

Gemini Program Platform Demo and Testing

Gemini Science Meeting - July 2022

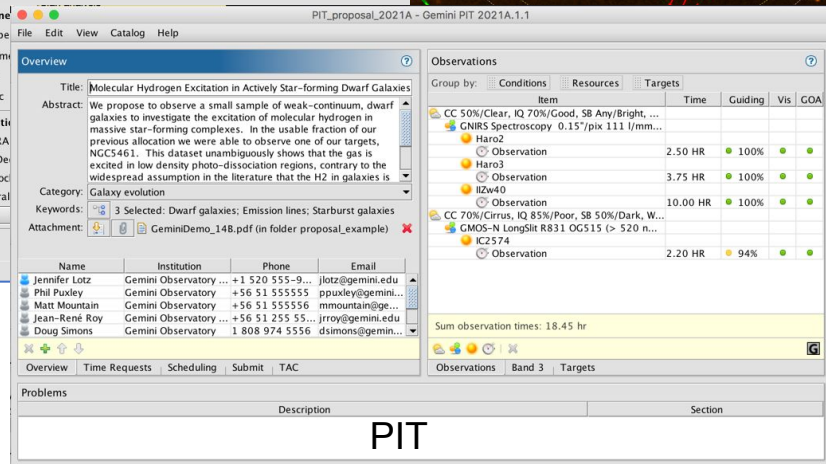
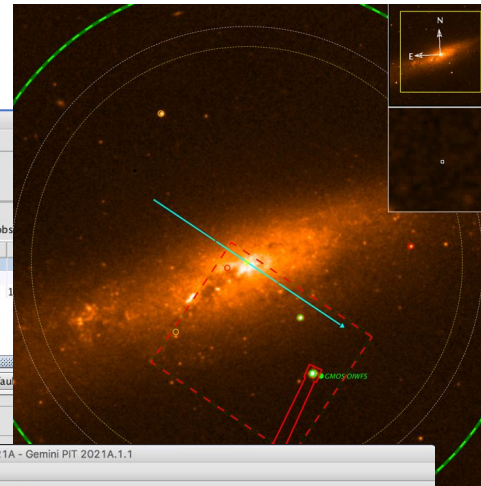
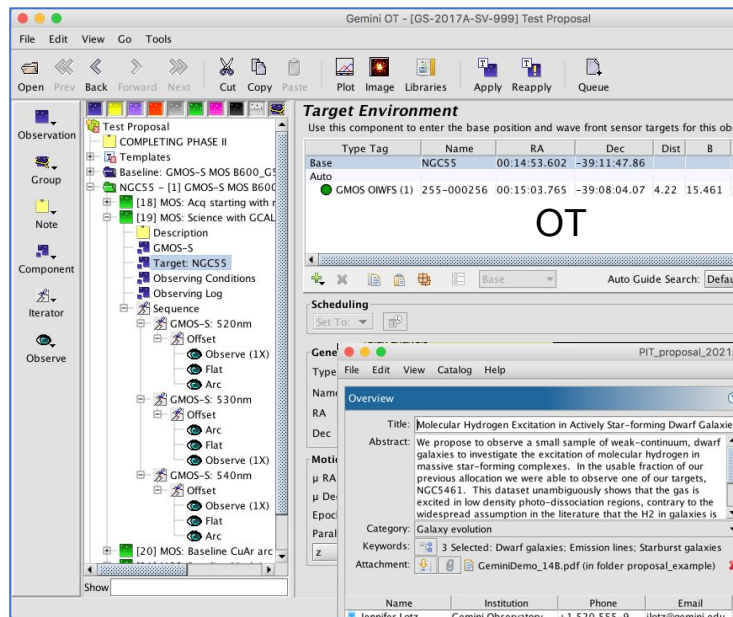
The current proposal and program preparation apps have been in use for ~20 years

