

Rubin Science Platform User Experience

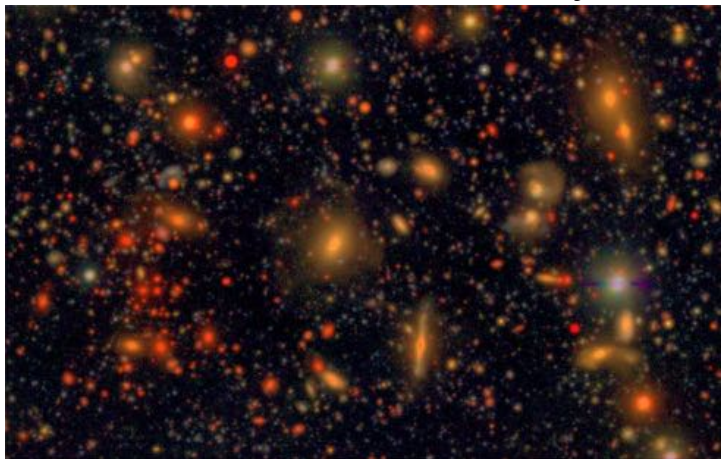
The Legacy Survey of Space and Time (LSST) will cover $\sim\frac{1}{3}$ of the sky each night. Over 10 years: millions of images, billions of objects, and trillions of measurements.

This unprecedented data volume and complexity requires a proportionately innovative and powerful platform for data processing and scientific analysis.



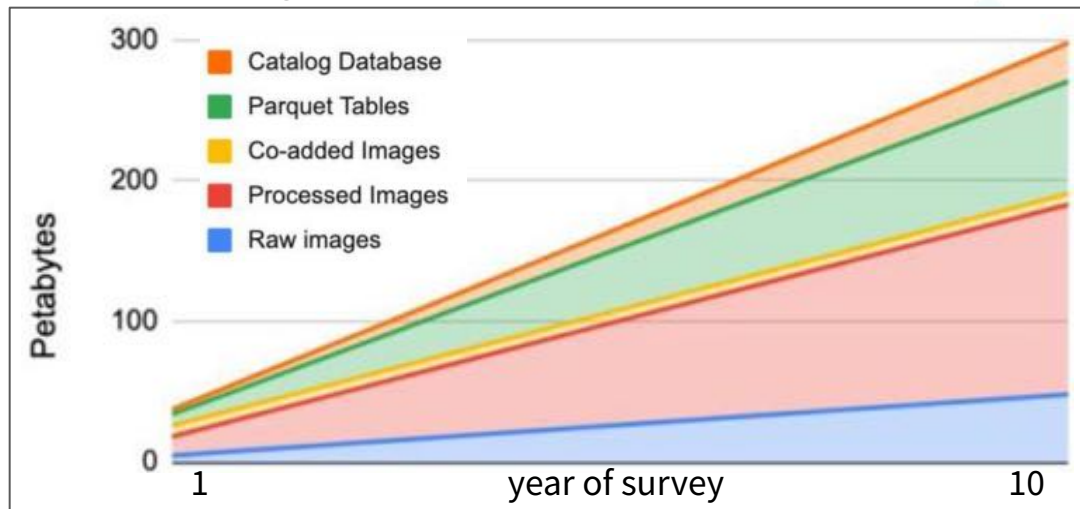
Rubin Science Platform User Experience

The final LSST 10-year sky map will be like having ~3 million of these, tiled over the entire southern sky.



Ivezić et al. 2019

The Rubin Observatory's total data holdings will start at ~40 PB and grow to ~300 PB over the 10-year LSST.



O'Mullane et al. 2021 (RTN-003.lsst.io)

Rubin Science Platform User Experience

Goal: Democratize science by removing barriers to participation in the Legacy Survey of Space and Time (LSST).

- abundant, discoverable documentation of the end-to-end system
- clear entry points and tutorials from beginner through advanced levels
- asynchronous, distributed, friendly support
- a stable software environment with compute resources
- prioritize research inclusion and seed expertise across the community
- enable anyone to become power user and push the cutting edge with LSST

Rubin Science Platform User Experience

Status: In regular use by hundreds of Rubin staff and community members now, and this will increase by >2x in the next year.

- deployed at 12 sites globally (e.g., data facilities, the summit)
- primary community site is the Interim Data Facility (Google Cloud)
 - ~300 users from the science community since June 2021
 - ~300 more new users to join in June 2022
 - Chile/USA/International ~ 15/45/40
- *thousands* of users by the start of Rubin Operations

The Rubin Science Platform was deployed at the Interim Data Facility (Google Cloud) primarily to enable Data Preview 0, which serves simulated LSST-like data. It has been terrific for development, integration, and community engagement.

Rubin Science Platform

Portal

Discover data in the browser



[Learn more about the portal.](#)

Notebooks

Process and analyze LSST data with Jupyter notebooks in the cloud



[Learn more about notebooks.](#)

APIs

Learn how to programmatically access data with Virtual Observatory interfaces





TAP Searches

1. Select TAP Service ⓘ

Using L1557 RSP <https://beta.test.cloud/tap/tap> - Refresh...

2. Select Query Type ⓘ

☒ Single Table (UI assisted) ☐ Full ADQL (advanced)

3. Select Table ⓘ

Table Collection (Schema): **dp001_dc2_catalogs**

Data Preview 0.1 includes five tables based on the DES's Data Challenge 2 simulation of 300 square degrees of the wide-field deep LSS100...

Table: **dp001_dc2_catalogs.object**

The object table from the DES DC2 simulated sky survey as described in arXiv:2011.04605. Includes astrometric and photometric parameters...

4. Enter Constraints ⓘ

34 of 137 columns selected

Reset Column Selections & Constraints

▼ ☒ Spatial ⓘ empty entryLongitude Column: Latitude Column: Shape Type: Coordinates or Object Name: Example: 52.127 160.4 -25.17 141.1m30s -1105.1m50s equ (2000) 238.2 -47.6 gal
NGC 2332 (NB: DC2 is a simulated sky, so names are not useful)Radius:

Valid range between: 1" and 360000"

► ☐ Temporal ⓘ

Output Column Selection and Constraints

☐	column_name char	constraints char	unit char	unit char	description char
☒	objectId			meta:dc2	Unique id.
☒	parentObjectId				Id of the parent object this object is
☒	ra		deg	pm.eq.ra	RA coordinate of the center of the ob
☒	dec		deg	pm.eq.dec	Decl coordinate of the center of the
☒	bandwidth				measure of how flux is affected by n
☒	clean				True if the source has no flagged pro
☒	zModelFlux_flag_g				Flag for issues with zModelFlux_flag
☒	zModelFlux_flag_i				Flag for issues with zModelFlux_flag
☒	zModelFlux_flag_r				Flag for issues with zModelFlux_flag
☒	zModelFlux_flag_u				Flag for issues with zModelFlux_flag
☒	zModelFlux_flag_g				Flag for issues with zModelFlux_flag
☒	zModelFlux_flag_i				Flag for issues with zModelFlux_flag
☒	zModelFlux_flag_r				Flag for issues with zModelFlux_flag
☒	zModelFlux_flag_u				Flag for issues with zModelFlux_flag
☐	zModelFlux_g				composite model (ZModel) flux in _g
☐	zModelFlux_i				composite model (ZModel) flux in _i
☐	zModelFlux_r				composite model (ZModel) flux in _r



TAP Searches

1. Select TAP Service ⓘ

Using LSST RSP <https://data.lsst.cloud/tap/tap> - Refresh...

2. Select Query Type ⓘ

☒ Single Table (if existed) ☐ SQL ADQL (advanced)

3. Select Table ⓘ

Table Collection (Schema): **dp081_dc2_catalogs**

Data Preview 0.1 includes five tables based on the DES's Data Challenge 2 simulation of 300 square degrees of the wide-field deep LSST ss...

Table: **dp081_dc2_catalogs.object**

The object table from the DES DC2 simulated sky survey as described in arXiv:2011.04815. Includes astrometric and photometric parameters...

4. Enter Constraints ⓘ

Remove 1 filter

Reset Column Selections & Constraints

Spatial ⓘ

Longitude Column: Latitude Column: Shape Type: Coordinates or Object Name: [Try NED then Simbad](#)

82.00000, -37.00000 Equ. (J2000) or: 82h00m00.00s, -37d00m00.00s Equ. (J2000)

Radius:

Valid range between: 0.000278 deg and 100 deg

Temporal ⓘ

Output Column Selection and Constraints

☒	column_name char	constraints char	unit char	unit char	description char
☒	ra		deg	j2000.ra	RA coordinate of the center of the object
☒	dec		deg	j2000.dec	Dec coordinate of the center of the object
☒	blendiness				measure of how flux is affected by blending
☒	clean	= 1			True if the source has no flagged neighbors
☒	extendedness	= 0			Either, 1=extended, 0=Point Source
☒	good	= 1			True if the source has no flagged neighbors
☒	mag_g_iModel		mag		Composite model (iModel) magnitude
☒	mag_i_iModel		mag		Composite model (iModel) magnitude
☒	mag_r_iModel		mag		Composite model (iModel) magnitude
☒	mag_u_iModel		mag		Composite model (iModel) magnitude
☒	mag_z_iModel		mag		Composite model (iModel) magnitude
☒	mag_g_iModel		mag		Composite model (iModel) magnitude
☒	mag_r_iModel		mag		Composite model (iModel) magnitude
☒	mag_z_iModel		mag		Composite model (iModel) magnitude
☒	mag_g_iModel	< 0.1	mag	stat.error	Error on mag_g_iModel
☒	mag_r_iModel	< 0.1	mag	stat.error	Error on mag_r_iModel
☒	mag_z_iModel	< 0.1	mag	stat.error	Error on mag_z_iModel



TAP Searches

1. Select TAP Service ⓘ

Using LSST RSP [https://data.lst.cloud/tap/tap](https://data.lsst.cloud/tap/tap) - Replace...

