



Data Preview 0.2: Kick-Off Info Session

Fri Jul 8 09:00 US Pacific
Mon Jul 11 21:00 US Pacific
Tue Jul 12 07:00 US Pacific

Fri Jul 8 16:00 UTC
Tue Jul 12 04:00 UTC
Tue Jul 12 14:00 UTC

Presented by the Rubin Observatory Community Engagement Team



U.S. DEPARTMENT OF
ENERGY

Agenda (1 hour)

1. Welcome & Introduction

- Rubin Observatory
- Rubin Science Platform (RSP)

2. Data Preview Zero (DP0)

- Goals and Timeline
- The DP0 Data Set
- The DP0-Era RSP
- RSP Usage Risks

3. DP0 Delegates

- Expectations
- Suggested Activities
- Virtual Events
- LSST Science Collaborations

4. Resources

- Documentation: dp0-1.lsst.org
- Tutorials: Jupyter Notebooks
- Community Forum ([Community.lsst.org](https://community.lsst.org))

5. Where to Get Support

- Support via the Community Forum
- Technical Assistance via GitHub Issues
- Contacts for the Code of Conduct

6. RSP Account Activation

- Demo RSP Log In

7. Important Links and time for Q&A

Community Engagement Team

We look forward to interacting with you during our live virtual DP0.2 seminar series and in our online Community Forum, and supporting all your DP0-related science.



