

**Future of Gemini Observatory**  
**Nancy A. Levenson**  
**9 March 2010**

## Core values

- International partnership enhances the scientific outcomes
- Gemini is a world-class facility, able to target any object in the sky
- We have a long-term and sustainable future
- We will complete major projects that are in progress





## Core strengths

- Queue delivers high-quality science efficiently
- We can respond to targets of opportunity
- Thermal infrared performance is unmatched on the ground
- Adaptive optics enables ground-breaking science
- Data are distributed rapidly, and archived permanently

## Timeline

- 31 December 2009 - deadline for “assessment point”
- 31 December 2012 - end of International Agreement
  - may extend for 3 years or longer
- 31 December 2010 - end of Cooperative Agreement
  - may extend or have new competition



# Timeline

## Timeline

- November 2009 - Gemini Board Meeting
  - Gemini assessment point
    - all except UK agree to continue in the partnership
  - resolution:
    - Observatory to develop plan for operations without UK

## Timeline

- November 2009 - Gemini Board Meeting
  - Gemini assessment point
    - all except UK agree to continue in the partnership
  - resolution:
    - Observatory to develop plan for operations without UK
- March 2010 - Gemini Board Retreat
  - Observatory submitted feasibility study for new operations

## Timeline

- November 2009 - Gemini Board Meeting
  - Gemini assessment point
    - all except UK agree to continue in the partnership
  - resolution:
    - Observatory to develop plan for operations without UK
- March 2010 - Gemini Board Retreat
  - Observatory submitted feasibility study for new operations
- May 2010 - Gemini Board Meeting



## Timeline

- November 2009 - Gemini Board Meeting
  - Gemini assessment point
    - all except UK agree to continue in the partnership
  - resolution:
    - Observatory to develop plan for operations without UK
- March 2010 - Gemini Board Retreat
  - Observatory submitted feasibility study for new operations
- May 2010 - Gemini Board Meeting
- July 2010 - Submit revised proposal to NSF

## Timeline

- November 2009 - Gemini Board Meeting
  - Gemini assessment point
    - all except UK agree to continue in the partnership
  - resolution:
    - Observatory to develop plan for operations without UK
- March 2010 - Gemini Board Retreat
  - Observatory submitted feasibility study for new operations
- May 2010 - Gemini Board Meeting
- July 2010 - Submit revised proposal to NSF
- January 2011 - new cooperative agreement begins
  - for 2 years or longer?

## Timeline

- November 2009 - Gemini Board Meeting
  - Gemini assessment point
    - all except UK agree to continue in the partnership
  - resolution:
    - Observatory to develop plan for operations without UK
- March 2010 - Gemini Board Retreat
  - Observatory submitted feasibility study for new operations
- May 2010 - Gemini Board Meeting
- July 2010 - Submit revised proposal to NSF
- January 2011 - new cooperative agreement begins
  - for 2 years or longer?
- January 2013 - UK participation ends

## Timeline

- November 2009 - Gemini Board Meeting
  - Gemini assessment point
    - all except UK agree to continue in the partnership
  - resolution:
    - Observatory to develop plan for operations without UK
- March 2010 - Gemini Board Retreat
  - Observatory submitted feasibility study for new operations
- May 2010 - Gemini Board Meeting
- July 2010 - Submit revised proposal to NSF
- January 2011 - new cooperative agreement begins
  - for 2 years or longer?
- January 2013 - UK participation ends
- 2015 or earlier - new International Agreement



# Observatory activities



# Observatory activities

- 2010 - development projects
  - GMOS-N CCDs
  - GNIRS
  - FLAMINGOS-2
  - GeMS (MCAO)

# Observatory activities

- 2010 - development projects
  - GMOS-N CCDs
  - GNIRS
  - FLAMINGOS-2
  - GeMS (MCAO)
- 2011 - development projects
  - GeMS
  - GPI

