National Science Foundation

LSST Update

AAAC Meeting
2019 September 27

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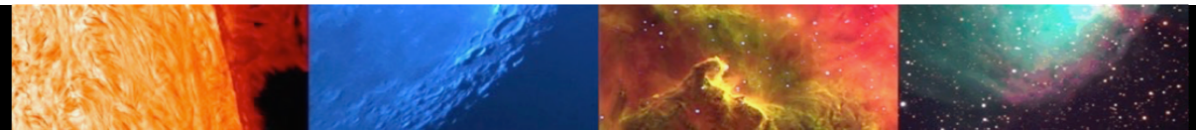
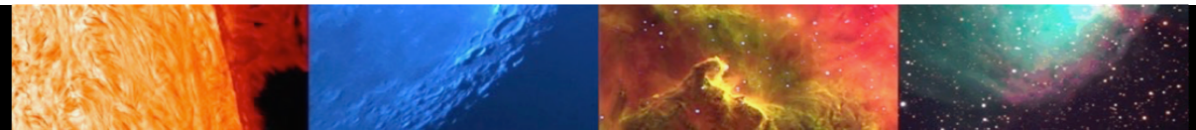
LSST Program Manager

Division of Astronomical Sciences (AST)

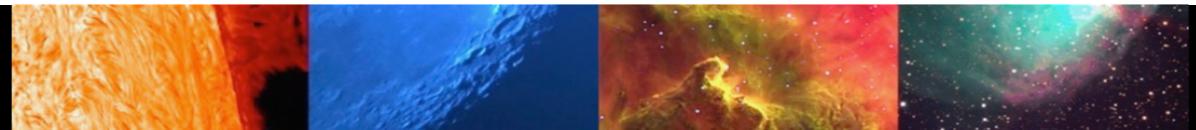


Overview

- Construction Update
- NSF-DOE Joint Oversight Group
- New Operations Funding Model
- Status of Operations Planning



Construction Update

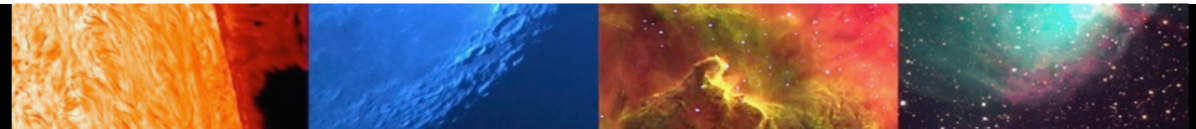


Large Synoptic Survey Telescope

- Ten-year survey of tens of billions of objects in space and time
- F1.2, 8.4m primary, FOV 3.5 deg (9.6 sq deg)
- 3.2 Gigapixel camera, 2 second readout, ~20 TB per night
- 825 visits/pointing (main survey: 18,000 sq deg), *ugrizy* filters
- ~10 M alerts per night, 60 second latency
- FY 2023 start of survey

LSST's Broad Science Themes

- A Comprehensive Survey of the Solar System
- Structure and Stellar Content of the Milky Way
- The Variable Universe
- The Evolution of Galaxies
- Cosmological Models and the Nature of Dark Energy and Dark Matter



