

NTCO Interns

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Stephen Goodsell

22 February 2024

NTCO Intern	Project Title	Supervisors	Date	Location
Collin Kielty	Expansion of the Nifty4Gemini data reduction pipeline	Marie Lemonie-Busserolle	17-Sep-18 to 18-Dec-18	Hilo, Hawaii
Viraja Khatu	Data Reduction Pipeline for GNIRS data	Marie Lemonie-Busserolle	20-May-19 to 19-Aug-19	Hilo, Hawaii
Shunyuan Mao	Data Analysis and Comparison of OPERA and DRAGraces	Alison Peck, Kristin Chiboucas, Siyi Xu	8-July-19 to 4-Sep-19	NOIRLab
Lowell Peltier	Historical Analysis of Queue Plans	Bryan Miller Andy Stephens	1-Feb-22 to 31-July-22	Remote/Hilo Hawaii
Fletcher Waller	Testing and Refining the GHOST Data Reduction Pipeline	Steve Margheim	26-May-22 to 26-Nov-22	La Serena, Chile

Thank you for your contributions



One Observatory, 2 telescopes

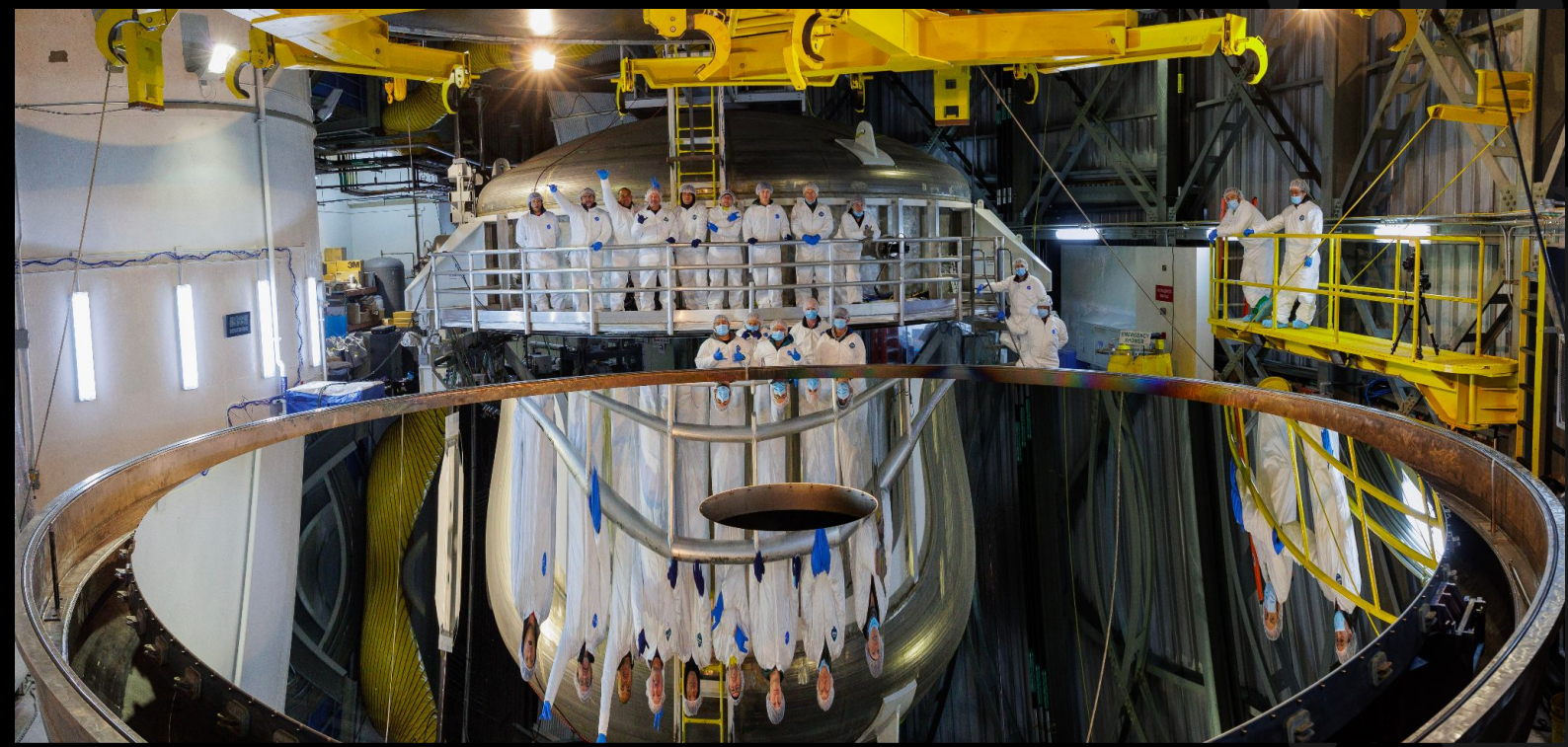
Twin 8.1-m visible/infrared optimized telescopes in Hawaii and Chile

