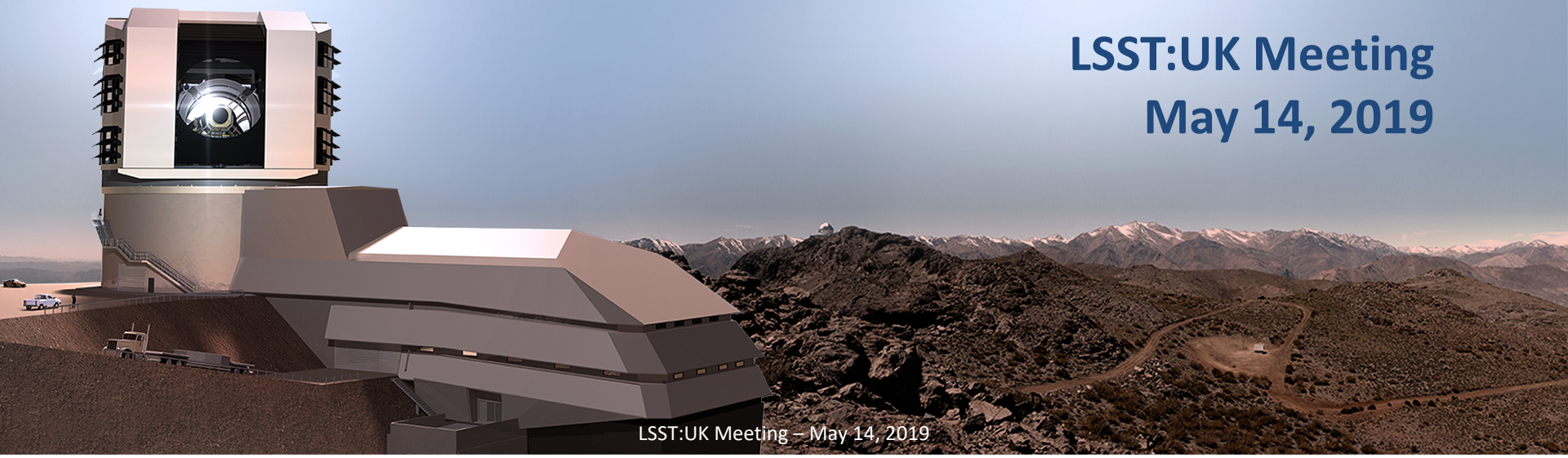


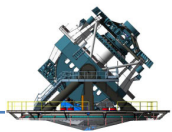


LSST Construction Status Update

Steven M. Kahn
LSST Director

LSST:UK Meeting
May 14, 2019





Summit Facility



- **Recent Accomplishments:**

- Closeout of Besalco Contract for Summit Facility Construction
- Final load testing of Pflow Platform Lift Completed
- Improvements of Clean/White Rooms to support 2 Camera team Sprints
- Progress with Hotel addn. – 2 new rooms now in use
- M1M3 Warehouse – complete by end of April



Summit Facility & Dome
~March 20, 2019



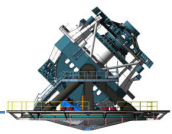
Pflow Lift Roof
Final Details

- **Current Status/Upcoming Milestones:**

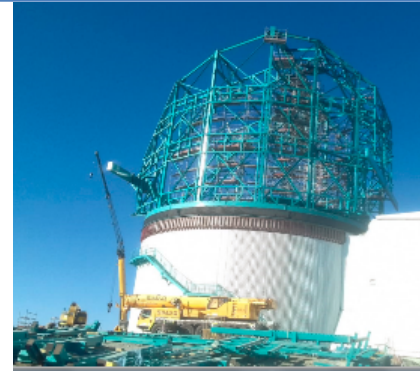
- Begin operational use of Platform lift in support of integration work
- Continue to add IT support across facility
- Improve weather protection and safety conditions for imminent winter season
- Complete Pachón Hotel Addition & Warehouse