2. Select Query Type ⓘ

☐ Single Table (UI assisted) ☒ Edit ADQL (advanced)

3. Advanced ADQL ⓘ

ADQL edits below will not be reflected in **Single Table** view

- Schema Browser
Schema → Table → Column
- dp11_dc2_catalogs
 - tap_schema
 - user

ADQL Query:

Reset Clear

```
SELECT objectId,ra,dec,blendedness,clean,extendedness,good,mag_g,dModel,mag_i,dModel,mag_r,dModel,
mag_u,dModel,mag_y,dModel,mag_z,dModel,magerr_g,dModel,magerr_i,dModel,magerr_r,dModel,
magerr_u,dModel,magerr_y,dModel,magerr_z,dModel,patch,tract
FROM dp11_dc2_catalogs.object
WHERE CONTAINS(POINT('ICRS', ra, dec),CIRCLE('ICRS', 62.137, 12.1) & 1 AND (clean = 1 AND extendedness = 0 AND good = 1 AND magerr_g,dModel < 0.1 AND magerr_i,dModel < 0.1 AND m
```

Type ADQL text; you can use the Schema Browser on the left to insert table and column names.

☒ Insert fully-qualified column names (recommended for table joins)

Popular Functions

```
TOP n -- limit the results to n number of records
ORDER BY (ASC/DESC) -- used for sorting
POINT('coordinate system', RIGHT_ASCENSION, DECLINATION)
CIRCLE('coordinate system', RIGHT_ASCENSION_CENTER, DECLINATION_CENTER, RADIUS)
BOX('coordinate system', RIGHT_ASCENSION_CENTER, DECLINATION_CENTER, WIDTH, HEIGHT)
POLYGON('coordinate system', POINT1, POINT2, POINTS ...)
DISTANCE(POINTS, POINT2)
CONTAINS(REGION1, REGION2)
INTERSECTS(REGION1, REGION2)
```

Sample Queries

Query the object table to get positions and composite model magnitudes and their errors in three filters using a CONE search to define a region on the sky. Filter on good sources only

```
SELECT objectId, ra, dec, good, mag_g,dModel as mag, mag_i,dModel as imag, mag_r,dModel as mag,
magerr_g,dModel as mag_err, magerr_i,dModel as imag_err, magerr_r,dModel as mag_err
FROM dp11_dc2_catalogs.object
```

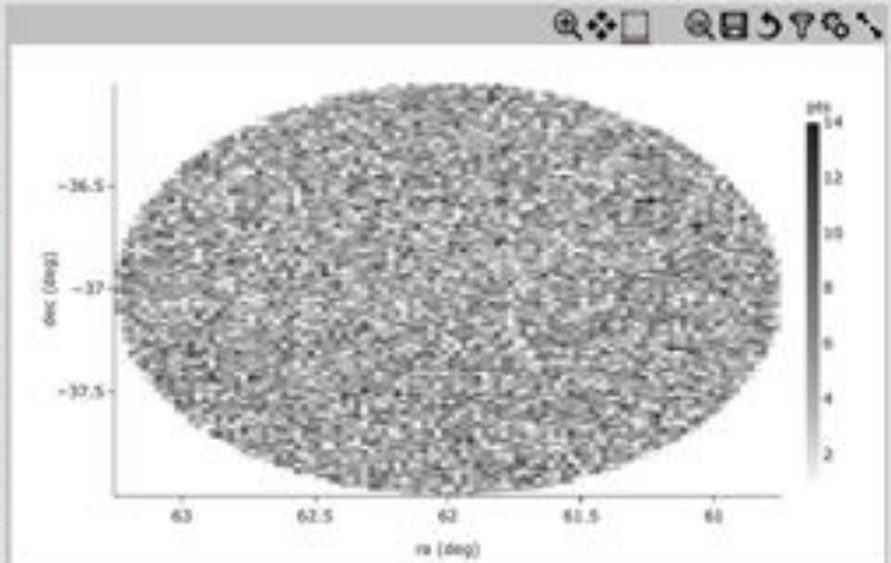
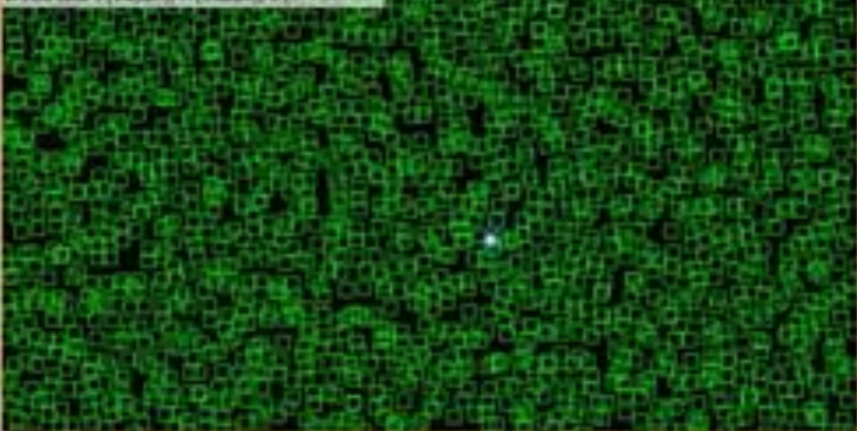
2

	column name char	constraints char	unit char	unit char	description char
☒	objectId			meta.id	Unique id.
☒	parentObjectId				Id of the parent object this object is
☒	ix		deg	pos.deg.ix	AA coordinate of the center of the o
☒	dx		deg	pos.deg.dx	Dist coordinate of the center of the
☒	intensity				measure of how flux is affected by h
☒	clean				True if the source has no flagged po
☒	cModelFux_flag_g				Flag for issues with cModelFux_flag
☒	cModelFux_flag_i				Flag for issues with cModelFux_flag
☒	cModelFux_flag_r				Flag for issues with cModelFux_flag
☒	cModelFux_flag_s				Flag for issues with cModelFux_flag
☒	cModelFux_flag_p				Flag for issues with cModelFux_flag
☒	cModelFux_flag_f				Flag for issues with cModelFux_flag
☐	cModelFux_g				composite model (CModel) flux in _
☐	cModelFux_i				composite model (CModel) flux in _
☐	cModelFux_r				composite model (CModel) flux in _

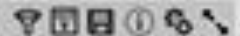
Coverage



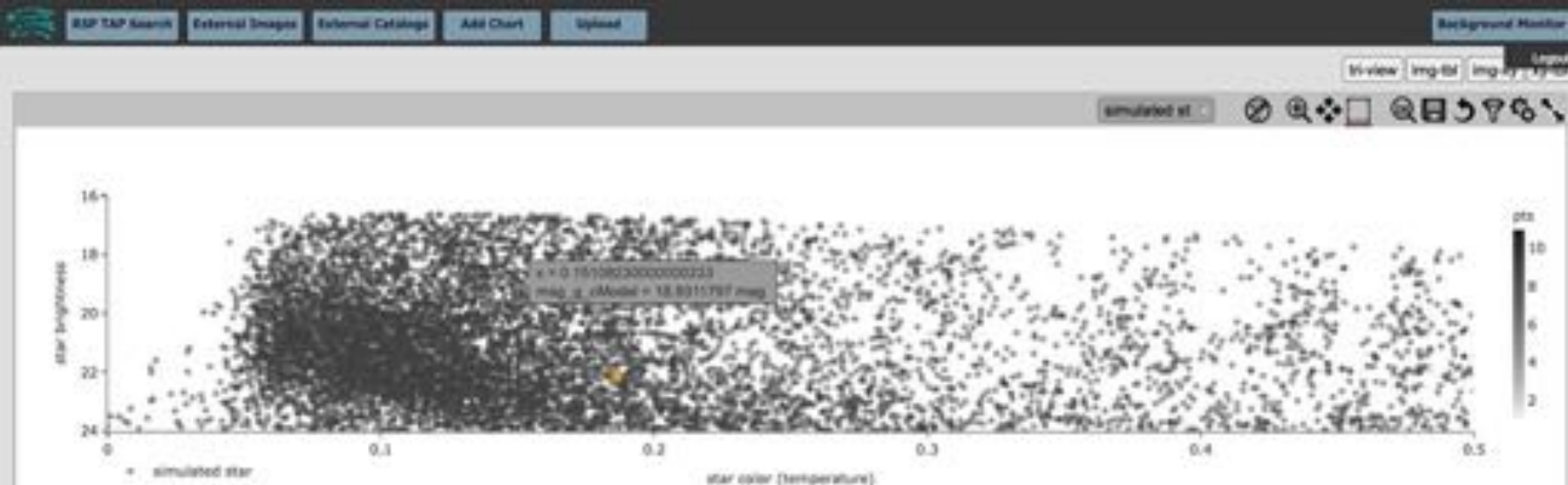
Downloaded from <http://ajphaphysiol.physiology.org/> by guest on September 11, 2012