Operated on behalf of the Gemini International Partnership





International Gemini Observatory

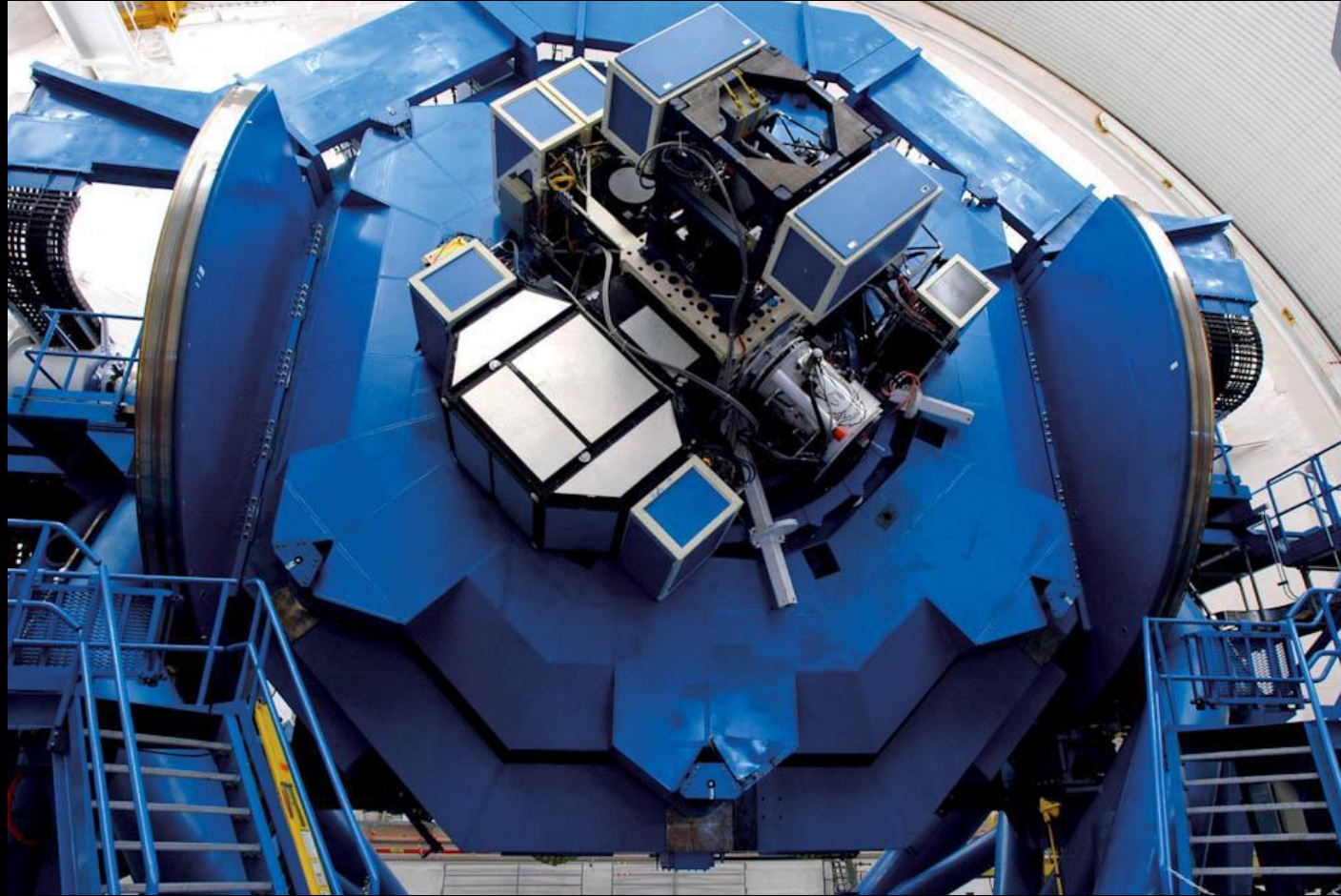


INTERNATIONAL
GEMINI
OBSERVATORY



International Gemini Observatory

Instrument Support Structure (ISS) with 5 ports





Gemini in 2020's: Building on Our Strengths



Supporting Diverse,
Discovery-based Science through
Operations and Instrumentation

