

# Gemini Information for the ALTAIR committee

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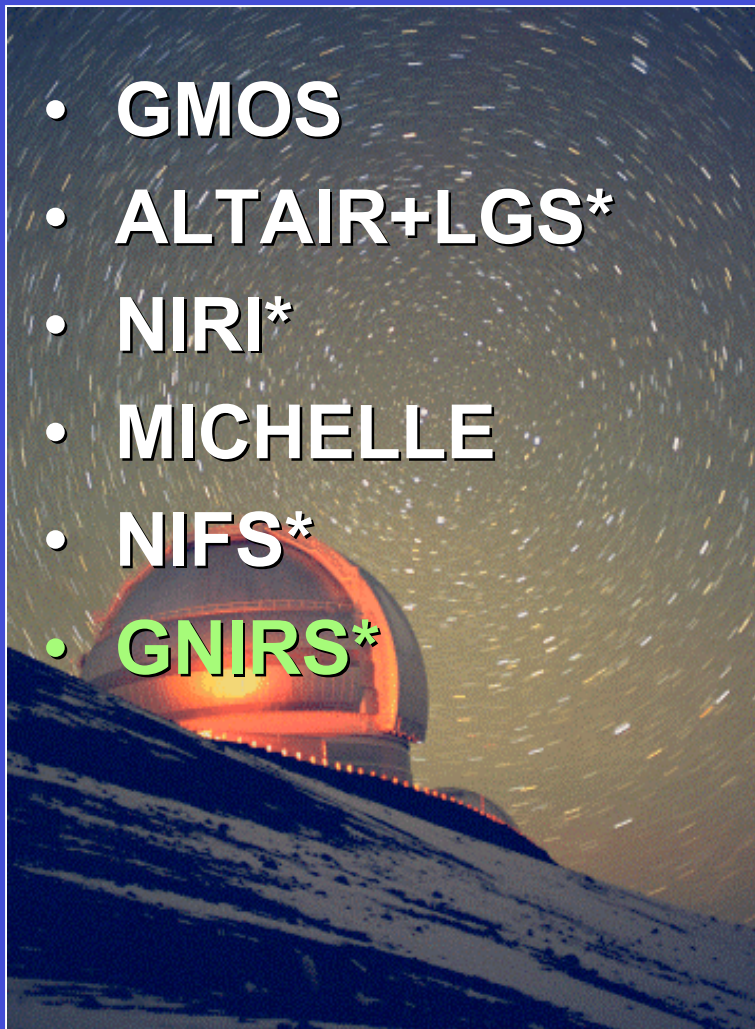
Tucson, Arizona

# Charge #1

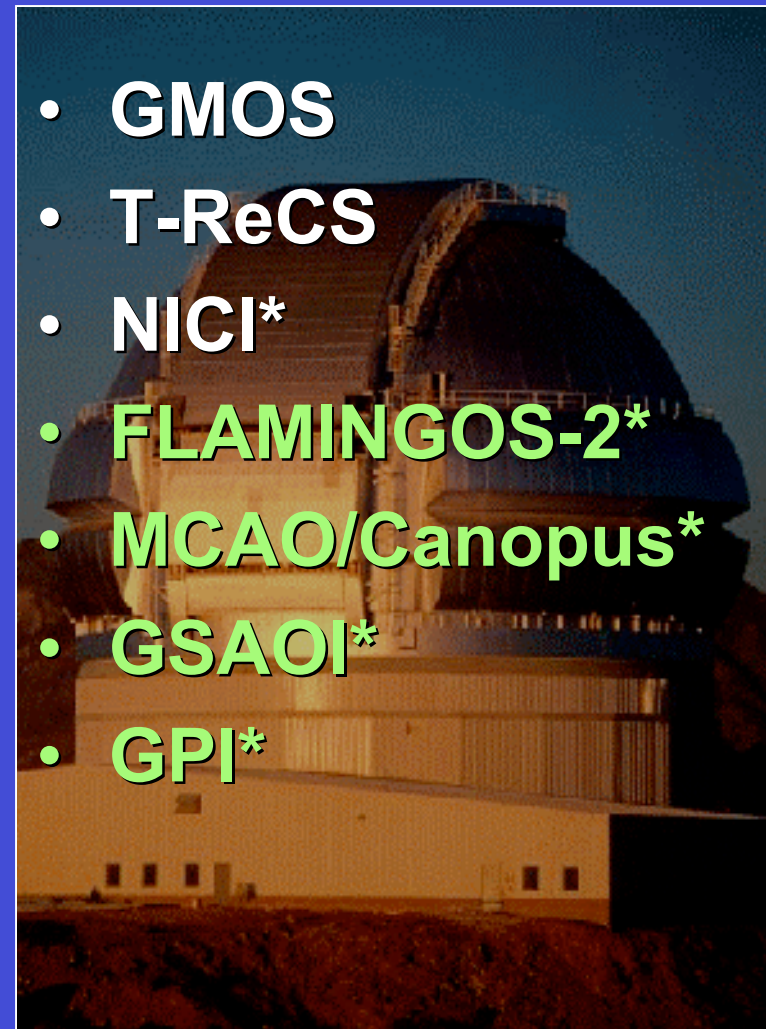
- Gather input from the broad U.S. community in order to develop an understanding of the instrumental (and other) capabilities needed on ground-based O/IR telescopes of aperture between 6.5 and 10 meters, between now and the end of the 2010-2020 decade. The list of capabilities should flow from community 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



