VERA C. RUBIN OBSERVATORY

Rubin Operations Status

S3ACC 2024
Palo Alto

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NSF NOIR Lab AURA SLAC U.S. DEPARTMENT OF ENERGY

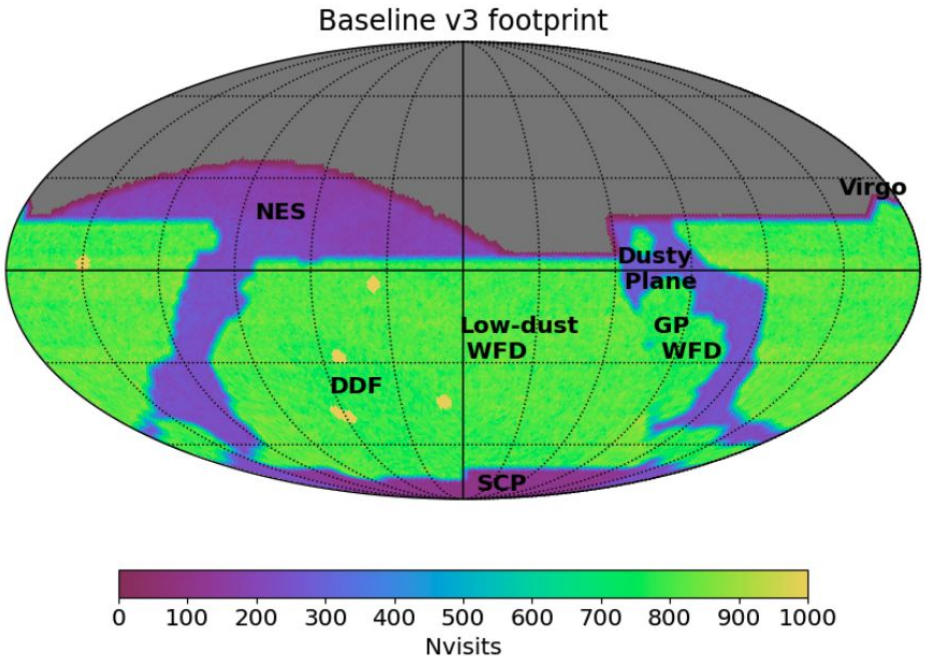
Vera C. Rubin Observatory

A large-aperture, wide-field ground-based telescope located on Cerro Pachón, Chile.

- 6.7 m effective aperture (8.4m ∅ M1) (MREFC)
- 9.6 deg^2 field-of-view (40 full moons)
- 3.2 Gpixel camera (DOE)
- 6 optical-NIR filters, *ugrizy* (320-1050nm)
- High étendue (AΩ) of 319 m^2 deg^2
- Fully automated data processing system (US Data Facility at SLAC, 5 PB raw data per year)
- Science Operations, operated by NOIRLab and SLAC to start second half 2025 (50-50 model)
- International In-kind program

Rubin will Deliver the Legacy Survey of Space and Time

- Rubin's overarching goal is to deliver the LSST to its diverse Science Community
- Fundamentally about data products, access, and tools
- We are on track to deliver this goal by implementing the Rubin Operations Plan
- The plan is comprehensive, covering 19 years (13 remaining).

