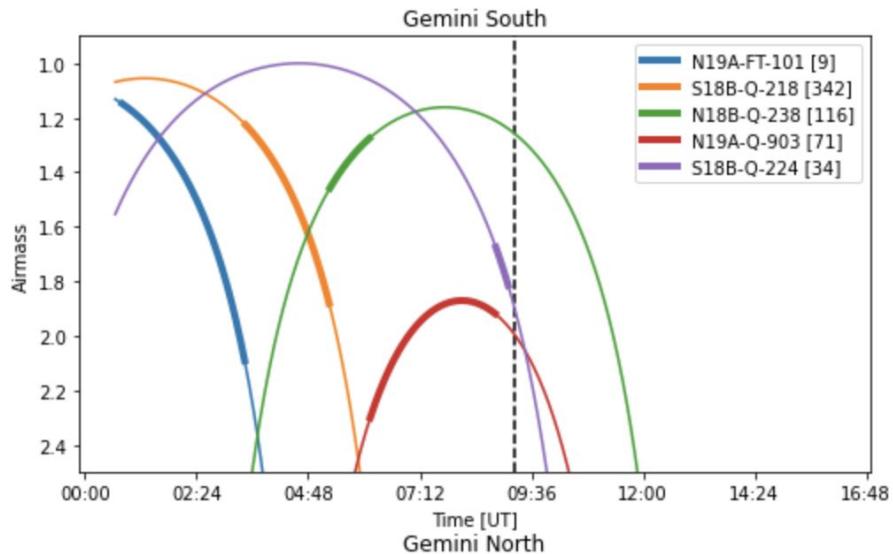
Wavelength (nm)

Create Proposal

The scheduler creates a new plan when the rToO is finished.

The new plan is displayed in the observer's tool.

Right: An example of GN and GS plans created together with a prototype scheduler using historical observations.



Targets View

Shows observations grouped by target.

Import target lists.

Copy observations.

Drag & drop of observations between targets.

← → ↻ explore.gemini.edu/targets/ngc7752 ☆ anonymous

Explore

Overview

Observations

Targets

Constraints

Configurations

5 Targets 7.51 hrs

Q

▼ **NGC 1055** 1 Obs

GMOS-N R831 1x300"

<0.8" <0.3 mag Gray

New 2.0 hrs

▼ **NGC 7752** 1 Obs

GMOS-N R831 1x300"

<0.8" <0.3 mag Gray

New 1.22 hrs

▼ **NGC 3705** 0 Obs

▼ **NGC 1068** 2 Obs

GMOS-N R831 1x300"

<0.8" <0.3 mag Gray

New 1.45 hrs

GNIRS SXD 0.60"

<0.7" <0.3 mag Bright

New 1.32 hrs

► **NGC 1087** 1 Obs

NGC 7752

Type Sidereal

Name NGC 7752

RA 23:47:04.834 J2000

Dec +29:27:32.17

Proper Motion

μ RA 0 mas/year

μ Dec 0 mas/year

Epoch 2000 years

Parallax 0 mas

RV 4926.4 km/sec

Source

Profile Point Source

SED Emission Line

λ 2.2 μm

Width 500 km/s


Flux 5E-19 W/m²

Continuum 1E-16 W/m²/μm

Magnitudes

14.3	B	Vega
12.095	J	Vega
11.513	H	Vega
11.187	K	Vega

Magnitude



23:47:04.834 +29:27:32.17 15-Oct-2022

Image DSS Gemini Show Target Catalog PWFS1

Site GN GS Plot Night Elevation Visibility 2022B

Import Targets Export Targets Create Proposal

Overview

Observations

Targets

Constraints

Configurations

▼ Good Seeing, Low Extinction

1: NGC 1055
GMOS-N R831 1x 300"
New 2.0 hrs

2: NGC 7752
GMOS-N R831 1x 300"
New 1.22 hrs

▼ Relaxed

3: NGC 1068
GMOS-N R831 1x 300"
New 1.45 hrs

4: NGC 1087
GNIRS SXD 0.60"
New 1.87 hrs

⊕ Obs ⊕ Const 🗑️ 🗑️

2 Constraints 6.60 hrs

🔍

Good Seeing, Low Extinction

Name: Good Seeing, Low Extinction

Image Quality: < 0.8"

