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

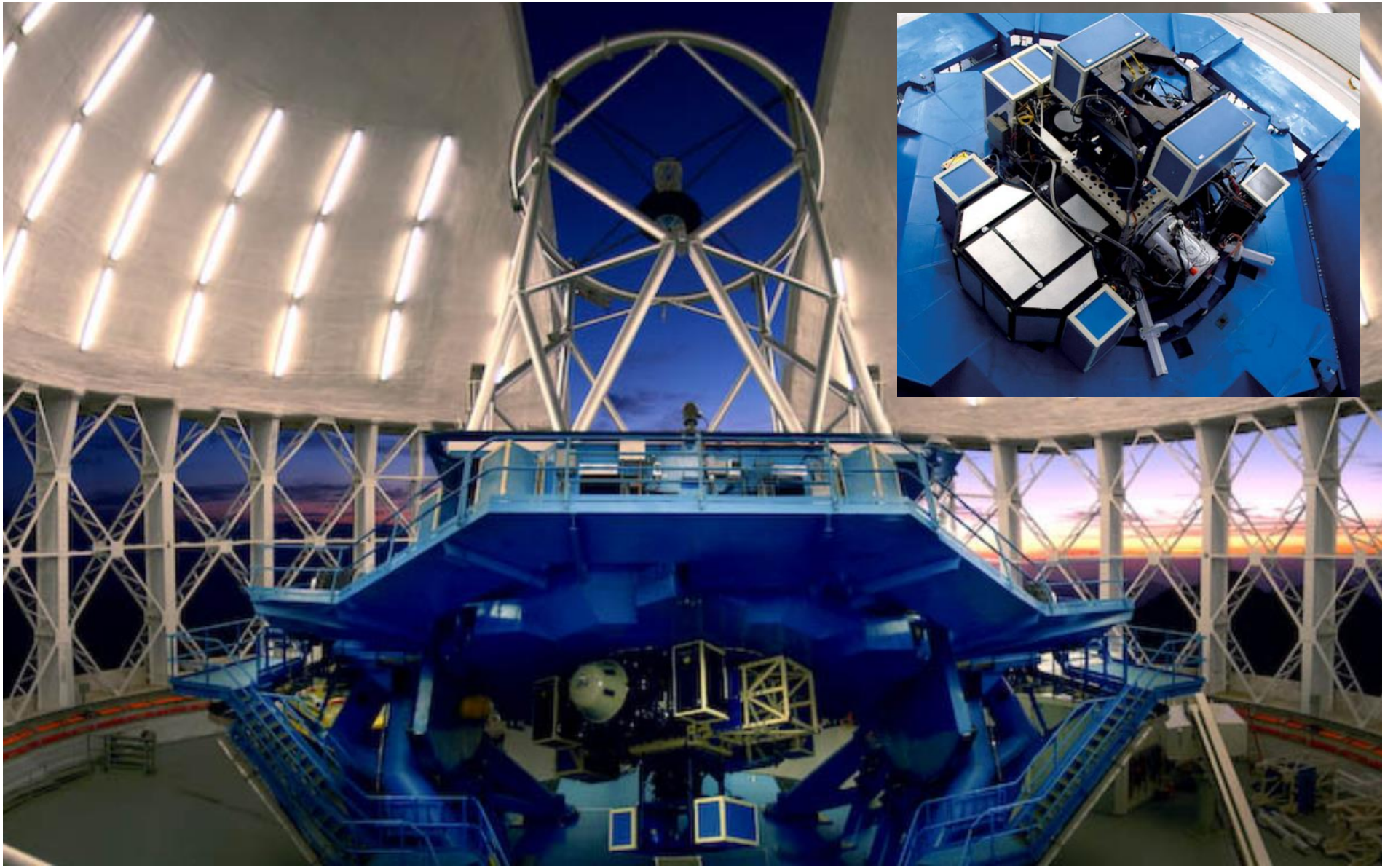
NOT INCLUDED

- 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

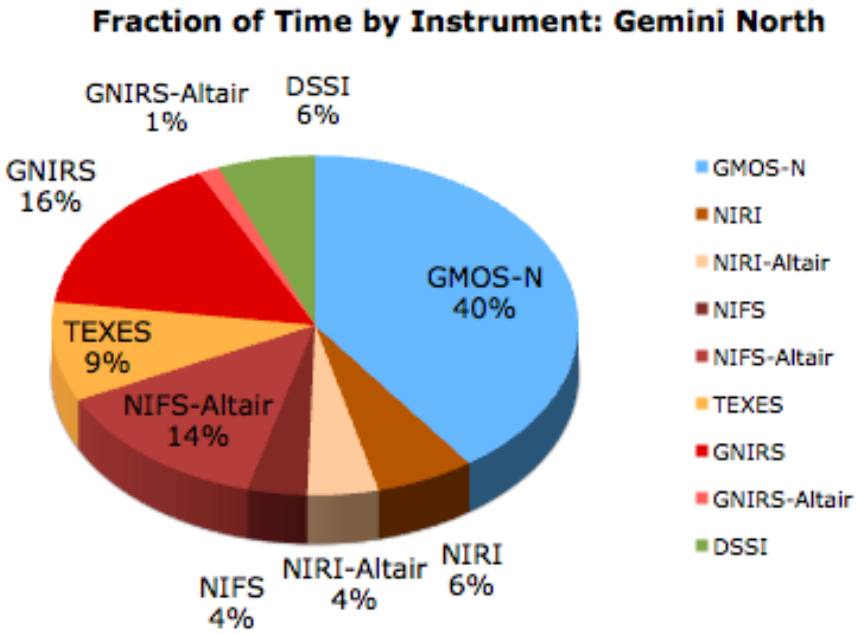
South upcoming
- GPI – extreme AO IFU/polarimeter

