

ALTAIR Meeting Notes

June 11, 2008

Meeting began with a Presentation by Todd Boroson (attached below) which outlined the background and charge for this committee. He also present how ALTAIR fit into a broader process that would involve not only NOAO and NSF but also ACCORD. During the ensuing discussion it was emphasized that we needed to look at current needs in the light of existing capabilities (both ground based and space assets) as well as needs that will be driven by new capabilities post 2010. NSF wants community & science driven recommendations and suggestions on a process for implementing those recommendations.

Peter Stritmatter represented ACCORD at this meeting and gave a presentation (attached below) A theme of his presentation was "Is the community serious about the system?"

Peter feels that with current structure we will not continue to lead in astronomy. Key points made that amplify the bullets in the presentation include:

- Funding for TSIP should including buying time with a greater "incentive factor". The current incentive factor of unity for straight time-purchase is less interesting to privates. He noted Chicago buying a Magellan time at ~1.5 incentive
- AODP has not been successful due to intermittent funding
- Need to contain operations costs
- Peter implied that it would be a good idea to shift resources from the "national" facilities to "privates" because the latter can leverage the funds. He emphasized the importance remarks about funding people with passion for building instruments or developing software. He reminded us of this point several times during the day.

Peter relayed a concerns from Shri Kulkarni (ACCORD chair. Major points are Independents are an integral part of system, indeed control ~80% of 6-10 meter glass, and stability of funding is needed for the system to be competitive.

Joan Najita followed with a presentation (attached below) that summarized current instrument capability on 6-10 meter telescopes . This summary of capabilities was largely structured as FOV vs. resolution in separate plots optical, near infrared and mid infrared. It was suggested that there be a Differentiation between Gemini & "other". It was also suggested that in addition to broad categories Joan circled on figures, it might prove useful to have a separate figure for diffraction-limited NIR. She also presented over subscription & demand for specific instruments as seen from NOAO for Gemini and other telescope through the TSIP program. David Koo made a case for workhorse instruments vs. special purpose.

Joe Jensen used the committee charge to present (attached below) current Gemini instrument capabilities, instrument plans, telescope usage and productivity and those area where he felt Gemini was most capable. He noted there will be another "Aspen" like meeting coming up. On WFMOS he laid

out a decision timeline, competitive studies due early 2009, simultaneously negotiate with Japan, May 2009 board will have bid packages and Japan agreement. WFMOS funding PROCESS is a big issue. Joe also noted GNIRS was 25-30% of total time on Gemini south and it's loss a substantial setback. GNIRS projected to be back on 2009A on Gemini north for commissioning and Flamingos 2 on Gemini south on similar time scale.

There was substantial discussion on WFMOS. There were question on the GSC selection process that none in the room could address. The committee needs a better understanding of how it recommendations fit in the context of renewal of Gemini partnership (2012) and of AURA cooperative agreement to operate Gemini (2010). If report comes out by early next year, it can have an influence on the new agreements. Todd/Larry say NSF welcomes committee input on these issues – more on process than revisiting decisions

On the Aspen instruments there was a general sense that the process of choosing instruments as funding shrank was a series of individually reasonable decisions that resulted in an undesired result. That was followed by a discussion of NSF's ability to plan/commit for longer than a year at a time. NSF cannot do so for more than 5 years but could do that according to Michael. However, many of the relevant programs (TSIP, AODP, Aspen) have been funded year to year. If NSF could make a longer-term (more stable) commitment that could be very helpful but , presumably, this comes at the price of less stability in some other areas. NSF needs to hear this from committee on this issue.

We then proceeded into a discussion of the types of information the committee will need for its report. This is briefly summarized as follows:

How telescopes used?

Need to get information from the observatories. At independents: by instrument demand on scheduled time. How far back in time should we look? 5 years, by year/by instrument w/overall oversubscription if available. It is clear that demand will NOT reflected in the above information unless oversubscription data is also available. We noted that such a data set will not be uniform but the prevailing view was "will take what we can get". One specific request was about TOO interruptions on Gemini and how do TOO affects the Gemini process and what happens to data?

Impact:

Initial discussion about what to measure; number of papers, citations? What other metrics are relevant? Some members questions why does the committee care?

Oversubscription rates

Time from data acquisition to publication.

Tom Soifer noted Spitzer tracks Publications/yr and bits into and out of the archive.

Will need to identify NOAO resources to ferret out stats. Committee needs to decide what information it needs for next meeting. Discussion ended without a proposal for anything specific to collect for the committee.

In the afternoon session we began by assessing current challenges: Many points were raised in this discussion which was intentionally wide ranging. Below are notable points and are not prioritized.

- Stability is a key issue. Funding and time should be predictable. Buy time would help here. Note that the desire seems to be not just for overall funding stability but also for some degree of stability at the observatory level in terms of funding and available time.
- New AODP roadmap is much need. Buying time should make improvement to system—MMT adaptive secondary for example. Limit to LGS at Keck is people so buying time could add capability.
- TSIP rules need to be tweaked with incentive and stability.
- For “time buy” as opposed to instrument support, does funding need to be accounted for? Probably.
- Private observatories are supportive of TSIP. For Magellan, Keck and MMT it provides leveraged gains. It also helps enable privates to maintain instrument groups.
- No high resolution capability optical on Gemini and no high res IR at all. ARIES with AO? NIRSPEC behind AO system loses a lot of efficiency; might this be improved with TSIP?.
- Should there be a “System” telescope for TOO? Is Gemini and its queue most suitable?
- Limit instrument complement on national facility, Trade between Gemini and Keck for ToO?
- Privates have opted to minimize operational expenses to maximize instrumental capabilities (queue/archive cost money).
- Does community want access to data archives in privates? The younger generation of astronomers expect that observatories produce data products; HST, Spitzer, Chandra. What is value between archive vs new instrument? Both cost dollars.
- Compare cost of Gemini with other telescope
- \$/publication \$/citation \$/slitCost is key in making trades.
- Nigh/night trade for Keck HIRES for Gemini Michelle or NIRI

The question arose on the utilization of the Gemini archive and publications from archive. Joe Jensen will provide information on the archive use.

We then turned to getting input from community. Todd listed methods used by ReSTAR to get 160 responses. There was some concern a number like this is not enough but most agree it would be representative (some responses were on behalf of groups/departments). Additional methods are to simply to talk to people After some discussion there was a general consensus to use a ReStar-like survey.

David Koo suggested survey be short, med, long survey but after some discussion, decided to just have short survey + option to continue + options to write essay(s). Some topics that come up in discussion of what should be in the survey: MOS and single object should be distinguished, just do low or high resolution for spectroscopy, more AO spectroscopy, IFU science, Simultaneous wavelength coverage (high res), UV coverage, survey questions should not bog down in detailed specification (comments are for that). Access: used independents, if so how was access obtained. Agreed that break between “now” and “future” is later than 2012, probably JWST launch (2014/5).

