

A long-exposure photograph of a night sky. The background is filled with numerous concentric white and blue star trails, indicating the Earth's rotation. In the lower right foreground, a large, metallic, dome-shaped telescope structure is visible, illuminated from below. The sky is dark, and the overall scene is a composite of astronomical imagery.

Korean 8m Class Optical Facility Gemini Observatory

Narae Hwang
Center for Large Telescopes (CfLAT), KASI

The 8th Survey Science Group Workshop, 2019.02.20-22, High One Resort



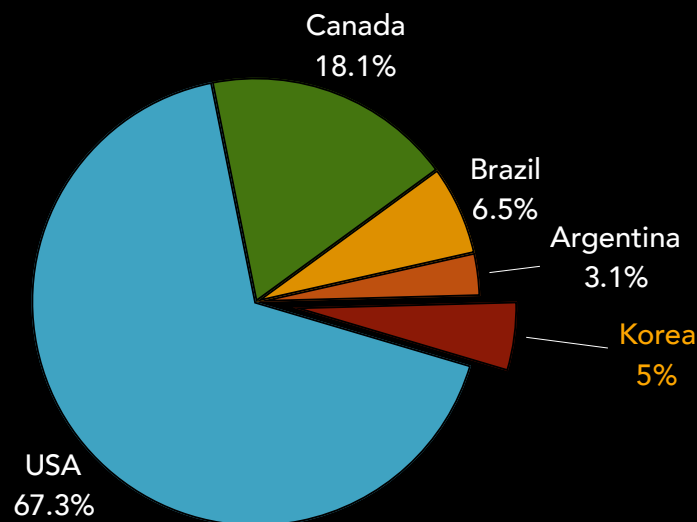
GEMINI OBSERVATORY



Exploring the Universe,
Sharing its Wonders

KASI/Korea – Official Partner of
Gemini Observatory as of Jan. 2019

2019 Partner Shares



NRC - CNRC



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KASI 한국천문연구원
Korea Astronomy & Space Science Institute

KASI – Official Partner of Gemini Observatory

KASI/Gemini Signing Ceremony
at "2018 Gemini Science Meeting"
in San Francisco, 2018/07/24



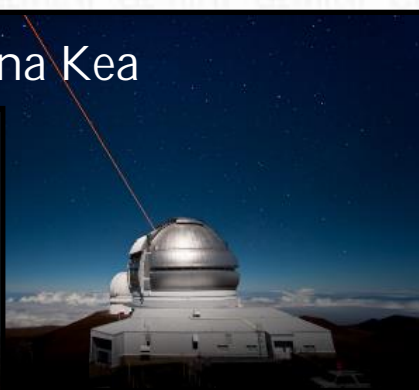


- Korean National Optical Facility for 2010's+
 - Multiple Purpose 8m-class Telescope
 - Northern/Southern Sky Coverage
 - Opportunities for New Instrumentations

Mauna Kea



Hilo, Hawaii



We are Here

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

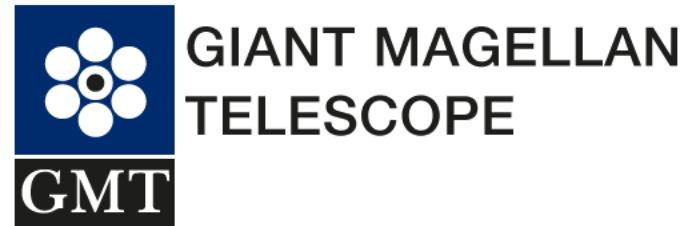


Cerro Pachon



La Serena, Chile

Korean Optical Facility in 2020's



- Ground-based 25 m (8.4m x 7 mirrors) telescope
- Las Campanas, Chile
- Operating from near UV, Optical to IR
- Active & adaptive optics operation
- Construction begins in 2015
- Expected early operation in 2024