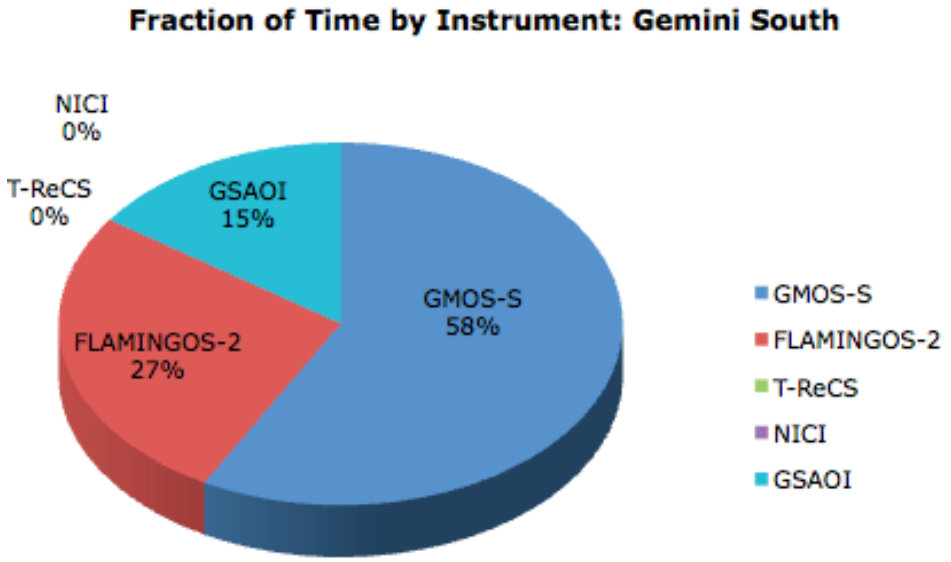
South recently retired
- NICI – NIR AO exoplanet imager
- T-ReCS – MIR imager/spectrograph

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.

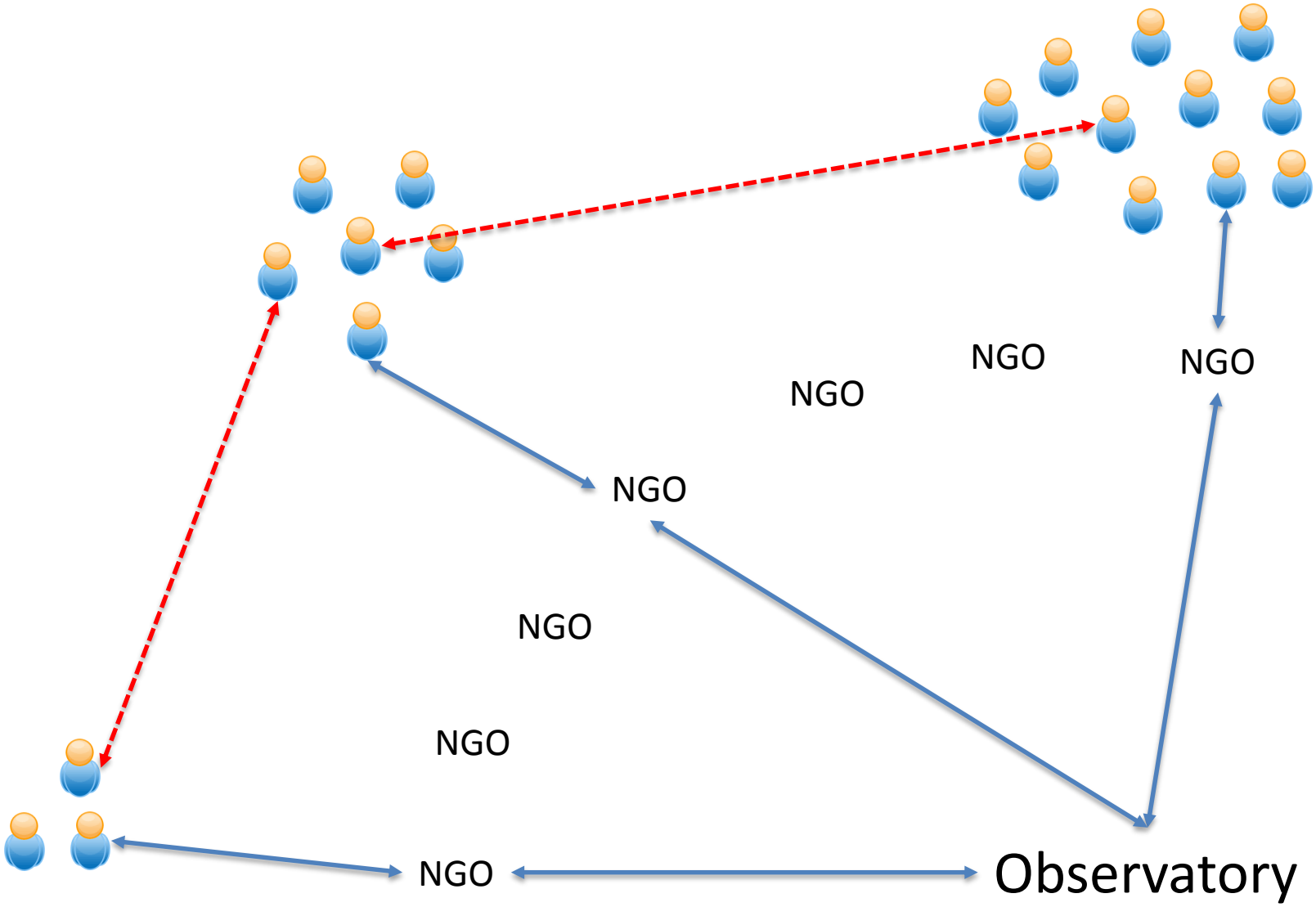
Future: plan to accommodate one new instrument per 2-3 years (Next: GHOS high-resolution optical spectrograph)

Instrument Demand (2013B)