Phase I Tool (PIT) -
proposal submission

Observing Tool (OT) -
Observation preparation,
execution, time accounting

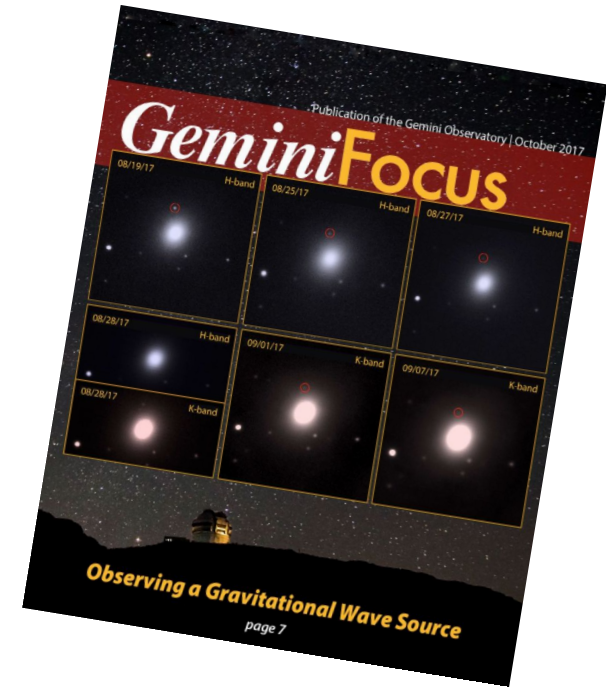
Many needed usability and
infrastructure changes
cannot be done with the
current software.

➡ Time to start fresh



The Gemini Program Platform (GPP) is the core of a new OCS with the following goals:

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



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

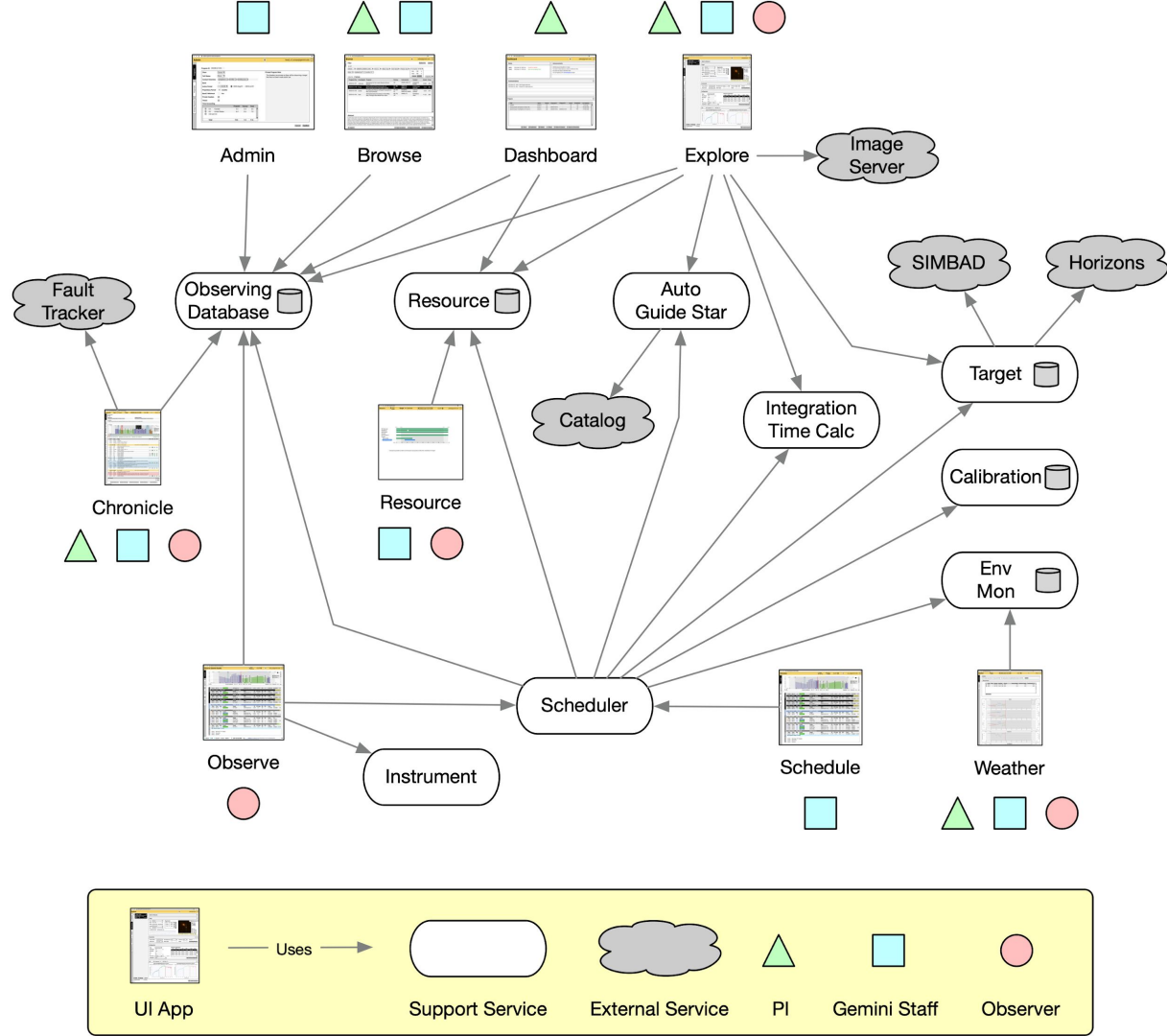
Web Applications

External: ▲

- Explore
- Dashboard
- Browse
- Chronicle
- Weather

Internal:

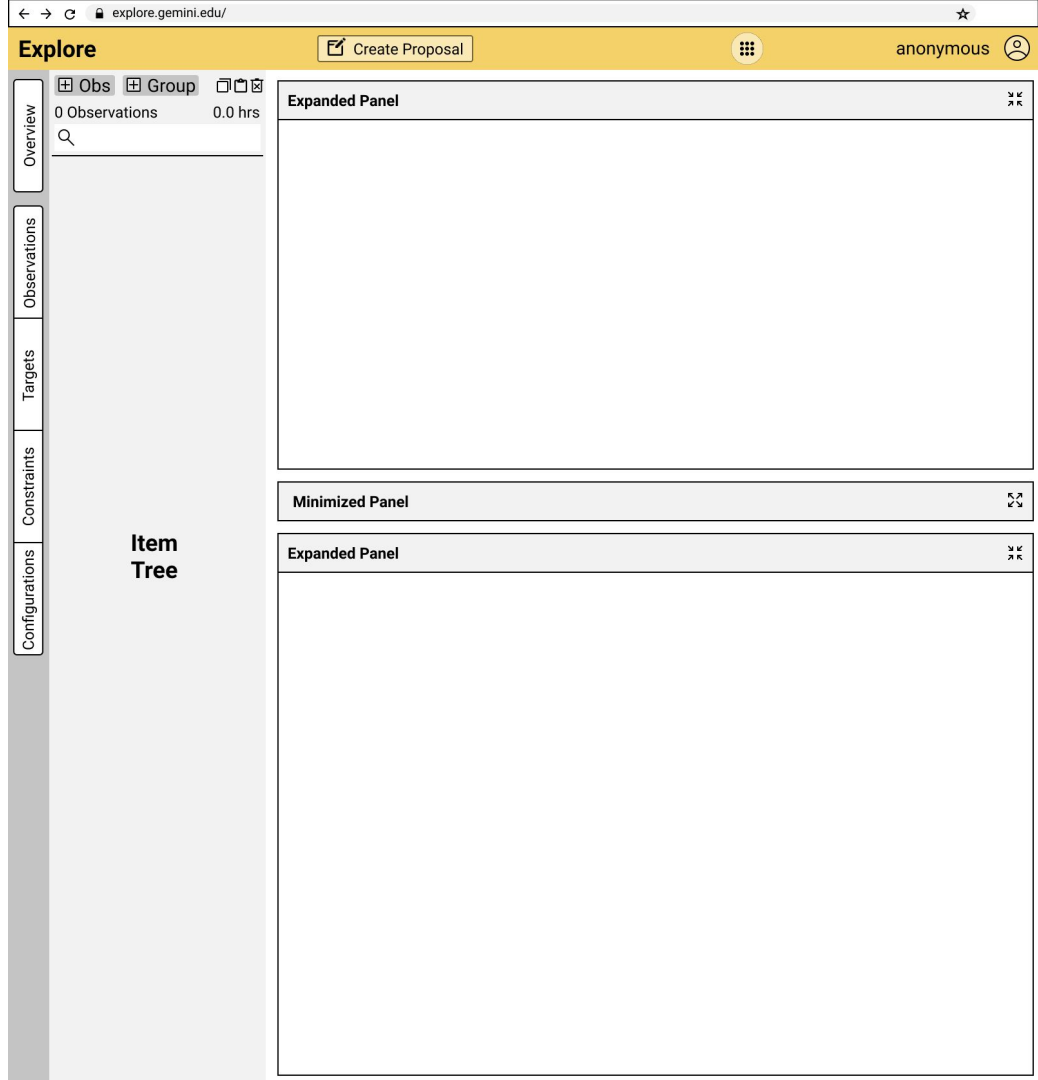
- Observe
- Resource
- Schedule
- Admin



Explore

Layout

- Application Switcher
- User Identity & Authentication
- Vertical Navigation Bar
- Item Tree
- Detail Panels
- Action buttons
- Observation Summary
- Search
- Create Proposal button



Observations View

A single screen shows all the important information:

- List of all observations
- Target details
- Constraints
- Instrument configuration
- ITC output

← → explore.gemini.edu/observations/1

Explore [Create Proposal](#) anonymous

Overview 1 Observation 1.22 hrs

Observations Summary

1: NGC 1055
GMOS-N R831 1x300"
<0.8" <0.3 mag Gray
New 1.22 hrs

Targets

Note for Observer

Targets Observation Date 2024-Jan-01 01:23 UT + Target

	RA	Dec	Dist	G	J	H	K
★ Science							
◎ NGC 1055	02:41:45.233	+00:26:35.45	0.00		12.09	11.51	11.40
🔍 Guide							
★ Gaia 123456789	02:41:40.702	+00:28:36.48	5.8'	12.34			

Type Sidereal
Name NGC 1055
RA 02:41:45.233
Dec +00:26:35.45
Epoch 2000
μ RA -123.45
μ Dec -123.45
Parallax 123.45
RV 123.45
Profile Gaussian
SED SpiralGalaxy.sed

Mag Band Sys
12.09 J Vega
11.51 H Vega
11.40 K Vega

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 550 nm
λ / Δλ 1600
S/N 40 at 556.28 nm
λ Range 200 nm
Focal Plane Single Slit 60 arcsec
Capabilities None
Position Angle Average Parallactic 168.66 °E of N

Matching Configurations

Inst	Disp	λ/Δλ	λ (nm)	FPU	Avail	Time
GMOS-N	R831	2198	433-667	1"x300"	22A,22B	1:22
GMOS-S	R831	2198	435-665	1"x300"	22A,22B	1:22
GMOS-N	B600	1688	392-708	1"x300"	22A,22B	1:36
GMOS-S	B600	1688	397-703	1"x300"	22A,22B	1:36

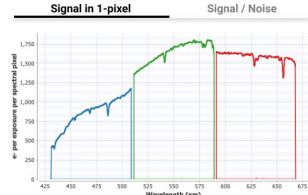
Advanced Configuration

ITC NGC 1055 Wavelength 550 nm S/N / exposure: 28.1 S/N Total: 40.3

Source Aperture Optimum arcsec
Sky Aperture Optimum arcsec

Integration Time 9 x 30s = 270s
Readout Noise 3.6 e-
Aperture Size 1.43 arcsec
Fraction of flux in aperture 0.67
Image FWHM 0.8 arcsec
Sky Aperture 7.15 arcsec
S/N per exposure 28.1
Total S/N 40.3
Peak (signal + background) 1772 e- (984 ADU)

Signal in 1-pixel Signal / Noise



Observations View

- Observations includes required calibrations
- OR group (GMOS North or South)
- Advanced Configuration

Explore [Create Proposal](#) anonymous

Overview 5 Observations 7.73 hrs

Observations Summary

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
☒ Daytime Arcs

3: NGC 1068
GNIRS SXD 0.6"
<0.8" <0.3 mag Bright 2.4 hrs
☒ Telluric Standard
☒ Telluric Standard
☒ Daytime Pinhole

OR 1 of 2

4: NGC 1087
GMOS-N R831 1x300"
<1.0" <0.5 mag Gray 1.83 hrs

5: NGC 1087
GMOS-S R831 1x300"
<1.0" <0.5 mag Gray 1.83 hrs

Note for Observer

Targets NGC 1055 Observation Date 2024-Jan-01 01:23 UT +Target

Science	RA	Dec	Dist	G	J	H	K
NGC 1055	02:41:45.233	+00:26:35.45	0.00		12.09	11.51	11.40