$$\text{def } \text{obj} :: \text{Object} \rightarrow \text{Object} = \dots$$

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	objectid	ra (deg) double	dec (deg) double	bandwidth	clean	extendedness	good	mag g iModel	mag i iModel	mag r iModel	mag u iModel	mag v iModel	mag z iModel	magerr g iModel
	long			double	boolean	double	boolean	(mag) double	(mag) double	(mag) double	(mag) double	(mag) double	(mag) double	(mag) double
☐	10996541564413673	60.8402575	-37.3941537	0.0	true	0.0	true	26.0742779	24.7382984	25.0612575	26.3030009	24.3176283	24.9626702	0.001171
☐	10996541564413707	60.8476432	-37.3933083	0.0	true	0.0	true	23.5732318	22.7333267	22.9603099	25.1944761	22.5031942	22.642108	0.0006093
☐	10996541564414034	60.8185057	-37.2985689	0.0	true	0.0	true	25.101279	23.2379439	25.0858753	25.2979425	24.736753	25.1128945	0.0068449
☐	10996541564416812	60.7946262	-37.237192	0.0	true	0.0	true	23.125750	21.4143259	21.6079817	23.3883087	21.2931240	21.3115438	0.0010108
☐	10996541564417027	60.8274044	-37.2326197	0.0	true	0.0	true	25.0449238	23.3446899	25.1446919	25.3961747	24.8677645	24.8619526	0.005344
☐	10996541564418038	60.8395523	-37.2013608	0.0	true	0.0	true	23.7520144	23.2725236	23.4180334	24.8036768	23.1261180	23.3382083	0.0107947
☐	10996541564418571	60.8286939	-37.2007057	0.0	true	0.0	true	25.2157390	25.1036956	25.062647	24.9128296	25.0166694	24.5726074	0.0068634
☐	10996541564419406	60.8068498	-37.1936574	0.0	true	0.0	true	22.3936185	21.993901	22.0189829	23.0054418	22.0195134	21.8367723	0.0012689
☐	10996541564418679	60.7806827	-37.1881824	0.0	true	0.0	true	25.1715708	24.8381187	25.1619889	25.1510686	24.1883820	24.626293	0.0010181



sp01_s02_catalog object ...

1 of 17

objectid	ra (deg)	dec (deg)	blendedness	clean	extendedness	good	mag_g_cModel	mag_i_cModel	mag_r_cModel	mag_u_cModel	mag_v_cModel	mag_z_cModel	mag_g_cModel
avg	double	double	double	boolean	double	boolean	< 24	< 24	< 24				
15996541364413707	60.8478432	-37.3010083	0.0	true		true	23.5732168	22.7310267	22.9813399	25.2340761	21.503240	22.642108	0.000995
15996541364416812	60.7948092	-37.2375182	0.0	true		true	22.1357555	21.4453226	21.6029667	23.3883087	21.2911140	21.3515438	0.000119
15996541364418138	60.8395317	-37.3513828	0.0	true		true	23.7730144	23.2725136	23.4190104	24.8636768	23.1361181	23.3285083	0.0107847
15996541364419406	60.8068498	-37.2636574	0.0	true		true	22.2416185	21.958811	22.0180829	23.8024416	22.0185234	21.5367722	0.0002880
15996541364415480	60.8309172	-37.2613785	0.0	true		true	22.6807162	22.0639671	22.1045110	23.7487345	21.957634	22.0110912	0.0043173
15996541364415505	60.790786	-37.2647095	0.0	true		true	22.0143172	20.8369473	20.7766046	24.5140958	19.5338305	19.6875861	0.0029061
15996541364414477	60.8045258	-37.286886	0.0	true		true	22.998878	20.7458985	21.8130390	25.509068	20.0686670	20.2817514	0.0061618
15996541364448831	60.7883101	-37.2350952	8.1e-6	true		true	20.3837629	20.0394781	20.1240778	21.14847	20.0481507	20.0321012	9.585e-6
15996541364448813	60.8457087	-37.2417521	2.3e-6	true		true	22.6295203	20.6453522	21.3879308	25.0640367	20.1380911	20.3185223	0.0042749
15996541364448052	60.8152739	-37.2368175	4.3e-5	true		true	22.5382736	21.6955894	21.8823918	23.4191822	21.6415828	21.6799331	0.0033385
15996541364448038	60.8269415	-37.242514	0.0	true		true	22.957629	20.3962681	21.809469	25.2185345	19.5399820	19.8055281	0.0059196
15996541364445029	60.8310417	-37.2308957	0.0	true		true	18.8006491	18.277961	18.4268419	19.7347949	18.2040887	18.2241033	4.468e-6
15996541364445278	60.8135357	-37.2342685	0.0	true		true	23.3811794	22.7799081	22.9156734	24.1587552	22.7481353	22.8975031	0.0077706

Rubin Science Platform

Portal

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02_Intermediate_TAP_Query.ipynb	6 hours ago
03_Image_Display_and_Manipulation...	6 hours ago
03b_Image_Display_with_Firefly.ipynb	22 days ago
04_Intro_to_Butler.ipynb	2 days ago
05_Intro_to_Source_Detection.ipynb	22 days ago
06_Comparing_Object_and_Truth-Ta...	22 days ago
08a_interactive_image_visualization.i...	6 hours ago
08b_interactive_Catalog_Visualizatio...	2 hours ago
09_Single_Star_Lightcurve_with_Butl...	6 hours ago
README.md	22 days ago

Launcher

melissagraham@nb-meli X

01_Intro_to_DPO_Notebo X

08b_interactive_Catalog_X

notebooks/tutorial-notebooks

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Terminal

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Markdown File

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03_image_Display_and_Manip...

03b_image_Display_with_Fit...

04_intro_to_Butler.ipynb

05_intro_to_Source_Detectio...

06_Comparing_Object_and...

08a_interactive_Image_Visua...

08b_interactive_Catalog_Vis...

09_Single_Star_Lightcurve...

README.md

Launcher

melissagraham@rib-melli...

01_intro_to_DP0_Notebo...

08b_interactive_CatLog...

LSST

Code

LSST



VERA C. RUBIN
OBSERVATORY

Introduction to Jupyter Notebooks for Data Preview 0

Last verified to run on 2022-04-18 with LSST Science Pipelines release w_2022_12

Contact author: Melissa Graham

Target audience: All DP0 delegates, especially those new to Notebooks.

Container Size: medium

Questions welcome at community.lsst.org/c/support/dp0

Find DP0 documentation and resources at dp0-1.lsst.io

Credit: Originally developed by Melissa Graham in the context of the Rubin DP0.1. Please consider acknowledging Melissa Graham if this notebook is used for the preparation of journal articles or software releases.

1.0 Introduction

This Jupyter Notebook will illustrate how notebooks work, introduce you to a few Python packages, and show off a bit of the functionality of the Rubin Science Platform (RSP) and the DESC's Data Challenge 2 (DC2) simulated data set for Data Preview 0 (DP0).

This notebook will teach you how to execute a Jupyter Notebook (including importing and using Python packages), query a DP0.1 catalog and retrieve desired columns of data (Section 2), and retrieve a DP0.1 image at a given coordinate (Section 3). **This notebook does not go into much detail - it's more of an appetizer than an entree!**