Operations Organization



Processes & Responsibilities

NGO

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

Observatory

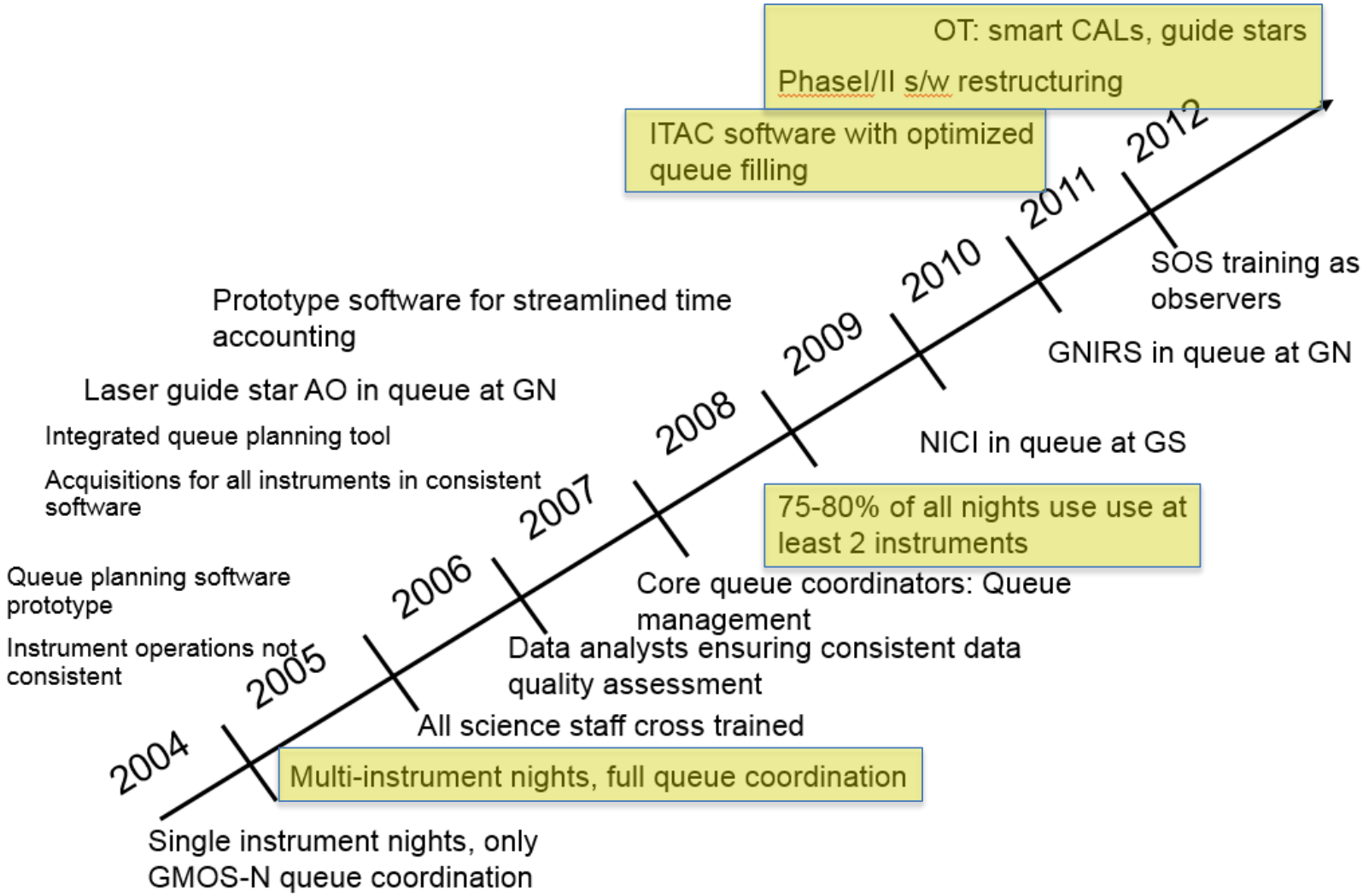
- International TAC process
- Phase II iterations
- Final phase II checking
- In-semester support
- Observing (increasingly non-research observers)
- Classical run support
- Data checking & archiving
- Data Reduction s/w provision
- Helpdesk

Observing Modes

Mode	Approx Fraction	Access
Queue[0]	>90% (by demand)	Partnership[1] Recent addition: eavesdropping
Classical[2]	<10% by demand	Partnership
Target of Opportunity	~20% of executed time	Partnership, via queue
Director's Discretionary Time	7% including staff time	Open, via queue
Poor-weather proposals	Few %, not topsliced (fills otherwise empty time)	Partnership, asynchronous, via queue

