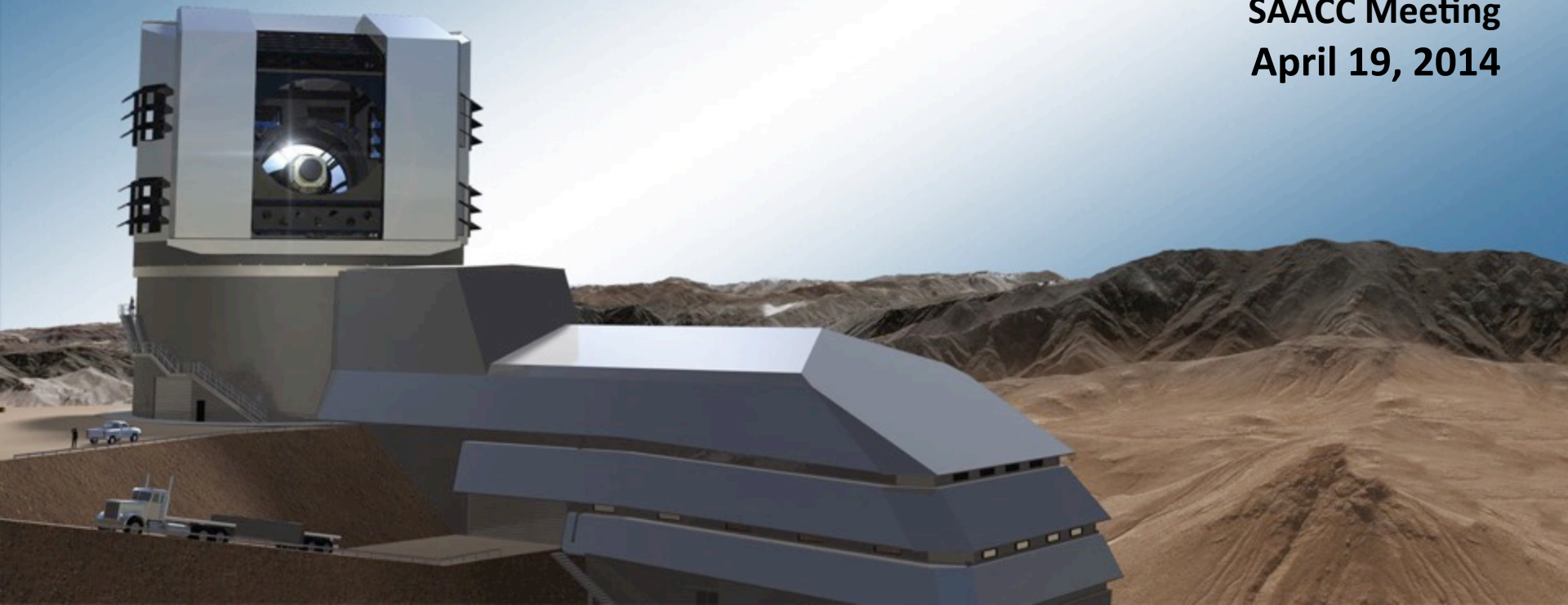


LSST Project Update

Jeff Kantor
LSST Data Management Project Manager

SAACC Meeting
April 19, 2014



LSST: A Deep, Wide, Fast, Optical Sky Survey



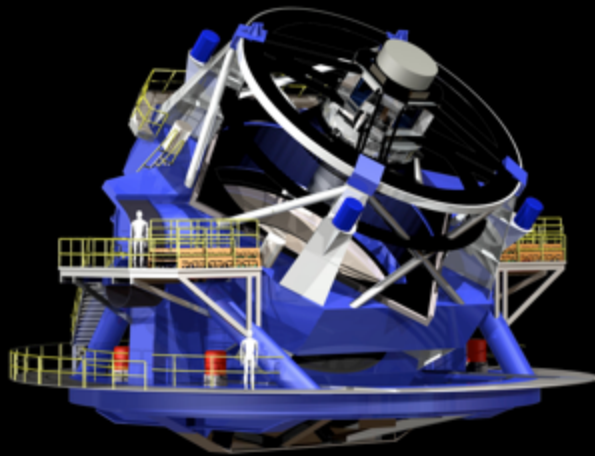
8.4m telescope

optical (ugrizy)

