



# Gemini 101

**Stéphanie Côté  
(Canadian Gemini  
Office, NRC)**

# All about Gemini:

1. Overview of the telescopes
2. Instrumentation
3. Operations
4. How to apply for time
5. Where to get help

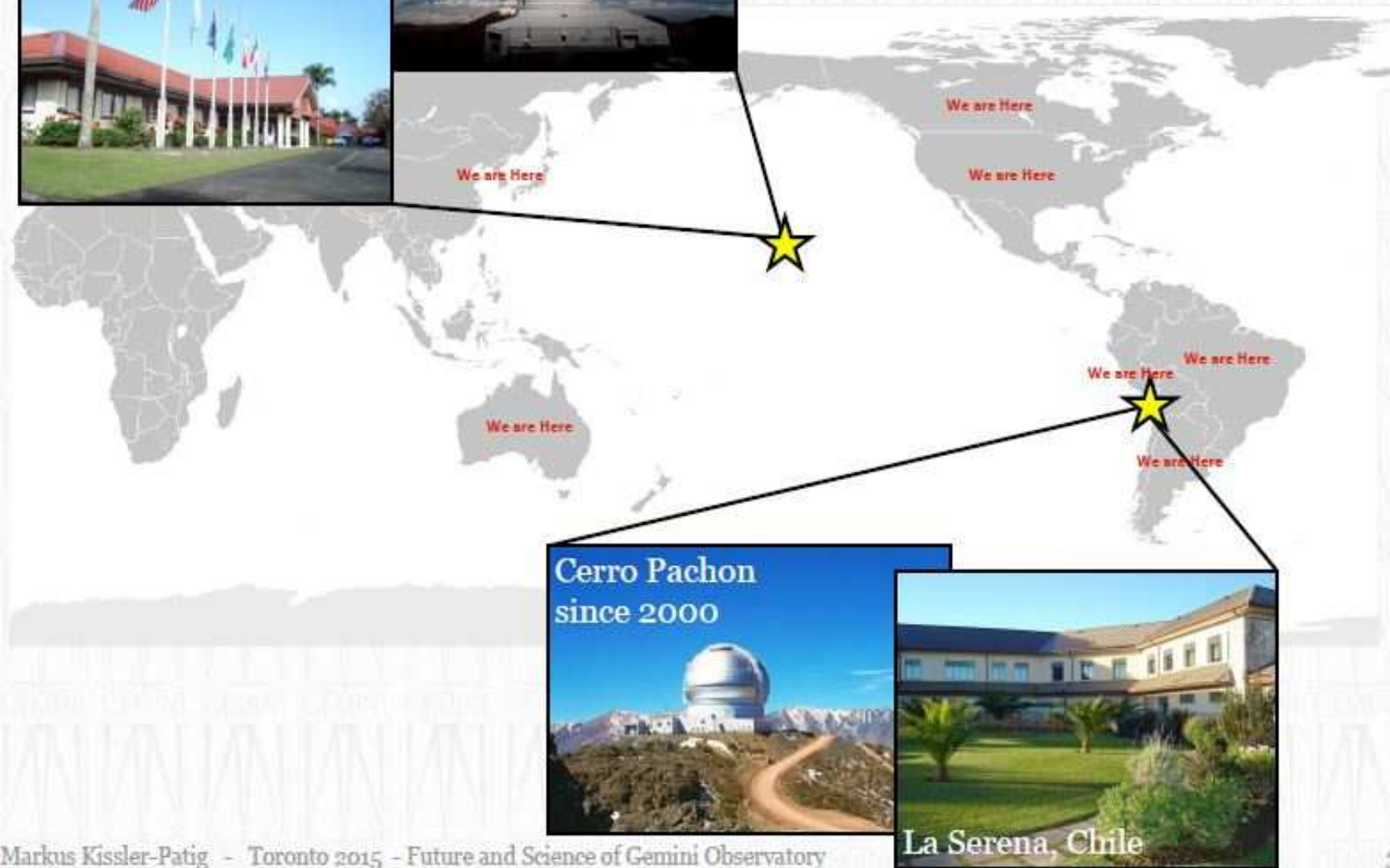


# 1) Overview



## Gemini Observatory:

Operating two twin 8m telescopes on Mauna Kea and Cerro Pachon: **providing access to the entire sky**



# The Gemini Observatory

Partnership at the start: United States, UK, Canada, Chile, Argentina, Brazil and Australia.

Now: UK & Australia left, South Korea and Israel are ramping in

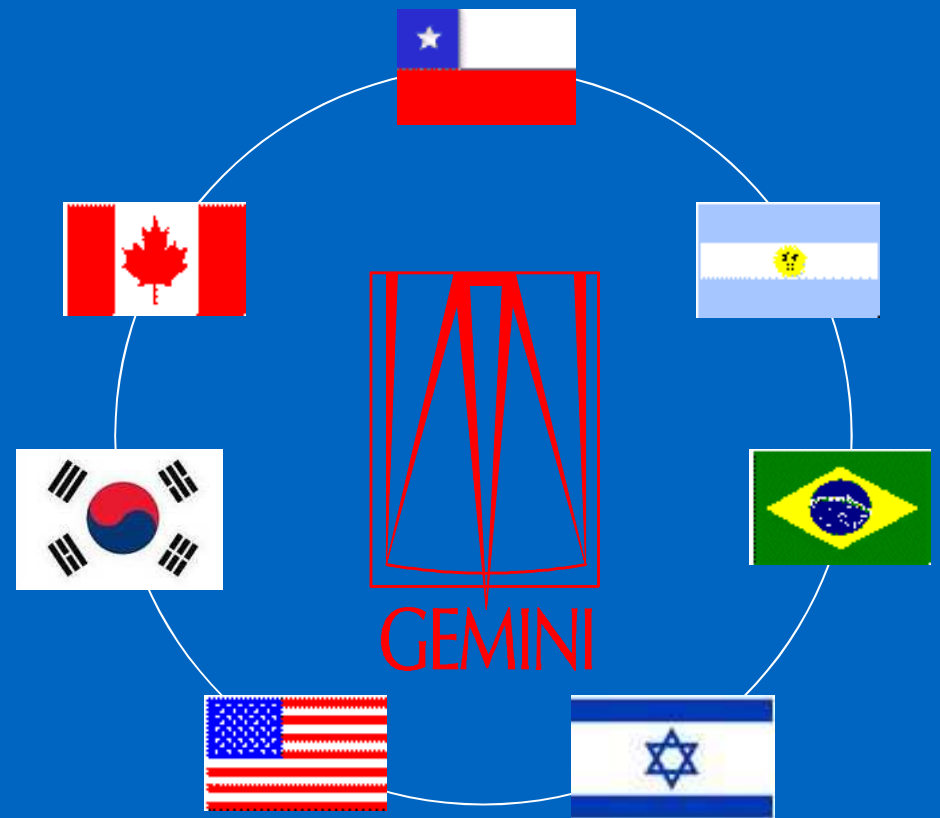
Budget : 184 M \$USD

**Canada:**  
**15% share of the time at the start**    **18.6% now**

Started operations in 2000

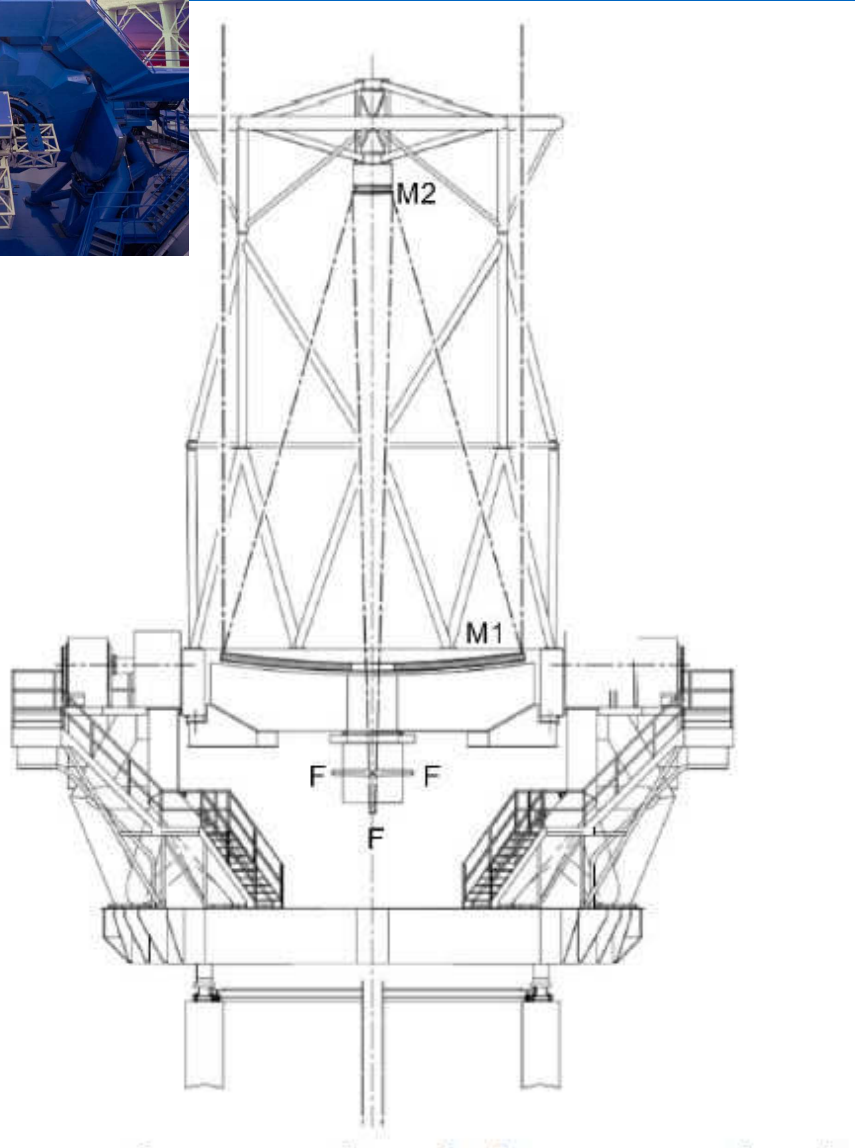
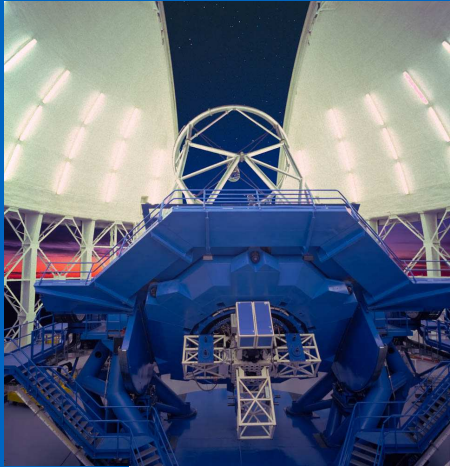
Each partner country has a National Gemini Office

In Canada: the CGO is located at HAA, and consists of Steph Côté, Tim Davidge, Eric Steinbring and Joel Roediger





# Gemini Telescope Design



Both Gemini Telescopes are of identical Alt-Az mounted, Ritchey-Chretien Cassegrain design:

Primary mirror : concave hyperboloid  
**8.1 m diameter**

Secondary Mirror: convex hyperboloid  
**1m diameter**

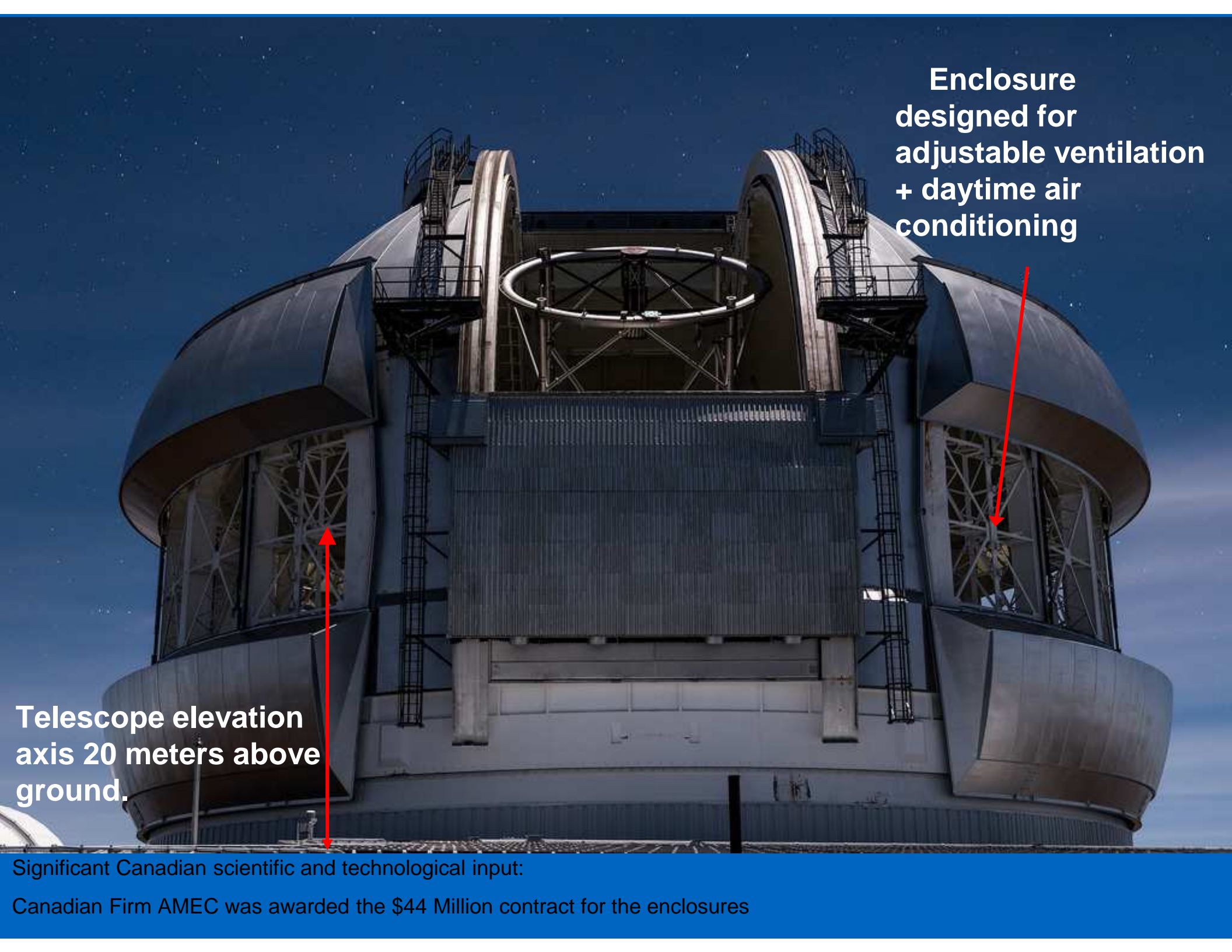
Gemini has a F/16 ratio (long):  
Focal length / aperture  
128 m / 8.1 m

# Top level performance

The Gemini Telescopes were designed to deliver:

- Superb image quality
  - Primary mirror actively controlled and Secondary mirror tip-tilt design
  - Enclosure design with vents to allow smooth flow of air
  - AO facilities to correct for image blurring caused by atmospheric turbulence
- Optimized IR observing ( extremely low emissivity)
- Versatility to take advantage of changing conditions and flexibility in scheduling
  - The great majority of Observations are done in Queue mode. Can change rapidly between selected instruments, with simultaneous mounting of 3 instruments





**Enclosure  
designed for  
adjustable ventilation  
+ daytime air  
conditioning**

**Telescope elevation  
axis 20 meters above  
ground.**

Significant Canadian scientific and technological input:

Canadian Firm AMEC was awarded the \$44 Million contract for the enclosures

# Primary Mirror Features

- 8m diameter, 20 cm thick, ULE weighs 22 tons.

