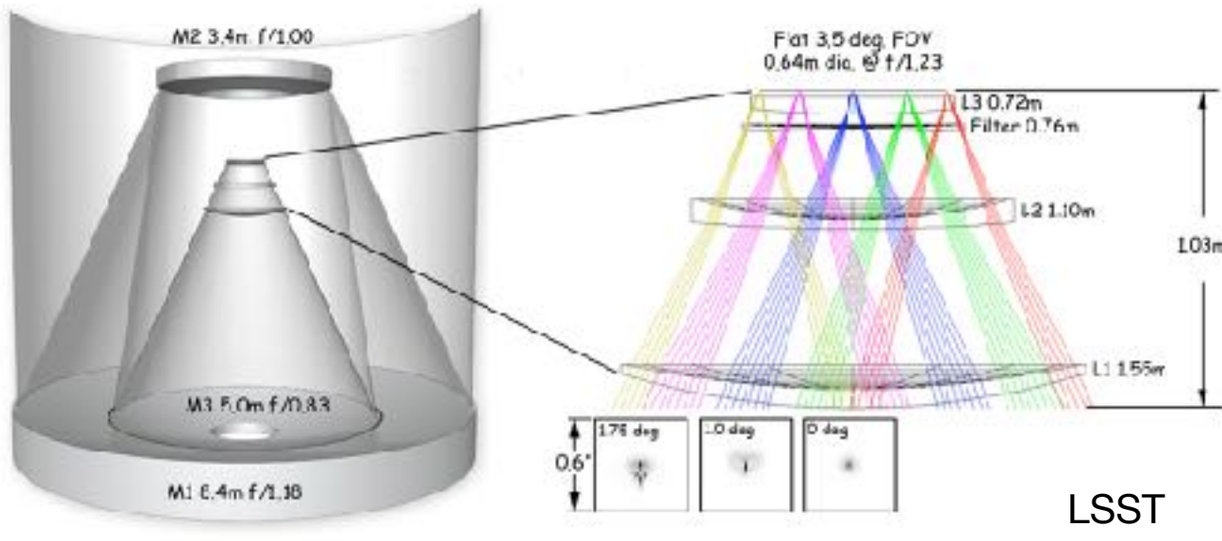
Rubin/LSST status and data right holders

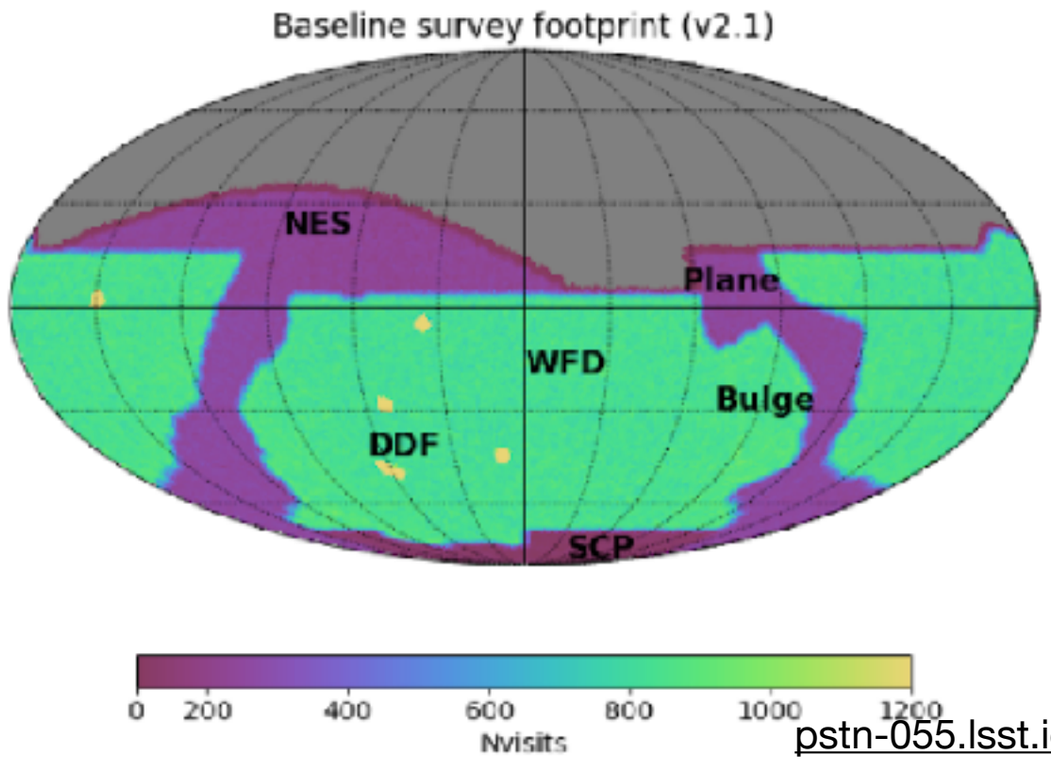
Yousuke Utsumi (SLAC National Accelerator Laboratory)

Vera Rubin Observatory's LSST survey

- **8.4m dedicated telescope in Chile**
  - Charles Simonyi Telescope
  - 3 Mirror systems (F/0.83)
  - 3.5deg in diameter
- **LSST Camera (SLAC)**
  - 3 lenses
  - ugrizy "curved" filters
  - 189 CCDs; 3.2G pixel in total
  - ~2 sec readout
- **"Legacy Survey of Space and Time"**
  - 10 years southern sky survey
    - **Deep** ~ 26.8 mag
    - **Wide** ~ 20000deg^2
    - **Fast** ~ 800 visits per field
  - **"Well-understood source catalog of stars and galaxies"**