Site Construction 1 of 2

Hard Rock Excavation Nearing Completion



EarthCam

Site Construction 2 of 2

Hard Rock Excavation Nearing Completion

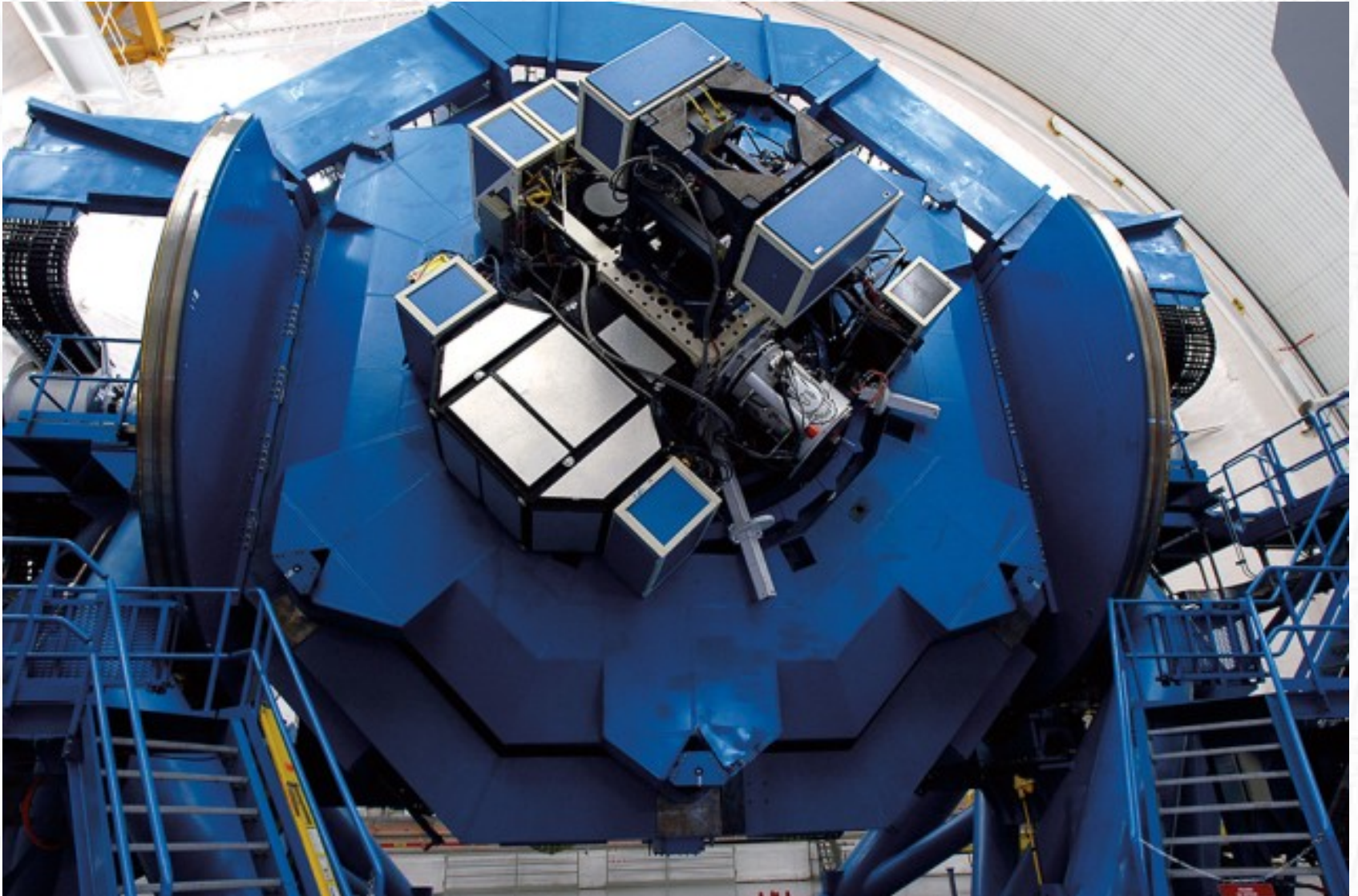


Primary Mirror Production Status



Current & Near Future Capabilities

Gemini Instruments



Gemini Current Instrumentation

North

facility

3 science instruments + AO all the time

Quick switch bet. instruments at will during the night obs

→ Enable agile operation adapting to varying obs condition

GMOS (optical imaging/long-slit/IFU)

NIRI (NIR imager)

NIFS (NIR IFU)

GNIRS (NIR long-slit)

Altair (NGS/LGS AO)

visiting

'Alopeke (optical speckle imager)

GRACES (high-res optical spectrograph)