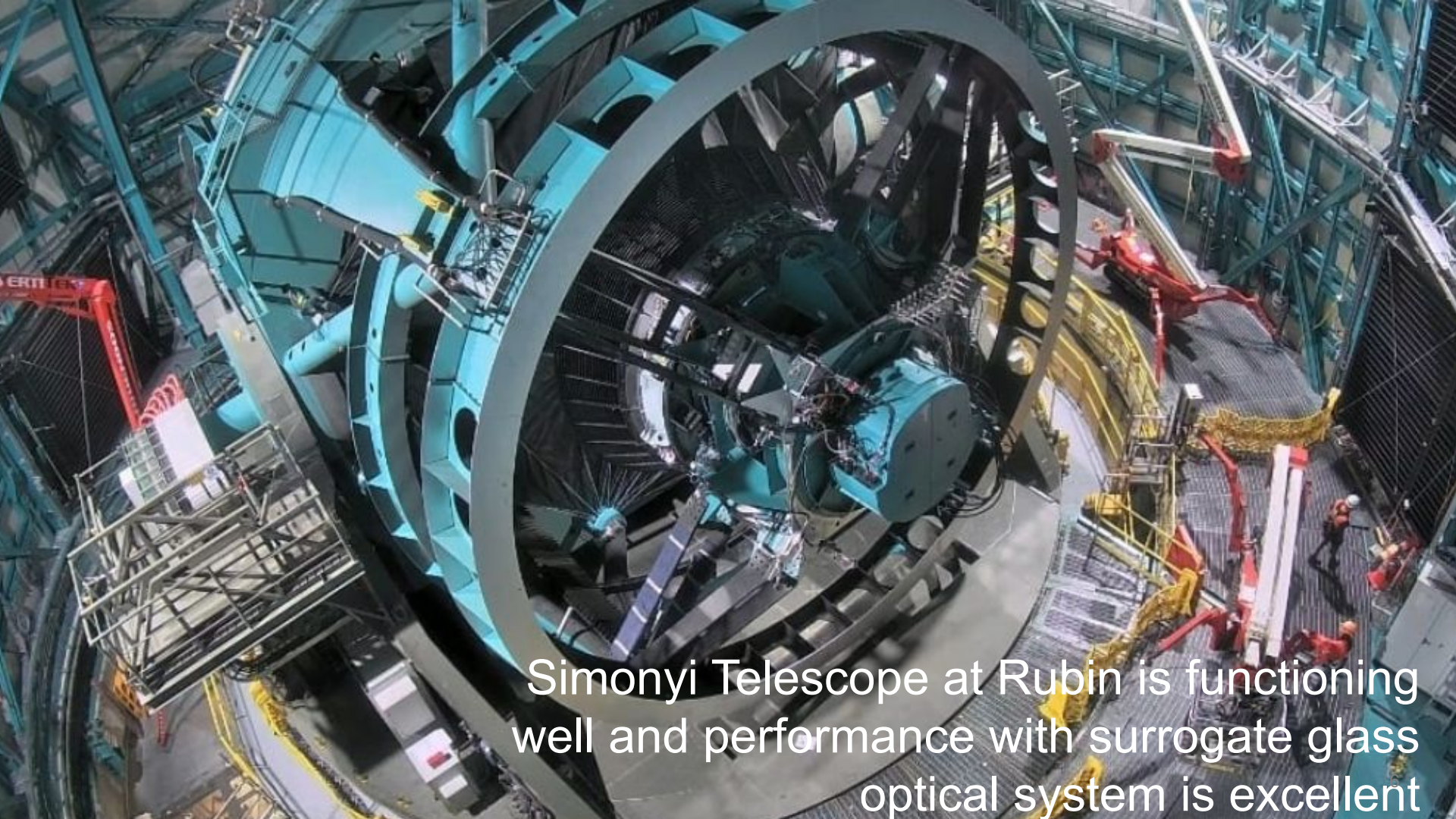


Rubin Observatory is nearing Completion!

(on sky data later this year)

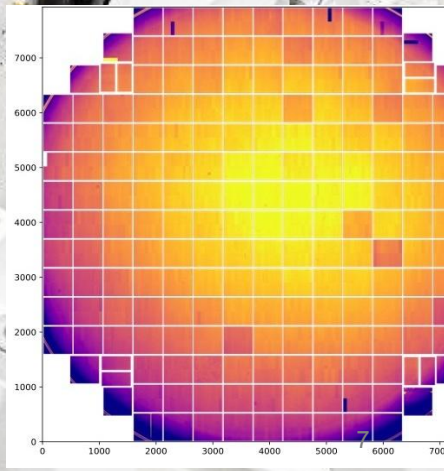
Rubin Summit Facility shown with lift up and dome door open for Mirror install