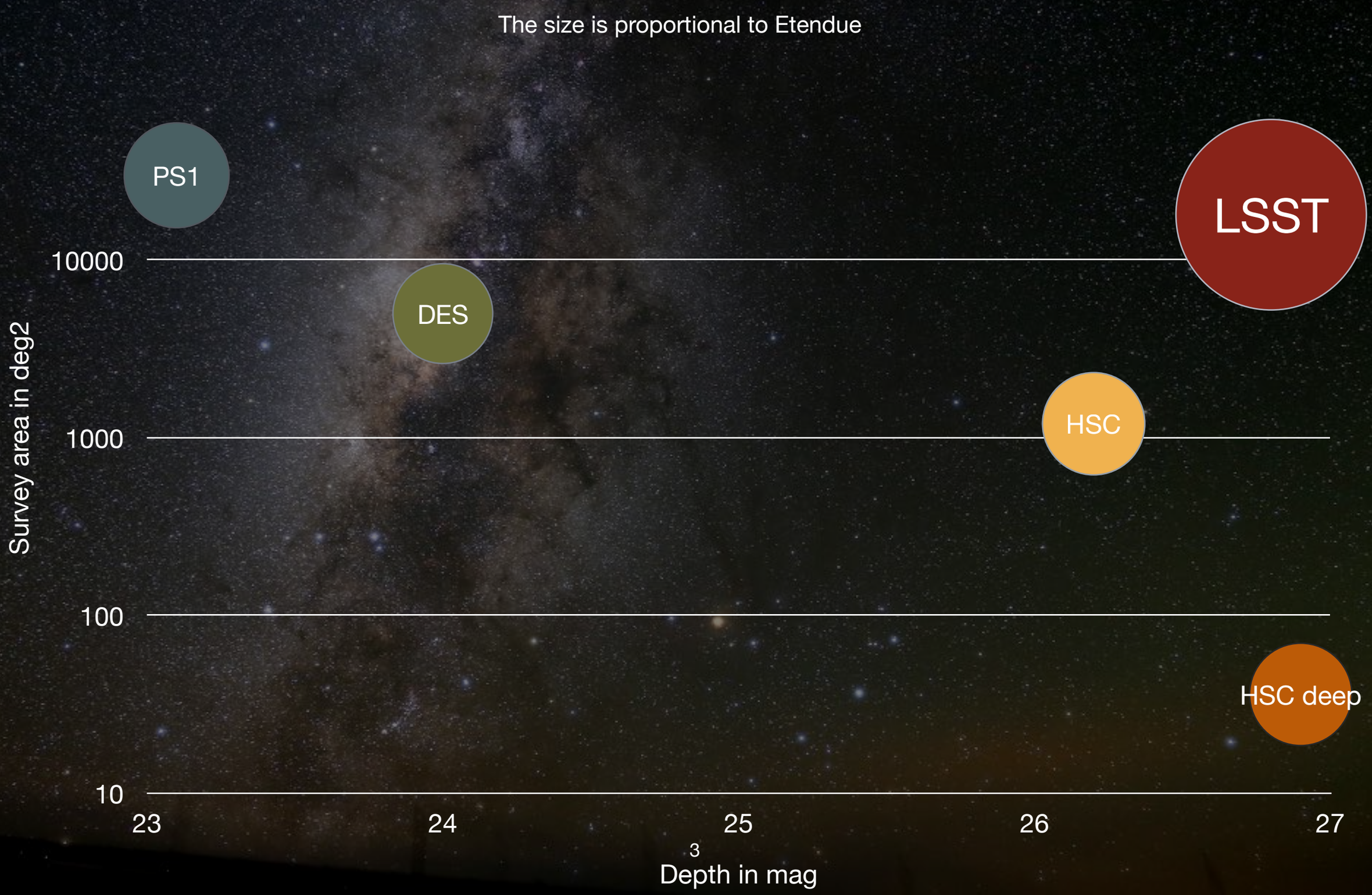


LSST

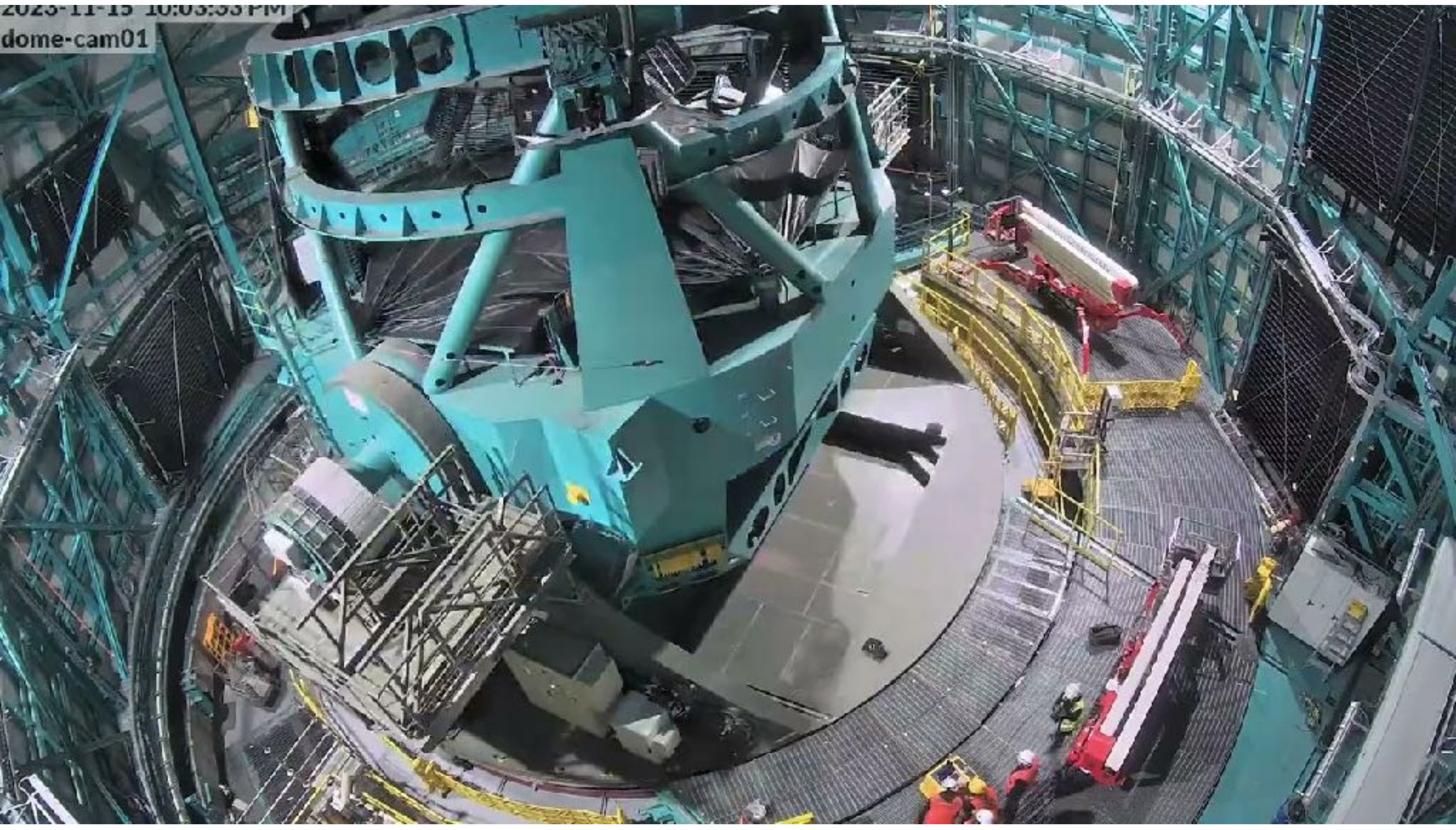


pstn-055.lsst.io

Vera Rubin Observatory's LSST survey



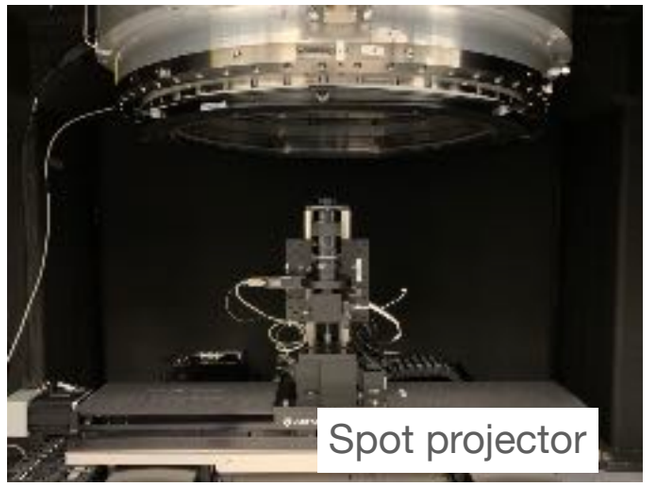
TMA testing in progress

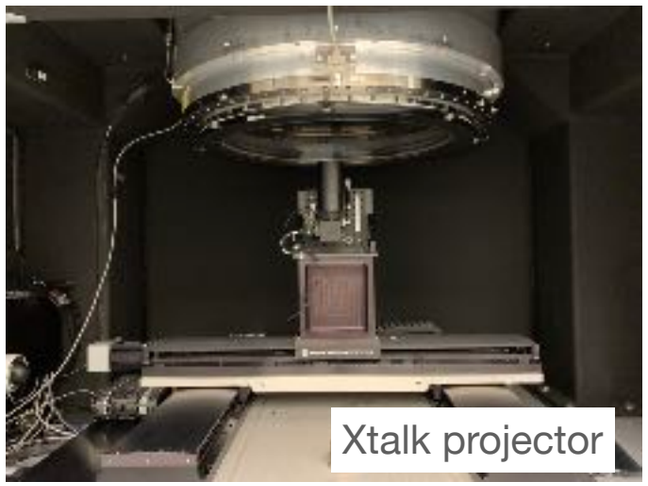


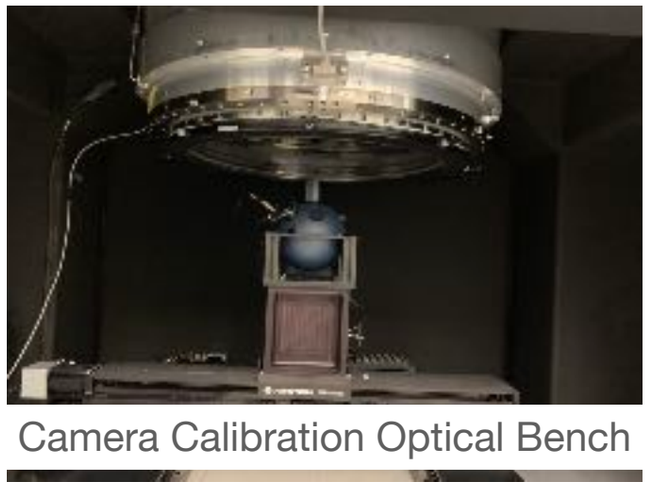