Enhancing Time Domain Astronomy

Revitalizing Adaptive Optics

Modernizing User Support &
Data Reduction Pipelines



INTERNATIONAL
GEMINI
OBSERVATORY

NRC-CARC



Ministerio de Ciencia,
Tecnología e Innovación
Argentina

KASI Korea Astronomy and
Space Science Institute



Gemini Portfolio



DEVELOPMENT				DIRECTORATE
FACILITY INSTRUMENTS	INSTRUMENT UPGRADES	FACILITY INFRASTRUCTURE	VISITING INSTRUMENT	GEMMA - PIO
GHOST SCORPIO IGRINS 2	<i>GeMS RTC Upgrade</i> GNIRS IFU GPOL+NIRI	GEMMA - GNAO	GIRMOS MAROON X	NO PROGRAM AFFILIATION
	GPI-2 GeMS-DM0/E GLAO Conceptual Design Planning			GOATS

OPERATIONS		SOFTWARE		
OPERATIONS IMPROVEMENTS	OBSOLESCENCE PROGRAM	ROUTINE OPS & MAINTENANCE	SOFTWARE	SCIENCE USER SUPPORT
Mastering the X-Y Positioner GN Vibration Mitigation BTOOB Polarization Improvement Shutter EC Repair Coating Chamber Upgrade M2 Replacement	<i>A&G Motion Control Upgrade</i> <i>IR Detector Controller</i> Gemini North Cloudcam Prototype <i>M2 CEM Upgrade Implementation</i> Platform Lift Drive Replacement <i>WFS Camera Upgrade</i>	GS-M1 Shutdown	<i>EPICS Upgrade</i> <i>OCS Upgrades</i> Upgrade TCC SW GEMMA - TDA DRAGONS Near-IR Support	Pygacq

Project Name	Current Project size	Proposed Project size	Est. End Date	Schedule	Scope	Resource Request	Risks
GNAO	Large	1-Mid-Scale	28-Sep-28	On Schedule	As Planned	Shortage	Medium
SCORPIO	Large	2-Complex	22-Aug-25	Critical	Change	Fully Staffed	High
GIRMOS	Large	2-Complex	01-May-29	Caution	As Planned	Fully Staffed	Low
IGRINS-2	Large	2-Complex	31-Mar-25	On Schedule	As Planned	Fully Staffed	Low
GN Vibration Mitigation	Medium	3-Large	05-Jun-25	On Schedule	As Planned	Shortage	Medium
GN M2 Replacement	Large	3-Large	16-Dec-25	Caution	As Planned	Fully Staffed	Low
GPI-2	Medium	3-Large	31-Aug-26	Caution	As Planned	Fully Staffed	Medium
OCS Upgrades (GPP)	Large	3-Large	01-Mar-24	Caution	As Planned	Shortage	High
GEMMA PIO	Medium	4-Medium	25-Sep-24	Critical	Change	Fully Staffed	Low
DRAGONS Near-IR Longslit	Large	4-Medium	25-Jul-25	Critical	As Planned	Lacking	Medium
EPICS Upgrade for RT Systems	Large	4-Medium	01-Sep-24	Critical	As Planned	Fully Staffed	Medium
GOATS	Large	4-Medium	01-Jul-26	Caution	As Planned	Fully Staffed	Low
GNIRS IFU	Large	4-Medium	30-Jun-24	On Schedule	As Planned	Shortage	Medium
GEMMA TDA	Large	4-Medium	25-Sep-24	Caution	As Planned	Shortage	Medium
GN M2 CEM Upgrade	Large	4-Medium	01-Sep-24	Caution	As Planned	Fully Staffed	Low
GPOL+NIRI	Medium	4-Medium	31-Mar-25	On Schedule	As Planned	Fully Staffed	Low
GLAO Conceptual Design Planning	Medium	5-Small	01-Apr-24	On Schedule	As Planned	Fully Staffed	Medium
MAROON-X Transition FS	TBC	5-Small	31-Mar-24	On Schedule	As Planned	Fully Staffed	Low
PYGACq	Medium	5-Small	25-Nov-25	On Schedule	As Planned	Shortage	Medium
TCC SW Upgrades	Medium	5-Small	09-Oct-24	Caution	As Planned	Shortage	Medium
GS Heavy Equipment Repair Shop	Medium	5-Small	19-Mar-24	On Schedule	As Planned	Fully Staffed	Low
GN IR Detector Controller	Large	5-Small	08-Feb-24	Caution	As Planned	Shortage	Medium
GS BTOOB Polarization Improvement	Medium	6-Change	pending	Caution	As Planned	Fully Staffed	High