[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

Science Operations Timeline



Current Ops: some features

- Science fraction
- Queue planning
- Time accounting & balancing

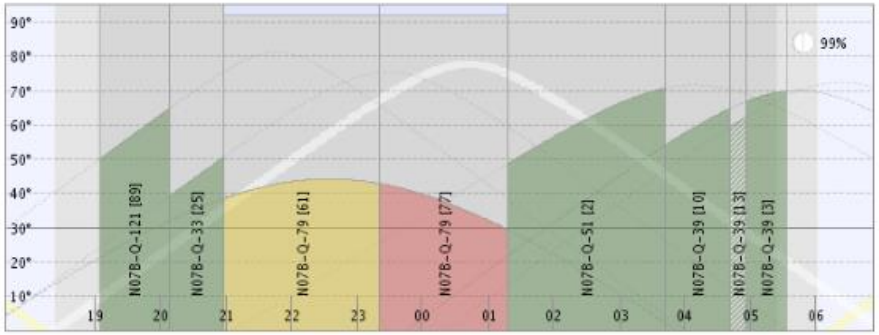
Science Time Requests

Queue Planning

Mauna Kea – 20070927

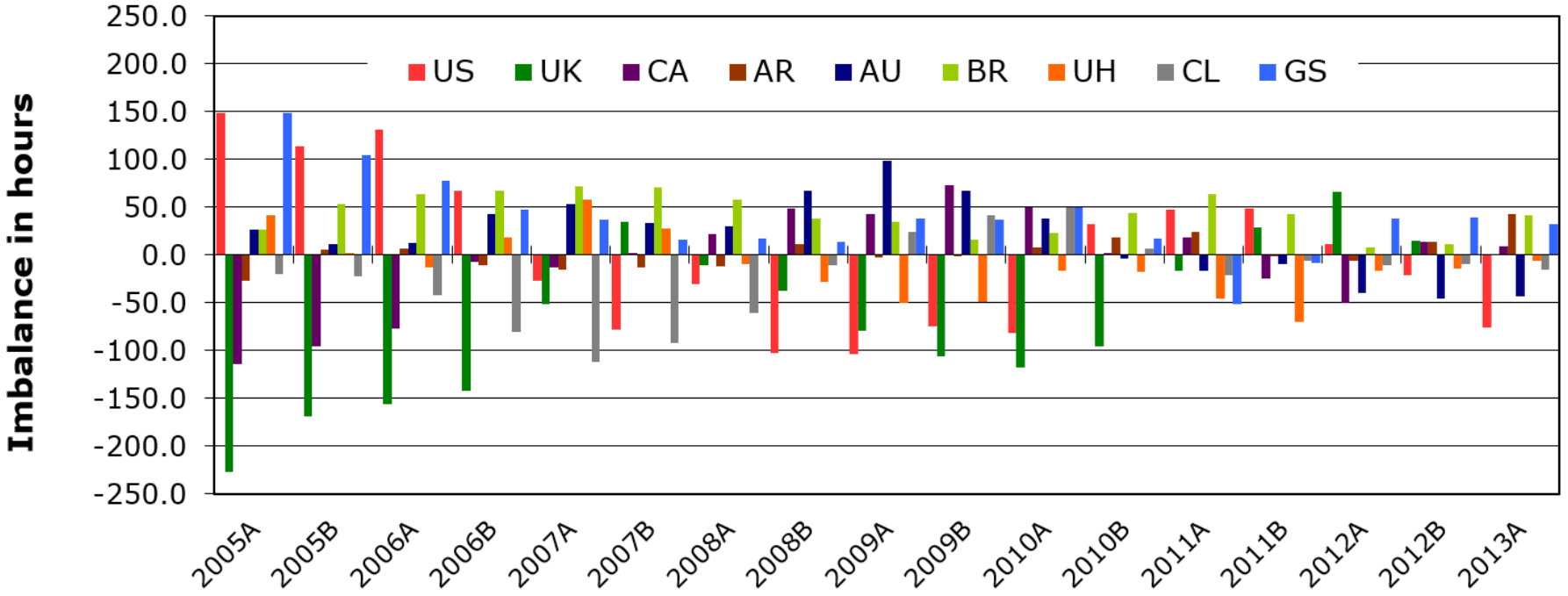
Good seeing, Thin Cirrus
SB = unconstrained / CC = 70 / IQ = 70 / WV = unconstrained

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



Start	Dur	BG	Observation	Steps	Inst	Config	WFS	Target	IQ	CC	WV	BG	Rise	Trans	Set
18:23	Sunset														
19:01	Evening 12° Twilight														
19:03	01:03	100%	N07B-Q-121 [89]	1 - 2	GMOS-N	B600, 1.5arcsec, none	OIWFS	[redacted]	A	70	A	A	17:38	21:46	01:53
	There is no observations at the beginning of the night. :(I am putting this band4 observation as a filler.														
20:07	00:50	100%	N07B-Q-33 [25]	1 - 3	GMOS-N	B1200, none, 1.0arcsec	OIWFS	[redacted]	70	70	A	A	19:28	23:27	03:27
	HIgh priority observations. Please observe this tonight. This has higher priority than the rest of the observations scheduled here.														
20:57	02:21	100%	N07B-Q-79 [61]	82 - 140	NIRI	H-cont	PWFS2	[redacted]	70	70	A	A	19:54	22:34	01:14
	you will probably be on time, if not early, when you finish this observation. Please do a specphot std (or any filler of your choice) between this observation and Q51.														
23:19	01:58	100%	N07B-Q-79 [77]	1 - 53	NIRI	H-cont	PWFS2	[redacted]	70	70	A	A	19:54	22:34	01:14
	Same target. No need to reslew. You will not finish this observation before hitting airmass=2.														
	Error: Observation reaches airmass 2.02.														
00:00	LST at midnight 00:01 23 • Moon illuminated fraction 0.994														
01:17	02:24	100%	N07B-Q-51 [2]	51 - 134	NIRI	H2 1-0	PWFS2	[redacted]	70	70	A	A	23:41	04:09	08:36
03:42	00:57	100%	N07B-Q-39 [10]	1 - 7	NIFS		PWFS2	[redacted]	70	70	A	A	01:53	05:44	09:35
04:40	00:16	100%	N07B-Q-39 [13]	1 - 6	NIFS		PWFS2	[redacted]	A	A	A	A	02:28	06:23	10:18
	Std for Q39-10 and 13.														
04:56	00:36	100%	N07B-Q-39 [3]	1 - 3	NIFS		PWFS2	[redacted]	70	70	A	A	01:53	05:44	09:35
	Stop when convinient.														
05:24	Morning 12° Twilight														
05:32	End of plan variant.														
06:02	Sunrise														