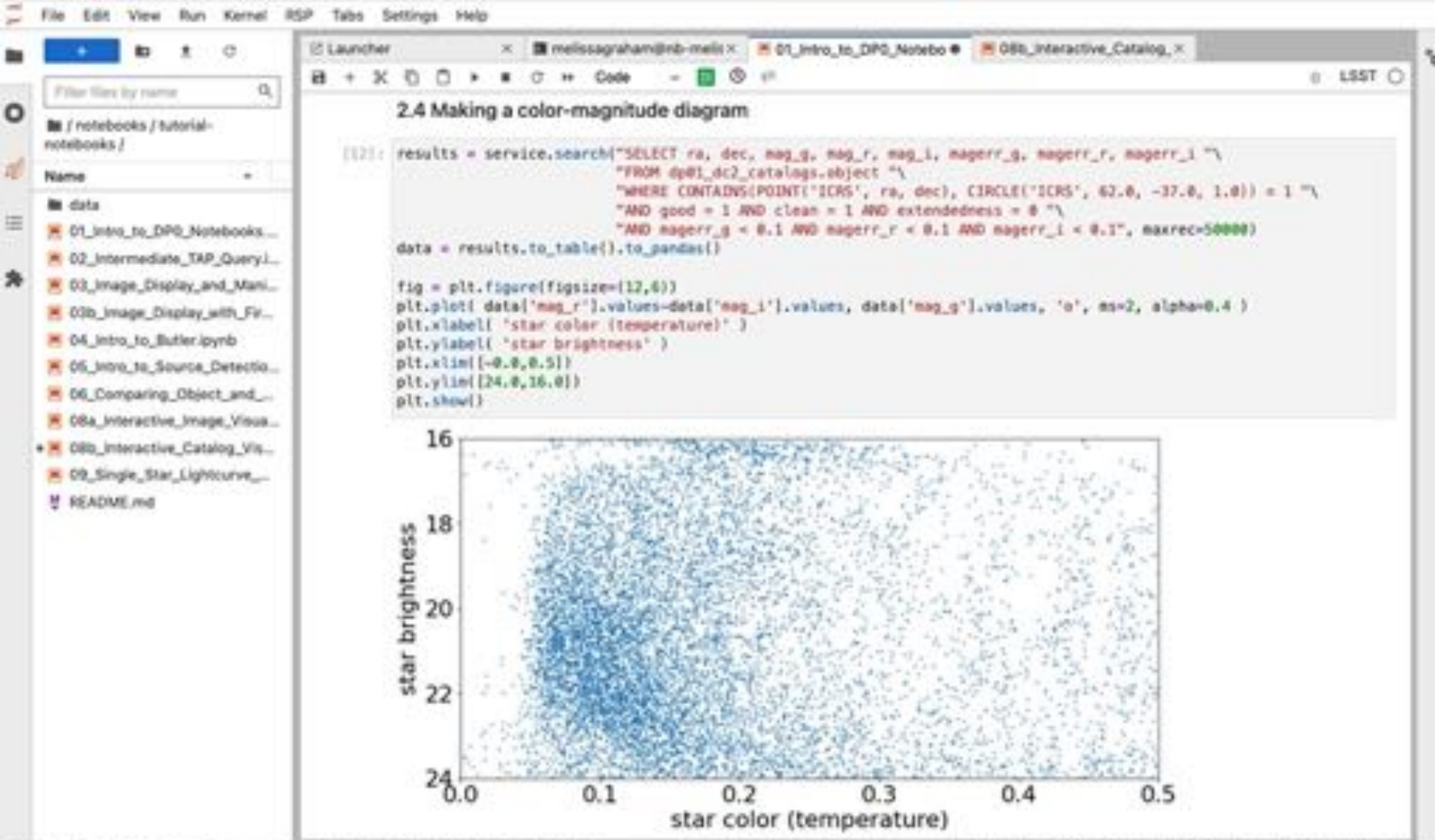
Table of Contents

If you want to see a ToC for this notebook, click on the icon of a bullet list in the leftmost vertical menu bar, and an automatically-generated ToC will appear at left. Click on the icon of the file folder at the top of the leftmost vertical menu bar to return to a directory view.

1.1 What is a Jupyter Notebook?

1 2 LSST | Idle Recommended (Weekly 2022_12) [168a239d...] (scikit-lab:recommended) data.lsst.cloud Mode: Command Ln 1, Col 1 01_intro_to_DP0_Notebooks_NSF_Site_Visit.ipynb

14



File Edit View Run Kernel RSP Tabs Settings Help

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01_Intro_to_DPO_Notebooks...

02_intermediate_TAP_Query...

03_Image_Display_and_Man...

03b_Image_Display_with_Fr...

04_Intro_to_Butler.ipynb

05_Intro_to_Source_Detectio...

06_Comparing_Object_and...

08a_interactive_image_Visua...

08b_interactive_Catalog_Vis...

09_Single_Star_Lightcurve...

README.md

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Markdown

27

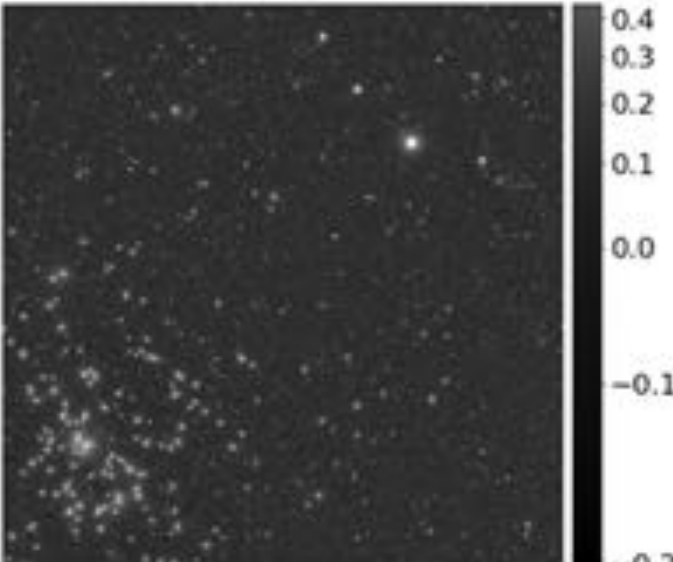
LSST

3.1 Retrieve and display an image with the butler

```
[21]: dataId = {'band': 'i', 'tract': 4431, 'patch': 17}
      my_deepCoadd = butler.get('deepCoadd', dataId=dataId)

      fig = plt.figure(figsize=(10,8))          # create a matplotlib.pyplot figure
      afw_display = afwDisplay.Display(1)      # create an alias for the lsst.afw.display.Display() method
      afw_display.scale('asinh', 'zscale')     # set the algorithm and scale for the pixel shading
      afw_display.stv(my_deepCoadd.image)      # display the image data you retrieved with the butler
      plt.gca().axis('off')                    # turn off the x and y axes labels

[22]: (11899.5, 16899.5, 7899.5, 12899.5)
```



2

2

LSST | idle

Recommended (Weekly 2022.12) [16ba239d...]

(scipy-lab-recommended) data.lsst.cloud

Mode: Command

Ln 1, Col 1

01_Intro_to_DPO_Notebooks_NSF_Site_Visit.ipynb

Rubin Science Platform User Experience

The butler: a powerful component of the LSST Science Pipelines.

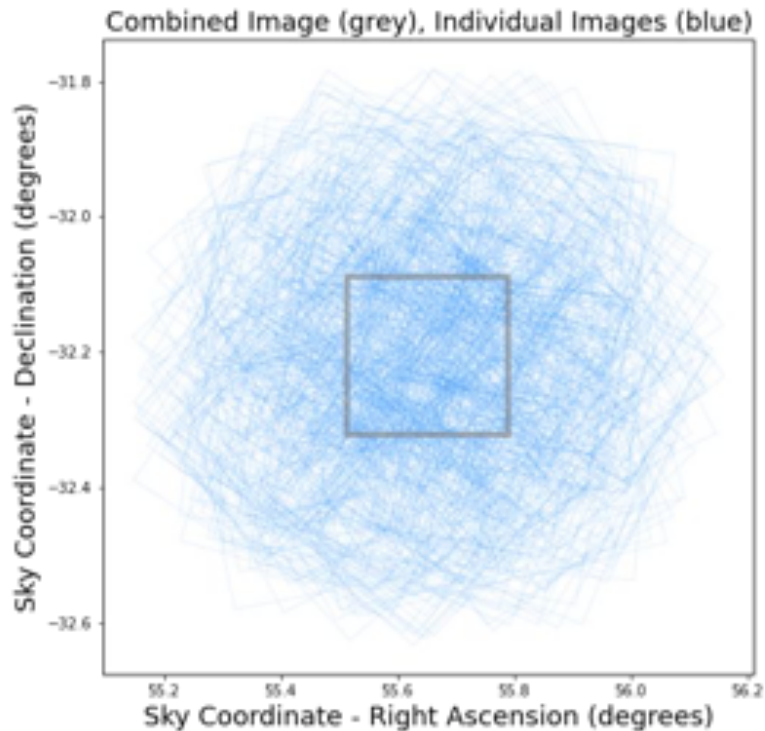


The butler allows users to ignore what is happening “behind the scenes” in terms of where and how the millions of images are stored (or compressed).

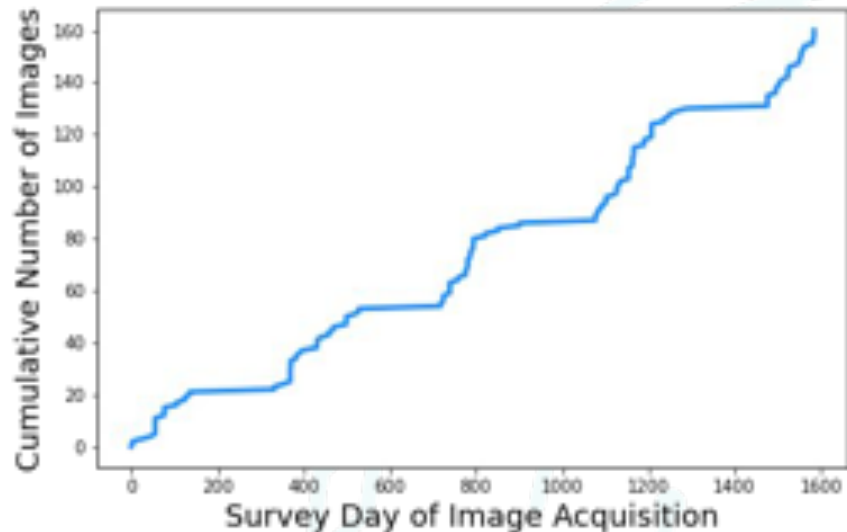


The butler enables users to flexibly query and retrieve *only the data they want* (e.g., full or cropped images, metadata).