0.5-1% photometry (sys)

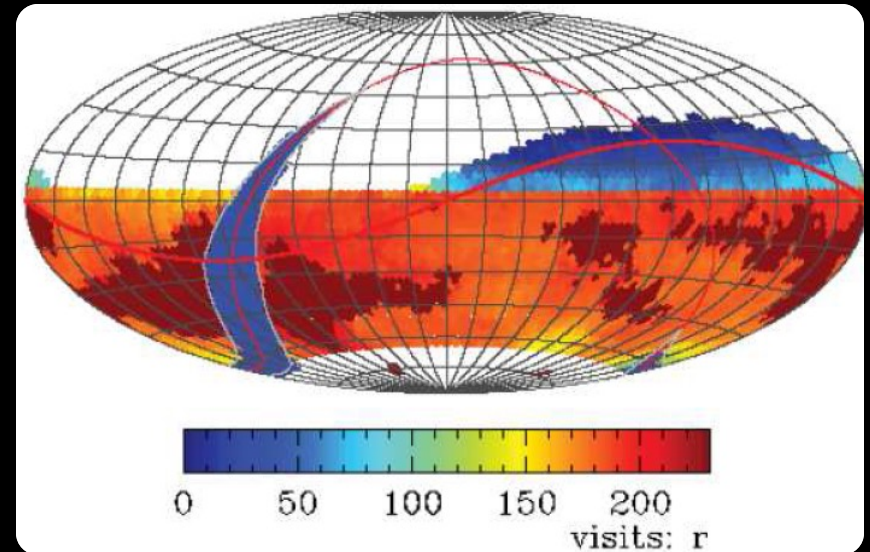
3.2Gpix camera

2 x 15sec exp / 2sec read



Location: Cerro Pachon, Chile

First Light: May 2019



Construction Start: July 2014 (planned)

Operations: May 2022

Data Management Sites and Centers



HQ Site
HQ Facility
Observatory Management
Science Operations
Education and Public Outreach

Archive Site
Archive Center
Alert Production
Data Release Production
Calibration Products Production
EPO Infrastructure
Long-term Storage (copy 2)
Data Access Center
Data Access and User Services

French Site
Processing Center
Data Release Production
(Proposed)



Base Site
Base Facility
Long-term storage (copy 1)
Data Access Center
Data Access and User Services

Summit Site
Summit Facility
Telescope and Camera
Data Acquisition
Crosstalk Correction