# Observatory activities

- 2010 - development projects
    - GMOS-N CCDs
    - GNIRS
    - FLAMINGOS-2
    - GeMS (MCAO)
  - 2011 - development projects
    - GeMS
    - GPI
  - 2010 and beyond - operations
    - queue
    - exchange time
- Subaru, possible expansion for Hyper SuprimeCam

## Issues: International Partnership

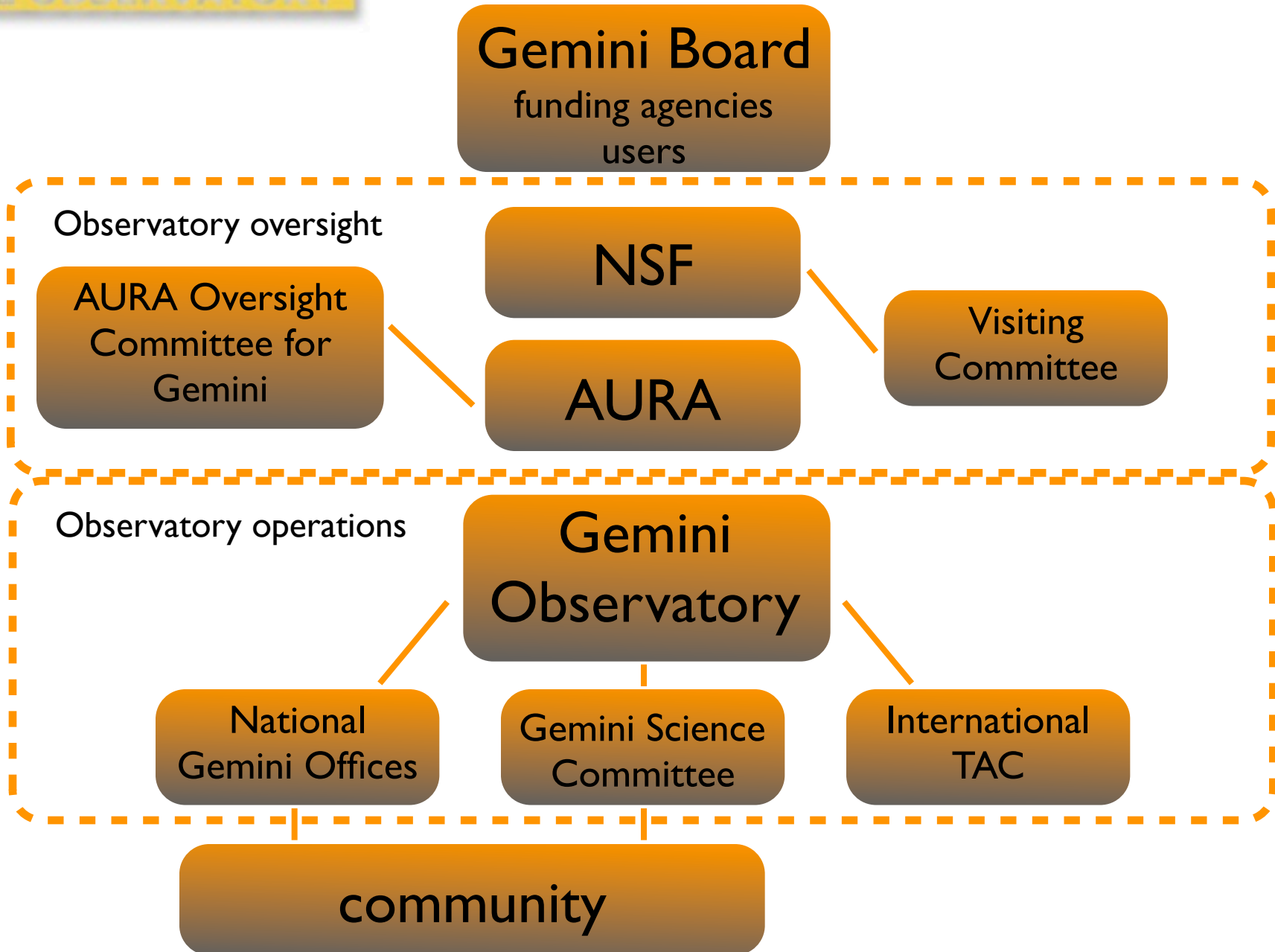
- revise partnership agreement?  
shares
- new partners?  
some have expressed interest
- vision for Gemini?