A major revitalization of Gemini Observatory capabilities and instrumentation



GN mirror recoating

GNIRS LR IFU

IGRINS-2

HR IFU

GN M2

GPI-2

22B

23A

23B

24A

24B

25A

25B

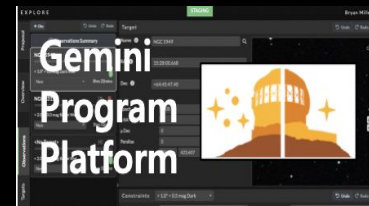
F2 MOS

GHOST

F2 + GeMS

SCORPIO

GS mirror recoating



Rubin
Sci Ops

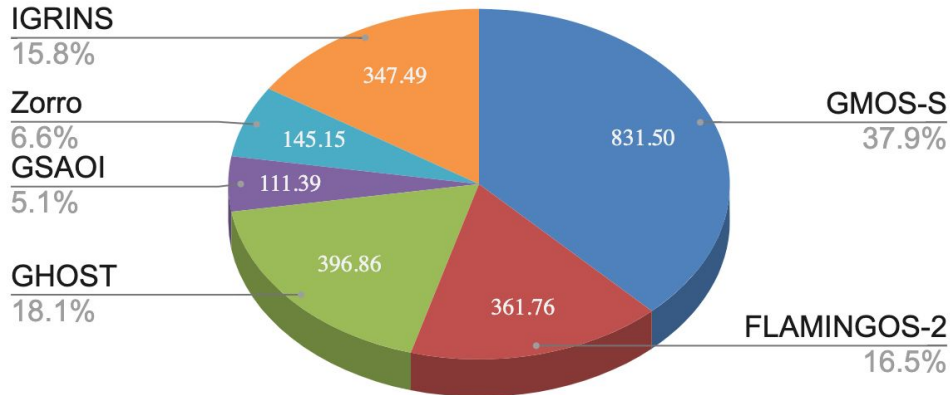
GHOST first science and proposals



GEMINI OBSERVATORY > OBSERVING > PHASE I: PROPOSING FOR TIME
STANDARD SEMESTER PROGRAM

2024A Call for Proposals

Fraction of Time by Instrument: Gemini South 2024A



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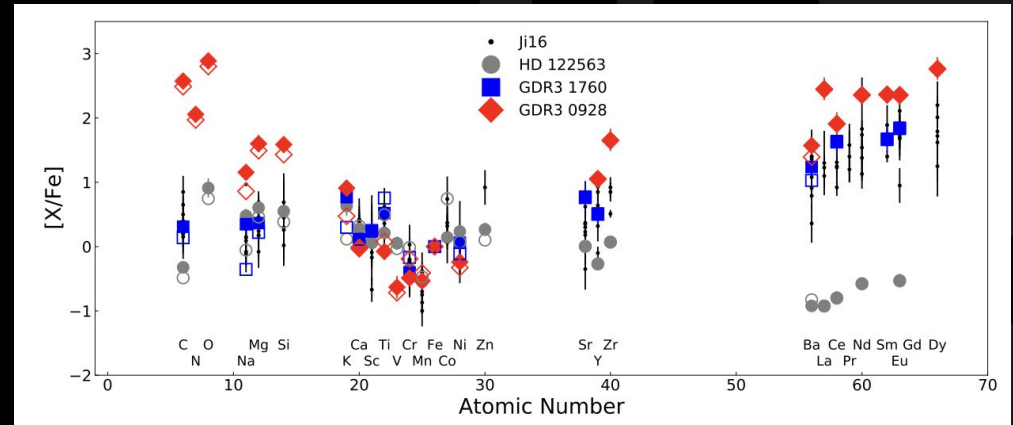
OPEN ACCESS