Rubin is well into Observatory Commissioning!
(test data is streaming off the summit)



Simonyi Telescope at Rubin is functioning well and performance with surrogate glass optical system is excellent

Camera has completed testing at SLAC, we expect to ship in Q2 2024

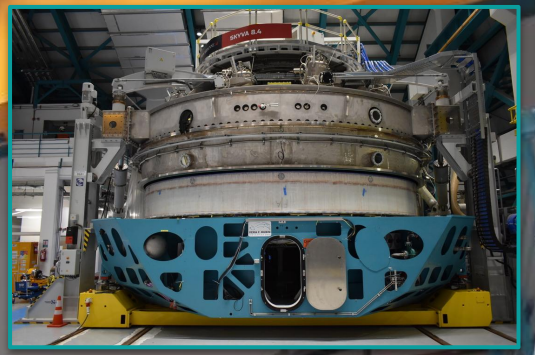


LSSTCam in cleanroom at SLAC (above), example of electro optical testing data demonstrating very good performance. **Ship May 2024**

Packed up!

Coming up now: – Glass, ComCam, LSSTCam, Operations, survey start …

M1/M3 Mirror on its cell, L3.
Coated April 27 2024.



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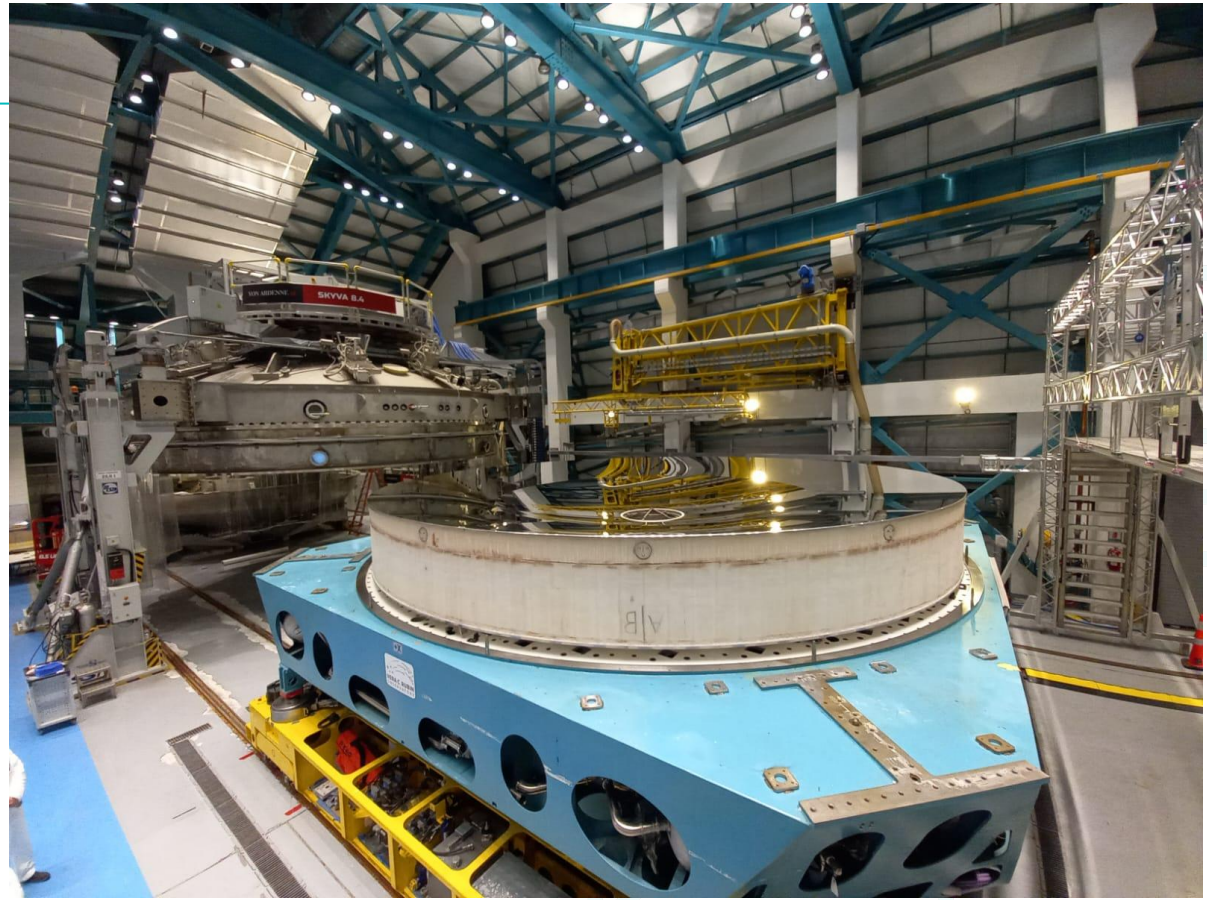
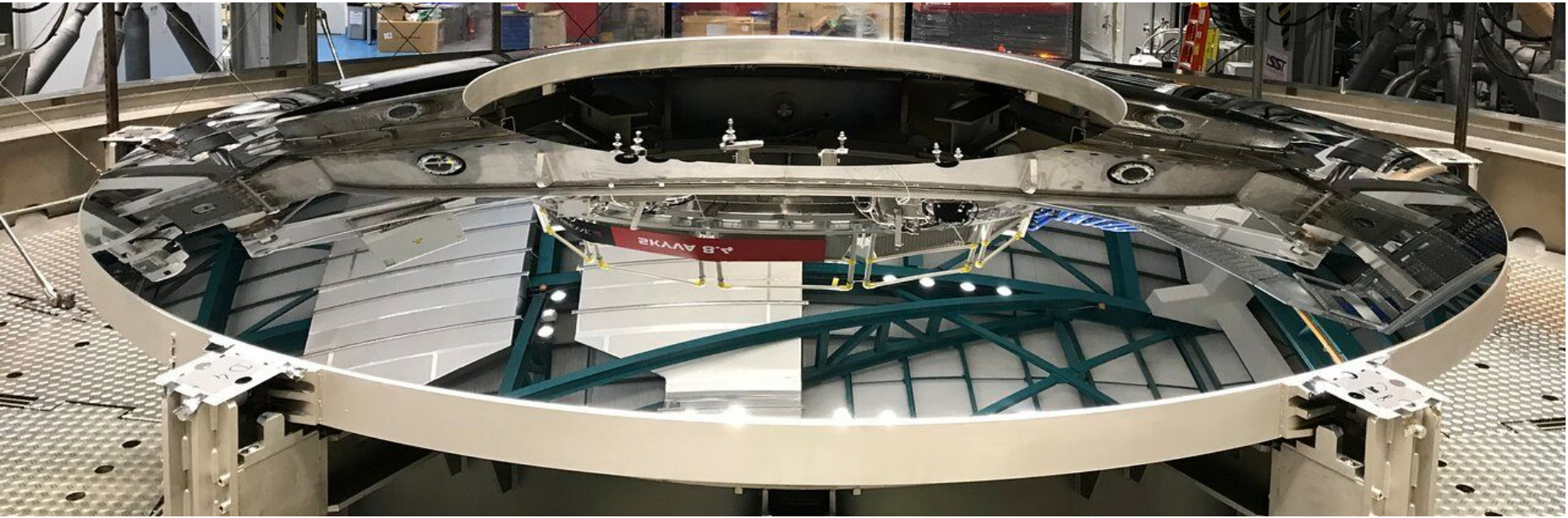
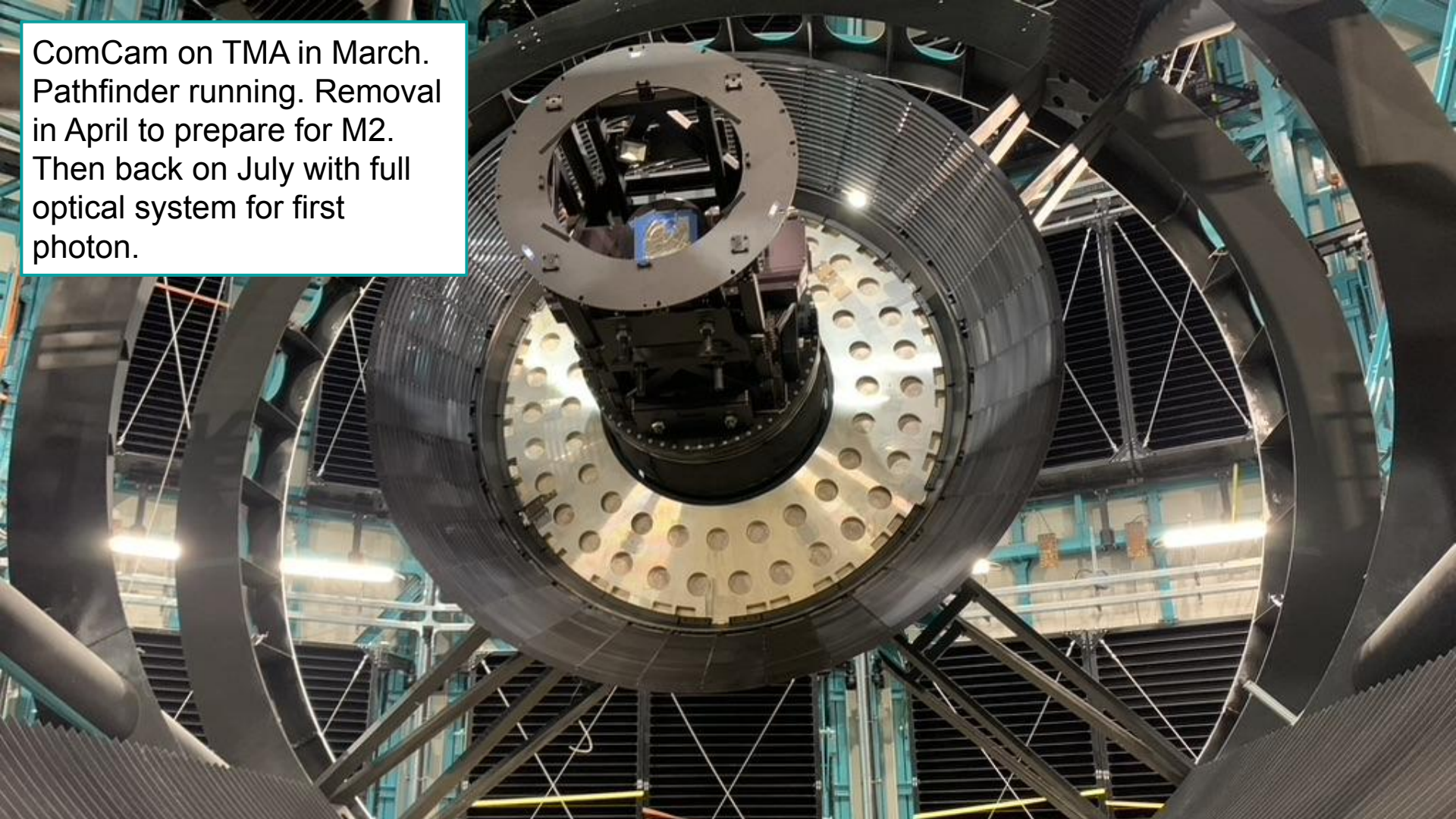