Sub-committee of David, Lisa Prato, Seth Redfield and ?? agreed to will draft survey and send around for comment. Lisa to Dave by Sunday, Dave to committee by Wed . Site live by end of week of 23

Other topics discussed:

- Special purpose techniques: polarimetry, interferometry, fast time domain.
- Ask Key people in ALMA, LSST, JWST, SDSSIII, Galaxy evolution etc for needed capabilities.
- AODP road map.
- JWST what is role of ground based NIR spectroscopy—what promised
- White papers solicited for science from survey respondents
- Capabilities worth trading for
- Allowed to think about new facility(ies).
- How will demand change in new era?
- When GSMT comes along, how to compete.
- Discussion of need for pipelines, status of pipelines at various observatories – distinguish between pipeline and tools+recipes. Pipelines Keck only for OSIRIS and Deimos. HIRES and NIRSPEC partially so. No pipelines at MMT and LBT and not a virtue according to Peter. Pipeline essential for MOS mode. Some pipeline for MIKE and IMACS at Magellan

Discussed Incremental funding to take PI's pipelines to make user friendly. System needs to get money to passionate and talented people to do this (Peter) . Pipelines should be evolutionary - modify as you learn from experience with instrument, start with adaptation from other similar instruments. How to adjust system and TSIP to meet this.

End of day comments:

Lynn: Want a "free market" of telescope time and capability that allows trades. Large teams figure ground rules going forward.

Jay Elias: Need critical mass on each facility to engender real access:

Joan: Different models from full serve Gemini, cost vs return vs self service model—trade cost benefit

Tom: Free market maximizes something; may or may not maximize science productivity.

David Koo: Think more globally (internationally) to maximize resources

Seth: Hard to predict science drivers in decade need to have mechanisms that allow TSIP to adapt

Lisa: Impressed by colleagues from privates who think system and TSIP is a good thing. Human interaction across boundaries enriching. Notes opposite effect of queue/remote observing.

Chris: All of us want more instruments and telescope time. We talk about being science driven but the Gemini Aspen process highlights vulnerability to budgets and events.

Briley: NSF needs to hear need for change.

Peter: Discussed cross use of instruments ; ie the need minimize replication across the system.

Optimum # of facility instruments on any one telescope surely less than current number of ~10. Cites VLT as efficient match of instruments to multiple telescopes.

Nancy: Moving to more specialized telescopes may be more rational; how to get there

Daniel: US investment is already large in capital and operational costs. Relatively minor changes in allocation of resources could make substantial differences. We need to be bold on recommendations of how \$'s are spent.

Tom Soifer: We must be mindful of the sociology of our profession. How do larger groups/large projects impact use of telescope or requirements on facilities?

Andy: Endorse TSIP for gaining access to large telescope as well as buying more Gemini time. Also need to increase efficiency of all instruments, spectrographs in particular. This is not only achieved by increasing throughput but through MOS.

Joe Jensen: Impact by this committee can affect not only Gemini but perhaps TMT as patterned after Gemini. More international. Work in collaborative way not just in fundraising. US can affect Gemini.

July 12

The second day began with a brief review of the previous day's proceedings.

Andy McWilliam commented that there is a stress on the high resolution spectroscopy community who needed access to large public telescope in US in both Optical and NIR. This needs to be listed under challenges. Chris John's Krull added that globular cluster work demand high resolution behind AO. Joe Jensen noted that at present Gemini does not provide high resolution or wide field anything. Noted low AO demand could well be due to lack of community experience. Development of robust and user friendly AO is seen as a high priority by ACCORD.

We then turned to discuss the contents and depth of a science case. One suggestion was an elaboration of what science AO enables on 8 meter telescopes. Chris said a science will need to be made for new instruments in the system where increased access is requested by community. David Koo suggested emphasizing new areas not around 10 years ago on large telescope. Lynne Hillenbrand suggest a minimalist approach to the science case and there was widespread understanding that there were unmet needs for strong science.

Tom Soifer pointed out there was precious little NIR large (20 arc min) field imaging. Also Large groups proposing large projects will be more common and we need to assess how these impact demand. Space programs have large amounts of time on large "legacy" programs. The community survey should assess what community thinks is appropriate amount of time on system telescopes for surveys. Daniel Eisenstein suggested we consider assessing the number of nights required by looking at big projects and divide by 10 years. Heidi Hammel cautioned we need to make sure to leave time for smaller and yet to be thought of projects. Chris suggested we consider two science cases. One to justify increased public access to what is available now and second for what will be needed in next decade.

Tom Soifer urged we need new instruments now for current users. Heidi pointed out that it will be important to have a strong science case for why we need new instruments on public facilities.

Who is the audience for science case? The consensus was that it is NSF and community itself.

What is science case for? Lynn suggest we all write one page. Tentative assignments as follows:

Lynn Hillenbrand: Star formation

David Koo: next Gen AO & galaxy evolution.

Joan Najita: Disk & planet formation

Daniel Eisenstein: Dark Energy and Large Scale Structure
John Monnier: Unmet need for angular resolution capability, Exoplanets.
Seth Redfield: High Resolution ISM & exoplanet spectroscopy
Larry Ramsey: exo-planet Radial Velocity
Andy: HR galaxy chemical evolution, integrated light globular
Chris Johns-Krull: General stellar astrophysics
Tom Soifer: Dusty galaxy evolution, NIR imaging
Nancy Levenson: AGN's, local and beyond
Tom Matheson: SN time domain
Heidi Hammel: Solar System science that needs large apertures
Lisa Prato: RV science

David Koo will seek input from Garth Illingworth. Goal would be to have these due Mid July as part of a general survey follow up. Noted Missing areas: compact objects, re-ionization, galaxy evolution, cluster evolution, IGM, Lensing evolution, High energy transient follow up, other time domain/transient science.

How to assess need for 6-10 meter time generated a wide ranging discussion perhaps pushing the boundaries of the topics. Suggestions on estimating time included:

- We should also consider getting white papers for, LSST, PTF, Pan stars
- Get data from AAS directory on full member at institutions with access
- Better to look proposers on telescopes
- Look at papers resulting from 6-10 meter telescopes
- Those propose over 5 year period represent most active 6-8 meter users.
- Number of PhD coming out of universities with access

Other topics included:

- There will be an increase in large teams doing large projects ; GPI is a large and science team , NICI campaign ~25 astronomers
- NASA is an example of buying for category of science or project on Keck for planet work. This is a model for non-independents buying time for specific projects.
- Many people get access by bringing desired data to the table.
- Get fraction of Gemini archive download which is US. Ratio of data in and data out. Effort to distinguish PI's
- Many coordinated science program already being submitted by Chandra, HST & Spitzer. TACS may be harder on joint.
- Look at each new facility in play will increase demands; JWST, GIA, ALMA 100's of nights.