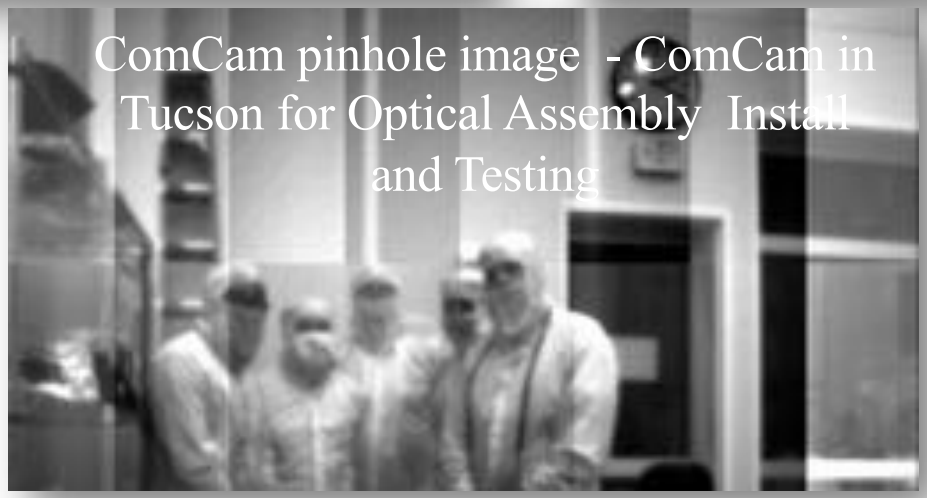
Camera Progress Summary


Cryostat introduced to Bench for Optical Testing (BOT)


L1-L2 Assembly Delivered to SLAC

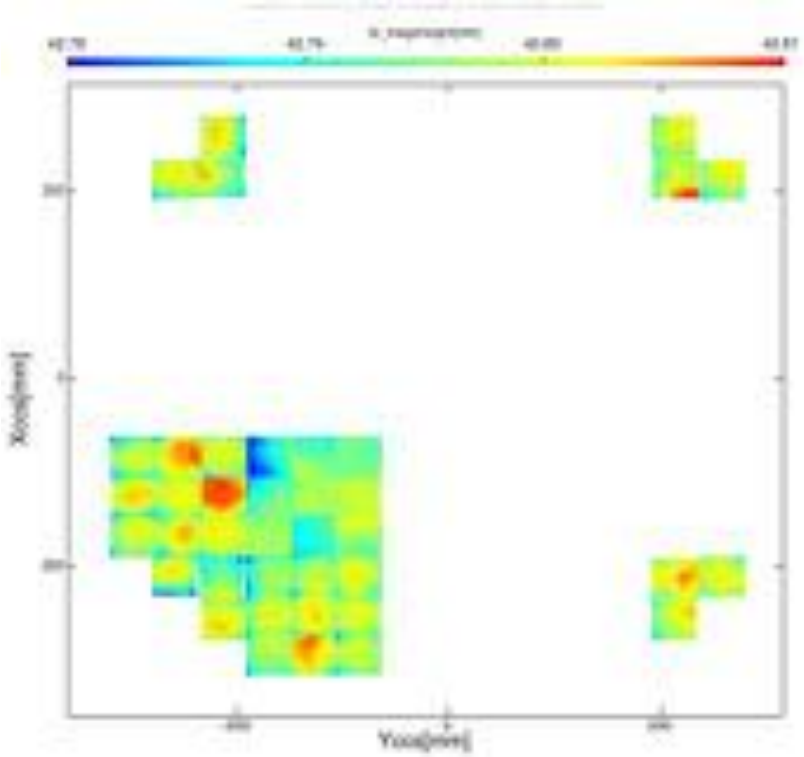

Production Manual Filter Loader

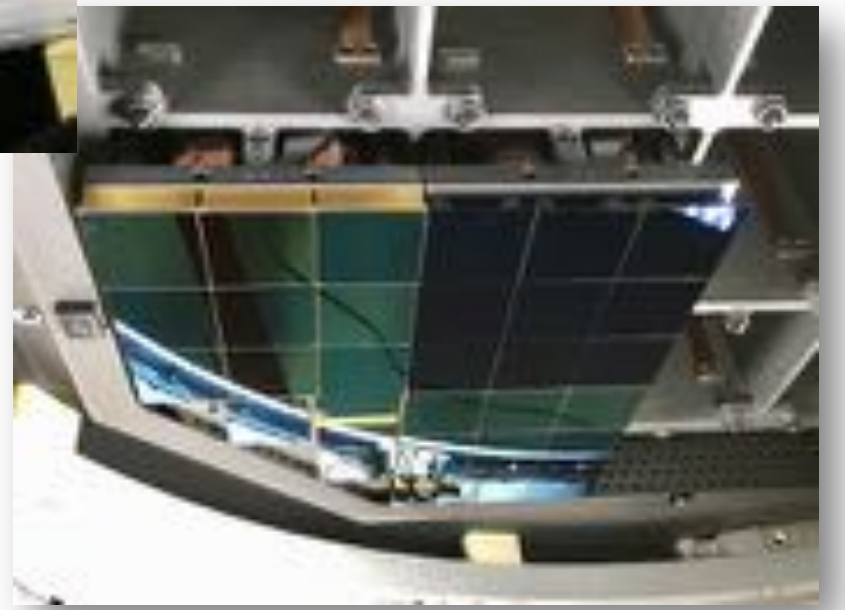

Refrigeration system Commissioning


ComCam pinhole image - ComCam in Tucson for Optical Assembly Install and Testing

Science Raft insertion has begun!