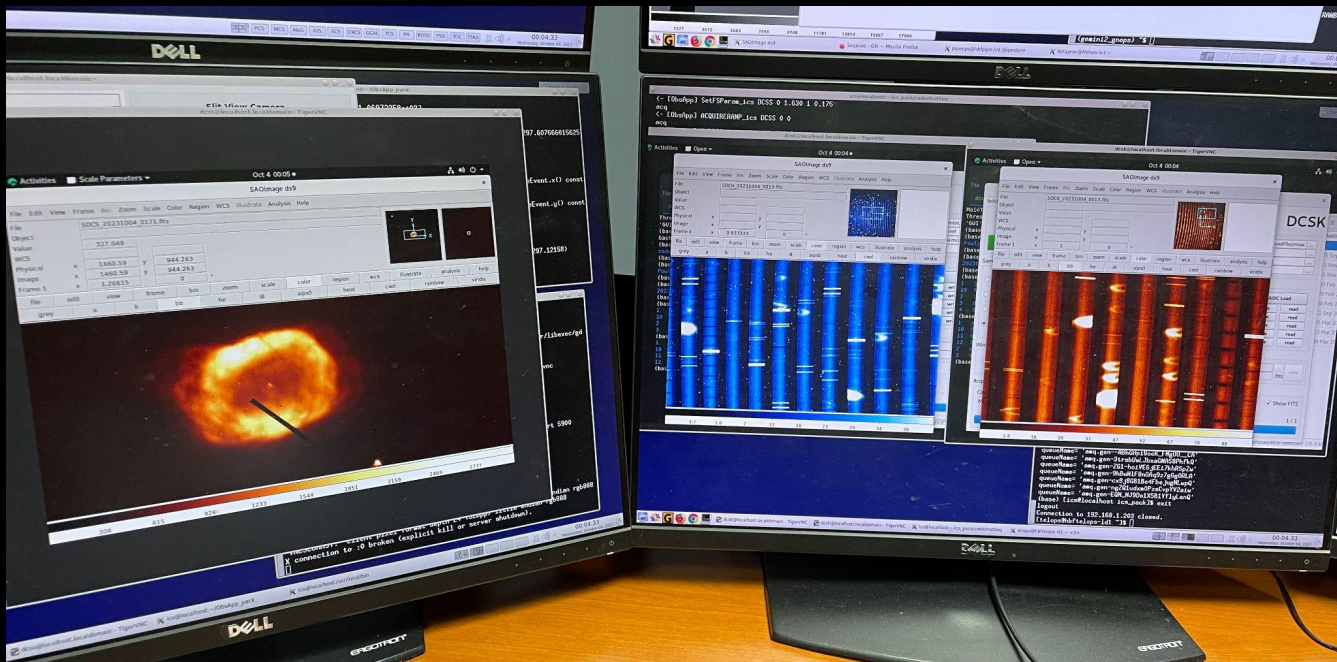
GHOST Commissioning Science Results: Identifying a New Chemically Peculiar Star in Reticulum II

Christian R. Hayes¹, Kim A. Venn², Fletcher Waller², Jaclyn Jensen², Alan W. McConnachie^{1,2}, John Pazder^{1,2}, Federico Sestito², André Anthony¹, Gabriella Baker³, John Bassett⁴, Joao Bento⁵, Trystyn Berg^{6,7}, Gregory Burley¹, Jurek Brzeski³, Scott Case³, Edward Chapin¹, Timothy Chin³, Eric Chisholm¹, Vladimir Churilov³, Adam Densmore¹, Ruben Diaz⁴, Jennifer Dunn¹, Michael Edgar⁸, Tony Farrell³, Veronica Firpo⁴, Joeleff Fitzsimmons¹, Juan Font-Serra⁴, Javier Fuentes⁴, Colin Ganton¹, Manuel Gomez-Jimenez⁴, Tim Hardy¹, David Henderson⁹, Alexis Hill¹, Brian Hoff¹, Michael Ireland^{3,5}, Venu Kalari⁴, Neal Kelly¹, Urs Klauser³, Yuriy Kondrat³, Kathleen Labrie⁹, Sam Lambert¹, Lance Luvaul⁵, Jon Lawrence³, Jordan Lothrop¹, G. Scott Macdonald¹, Slavko Mali³, Steve Margheim¹⁰, Richard McDermid³, Helen McGregor³, Bryan Miller⁴, Felipe Miranda¹, Rolf Muller³, Jon Nielsen⁵, Ryan Norbury¹, Oliver Oberdorfer⁹, Naveen Pai³, Gabriel Perez⁴, Pablo Prado⁴, Ian Price⁵, Carlos Quiroz⁴, Vladimir Reshetov¹, Gordon Robertson³, Roque Ruiz-Carmona⁴, Ricardo Salinas⁴, Kim M. Sebo⁵, Andrew Sheinis¹¹, Matthew Shetrone¹², Keith Shortridge³, Katherine Silversides¹, Karleyne Silva⁴, Chris Simpson⁹, Greg Smith³, Kei Szeto¹, Julia Tims³, Eduardo Toro⁴, Cristian Urrutia⁴, Sudharshan Venkatesan³, Lewis Waller³, Ivan Wevers¹, Ramunas Wierzbicki¹, Marc White⁵, Peter Young⁵, and Ross Zhelem³