## **Issues: governance**

- composition of Board
  - How many members from each partner?
  - Do “designated” members have special authority?
  - Should the Observatory participate on the Board?
- maintain executive agency and managing agency?
- oversight of Observatory?



# Issues: governance



# Science goals

## **Science goals**

- my concern as Head of Science: scientific output of Gemini

## Science goals

- my concern as Head of Science: scientific output of Gemini
- your aims
  - as individual astronomers: your own science results
  - as a national community:
    - having access to leading capabilities for research
    - develop next generation of astronomers



# **Gemini capabilities**



## **Gemini capabilities**

- 8m telescopes generally and Gemini specifically are aligned with national priorities

## **Gemini capabilities**

- 8m telescopes generally and Gemini specifically are aligned with national priorities
- Observatory responds to needs of partners for example:
  - guarantee time according to partner share
  - time allocation committee organization

## **Gemini capabilities**

- 8m telescopes generally and Gemini specifically are aligned with national priorities
- current capabilities:

MICHELLE

NIRI

NIFS

GMOS-N

ALTAIR

T-ReCS

NICI

Phoenix

GMOS-S

## Gemini capabilities

- 8m telescopes generally and Gemini specifically are aligned with national priorities
- current and **near-term** capabilities:

MICHELLE

NIRI

NIFS

GMOS-N\*

ALTAIR

**GNIRS**

T-ReCS

NICI

Phoenix

GMOS-S

**FLAMINGOS-2**

**Gemini MCAO System**

**GSAOI**

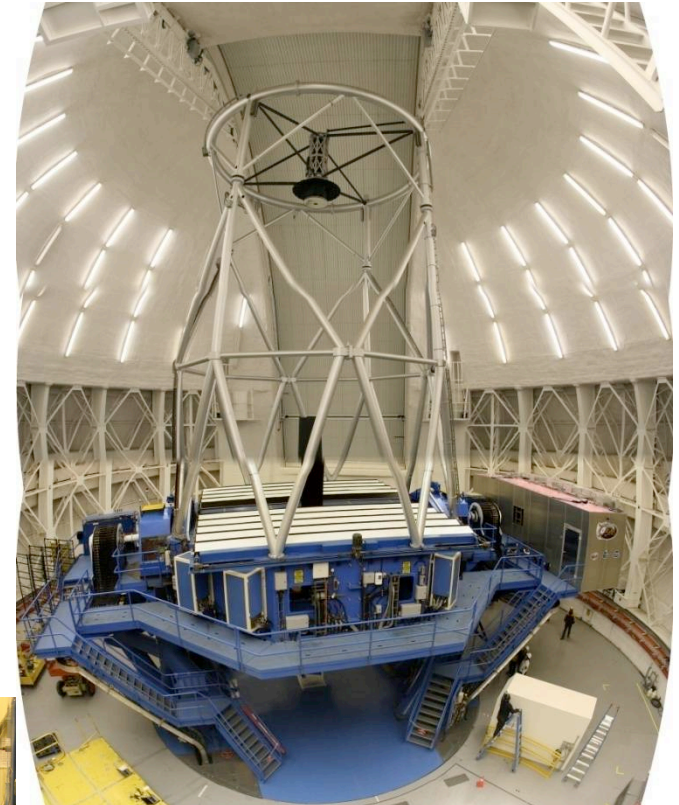
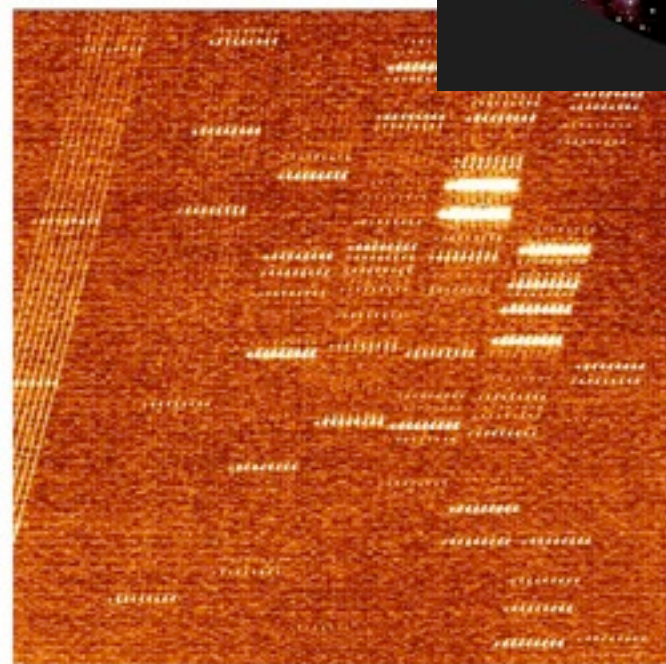
**GPI**