- 120 hydraulic actuators move mirror surface at its optimum shape as telescope tracks across the sky.

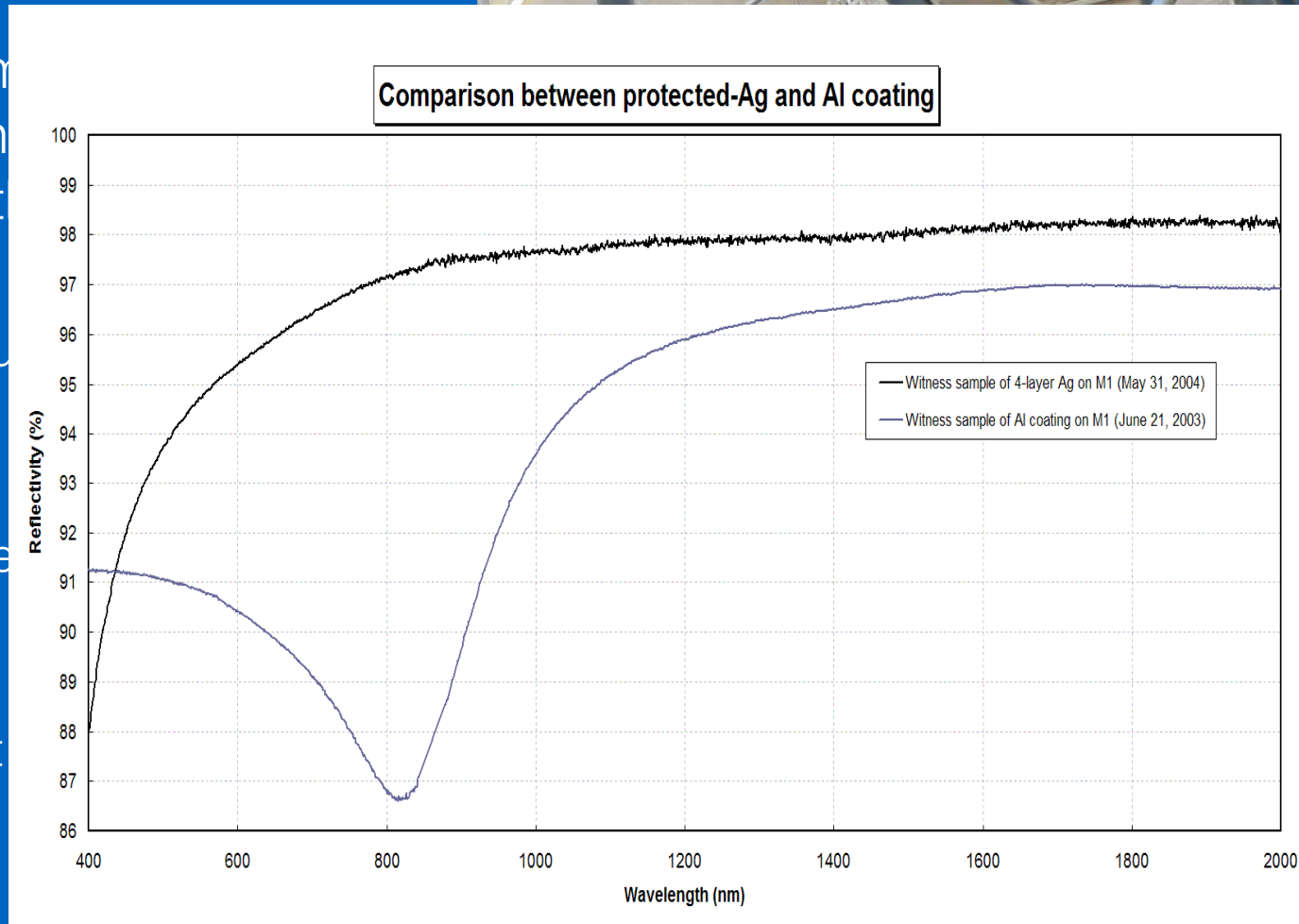
- Primary mirror: temperature controlled.

- Minimize temperature difference between mirror and ambient air.

- Target is  $\pm 1^\circ\text{C}$  to meet pointing requirement.

- Rear copper plate cooled by glycol

- Heating of mirror silver surface.





# Fast Instrument Switching

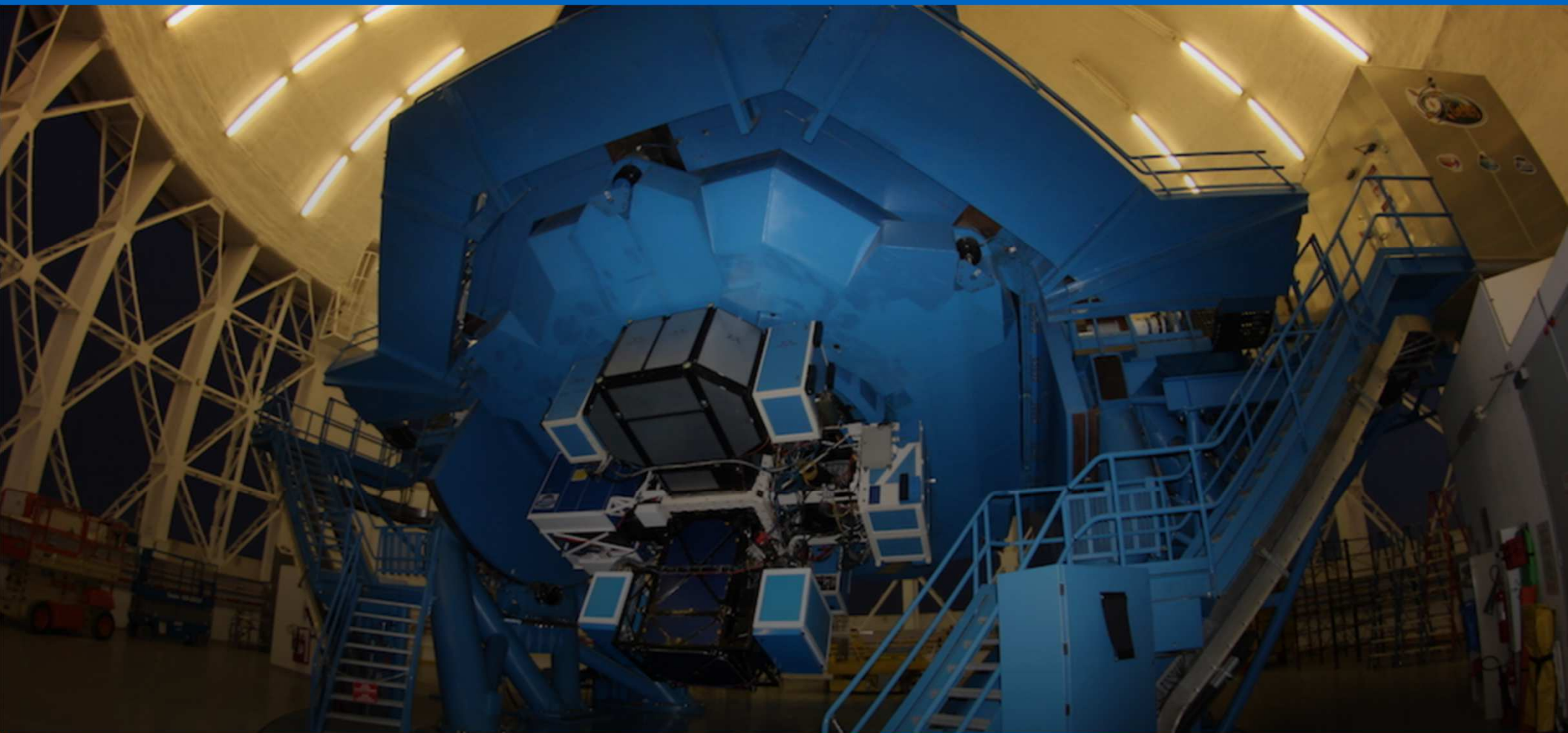


Image credit: GPI team

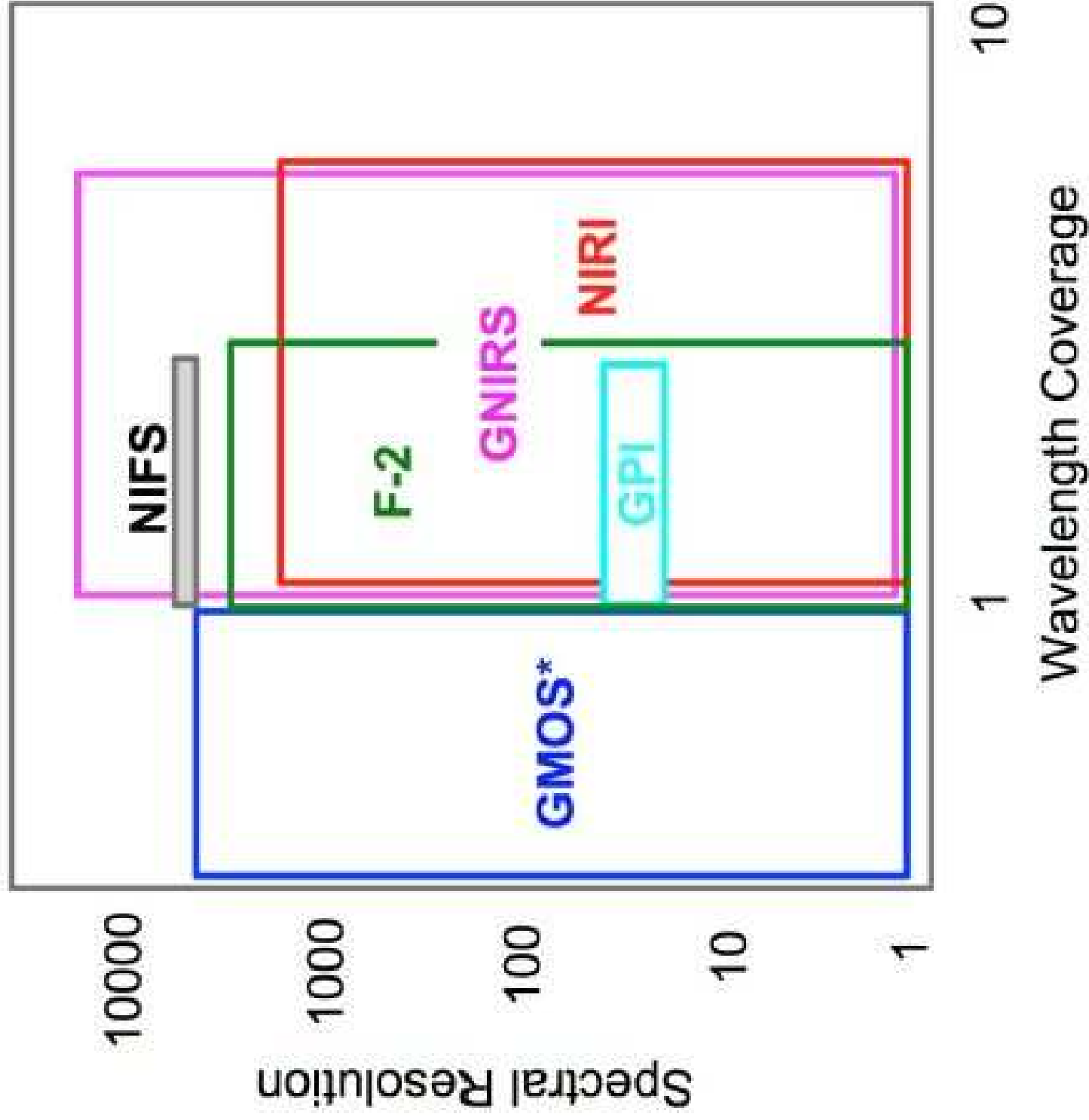
# Gemini North

VISIBLE	NEAR-IR	MID-IR	OTHER FACILITIES
Facility Instruments			
<b>GMOS</b> (multi-object, long-slit and IFU spectrograph and imager) <a href="#">Instrument Fact Sheet</a>	<b>NIRI</b> (1-5 $\mu$ m imager) <a href="#">Instrument Fact Sheet</a>		<b>GCAL</b> (facility calibration unit)
	<b>NIFS</b> (1.0-2.5 $\mu$ m integral field spectrograph) <a href="#">Instrument Fact Sheet</a>		<b>ALTAIR</b> (facility natural/laser guide star AO system)
	<b>GNIRS</b> (1-5 $\mu$ m long-slit and 0.9-2.5 $\mu$ m cross-dispersed spectrograph; formerly at Gemini South) <a href="#">Instrument Fact Sheet</a>		
Visiting Instruments			
<b>GRACES</b> (0.4-1.0 $\mu$ m high resolution spectrograph)		<b>TEXES*</b> (10-20 $\mu$ m high resolution spectrograph)	



# Gemini South

VISIBLE	NEAR-IR	MID-IR	OTHER FACILITIES
Facility Instruments			
<b>GMOS</b> (multi-object, long-slit and IFU spectrograph and imager) <a href="#">Instrument Fact Sheet</a>			<b>GCAL</b> (facility calibration unit)
	<b>GSAOI</b> (high-resolution imager for use with Multi-Conjugate Adaptive Optics system "GeMS") <a href="#">Instrument Fact Sheet</a>		<b>GeMS</b> (Multi-conjugate adaptive optics system)
	<b>GPI</b> (adaptive-optics imaging polarimeter/integral-field spectrometer) <a href="#">Instrument Fact Sheet</a>		
	<b>FLAMINGOS-2</b> (long-slit spectrograph and imager) <a href="#">Instrument Fact Sheet</a>		
Visiting Instruments			
<b>DSSI/Speckle</b> ** (diffraction-limited optical imager)	<b>Phoenix</b> ** (high-resolution spectrograph)		





# GMOS

Partly built  
in Victoria!