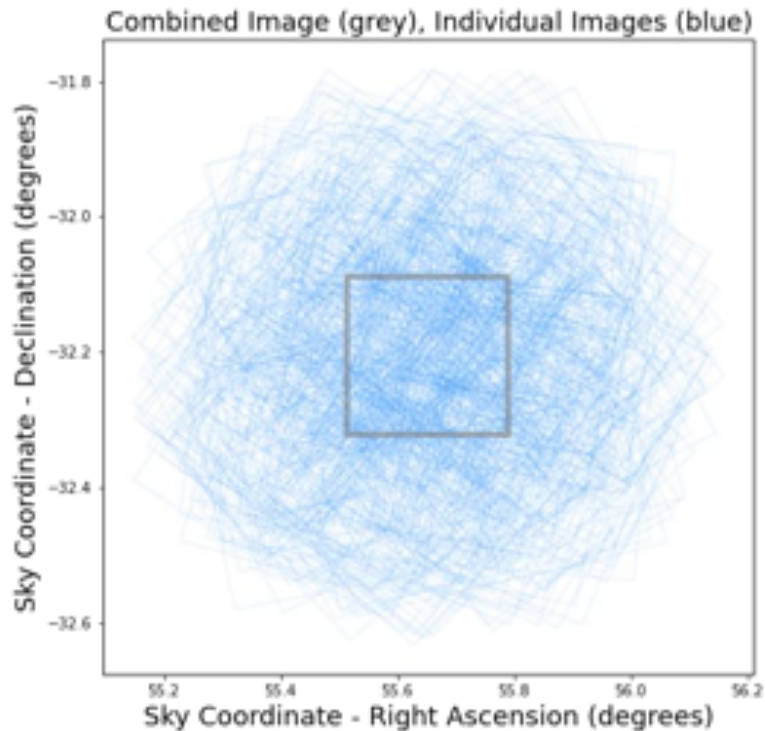
Rubin Science Platform User Experience



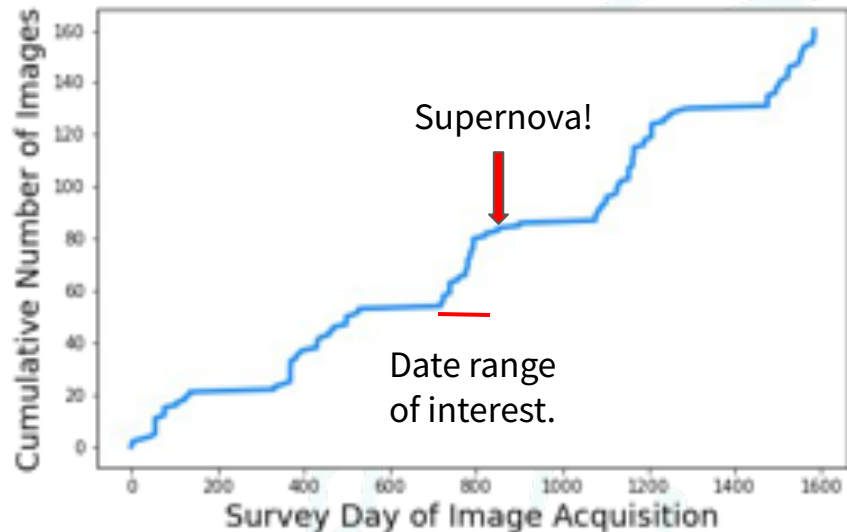
With a couple lines of code and a short wait, users can find all the individual images overlapping any region of sky (left) and metadata like acquisition date (below).



Rubin Science Platform User Experience



With a couple lines of code and a short wait, users can find all the individual images overlapping any region of sky (left) and metadata like acquisition date (below).



The screenshot shows a JupyterLab environment. On the left is a file browser pane with a search bar and a list of files. The file `08b_Interactive_Catalog_Visualization.ipynb` is selected. The main pane displays the content of this notebook. At the top, there's a logo for the VERA C. RUBIN OBSERVATORY. Below the logo is the title 'Interactive Catalog Visualization' and a paragraph of introductory text. This is followed by a section titled 'Learning Objectives' which lists three points: 1. **HoloViews**: Produce high-quality interactive visualizations easily by annotating plots and images rather than using direct calls to a plotting library. 2. **Bokeh**: A powerful data visualization library that provides interactive tools including brushing and linking between multiple plots. **HoloViews + Bokeh**. 3. **Datashader**: Accurately render very large datasets quickly and flexibly. The notebook concludes with a paragraph about the Holoviz ecosystem and its community.

File Browser (Left):

- Filter files by name
- / notebooks / tutorial-notebooks /
- Name
- data
- 01_Intro_to_DP0_Notebooks...
- 02_Intermediate_TAP_Query...
- 03_Image_Display_and_Man...
- 03b_Image_Display_with_Fr...
- 04_Intro_to_Butler.ipynb
- 05_Intro_to_Source_Detectio...
- 06_Comparing_Object_and...
- 08a_Interactive_Image_Visua...
- 08b_Interactive_Catalog_Vis...**
- 09_Single_Star_LightCurve...
- README.md

Notebook Content (Right):

Interactive Catalog Visualization

Last verified to run on 2022-04-18 with LSST Science Pipelines release w_2022_12

Contact authors: Leanne Guy

Target audience: All DP0 delegates.

Minimum Container Size: medium

Questions welcome at community.lsst.org/c/support/dp0

Find DP0 documentation and resources at dp0-1.lsst.io

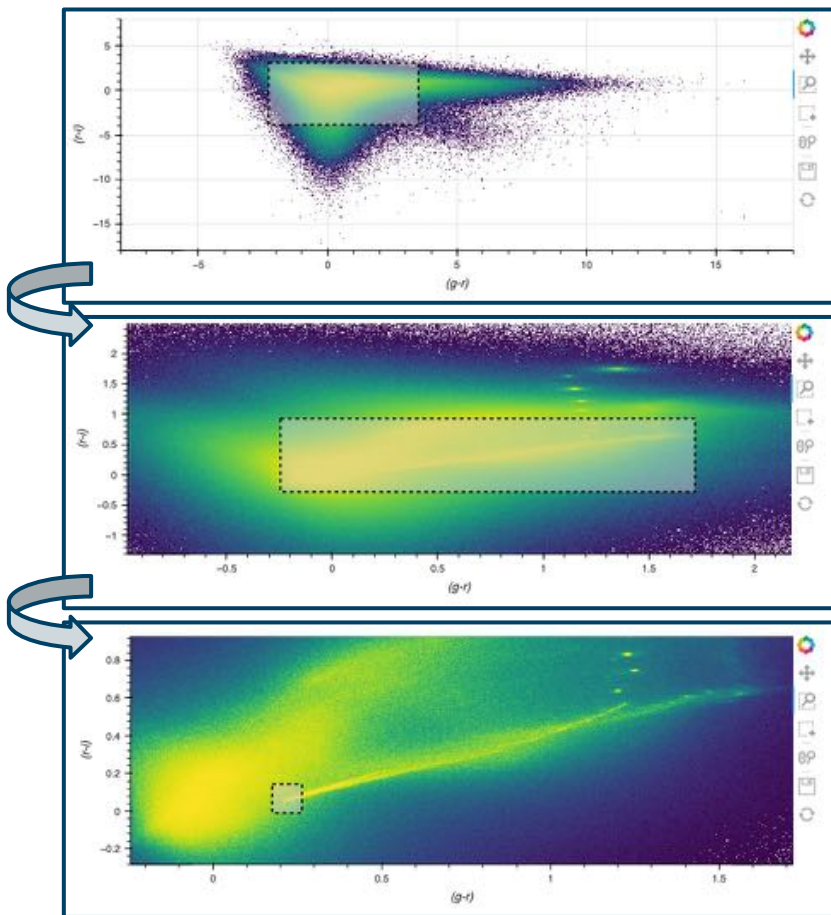
Credit: This tutorial was inspired by a notebook originally developed by Keith Bechtol in the context of the LSST Stack Club. It has been updated and extended for DP0.1 by Leanne Guy. Please consider acknowledging Leanne Guy and Keith Bechtol in any publications or software releases that make use of this notebook's contents.

Learning Objectives

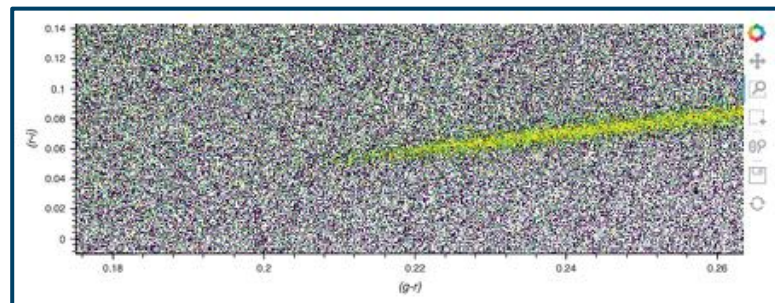
This tutorial, together with tutorial `08a_Interactive_Image_Visualization`, introduces three open-source Python libraries that enable powerful interactive visualization of catalogs.

1. **HoloViews**: Produce high-quality interactive visualizations easily by annotating plots and images rather than using direct calls to a plotting library
2. **Bokeh**: A powerful data visualization library that provides interactive tools including brushing and linking between multiple plots. **HoloViews + Bokeh**
3. **Datashader**: Accurately render very large datasets quickly and flexibly.

These packages are part of the **Holoviz** ecosystem of tools intended for visualization in a web browser and can be used to create quite sophisticated dashboard-like interactive displays and widgets. The goal of this tutorial is to provide an introduction and starting point from which to create more advanced, custom interactive visualizations. Holoviz has a [vibrant and active community](#) where you can ask questions and discuss visualizations with a global community.