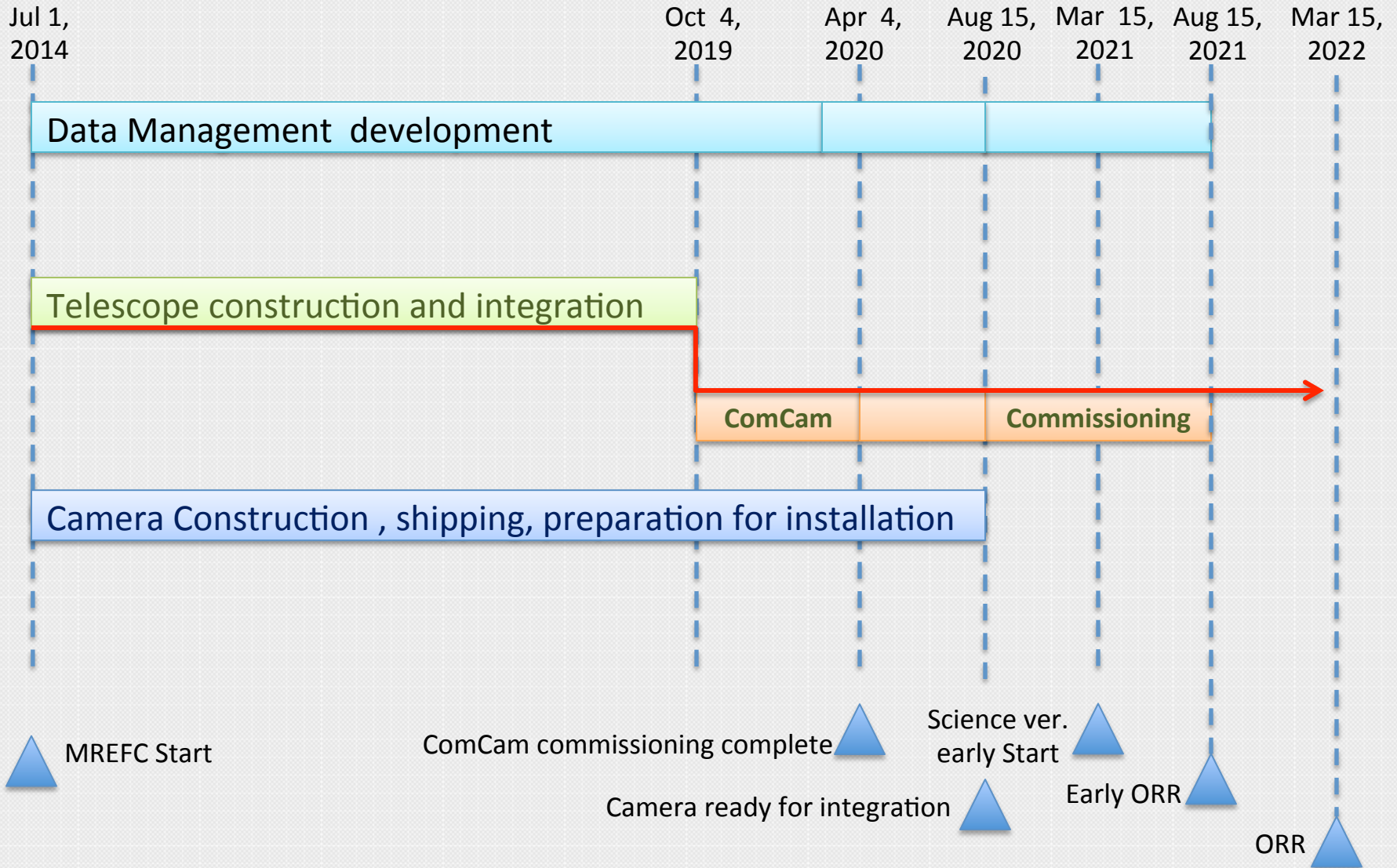
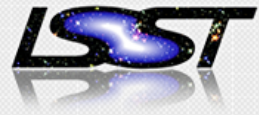