¹ NRC Herzberg Astronomy and Astrophysics Research Centre, 5071 West Saanich Road, Victoria, BC V9E 2E7, Canada; Christian.Hayes@nrc-cnrc.gc.ca, chrishayesastro@gmail.com



IGRINS2: first light!



Built by KASI, clone of popular visiting instrument IGRINS (Gemini-S):
 high resolution ($R \sim 45,000$) infrared (1.45-2.5 micron) spectrograph
 Delivered to Hilo in September 2023, first telescope integration run in October 2023
 → on track for shared risk call for proposals in 24B

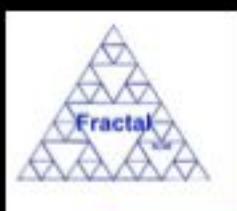
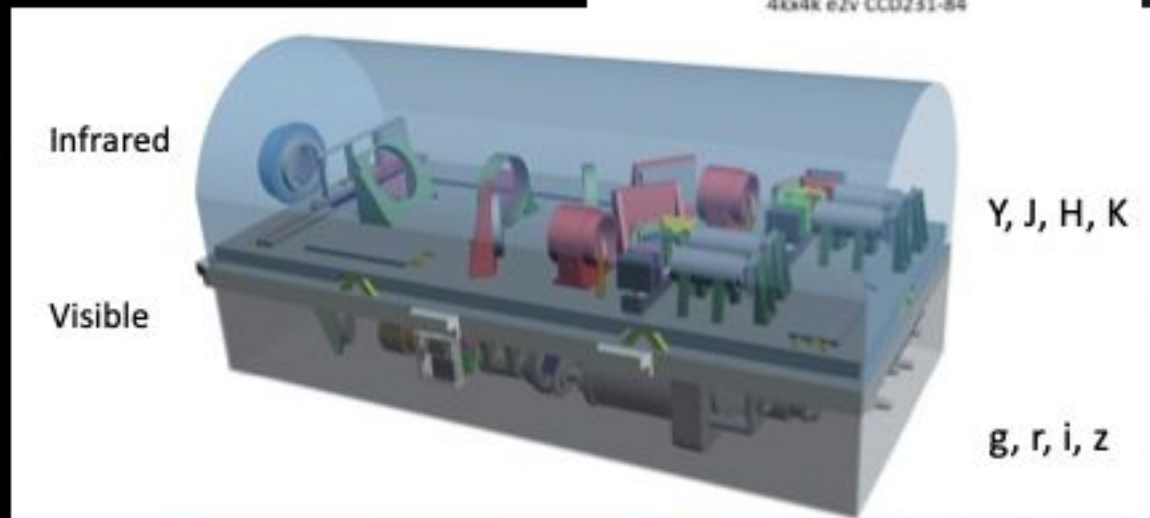
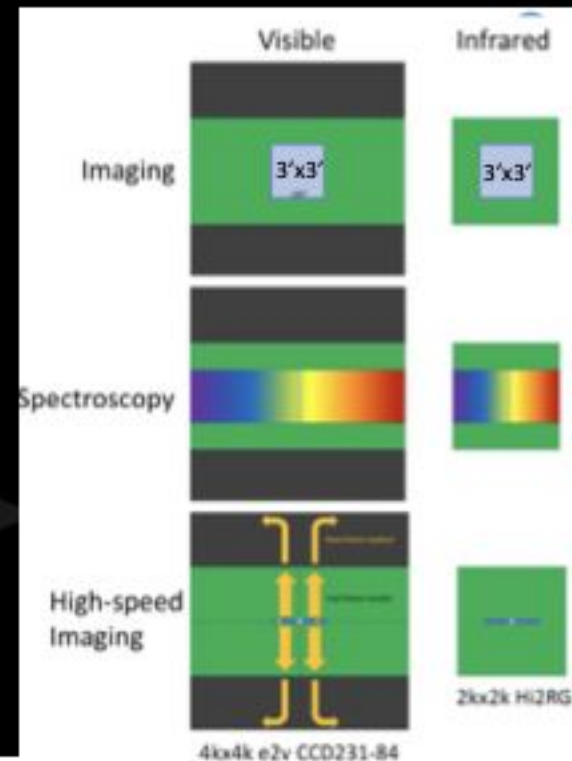
Workhorse capability for time-domain astronomy