9
~~3~~ Science Rafts and 4 corner Rafts installed





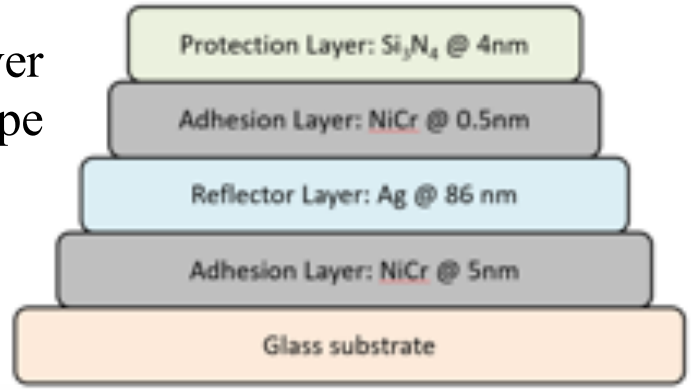
Telescope Progress Summary

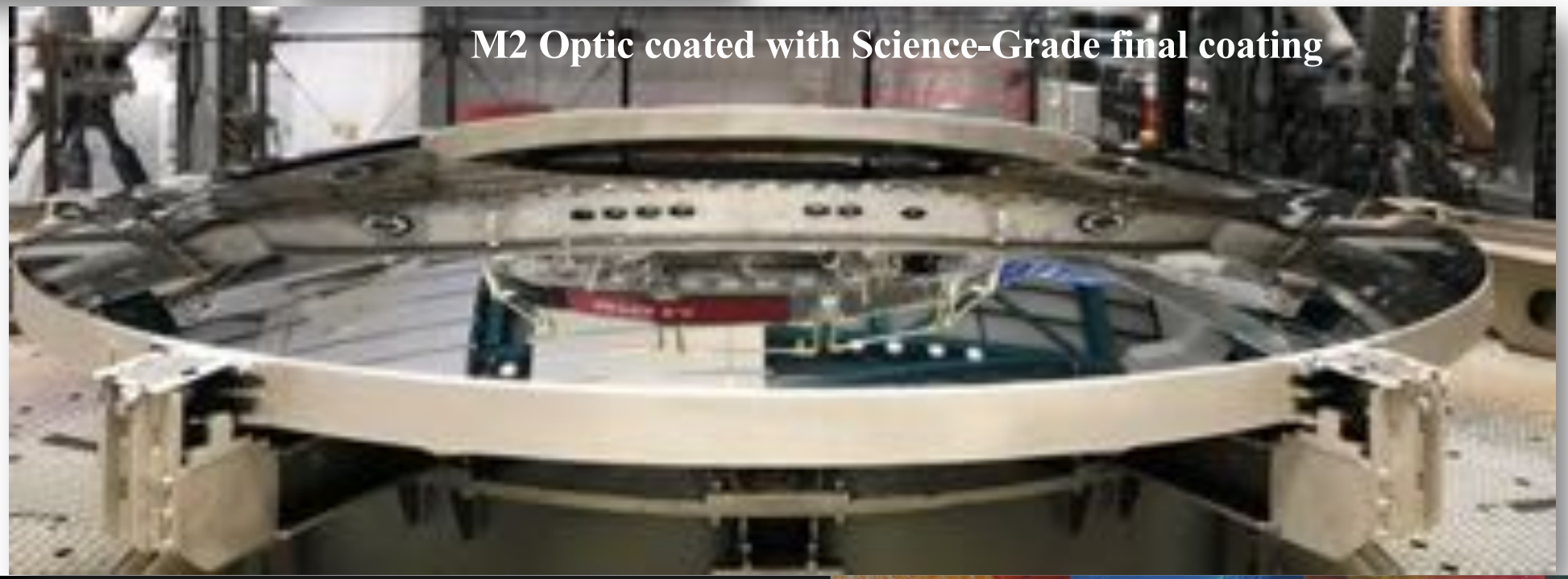

Coating facility completed – Protected Silver on M2 July 16


AuxTel under computer control