Guide

Star	RA	Dec	Dist	G	J	H	K
Gaia 123456789	02:41:40.702	+00:28:36.48	5.8'	12.34			

Type Sidereal Mag Band Sys

Name NGC 1055 RA 02:41:45.233 Dec +00:26:35.45

Epoch 2000 μ RA -123.45 μ Dec -123.45

Parallax 123.45 RV 123.45

Profile Gaussian SED SpiralGalaxy sed

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 (Advanced) GMOS-N Longslit R831 @ 650nm 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 650 nm λ / Δλ 2198 S/N 33

FPU 1.0" x 300" slit λ Coverage 532 - 767 nm Exp Time 1200 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 NGC 1055 Wavelength 550 nm S/N / exposure: 28.1 S/N Total: 40.3

Source Aperture Optimum arcsec Sky Aperture Optimum arcsec

Integration Time 9 x 30s = 270s Readout Noise 3.6 e Aperture Size 1.43 arcsec





Fraction of flux in aperture 0.67 Image FWHM 0.8 arcsec Sky Aperture 7.15 arcsec

S/N per exposure 28.1 Total S/N 40.3 Peak (signal + background) 1772 e- (984 ADU)

Signal in 1-pixel Signal / Noise

Observations View: Configuration (Advanced)

- Customize instrument parameters
- Modify default wavelength dithers and spatial offsets
- Exposure Modes
 - S/N
 - Exposure Time
 - Exposure Count
 - Time & Count

Configuration (Advanced)		GMOS-N Longslit R831 @ 650nm 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	650 nm	$\lambda / \Delta\lambda$	2198	S/N	33
FPU	1.0" x 300" slit ▼	λ Coverage	532 - 767 nm	Exp Time	1200 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	

Targets View

- Shows observations grouped by target
- Bulk-edit targets (shared)
- Import target lists
- Copy observations
- Drag & drop of observations between targets

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

Explore Import Targets Create Proposal anonymous

Overview: 5 Targets 6.65 hrs

Observations: **Targets Summary**

Targets:

- ▼ **NGC 1055** 1 Obs
 - 1: GMOS-N R831 1x300"
 - <0.8" <0.3 mag Dark
 - New 1.22 hrs
- ▼ **NGC 7752** 1 Obs
 - 2: GMOS-N R831 1x300"
 - <0.8" <0.3 mag Dark
 - New 1.20 hrs
- **NGC 3705** 0 Obs
- ▼ **NGC 1068** 1 Obs
 - 3: GNIRS SXD 0.60"
 - <0.6" <0.3 mag Bright
 - New 2.40 hrs
- ▼ **NGC 1087** 2 Obs
 - 4: GMOS-N R831 1x300"
 - <1.0" <0.5 mag Gray
 - New 1.83 hrs
 - 5: GMOS-S R831 1x300"
 - <1.0" <0.5 mag Gray
 - New 1.83 hrs
- ▼ **Unassigned** 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

Configurations: **Constraints**

NGC 7752

Type: Sidereal

Name: NGC 7752

RA: 23:47:04.834 J2000

Dec: +29:27:32.17

Motion

μ RA: 0 mas/year

μ Dec: 0 mas/year

Epoch: 2000 years

Parallax: 0 mas

RV: 4926.4 km/sec

Source: Library

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

Image: DSS Gemini

Guide: GS OIWFS

Fast R 12.56 23:46:43.934 +29:25:24.07

Finding Charts

SDSS

HST

Finding Chart

Site: GN GS Plot: Night Elevation Visibility 2022B

Constraints View

- Shows observations grouped by constraints
- Bulk-edit constraints
- Drag & drop observations between constraints
- Import timing windows
- Copy observations

← → ↻ explore.gemini.edu/constraints/ ★

Explore Create Proposal

anonymous

Overview Observations Targets Constraints Configurations

2 Constraints 6.65 hrs

Good & Dark 2 Obs

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

2: NGC 7752
GMOS-N R831 1x 300"
New 1.20 hrs

Good & Bright 1 Obs

3: NGC 1068
GNIRS SXD 0.60"
New 2.40 hrs

Poor & Gray 2 Obs

4: NGC 1087
GMOS-N R831 1x 300"
New 1.83 hrs

5: NGC 1087
GMOS-N R831 1x 300"
New 1.83 hrs

Poor & Bright 3 Obs

Good Seeing, Thin Clouds

Name Good Seeing, Thin Clouds

Image Quality < 0.8"