Cloud Extinction: < 0.3 mag

Moon Background: Gray

Water Vapor: Unconstrained

Elevation: < 2 airmass

Strehl: None

Contrast: None

Timing Windows

Open on 2020-Sep-01 @ 12:00 UT and close on 2020-Sep-03 @ 12:00 UT

Open on 2020-Sep-05 @ 12:00 UT, remain open for 24h, repeat 2 times with a period of 48:00

Open on 2020-Sep-01 @ 12:00 UT and: 📄 Import Timing Windows

Remain open forever

Close on 2020-Sep-03 @ 12:00 UT

Remain open for HH:MM

Repeat with a period of HH:MM:SS

Forever

N times

Constraints View

Shows observations grouped by constraints.

Import timing windows.

Copy observations.

Drag & drop observations between constraints.

Overview

Observations

Targets

Constraints

Configurations

GMOS-N R831 1x300"

1: NGC 1055
 <0.8" <0.3 mag Gray
 New 1.22 hrs

2: NGC 7752
 <0.8" <0.3 mag Gray
 New 1.22 hrs

GNIRS SXD 0.60"

3: NGC 1068
 <0.8" <0.3 mag Bright
 New 1.45 hrs

4: NGC 1087
 <0.8" <0.3 mag Bright
 New 1.87 hrs

Obs Config

2 Configurations 6.60 hrs

🔍

GMOS-N R831 1x300"

Mode

Wavelength nm

$\lambda / \Delta\lambda$

S/N

λ Range nm

Focal Plane 60 arcsec

Capabilities

Matching Configurations

Inst	Disp	R	$\Delta\lambda$	FPU	Avail	Time
GMOS-N	R831	2198	207nm	1"x300"	20A,20B	1:22
GMOS-S	R831	2198	207nm	1"x300"	20A,20B	1:22
GMOS-N	B600	1688	207nm	1"x300"	20A,20B	1:56
GMOS-S	B600	1688	207nm	1"x300"	20A,20B	1:56

Name Binning

Disperser Read Mode

Filter ROI

Wavelength nm $\lambda / \Delta\lambda$

FPU λ Coverage

Nod & Shuffle Read Noise

λ Dithers nm

Spatial Offsets arcsec

Exposure Mode

S/N

Exp Time sec

Exp Count

Warning: Requirement Not Met. Delivered $\lambda / \Delta\lambda$ (1465) is less than requested (1600). Dismiss

Configurations View

Make bulk configuration changes.

Drag & Drop observations between configurations.

Proposal View

Add investigator details.

Enter abstract.

Attach PDF template.



Share and Collaborate.



Export PDF.

Duplicate proposal.

Submit proposal.

← → ↻ 🔒 explore.gemini.edu/proposal/

Explore Spectroscopic investigations of novae in nearby galaxies  pdoe@gmail.com 

Proposal  

Proposal Details


Title Spectroscopic investigations of novae in nearby galaxies **Class** Queue **Type** Gemini Partner

Partners 🇨🇦 Canada 50% 🇺🇸 USA 50% **Minimum** 80% **Category** Galaxy Evolution

Band 1&2 6.56h (CA 3.28h, US 3.28h) **Keywords** Stellar Populations, Spiral Galaxies


Band 3 8.00h (CA 4.00h, US 4.00h) **ToO Activation** None

Name	Partner	Status	Gender	Affiliation	email	ORCID	Sharing
Principal Investigator	🇨🇦	PhD	<input checked="" type="checkbox"/>	University 0	pi@university0.edu	0000-0000-0000-0000	owner
Co-Investigator #1	🇨🇦	PhD	<input checked="" type="checkbox"/>	University 1	coi1@university1.edu	0001-0001-0001-0001	submit
Co-Investigator #2	🇺🇸	PhD	<input type="checkbox"/>	University 2	coi2@university2.edu	0002-0002-0002-0002	edit
Co-Investigator #3	🇺🇸	Student	<input type="checkbox"/>	University with a very long name	coi3@university3.edu	0003-0003-0003-0003	read