Document LDM-129

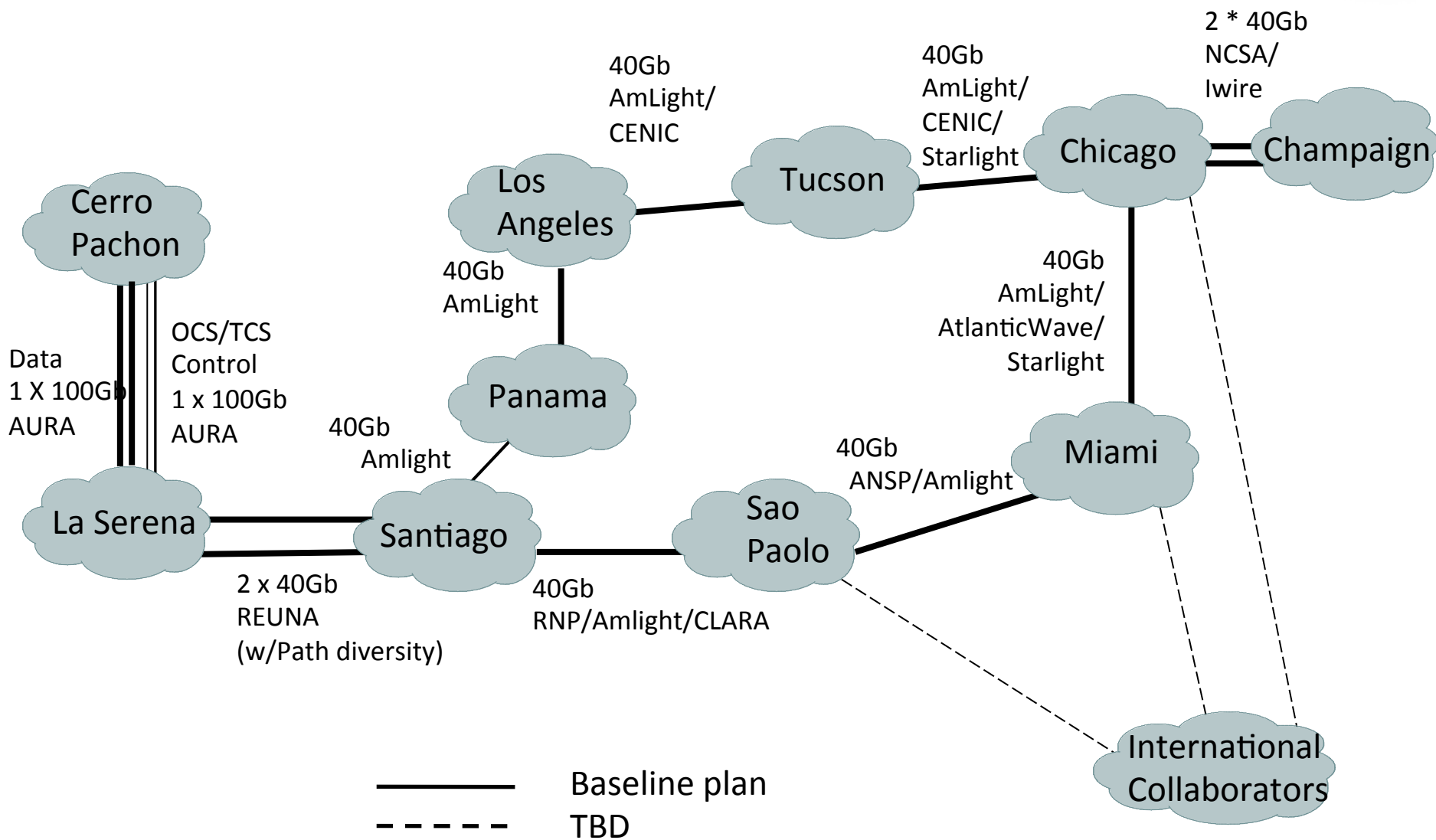


| | |
|---------------------------------|-------|
| Teraflops (Year1) | 30 |
| Teraflops (Year10) | 54 |
| File Storage TB (Year1) | 13450 |
| File Storage TB (Year10) | 29000 |
| DB Storage TB (Year1) | 11329 |
| DB Storage TB (Year10) | 89858 |
| Floorspace sq. ft. (High Water) | 500 |
| Power kW (High Water) | 216 |

Integrated Schedule key milestones



LSST Long Haul Network Links (Baseline)



LDM-142 Bandwidths, Providers, Deployment Schedule



| FISCAL YEAR | R&D | | Construction | | | | | Commissioning | | Operations |
|--|------|------|--------------|------|------|------|------|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 - 2031 |
| Mountain – Base AURA | 0 | 0 | 1 | 1.5 | 2 | 200 | 200 | 200 | 200 | 200 |
| Base – Santiago REUNA | 1 | 1 | 1 | 1.5 | 2 | 2.5 | 3 | 200 best case [1] 100 likely case 40 worst case | 200 best case [1] 100 likely case 40 worst case | 200 best case [1] 100 likely case 40 worst case |
| Santiago – Miami FIU/AMLIGHT | 1 | 1 | 1 | 1.5 | 2 | 2.5 | 3 | 100 best case [1] 40 likely case 10 worst case | 100 best case [1] 40 likely case 10 worst case | 100 best case [1] 40 likely case 10 worst case |
| Miami – Chicago FIU AMLIGHT | 1 | 1 | 1 | 1.5 | 2 | 2.5 | 3 | 100 best case [1] 40 likely case 10 worst case | 100 best case [1] 40 likely case 10 worst case | 100 best case [1] 40 likely case 10 worst case |
| Chicago – Archive NCSA | 1 | 1 | 1 | 1.5 | 2 | 2.5 | 3 | 100 best case [1] 40 likely case 10 worst case | 100 best case [1] 40 likely case 10 worst case | 100 best case [1] 40 likely case 10 worst case |
| Santiago - Los Angeles FIU AMLIGHT | 1 | 1 | 1 | 1.5 | 2 | 2.5 | 3 | 100 best case [1] 20 likely case 10 worst case | 100 best case [1] 20 likely case 10 worst case | 100 best case [1] 20 likely case 10 worst case |
| Los Angeles - Tucson – Chicago FIU AMLIGHT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 best case [1] 20 likely case 10 worst case | 100 best case [1] 20 likely case 10 worst case | 100 best case [1] 20 likely case 10 worst case |
| Chicago –Lyon RENATER (PROPOSED) | 0 | 10 | 10 | 10 | 10 | 10 | 10 | 100 best case [2] 20 likely case 10 worst case | 100 best case [2] 20 likely case 10 worst case | 100 best case [2] 20 likely case 10 worst case |