## Gemini Multi-Object Spectrograph

Detector Three Hamamatsus CCDs  
each 2048 x 4176 pixels

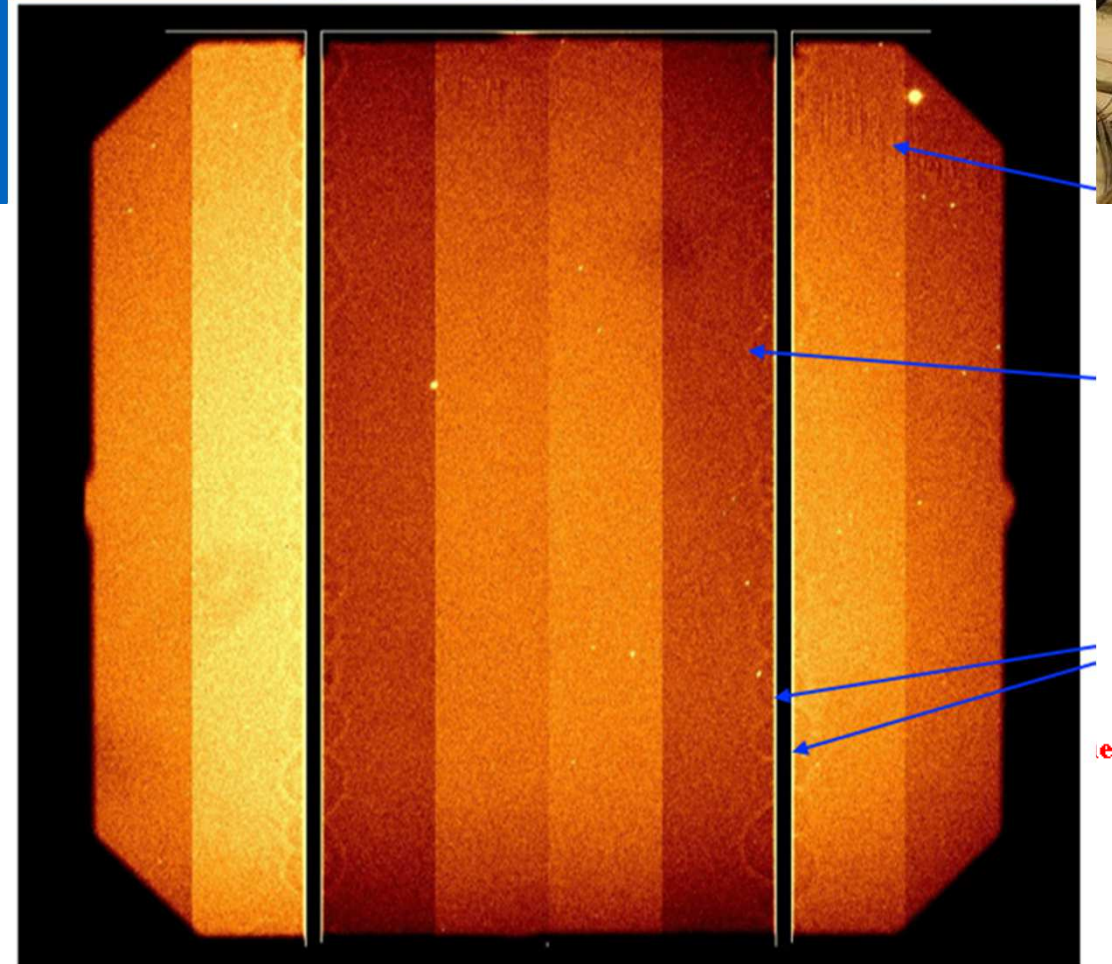
Wavelength range 0.36 to 1.03  $\mu\text{m}$

Field-of-View 5.5 arcmin

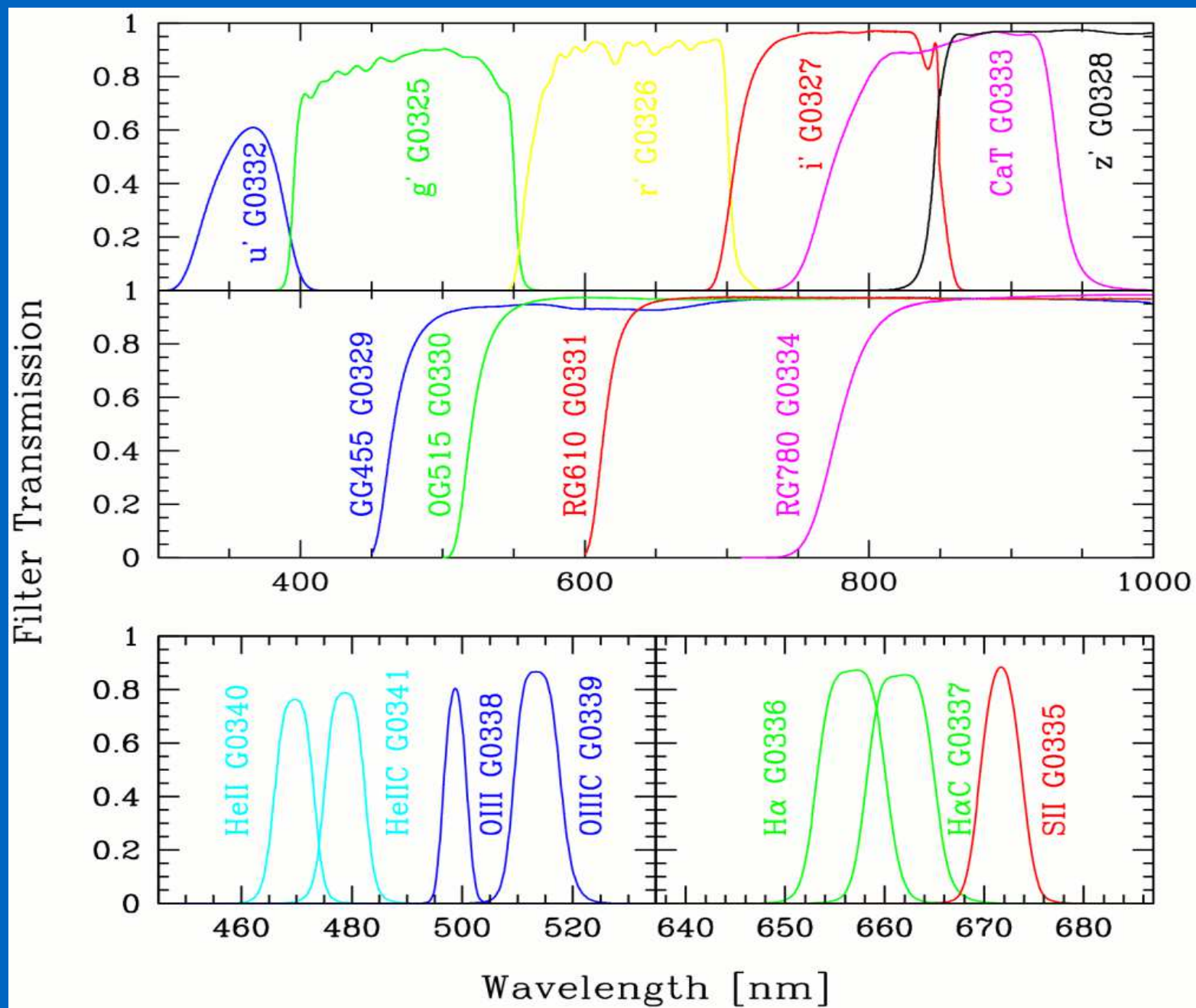
Pixel scale 0.0807 arcsec/pixel  
15  $\mu\text{m}$  pixel size

Read noise ~4.1 e- rms

12 amplifier readout



Imaging: 0.0807"/pixel over a 5.5 arcmin Field-of-View



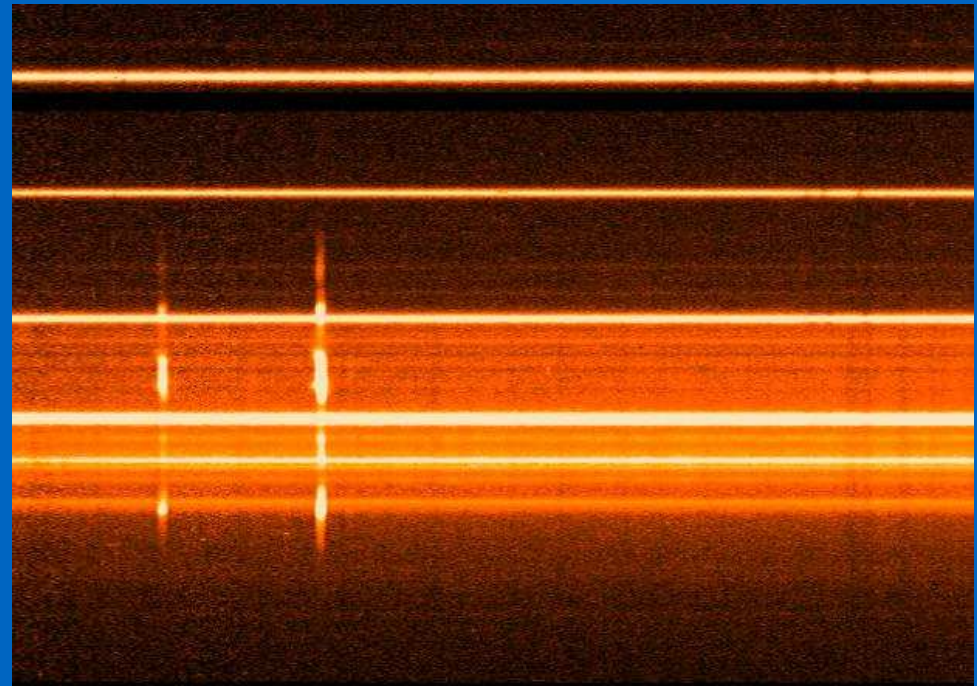


## Longslit spectroscopy:

Slit widths: 0.25" to 5"

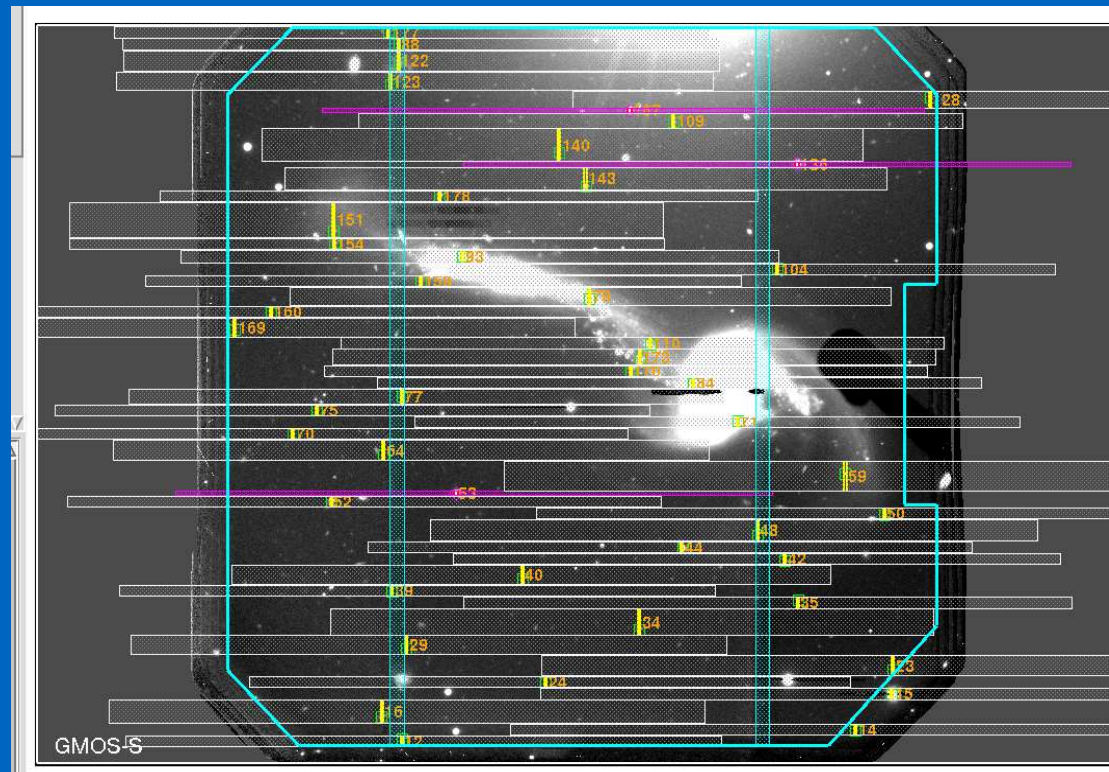
Slit Length: up to 5.5 arcmin

Dispersion:  $R \sim 630$  up to  $R \sim 4400$   
(choice of 6 gratings)