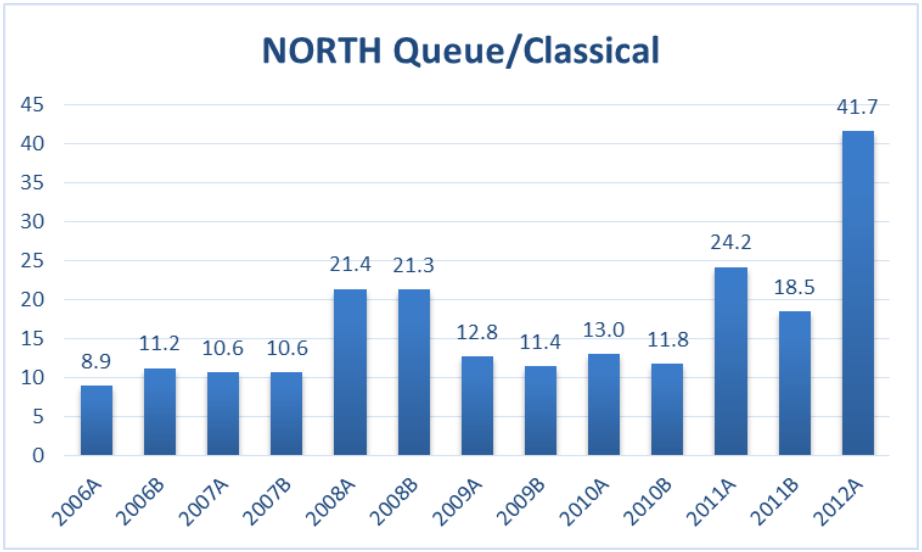
Partner Shares & Balancing

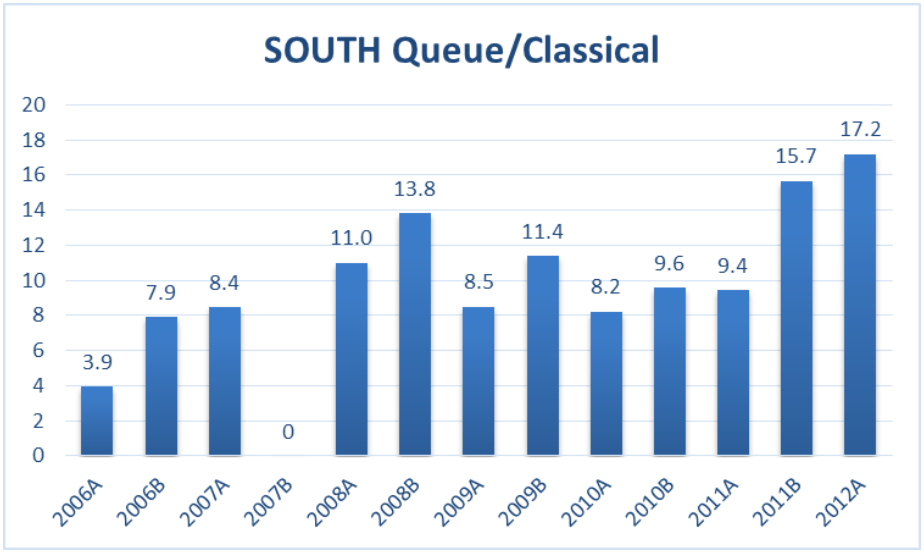


Past Evolution

- Classical / Queue distribution
- Programme length
- Joint (Collaborative) Programmes