2024-1-17 © Jacqueline/SLAC

Extensive Camera testing…

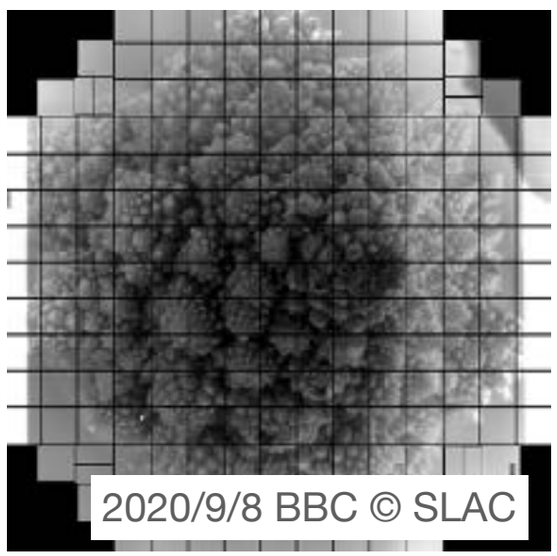

Flat projector

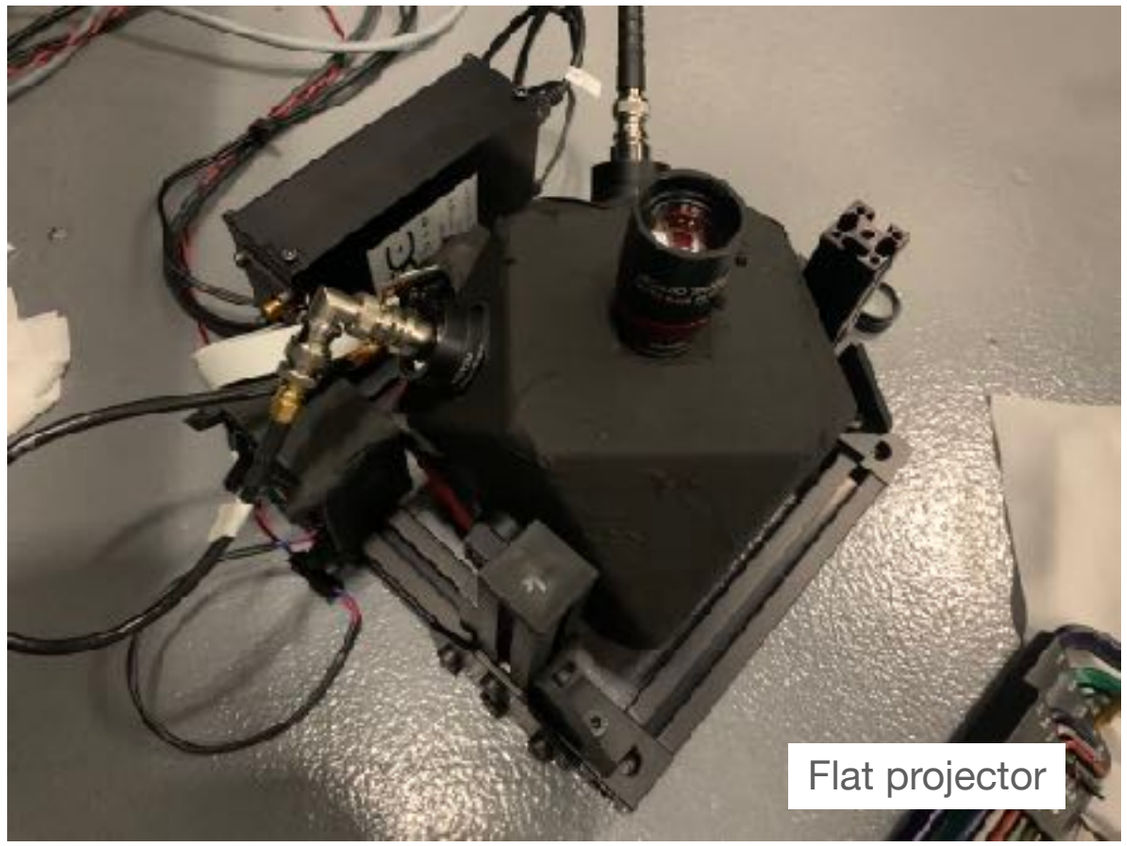

Spot projector

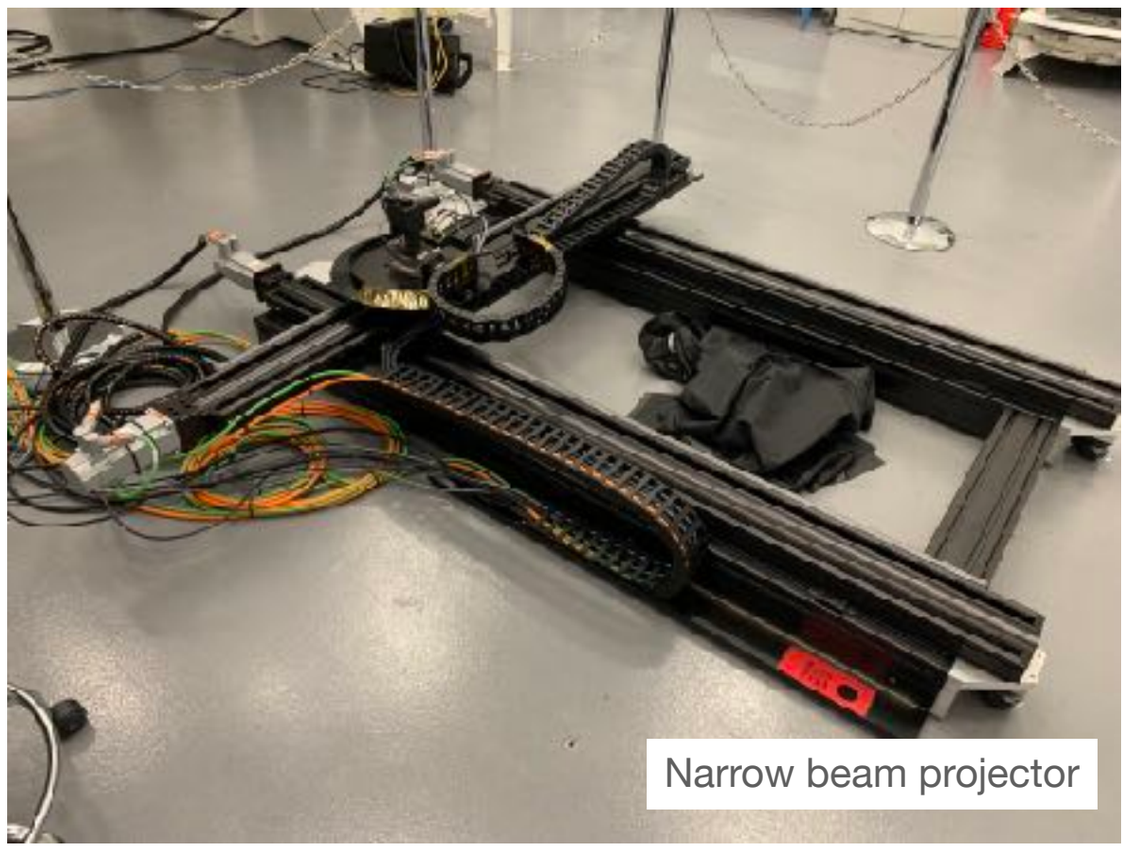

Xtalk projector


Camera Calibration Optical Bench


© Jacqueline/SLAC


