AST Portfolio Review and the LSST

CAPS

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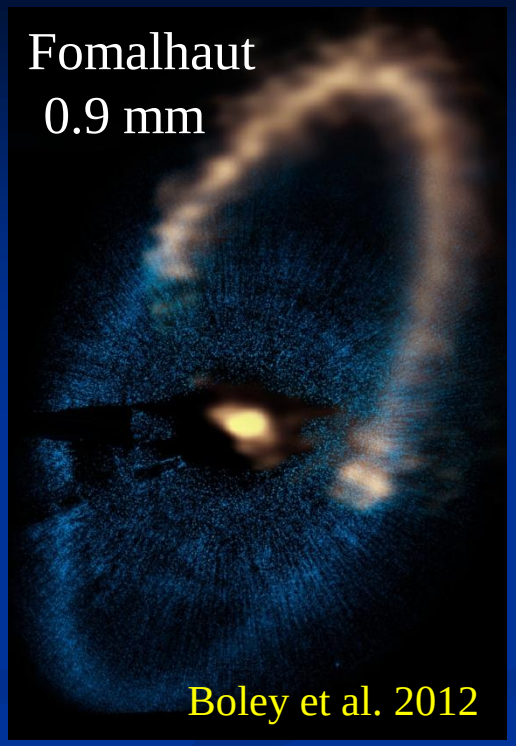
ALMA

- Early science started in September
  - 112 projects selected from over 900 Cycle 0 proposals
  - First paper published
- 61/66 antennas in Chile; 39 accepted
- Final North American deliverables on course for late 2012 completion
- Inauguration in 2013



Vision & Voyages Recommendations

- "NSF grants and support for field activities … should continue"
- "supports the National Observatories' ongoing efforts to provide public access … synergy … coordinated observing campaigns"
- "…ground-based … facilities supported … by NSF are essential"
- "timely completion of LSST"
- "expansion of NSF funding for the support of planetary science in … laboratories"

FY13 Budget Outlook

- FY13 AST budget request
  - Significant reductions in NRAO, Gemini, NSO
  - NOAO stays at lower level of FY 2012
  - Attempt to maintain grants at FY12 level
    - FY12 success rate will be ~13%
  - Dependent on final appropriation and sequestration
- FY13 Senate Appropriations language (FYI #63)
  - Facility reductions restored
  - Dramatic reductions in grants program may be required if language persists in final appropriation

Budget Compared to NWNH

- NWNH (*New Worlds, New Horizons*) assumed budget doubling from 2010 to 2020
  - Would have resulted in FY13 AST budget of $303.5M
  - FY13 President's request for AST is $244.5M including $12M for EARS
    - Core AST funding will be ~$70M below Astro2010 assumption, and below the FY10 level
- In January 2012 letter, AST advised community to expect budget between $245M and $340M in FY20
  - Achieving $340M would require passage of FY13 budget request and 5%/yr increase until FY20
  - Serious modification of expectations and of current portfolio will be required in order to respond to any decadal recommendations for new capabilities

Portfolio Review

Why Conduct a Portfolio Review?

- Foreseeable budgets will not be sufficient to meet the aspirations of the astronomical community

- NRC decadal survey in Astronomy & Astrophysics advised: "If … budget is truly flat … there is no possibility of implementing … the recommended program … without … enacting the recommendations of the first 2006 senior review and/or … a second more drastic … review before mid-decade." (p. 240)

- Such reviews should be carried out periodically in any case, for responsible stewardship of the AST portfolio

Over-riding Goal

- Position ground-based astronomical research in the US for success in 2020 and beyond

- Look to the future of scientific advances and our community under a more constrained budget environment

Starting Points: Decadal Surveys

- ***New Worlds, New Horizons*** Chapter 2 (Science Frontiers questions) and ***Vision and Voyages*** Chapter 3 are the driving forces
- Boundary conditions: No re-visiting the ordering of decadal survey recommendations, and no re-visiting of their science priorities
  - I.e., take decadal surveys as a "given", and interleave their recommendations with existing capabilities
- "Capabilities" includes facilities, programs (including grants), and state of the profession
- External committee of 17 scientists
  - Chaired by Daniel Eisenstein of Harvard