# Near-term capabilities

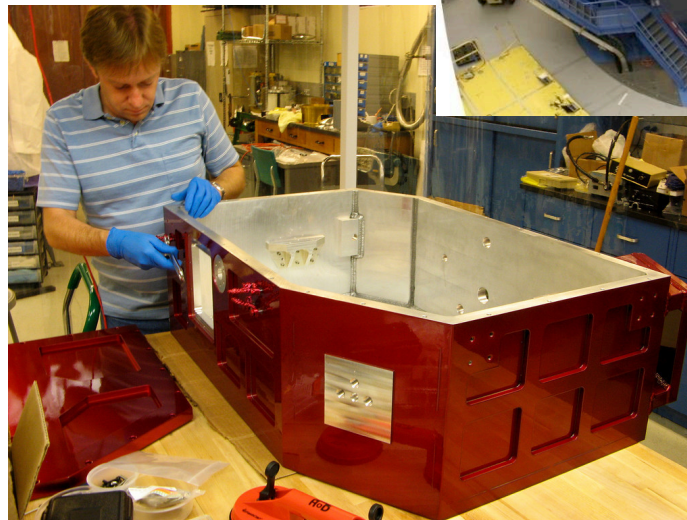
FLAMINGOS-2



GNIRS



GeMS



GPI



## **Gemini capabilities**

- 8m telescopes generally and Gemini specifically are aligned with national priorities
- through time exchange: complementarity with Subaru