Prioritizing capabilities

- Independents have voted with feet. MOS, wide field imaging always win over niche capabilities, polarimetry, interferometry. Breakthrough technologies: LGS technology can enable better

science but community is slow to catch on. Conservatism on part of community in adopting new technology like AO.

- Instrument funding from ATI and TSIP will require continued assessment of capabilities and demand and make sure we are creating new capability.
- Committee should provide a justified assessment of priorities and a process for determining priorities.
- Our view of capability should extend beyond US .

Challenges of creating a system

- Peter Strittmatter urged the system be configured to address access and budget. ACCORD makes time available for peer reviewed access for compensation. In next 10 years 6-10 m telescope will want AO. LBT has unique interferometric capability; an advantage for national access.
- Why do we not now have more. Mechanisms are not in place. NOAO TAC does good job with TSIP time. Has not gone on between Keck-Magellan etc. Here is where "broker" concept could come into play. Without dramatic increase in investment one can add to capability.
- Chris Johns-Krull suggested trading Gemini time to independents in exchange for public access. UK selling time may present opportunity.
- New & More: new 8 meter with MOS fiber feeds to low and high resolution spectrograph.
- New major instruments with significant increase capability can buy enough community time to make an impact.
- TSIP and MRI limits are \$2 million per year. 50% limit in TSIP process can be changed.
- Need to identify science driven instrumental needs to try to drive to change the process. Need to put concepts on the table that people want.
- Must continue to have PI's who passionately want instrument for (their) science.

Next meeting will be at NSF in Arlington in early Aug to early Sept time



ALTAIR - Access to Large Telescopes for Astronomical Instruction and Research

Introduction and Charge

Todd Boroson

June 10, 2008



Background

- Senior Review
 - NOAO should provide access to state-of-the-art capabilities on high-performance telescopes of all apertures
 - Choices should be made or priorities set on scientific basis
- Defining path forward requires
 - Prioritized list of capabilities
 - Instruments, observing modes, telescope/site characteristics, etc.
 - Estimate of nights needed
 - Justification for above based on community expressions of scientific interest
 - Understanding how these things may change over next decade



The Charge

- Gather community input, and using this, do the things below
- Understand how the community uses these telescopes
- Develop a list of desired capabilities
 - Optimum for Gemini
 - Optimum for other telescopes
- Provide recommendations to guide US (NSF) position on Gemini
- Provide recommendations to guide US (NSF) position on other telescopes (TSIP)



Process - next steps

- Produce a compelling report
- Publicize throughout community
- Develop a plan for implementing the ALTAIR recommendations
 - ACCORD should be involved in this
- Present and advocate to NSF
- Obtain funding to carry out plan



ReSTAR

- ReSTAR did this for the small and mid-sized telescopes
 - Met 4 times
 - Gathered web survey input from 160 people
 - Gathered additional community input from other groups
 - Discussed and analyzed input
 - Wrote compelling report that includes
 - Discussion of the science enabled by these facilities
 - Description of the needed capabilities that are missing
 - Estimates of the amount of time needed
 - Identification of capabilities that require near- or long-term development
 - Principles to guide a plan to address their recommendations
- NOAO has put together implementation plan
 - Discussions with NSF to modify plan are ongoing
 - Expect to circulate plan for community discussion soon
 - Hope to begin implementation in FY 2009

ALTAIR MEETING

June 11th/12th

ALTAIR MEETING

June 11th/12th

What is the US. Telescope System?

- **Public/ Independent O/IR facilities**
- **Public has 20% of collecting area**
- **Public has 90% of NSF O/IR funding**
- **ACCORD represents US O/IR observatories; is a trade association.**

Members: C. Alcock, M. Bolte, T. Boroson*, W. Freedman, S. Hawley, G. Jacoby, R. Kudritski, S. Kulkarni, D. Lambert, W. Smith, P. Strittmatter

ALTAIR MEETING

June 11th/12th

Collecting Area (D2) of U.S. O/IR Telescopes with D > 3m

Independents		NSF Funded	
• Keck (2 x 10m)	200	Gemini N/S (2 x 8m)(50%)	65
• LBT (2 x 8.4m) (50%)	71	KP 3.8m	16
• HET 9m (90%)	73	CTIO 3.8m	16
• Magellan (2 x 6.5m)	84	WIYN (40%)	4
• MMT 6.5m	42	SOAR (25%)	4
• Palomar 5m	25		
• SOAR 4m (50%)	8		
• ARC 3.5m	11		
• WIYN 3.5m (60%)	7		
• Lick 3.0m	9		
• SALT			
Total	530		105

ALTAIR MEETING

June 11th/12th

Question: Is the community serious about “The System”?

Has been Key to US competitiveness in O/IR astronomy.

Will it continue that role?

ALTAIR MEETING

June 11th/12th

Question: Is the community serious about “The System”?

Advantages of System:

- **Leverage independent investment.**
- **Exploits PI Passion and Originality**
- **Increases instrumentation /time for to US community.**
- **Key element in maintaining US competitive position**
- **Enables evolution to ELT era.**
- **Supported by ACCORD.**

ALTAIR MEETING

June 11th/12th

Question: Is the community serious about “The System”?

Disadvantages:

- **Requires financial support.**
- **Implies changes in NSF funding priorities.**
- **Care required not to discourage independent investment.**

ALTAIR MEETING

June 11th/12th

Key Components for System to work:

Funding for:

TSIP (including buy time)

AODP

ATI

“Real” grants program

Look forward to GSMT and LST.

Need to contain operations costs etc.

ALTAIR MEETING

June 11th/12th

From the ACCORD chair (S. Kulkarni)

- **The Independent observatories are an integral part of the system.**
- **The first and foremost requirement we have is stability in funding.**
- **An improvement in efficiency at the independents is beneficial to the entire system. This means steady funding for improvements in the telescopes, better detectors etc.**
- **Finally, AO is a big issue for all large telescopes; stable support is essential.**

ALTAIR MEETING

June 11th/12th

What can ALTAIR do?

- Review System from perspective of optimum use of resources to maintain US leadership in O/IR research.
- Identify funded activities that do not contribute to research leadership goal.
- Recommend improved distribution of resources within current budget constraints
- Examine whether we are “headed in the right direction”.