2020/9/8 BBC © SLAC

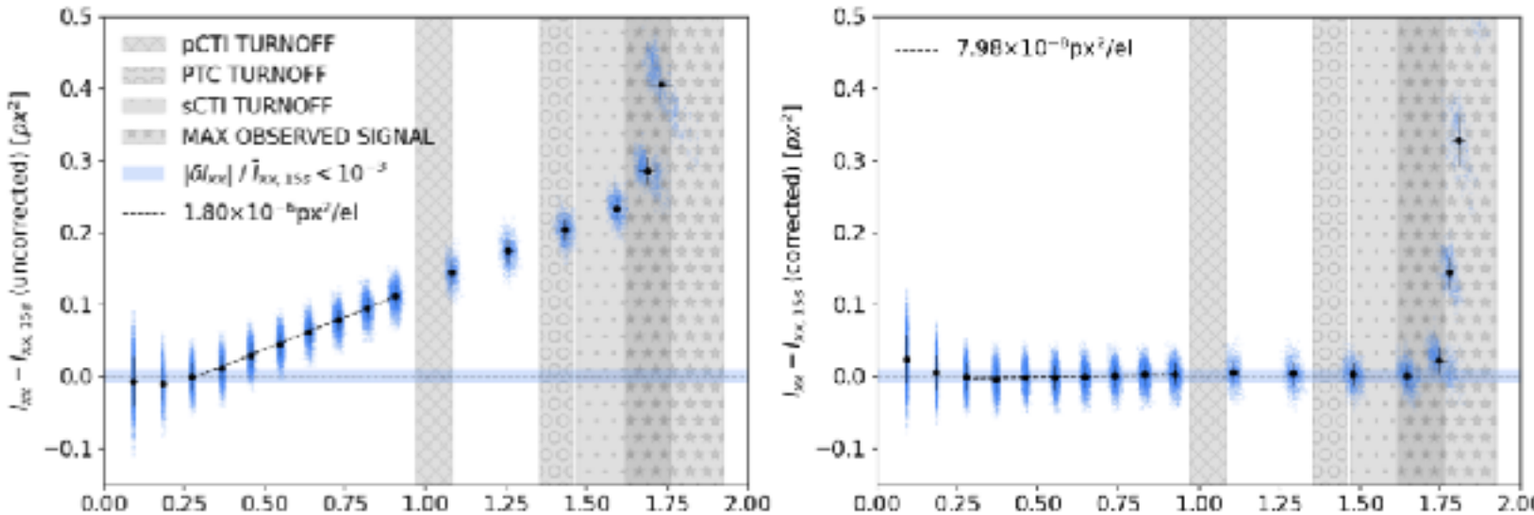

Flat projector


Narrow beam projector

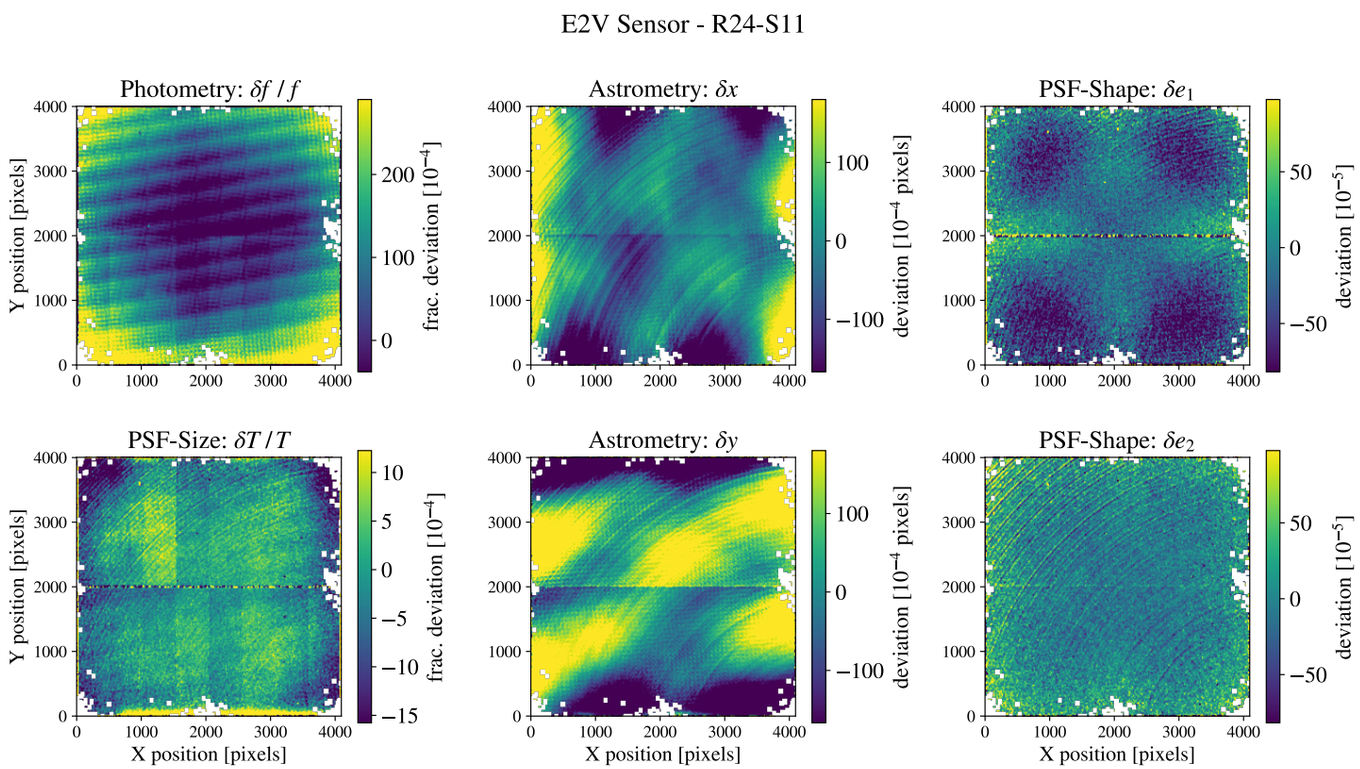
Testing in progress

- **Uniform illumination**
  - Characterization: Noise, Gain, CTI, linearity, PTC, defects…
  - Optimization
- **Structured illumination**
  - artificial star measurements
  - surface effect, tree-rings
- X-talk
  - non-linearity, delayed component
  - assessing impact of satellite streak
- Persistency
- **Narrow beam w/ flexible stage**
  - Throughput of Lens+filter+QE
  - Optical alignment by ghosts