TEXES (mid-IR spectrograph)

POLISH2 (optical polarimeter)

South

facility

GMOS (optical imaging/long-slit/IFU)

GPI (ExAO coronagraph)

FLAMINGOS-2 (NIR imager/long-slit)

GeMS/ GSAOI (MCAO NIR imager)

visiting

DSSI (optical speckle imager)

Phoenix (high-res NIR spectrograph)

More details on www.gemini.edu

Credit: Jennifer Lotz (AAS#233)

Gemini Observing Opportunities

K-GMT SP

Spring & Fall Semester: BI-ANNUAL, queue, classical, ToO, priority visitor, eavesdropping; time exchange w/ Subaru

KASI is not
part of LLP yet!

Large & Long Programs: ANNUAL, queue, ToO, and priority visitor; February: letter of intent due, March: proposal deadline

Fast-Turnaround: MONTHLY; queue, ToO

Director's Discretionary: open call, queue, ToO

Poor Weather Programs: open call, queue (UNDERSUBSCRIBED)

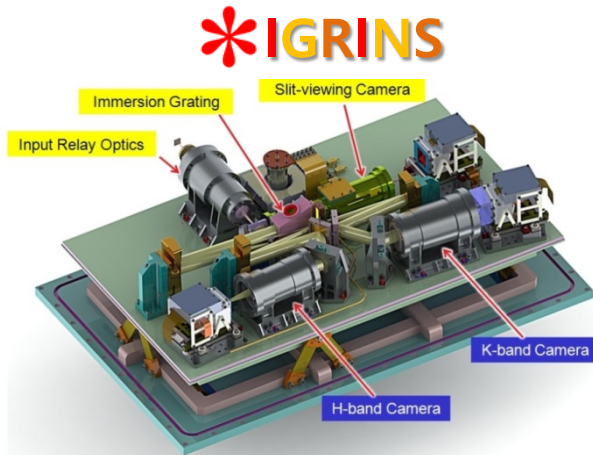
K-GMT SP

Time exchange Program with Subaru: regular, intensive, poor weather (only for HSC)

Credit: Jennifer Lotz (AAS#233)

K-GMT Science Program

- Provides Korean community with access to large telescope/observing facilities
 - Phase I: 2009~2013
 - Phase II: 2014~ (Open time to Korean community)
 - **Gemini: 2015~**
 - **MMT: 2014~**
 - **IGRINS**: @McD/DCT(2014~), @Gemini-South(2018A), @DCT (2018B~)



Korean Gemini Office (KGO)

Acting as an interface bet. Korea and Observatories
i.e. "virtual observatory"