Abstract 

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut sem nulla pharetra diam sit amet nisl suscipit adipiscing. Sit amet commodo nulla facilisi nullam. Morbi enim nunc faucibus a pellentesque sit. Molestie a iaculis at erat pellentesque adipiscing. Aliquam id diam maecenas ultricies mi eget. Feugiat scelerisque varius morbi enim nunc. Quis commodo odio aenean sed adipiscing diam donec. Cursum sit amet dictum sit amet justo. Ut sem nulla pharetra diam sit amet nisl. Consectetur purus ut faucibus pulvinar elementum integer enim neque. Fames ac turpis egestas integer eget aliquet nibh. Feugiat nibh sed pulvinar proin gravida hendrerit lectus a. Tellus pellentesque eu tincidunt tortor aliquam nulla facilisi.

Senectus et netus et malesuada fames ac turpis egestas maecenas. Semper feugiat nibh sed pulvinar proin gravida hendrerit lectus. Viverra suspendisse potenti nullam ac. Imperdiet massa tincidunt nunc pulvinar sapien et ligula ullamcorper malesuada. Dui id ornare arcu odio ut sem nulla pharetra. Bibendum est ultricies integer quis auctor. Tellus at urna condimentum mattis pellentesque id nibh. Sed nisi lacus sed viverra tellus in hac. A lacus vestibulum sed arcu non odio.

Preview 

GEMINI OBSERVATORY
observing time request summary

Semester: 2020A **Observing Mode:** Queue **Gemini Reference:**

Instruments:

Time Awarded: NaN **Thesis:** No







Band 3 Acceptable: Yes **Band 3 Time:** 10.0 hr **Band 3 Minimal Time:** 5.0 hr

Title: Spectroscopic investigations of novae in nearby galaxies

Principal Investigator: Pat Doe
PI institution: University, CA,
PI status: PhD
PI phone/e-mail: 123-456-7890 / pdoe@gmail.com

Partner Submission Details (multiple entries for joint proposals)



Partner	Lead	PI Request		Reference	NTAC Recommendation	
		Time	Min		Time	Min



 Download Template  Attach PDF  Share  Export As PDF  Duplicate  Submit Proposal

Proposal View

After submission
receive email
confirmation and may
retract proposal.

← → ↻ 🔒 explore.gemini.edu/proposal/

Explore Spectroscopic investigations of novae in nearby galaxies  pdoe@gmail.com 

Proposal  

Proposal Details


Title Spectroscopic investigations of novae in nearby galaxies **Class** Queue **Type** Gemini Partner

Partners 🇨🇦 Canada 50% 🇺🇸 USA 50% **Minimum** 80% **Category** Galaxy Evolution

Band 1&2 6.56h (CA 3.28h, US 3.28h) **Keywords** Stellar Populations, Spiral Galaxies



Band 3 8.00h (CA 4.00h, US 4.00h) **ToO Activation** None

Name	Partner	Status	Gender	Affiliation	email	ORCID	Sharing
Principal Investigator	🇨🇦	PhD	<input checked="" type="checkbox"/>	University 0	pi@university0.edu	0000-0000-0000-0000	owner
Co-Investigator #1	🇨🇦	PhD	<input checked="" type="checkbox"/>	University 1	coi1@university1.edu	0001-0001-0001-0001	submit
Co-Investigator #2	🇺🇸	PhD	<input type="checkbox"/>	University 2	coi2@university2.edu	0002-0002-0002-0002	edit
Co-Investigator #3	🇺🇸	Student	<input type="checkbox"/>	University with a very long name	coi3@university3.edu	0003-0003-0003-0003	read

Abstract 

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut sem nulla pharetra diam sit amet nisl suscipit adipiscing. Sit amet commodo nulla facilisi nullam. Morbi enim nunc faucibus a pellentesque sit. Molestie a iaculis at erat pellentesque adipiscing. Aliquam id diam maecenas ultricies mi eget. Feugiat scelerisque varius morbi enim nunc. Quis commodo odio aenean sed adipiscing diam donec. CURSUS sit amet dictum sit amet justo. Ut sem nulla pharetra diam sit amet nisl. Consectetur purus ut faucibus pulvinar elementum integer enim neque. Fames ac turpis egestas integer eget aliquet nibh. Feugiat nibh sed pulvinar proin gravida hendrerit lectus a. Tellus pellentesque eu tincidunt tortor aliquam nulla facilisi.