## Multi-Object spectroscopy:

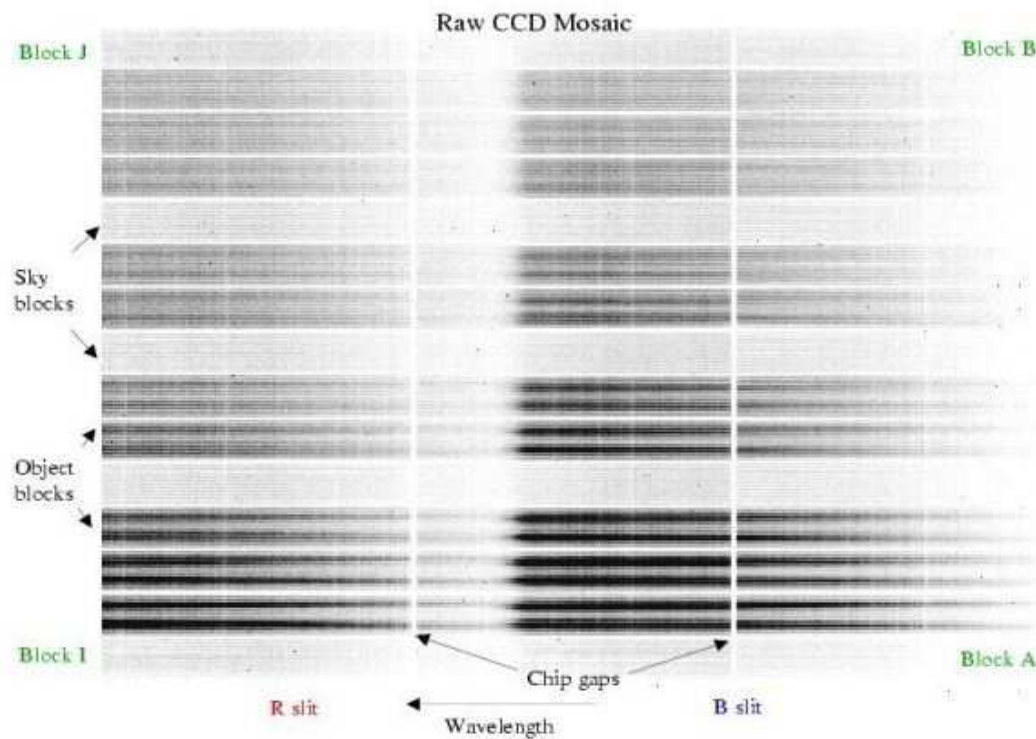
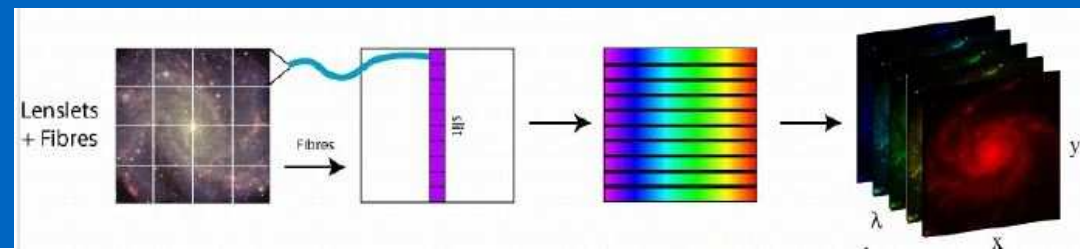
- Up to several hundred slitlets over the whole Field-of-view with any of the gratings
- Uses custom-designed laser-milled masks



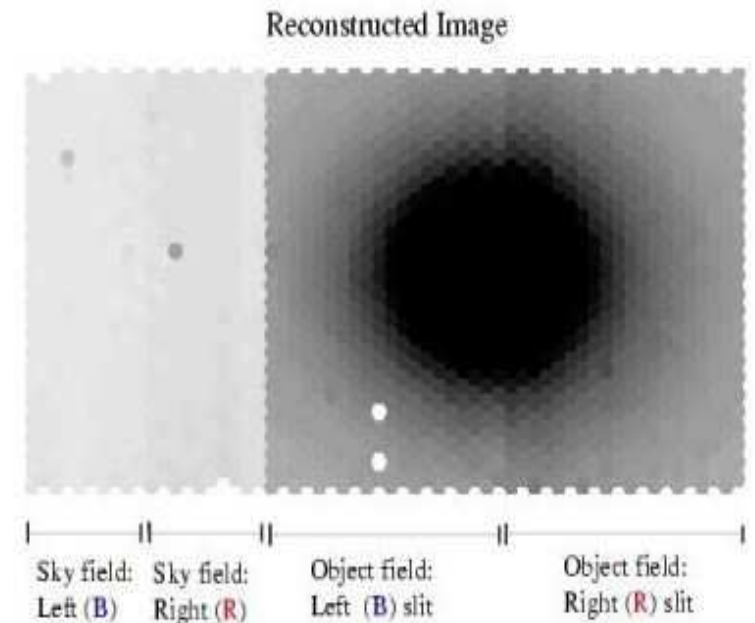


# GMOS IFU

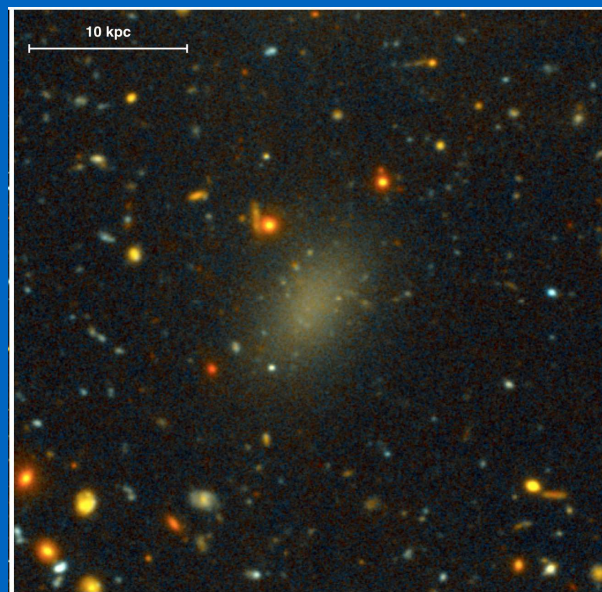
The integral field mode of GMOS provides the ability to perform spatially resolved spectroscopy. This mode uses a lenslet array of 1000 elements for a science field of view of  $5'' \times 7''$ . The nearby sky is sampled with 500 elements.



## GMOS IFU Example Data: NGC 221



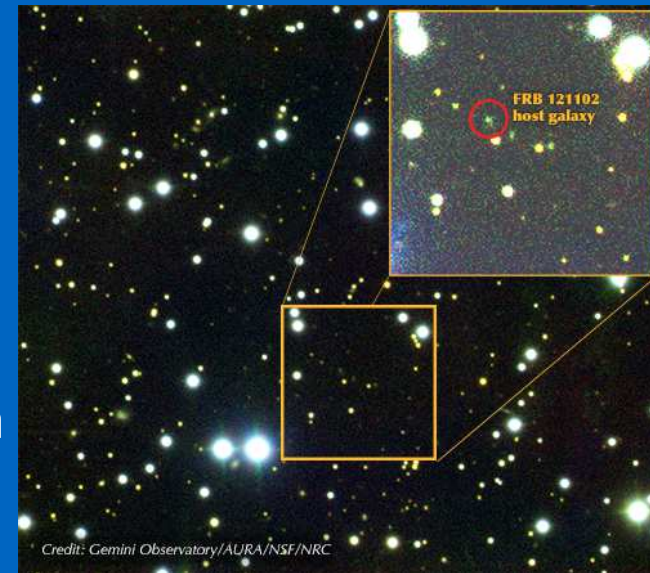
# GMOS Science: recent Canadian press releases



Dragonfly44:  
Ultra-Compact-Dwarf  
= “failed galaxy”, is  
99.99% dark matter

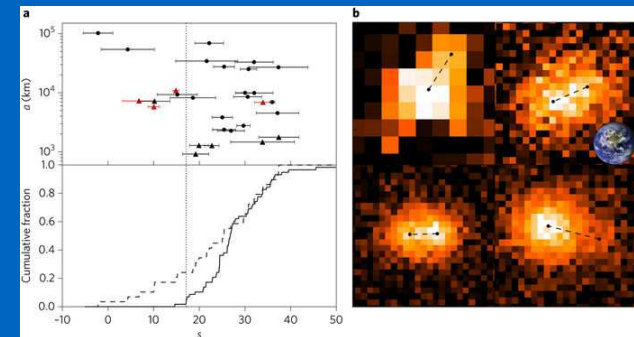
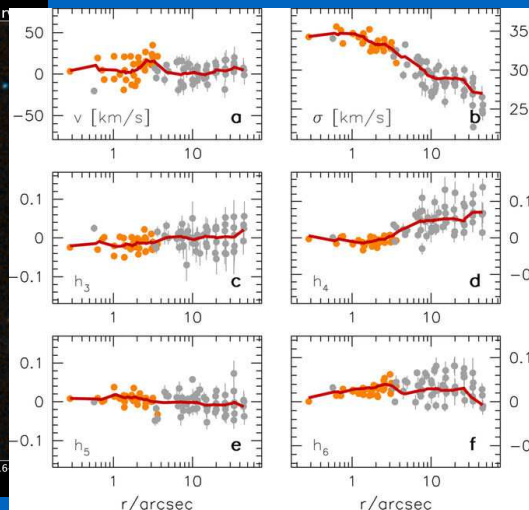
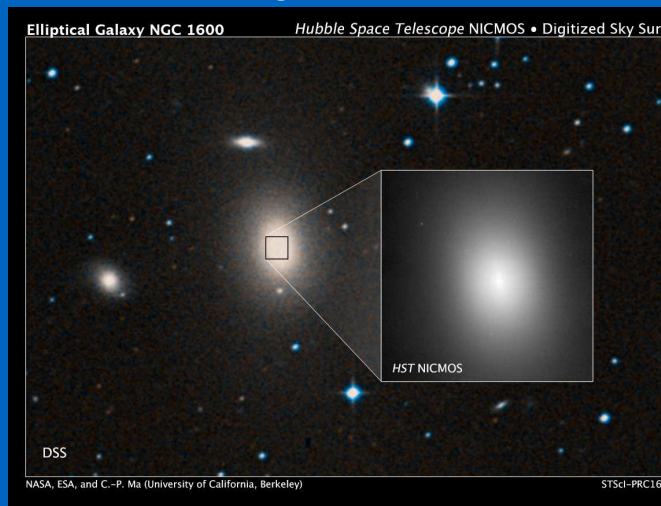
First optical identification  
of a Fast Radio Burst =  
dwarf galaxy at  $z=0.19$

Van Dokkum, Abraham, Brodie et al 2016  
ApJ 828,L6



Tendulkar et al 2017 ApJ 834 L7

NGC1600: Super Massive Black Hole  
 $17 \times 10^9 M_{\odot}$  in this rather isolated galaxy