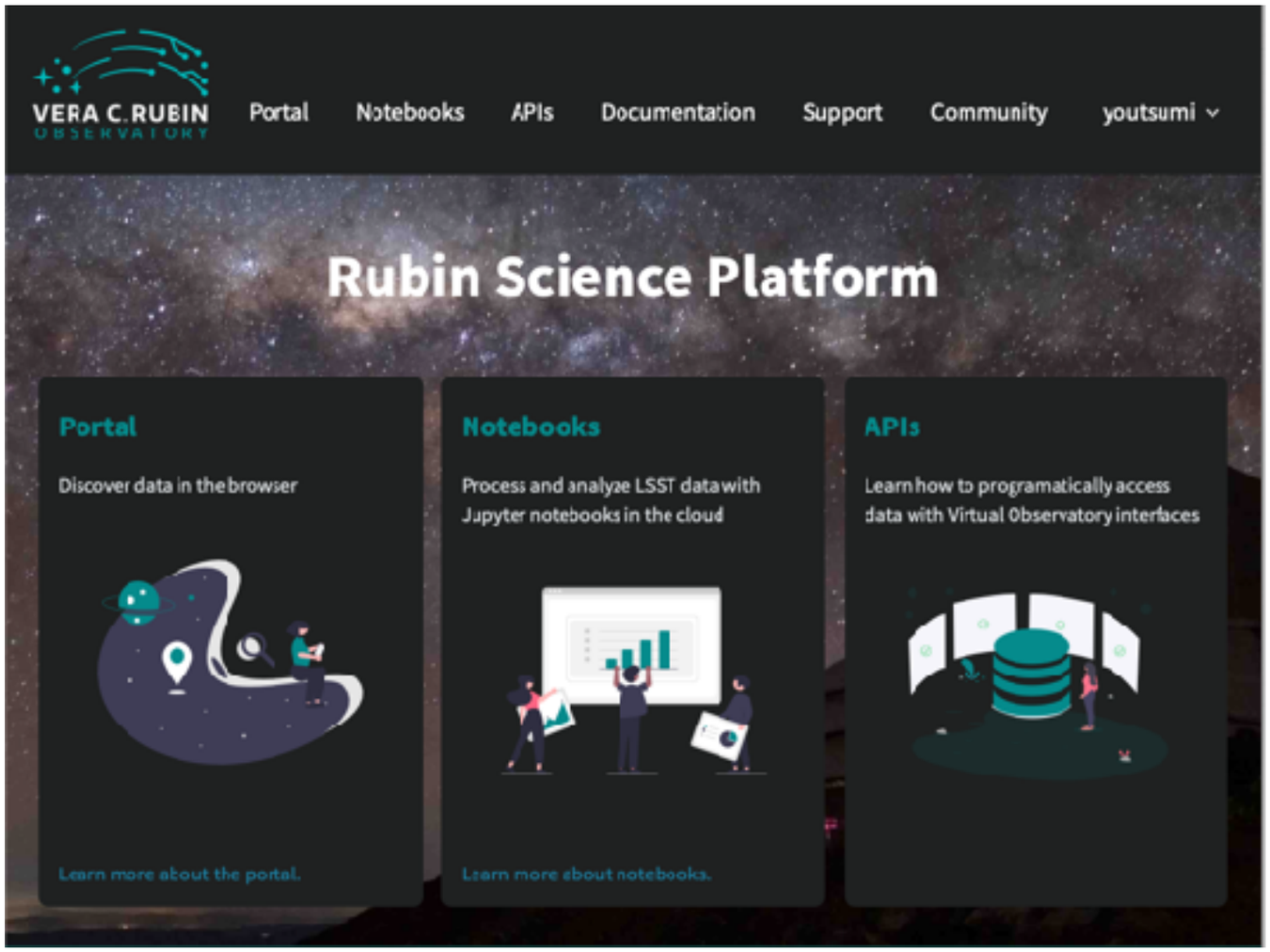
Testing “Brighter-Fatter” correction (Broughton, Utsumi et al., submitted)