Senectus et netus et malesuada fames ac turpis egestas maecenas. Semper feugiat nibh sed pulvinar proin gravida hendrerit lectus. Viverra suspendisse potenti nullam ac. Imperdiet massa tincidunt nunc pulvinar sapien et ligula ullamcorper malesuada. Dui id ornare arcu odio ut sem nulla pharetra. Bibendum est ultricies integer quis auctor. Tellus at urna condimentum mattis pellentesque id nibh. Sed nisi lacus sed viverra tellus in hac. A lacus vestibulum sed arcu non odio.

Preview  

GEMINI OBSERVATORY
observing time request summary

Semester: 2020A **Observing Mode:** Queue **Gemini Reference:**

Instruments:

Time Awarded: NaN **Thesis:** No







Band 3 Acceptable: Yes **Band 3 Time:** 10.0 hr **Band 3 Minimal Time:** 5.0 hr

Title: Spectroscopic investigations of novae in nearby galaxies

Principal Investigator: Pat Doe
PI institution: University, CA,
PI status: PhD
PI phone/e-mail: 123-456-7890 / pdoe@gmail.com

Partner Submission Details *(multiple entries for joint proposals)*

Partner	Lead	PI Request		Reference	NTAC Recommendation	
		Time	Min		Time	Min

 Download Template  Attach PDF  Share  Export As PDF  Duplicate  **Retract Proposal**

Everything, and more, that can be done with the UI can be done programmatically with APIs

GraphQL query structures will be used, different from REST (e.g. URL endpoints).

GraphQL allows more flexible queries.

Planned aids for users:

- Define common queries, like endpoints, in client libraries (e.g. Python)
- Users just need to fill in the parameters
- Provide examples

```
# Filter settings using a dictionary. This is all the user has to do.
variables = {"filters":
            {"searchString": "Q-10?",
             "instruments": ["GMOSN", "GMOSS", "GNIRS"],
             "partners": ["CL", "US"],
             "completionPercentage":
                 {"minPercentage": 30,
                  "maxPercentage": 80
                 }
            }
           }

# Execute the query
result = browse_query(variables)

# Extract the programs from the result.
programs = result["data"]["programs"]

# For each program, print the pid and PI lastName
for p in programs:
    print(p["pid"] + " - " + p["pi"]["lastName"])
```


The algorithmic scheduler will create the queue plans rapidly in real-time as events occur.

Requirements:

- Fast - create a new plan in < 1 minute
- Schedules GN/GS together when appropriate (e.g. both in queue)
 - Faster completion for observations that can be done at either site (~25%)
 - Fewer programs for PIs to manage
 - Allows better coordination
- Queue plans are equivalent to human-generated, are evaluated based on a metric that encodes observatory goals, e.g.
 - Respect TAC rankings (Band)
 - Complete 100% of highest-ranked programs
 - Foster thesis programs and time-critical observations

Example use case: rapid ToO

A team studying young SNe has time on Gemini for follow-up

Their Target Observation Manager (TOM) identifies an event from LSST classified as a SNe by the ANTARES broker.

The TOM sends rToO (interrupting) observation requests to Gemini via the API for SCORPIO or GMOS-N, whatever is available.



<https://antares.noirlab.edu>



<https://tomtoolkit.github.io>



Create a new query using [MARS](#) [Lasair](#) [Scout](#) [MyBroker](#) [AutoBroker](#) [ANTARES](#)

Name	Broker	Created	Run	Delete
Deltamag > 1, R/B > 0.75, r	MARS	2018-12-28 02:12:12	Run	Delete
Name Query	MyBroker	2018-12-28 14:12:00	Run	Delete
Score > 50	AutoBroker	2018-12-28 18:12:28	Run	Delete

Broker

Name contains

[Filter](#) [Reset](#)

Observing

The scheduler determines that the best site for the ToO, based on conditions and target visibility, etc, is Gemini South.