**Melissa
Graham**



**James
Annis**



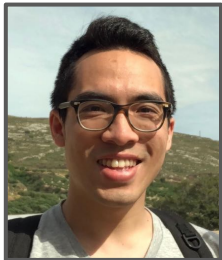
**Greg
Madejski**



**Alex
Drlica-Wagner**



**Tina
Adair**



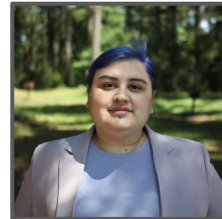
**Ryan
Lau**



**Douglas
Tucker**



**Jeff
Carlin**



**Gloria
Fonseca Alvarez**



**Brian
Nord**



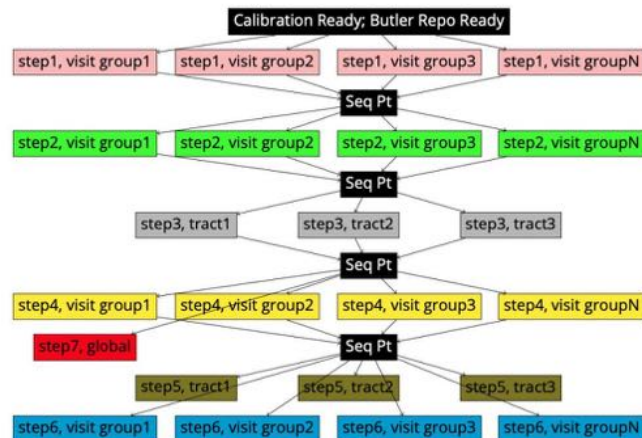
**Christina
Williams**

Rubin Data Production & System Performance

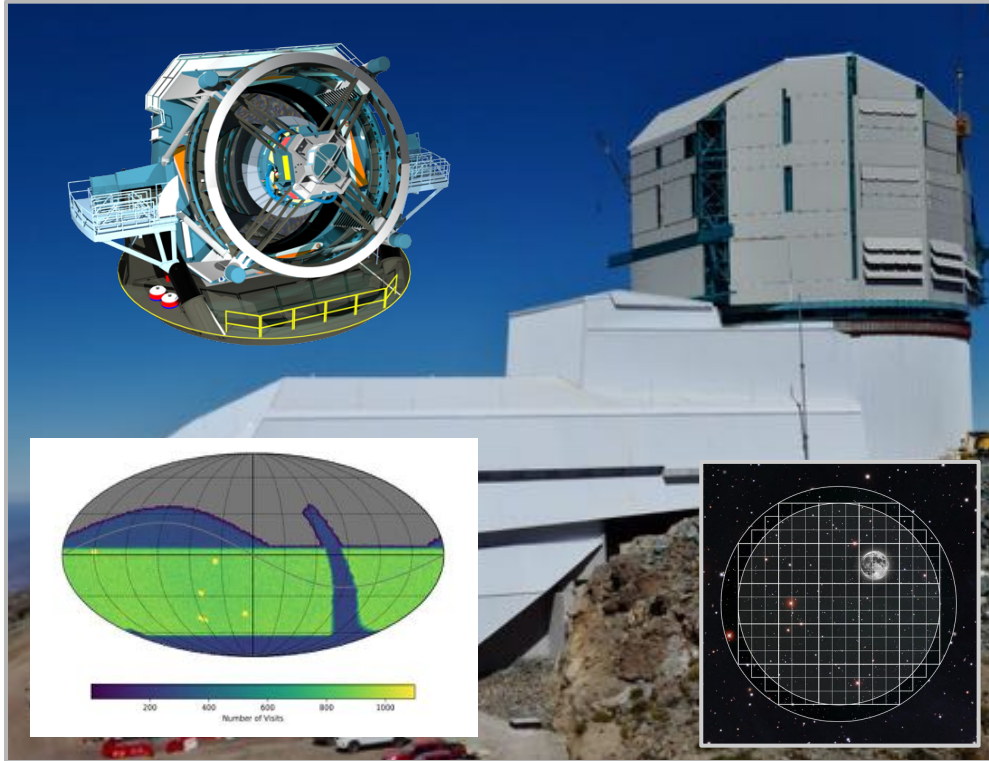
A large team of Rubin staff from the Data Production and System Performance departments have worked hard to bring you to DP0.2:

- Building the LSST science pipelines and middleware,
- Processing the DC2 data, verifying and validating the data products,
- Building the Qserv database, loading the catalogs and testing the performance,
- Building the Rubin Science Platform,
- Developing documentation and tutorials.

We are all very excited to continue working with the community as you start to do science with DP0.2.



The Vera C. Rubin Observatory



The Rubin Observatory, located in Chile, has an 8.4 meter diameter primary mirror and a 9.6 deg² field-of-view camera with six filters, *ugrizy*.

Once complete, Rubin Observatory will execute the **Legacy Survey of Space and Time (LSST)**.

The 10-year southern sky survey will 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

The LSST will cover $\sim\frac{1}{3}$ of the sky each night, detect billions of stars and galaxies, and millions of transients, variables, and moving objects -- a data set of unprecedented volume and complexity.

Rubin Science Platform (RSP)

It will not be possible to download the entire LSST data set, and scientists will need a venue for “**next-to-the-data analysis**”.

The **Rubin Science Platform (RSP)** is a set of integrated web-based applications and services running at the Rubin Observatory Data Access Centers (DACs).



Portal Aspect

exploratory analysis and visualization of the Rubin archive



Notebook Aspect

in-depth ‘next-to-data’ analysis and creation of added-value data products



API Aspect

remote access to the Rubin archive via industry-standard APIs

The RSP will include tools to query, visualize, subset, and analyze the full LSST data archives in a stable software environment located “next-to-the-data”, along with storage space, compute resources, and remote access options.



Data Preview 0 (DP0)

DP0 is the first of three planned data previews between now and Operations.

Rubin's DP0 Goals

- enable the community to prepare for early LSST science with the RSP
- test integration of the LSST science pipelines and the RSP
- use feedback on data products and RSP functionality to inform future development

DP0 Data Set

- simulated LSST-like images and catalogs from the DESC's Data Challenge 2 (DC2)
- future DP data sets will be based on LSST commissioning data from Rubin Observatory

DP0 Timeline

- DP0.1, June 2021: *DC2 as processed by the DESC available in the RSP*
- DP0.2, June 2022: *DC2 as reprocessed by Rubin Data Production available in the RSP*

The DP0 Simulated Data Set

Simulated LSST-like images and catalogs generated by the LSST Dark Energy Science Collaboration (DESC) for their Data Challenge 2 (DC2; [arXiv:2101.04855](https://arxiv.org/abs/2101.04855)).