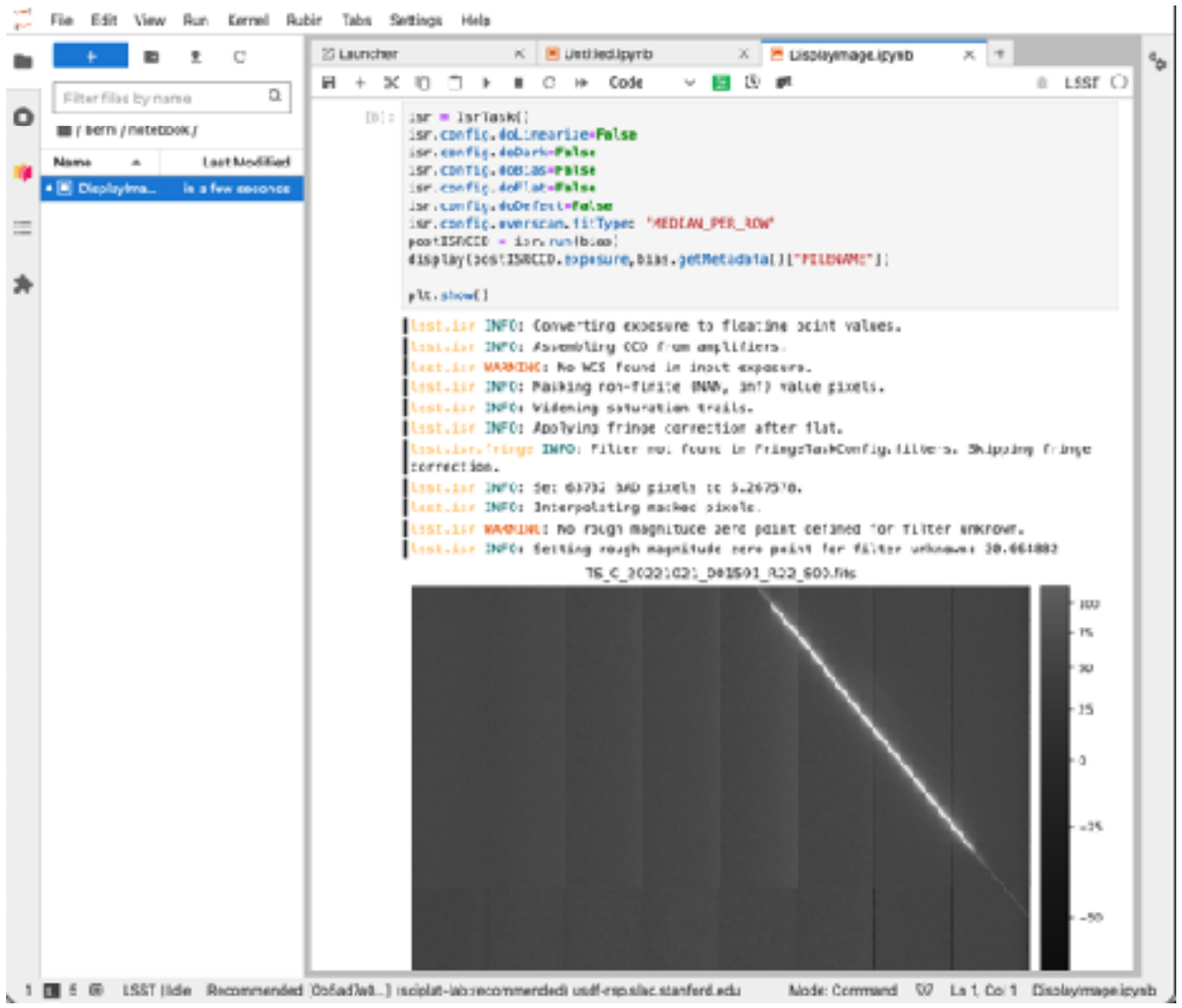


Systematics of artificial star measurement (Esteves, Utsumi et al., 2023)



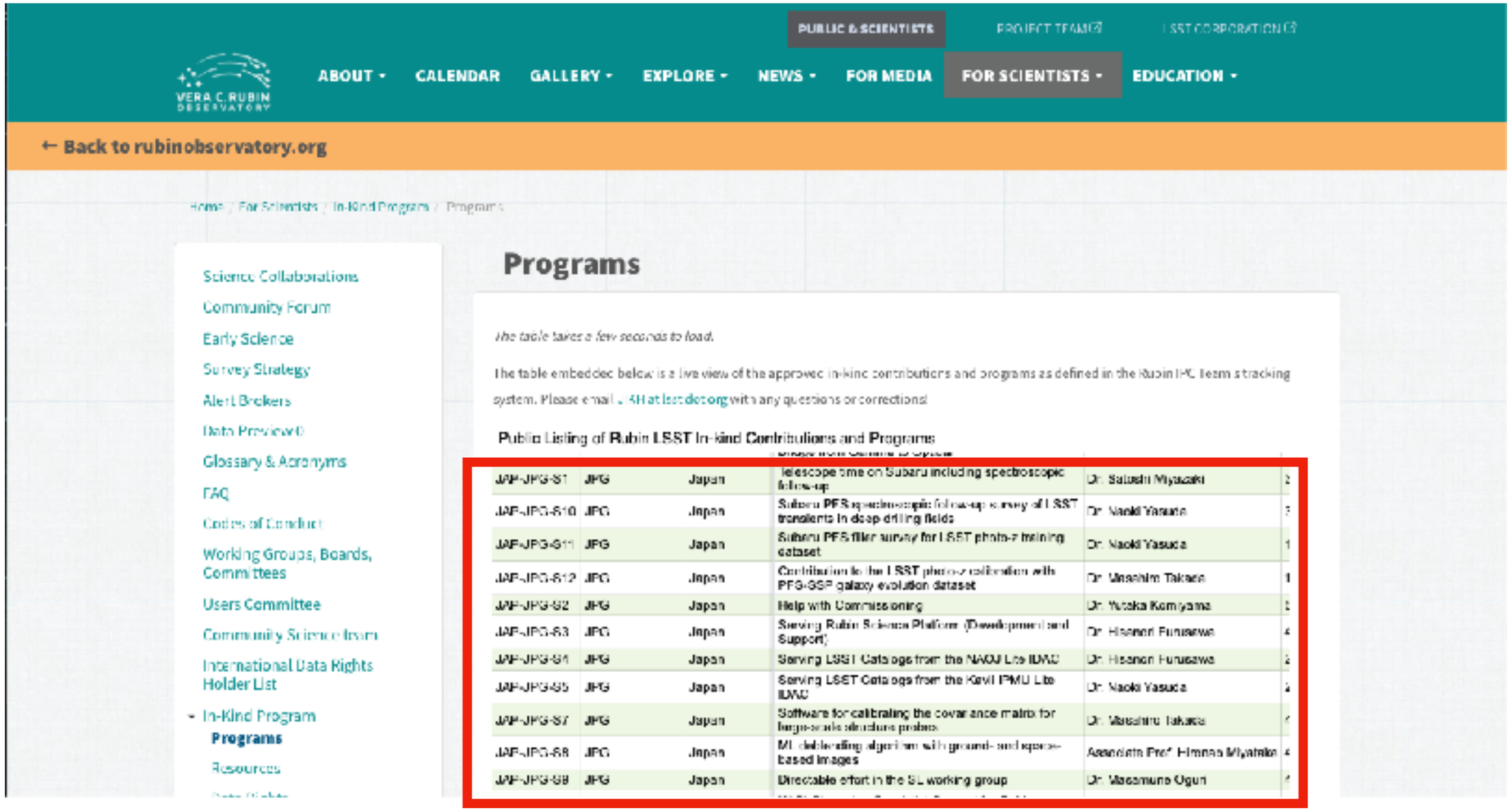
Data rights





- Raw data: 60PB; Catalog 20PB; Processed image: ~several hundreds PB
- Rubin will provide for DRH (Data Right Holders) access data from pixels to catalogs through the **Rubin Science Platform** on Google Cloud (VO, Jupyter notebook, APIs…)
- Transient alert stream will be made public through **alert brokers**; however alert database will be restricted
- Data will be public after 2 years, however no concrete plan yet, limited service?)