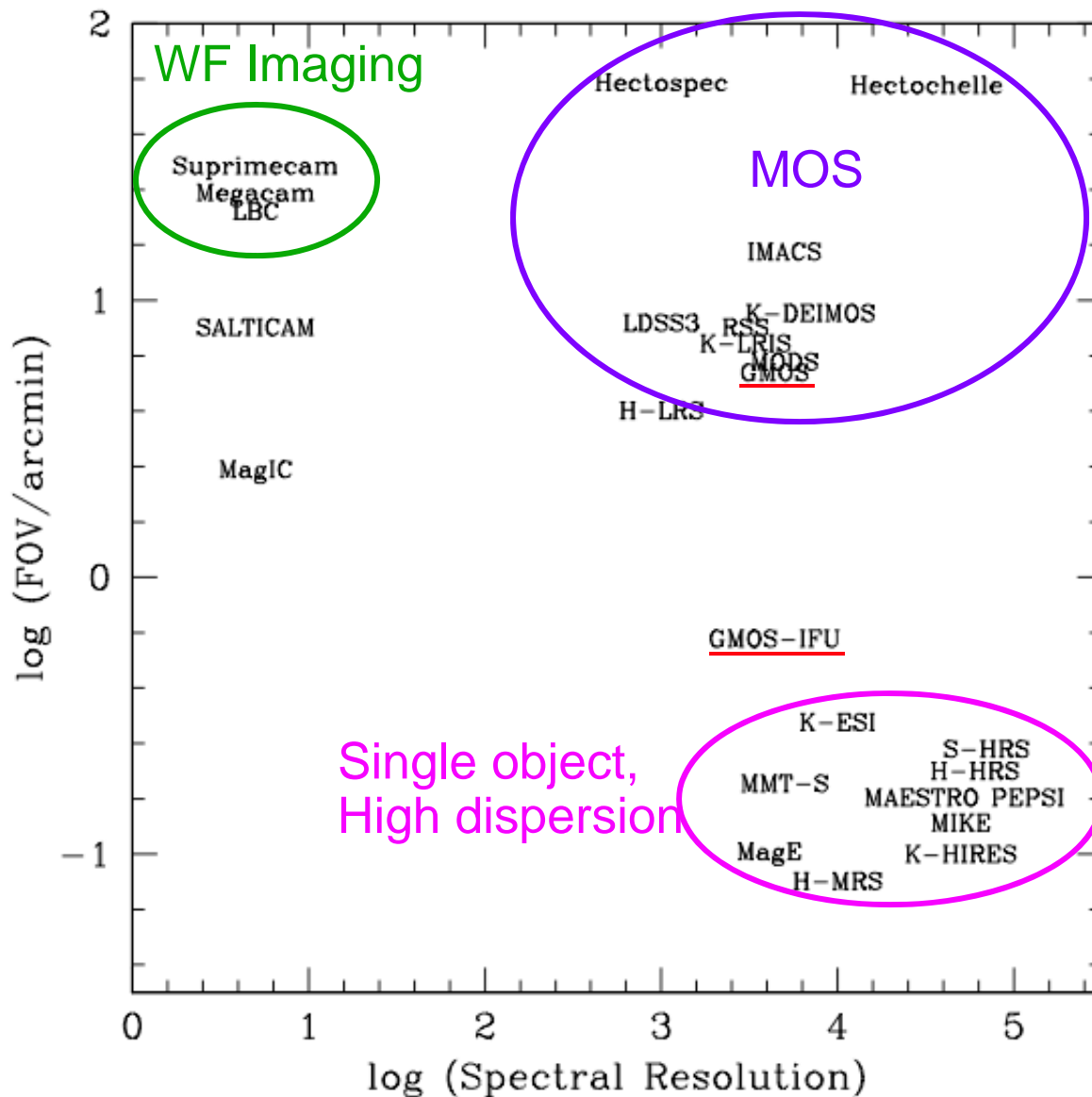
Large Telescopes

Facility	Aperture	Hemisphere	Partners
Gemini	8m x 2	N & S	US, International
Keck	10m x 2	N	UC, Caltech, NASA
Magellan	6.5m x 2	S	Carnegie, UA, Harvard, U. Mich, MIT
MMT	6m	N	Smithsonian, UA
HET	9.2m eff.	N	UT, Penn St., Stanford, Intl
LBT	8.4m x 2	N	AZ, Ohio St., Notre Dame, Intl.
SALT	11m	S	HET, Rutgers, U. Wisc, Carnegie Mellon, UNC, Dartmouth, AMNH, Intl.
Subaru		N	
VLT	8m x 4	S	