8 band optical/IR imager and spectrograph
simultaneous coverage 0.37 - 2.3 μ m
 grizYJHK 3'x3' imaging or R~4000, 3' long slit

Rapid acquisition and readout

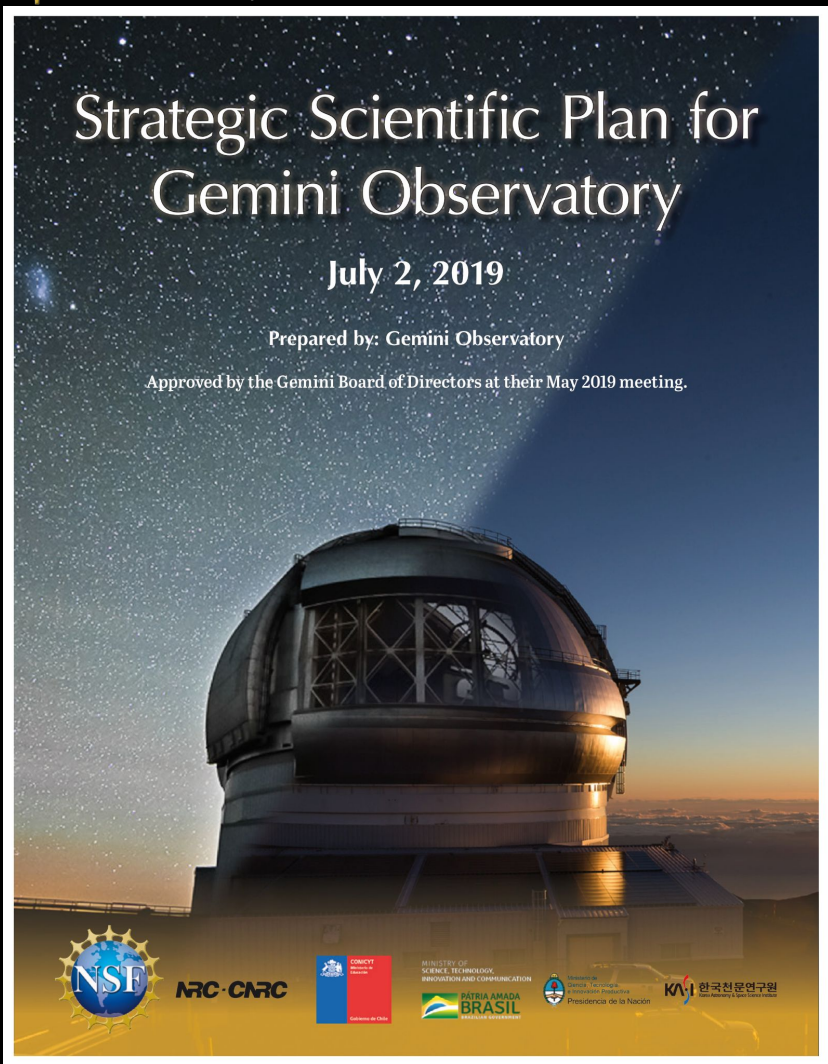
Gemini South commissioning
 (in time for Rubin/LSST alerts)

late 2025?