Fraser, Bannister, Pike et al 2017 Nature  
Astronomy 1, 88

Colors of Outer Solar  
System Objects: Neptune  
migrated outward slowly

Thomas, Ma, McConnell et al 2016, Nature 533, 340

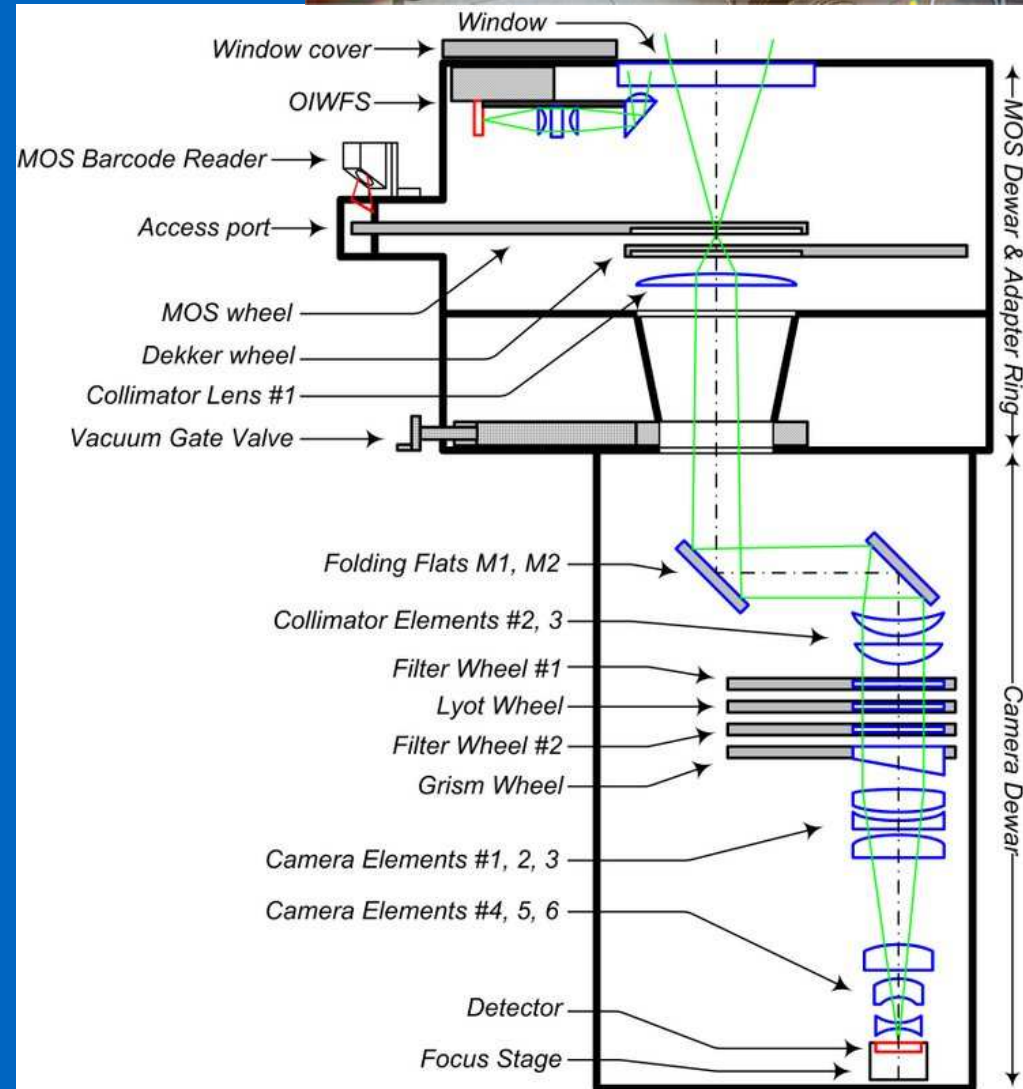


# Flamingos-2



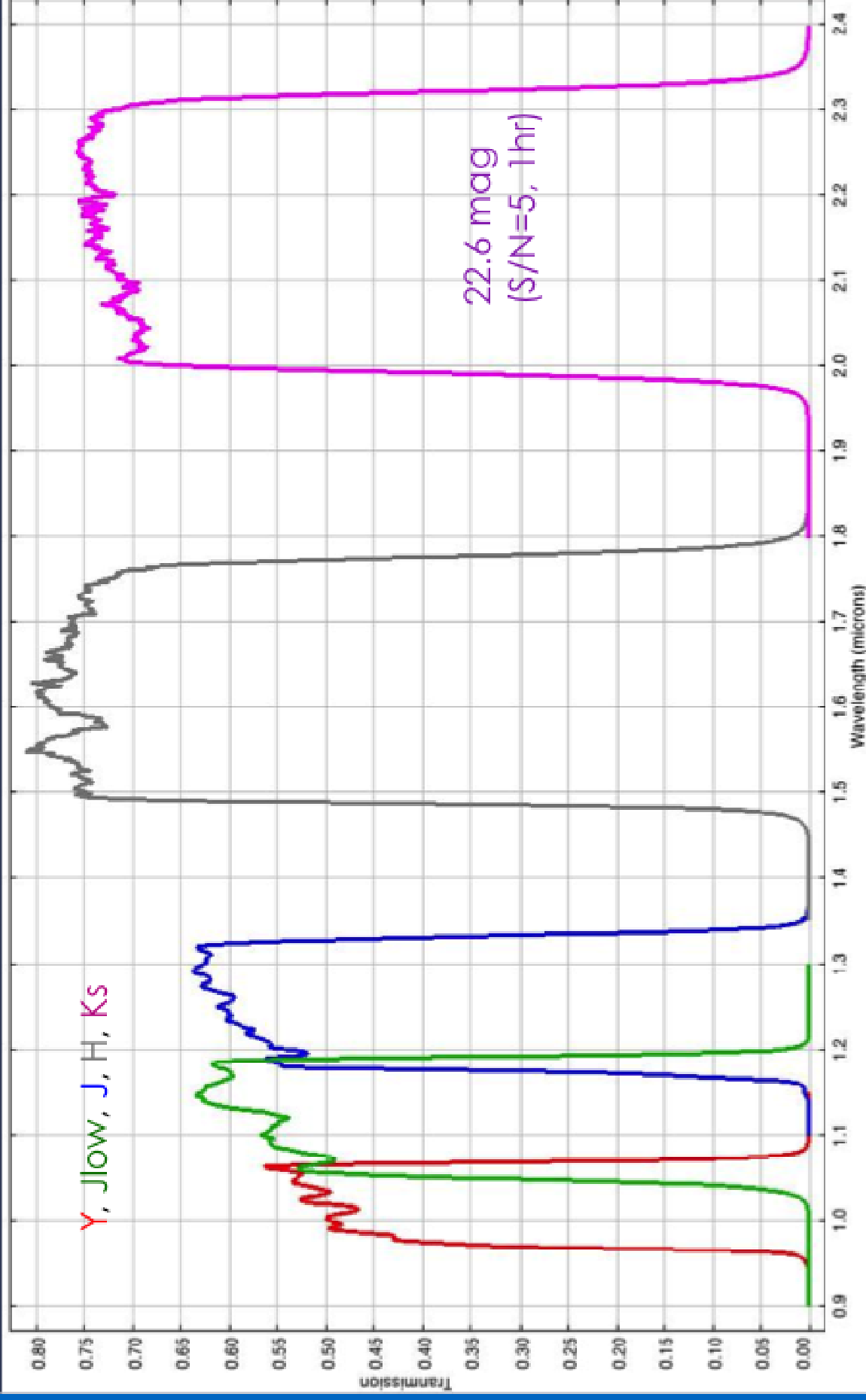
## Near-Infrared Imager and Spectrograph

Wavelength Range	0.9 – 2.4 microns
Detector	Hawaii-2 array 2048x2048 pixels
Imaging FOV	6.1 arcmin diameter (circular)
Pixel scale	0.18 arcsec/pixel
Spectroscopic FOV	6.1' x 2'
Dispersion	Two grisms $R \sim 1200$ for JH or HK One medium-res grism $R \sim 3000$ covering one Band
Longslits	1 to 8 pixels wide ( $=0.18''$ to $1.44''$ ) and 4.4' long

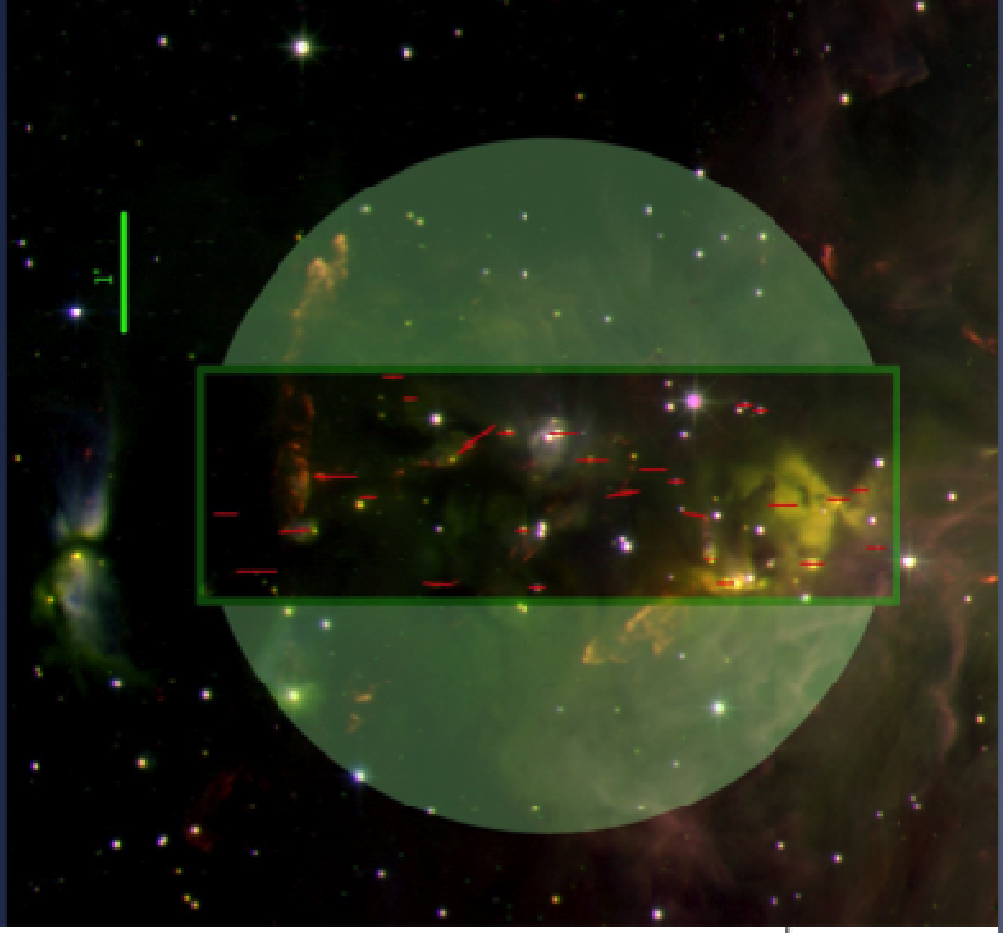
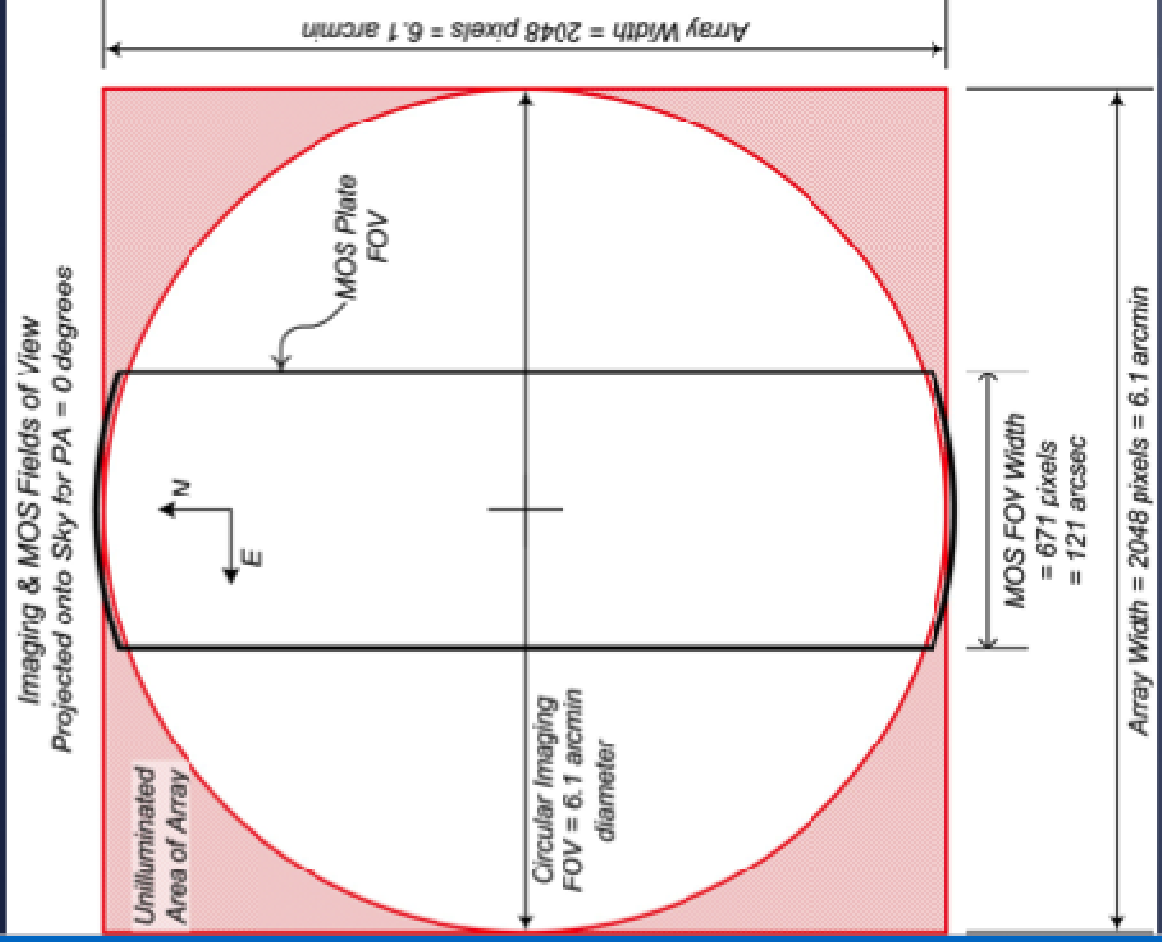