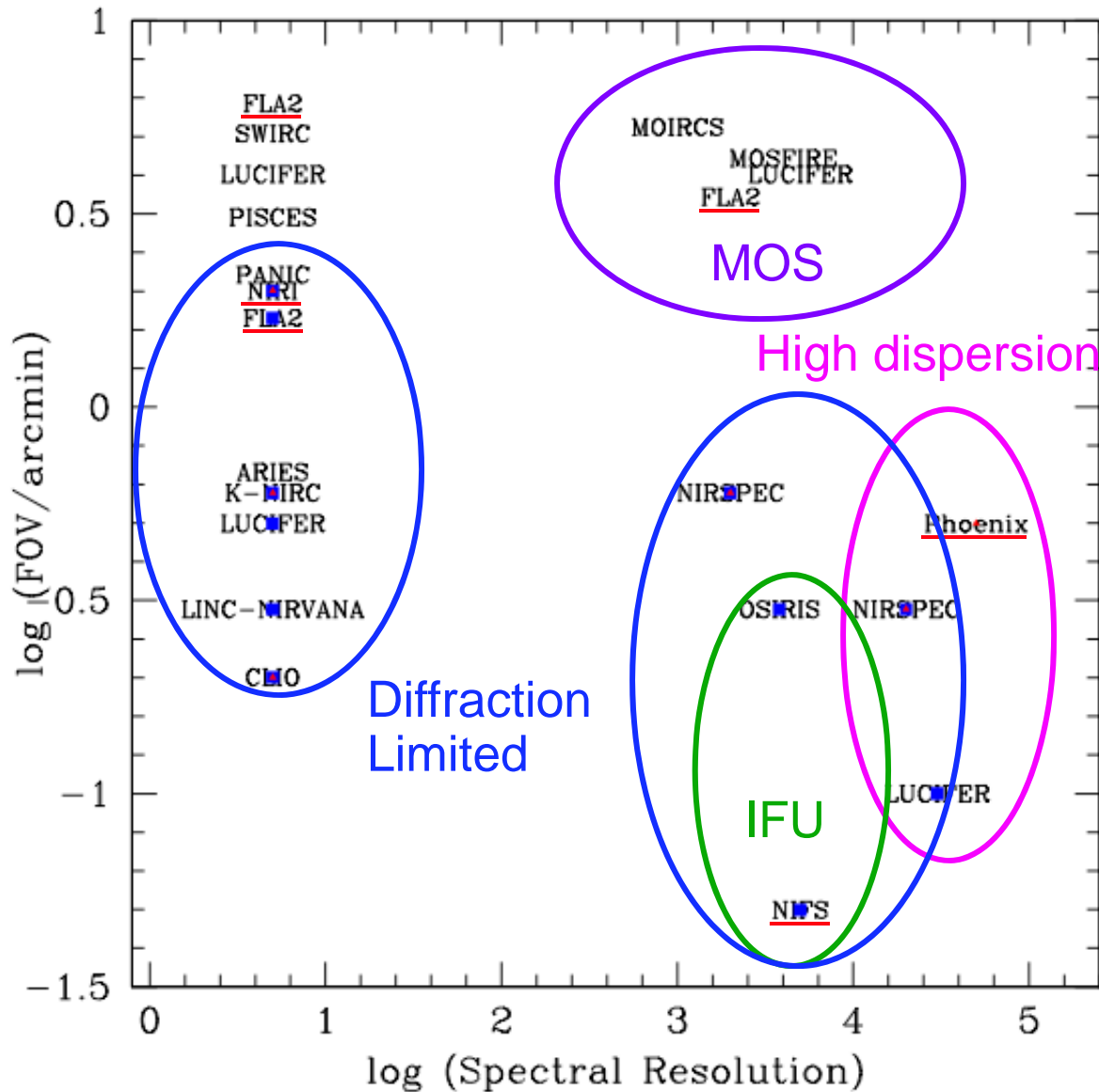
Instrument Webpages

Gemini	www.gemini.edu
Keck	ww2.keck.hawaii.edu/inst/index.php
Magellan	www.lco.cl/lco/telescopes-information/magellan
MMT	www.mmt.org
HET	www.as.utexas.edu/mcdonald/het/het.html
LBT	medusa.as.arizona.edu/lbto
SALT	www.salt.ac.za
Subaru	
VLT	

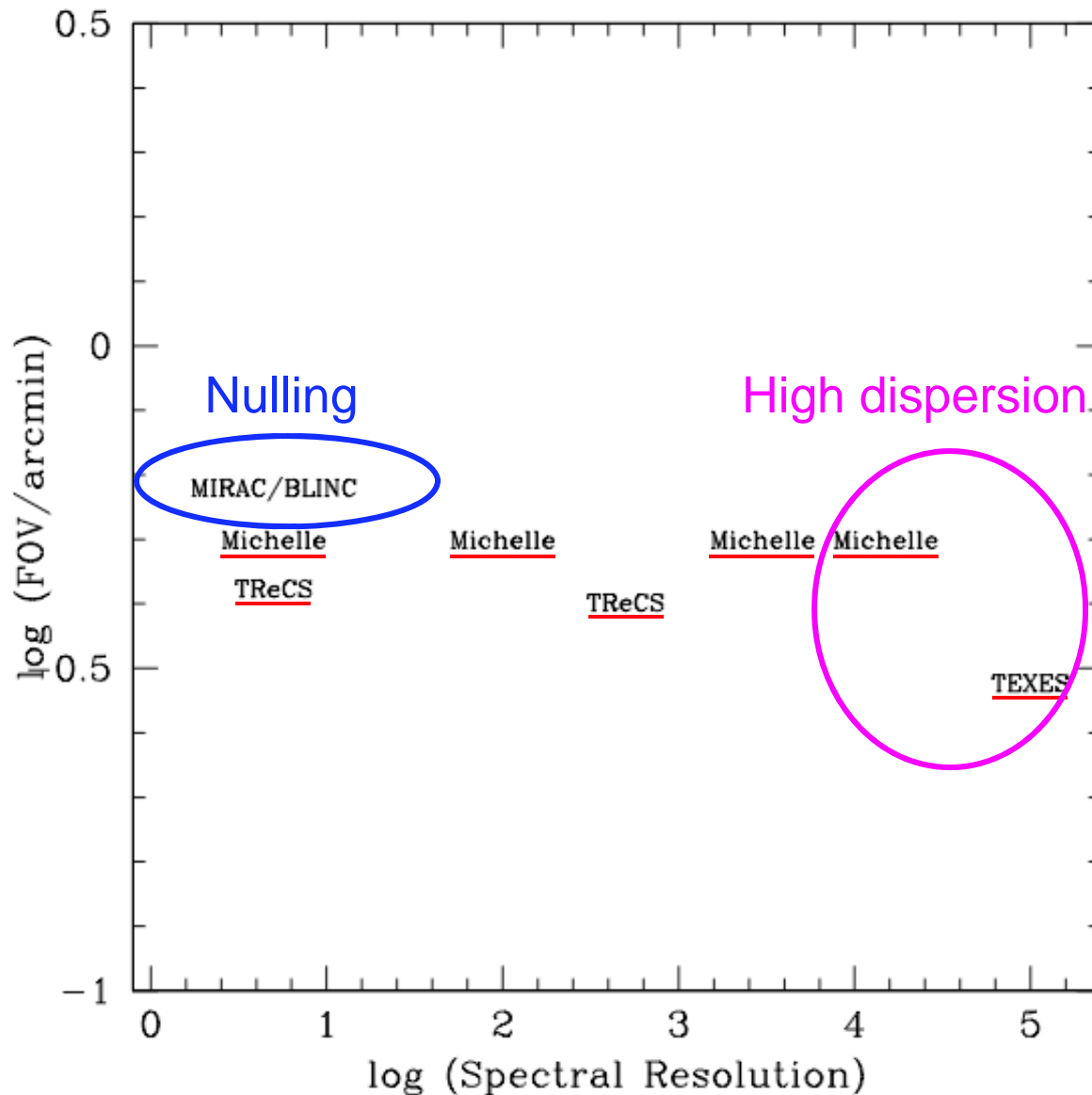
Instrumentation: Optical



Instrumentation: Near-IR



Instrumentation: Mid-IR



NOAO Proposal Statistics (2007B, 2008A)

Telescope	# Proposals	Nights Requested	Nights Allocated	Oversubscription
Keck-I	35	52	11	4.7
Keck-II	41	54	8	6.8
Gemini-N	315	366	118	3.1
Gemini-S	153	195	75	2.6
Mag-I	6	13	4	3.3
Mag-II	11	20	6	3.3
MMT	25	52	25	2.1
HET	16	23	15	1.5

High demand for TSIP resources, especially Keck I and II.

NOAO Proposal Statistics (2007B, 2008A)

Telescope	Nights Requested	Instrument	Nights Requested	Fraction
Keck-I	52	HIRES	39	0.75
Keck-II	54	NIRSPEC	20	0.37
		NIRC/AO	13	0.24
		ESI	11	0.2
Mag-I	13	IMACS	13	1.0
Mag-II	20	MIKE	16	0.8
MMT	52	Hectospe	13+	0.5

Popular TSIP resources are high res spectroscopy (opt and NIR), optical MOS, and high angular resolution imaging.

Gemini Information for the ALTAIR committee

J. Jensen, V. Smith

June 11-12, 2008

Tucson, Arizona

Charge #1

- Gather input from the broad U.S. community in order to develop an understanding of the instrumental (and other) capabilities needed on ground-based O/IR telescopes of aperture between 6.5 and 10 meters, between now and the end of the 2010-2020 decade. The list of capabilities should flow from community scientific aspirations and should represent all areas of astronomical research and wavelength and types of observation, though the committee should roughly prioritize and/or establish a time sequence.