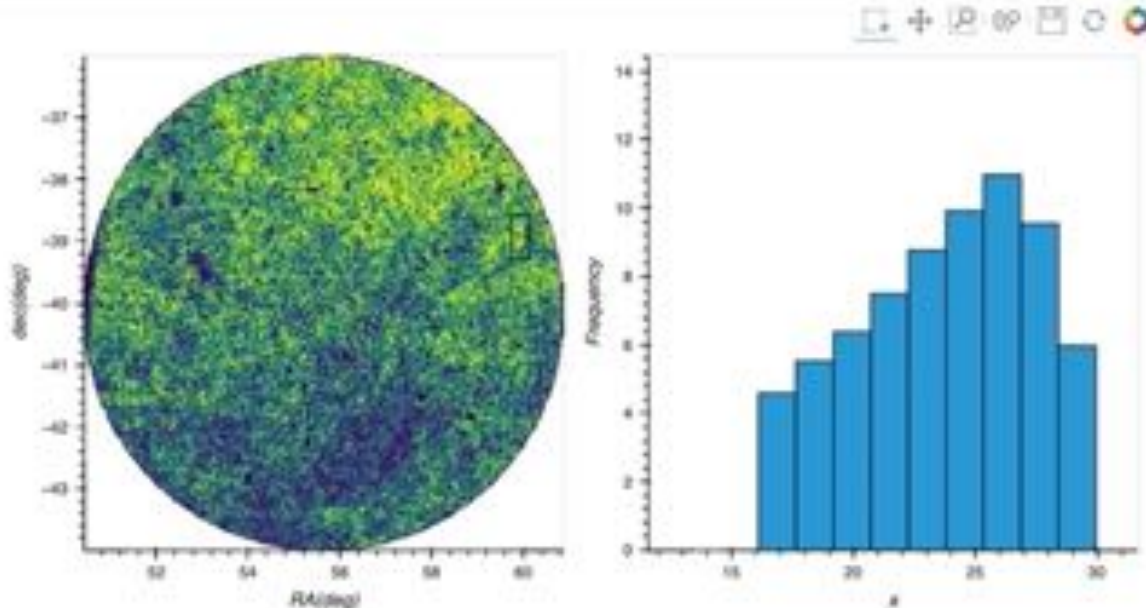


Users can interact with plots of millions to billions of objects using software that *automatically* rasterizes or aggregates datasets into regular grids, only plotting individual points where and when they can be distinguished.



```
[49]: dmap = hv.DynamicMap(update_histogram, streams=[box]).options(
    height=400, width=400)
    datashade(points,
        cmap=process_cmap("Viridis", provider="bokeh")) + \
    box_plot.options(height=400, width=400) + \
    dmap
```

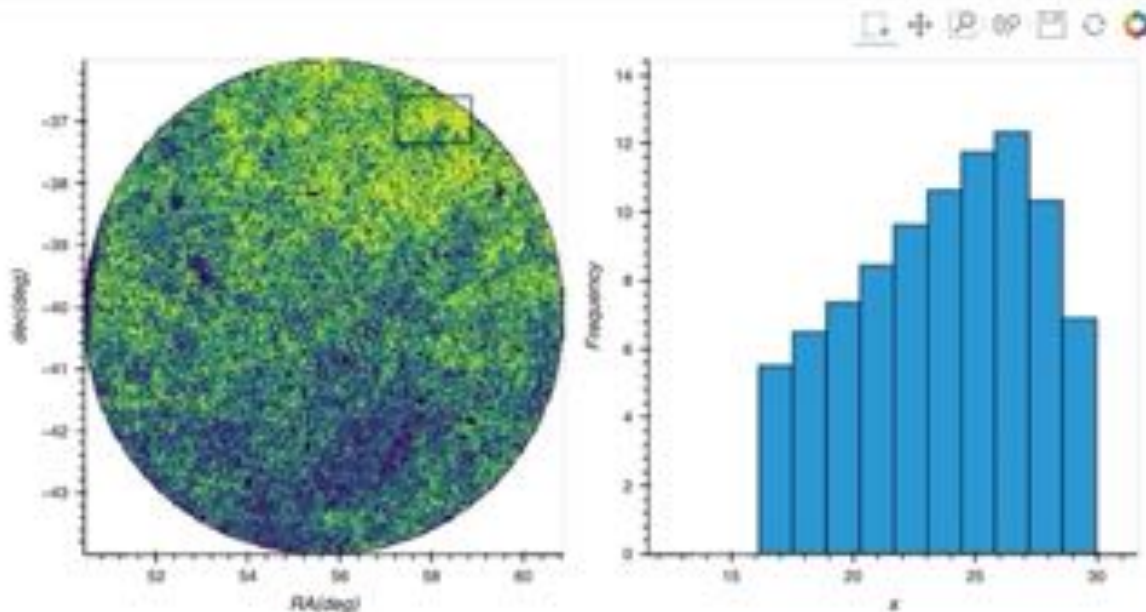
[49]:



Try changing the box selection and watch as the histogram is recomputed and displayed.

```
[49]: dmap = hv.DynamicMap(update_histogram, streams=[box]).options(
    height=400, width=400)
    datashade(points,
        cmap=process_cmap("Viridis", provider="bokeh")) + \
    box_plot.options(height=400, width=400) + \
    dmap
```

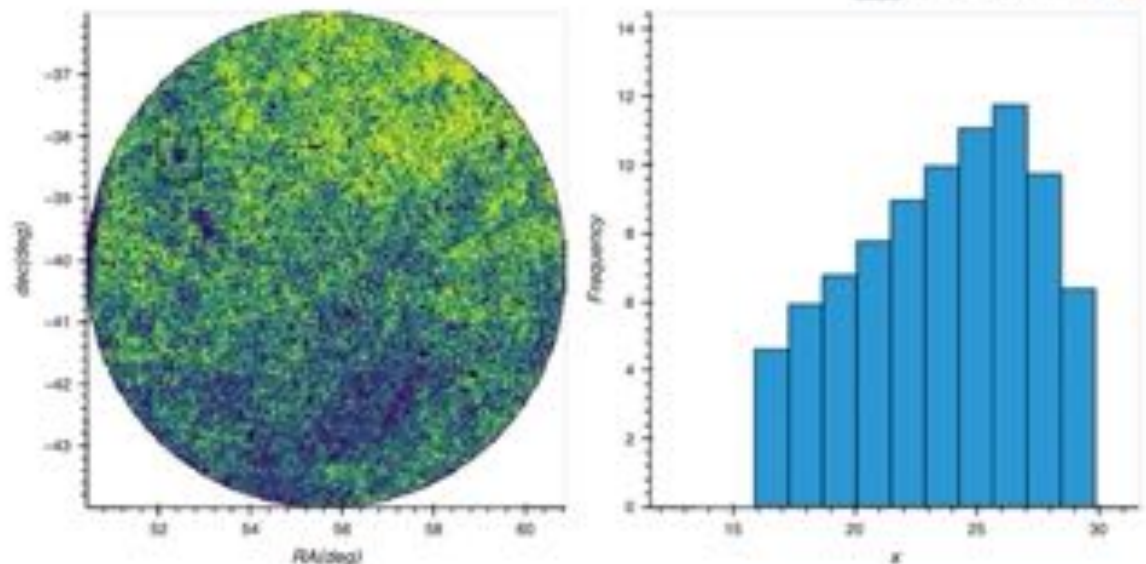
[49]:



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[49]: dmapp = hv.DynamicMap(update_histogram, streams=[box]).options(
    height=400, width=400)
dashade(points,
    cmap=process_cmap("Viridis", provider="bokeh")) + \
box_plot.options(height=400, width=400) + \
dmapp
```

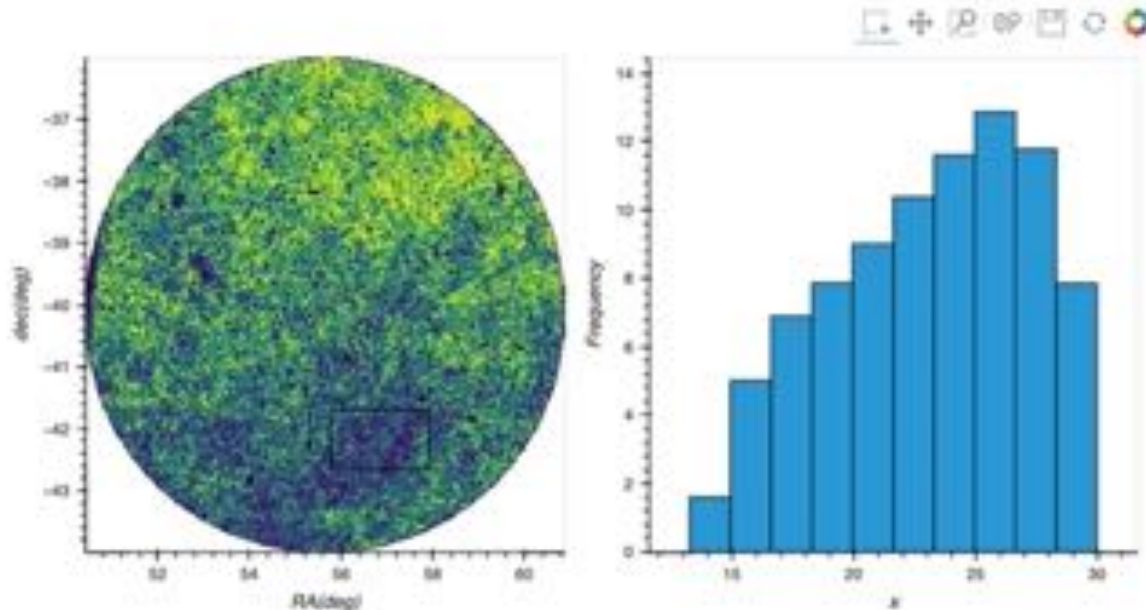
[49]:



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```
[49]: dmap = hv.DynamicMap(update_histogram, streams=[box]).options(
    height=400, width=400)
    datashade(points,
        cmap=process_cmap("Viridis", provider="bokeh")) + \
    box_plot.options(height=400, width=400) + \
    dmap
```