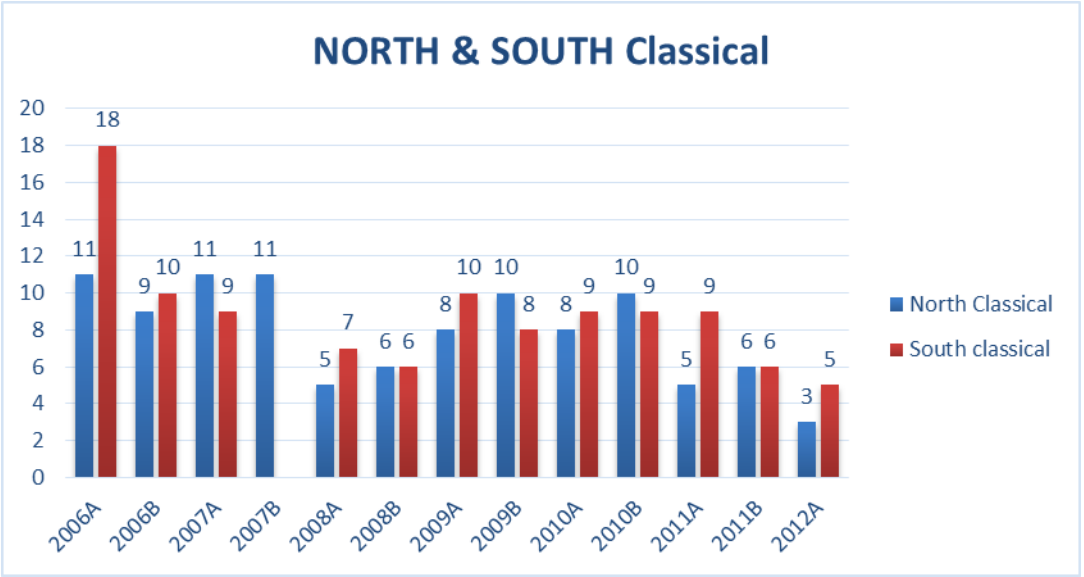
Classical & Queue



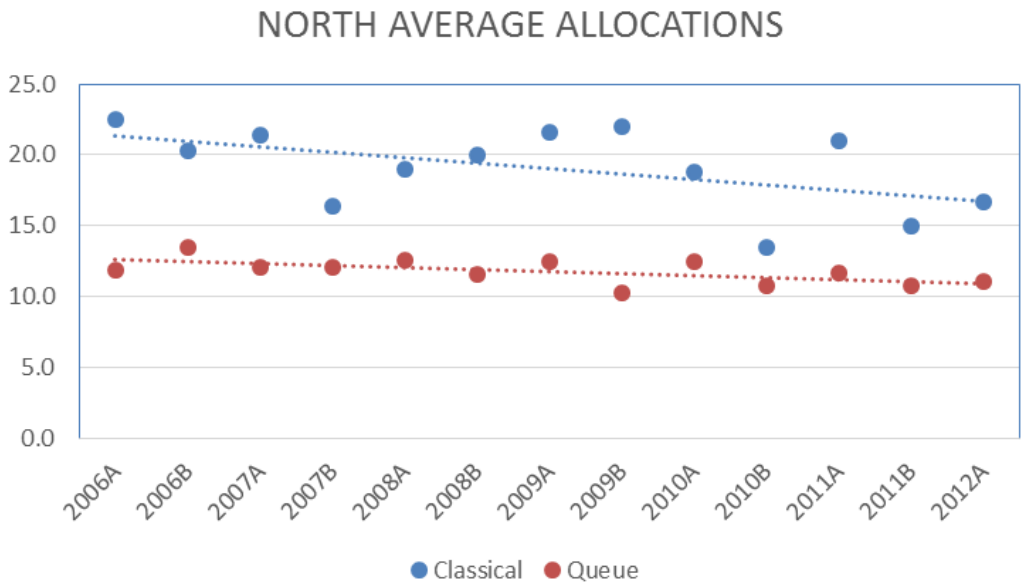


Data on number of *allocated* programmes

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

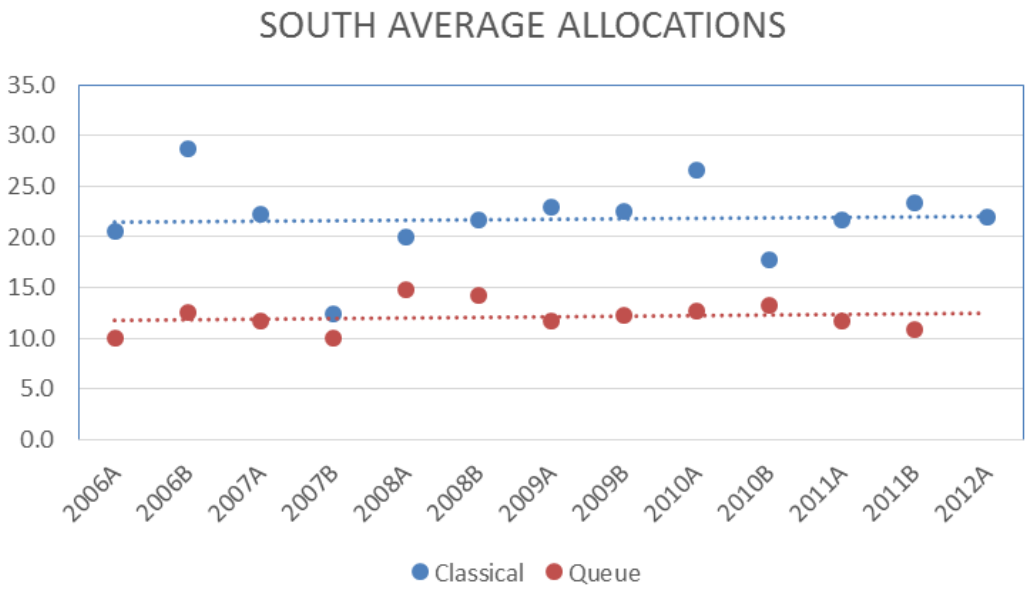


Average Allocation per programme



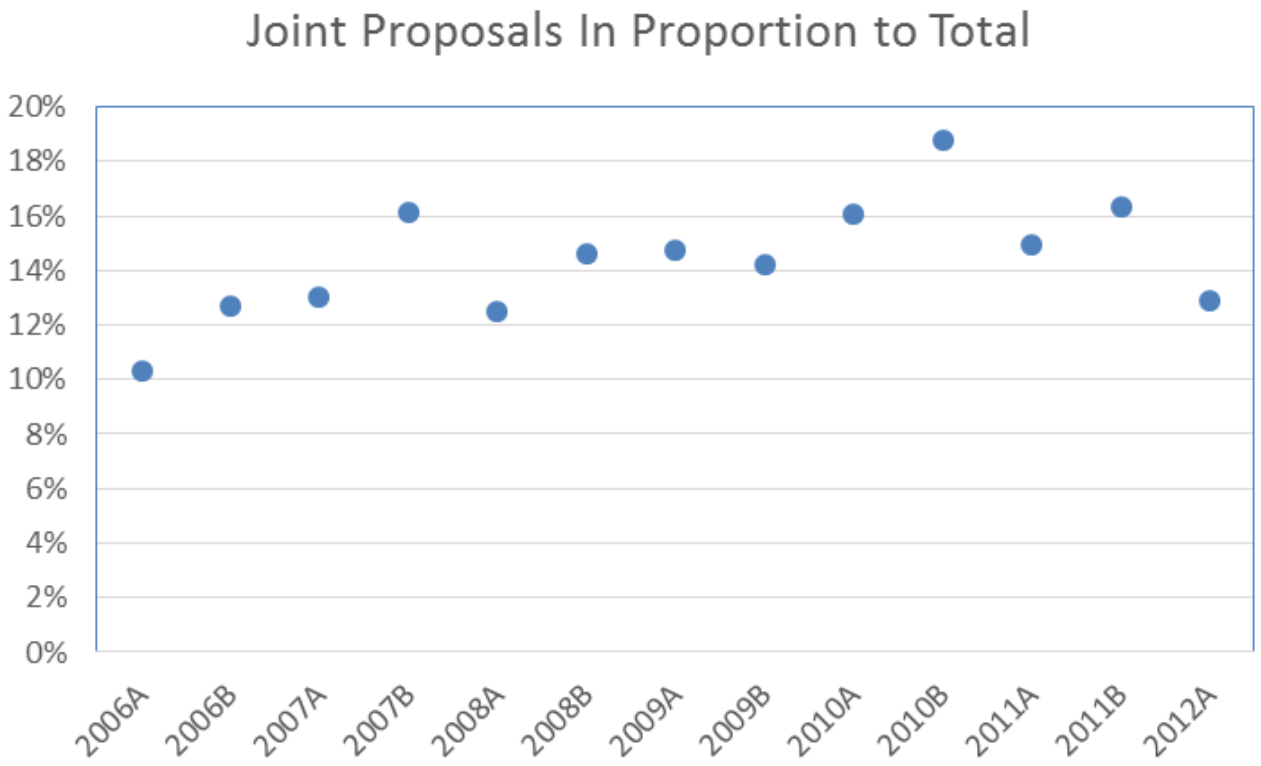
Data on *hours* allocated to programmes

