NYAC Partnership with the International Gemini Observatory

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### International Partnership

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSF</td>
<td>50.119%</td>
<td>53.91%</td>
</tr>
<tr>
<td>STFC (UK)</td>
<td>23.81%</td>
<td>22.00%</td>
</tr>
<tr>
<td>NRC (Canada)</td>
<td>15.00%</td>
<td>13.86%</td>
</tr>
<tr>
<td>ARC (Australia)</td>
<td>6.19%</td>
<td>5.72%</td>
</tr>
<tr>
<td>CONICYT (Chile)</td>
<td>0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>CONICET (Argentina)</td>
<td>2.381%</td>
<td>2.2%</td>
</tr>
<tr>
<td>MCT (Brazil)</td>
<td>2.5%</td>
<td>2.31%</td>
</tr>
</tbody>
</table>

U. Hawaii receives 10% of Gemini North, Chile receives 10% of Gemini South Partners have also traded their shares with each other.

Total budget (operations + facilities + instrumentation) for both telescopes is ~$40M/yr.

Gemini time is partly fungible with Subaru and Keck.
Instrumentation capabilities

**GMOS** (multi-object, long-slit and IFU spectrograph and imager)
**NIRI** (1-5µm imager with grism spectroscopy)
**Michelle** (10-20µm imager/ spectrometer; imaging polarimetry)
**ALTAIR** (facility natural/laser guide star AO system)
**NIFS** (1.0-2.5µm integral field spectrograph)
**TEXES** (visiting 10-20µm high resolution spectrograph)
**GCAL** (facility calibration unit)
**GNIRS** (1-5µm long-slit and 0.9-2.5µm cross-dispersed spectrograph; formerly at Gemini South)

**GMOS** (multi-object, long-slit and IFU spectrograph and imager)
**Phoenix** (high resolution spectrometer)
**T-ReCS** (formerly known as MIRI; imager and spectrometer)
**GCAL** (facility calibration unit)
**NICI** (coronagraphic imager)
**MCAO (Canopus)** (Multi-conjugate adaptive optics system)
**FLAMINGOS-2** (multi-object spectrograph)
**GSAOI** (high-resolution imager for use with Multi-Conjugate Adaptive Optics system "Canopus")
AO/ELT case

• Gemini is the most advanced observatory in the MCAO/Laser Guide Star/Extreme AO regime

• ELTs will operate almost entirely in one of these modes

• If these capabilities do not deliver, then likely neither will the ELTs

• Being scientifically successful with Gemini will be good preparation for the ELT era
Post 2012

• The UK has expressed its intention to withdraw at the end of the expiry of the international agreement, Dec 31 2012

• Gemini is planning for a 25% reduction of operation budget by streamlining, shedding scientific staff, retiring instruments and suspending instrumentation development

• Any incremental funding would likely go to instrumentation development.
Receptiveness of Gemini

- Positive contacts with:
  Doug Simons (Gemini Director)
  Nancy Levenson (Deputy Director / HoS)
  Larry Ramsey (Chair of Gemini Board)

- Rumors are that there are rumors of a NYAC partnership

- Brazil has expressed an interest in a larger share, but also wishes to join ESO

- Possible opportunity to present to the board in May 2011.
Science

- Gemini has obvious scientific breadth
- I am soliciting for specific instances of science interests within NY state - all contributions are welcome (subject to being made to fit)
• Gemini has expressed immediate interest in an X-Shooter (0.3-2.5 micron spectrograph) or 4k IR imager to replace NIRI
• High resolution IR spectroscopy is also a clear niche
• These are well matched to instrumentation capabilities within the state, and lead to the idea of a center related to astronomical technology
• Suggestions and participation in formulation of such a center is welcome
### Attracting Federal Funding

<table>
<thead>
<tr>
<th>AAS Members</th>
<th>Federal Funding</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>&gt;1000 JPL</td>
<td>$1.3B</td>
</tr>
<tr>
<td>MD</td>
<td>777 STSci, GSFC, APL</td>
<td>&gt;$1B</td>
</tr>
<tr>
<td>MA</td>
<td>533 SAO</td>
<td>&gt;$100M</td>
</tr>
<tr>
<td>AZ</td>
<td>392 NOAO+...</td>
<td>$28M+...</td>
</tr>
<tr>
<td>NY</td>
<td>322 ???</td>
<td>???</td>
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Pitfalls

• What’s the minimum share of interest?

• 10% of 50% is 5%

• In-kind contributions will be treated with suspicion, yet it is likely the state will be reluctant to send money out of state

• Chicken vs Egg
Open invitation

• Please contact jpl@astro.cornell.edu if interested in participating