The Giant Magellan Telescope ("GMT Statement")

"Yes We Can!"

Wendy Freedman
Carnegie Observatories
Chair, GMT Board

Science with Giant Telescopes: Public Participation in TMT and GMT, Chicago
June 16, 2008
Why, Which, Where, What, When?

1. Why build these large optical telescopes?
2. Which telescope(s) should be built?
3. Where will they be built?
4. What are the next steps?
5. When will they be built?
GMT Institutions

- Australian Astronomy Lim.
- Australian National Univ.
- Carnegie Observatories
- Harvard University
- Smithsonian Astrophysical Observatory
- Texas A&M University
- University of Arizona
- University of Texas, Austin
- Korea Astronomy & Space Science Institute *NEW*

Looking to the Future:

- National Science Foundation
Telescope Concept

Alt-az mount

Laser housing

Pier

Seven x 1.1m segmented secondary mirror
(3.2 m Φ)

Seven x 8.4 m segmented borosilicate primary mirror

Telescope stats
Height: 38.7 meters
1,125 metric tons
Lowest Mode: 4.5 Hz
(4.3 Hz with pier)

www.gmto.org
### GMT Project

#### Project SWG
- Steve Shectman  
  Carnegie Observatories
- Roger Angel  
  U. Arizona
- Dan Fabricant  
  Harvard/Smithsonian CfA
- Phillip MacQueen  
  U. Texas at Austin
- Matt Johns  
  Carnegie Observatories
- Charles Jenkins  
  Australia
- David Sprayberry  
  NOAO

#### Science WG
- Warrick Couch  
  Australia
- Xiaohui Fan  
  Arizona
- Karl Gebhardt  
  Texas
- Gary Hill  
  Texas
- John Huchra  
  Harvard
- Scott Kenyon  
  Smithsonian
- Pat McCarthy (chair)  
  Carnegie
- Michael Meyer  
  Arizona

#### GMT Board
- Pat McCarthy, Wendy Freedman (Chair)  
  Carnegie Observatories
- Roger Angel, Peter Strittmatter  
  U. Arizona
- Bob Kirshner, Charles Alcock  
  Harvard/Smithsonian CfA
- David Lambert, Mary Ann Rankin  
  U. Texas at Austin
- Ed Fry, Nick Suntzeff  
  Texas A&M
- Penny Sackett, Matthew Colless  
  Australia
- Alycia Weinberger  
  Carnegie/DTM
- David Sprayberry  
  NOAO
- Megan Donahue  
  Michigan State
GMT, NSF, AURA and the community

http://www.gmto.org/overview

Letter to AURA and NSF

GMT interest in working with NSF, AURA and community

http://www.aura-astronomy.org

“The GMT Board believes that substantial benefits would accrue to both the public and private institutions by forming a strong partnership based on the common goals and aspirations of the scientific community…”
GMT Key Milestones

- 2005: Casting of GMT1 mirror
- 2006: Positive External CoDR
- 2006: NSF funding for technology development
- 2006: Australia joins the GMT project
- 2007: GMTO Corporation formed
- 2007: Design Development Phase
- 2007: GMT Board completes Founders’ Agreement
- 2008: Generation of GMT1 front surface completed
- 2008: Korea announces intention to join GMT
- 2008: GMT1 Testing and Polishing Phase to Begin
The GMT on Las Campanas Peak
GMT SCIENCE: CONTEXT & SYNERGY

Broad Synergy Across Wavelength, Spatial and Time Domains

- Physical Diagnostics
- Deep/Wide Surveys
- High-resolution imaging
- High SNR & Res. Spectroscopy
Advantages to Two US ELTs

- Competitive position for GSMT in next decadal survey
- Increase science for whole astronomical community
- Opportunity to optimize instrumentation
- Increase number of instruments on sky at given time
- 50% share by NSF in one telescope not current option
- 25% of one does not provide much access to US community
- Potential collaborative technologies
- Most of the funding is coming from outside of NSF
- This is win-win for the community and the projects
ELT Context

• 2001 Decadal Survey
  – GSMT (30-m class) optical telescope
  – #1 priority for ground-based astronomy
  – 50-50 public-private partnership

• This decade:
  – Giant Magellan Telescope (GMT)
  – Thirty-Meter Telescope (TMT)
  – European Extremely Large Telescope (E-ELT)

• 2010 Decadal Survey
  – beginning fall 2008
  – GSMT will be re-ranked relative to LSST, SKA, ATST
  – NSF budget still constrained; no construction funding until after 2012
1. **Why** build these large optical telescopes? 
   - Exciting Science / Synergy with Next-Generation 
   - “Great Observatories”/ Optical Window Unique

2. **Which** telescope(s) should be built? 
   - GMT, TMT, E-ELT 
   - Note: Keck(2), Magellan(2), Gemini(2), VLT(4), Subaru, HET (2)

3. **Where** will they be built? 
   - Chile, Hawaii (?)

4. **What** are the next steps? 
   - Optical Community Consensus / White papers for Decadal Survey / Funding

5. **When** will they be built? 
   - < 2018!!! [Synergy with JWST]