- 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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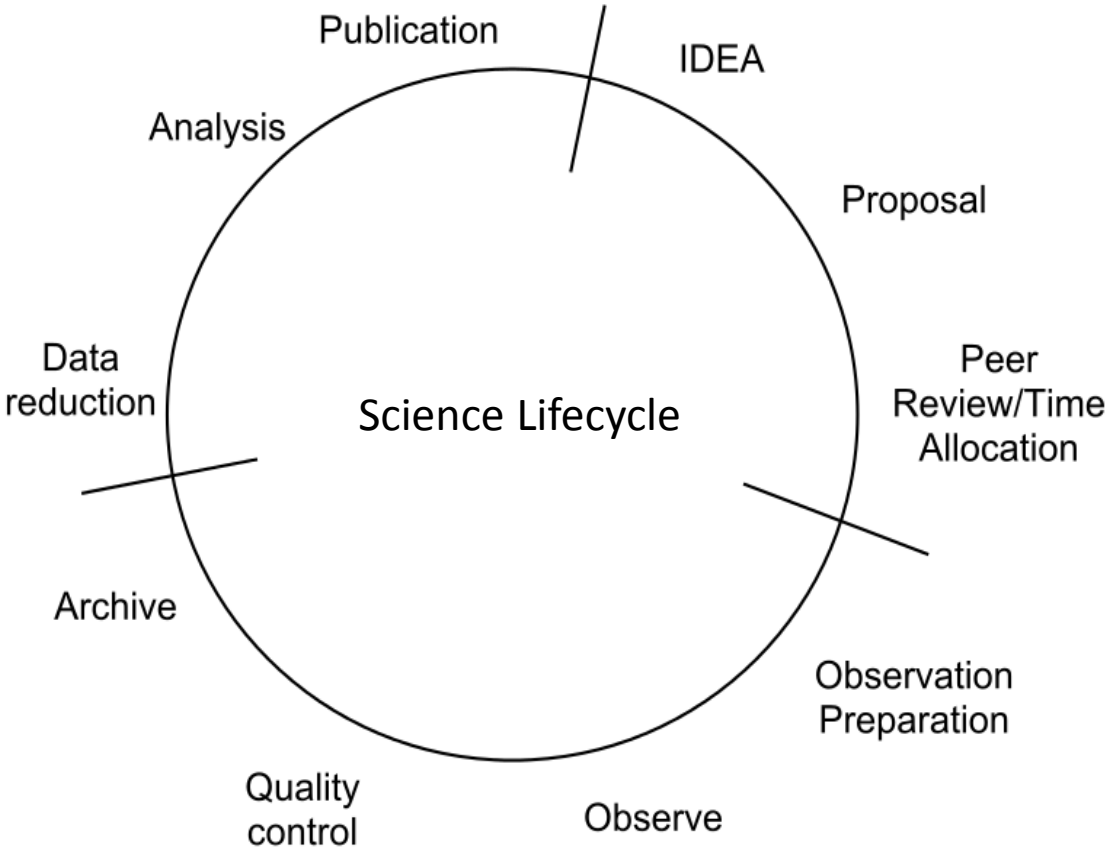
Mode	Approx Fraction	Access
Large and Long Programmes	20% initially	Partnership (Elective pool); via annual LPTAC
Fast Turnaround (monthly)	<10% initially	Partnership; peer-reviewed (TBD)
Remote Observing	?	Partnership, post-2016
"Priority Visitor" observing	2014B (LLPs first)	Partnership