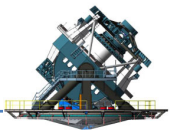


Warehouse for M1M3 and Future
Storage



- Recent Accomplishments:
 - Major structural beams installed and aligned to proceed with assembly sequence
 - Missing roof purlin fabrication contract in place with Chilean vendor
 - Vertical purlins attached to both sides (to support cladding)
 - Cladding materials received onsite
 - Additional onsite labor added to pre-assemble aperture shutter pieces
- Current Status/Upcoming Milestones:
 - Focused work flow to integrate cladding and prepare for louver arrivals
 - Install aperture shutter structure and roof purlins
 - 12 louvers (of 36) to ship in Mid April
 - Priority to enclose structure July



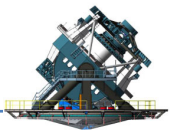


Telescope Mount Assembly (TMA)



- Recent Accomplishments:
 - Subsystem disassembly and packaging ongoing
 - Review of logistics plans to determine most efficient/flexible plan
 - Initial shipments to Chile
 - Large loading May 2019
 - Real-time network issue with National Instruments hardware resolved
- Current Status/Upcoming Milestones:
 - Packaging continuing
 - Onsite Assembly Integration Test Plan review in Chile in April
 - Acceptance Test/SW Review in May

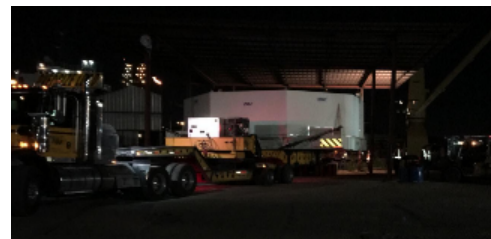
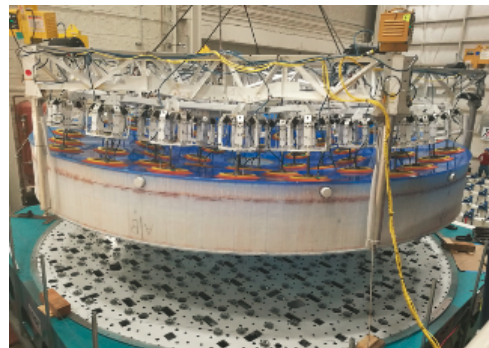
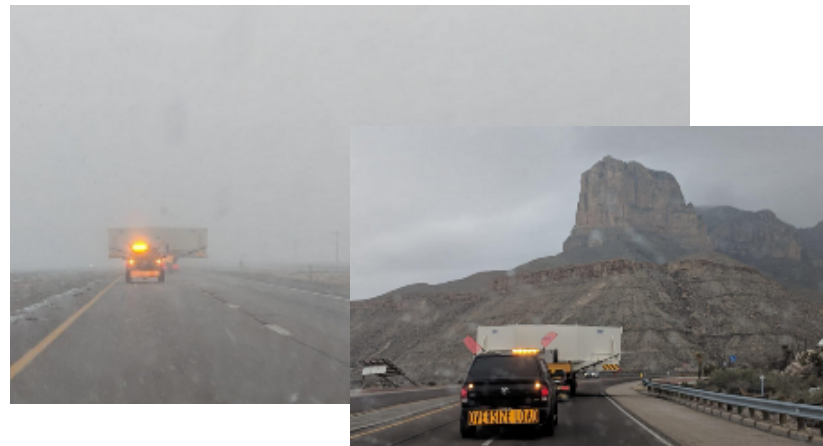


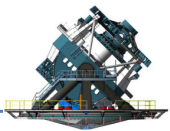


M1M3 Cell Assembly



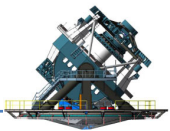
- Recent Accomplishments:
 - Two 10-day integrated optical testing campaigns completed
 - Mirror surfaces meet requirements
 - Mirror support system verified to meet requirements
- Current Status/Upcoming Milestones:
 - M1M3 mirror shipping to Chile (arrived last week)





M1M3 Safely on the Mountain!