# Filters Transmission



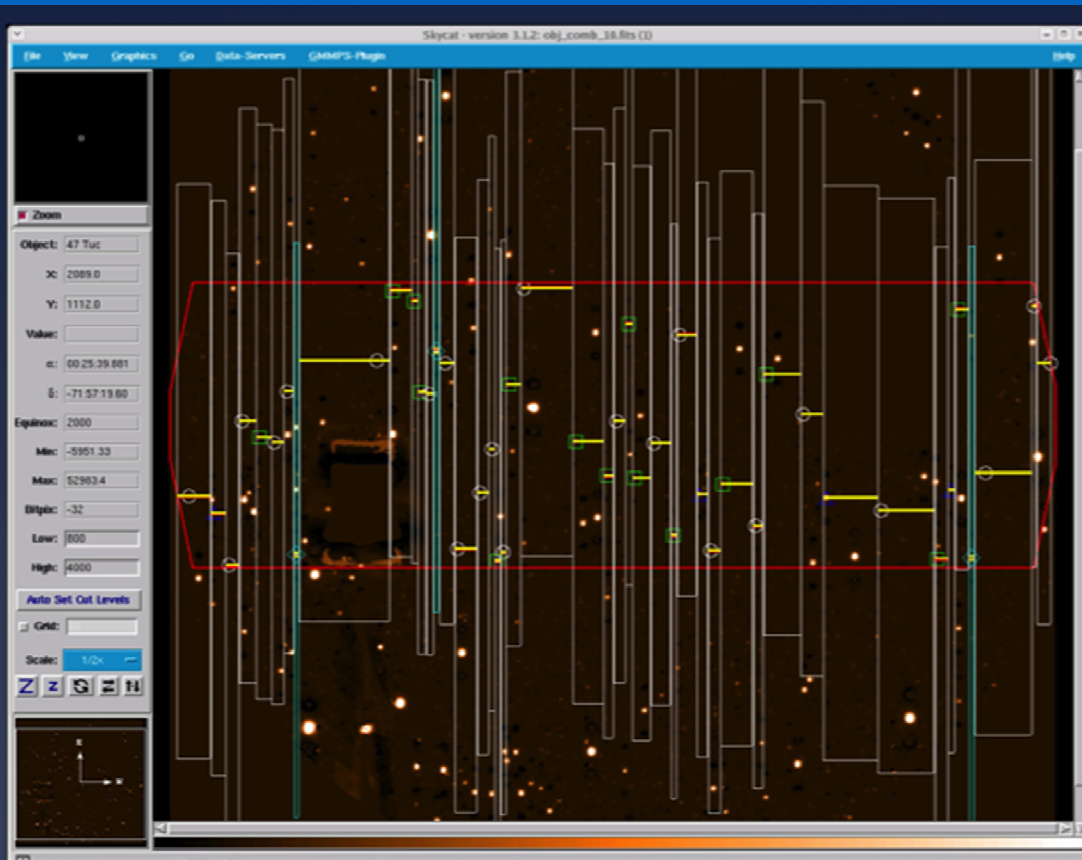
# Fields of View



# F2 MOS mode

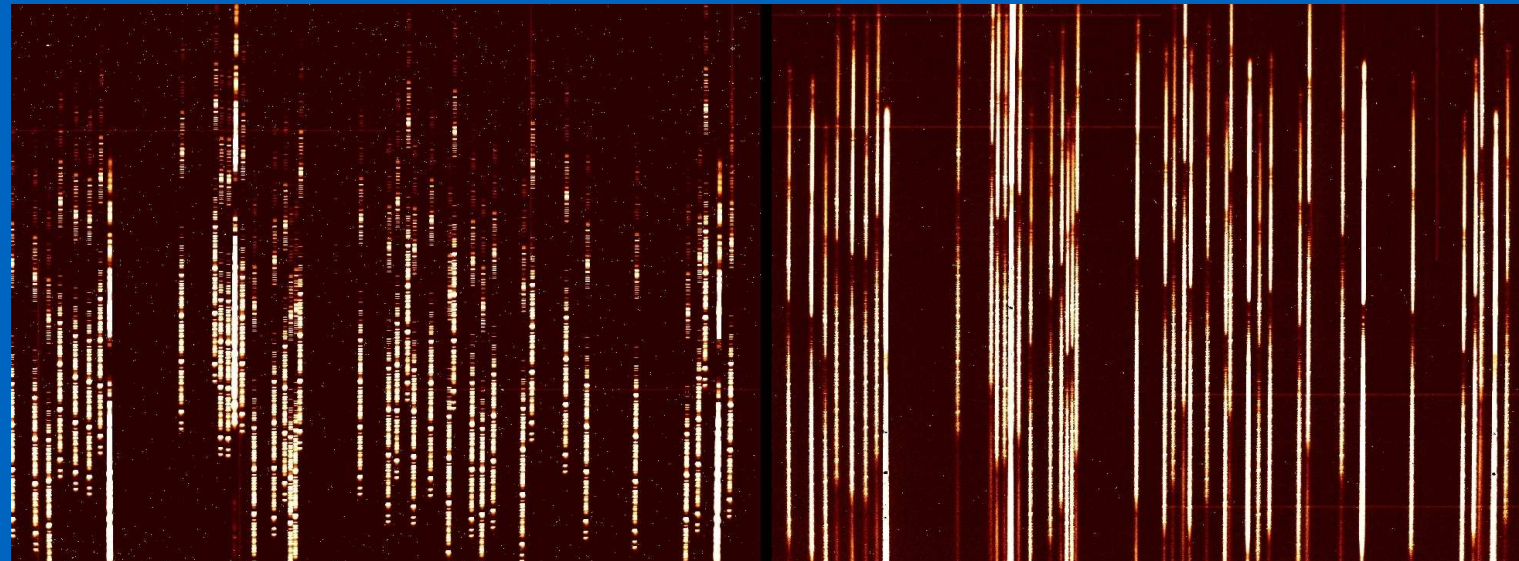
MOS Field-of-View  $6.1 \times 2$  arcmin

MOS wheel holds 9 masks



Before sky subtraction

After sky subtraction



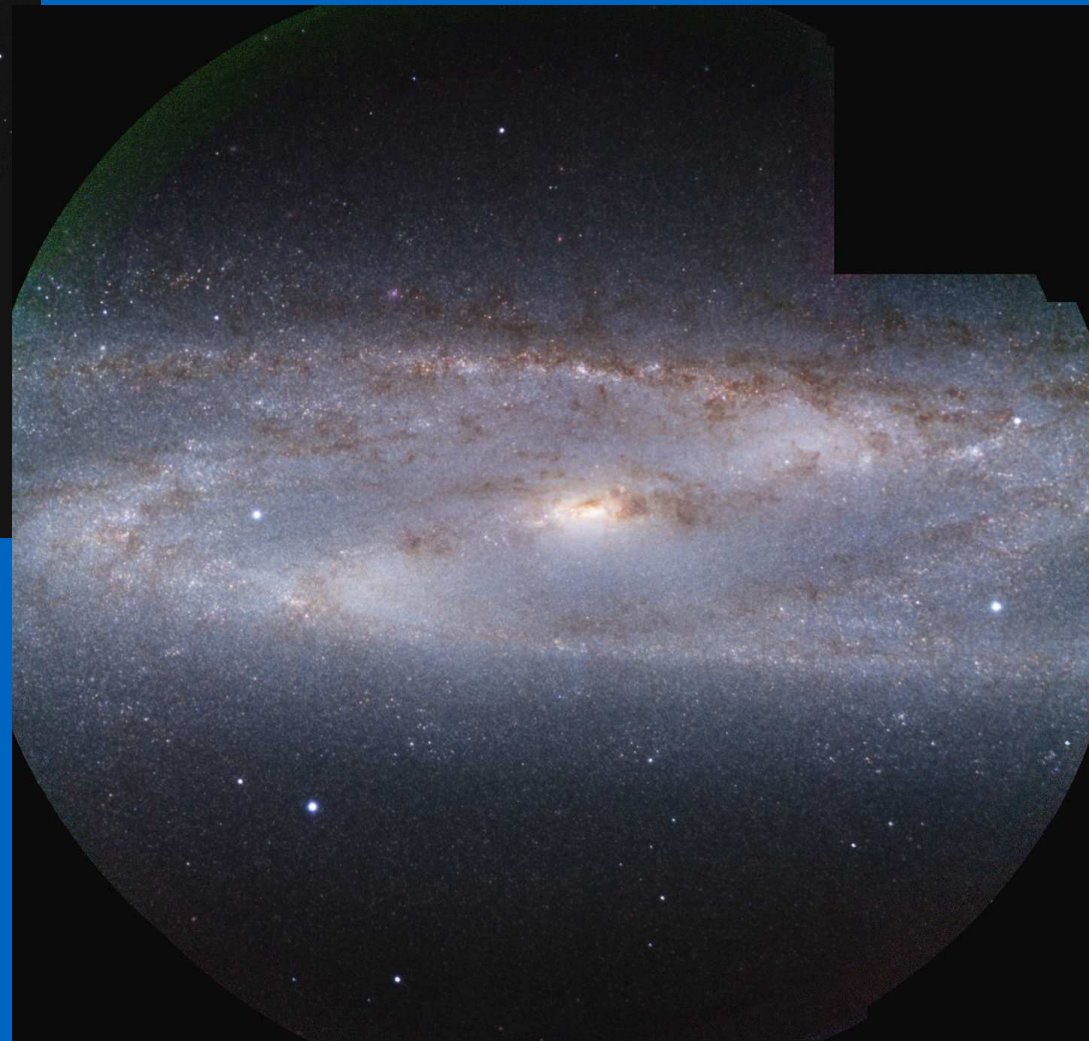


# F2 Science

- Near-IR imaging applications:
  - Galactic centre and disk populations
  - resolved populations & star formation in nearby galaxies
  - late stages of stellar evolution in globular clusters, etc
  - galaxy structure and morphology in  $z > 1$  clusters
  - high redshift galaxy SEDs; deep IR imaging around high- $z$  radio sources
- Spectroscopic applications:
  - stellar spectroscopy in regions of high extinction
  - MOS spectra of red stars: red supergiants, AGB stars, in nearby galaxies
  - galaxy dynamics in distant clusters
  - internal dispersions and fundamental plane at  $z > 1.4$
- High- $z$  galaxy surveys,  $z$  confirmations



NGC2442 in JHK, 0.6: seeing



NGC253 in JHK, 0.7" seeing

# Base Facility Observing in Both Hemispheres



From the Gemini Base Facility in Hilo

...And La Serena in Chile



Image credit: Gemini Observatory



# And now Observing from Victoria!

*GROW-op on Observatory Hill:*



Celia Blain, Ben Gerard and Zach Draper (from UVic) observing with GPI at DAO



# Proposing for time at Gemini


**The regular proposal:** *once per semester*, through the national Time Allocation Committees (TAC)

for regular proposals

(oversubscription: <2)

70%

Two Calls per year with Deadlines: March 31<sup>st</sup>, September 30<sup>th</sup>


 **Large & Long Programs:** *once per year*, through the Large Program TAC

for large and/or long **ambitious** proposals

(oversubscription: >5)

20%

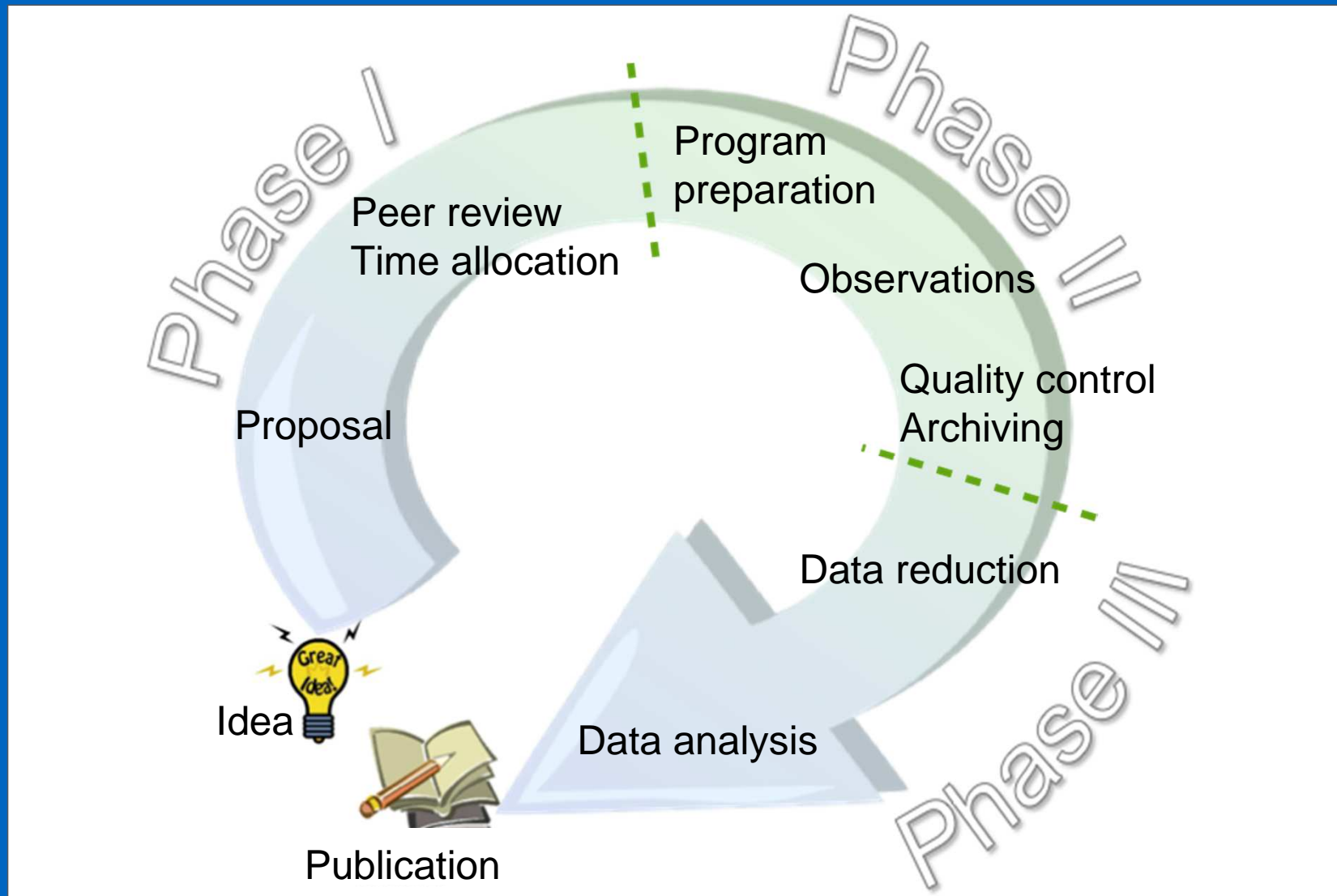
One Call per year with Deadline March 31<sup>st</sup>

 **Fast turnaround programs:** *once per month*, peer reviewed, no TAC

for short, rapid, immediate and/or follow-up proposals

10%

# The life cycle of Gemini programs





[www.gemini.edu/llpps](http://www.gemini.edu/llpps)  
[@GeminiObs](https://twitter.com/GeminiObs)