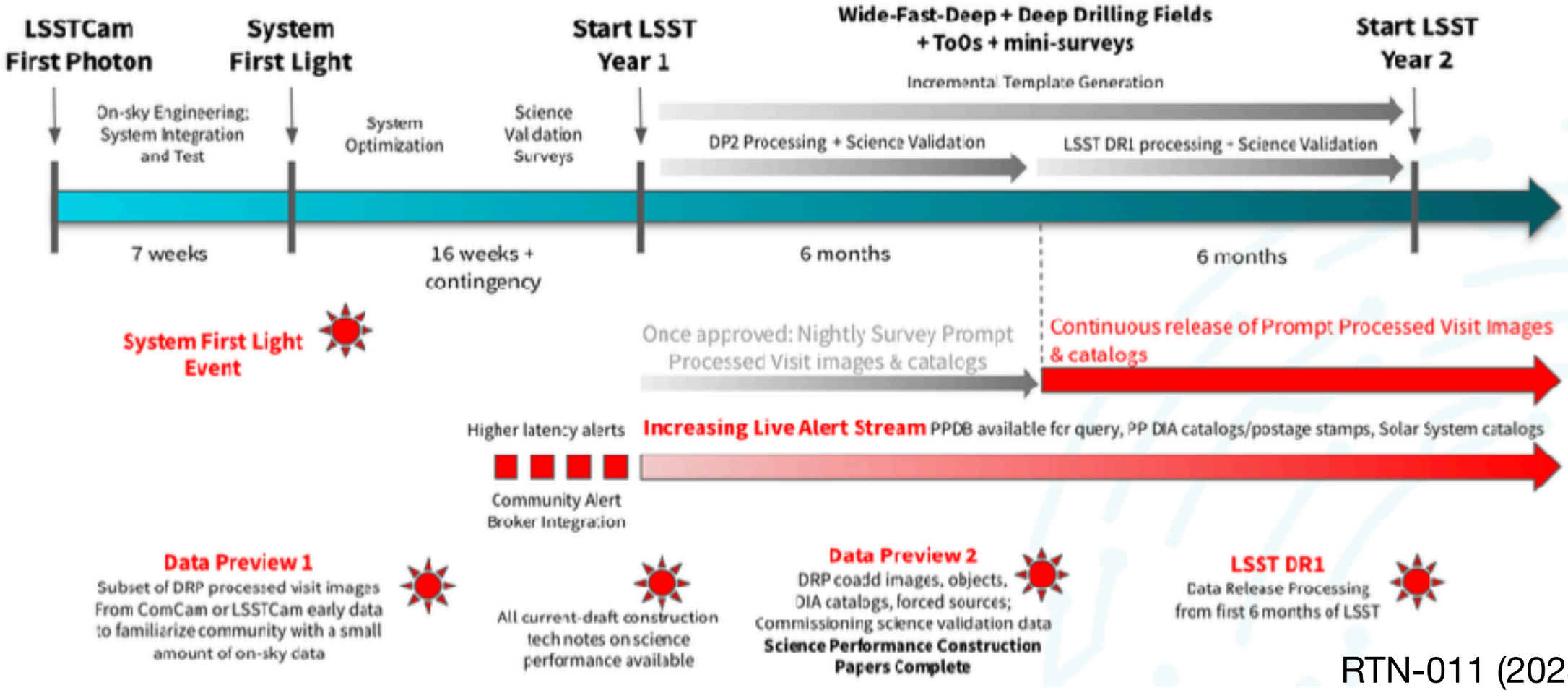
In-kind contribution



- Japanese community (PL: Satoshi Miyazaki) will receive 37~52 (PIs+4JAs) slots in return for in-kind contribution such as Subaru time and data products, computer resources, and workforces
- The first batch of PIs and JAs who work on In-kind contributions is approved.
- Call for proposal for 20—25PI slots (the second batch) was due on December
  - Selection is underway

Schedule

11 Dec 2024 24 Jan 2025 May 2025? :Current forecast (https://www.lsst.org/about/project-status)



RTN-011 (2023-10-31)

- The second batch of PI/JA under selection will have access to DP0 and will likely to have DP1.
  - Get ready for early science using HSC's heritage!
- Observing strategy is still under discussion.
  - How regular observation will be made?
  - ToO https://community.lsst.org/t/rubin-too-2024-berkeley-and-online-on-march-18-20-2024/8180

Summary

- **LSST**
  - 10 years southern sky survey in optical
  - “Well-understood source catalog of stars and galaxies”
- **Construction of Rubin Observatory is underway**
  - Telescope Mount Assembly is in testing
    - Moving, pointing testing with amateur telescope
    - Commissioning Camera (ComCam; 9 CCDs) will be used for initial testing
  - AuxTel (1CCD) observation to verify software readiness scheduler/analysis is in progress
  - LSST Camera will be leaving SLAC soon
- **Analysis using RSP is underway**
  - Detailed characterization and optimization of the Camera
  - DP0.2 (generic field) and DP0.3 (solar system) are available
- **In-kind contribution (JAP-JPG)**
  - DRH selection of 20—25 PIs is in progress
  - Get ready for early science using DP0.2 and DP0.3