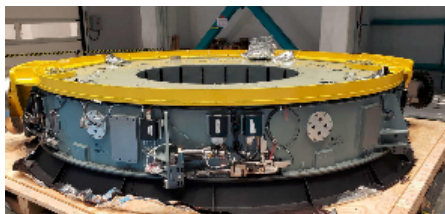


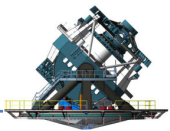


Secondary (M2) Mirror Assembly



- Recent Accomplishments:
 - Integration on summit commenced with mating of surrogate mirror assembly and cart
 - Active control system to be demonstrated
- Current Status/Upcoming Milestones:
 - Plan for coating of M2 optic in June after completion and acceptance of coating plant



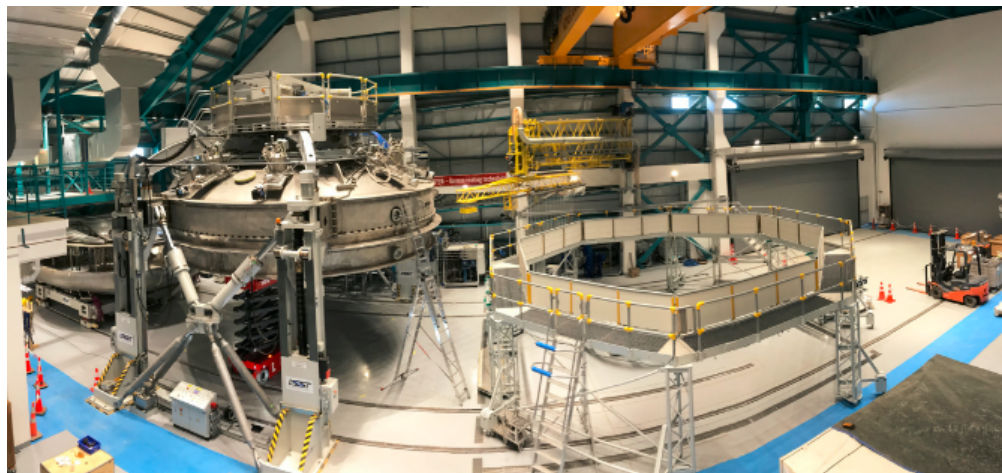
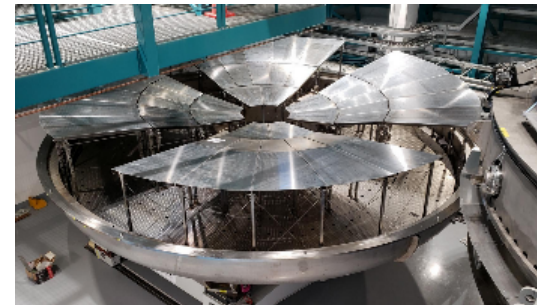
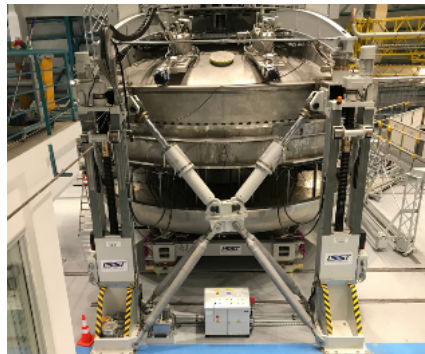