The observer will then be notified of the ToO and respond to it.

The screenshot displays the Gemini South observing interface. At the top, the current observing session is identified as **22A-Q-222 [93]** in Science mode, with a Parallactic angle and Blind Offset. The interface shows a timeline of observations with a vertical red line indicating a conflict at 3:30am. A notification banner states: **A Rapid ToO is now available! Switch to 22A-Q-119 [87] immediately.** Two buttons are provided: **Stop and Switch** and **Abort and Switch**. The interface also shows current conditions (IQ 0.72", CC 0.03, WV 3.2 mm, BG 50) and a list of observation steps.

Step	Exp (sec)	p	q	λ (nm)	FPU	Disperser	Filter	Xbin	YBin	ROI	S/N	Dataset(s)
1	10	+	0.0	0.0			r	2	2	ccd2		S20220406S0233
2	20		10.0	0.0	1"		r	1	1	stamp		S20220406S0234
3	40	+	0.0	0.0	1"		r	1	1	stamp		S20220406S0235
4	40	+	0.0	0.0	1"		r	1	1	stamp		S20220406S0236

Step	Exp (sec)	p	q	λ (nm)	FPU	Disperser	Filter	Xbin	YBin	ROI	S/N	Dataset(s)	
1	1200	+	0.0	0.0	600	1"	B600	GG455	2	2	full	293.6	S20220406S0237
2		F	0.0	0.0	600	1"	B600	GG455	2	2	full		S20220406S0238
3		F	0.0	15.0	605	1"	B600	GG455	2	2	full		S20220406S0239
4	1200	+	0.0	15.0	605	1"	B600	GG455	2	2	full	404.4	S20220406S0240
5	1200	+	0.0	15.0	605	1"	B600	GG455	2	2	full	490.9	S20220406S0241

15:32 (932 s) Remaining

6 F 0.0 15.0 605 1" B600 GG455 2 2 full

7 F 0.0 0.0 600 1" B600 GG455 2 2 full

8 S 1200 + 0.0 0.0 600 1" B600 GG455 2 2 full 564.2

9 S 1200 + 0.0 0.0 600 1" B600 GG455 2 2 full 626.0

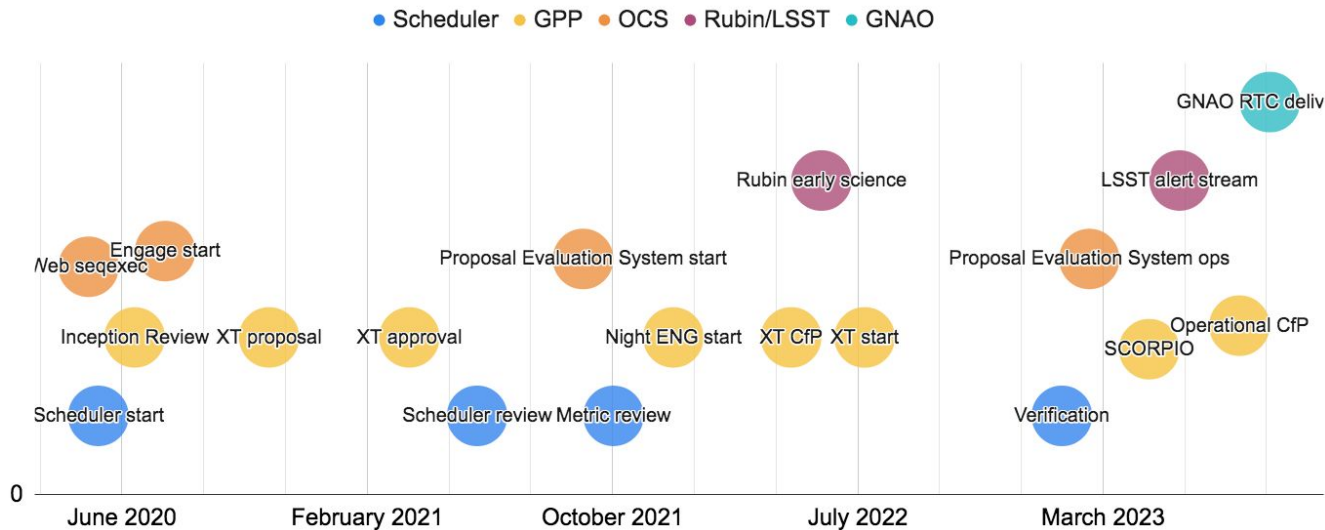
Mount M1 Tip/Tilt Coma 500 Hz 22A-Q-222 [93] Acq Science: 5/14 Steps (1:05:32 Remaining, 0:05:32 in Scheduling Unit)