 한국천문연구원
K-GMT SCIENCE GROUP

Korean Gemini Office

TAC
Obs. Support
Tech. Support



한국천문학회
THE KOREAN ASTRONOMICAL SOCIETY



McDonald Observatory
The University of Texas at Austin



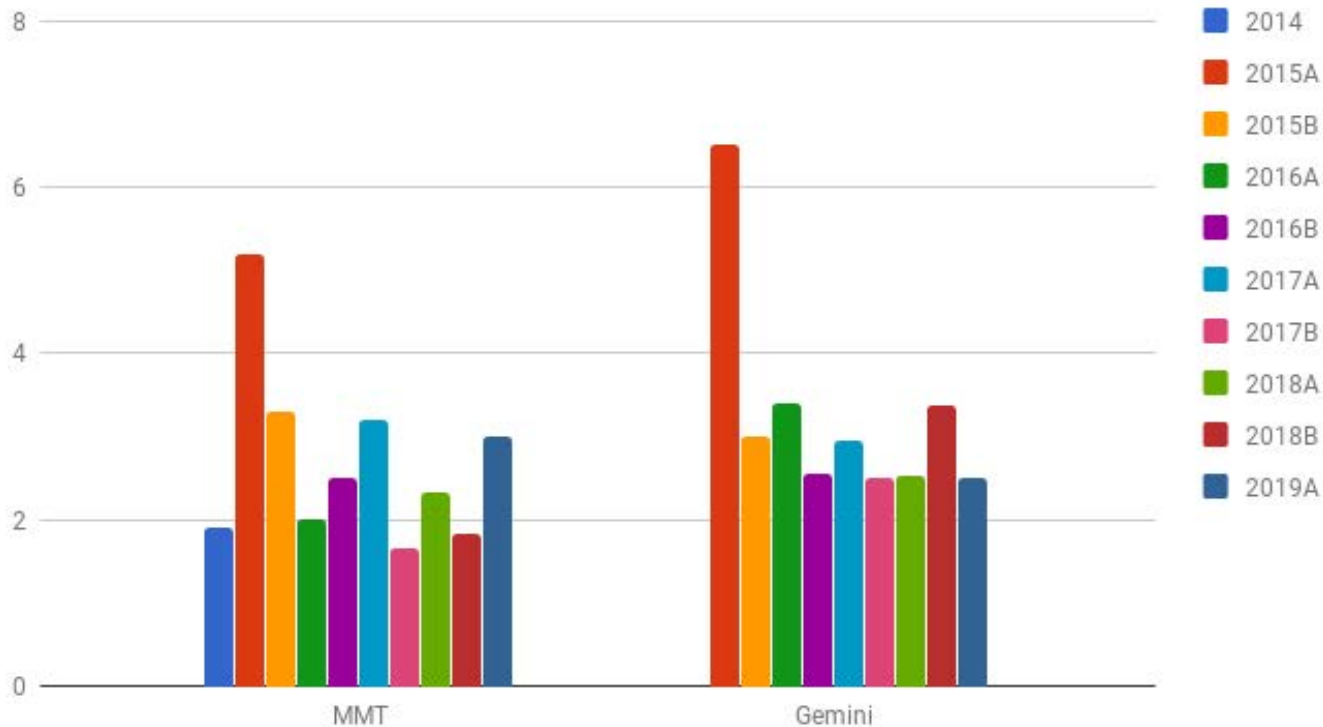
The MMT Observatory

A joint facility of The Smithsonian Institution and The University of Arizona

K-GMT Science Program at Work

- Proposal Call:
 - 2 times per year (March, Sept)
 - About ~30 proposals (on average) received
 - Oversubscription rate ~ 3.0 (on average)