Secondary Mirror is already coated and it will be integrated with mirror support cell in May 2024

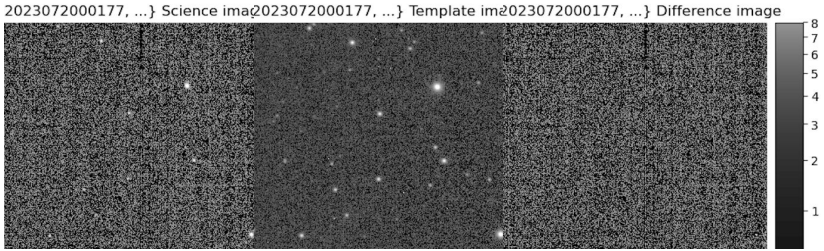


3.5 meter diameter meniscus secondary mirror shown after over coated silver coating

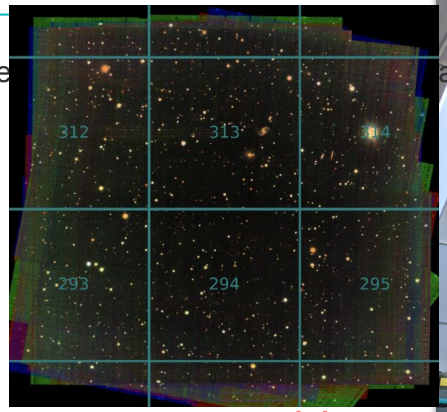

ComCam on TMA in March. Pathfinder running. Removal in April to prepare for M2. Then back on July with full optical system for first photon.

1.2m diameter Auxiliary Telescope (AuxTel) Operation

- AuxTel will continue testing of Rubin software compone ata acquisition for testing pipelines, calibration & data analysis and Operations training.