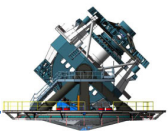
Coating Plant



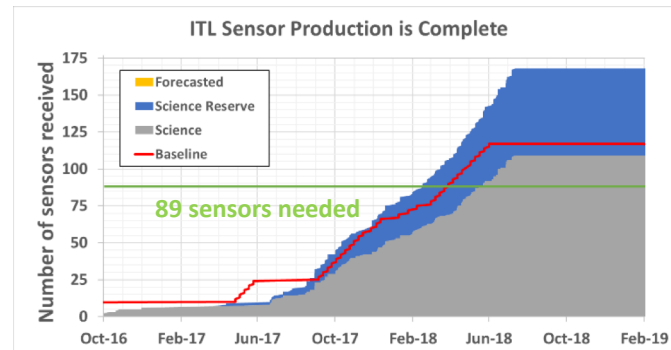
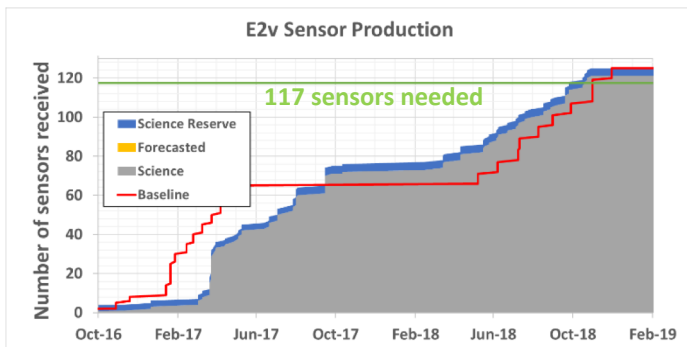
- Recent Accomplishments:
 - Coating system completely assembled
 - Washing/drying boom installed
 - High vacuum achieved to meet requirements
 - Magnetrons fired up with initial sputtering tests

- Current Status:
 - Final acceptance of wash station and scaffolding complete
 - Test plans for coating plant being reviewed for final test (May 20-24)
 - Project complete by June 2019

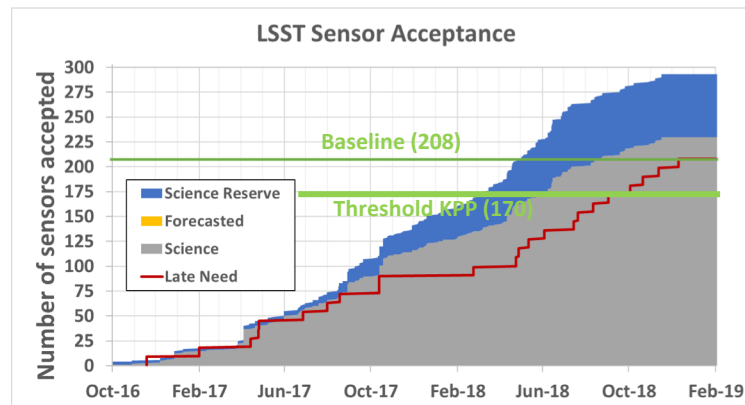


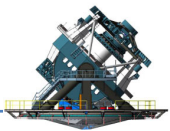


LSST Science Sensor procurement is complete!!!



Vendor	Received	Science Grade	Reserve	Engineering Grade
e2v	125	121	4	0
ITL	256	109	59	88
Total	381	230	63	88





Cryostat progress



–Accomplishments and status:

- Cryostat was completed
- Vacuum system process upgrade significantly reduced pump down time (factor of 3)
- EO Testing on engineering rafts

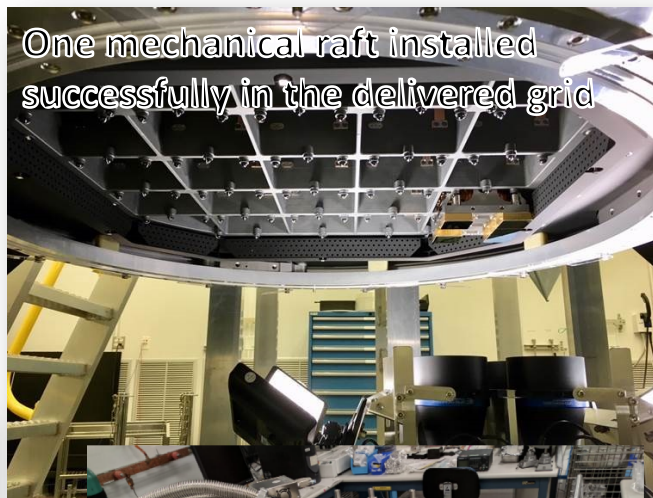
–Remaining work

- Vacuum system backup pump upgrade end of 2020.