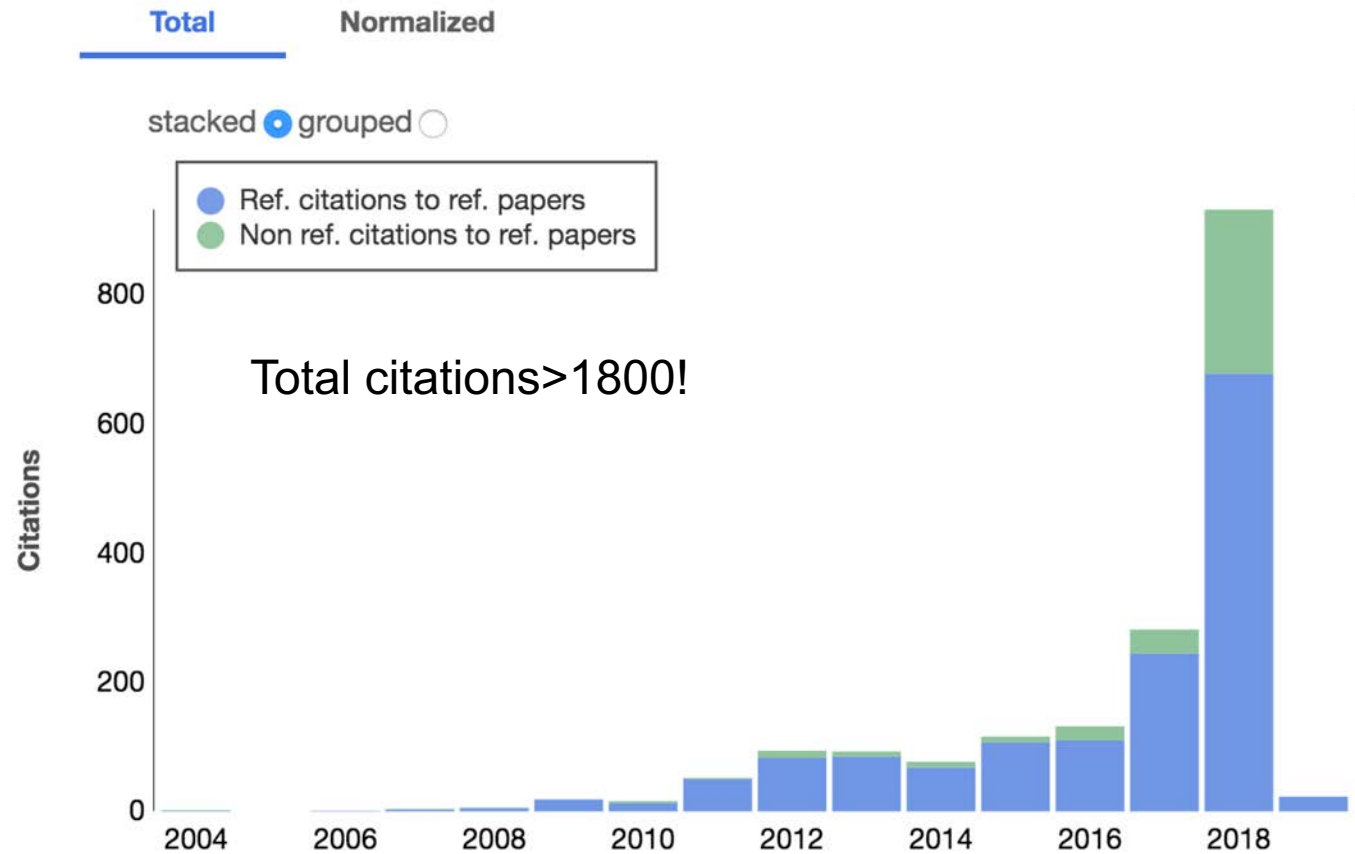
K-GMT SP Subscription Rate



Gemini Publications

❖ about 53 papers published since 2000

◆ 2014-2018: about 40 papers



Opportunities for Survey Oriented Scientists

❖ Sky Coverage

- ◆ Gemini: North-South sky coverage

❖ Time Cadence Observation over Extended Period

- ◆ Gemini: Agile queue operation
- ◆ Gemini: Multiple science instruments
- ◆ Gemini: Transient follow-up observations

❖ High Spectral Resolution

- ◆ Gemini: High-R Optical (GRACES, GHOST) & NIR (IGRINS) Spectrometer

❖ High Spatial Resolution

- ◆ Gemini: GPI, GEMS + GSAOI, GNAO (under planning)

❖ Wide FOV

- ◆ Gemini-Subaru: HSC + PFS (in the future)

Opportunities for Survey Oriented Scientists

❖ How to Empower Big Survey Project?

◆ Need more nights?

- Increase share (current 5% → xx%)
- Sign-up for LLP
- Etc.

◆ Need longer commitment?

◆ Bottom line is SCIENCE and Community Support!

◆ We Have a Milestone in 2020!

Opportunities for Survey Oriented Scientists

- ❖ Annual Users Meeting for Science Discussions
- ❖ Opportunities to share your idea on new survey project
- ❖ 3rd K-GMT Science Program Users Meeting 2019
 - ◆ 115 Participants (~ 50 students + ~ 20 postdocs + ~ 40 faculties)
 - ◆ 28 talks + 9 posters over 2.5 days (13 talks by Postdocs/Students)



Things to Come in 2019-2020

❖ K-GMT Summer School in July, 2019

- ◆ Exoplanet Science + Instrumentation (TBC)
- ◆ Stay tuned!

❖ Gemini Science Meeting 2020 in Korea!

- ◆ Not determined when & where yet
- ◆ But around June-July, possibly in Seoul or Gyeongju (?)



Things to Come in 2019-2020

❖ 2019 GMT Community Science Meeting

- ◆ Baryonic Cycle in Galaxies
- ◆ Sept. 18-20, Omni La Costa Resort, San Diego, CA
- ◆ SOC: Hsiao-Wen Chen (Chicago), Casey Popovich (TAMU), Jong-Hak Woo (SNU), etc.



Summary

- The largest Korean optical telescope is... **8.1m Gemini**! And we have **TWO**!
- Enjoy many new science opportunities!



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e Innovación Productiva
Presidencia de la Nación



More Information?

Please refer to <http://kgmt.kasi.re.kr/kgmtscience>

Or just Google “K-GMT Science Group”