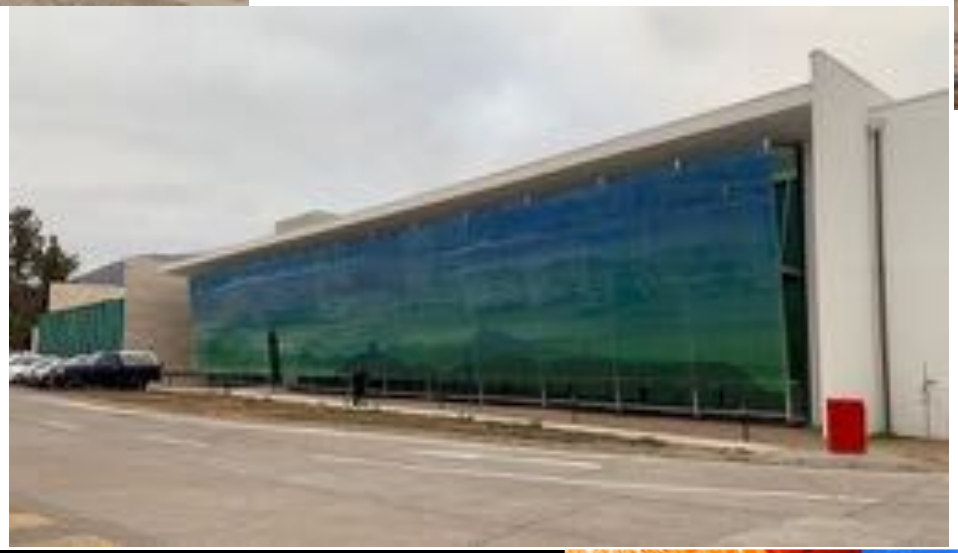
M2 Coating – 2019 July 16

M2 Protected Silver Recipe

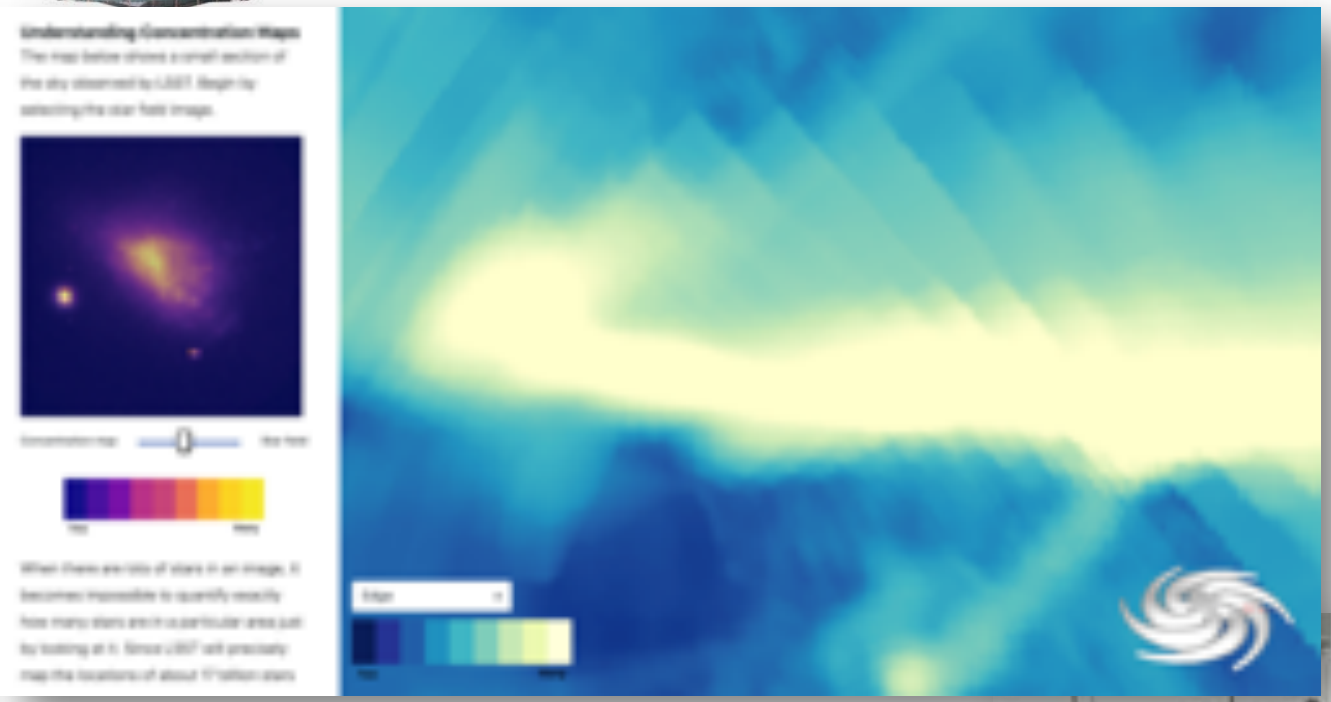




La Serena Base Facility Complete



EPO work progressing well.

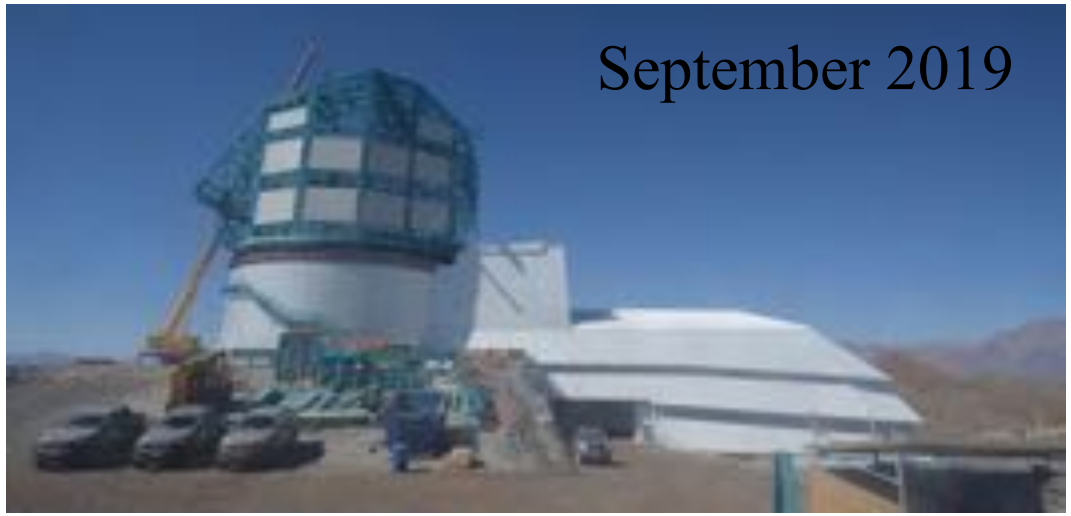


Planetarium video showing LSST

First Spanish-language user testing at Chile summer school

In *Mapping the Milky Way,* students use LSST's extensive sky coverage and object density to discover the shape of our Galaxy and where we live within it.