Two-Phase Committee Charge

1. Recommend the *critical capabilities* needed over the period from 2015 to 2025 that would enable progress on the science program articulated in the Astronomy & Astrophysics and Planetary Decadal Surveys. (Not only observational capabilities, but also theoretical, computational, laboratory, research support, workforce, education)

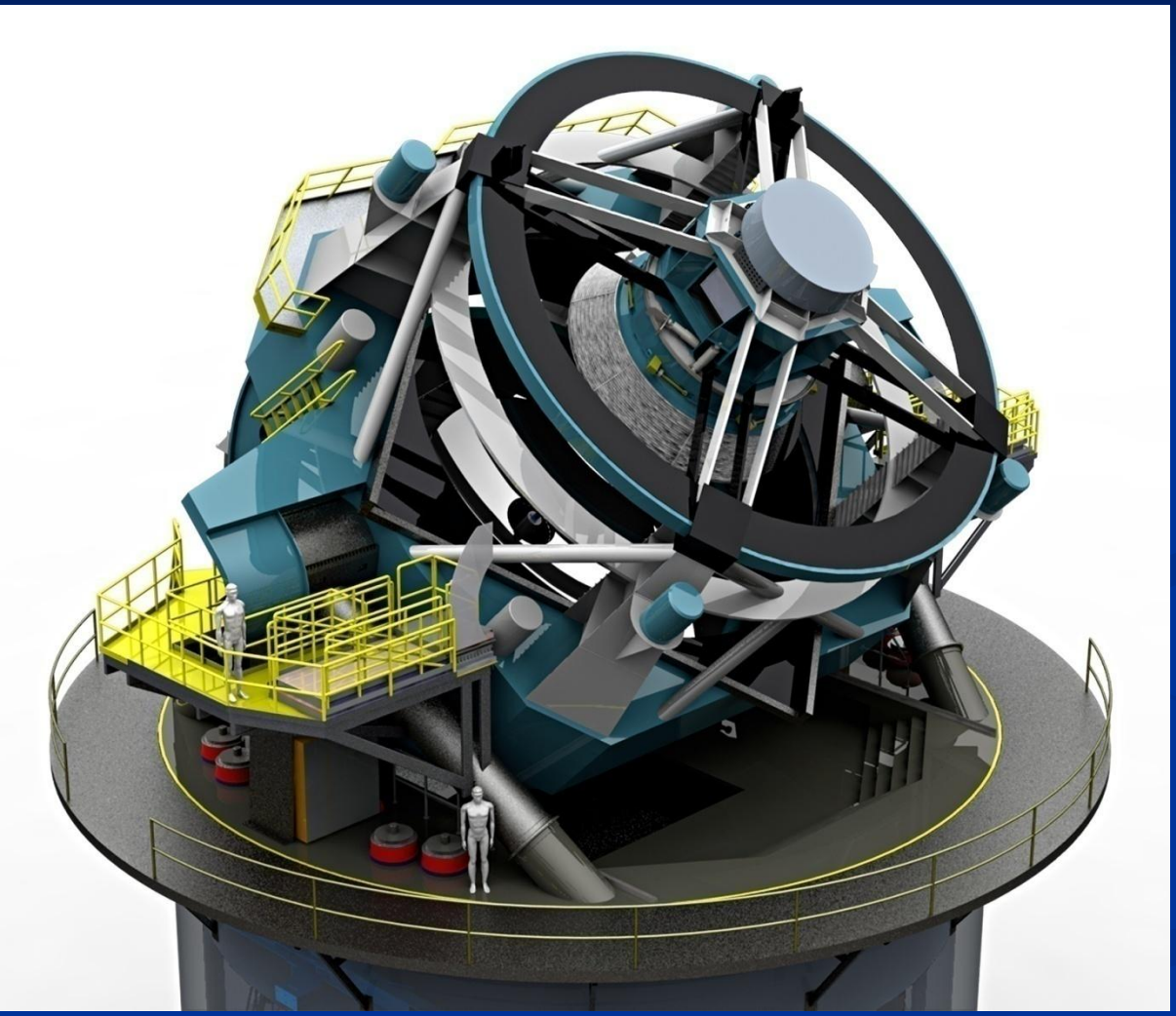
2. Recommend the *balance of investments* in new and in existing, but evolved, facilities, grants programs, and other activities that would deliver the needed capabilities within the constraints of each of the provided budgetary scenarios. (May include closure or divestment of facilities, termination of programs and other activities.)