Current Status

Explore is under active development (demo)

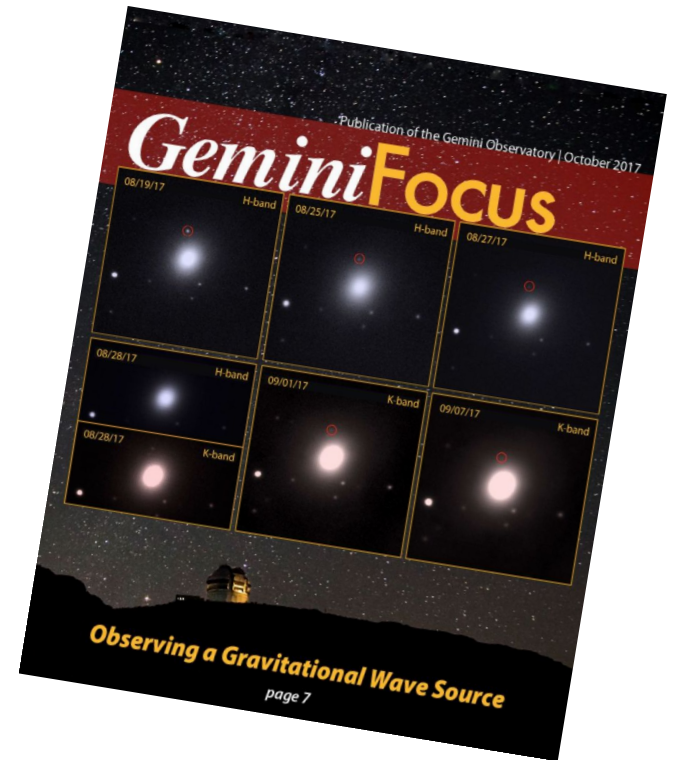
We are working towards a system that supports GMOS-N/S imaging and longslit by May 2022, when we issue a CfP for early science testing (XT).

Full operations expected for the start of 2024A.



Summary: OCS Upgrades and GPP will make the use of Gemini easier and more efficient for all users and provide a platform for the future.

- Improve usability - e.g. make Phase 2 preparation much easier
- Improve efficiency - e.g. improve flexibility and reduce staff workload with an automated scheduler
- Support Time Domain Astronomy (TDA) - e.g. provide the software framework for the GEMMA scheduler and APIs
- Support new instruments - e.g. SCORPIO and GNAO/GIRMOS
- Avoid obsolescence - e.g. make the code maintainable and scalable



See Oct 2017 Gemini Focus, pg. 20
Update in Jan 2021 NOIRLab Mirror

Resources and Feedback

Announcements are posted to the Gemini Science Software Blog

<http://staff.gemini.edu/scisoft/>

Project updates and documents:

<https://www.gemini.edu/observing/operations-development>

You may provide feedback with a suggestion form on the above page, or email bryan.miller@noirlab.edu or andrew.stephens@noirlab.edu.

Related sessions at AAS237

DRAGONS data reduction demo

Every day, 4:40–5:10 pm ET, NOIRLab Booth

Building the Follow-up Ecosystem for Science in the 2020s

Tuesday, January 12, 12:00–1:30 pm ET

224 The Data Lab Science Platform and Open-Data Ecosystem at NSF's
NOIRLab

Tuesday, January 12, 4:10–5:40 pm ET

NOIRLab's Data Services: A Practical Demo Built on Science with DES DR2

Thursday, January, 14, 4:10–5:40 pm ET

NOIRLab Town Hall

Thursday, January 14, 1:10–2:40 pm ET