NOTES:

All bandwidths are in gigabits/second (Gbps)

Bandwidths are guaranteed minimum available, except as noted in table

All allow burst up to unused capacity

[1] best/likely cases presumes continued IRNC, international REN investments, and industrial partnerships through AMPATH/AMLIGHT

[2] IN2P3 provides this and will match the other links in capacity to the degree possible.

LSE-78 LSST Observatory Network Design



- Determined 16 to 18 bit LCR will be approved and 100 Gbps link between summit and base needed for OCS and non-LSST traffic (01-Jan-14)
- Determined 10 Gbps link between Chile and US needed for OCS traffic (01-Jul-13)
- Decide whether to outsource Mountain – Base operations
(DMTC-7400-0350 Mountain - Base Network Acquisition Review 01-Jul-14)
- Finalize agreements with Brazil regarding LSST participation and investment in Chile – US links
(DMTC-8100-0350 Chile - US Network Acquisition Review 01-Jan-15)
- Finalize agreements with US research and education networks for Los Angeles – Tucson – Chicago link
(DMTC-8200-0350 US National Network Acquisition Review 01-Jan-15)
- Finalize agreement with IN2P3 for French participation and Chicago – Lyon link (needed 01-Jul-15)



- Documents the technical aspects of the network services
 - Definitions of transport services and technologies
 - Including performance tuning
- Defines the LSST:NET Team and Operations
 - Portal
 - Single NOC Point of contact
 - Network utilization monitoring
 - Service Requests
 - Trouble ticket management
 - Escalation and outage management
 - Team
 - Staff responsibilities for operations across continents
 - Integrated NOC activities



- Develops a plan to conduct at-scale experiments of end-to-end performance tests from La Serena, Chile to NCSA
 - “Optimizing Throughput on Guaranteed Bandwidth WAN Networks for the LSST” paper by Freemon, D. M., provides the theoretical underpinnings
- Describes Test Plan components and the at-scale testbed:
 - End-to-End Path Description of networks and operators
 - Performance Metrics
 - Instrumenting the End-to-End path for segment measurement
 - Phased Test Plan Description
 - Implementation Schedule Proposal
- Initially an R&D document, which may evolve into operations

LSST MREFC Funding Status



- NSB approved LSST to request MREFC funding (July 2012)
- NSF and President Obama FY14 budget requested \$27.5M (full) funding for LSST (February 2013)
- LSST passes Final Design Review (December 2013)
- Omnibus Budget passed with NSF directed to start LSST (January 2014)
- NSF briefs NSB on LSST MREFC (February 2014)
- NSF and President Obama FY15 budget requested \$473M (full) funding for LSST (March 2014)
- NSF Director approves LSST MREFC request for next NSB meeting (April 2014)
- NSB Meeting (May 2014)

Press Release 12-137

National Science Foundation Will Advance the Large Synoptic Survey Telescope



An artist's rendering of the proposed Large Synoptic Survey Telescope.
[Credit and Larger Version](#)

July 18, 2012

With approval from the National Science Board, the National Science Foundation (NSF) Director will advance the Large Synoptic Survey Telescope (LSST) to the final design stage. This action permits the NSF Director to include funds for LSST construction in a future budget request. To be located in Chile, the LSST is a proposed 8-meter wide-field survey telescope that will survey the entire sky approximately twice per week, delivering a large and comprehensive data set that will transform astronomical research.