Portfolio Review Timeline

- September 2011: Start
- January 2012: Completed first pass at Phase 1
- April 2012: 3rd of 3 face-to-face meetings
- July 2012: Final draft report submitted to NSF
- Late summer: MPS Advisory Committee vote to accept
  - Report becomes public at this point
  - Planning subsequent community briefings
- November 2012: AST implementation plan released
  - Plan will be a living document, evolving over years
- Recommendations and implementation will have profound impact on ground-based astronomy in next decade

LSST

Large Synoptic Survey Telescope

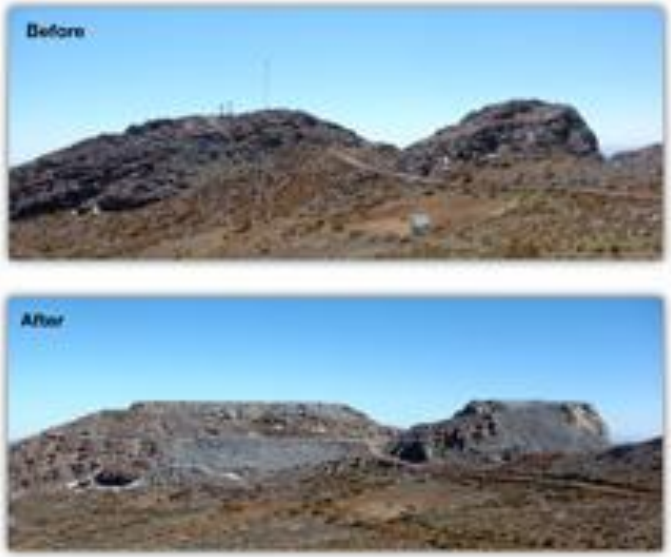


- 8.4 meter primary mirror
- 3.3 gigapixel digital camera
- 3.5 deg field of view
- 30 terabytes of data nightly
- Complete coverage of the visible sky twice per week
- Nominal 10-yr lifetime
- To be located on Cerro Pachon, Chile

- Site, telescope, and data handling to be funded by NSF
- Camera funding by DOE (SLAC)
- Cost estimate $656M in then-year dollars ($457M NSF, $160M DOE, $39M private)
- Aiming for FY14 construction start

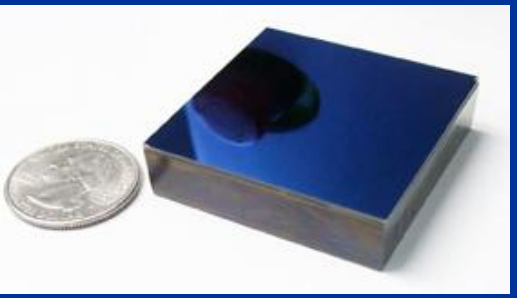
LSST Technical Progress

- Fabrication of M1/M3 mirrors: final abrasive grinding, then polishing – complete by end of CY2012

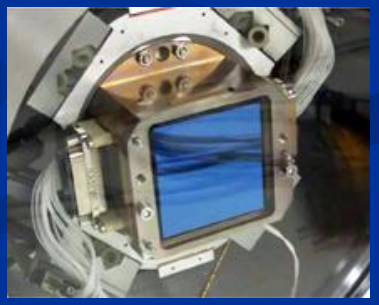


- M2 substrate completed and in storage

- Site leveling completed



- Two vendors have fabricated fully-operable prototype sensors that meet the major specifications.



LSST Review Status

- NSF Preliminary Design Review held Aug. 29-Sept. 2
  - "The Panel considers that the LSST Project has met the requirements for PDR
- DOE CD-1 "Lehman" review of Camera, Nov. 1-3
  - The Project met all the CD-1 requirements "and in some areas has even significantly exceeded them"
- Needs for FY14 budget request
  - NSF/DOE funding profiles and MOU; cost-update and system-engineering reviews
  - Availability of funds for operations (requires ability to respond to recommendations of portfolio review)
- Goal: NSB permission (July) for NSF Director to include in a future budget request