Current and Planned Instrumentation

Mauna Kea

- GMOS
- ALTAIR+LGS*
- NIRI*
- MICHELLE
- NIFS*
- GNIRS*

Cerro Pachón

- GMOS
- T-ReCS
- NICI*
- FLAMINGOS-2*
- MCAO/Canopus*
- GSAOI*
- GPI*

*AO instrumentation

Gemini Instrument Plans

- **Short-term development plans:**
 - GNIRS:
 - Re-commission on Gemini-N in 2009A
 - NICI:
 - Commissioning at Gemini-S is nearing completion
 - Campaign to start in next few months
 - FLAMINGOS-2:
 - Pre-ship AT scheduled for July
 - Installed on telescope before end of year, commissioning in 2009A
 - MCAO/Canopus+GSAOI:
 - Integration on telescope and commissioning in 2009

Gemini Instrument Plans

- **Instrument upgrades:**
 - GMOS-N: upgrade with red-sensitive CCDs in 2009
 - GNIRS: refurbished and re-commissioned on Gemini-N in 2009
 - Tunable narrow-band filters for FLAMINGOS-2
 - Detector controller replacements for NIRI, GNIRS, and MICHELLE

Gemini Instrument Plans

- **Aspen Instruments:**
 - GPI: extreme-AO coronagraph for planet finding [funded]
 - Final design phase; just passed CDR
 - Possible use at Gemini-North and South
 - WFMOS: wide-field highly multiplexed fiber spectrometer
 - Conceptual design studies to be completed in 2009; construction by ~2015 [not yet funded]
 - Collaboration with Japan for installation on Subaru
 - GLAO: improved seeing over a large field
 - Possible facility upgrade for Gemini-North; feasibility study has been completed, but not a design
 - No new instruments proposed yet; backwards compatible
 - Site monitoring survey of MK under way

Gemini Instrument Plans

- **Beyond Aspen:**
 - GLAO imager or spectrograph?
 - Replacements for aging instruments? (GMOS, NIRI, T-ReCS, MICHELLE...)
 - Others?
 - Next Abingdon/Aspen/A_____ meeting?
- Gemini's long range plan will be constructed over the next two years in support of the partnership renegotiation and with input from the Decadal Survey
 - Community input will be needed

Gemini Instrument Plans

- Additional resources that are available for this meeting, if desired:
 - [Instrument status update](#) slides
 - [Aspen](#) instrument science case slides
 - Aspen (and other) documents on the web:
<http://www.gemini.edu/node/10727>

Charge #2

- Develop an understanding of the U.S. community's present use of the large telescopes within the system, the Gemini telescopes and those available through TSIP, including how the oversubscription rates, the number of astronomers who use them, the papers published, and the impact of those papers are related to the capabilities that are being provided. Both instrumental capabilities and aspects of operations (e.g., queue vs. classical) should be considered.

Gemini Usage:2008B

2008B by Instrument- U.S.(Submitted)

North

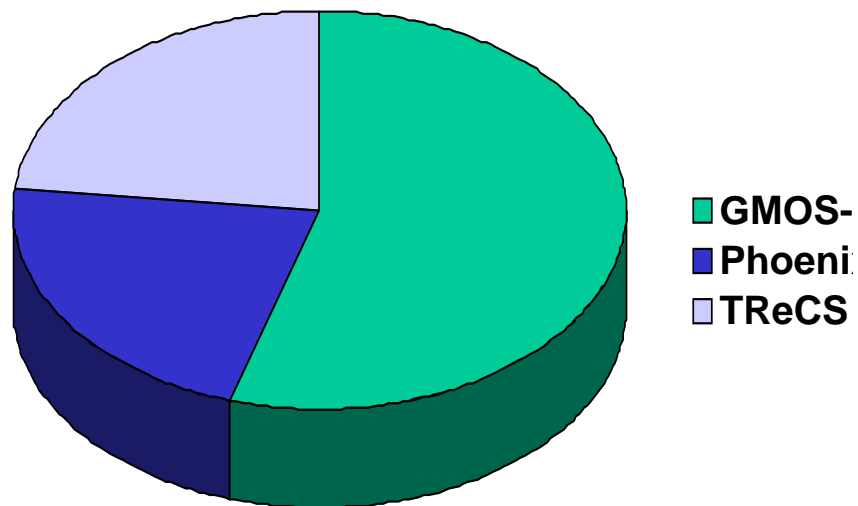
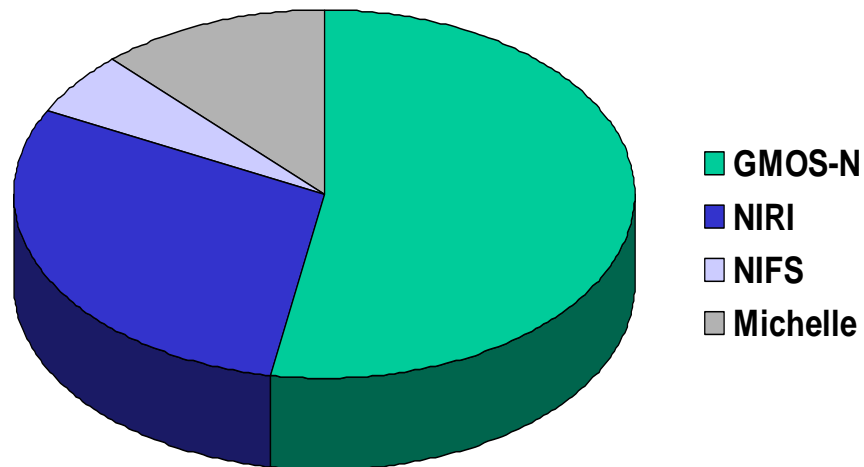
- GMOS-N: 49 proposals, 632.5 hrs.
- NIRI: 18 proposals, 209.4 hrs.
- NIRI-Altair: 14 proposals, 147.2 hrs.
- NIFS: 0 proposals, 0.0 hrs.
- NIFS-Altair: 7 proposals, 67.0 hrs.
- Michelle: 12 proposals, 142.1 hrs.
- (LGS: 11 proposals, 91.1 hrs.)

South

- GMOS-S: 32 proposals, 420.5 hrs.
- Phoenix: 8 proposals, 168.9 hrs.
- TReCS: 12 proposals, 179.4 hrs.