Suprime Cam

High Dispersion Spectrograph

FMOS

MOIRCS

Hyper Suprime Cam

# Gemini capabilities

## Image quality and IR optimization

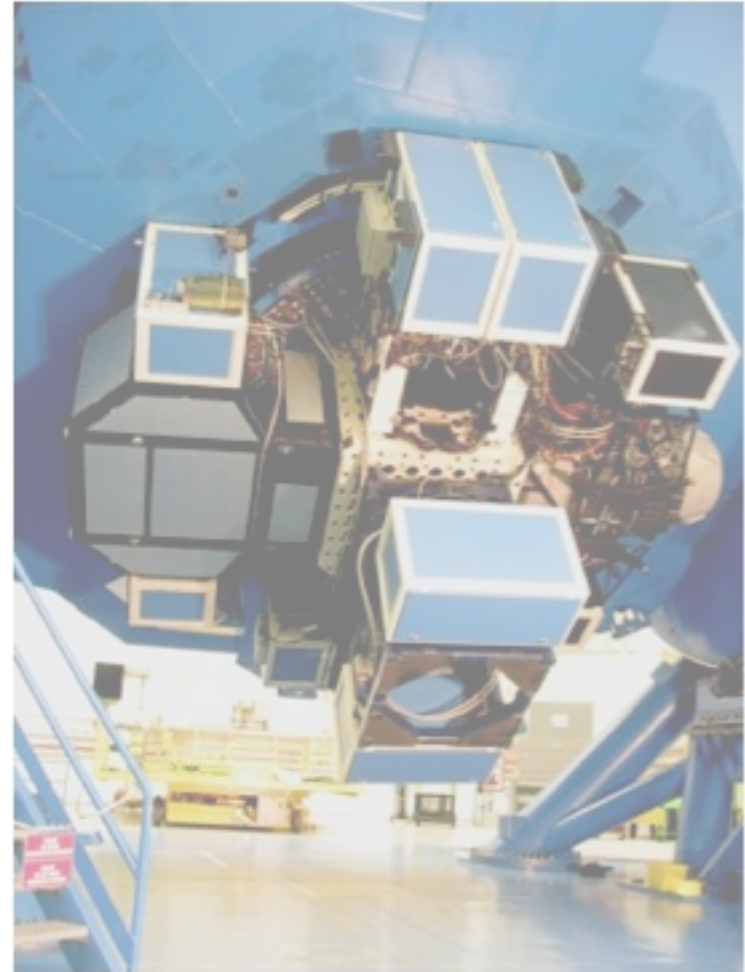
MICHELLE  
T-ReCS

Mid-infrared:  
inherently diffraction-limited

NIRI  
NIFS  
NICI  
GNIRS  
FLAMINGOS-2  
GSAOI  
GPI

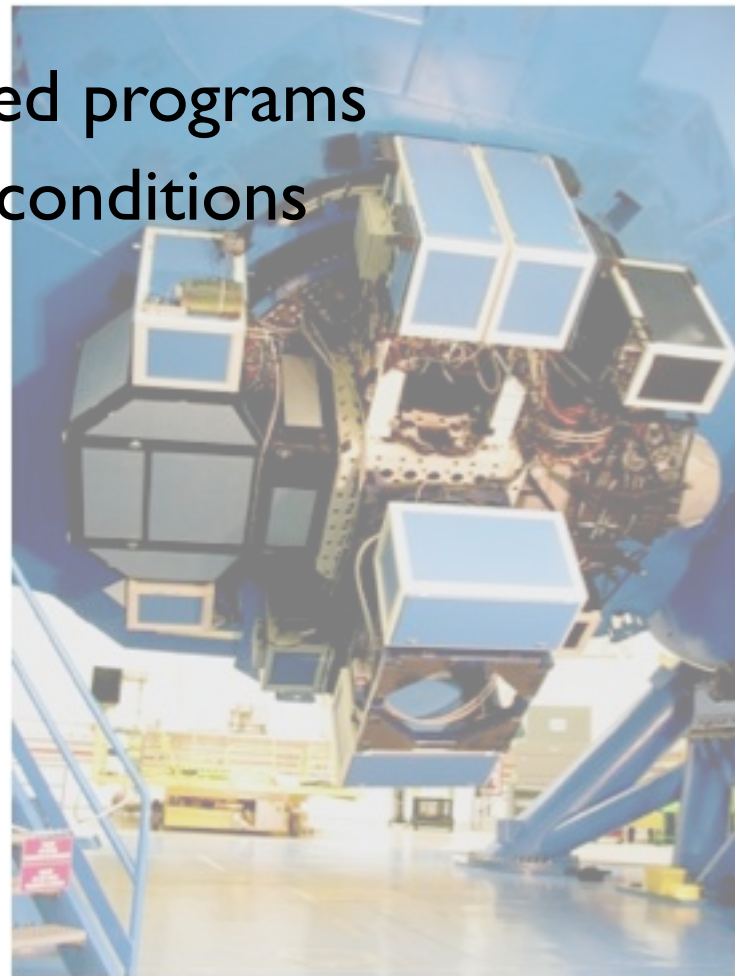
diffraction-limited through AO

# Gemini capabilities



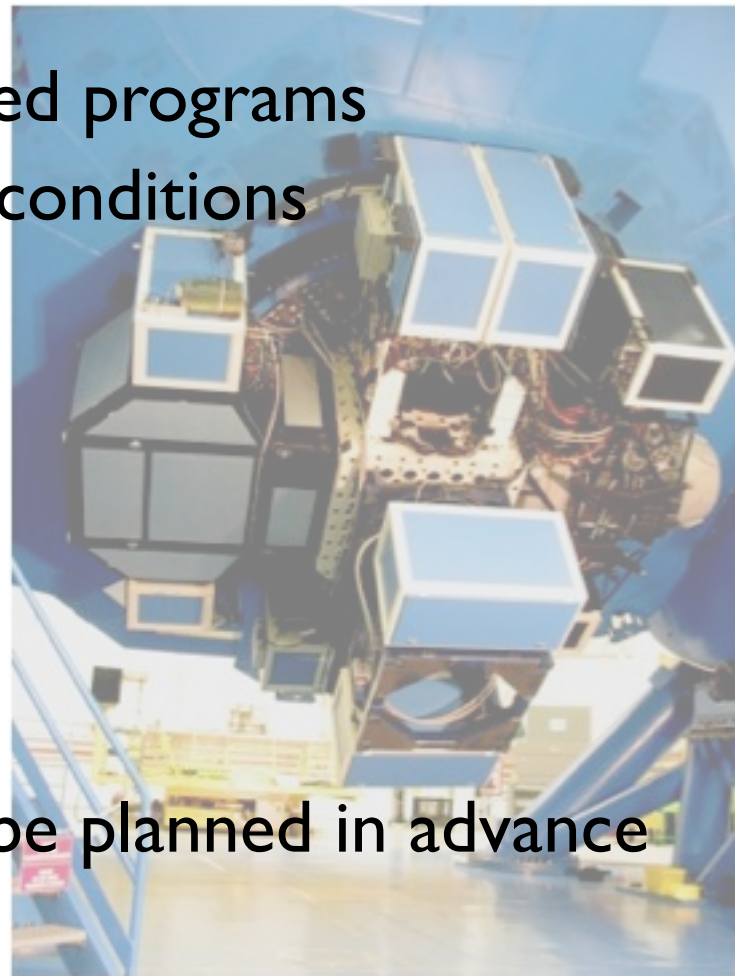
# Gemini capabilities

- queue scheduling
  - top-ranked science has priority
  - high completion rates of top-ranked programs
  - data are obtained under required conditions
  - monitoring programs are feasible
  - high open-shutter efficiency



# Gemini capabilities

- queue scheduling
  - top-ranked science has priority
  - high completion rates of top-ranked programs
  - data are obtained under required conditions
  - monitoring programs are feasible
  - high open-shutter efficiency
- targets of opportunity
  - multiple instruments available
  - rapid response
  - some targets of opportunity may be planned in advance





# **Brazil in the Gemini Partnership**

## **Brazil in the Gemini Partnership**

- Brazilian community to
  - become engaged
  - identify your needs
  - provide direction

# **Brazil in the Gemini Partnership**

- Brazilian community to
  - become engaged
  - identify your needs
  - provide direction
- Encourage an expansive vision
  - for a leading international observatory
  - with active development of capabilities and operations





# **Brazil in the Gemini Partnership**



## **Brazil in the Gemini Partnership**

**US\$20M/year**

## **Brazil in the Gemini Partnership**

**US\$20M/year**

**> 50% of Gemini**



Dr. Nancy Levenson, Deputy Director/Head of Science  
Southern Operations Center – Colina El Pino (s/n), La Serena, Chile  
Phone: 56 (51) 205603 Fax: 56 (51) 205684 Email: [nlevenson@gemini.edu](mailto:nlevenson@gemini.edu)

9 March 2010

To the Brazilian Astronomical Community:

I appreciate your past and current contributions to the Gemini Partnership, including your scientific activity and results, and participation in the governance of the Observatory. While you are considering your future possibilities for involvement in national and international observatories, with the opportunity of renegotiating the international agreement I encourage you to increase your share in Gemini significantly, to become a major partner.

Sincerely yours,  
Nancy Levenson