



Introduction to Community Participation in Data Preview 0

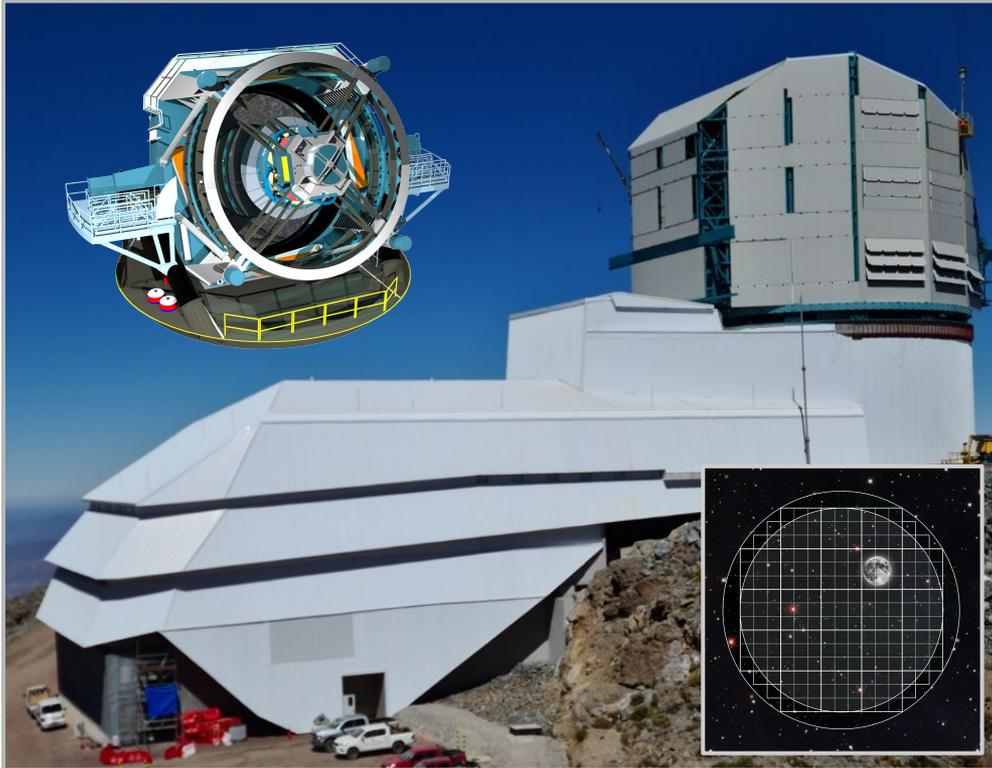
Winter 2022 AAS

Presented by
the Rubin Observatory Community Engagement Team



U.S. DEPARTMENT OF
ENERGY

The Vera C. Rubin Observatory



The Vera C. Rubin Observatory is located on Cerro Pachón in Chile. The Simonyi Survey Telescope's primary mirror has an 8.4 meter diameter and its camera an 9.6 deg^2 field-of-view and six optical-NIR filters: *ugrizy*.

Once construction and commissioning are complete, Rubin Observatory will execute the 10-year Legacy Survey of Space and Time (LSST).

The survey and observatory are designed to make major advances in four core science areas:

1. Probing dark energy and dark matter
2. Taking an inventory of the solar system
3. Exploring the transient optical sky
4. Mapping the Milky Way

This talk provides a basic overview of the process to choose a survey strategy to maximize science.

What is Data Preview 0 (DP0)?

Who: Up to 600 scientists and students (+Rubin Obs. staff).

What: Analyzing *simulated* LSST-like data products.

Where: In the Rubin Science Platform (RSP).

When: DP0.2 application form opens Mar 1, closes Apr 30.

Why: To serve as an early integration test of the LSST science pipelines and the RSP, and to enable the community to prepare to do science with the LSST data set.

Phase 1 (DP0.1) success!

~250 people joined in 2021 and will continue into 2022.

Phase 2 (DP0.2) in 2022

~300 *new* participants will join by June, when Rubin will release simulated data products generated with the latest version of the LSST Science Pipelines, including difference images.

What is Data Preview 0?

Who: Up to **600 scientists and students** (+Rubin Obs. staff).

What: Analyzing *simulated* LSST-like data products.

Where: In the Rubin Science Platform (RSP).

When: DP0.2 application form opens Mar 1, closes Apr 30.

Why: To serve as an early integration test of the LSST science pipelines and the RSP, and to enable the community to prepare to do science with the LSST data set.

600 “DP0 Delegates”

Temporarily capped due to the Rubin pre-operations team’s limited ability to provide support for services that are still in development.

DP0 delegates are invited to learn to use the RSP, provide feedback to Rubin, and share what they learn and do with the broader community.

What is Data Preview 0?

Who: Up to **600 scientists and students** (+Rubin Obs. staff).

What: Analyzing *simulated LSST-like data products*.

Where: In the Rubin Science Platform (RSP).

When: DP0.2 application form opens Mar 1, closes Apr 30.

Why: To serve as an early integration test of the LSST science pipelines and the RSP, and to enable the community to prepare to do science with the LSST data set.