## Cerro Pachón



\*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

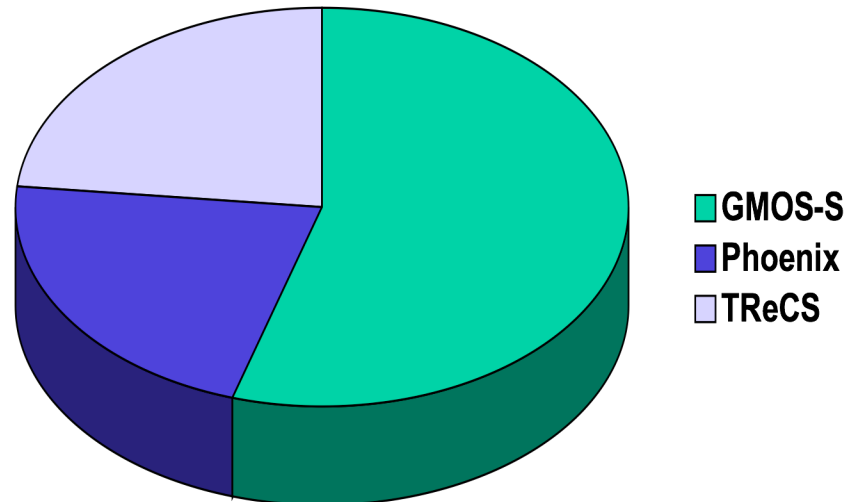
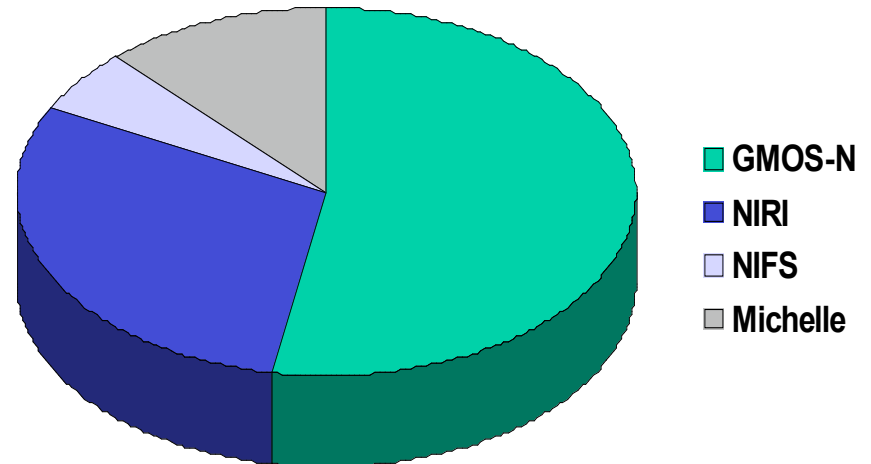
- GMOS-N: 49 proposals, 632.5 hrs.
- NIRI: 18 proposals, 209.4 hrs.
- NIRI-Altair: 14 proposals, 147.2 hrs.
- NIFS: 0 proposals, 0.0 hrs.
- NIFS-Altair: 7 proposals, 67.0 hrs.
- Michelle: 12 proposals, 142.1 hrs.
- (LGS: 11 proposals, 91.1 hrs.)