Simulated images over 300 square degrees with a baseline (fiducial) survey strategy for the wide-fast-deep (WFD) region and cadence only (i.e., no deep drilling fields).

Simulated astrophysical objects in the WFD images include galaxies (with large-scale structure), Type Ia supernovae, and stars (10% have variability).

Imaging data products include:

- processed visit images (PVIs), deep coadds, and difference images

Catalog data products include:

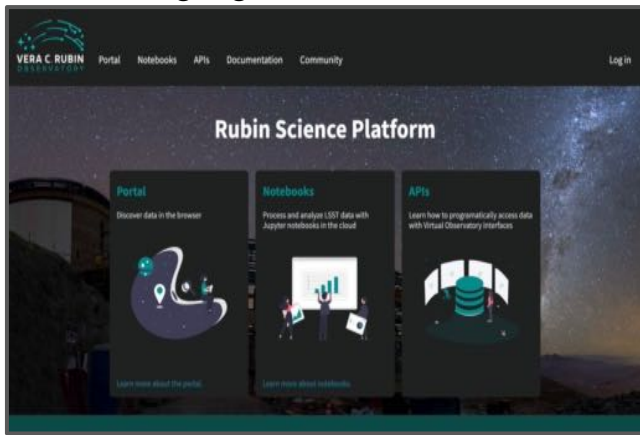
- SNR>5 detections and forced photometry in all image types

**DP0.2 Data
Products
Definitions
and Schema:**
dp0-2.lsst.io

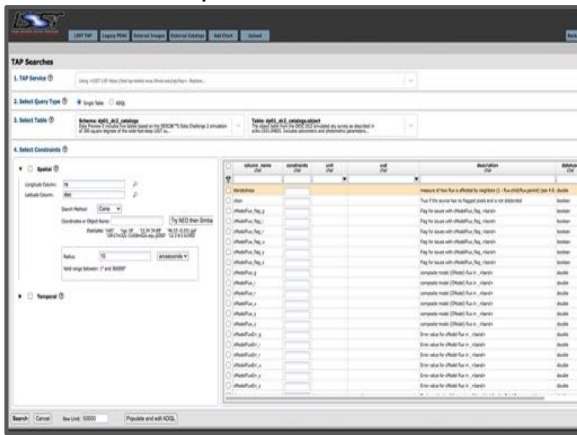
The DP0-Era Rubin Science Platform

The DP0-era RSP provides delegates with access to the data set via the Portal, Notebook, and API Aspects. All three aspects have tools to query, subset, visualize, and analyze the DP0 data set, as well as documentation and tutorials for users. The LSST Science Pipelines (and many other common software packages) are pre-installed in the Notebook environment.

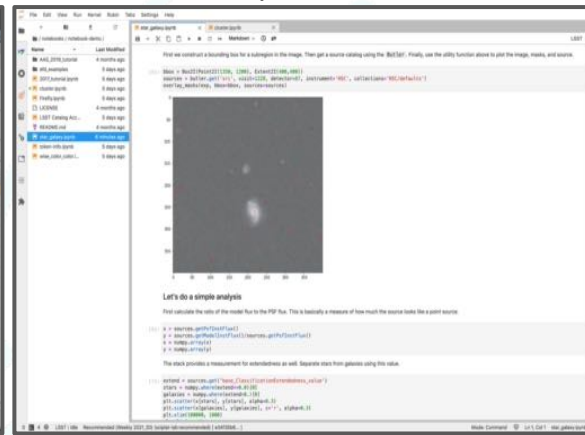
RSP Landing Page



RSP Portal Aspect



RSP Notebook Aspect



The DP0-Era Rubin Science Platform

The RSP and the LSST Science Pipelines are in *active development*.