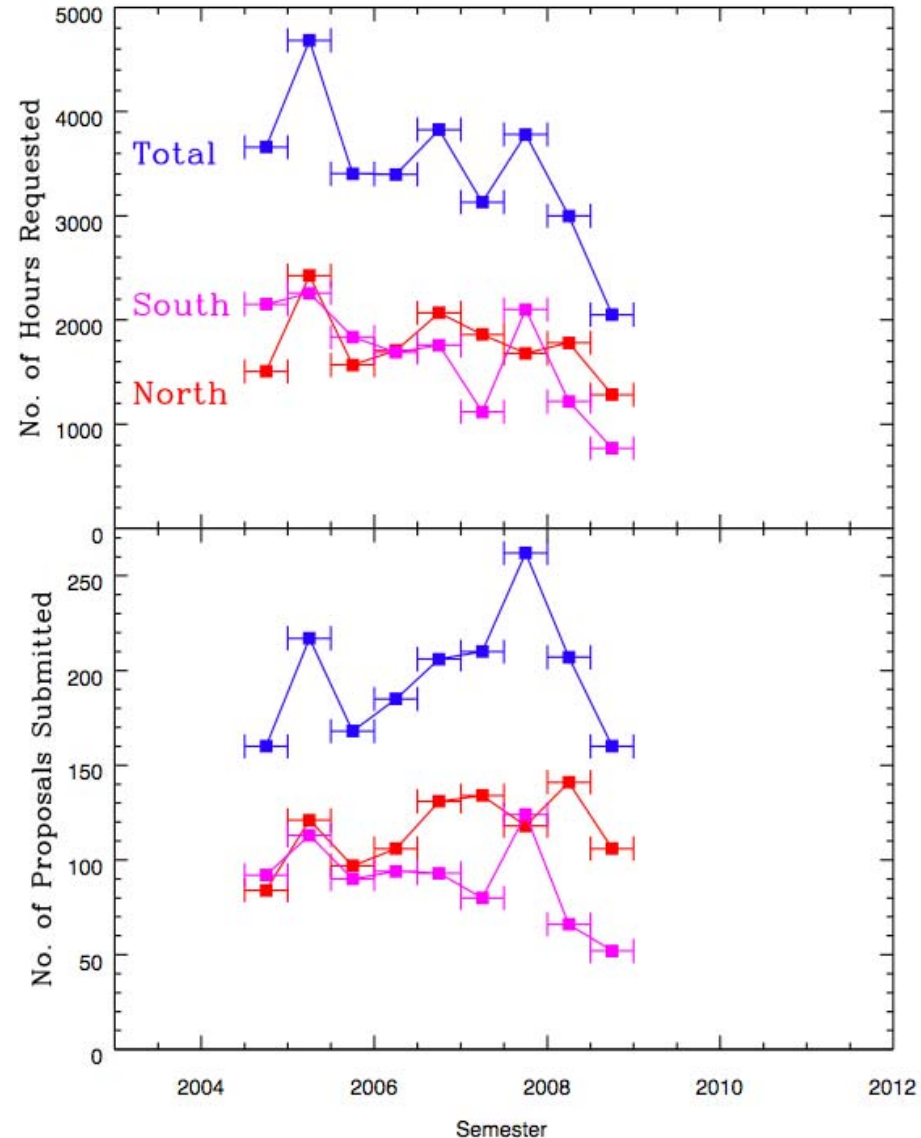
Time Trades

- HIRES (Keck): 10 proposals, 210.0 hrs.
(HIRES time is available both as Gemini or TSIP time)
- SuprimeCam (Subaru): 2 proposal, 50.0 hrs.
- MOIRCS (Subaru): 3 proposals, 24.4 hrs.



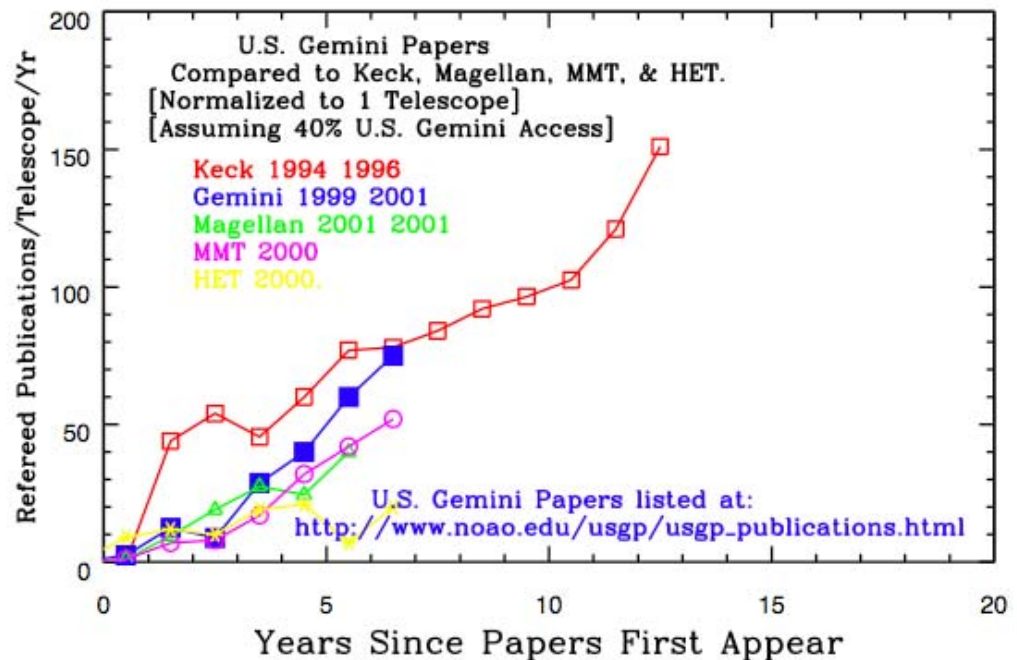
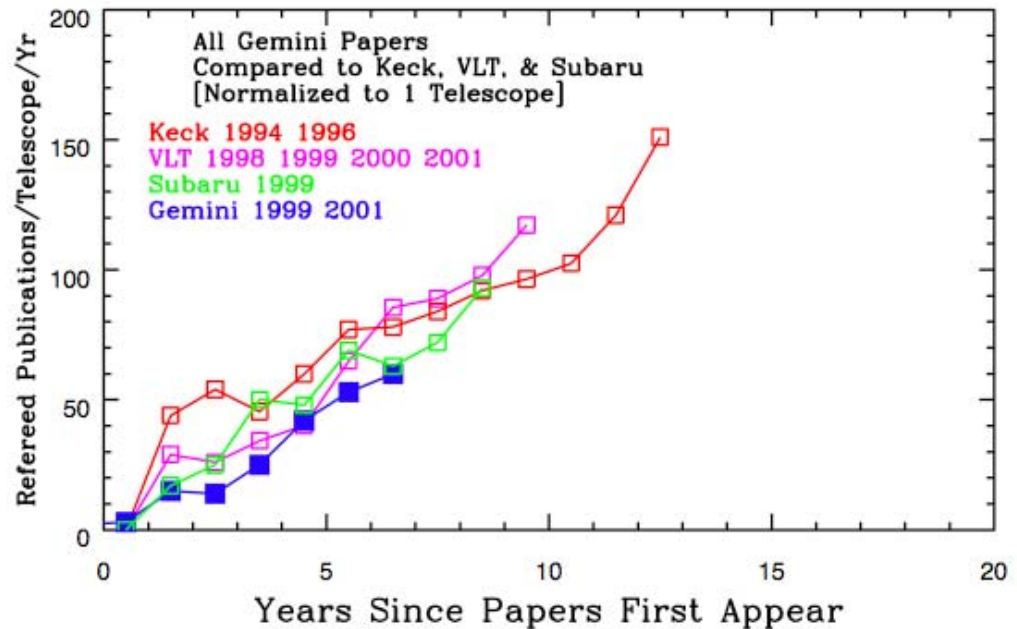
Gemini Usage

- Oversubscription Rates
- There is a decline on 'hours requested', but the number of 'submitted proposals' has remained more constant.
- The spike in 2007B was due to the loss of GNIRS and the Special CfP.
- Gemini-S affected by the loss of GNIRS and limited instrument complement.