Effort Distribution



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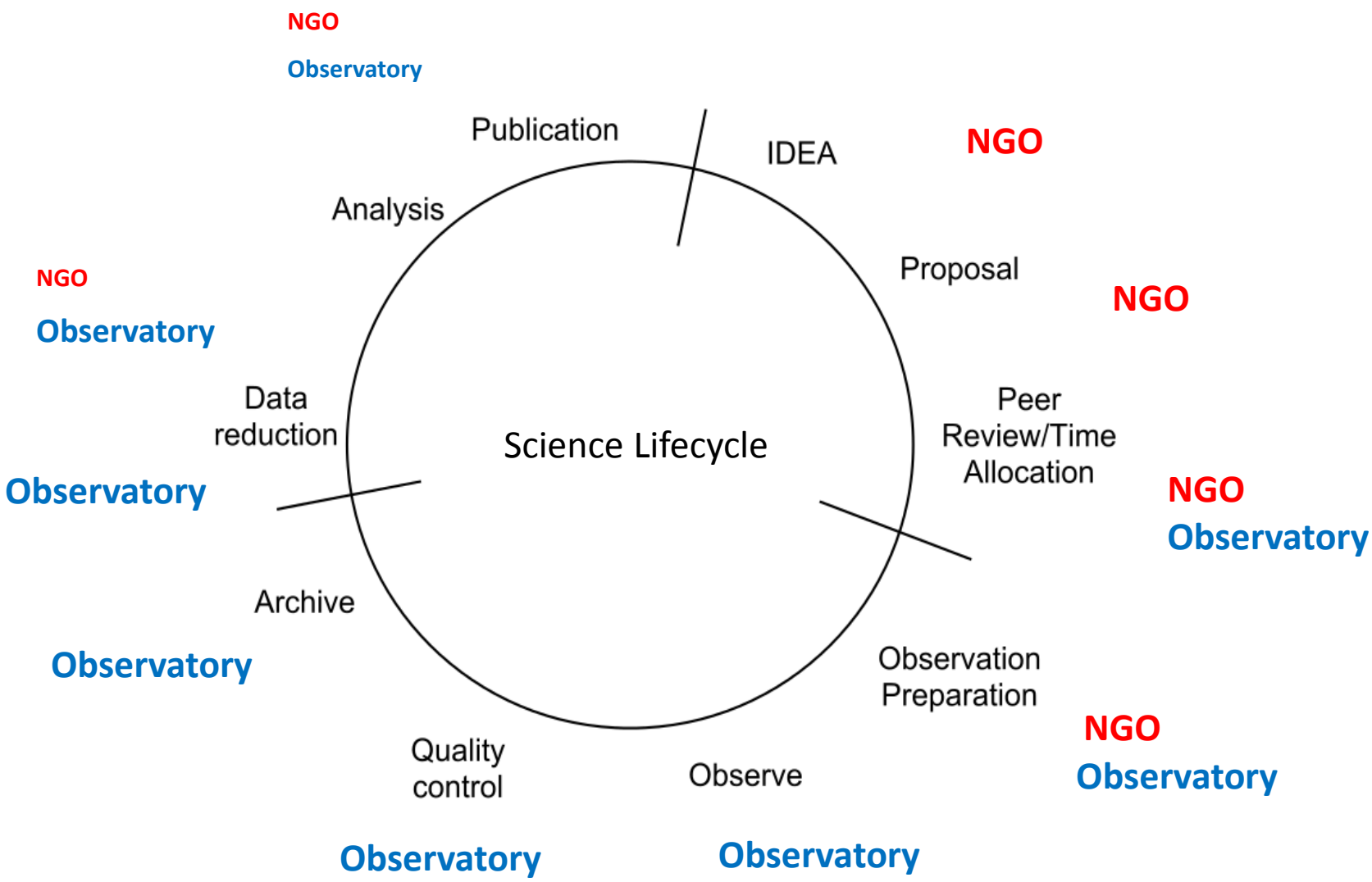
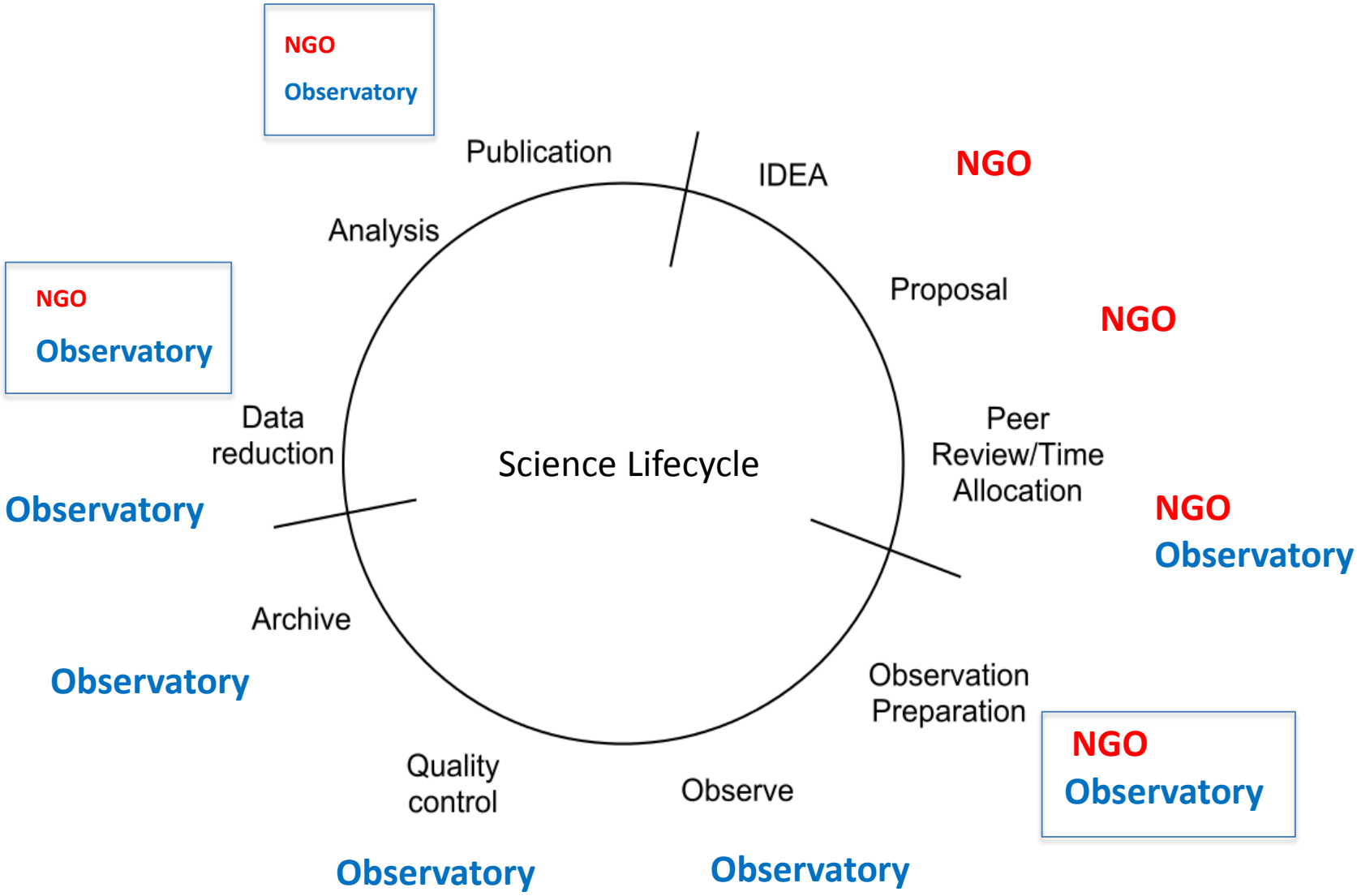


Effort Distribution



Where to fill in the gaps

http://www.gemini.edu/

And go to the "science" pulldown

GeMS/GSAOI Orion “Bullets”