The software will evolve over the course of your DP0 participation (e.g., bug fixes, functionality expansions, package updates). Code that you write will require some maintenance.

The DP0-Era RSP offers limited functionality compared to the Operations-Era.

This is truly a *preview* of the RSP. Your active use and feedback will be used to guide future development of the science pipelines' functionality and the RSP's tools.

There are some risks inherent in using the DP0-era RSP.

E.g., some data sharing safeguards are not in place, compute resources are finite and shared by all users; we will review the risks. Delegates are responsible for safe use of the RSP.

Rubin staff are limited in their capacity to provide support for RSP use during DP0.

Multiple venues for delegates to ask questions and report issues are provided (this talk will review these venues) but generally, answers and issue resolution may take some time.

RSP Usage Risks

Always shut down your notebooks and log out of Jupyter Lab when you are done working.

Bulk downloads of data from the RSP are not supported; delegates should work *in the RSP*.

Acceptable Use Policy: RSP users may do science and undertake investigations that otherwise further the mission of the observatory, but will lose access if they misuse our resources, interfere with other users, or otherwise do anything that would bring the observatory into disrepute

Use storage space appropriately:

- /home: your space for storing files that other users cannot see (but Rubin staff can)
- /scratch: shared space for all that is not backed up (use this for temporary sharing)
- /project: shared space in which all files are read/writeable by all; be careful!

Advanced Butler users: as there are no global write/delete restrictions, avoid disaster by only writing to your own “u/<user>/*” named collections.

DP0 Delegates

What is a “DP0 Delegate”? A scientist or student who is given an account for the RSP at the Interim Data Facility (IDF; the Google Cloud), via which they can access the DP0 data set.

Why “delegate”? The term reflects their role of representing the broad science community as learners, testers, and providers of feedback, and of sharing the benefits of their DP0 participation with their communities as teachers and colleagues.

Why 600? The total number of delegates is limited to 600 because the Rubin pre-operations team has a limited ability to provide support for services that are still in development.

Will more people be able to join? Yes, Rubin Observatory will continue to scale up the number of RSP users in a safe and sustainable way, until (at least) by the time of Operations, everyone with Rubin data rights who wants an RSP account will be able to get one.

DP0 Delegates

Delegates are expected to:

- Be aware of the usage risks in the RSP's active development environment.
- Use their RSP accounts! Explore the RSP. Access and analyse the DP0 data set.
- Use the [documentation and tutorials](#) to learn to use the RSP.
- Report bugs and issues when they are encountered.
- Do their own DP0-related science at their own pace in the RSP.
- Choose a delegate activity to do for DP0 (next slide).

**Documentation
and tutorials:**
dp0-2.lsst.io

DP0 Delegate Activities

"Delegates are invited to take on a simple activity to inform and improve development of the Rubin Science Platform, and/or extend and enhance the benefits of DP0 within the science community."

Inform and improve the Rubin Science Platform

- complete a feedback survey for Rubin Observatory when requested
- submit bug reports via GitHub issues
- respond to calls to test new features as they arise
- post examples of your DP0-related work in the Community Forum

Extend or enhance the benefits of DP0 in the science community

- join one of the eight LSST Science Collaborations
- help other delegates resolve issues reported in the Community Forum
- participate in the DP0 Delegate Assemblies
- contribute tutorials to the [delegate-contributions-dp02](#) repo
- share your DP0-related work outside of DP0

DP0 Virtual Events

Delegate Assemblies: Fridays, 9-11am US Pacific (biweekly)

- **first hour:** usually a “formal” presentation with Q&A
 - *demonstrations and tutorials by Rubin staff*
 - *presentations from delegates about their DP0 work*
- **second hour:** usually breakout sessions for discussion
 - *“office hours” for Q&A with Rubin staff*
 - *grassroots DP0 science working groups*
- all are welcome to attend one or both hours
- first hour will be recorded and made available

Third Thursdays: monthly at 04:00 and 14:00 UTC

- office hour for drop-in discussions or Q&A with Rubin staff
- Thu Jul 21 2022; to be continued if there is interest