Cryostat Prior to final assembly



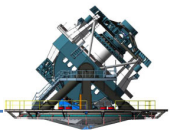
Cryostat Delivery into the BOT



One mechanical raft installed successfully in the delivered grid



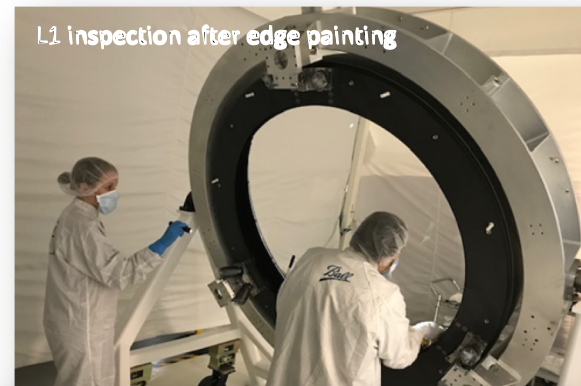
Cryostat During Leak Testing with vacuum system

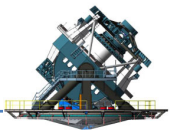


Optics progress



- Recent accomplishments
 - L1 pad assembly completed
 - L1 edge painting completed
 - R-band filter first surface coating completed.
 - L3 BBAR coating completed and lens back at TSESO
- Upcoming work
 - Test L1 in mount and complete L1-L2 assembly
 - Mount L3 in its barrel
 - Complete polishing and coating of the filters

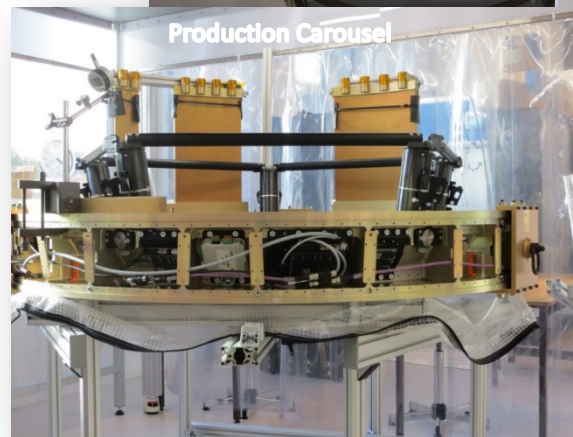
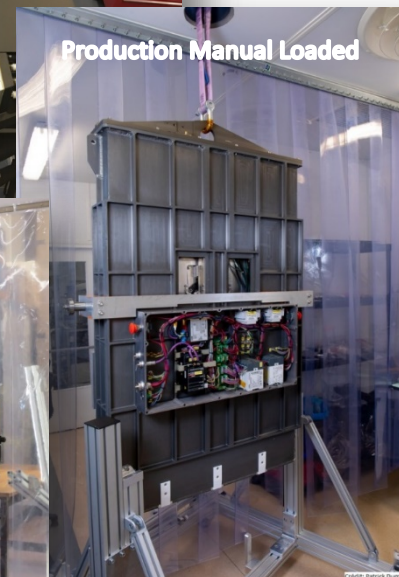
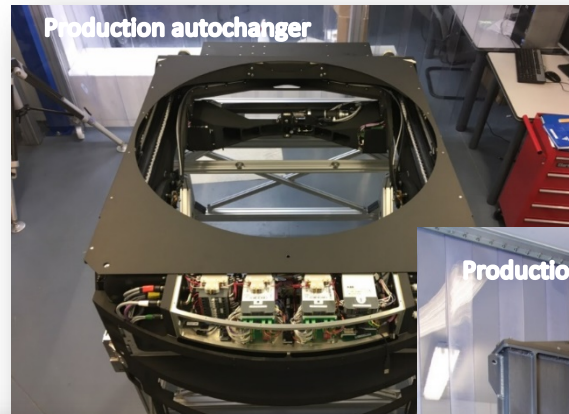