Cloud Extinction < 0.3 mag

Moon Background Dark

Water Vapor Unconstrained

Elevation < 2 airmass

Strehl None

Contrast None

Relative Priority

☐ Low ☒ Medium ☐ High

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:

☐ 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

Import Timing Windows

Configurations View

- Bulk-edit configurations
- Drag & Drop observations between configurations

← → ↻ explore.gemini.edu/configurations/ ☆ anonymous

Explore Create Proposal

Obs Config 2 Configurations 6.65 hrs

Overview Observations Targets Constraints **Configurations**

▼ GMOS-N R831 1x300"

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

2: NGC 7752
<0.8" <0.3 mag Dark
New 1.20 hrs

4: NGC 1087
<1.0" <0.5 mag Gray
New 1.83 hrs

▼ GMOS-S R831 1x300"

5: NGC 1087
<1.0" <0.5 mag Gray
New 1.83 hrs

▼ GNIRS SXD 0.60"

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

GMOS-N R831 1x300"

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"	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 GMOS-N R831 1x300"

Disperser R831

Filter None

Wavelength 715 nm

FPU 1.5" x 300" slit

Nod & Shuffle No

Binning 2 x 2

Read Mode Slow, Low Gain

ROI Full Frame

$\lambda / \Delta\lambda$ 1465

λ Coverage 612 - 819 nm

Read Noise 4.1 electrons

λ Dithers -5, 5 nm

Spatial Offsets 0, 15 arcsec

Exposure Mode S/N

S/N 40

Exp Time 600 sec

Exp Count 6

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

NGC 1055 Position Angle

Position Angle Average Parallaxic

Authentication



Goals:

- Users gain access to all proposals/programs to which they are entitled
- Avoid managing individual's email addresses and affiliations
- Help track publications based on each program

ORCID

- Required for AAS journal submission
- Free, easy to obtain, unique to an individual
 - <https://orcid.org>
- Keeps current email addresses and affiliations in sync

Proposal View

- Investigator details
- Enter abstract
- Request details
- Attach PDF templates
- Share and collaborate
- Export PDF
- Duplicate proposal
- Submit or retract proposal

← → ↻ explore.gemini.edu/proposal/

ExploreSpectroscopic investigations of novae in nearby galaxies

pdoe@gmail.com

Proposal

Overview

Observations

Targets

Constraints

Configurations

Proposal Details

TitleSpectroscopic investigations of novae in nearby galaxies

ClassQueue

TypeGemini Partner

Partners🇨🇦 Canada 50% 🇺🇸 USA 50%

Minimum80%

CategoryGalaxy Evolution

KeywordsStellar Populations, Spiral Galaxies

Band 1&26.56h (CA 3.28h, US 3.28h)

ToO ActivationNone

Band 38.00h (CA 4.00h, US 4.00h)

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 Time	Min	Reference	NTAC Recommendation Time	Min	Rank
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Download Template