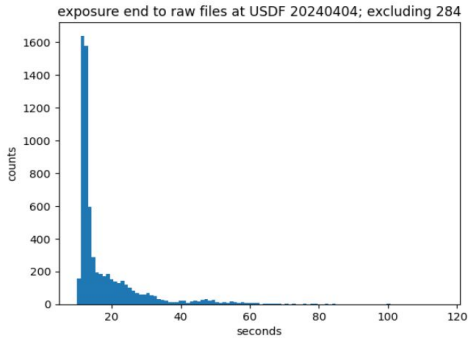


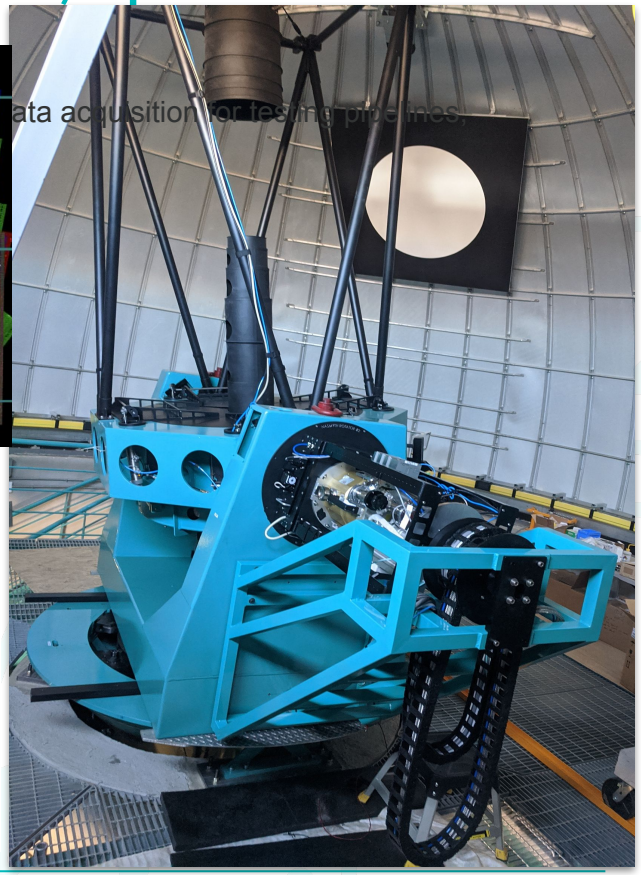
Difference imaging



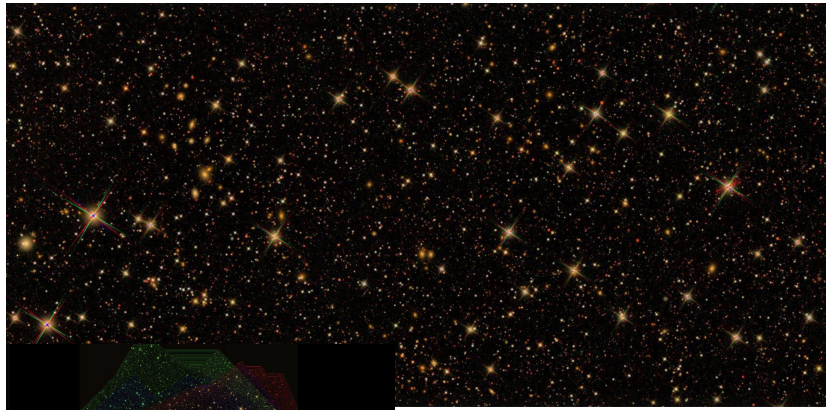
coadds

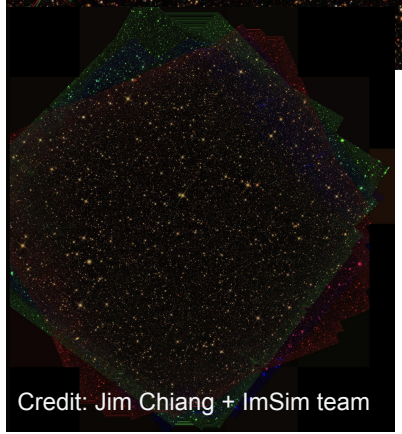
- Data Transfer testing from Summit in Chile to USDF at SLAC
  - Requirement is 7-10s (including writing data at USDF)





Operations Rehearsal for Commissioning





Demonstrate full **24-hour operations cycle** to manage **two parallel data streams** from the summit in preparation for **first on-sky ComCam images** in July 2024

- **AuxTel** was driven “normally” at the summit
- Simonyi Survey Telescope was offline with (or without) ComCam cold
- **ComCam simulated images** run through ComCam DAQ in “playback mode”

Nominally 3 x 24-hour cycles (Tue/Wed/Thur), with one additional night as backup (Fri)

Focus on “data aspects” of operations workflow

- Command and control of physical hardware will be tested via other means

Being coordinated by Keith Bechtol with all parts of the Rubin Observatory.

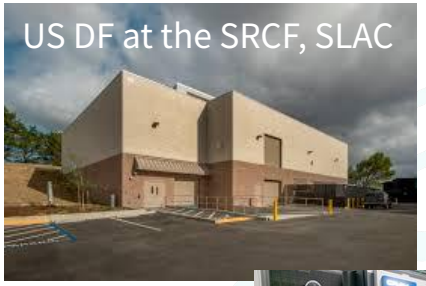
See RDM plenary: Data Facilities/Infrastructure

Data Facilities for Full Survey Operations Phase

The US Data Facility (USDF) at SLAC has been operational since August 2022.

All three Rubin Data Facilities are in development:

- *USDF: All archive, all prompt processing, 35% of data release processing, and cloud-based data access services to the LSST science community.*
- *French Data Facility at CC-IN2P3: 40% of data release processing and long-term storage*
- *UK Data Facility: 25% of data release processing*