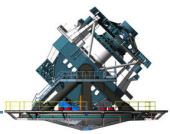


Filter exchange system progress



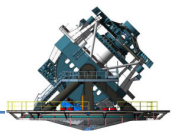
- Recent accomplishments
 - Production autochangers completed at IN2p3
 - Production Manual Loader completed at IN2P3
 - Production Carousel Under final assembly at IN2P3
- Upcoming work
 - Complete testing
 - Final acceptance review expected in July.





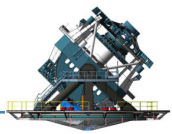
Science Pipelines release 17.0.0 (and 17.0.1)

- Releases made in March 2019
- Delayed from November 2018 to include better support for LSST and associated cameras (the “obs_lsst”) package.
- Comprehensive release notes at <http://ls.st/68c> describe new features and changes. Highlights include:
 - First release including an Alert Production pipeline prototype.
 - DCR-corrected template construction.
 - Improved astrometric matching.
 - Preview versions of new middleware.



Recent technical progress (selected highlights)

- Prototype version of Auxiliary Telescope spectral reduction pipeline available (albeit still under heavy development).
- Exploratory work on galaxy model fitting producing promising results which will be incorporated into future measurement algorithms.
- Task available to inject simulated sources into data now available.
- Upgraded systems for calculating and submitting verification metrics.
- Many, many changes and improvements: <http://ls.st/df8>



Community Broker workshop (Invitational)

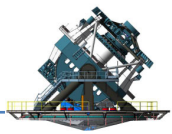
- SOC: Leanne G, Eric B, Melissa G, Bob B, Zeljko I, Federica B, Rachel S, Joshua B
- Logistics: Seattle Sheraton, 19–21 June 2019, <http://ls.st/8ea>
- Invitations to representatives of all letters of intent submitters

Algorithms workshop

- Planning ramping up, LPG, RHL, JB on the SOC + TBD
- October 2019, possibly at Flatiron Institute (?)

Detailed design review of the full operations-era platform:

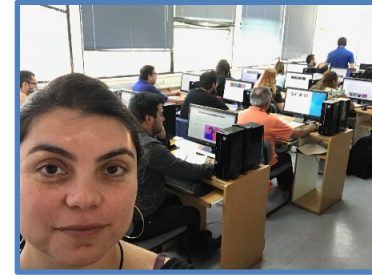
- 10-12 April, AURA/NOAO MCR
- Committee of 9 from across SC, project stakeholders, external
- <https://project.lsst.org/reviews/lsp-fdr/>
- Document review & preparations

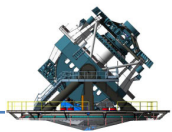


EPO work completed



- Completed 2 Formal Education interactive online investigations
 - *Mapping the Milky Way, Surveying the Solar System*
 - First Spanish language user testing in Chile →
 - Completed 2 edu videos (intro and assessment)
- Completed 15 short videos in planetarium format (contracted effort with Fiske Planetarium and IPAC)
- Set up forum for feedback from the 4 EPO audience groups
- Finalized Citizen Science Phase 1 development
 - Spanish language capability, project setup workflow, Zooniverse Project Builder platform ready to receive data from LSST Science Platform. Phase 2 begins FY21





Conclusion and Summary



- 2019 continues to be a very busy year for LSST Construction.
- Essentially all subcomponents are fabricated. We are now fully focused on assembly, integration, verification and commissioning.
- There have been some “snags” along the way, but at present we expect the system performance to be fully compliant with our Science Requirements Document, unchanged since early in the Project.
- Both budget and schedule contingency are tight, we do expect to complete the construction of LSST on time and at cost.