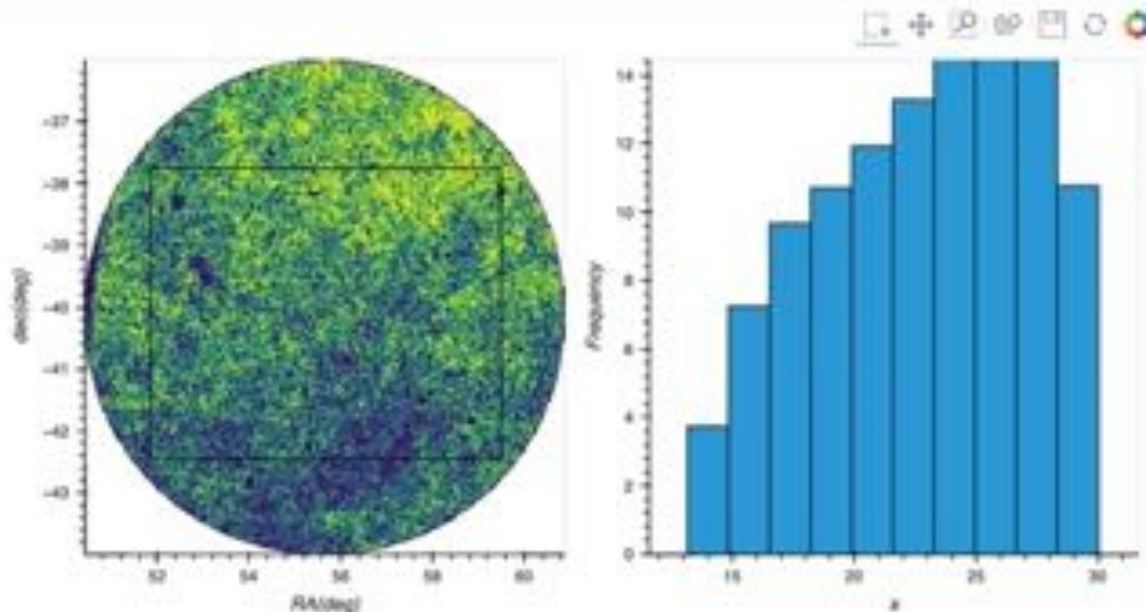
[49]:



Try changing the box selection and watch as the histogram is recomputed and displayed.

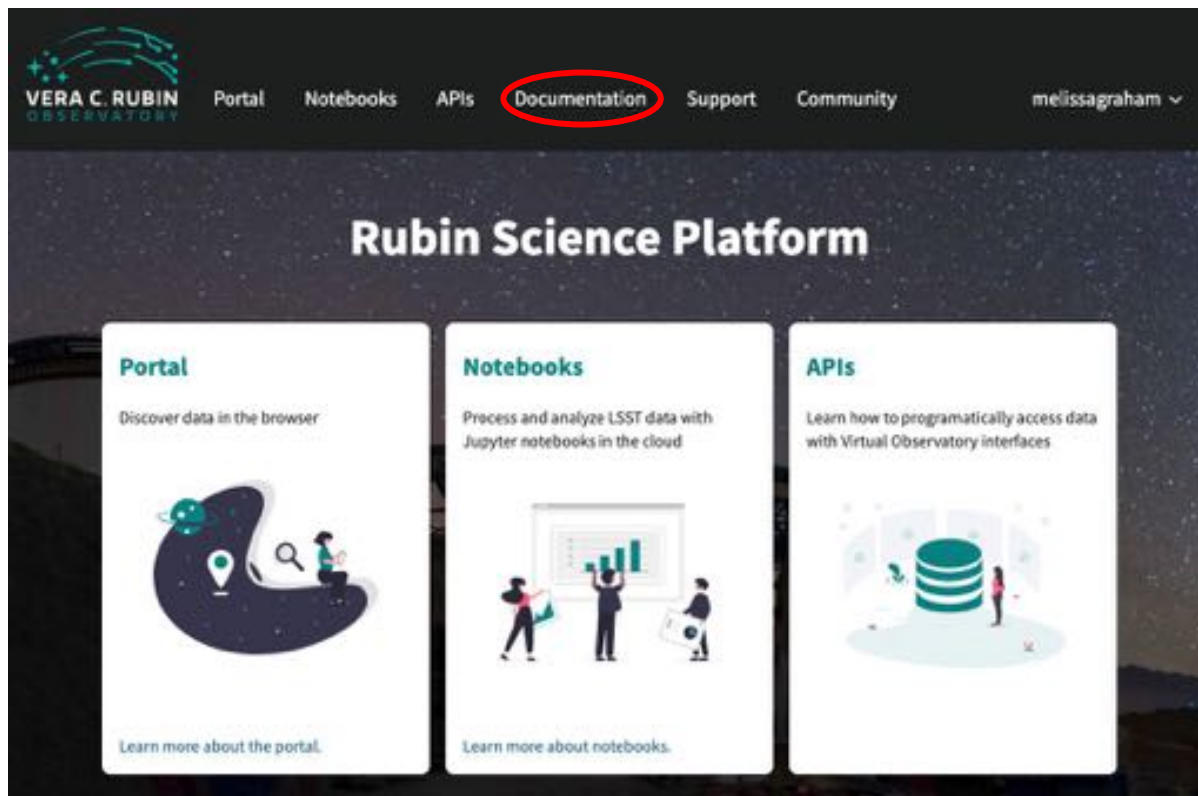
```
[49]: dmap = hv.DynamicMap(update_histogram, streams=[box]).options(
    height=400, width=400)
    datashade(points,
        cmap=process_cmap("Viridis", provider="bokeh")) + \
    box_plot.options(height=400, width=400) + \
    dmap
```

[49]:



Try changing the box selection and watch as the histogram is recomputed and displayed.

Rubin Science Platform User Experience



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Documentation

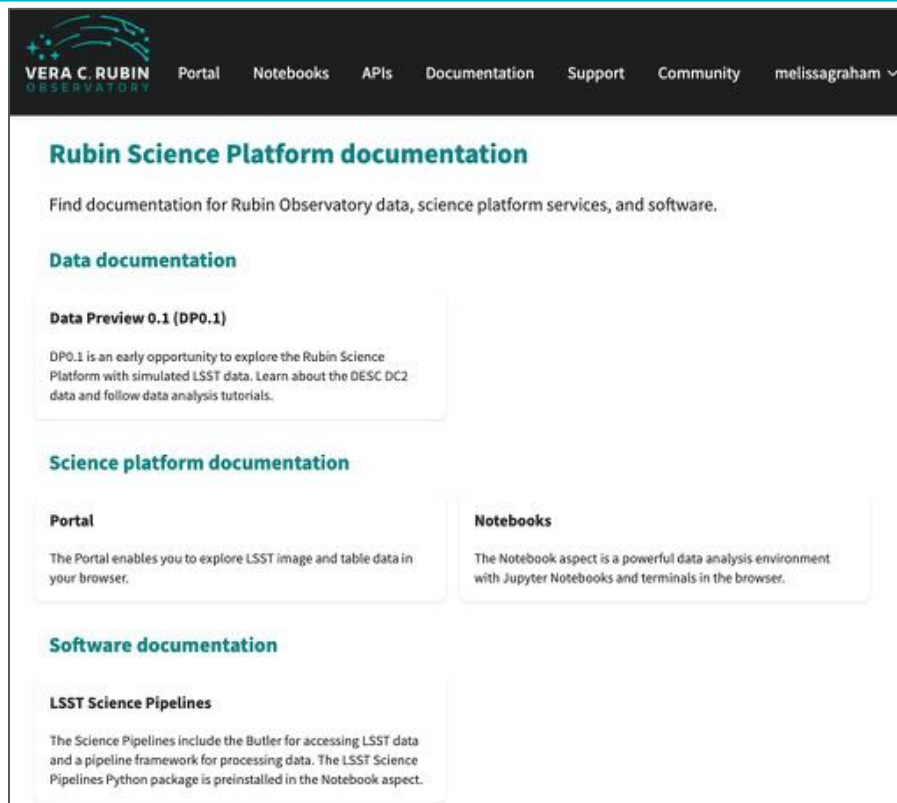
Data Release documentation

- dp0-1.lsst.io
- high-level processing summaries
- data products descriptions
- catalog schema

