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

2019 Partner Shares

- USA: 67.3%
- Canada: 18.1%
- Brazil: 6.5%
- Argentina: 3.1%
- Korea: 5%

O&M Budget: $29.3M
IDF Contributions: $2.9M

Limited Term Collaborators:
- Weizmann Institute ($100K/year)
- Ben Gurion University ($100K/year)

Current International Agreement expires in 2021; “assessment point” Nov. 2018

O&M Budget: $27.1M
IDF Contributions: $2.7M

Limited Term Collaborators:
- Korea ($1.35M/year)
- Weizmann Institute ($100K/year)
- Ben Gurion University ($100K/year)
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
Gemini Observatory:
Operating twin 8m telescopes on Mauna Kea and Cerro Pachon: providing access to the entire sky
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

Coating Chamber/Summit Support Bldg.

Enclosure Ring Wall & Telescope Pier
Site Construction 2 of 2
Hard Rock Excavation Nearing Completion

- Utility Trench
- Telescope Pier
- Enclosure Ring Wall
Primary Mirror Production Status

Glass for 6 & 7 In Hand

GMT Primary Mirror Segments: Tri-annual Review – 7/31/2018

James Fanson
Current & Near Future Capabilities
Gemini Instruments
### Gemini Current Instrumentation

<table>
<thead>
<tr>
<th>North</th>
<th>South</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>facility</strong></td>
<td><strong>facility</strong></td>
</tr>
<tr>
<td>GMOS (optical imaging/long-slit/IFU)</td>
<td>GMOS (optical imaging/long-slit/IFU)</td>
</tr>
<tr>
<td>NIRI (NIR imager)</td>
<td>GPI (ExAO coronagraph)</td>
</tr>
<tr>
<td>NIFS (NIR IFU)</td>
<td>FLAMINGOS-2 (NIR imager/long-slit)</td>
</tr>
<tr>
<td>GNIRS (NIR long-slit)</td>
<td>GNIRS (NIR long-slit)</td>
</tr>
<tr>
<td>Alta ir (NGS/LGS AO)</td>
<td>GeMS/ GSAOI (MCAO NIR imager)</td>
</tr>
</tbody>
</table>

- 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

---

More details on [www.gemini.edu](http://www.gemini.edu)

Credit: Jennifer Lotz (AAS#233)
Gemini Observing Opportunities

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

**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)

**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”

K-GMT SCIENCE GROUP

Korean Gemini Office

TAC
Obs. Support
Tech. Support

한국천문연구원

한국천문학회

THE KOREAN ASTRONOMICAL SOCIETY

GEMINI OBSERVATORY

Exploring the Universe, Sharing its Wonders
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)
Gemini Publications

- about 53 papers published since 2000
  - 2014-2018: about 40 papers

Total citations > 1800!
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!
More Information?

Please refer to http://kgmt.kasi.re.kr/kgmtscience
Or just Google “K-GMT Science Group”