### South

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

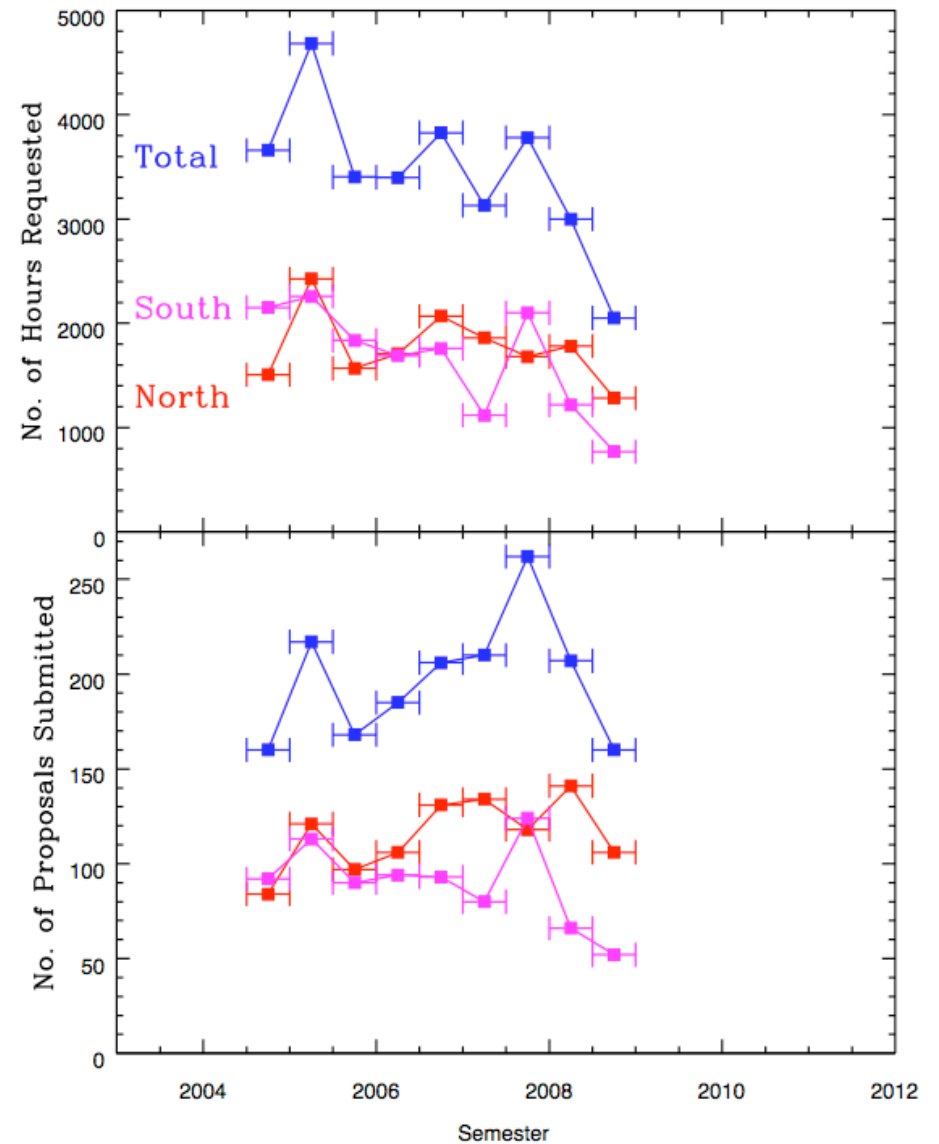
### Time Trades

- 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.