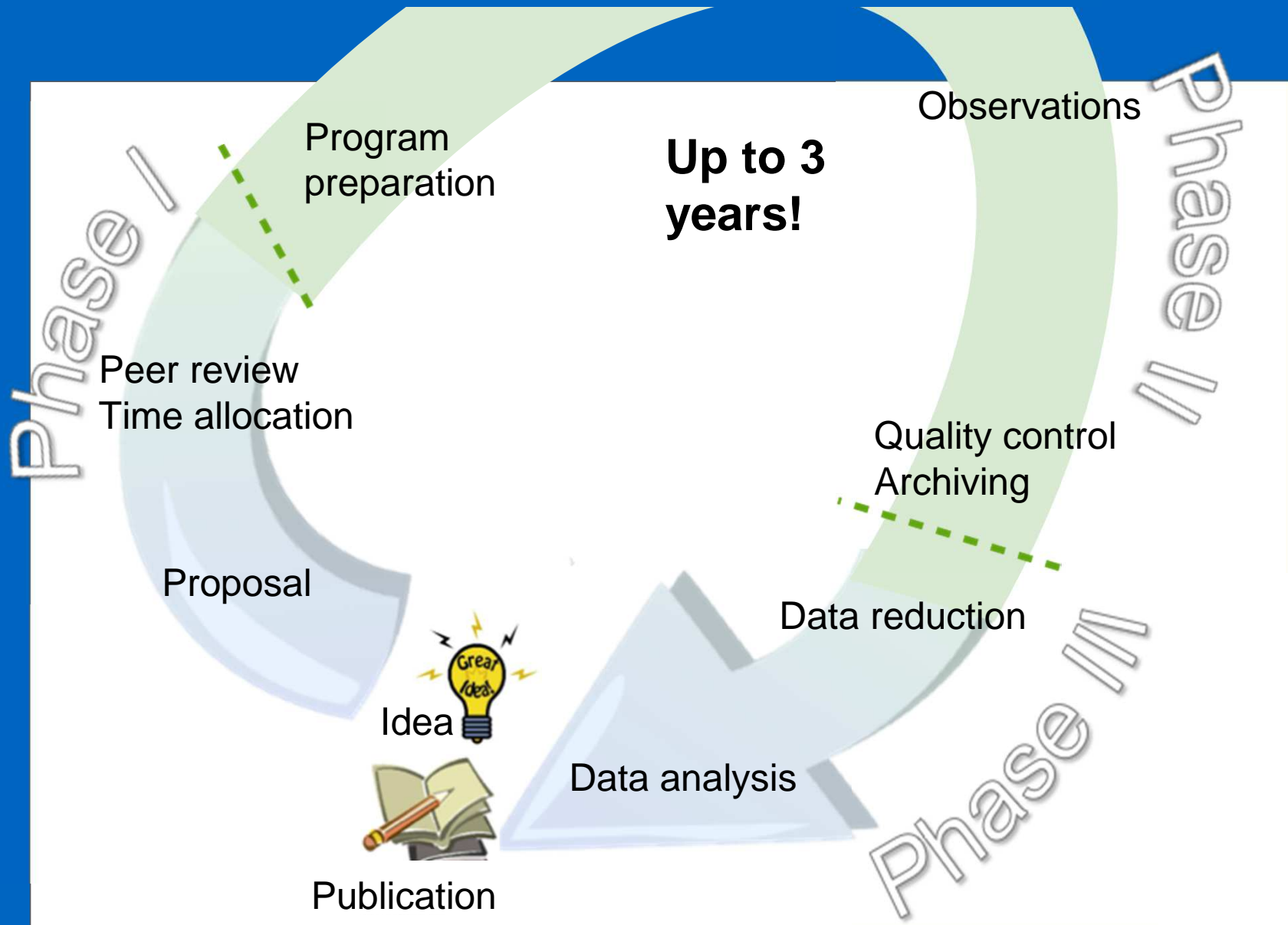
The background of the slide is a photograph of the Gemini North telescope at night. The telescope is a large, multi-story structure with a prominent dome, illuminated from within, casting a warm glow. It is situated on a dark, rocky mountain peak. The sky is a deep black, filled with numerous stars and the faint, hazy band of the Milky Way galaxy stretching across the upper portion of the image. The overall scene is serene and awe-inspiring, capturing the beauty of astronomical observation.

# **Large and Long Programs**

## **High-Impact Science Over Multiple Semesters**



# Life cycle of LP



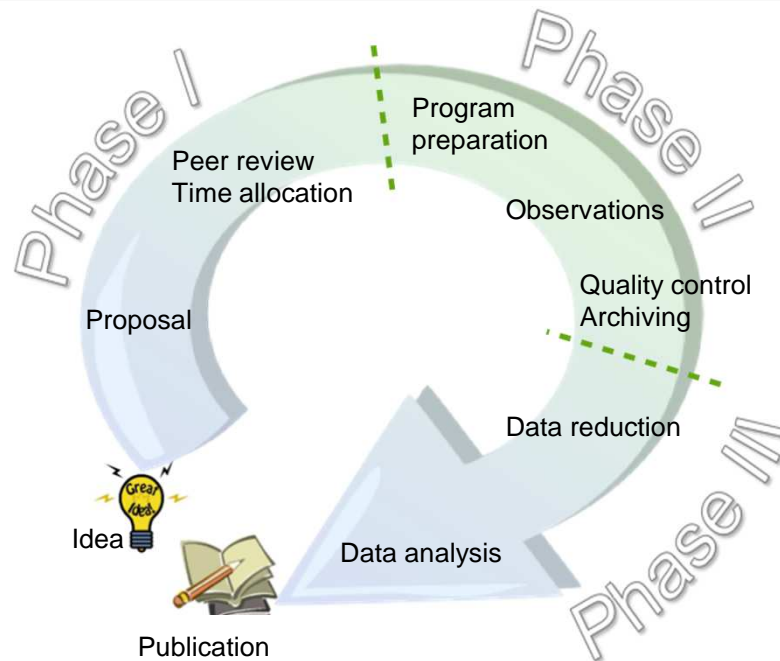
# **Fast Turnaround Program**

**Monthly Proposal Calls - Data Within 4 Months**



@GeminiObs  
[www.gemini.edu/ftp](http://www.gemini.edu/ftp)

# The life cycle of Gemini programs



**~ 3 months  
between  
idea and data**



# Fast Turnaround



Developed in  
Victoria!

Fast Turnaround is good for:

- Few hours projects
- Pilot/feasibility studies
- Completing samples
- Following up unusual events
- high risk - high reward

10% at both telescopes! (~20 hours per month per site)

# Fast Turnaround

The proposal are reviewed by the PIs themselves. Each PI receives 8 to 10 proposals to rank.

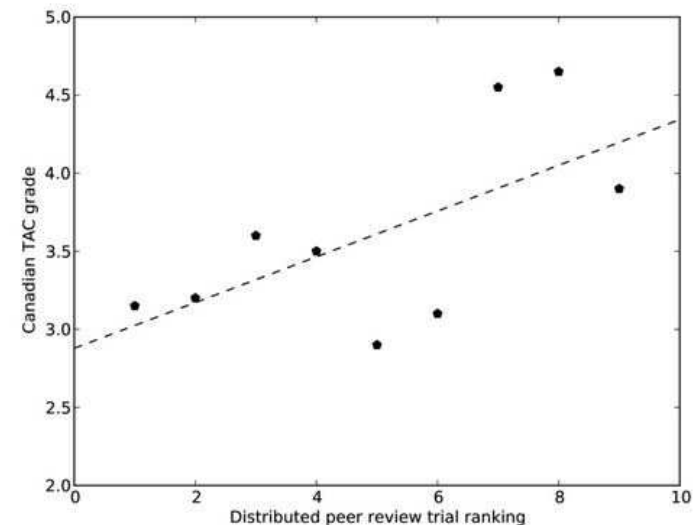
Comments by PhD students who participated:

*“I found this challenging and time-consuming but actually EXTREMELY helpful. Since I cannot fill in the knowledge blanks with the proposals, reviewing these helped me better understand how to craft an easily understandable proposal.”*

*“I found it challenging, but definitely interesting. It felt like a very good exercise.”*

*“I found it both interesting and challenging. It was actually very useful for learning what’s going on in these fields, more so than a journal club or astro-ph discussion.”*

Comparison of proposal grades returned by the Canadian TAC for the 9 participating proposals with the final ranking from the distributed peer review trial. The CanTAC grades range from 1 (strongest) to 5 (weakest).

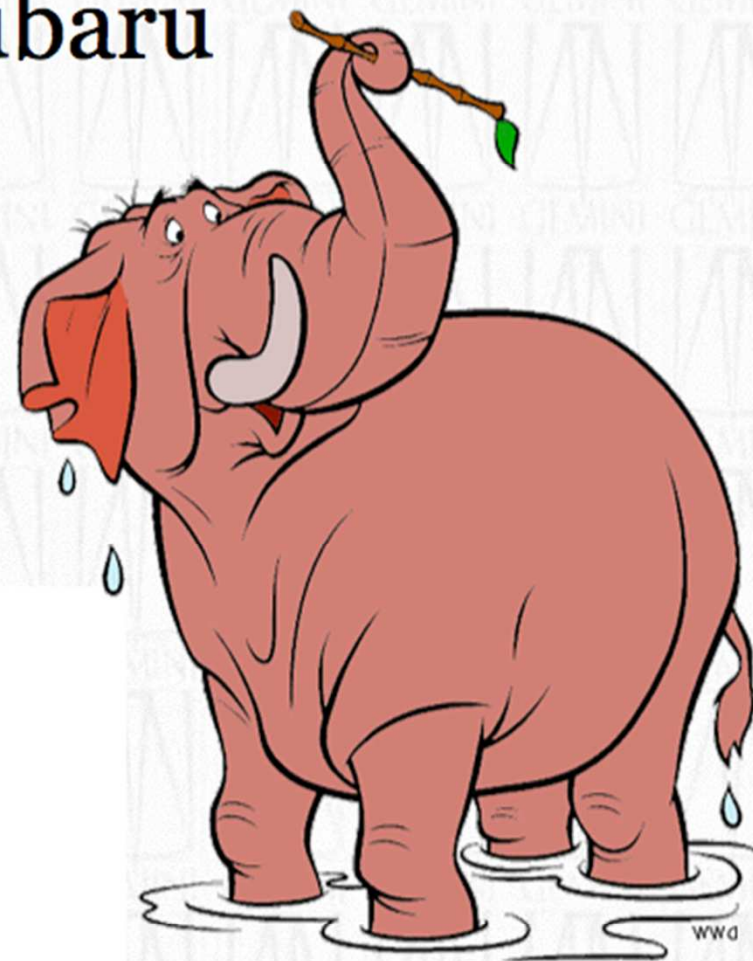


VLT

Keck

Subaru

Gemini

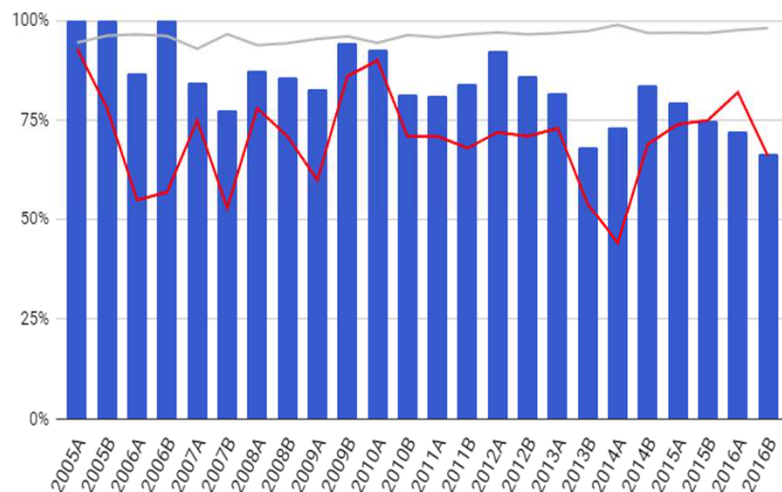




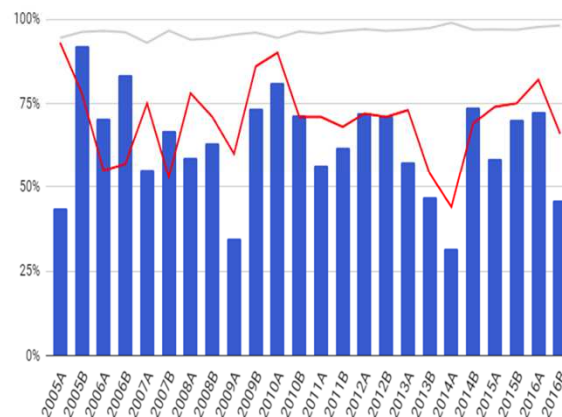
# What are the “Bands”

- The successful proposals are ranked by the Time Allocation committee and get assigned to Bands.
- Band 1 and 2 have priority.
- Band 3 is overfilling the queue with programs with less restrictive observing conditions that can be observed when there are no suitable Band 1 or 2 programs.
- The observing conditions are : CC = Cloud Cover; IQ=Image quality; SB= Sky Brightness; WV= Water Vapor
- Band 4 is weather loss (not charged to the partners)

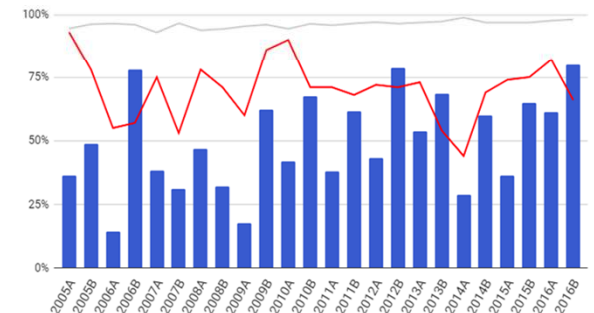
Fraction of queue programs at 80% or above, GN Band 1 excluding ToOs and blocked modes



Fraction of queue programs at 80% or above, GN Band 2 excluding ToOs and blocked modes



Fraction of queue programs at 80% or above, GN Band 3 excluding ToOs and blocked modes



# PHASE I TOOL

Untitled[\*] - PIT 0.0.11

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. The weakness of the dwarf galaxy continua permits detection of the higher-level H<sub>2</sub> transitions which are essential to determine the gas excitation and relative contributions of thermal and UV-excited gas.