User Guides for the Rubin Science Platform

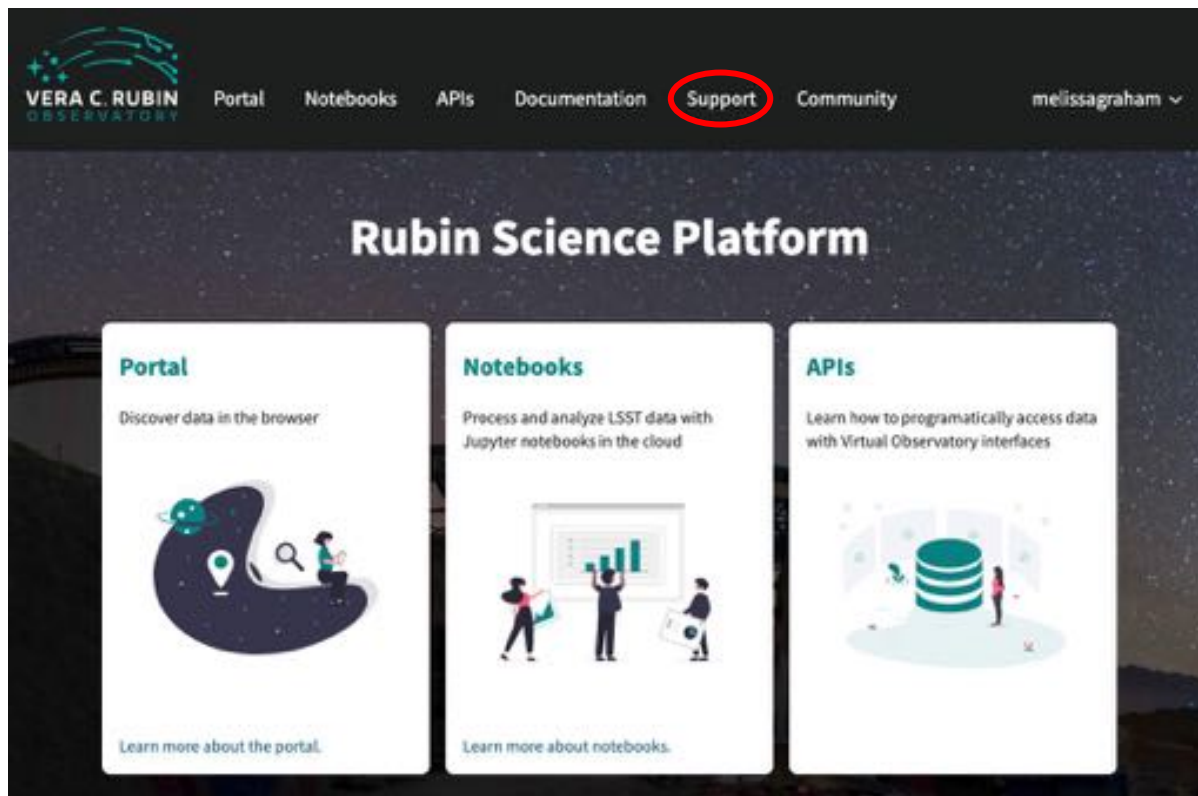
LSST Science Pipelines documentation

- pipelines.lsst.io
- module descriptions
- use-case examples and FAQs
- software releases & version history

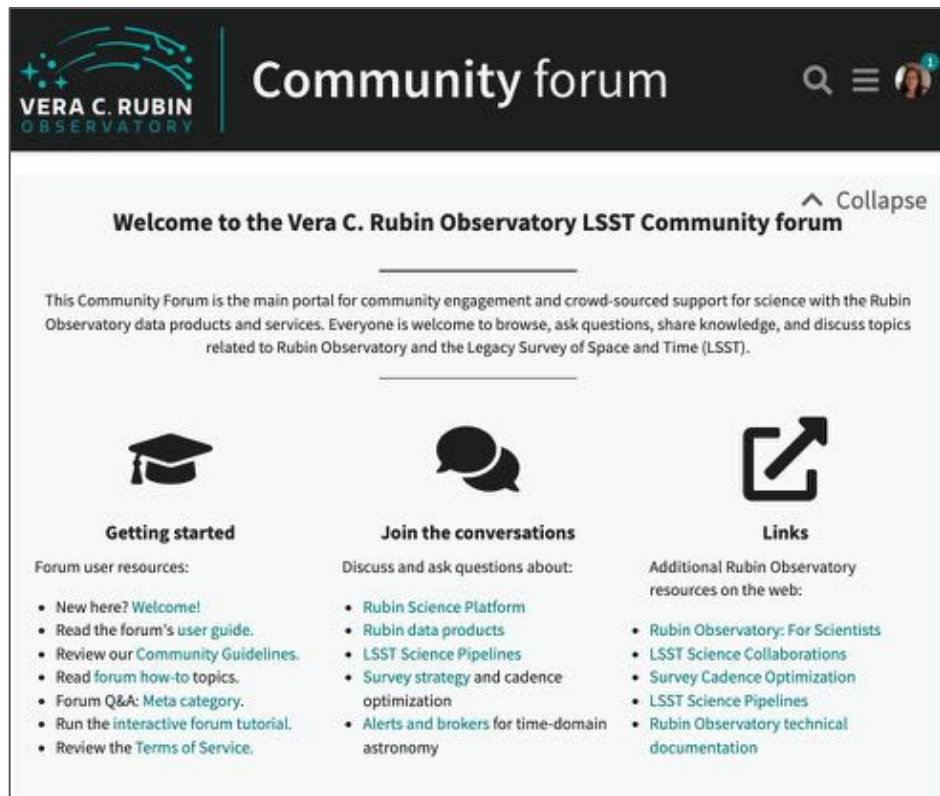


The screenshot shows the Rubin Science Platform documentation website. The header features the Vera C. Rubin Observatory logo and navigation links: Portal, Notebooks, APIs, Documentation, Support, Community, and a user profile 'melissagraham'. The main content area is titled 'Rubin Science Platform documentation' and includes a subtitle: 'Find documentation for Rubin Observatory data, science platform services, and software.' Below this, there are several sections: 'Data documentation' with a 'Data Preview 0.1 (DP0.1)' card, 'Science platform documentation' with a 'Portal' card and a 'Notebooks' card, and 'Software documentation' with an 'LSST Science Pipelines' card. Each card provides a brief description of the resource.

Rubin Science Platform User Experience



Rubin Science Platform User Experience



Community forum

Welcome to the Vera C. Rubin Observatory LSST Community forum

This Community Forum is the main portal for community engagement and crowd-sourced support for science with the Rubin Observatory data products and services. Everyone is welcome to browse, ask questions, share knowledge, and discuss topics related to Rubin Observatory and the Legacy Survey of Space and Time (LSST).



Getting started

Forum user resources:

- New here? [Welcome!](#)
- Read the forum's [user guide](#).
- Review our [Community Guidelines](#).
- Read [forum how-to](#) topics.
- Forum Q&A: [Meta category](#).
- Run the [interactive forum tutorial](#).
- Review the [Terms of Service](#).



Join the conversations

Discuss and ask questions about:

- [Rubin Science Platform](#)
- [Rubin data products](#)
- [LSST Science Pipelines](#)
- [Survey strategy and cadence optimization](#)
- [Alerts and brokers for time-domain astronomy](#)

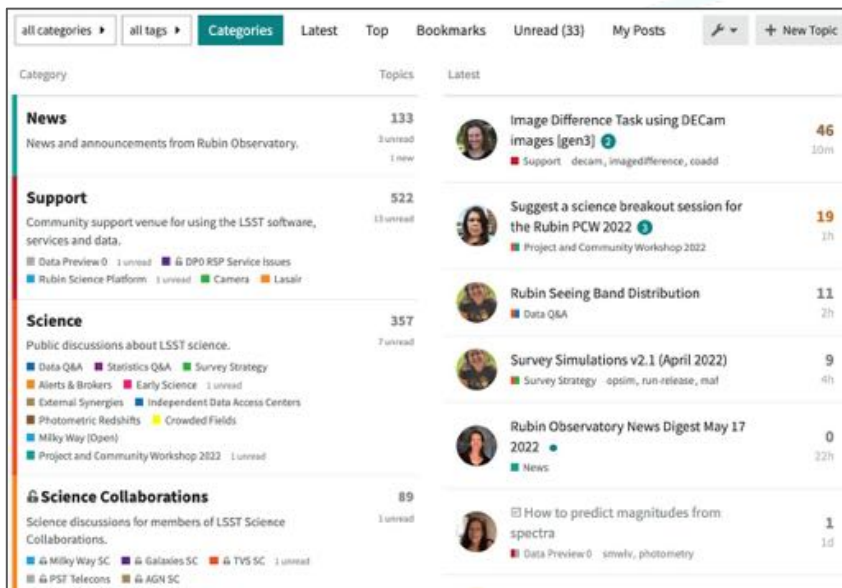


Links

Additional Rubin Observatory resources on the web:

- [Rubin Observatory: For Scientists](#)
- [LSST Science Collaborations](#)
- [Survey Cadence Optimization](#)
- [LSST Science Pipelines](#)
- [Rubin Observatory technical documentation](#)

With *thousands of users*, knowledge bottlenecks are a risk to science. Support must be accessible and timely. A crowd-source model is the only sustainable option.



all categories | all tags | **Categories** | Latest | Top | Bookmarks | Unread (33) | My Posts |  |  New Topic

Category	Topics	Latest
News News and announcements from Rubin Observatory.	133 3 unread 1 new	 Image Difference Task using DECam images [gen3] Support · decam, imagedifference, coadd 46 10m
Support Community support venue for using the LSST software, services and data.	522 13 unread	 Suggest a science breakout session for the Rubin PCW 2022 Project and Community Workshop 2022 19 1h
Science Public discussions about LSST science.	357 7 unread	 Rubin Seeing Band Distribution Data Q&A 11 2h
Science Collaborations Science discussions for members of LSST Science Collaborations.	89 1 unread	 Survey Simulations v2.1 (April 2022) Survey Strategy · opsim, run-release, mal 9 4h
		 Rubin Observatory News Digest May 17 2022 News 0 22h
		 How to predict magnitudes from spectra Data Preview 0 · smwlv, photometry 1 1d

Rubin Science Platform User Experience

An accessible, powerful platform built for the LSST era
with abundant, sustainable support for big science.