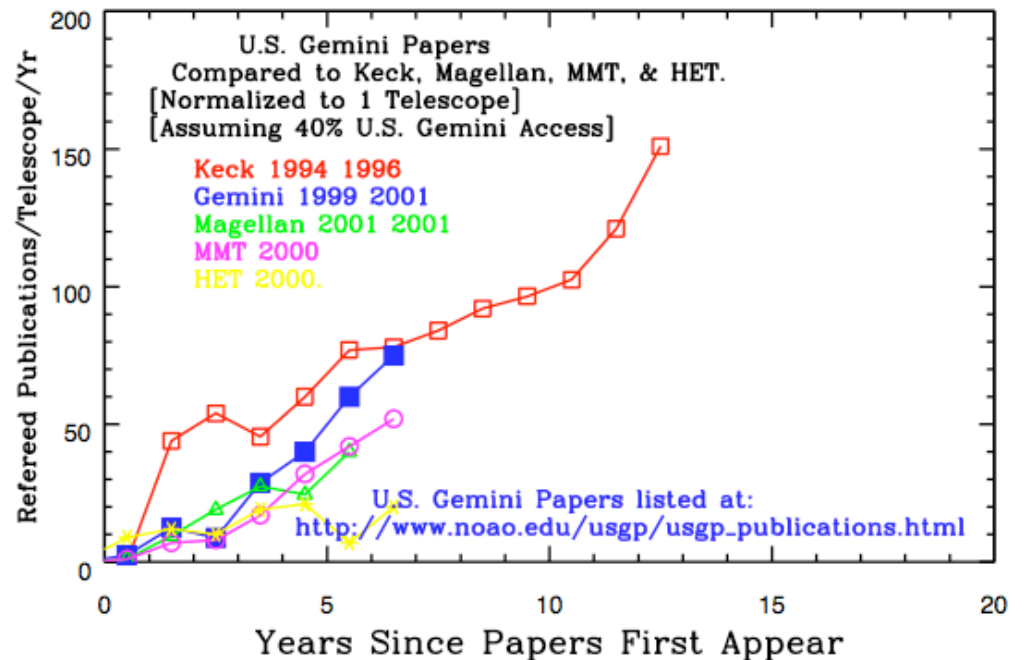
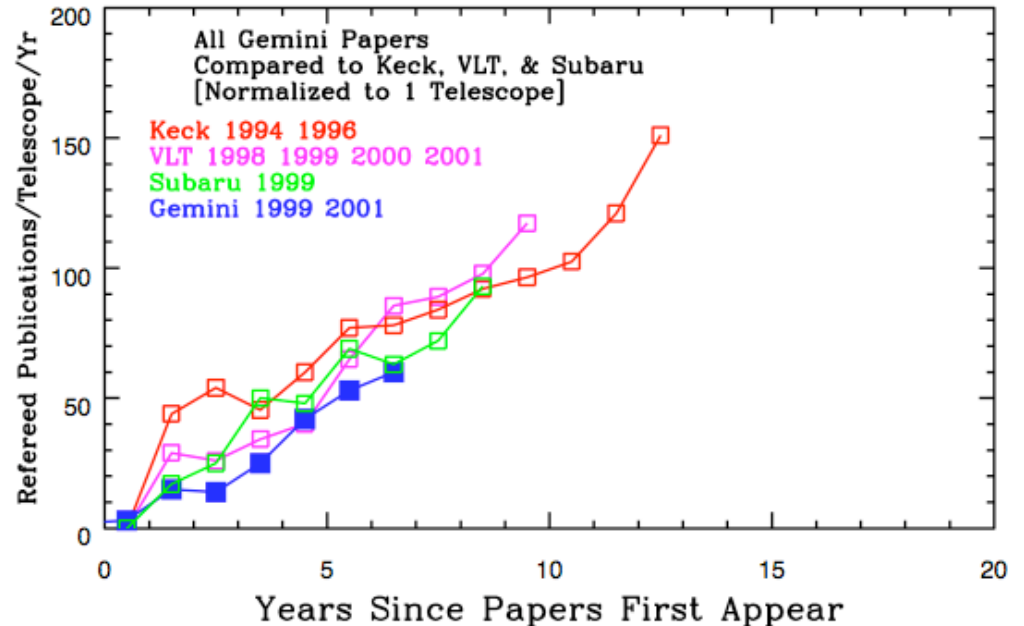
# Gemini Usage

- 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.