Dome



Telescope Mount Assembly

Current Challenges

- Telescope Mount Assembly delays
- Dome fabrication and installation delays
- Tight cost and schedule contingencies

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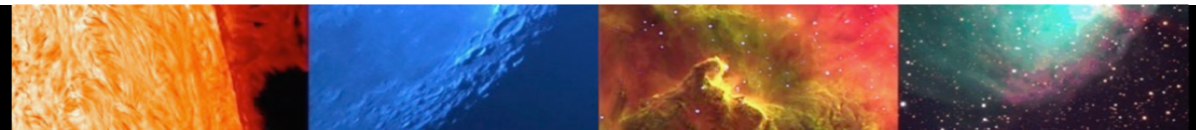
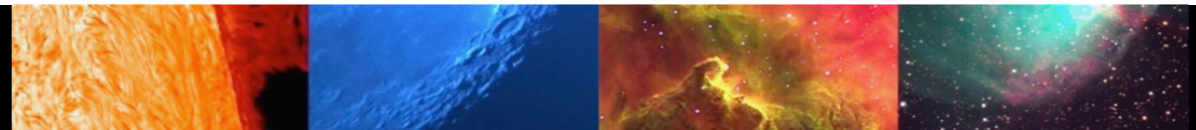
NSF-DOE Joint Oversight Group (JOG)



NSF-DOE Joint Oversight Group (JOG)

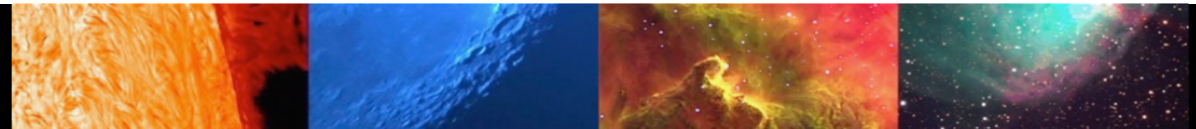
- In 2012, NSF and DOE signed an MOU for the LSST project, including operations, with NSF as the lead agency.
- The MOU formally established the JOG, currently led by AST (R. Gaume) at NSF and HEP (J. Siegrist) at DOE.
- All LSST issues and problems are managed by the JOG, not by either agency independently!
- JOG is the starting point for changes and questions.
- JOG meets weekly (at least) and asks project leaders to join when appropriate (also weekly, following agencies' meeting alone).
- Meeting twice weekly, separately for construction and ops planning.

New Operations Funding Model



New Operations Funding Model

- Only in-kind contributions (rather than monetary) will be accepted from international participants for access to LSST proprietary data.
- NSF and DOE will consider and approve in-kind contributions of appropriate value to the community.
- In-kind offsets to operations funding is the first priority.
- NSF and DOE will form an International Resource Board to review yearly budgets and monitor international contributions.
- June 2021 is deadline to convert original holders of monetary agreements to in-kind.
- JOG received LSST Data Rights Policy for consideration.
- NSF and DOE will fund pre-operations/operations without descopes.
- NSF-DOE funding levels and scope to be settled soon.



LSST Data Types and Access (not new)

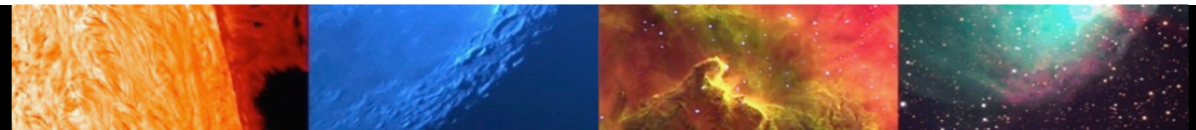
Data Types

1. Transient event alerts are streamed publicly with alerts going out within one minute. Alerts include position, flux, and “postage stamp” images of the transient. LSST will catalogue ~ 6 million bodies in the Solar System, and information on these will be made public daily.
2. Prompt data products are provided daily (raw images, calibrated images, difference images, sources detected).
3. The calibrated, corrected object catalogues are to be released annually.

Data Access Policy (open or proprietary)

- Open public access (globally to anyone at the same time) is provided for transient alerts (#1) .
- Proprietary access (two-year period) for #2 and #3 is provided for US and Chilean scientists, as well as approved international participants.
- Open public access for #3 after the two-year proprietary period.

Status of Operations Planning



Ongoing Operations Planning

- Working with awardees, AURA and SLAC, to work out details of revised distribution of NSF and DOE scope and budgets.
- Operations plans and budgets are also being revised for resubmission and review in 2020.
- Developing details of processes to obtain, evaluate, consider, and approve in-kind contribution proposals from international participants.