Stack Club: Fridays, 9-11am US Pacific (biweekly)

- informal co-working sessions with Rubin staff present to help out

Schedule and planned content of DP0 Delegate Assemblies

Date	First Hour	Second Hour
2022-07-08	Kick-off info sessions for new delegates (beginner)	Introduction to the DP0.2 Time-Domain Data Products (intermediate)
2022-07-22	Catalog Data with the TAP Service (beginner)	Time-Domain Catalogs in the TAP Service (intermediate)
2022-08-05	Visualizing Image Data (beginner)	<i>breakouts</i>
2022-08-19	Data Query & Retrieval with the Butler (beginner)	Time-Domain Data in the Butler (intermediate)

Additional delegate assemblies to be posted. Rows in *italics* are tentative topics.

Schedules and connection info:
dp0-2.lsst.io

Join the LSST Science Collaborations

All DPO delegates are welcome to join one or more of the eight LSST Science Collaborations. The 8 SCs:

- provide expert advice and analysis to Rubin
- fundraise for their teams and projects
- implement research inclusion practices
- train, educate, & engage the scientific community
- collaborate on software development

SC members enjoy and benefit from a supportive collaborative environment that places them in the best position to generate science with Rubin data!

DPO Partnership Program: The Science Collaborations are looking to pair their long-term members with new-to-Rubin scientists and students from small and/or underserved US institutions. Contact Melissa Graham if you're interested and keep an eye out for future advertising.



Transients and Variable Stars SC



Stars, Milky Way, & Local Volume



Strong Lensing SC



Active Galactic Nuclei SC



Solar System SC



Galaxies SC



Dark Energy SC



Informatics and Statistics SC

First, a tour of the DP0 documentation at dp0-2.lsst.io.

Open in your browser and follow along.

- the main page & sidebar menu
- delegates homepage (seminar schedules, support venues)
- data products definitions document
- data access and analysis tools (RSP user guide)
- tutorials

Jupyter Notebook Tutorials

<https://github.com/rubin-dp0/tutorial-notebooks>

Title	Brief Description
01. Introduction to DP0.2	Use the Jupyter Notebooks and Rubin python packages to access LSST data products.
02. Catalog Queries with TAP	Explore the DP0.2 catalogs via TAP and execute complex queries to retrieve data.
03a. Image Display and Manipulation	Learn how to display and manipulate images using the LSST Science Pipelines.
03b. Image Display with Firefly	Use the Firefly interactive interface for image data.
04a. Introduction to the Butler	Use the Butler to query DP0 images and catalogs.
05. Introduction to Source Detection	Access, display, and manipulate images; detect, deblend, and measure sources; and extract, plot, and use object footprints.
06a. Interactive Image Visualization	Create interactive image visualizations with the HoloViews and Bokeh open-source python libraries.
06b. Interactive Catalog Visualization	Create interactive catalog visualizations for large datasets with HoloViews, Bokeh, and Datashader.
07a. DiaObject Samples	Use the DiaObject table parameters to identify a sample of time-variable objects of interest.
07b. Variable Star Lightcurves	Use the DP0.2 catalogs to identify variable stars and plot their lightcurves.

- These notebooks appear in a read-only folder of your home directory in the RSP.
- It is recommended to copy into another directory if you want to edit and save.
- These notebooks are regularly maintained and updated, which can cause git version control issues for delegates.
- See “Troubleshooting Tips” in the docs for the Notebook Aspect at dp0-2.lsst.io.

Rubin Community Forum

Next, a tour of our Community Forum at [Community.lsst.org](https://community.lsst.org).

Open in your browser and follow along.