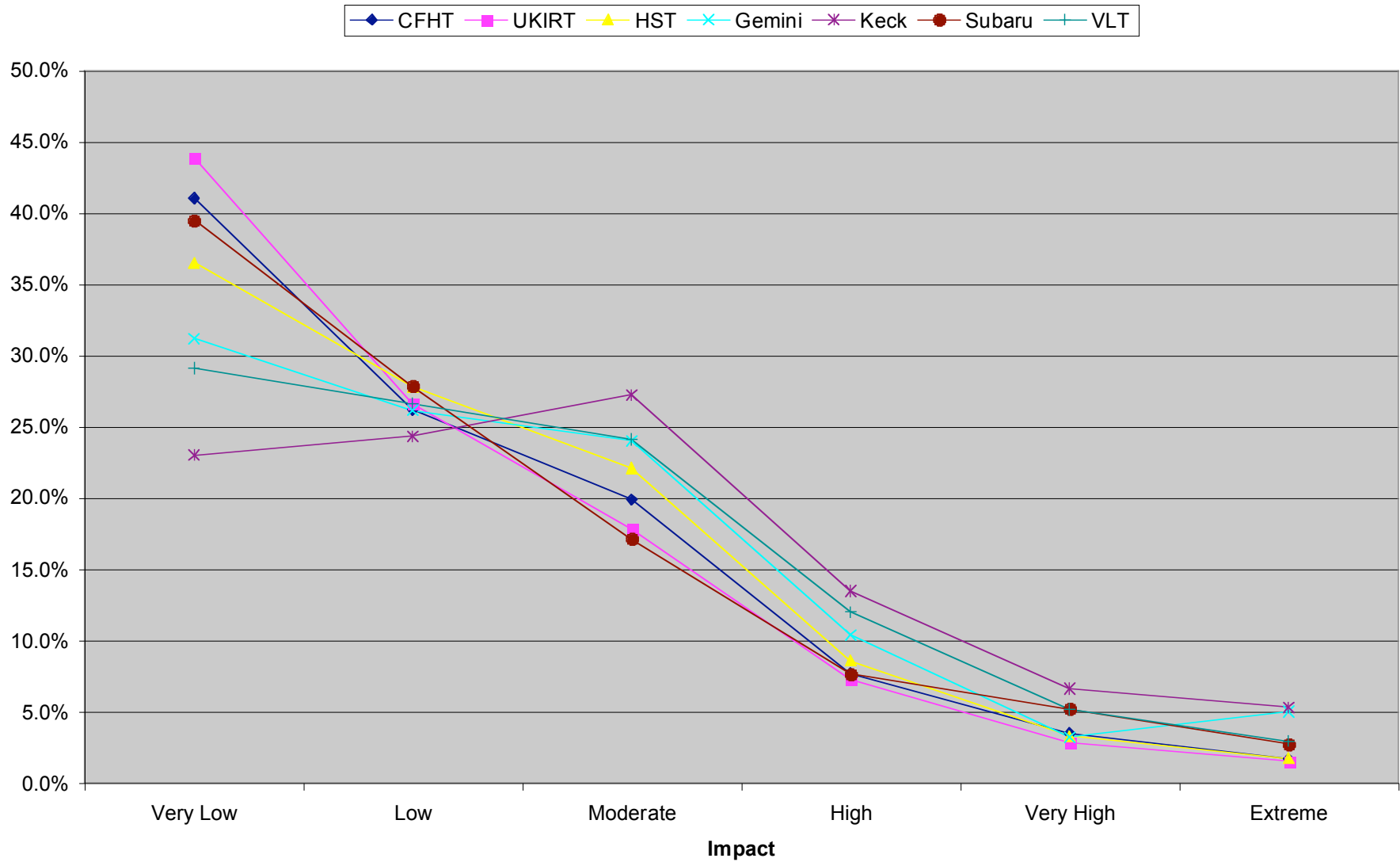
# Gemini Usage

- 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.