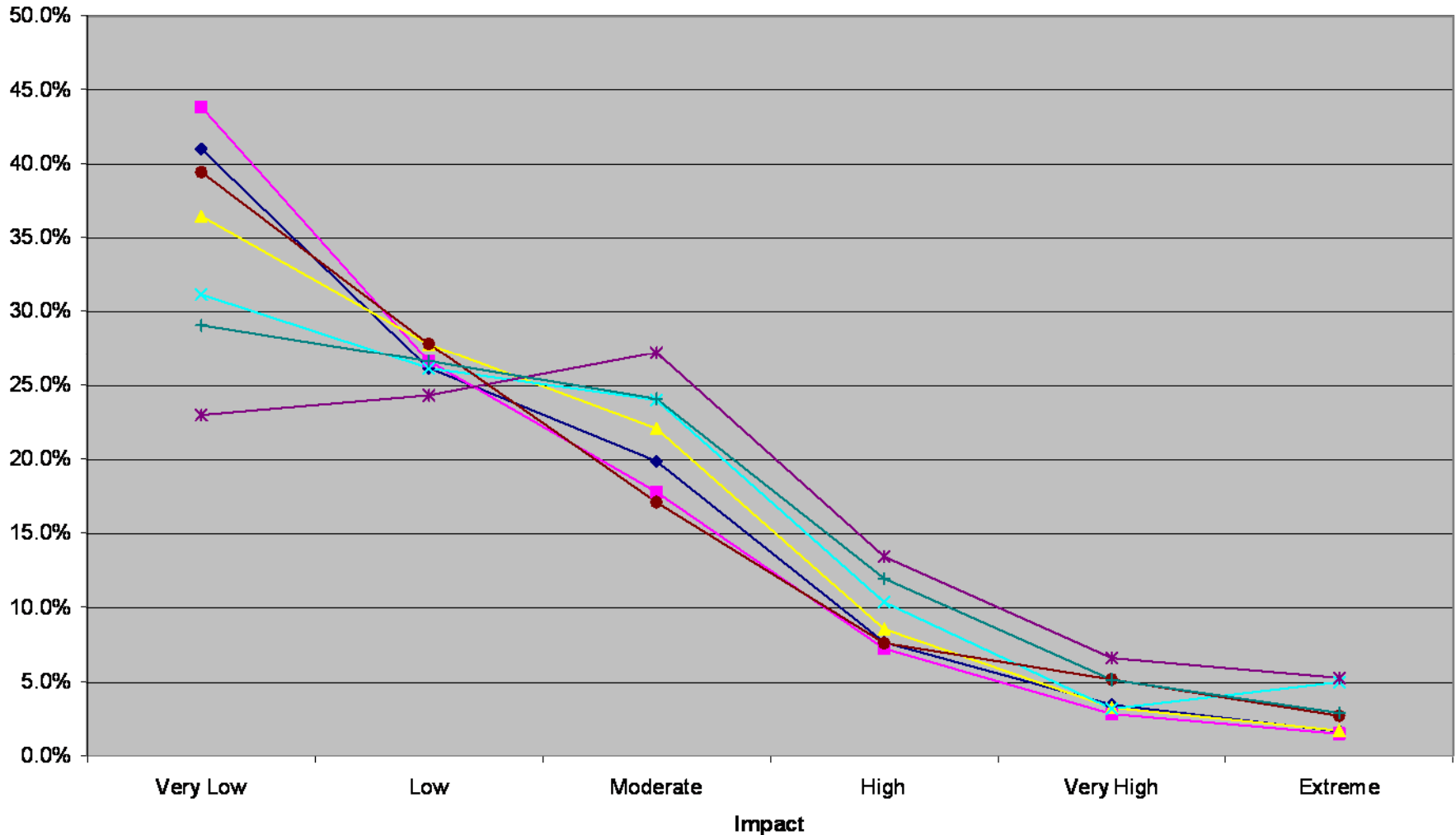
Gemini Usage

- Publication rates-- normalized to 1 telescope.
- Normalization applied two years after telescope first light.
- Top: all papers.
- Bottom: U.S. papers.



Gemini Usage: Citation Distributions

% of Papers vs Impact



Gemini Usage

- Additional resources:
 - Jean-Rene's report on [Gemini science results](#)
 - Jean-Rene and Dennis' report on [science productivity, publications, and citation rates](#)

Charge #3

- Within the context of the entire U.S. system, identify those capabilities which the Gemini telescopes are the best suited to provide – because of the amount of access that the community has or the particular characteristics of the telescopes or sites. Similarly, identify the optimum capabilities for non-federally-funded telescopes through which access might be provided to the broad community through programs like TSIP.

Gemini Capabilities

- **Optimized for excellent image quality**
 - Excellent sites
 - Active optics
 - Adaptive Optics using laser guide stars
 - Engineered into the whole observatory
- **Optimized for thermal IR sensitivity**
 - Sophisticated multi-layer protected silver on all three mirrors at both sites
 - Minimal top end mass
 - Light-weight chopping secondary
 - Excellent dry sites

Gemini Capabilities

- **Optimized for productivity**
 - Fast and easy instrument switching to adapt to changing weather or faults
 - Full queue and classical observer support
 - Proposal preparation support, observation preparation support
 - National Gemini offices provide community support
 - Well-defined data products and archive
 - Flexible observing modes for targets of opportunity (rapid or not)
 - Data reduction scripts and reduction support
 - Success determined more by TAC rank and observing strategy than by luck

Charge #4

- Provide a set of recommendations to guide the formulation of the U.S. position on Gemini, with particular attention to the expected transition in 2012 to a new international agreement. These recommendations should cover items such as number of nights the community needs on 6.5 to 10m telescopes, future instrumental capabilities, operations modes, access to archived data, and types of user support. The recommendations should also address processes for ensuring a strong link between Gemini capabilities and the interests of the U.S. community, taking into consideration the nature and constraints of the international partnership.

Charge #5

- Provide a set of recommendations to guide federal activities aimed at expanding the system of large telescopes using TSIP or other mechanisms. These recommendations should cover the same areas as those for Gemini.