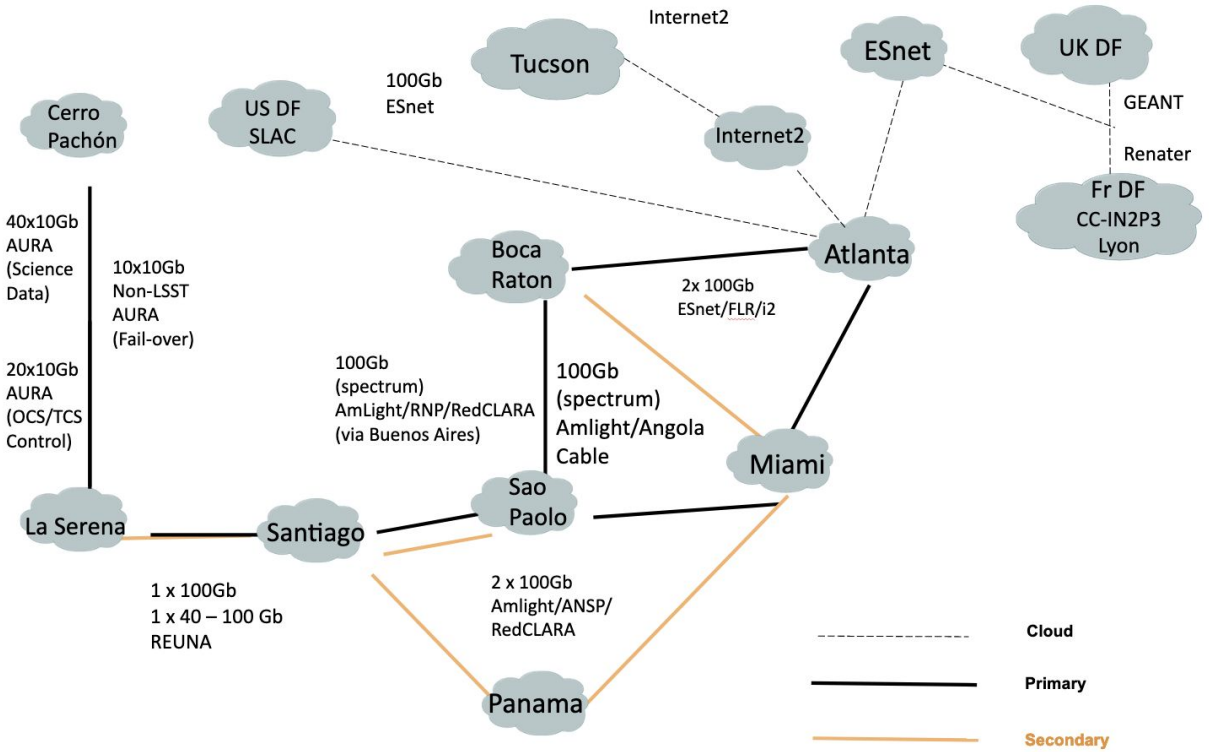


Cloud: IDF to US DAC transition is underway

FY24: Ramp up US DF capabilities, connect 3 DFs together, evolve IDF into US DAC

See RDM plenary: Data Facilities/Infrastructure

Networks - to support all that data movement



2024

LSST Camera ship from SLAC in California to Chile May

Primary/tertiary mirror (M1M3) coated April (done!)

Secondary mirror (M2) installed June

ComCam installed June

M1M3 installed July

ComCam on sky July, we are now a working observatory!

LSST Camera installed on telescope mount November

Rubin Observatory, Cerro Pachon

Early 2025

LSST Camera First Photon (January)

System First Light mid Feb and associated media splash April

Late 2025

Legacy Survey of Space and Time begins ~ end of 2025

Operations Timeline: Data releases

Event		Date Range
DP0.1	DC2 Simulated Sky Survey	June 2021
DP0.2	Reprocessed DC2 Survey	June 2022
DP0.3	Solar System PPDB Simulation	August 2023
SFL	**System First Light**	Feb 2025 - Apr 2025
DP1	ComCam/LSSTCam Data	Apr 2025 - May 2025
OPS	**Start of Operations**	Jul 2025 - Sep 2025
SVY	**Start of Survey**	Jul 2025 - Nov 2025
DP2	LSSTCam Science Validation Data	Dec 2025 - Apr 2026
DR1	LSST First 6 Months Data	Jul 2026 - Jan 2027
DR2	LSST Year 1 Data	Jul 2027 - Jan 2028