Attach PDF

Share

Export As PDF

Duplicate

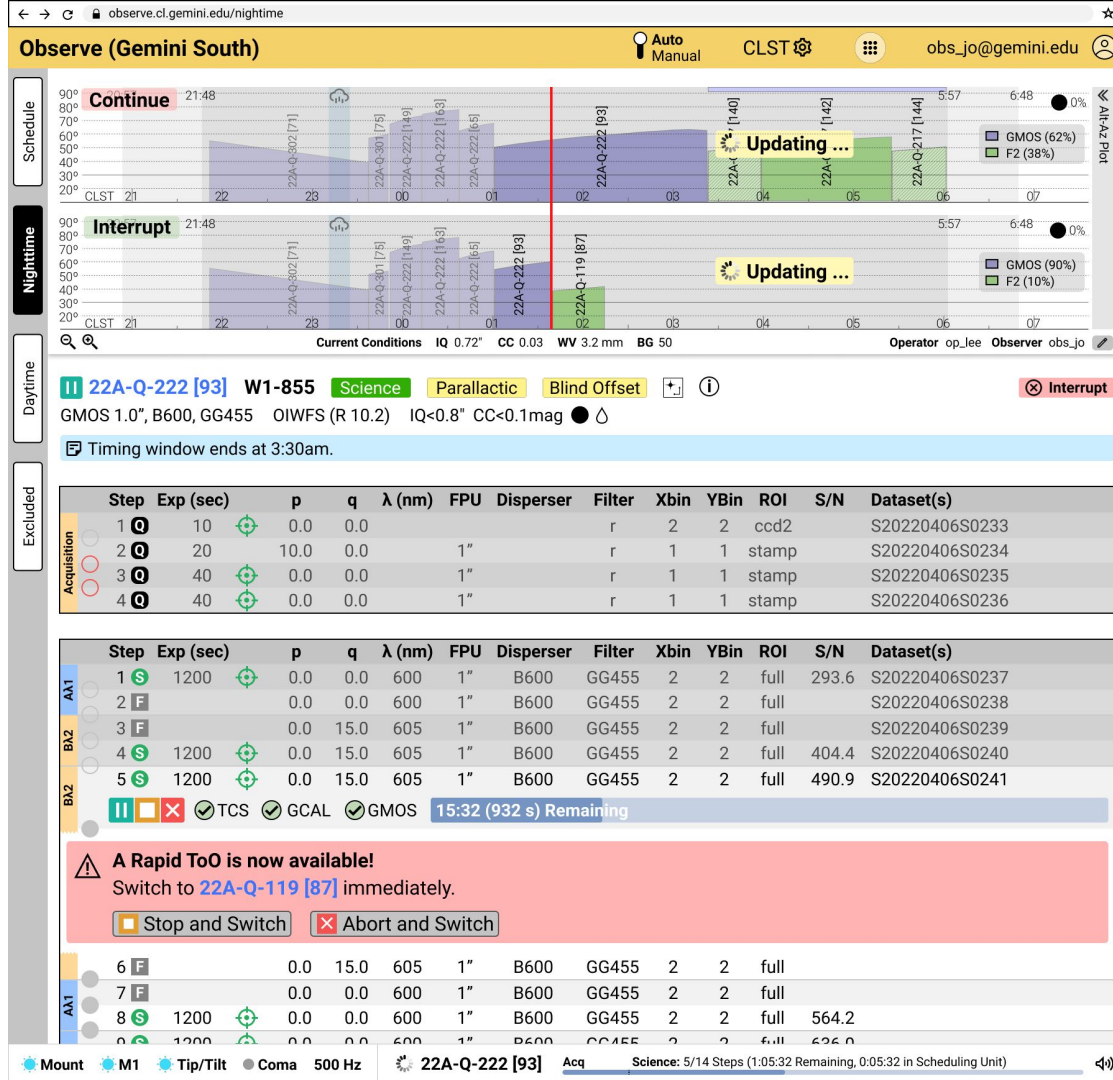
Submit Proposal

Explore Demo

Observe

Observation execution

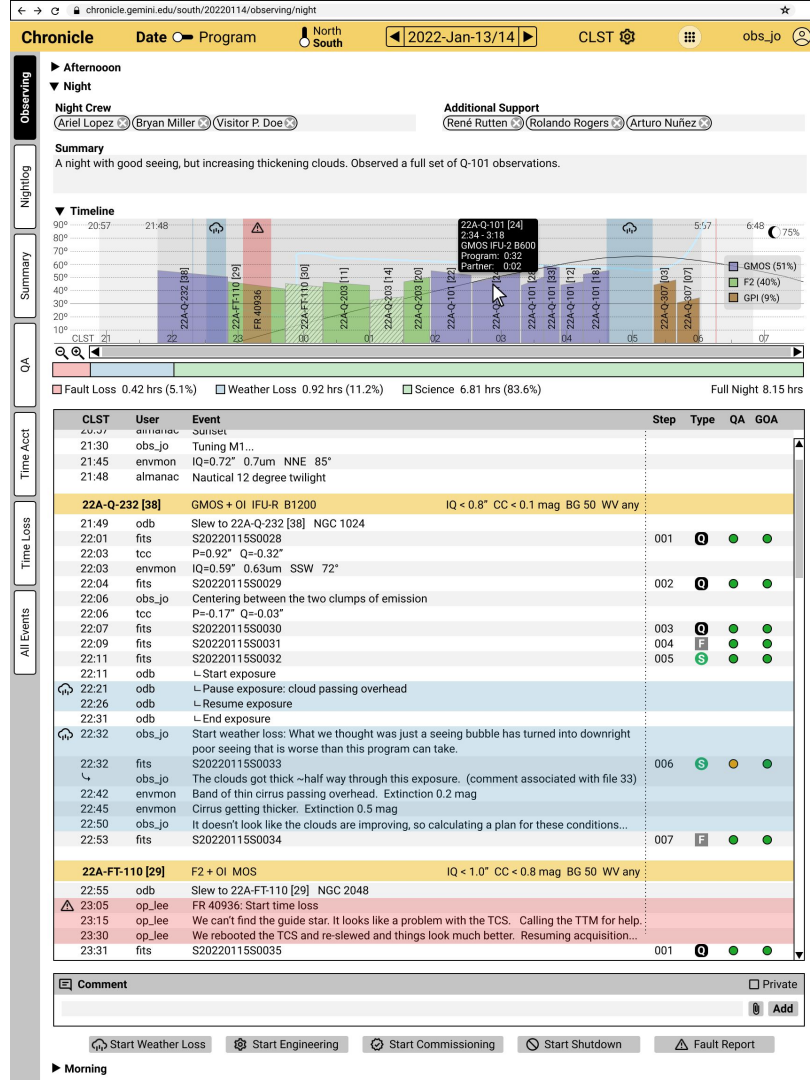
- Interfaces with automated real-time scheduler
- Suggests observations when conditions change or new observations become available (ToOs)
- Gives instructions on how to best interrupt observations



Chronicle

Logging

- Night and Observing logs
- Dataset comments
- Data quality assessment
- Program time accounting
- Automatic logging of observing actions, weather, faults, etc.
- View details by night or by program
- Communication between day & night staff



GPP Project Timeline

- **Chronicle** development planned for October 2022 through June 2023
- **Explore/Observe** full support for GMOS long-slit spectroscopy by September 2023, then start adding other instruments & modes.
- **XT1** with GMOS at the end of January 2024 (23B/24A)
 - Special call for proposals
- **XT2** during 2024/2025 as more instruments are supported
 - Convert some existing programs
- **Project completion** estimated by June 2025*

* Rubin operations start mid-2024 with the alert stream in early 2025

Inception Review Docs: http://software.gemini.edu/ocsupgrades/GPP_Inception_Review/

We are slowly ramping up community testing, this session being one example

Early testing will include:

- Filling in questionnaires on features and usability
- Mock use sessions
- Interviews
- Quantitative use tests (timed activities with old/new systems)

Let us know if you are interested in participating in more tests.

andrew.stephens@noirlab.edu