Simulated data products

Images and catalogs from Data Challenge 2 (DC2) by the Dark Energy Science Collaboration (DESC).

“The LSST DESC DC2 Simulated Sky Survey”
[arXiv:2010.05926](https://arxiv.org/abs/2010.05926)

What is in the DESC's DC2 Simulation?

Science Drivers: The core science goals that DC2 was developed to address are all extragalactic, such as weak lensing correlations and Type Ia supernova cosmology.

Simulated DC2 Images Used for DP0: five years of observations of 300 square degrees of extragalactic regions in six filters with the initial (v1) baseline survey strategy (minion_1016).

Extragalactic objects such as clusters, galaxies, Type Ia supernovae, and active galactic nuclei. Extragalactic effects such as weak and strong lensing, and spatial correlations.

Galactic stars, including periodic and non-periodic variability. Galactic effects such as stellar density variations and dust extinction.

DC2 does not include solar system objects or other types of extragalactic transients such as tidal disruption events or core collapse supernovae.

What is Data Preview 0?

Who: Up to **600 scientists and students** (+Rubin Obs. staff).

What: Analyzing *simulated LSST-like data products*.

Where: In the **Rubin Science Platform** (RSP).

When: DP0.2 application form opens Mar 1, closes Apr 30.

Why: To serve as an early integration test of the LSST science pipelines and the RSP, and to enable the community to prepare to do science with the LSST data set.

Rubin Science Platform

The system by which users will access the LSST data products and perform scientific analyses with Rubin-provided compute resources and services, such as Jupyter Notebooks and query interfaces.

What is Data Preview 0?

Who: Up to **600 scientists and students** (+Rubin Obs. staff).

What: Analyzing *simulated LSST-like data products*.

Where: In the **Rubin Science Platform** (RSP).

When: **DP0.2 application form** opens Mar 1, closes Apr 30.

Why: To serve as an early integration test of the LSST science pipelines and the RSP, and to enable the community to prepare to do science with the LSST data set.

DP0.2 Application Form

- no proposal component
- a few multiple-choice questions about yourself (career stage, science interests, etc.)
- see ls.st/rtn-004 for more info

RSP accounts require Rubin data rights. All astronomers and students working or studying in the US and Chile, and all International Program team members, have Rubin data rights. (Rubin Data Policy: ls.st/rdo-013)

How will delegates will be selected for DP0?

The selection process uses a weighted randomized method to prioritize diversity in representation from across the broad astronomical community, such as:

- scientific interests (e.g., cosmology, transients, local volume)
- underrepresented groups (on the basis of, e.g., race, gender)
- institution types (e.g., small/underserved US colleges)
- career stages (e.g., students, early-career researchers)
- global location (e.g., Chilean astronomers)
- novice perspectives (e.g., students, new python users)
- relevant experience (with, e.g., science platforms, DC2)

The selection process is described in detail in the Rubin Tech Note 004, “Guidelines for Community Participation in Data Preview 0” (ls.st/rtn-004).

What is Data Preview 0?

Who: Up to **600 scientists and students** (+Rubin Obs. staff).

What: Analyzing *simulated LSST-like data products*.

Where: In the **Rubin Science Platform** (RSP).

When: **DP0.2 application form** opens Mar 1, closes Apr 30.

Why: To serve as an **early integration test** of the LSST science pipelines and the RSP, and to enable the community to **prepare to do science** with the LSST data set.

Data Previews 1 and 2

The next two Data Previews will be based on commissioning data from the Rubin Observatory, and are planned to start in 2023.

Thus, DP0 is an essential first step as we all prepare for Rubin Observatory to begin the LSST.

At least by the start of Rubin Observatory Operations, **all** data rights holders will be able to have **RSP** accounts.

What are the benefits for DPO delegates?

Have an accelerated learning experience in a supportive environment.

- biweekly virtual seminars with hands-on lessons and co-working sessions
- multiple venues for Q&A and help from Rubin staff and your co-delegates
- open access to documentation and tutorials

Design and test your plans for LSST science.

- have your analysis code ready for the release of commissioning data
- opportunities to collaborate and share your results
- publish/publicize software you build (e.g., analysis tools)

Advocate for developments to maximize LSST science.

- use what you learn to take on a leadership role in your field
- provide feedback to Rubin about its data products and services
- help to enhance Rubin's scientific potential for everyone

Find more information about Rubin's DP0.

Drop by the Rubin Observatory booth in the AAS Exhibit hall and ask us questions.

Visit the Rubin Community Forum ([Community.lsst.org](https://community.lsst.org)).

- Post questions in the “Support - Data Preview 0” category.
- Read DP0-related posts and news.

Subscribe to the science mailing list at lsst.org/scientists.

- Email notifications when **DP0 applications open in March 2022**.

References:

The LSST DESC DC2 Simulated Sky Survey, [arXiv:2010.05926](https://arxiv.org/abs/2010.05926)

Guidelines for Community Participation in Data Preview 0, [ls.st/rtn-004](https://lsst.org/rtn-004)

Rubin's Phase 1 (DP0.1) Documentation, dp0-1.lsst.io

The Rubin Observatory Data Policy, [ls.st/rdo-013](https://lsst.org/rdo-013)