TAC Category: Extragalactic

Keywords: 2 Selected: Starburst galaxies; Dwarf galaxies

Attachment: Science-and-Tech-case.pdf (in folder: My Documents)

Name	Institution	Phone	Email
Stephanie Cote	Herzberg Institute of Astr...	(250) 363-0026	Stephanie.Cote@nr...

Overview | Scheduling and Time Requests | Submit

### Observations

Group by: Resources | Targets | Conditions

Item	Time	Guiding	Vis	GSA
Flamingos2 Longslit JH JH (1.390 um) 2-pix longslit				
ngc6822				
CC 70%/Cirrus, IQ 70%/Good, SB Any/Bright...				
Observation	2.00 HR	100%		

Total requested time: 2.00 hours

Lookup <enter a target here>

Observations | Band 3 | Targets

### Problems

Description	Section
-------------	---------

Ready

- Scientific and Technical cases included as a PDF attachment, created with either LaTeX or DOC templates provided on the Gemini webpages
- Observations are entered as 'trees' containing Resources, Conditions, and Targets, with automatic guidestar and target-duplication checking from the database
- Missing information or problems are readily displayed

# PHASE I TOOL

## Scientific and Technical cases:

- One page limit for Scientific justification, excluding references
- Up to two other pages for references, including up to 3 figures with captions
- One page each for Experimental Design and Technical Justification; no extra figures
- Other sections as indicated

### Scientific Justification

*Be with figures, captions and references*

White Dwarf (WD) stars are relics of the age and evolution of the Galaxy. The cooling rate slows as their temperature decreases and the census finds more WDs at lower temperatures. Such a census is needed as chronometers have come into use (Hansen 1998). They showed that there is a consequence of the finite age of the Galaxy of  $8 \pm 1.5$  Gyr (Leggett et al. 2000) 6000 WDs found in the Sloan Digital Sky Survey (SDSS) the fact that the sample includes

Cool WDs have atmospheres dominated by the primary opacity source in H and He (Hansen 1998). H-rich WDs have CIA become significant below 10000 K and produce broad absorption features in the optical (Harris et al. 2006) is Rayleigh scattering, so He-rich atmospheres, collisions between atoms are denser than the H atmospheres and temperatures compared to pure

Due to the effect on opacity, the determination of an accurate temperature and atmospheric composition. The atmospheric composition is to be determined from ultracool WDs. Bergeron & Leggett (2002) LHS 3250 and SDSS 1337+00, presents their best fit solutions for the optical and near-IR photometry. SDSS is also shown. Bergeron & Leggett (2002) fit with mixed H/He models, yet

Gemini Proposal

### Technical Description

*requested (seeing, cloud coverage, etc.) one page with no additional*

Our search for ultracool White Dwarfs is presented in Gates et al. (2004) in Harris et al. (submitted) absorption (see Science Citation Index) obtain near-infrared photometry and the IR observations for the service proposal, and the spectroscopy and photometry

The SDSS  $z$ -band magnitudes to be corresponding  $H$  and  $K$ , which are equal to NIRC2 ITC for CC50 IQ85

$J$	exp.
18.5	$5 \times 30$
19.5	$5 \times 60$
20.0	$9 \times 60$
20.5	$18 \times 60$
21.3	$54 \times 60$

Using these exposure times SDSS0310-01 will require  $(2.5 + 2.5 + 2.5)$  mins, to get which will still allow us to get and SDSS1251+44 will require  $H$  band photometry we require provide S/N  $\sim 20$  for SDSS 9.58 hours. With acquisitions separate acquisitions are required is necessary and sufficient at  $J$  and  $H$  to distinguish between different compositions, and hence

Gemini Proposal

Page 4

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**Band 3 Plan** *If applying for queue time and it is acceptable for the proposal to be scheduled in Band 3, describe the changes to be made to allow it to be successful in Band 3 (limit text to half a page).*

If awarded time in Band 3 we will reduce our request to 7.9 hrs, and use IQ85 and CC50 conditions. We will drop the 2hr-long  $K$  band observation for one target (getting  $J$  and  $H$  only), and the 2hr-long  $H$  band observation for another (getting  $J$  only). Also we will obtain lower S/N data at  $H$  (10 vs. 20) for another faint target, by taking data in IQ85 instead of IQ70. This would almost allow the same science, although the constraints on the two faintest targets will be weakened, and knowledge of the CIA opacity behaviour at its strongest point, in the  $K$  band, will be reduced.

**Classical Backup Program** *If applying for classically scheduled time, describe the program you will pursue should the weather be worse than the requested observing conditions (limit text to half a page).*

This is not a classical request.

**Scheduling Constraints** *If there are scheduling constraints for your program, describe them here.*

There are no constraints.

**Justify Target Duplications** *If your targets have been previously observed by Gemini using similar setups to those proposed here, justify the duplication below.*

The GSA search revealed no duplicate observations.

**Publications** *Enter a list of publications written by the PI and Co-Is that support this proposal.*

Gates et al. 2004 ApJ 612 L129 "Discovery of New Ultracool White Dwarfs in the SDSS"  
Kilic, Munn, Harris et al. 2006 AJ 131, 582 "Cool White Dwarfs in the SDSS"  
Harris, Munn, Kilic et al. 2006 AJ 131, 571 "The White Dwarf Luminosity Function from SDSS Imaging Data"  
Bergeron & Leggett 2002 ApJ 580, 1070 "Analysis of Two Very Cool White Dwarfs"  
Bergeron, Ruiz, Hamuy et al. 2005 ApJ 625, 838 "On the Interpretation of High-Velocity White Dwarfs as Members of the Galactic Halo"

is necessary and sufficient at  $J$  and  $H$  to distinguish between different compositions, and hence



# PIT Help

[www.gemini.edu/sciops/observing-gemini/proposal-submission/phase-i-tool-pit/phase-i-tool-help/](https://www.gemini.edu/sciops/observing-gemini/proposal-submission/phase-i-tool-pit/phase-i-tool-help/)

Programs

- Policies for Competitive ToOs
- Advice for Band 3 Programs
- What to expect
- Telescope Time Charging
- Data Rights and Distribution
- Participant Subscription

Instruments

- Future Instrumentation & Current Development
- Queue and Schedules
- Data and Results
- Gemini Research Staff
- Helpdesk
- Statistics

**enewscast**

https://www.gemini.edu/sciops/observing-gemini/proposal-submission/phase-i-tool-pit/phase-i-tool-help/

Search

**Video tutorial: How to use the Overview section, the menu bar and the Problems section (or [read about the section](#)).**

**Can't see well?** Get to a [full size video in a separate window](#).

Gemini Observatory Phase I Tool Tutorial - Overview

**Gemini PIT tutorial**

**Overview**

**Video timestamps**

00:25	Menu bar
00:40	Problems section
01:10	Title and Abstract
01:29	TAC category
01:50	Keywords
02:25	Attachment (including Science and Technical Justifications)

# ITC (Integration Times Calculators)

[www.gemini.edu/sciops/instruments/integration-time-calculators](http://www.gemini.edu/sciops/instruments/integration-time-calculators)

GMOS-N ITC | Gemini Observa

← → ↺ 🏠

https://www.gemini.edu/sciops/instruments/integration-time-calculators

🔍 Search

Integration Time Calculators

Flamingos-2 ITC

GMOS-N ITC

GMOS-N Properties

GMOS-S ITC

GNIRS ITC

GSAOI ITC

NIFS ITC

NIRI ITC

Michelle ITC

T-ReCS ITC

AcqCam ITC

ITC Help

Release Notes

Future Instrumentation & Current Development

Queue and Schedules

Data and Results

Gemini Research Staff

Helpdesk

Statistics

enewscast

Astronomical source definition

Spatial profile and brightness:[\(more info\)](#)

Choose one of point, extended or user-defined source profile and the brightness in any filter/wavelength

☒ Point source [\(nominal PSF\)](#) with spatially integrated brightness 20.0 mag (e.g. 19.3 mag or  $2e-17$  W/m<sup>2</sup>/μm)

☐ Extended source having ... (When this option is selected the image quality selection in section 3 of the ITC is disabled.)

☐ Gaussian profile with full width half maximum (including seeing) of 1.0 arcsec and spatially integrated brightness of 20 mag (e.g. 19.3 mag or  $2e-17$  W/m<sup>2</sup>/μm)

☐ Uniform surface brightness 22.0 mag/arcsec<sup>2</sup> (e.g. 21.6 mag/arcsec<sup>2</sup>)

with the above brightness normalisation applied in filter R (0.67μm) band

reset

calculate

Spectral distribution:[\(more info\)](#)

Choose one SED, the redshift and extinction

☐ Library spectrum of a non-stellar object spiral galaxy (Sc)

☒ Library spectrum of a star with spectral type A0V

☐ Single emission line at wavelength 0.656 μm with line flux 5.0e-17 erg/s/cm<sup>2</sup> and line width 500.0 km/s on a flat (in wavelength) continuum of flux density 1.0e-17 erg/s/cm<sup>2</sup>/Å

☐ Model black body spectrum with temperature 10000 K

☐ Model power-law spectrum ( $S_{\lambda} = \lambda^{-1.0}$ )

☐ User-defined spectrum read from file (size < 1MB) 

Browse...

 No file selected.

with the spectrum mapped to a redshift ☒  $z = 0.0$  or a radial velocity ☐  $v = 0.0$  km/s



# OT (Observing Tool)

**File Edit View Go**

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

**Observation**

- COMPLETING PHASE II
- Top-Level Program Overview
- PhaseII Filling Note
- Templates
- Baseline: GMOS-N LongSlit B1200\_G5301 None L
- kdg61 - [1] GMOS-N LongSlit B1200\_G5301 None L
- Status
- [11] Longslit: Acq (blind offset)
- [13] Longslit: Acq (blind offset)
- [12] Longslit: Science with GCALflats
- Description
- GMOS-N**
- Observing Conditions
- Target: kdg61
- Observing Log
- Sequence
- GMOS-N Sequence
  - Offset
  - Offset
  - Observe (1X)
  - Flat
  - Arc
  - Offset
  - Observe (1X)
  - Arc
  - Flat
  - Offset

**Gemini Multi-Object Spectrograph (North)**

The GMOS North instrument is configured with this component.

Filter: None Exposure Time (sec): 2400.0

Disperser: B1200\_G5301 Central Wavelength (nm): 505.0

Order: 1 ☐ MOS pre-imaging ☐ Use Nod & Shuffle

CCD manufacturer: E2V

**Position Angle** Fixed 218.00 °E of N

**Focal Plane Unit** ☒ Built-in Longslit 0.50 arcsec ☐ Custom Mask MDF

Slit Width: Other

CCD Readout Translation Stage Regions of Interest ISS Port Nod & Shuffle

X Binning: 1 Y Binning: 4

**Set the CCD Readout Characteristics**

☒ Slow Read/Low Gain : Standard Science Mode ☐ Use 3 Amplifiers

☐ Fast Read/Low Gain : Acquisitions / Rapid Readout ☒ Use 6 Amplifiers

☐ Fast Read/High Gain : Bright Targets Imaging/Spectroscopy

Resulting CCD Gain: 2.2

Show



# Data Reduction

Gemini provides data reduction tools for all instruments; available through the easy to install, python/pyraf based “Ureka” package <http://ssb.stsci.edu/ureka/> (developed with STScI)



The User Forum:

<http://drforum.gemini.edu>



# Helpdesk



The screenshot shows the Gemini Observatory website's helpdesk submission page. The header features the Gemini Observatory logo and navigation links: Science, Public/Images, About, Careers, and Contact. A search bar with 'Google Custom Search' and a 'Search' button is also present. On the left, a sidebar menu lists various sections: Announcements, Contact, Library, PLO, Sciops (highlighted), Gemini Home, Telescopes and Sites, Science Visitors at Gemini, Observing With Gemini, Instruments, Future Instrumentation & Current Development, Queue and Schedules, Data and Results, Gemini Research Staff, Helpdesk (with sub-links: Submit a General Helpdesk Request, Structure and Responsibilities, Follow-up, Categories, NGO and Gemini Support), and Statistics. The main content area is titled 'Submit a General Helpdesk Request' and includes a breadcrumb trail: Gemini Observatory > Sciops > Helpdesk. A red instruction reads 'Please fill in all the fields.' The form contains several fields: 'Email Address' (with a note that it will be used for contact), 'Gemini Partner Country' (a dropdown menu currently showing 'Canada'), 'Topic' (a dropdown menu currently showing 'GMOS'), 'One line summary' (a text box), and 'Details' (a larger text box). A 'SUBMIT' button is located at the bottom left of the form area. In the top right corner of the form area, there is a link to 'Change page style:' with a 'Default' dropdown menu.

**GEMINI OBSERVATORY**

Science Public/Images About Careers Contact Google Custom Search Search

Change page style: Default

## Submit a General Helpdesk Request

Gemini Observatory > Sciops > Helpdesk

Please fill in all the fields.

Email Address: (this address will be used to contact you when work is done on your request - please double-check that the email address is correct)

Gemini Partner Country: (of your home institution)  
Select Gemini Staff if you do not see your country listed.

Canada

Topic: GMOS

One line summary:

Details:

SUBMIT

Or email [Gemini@nrc.ca](mailto:Gemini@nrc.ca)

# Gemini Science Fellows

- Three-year postdoctoral fellowship, with half of the Fellow's time spent on personal research, and half on Observatory support duties. Personal research is supported by the Gemini research budget.
- One fellow for each site (Hilo and La Serena) is selected annually
- Applicants propose a 3-year research program in which Gemini observations figure prominently.

[www.gemini.edu/jobs](http://www.gemini.edu/jobs)