bryan.miller@noirlab.edu



Interactive Use and Testing

Explore: <https://explore.gemini.edu>

Instructions for activities: <https://bit.ly/gsm22gppworkshop>

Feedback spreadsheet: <https://bit.ly/gsm22gppfeedback>

Instructions

You may try out Explore at <https://explore.gemini.edu>

Feedback can be entered here

<https://bit.ly/gsm22gppfeedback>

You may upvote other's suggestions.

We are especially interested in bug reports and comments about the usability of the existing features.

New feature suggestions are welcome, but realize that many planned capabilities are not implemented yet.

Suggested Activities

- Create a program for your work
 - Note that currently everyone can see all programs
 - All work will be deleted within 24 hours when the Heroku “dynos” reset (work will become persistent once we have the real database in the backend)
- If you have an ORCID, use yours to log in.
- Create observations for the same target for north and south
 - Edit the constraints for both together
 - Change the constraints for a single observation
 - Edit the target information for both, then edit the target for just observation
- Find and view the automatically-generated sequence
 - Review how this changes as configurations, constraints, or target properties are updated

Timed Activity

Time how long it takes you to do create the following observation:

- HII Region in IC 2574 (10:28:50.8 +68:25:24.7)
- R = 20 AB
- Gaussian profile, FWHM = 5 arcsec
- SED: HII region
- IQ: 1.5 arcsec, CC \leq 0.3 mag
- Spectroscopy
 - PA fixed at 0 deg
 - Wavelength = 0.85 μ m
 - Resolving power: 2500
 - S/N = 100