GNAO+GIRMOS



Revitalizing Adaptive Optics

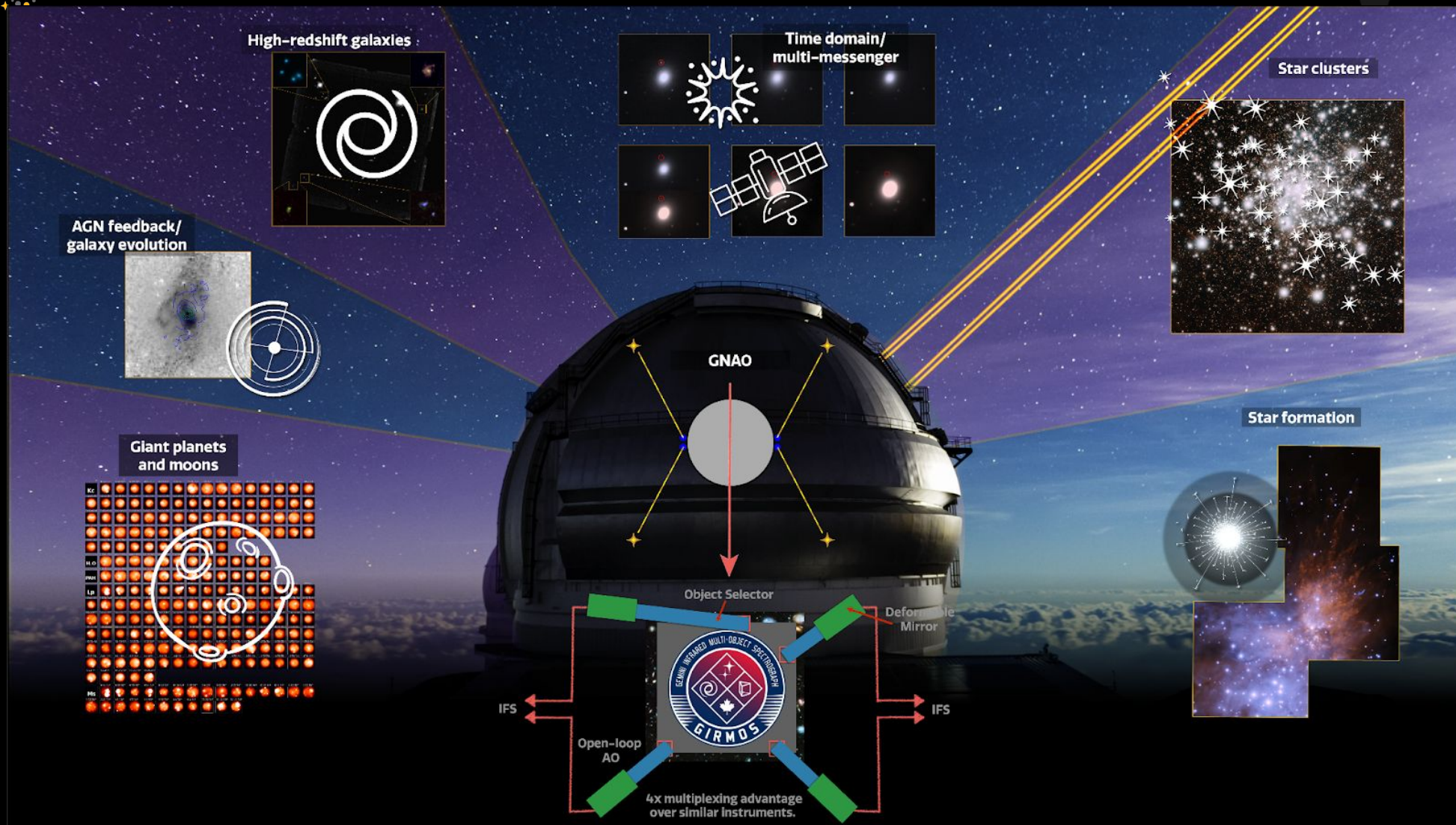
GNAO Goals

- revitalize aging AO facility at Gemini-N
- utilize Maunakea, one of the world's best sites for AO
- support nightly queue operations for AO
- support GIRMOS, Canadian-built TMT-pathfinder instrument
- enable a path for adaptive secondary mirror at Gemini-N
- build upon the MCAO legacy of GeMS





GNAO + GIRMOS





Benefits of NTCO Interns @ Gemini Observatory



Benefits to the NTCO Intern

- Experience of working abroad in an International Community
- Experience can help determine career path
- Expands professional network

Benefits to the Observatory

- Focused project effort
- Connection to the Canadian Community
- Fresh ideas and insights





NRC-CNRC

