Gemini Observatory Science Operations

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Gemini Observatory
Contents

INCLUDED
• Partnership
• Telescopes and Instrumentation
• Support Organization & Responsibilities
• Modes, Timeline, Current state & Evolution
• Future Developments

NOT INCLUDED
• Governance
• Time allocation details
• Data reduction
• Science Archive
• Post-UK Transition & Sustainability Activities
The Gemini Partnership

Note: UK Withdrawal completed end 2012. Full financial impact by end of 2015.
Telescope Design & Instrument package
Instrumentation

North
• ALTAIR – facility AO bench (IR at present)
• GMOS – Optical imager/spectrograph/IFU
• GNIRS – NIR spectrograph
• NIFS – NIR IFU spectrograph
• NIRI – NIR imager

North Visitors (at present)
• TEXES – MIR high-resolution spectrograph
• DSSI – optical diffraction-limited speckle camera

North recently retired
• Michelle – MIR imager/spectrograph

South
• Canopus – facility AO bench
• FLAMINGOS-2 – NIR imager/spectrograph
• GMOS - Optical imager/spectrograph/IFU
• GSAOI – high-res imager for use with Canopus

South upcoming
• GPI – extreme AO IFU/polarimeter

South recently retired
• NICI – NIR AO exoplanet imager
• T-ReCS – MIR imager/spectrograph

Summary: workhorse facilities north and south (not necessarily identical); specialist/niche instruments on top, increasingly supplemented by visitors in the north. 4 facility instruments+AO is supportable in the post-UK future.

Future: plan to accommodate one new instrument per 2-3 years (Next: GHOS high-resolution optical spectrograph)
Processes & Responsibilities

NGO
- General user education
- Local web pages
- Phase I support
- National TAC process
- Phase II support & iteration
- Helpdesk

Observatory
- International TAC process
- Phase II iterations
- Final phase II checking
- In-semester support
- Observing (increasingly non-research observers)
- Classical run support
- Data checking & archiving
- Data Reduction s/w provision
- Helpdesk
Observing Modes

<table>
<thead>
<tr>
<th>Mode</th>
<th>Approx Fraction</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queue^0^</td>
<td>&gt;90% (by demand)</td>
<td>Partnership^1^ Recent addition: eavesdropping</td>
</tr>
<tr>
<td>Classical^2^</td>
<td>&lt;10% by demand</td>
<td>Partnership</td>
</tr>
<tr>
<td>Target of Opportunity</td>
<td>~20% of executed time</td>
<td>Partnership, via queue</td>
</tr>
<tr>
<td>Director’s Discretionary Time</td>
<td>7% including staff time</td>
<td>Open, via queue</td>
</tr>
<tr>
<td>Poor-weather proposals</td>
<td>Few %, not topsliced (fills otherwise empty time)</td>
<td>Partnership, asynchronous, via queue</td>
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^0^ Banded by TAC priority, completion rate targets set by Board

^1^ Partners can elect to operate “open skies” policy – e.g. US

^2^ Classical is pre-prepared but flexible
Current Ops: some features

- Science fraction
- Queue planning
- Time accounting & balancing
Science Time Requests

The graphs show the percentage of science time requests from 2009A to 2011B. The lines indicate the range of requests (GN Min, GN Max, GN actual) and (GS Min, GS Max, GS actual) for each year.
Queue Planning

Good seeing, Thin Cirrus
SB = unconstrained / CC = 70 / IQ = 70 / WV = unconstrained

Start from Q79-61 after the IQ/LGS teams are done with their work.

Observation: N07B-Q-121 [89]
Start: 19:03
Duration: 01:03
Notes: 100% B600, 1,5 arcsec, none
Target: QiWFS

There are no observations at the beginning of the night. I am putting this band 4 observation as a filler.

High priority observations. Please observe this tonight. This has higher priority than the rest of the observations scheduled here.

Same target. No need to reslew. You will not finish this observation before hitting airmass 2.0.

Observation: N07B-Q-79 [61]
Start: 20:57
Duration: 02:21
Notes: 100% B1200, none, 1.5 arcsec
Target: QiWFS

If you are on time, not early, you will finish this observation. Please do a speck shot (or any filler of your choice) between this observation and Q51.

Observation: N07B-Q-39 [10]
Start: 03:42
Duration: 00:57
Notes: 100% H2:1:0
Target: QiWFS

Stop when convenient.

Observation: N07B-Q-39 [13]
Start: 04:40
Duration: 00:16
Notes: 100% NIFS
Target: QiWFS

Stop when convenient.

Observation: N07B-Q-39 [3]
Start: 05:02
Duration: 00:36
Notes: 100% NIFS
Target: QiWFS

Stop when convenient.
Partner Shares & Balancing

![Graph showingPartner Shares & Balancing](image)
Past Evolution

• Classical / Queue distribution
• Programme length
• Joint (Collaborative) Programmes
Data on number of *allocated* programmes

- Allocated classical time has been on a generally downward trend
- Classical requests always dominated by the US
Average Allocation per programme

Data on *hours* allocated to programmes

- North programmes are getting shorter
- South programmes are not!
Multi-partner Programmes

- Joint Proposals explicitly involve co-Is from more than one partner
- Fraction of successful proposals which are joint has been on a gradual increasing trend since 2006
- All but ~5% of all joint proposals have been for queue time
Future Evolution

• Observing/proposal modes
  ➢ More options for PIs
  ➢ Increase science productivity
  ➢ Closer contact with community
  ➢ Increase collaborative opportunities
  ➢ Financial drivers also involved

• User support through the science lifecycle
  ➢ Increase publication rate per programme
## Future Observing Modes

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<td>Large and Long Programmes</td>
<td>20% initially</td>
<td>Partnership (Elective pool); via annual LPTAC</td>
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<tr>
<td>Fast Turnaround (monthly)</td>
<td>&lt;10% initially</td>
<td>Partnership; peer-reviewed (TBD)</td>
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<tr>
<td>Remote Observing</td>
<td>?</td>
<td>Partnership, post-2016</td>
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<tr>
<td>“Priority Visitor” observing</td>
<td>2014B (LLPs first)</td>
<td>Partnership</td>
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Effort Distribution

Science Lifecycle

IDEA

NGO Observatory

Proposal

Peer Review/Time Allocation

Observation Preparation

NGO Observatory

Observe

Observatory

NGO Observatory

Publication

Analysis

Data reduction

Archive

Quality control
Where to fill in the gaps

http://www.gemini.edu/

And go to the “science” pulldown