- the banner
- navigation and search
- categories and tags
- topics and replies
- notifications (watch the “DP0 RSP Service Issues” category)
- moderation (flagging posts)
- user profiles & direct messaging

Support via the Rubin Community Forum

Category: “Support - Data Preview 0”

- scientific support for everyone, for example:
 - *questions about the contents of the DP0 data set*
 - *how to use various functionality of the RSP*
 - *discussions about unexpected or interesting results of data analyses*

Category: “Support - DP0 RSP Service Issues”

- visible only to “DP0 Delegates” group (*and forum moderators*)
- for discussion of transient or potential issues (*e.g., local or general issue? feature or bug?*)

For both categories, delegates are encouraged to respond to each other’s posts, and help each other to crowd-source solutions to technical or scientific issues when possible.

Use the ‘dp0’ tag for your DP0-related topics.

Technical Assistance via GitHub Issues

Submit a GitHub Issue for:

- bug reports, persistent technical issues (e.g., *did not go away in 5 min or after a refresh*)
- requests for assistance from Rubin staff, e.g.,
 - *connection problems (504 errors)*
 - *slow response times, hanging queries*
 - *authentication issues, login failures*
 - *change in behavior of RSP functionality*

Now, a demonstration of how to submit an issue at
github.com/rubin-dp0/Support

Open in your browser and follow along.

Support for Code of Conduct Violations

Code of Conduct: [ls.st/comms-coc](https://lsst.comms-coc)

- Bullying and harassment will not be tolerated.
- Research inclusion and collaborative work must not be impeded by poor behavior.
- Discussion should be constructive and civil at all times.

If you experience or witness a violation of the COC in the Community Forum, *flag the post*.

community.lsst.org/t/how-and-why-to-flag-a-post

community.lsst.org/t/how-to-react-if-your-post-is-flagged

If you experience or witness a violation of the Code of Conduct in another venue, please reach out to Sandrine Thomas, one of the Rubin Observatory Workplace Culture Advocates:

project.lsst.org/workplace-culture-advocate

Please also feel free to reach out to any Community Engagement Team member at any time.

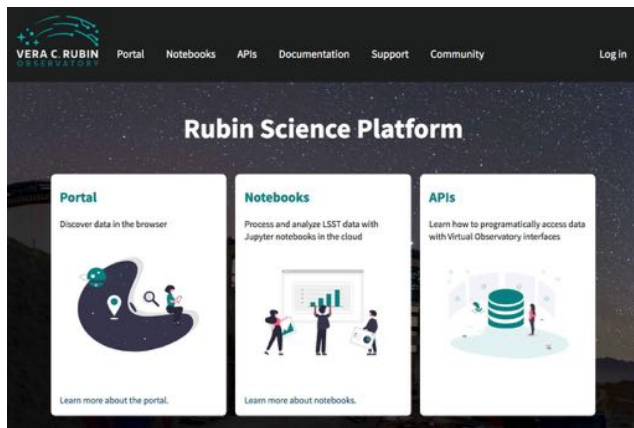
RSP Account Authorization

You must accept the email invitation to join the GitHub Organization “rubin-dp0” and its “Delegates” team in order to access the Rubin Science Platform.

- *Not sure? Check if you can see this list:* github.com/orgs/rubin-dp0/teams/delegates/members

A brief demo of using the Portal and the Notebook Aspects

Open in your browser and follow along (*iff* you’ve accepted the GitHub invite).



Use any web browser
Be logged into GitHub
Navigate to data.lsst.cloud

Note: Documentation available via the link in the top menu bar, and at dp0-2.lsst.io under “Data access and analysis tools”.

Important Links

Rubin Science Platform	data.lsst.cloud
Documentation & Resources	dp0-2.lsst.io
Community Forum	Community.lsst.org
GitHub Org (tutorials & issues)	github.com/rubin-dp0
Virtual events connection info	ls.st/dp0-events
Science Collaborations	lsst.org/scientists/science-collaborations
The LSST DESC DC2 Simulated Sky Survey	arXiv:2010.05926
DESC DC2 Data Release Note	arXiv:2101.04855
Additional Rubin Observatory documents:	
Science Platform Vision Document	lse-319.lsst.io
Observatory Data Policy	ls.st/rdo-013
Code of Conduct	ls.st/comms-coc