



DP0 Delegate Assembly

reminder
to turn
recording
on!

“DP0.2 Half-Year in Review”

Featuring: Delegate Flash Talks

Fri Dec 9, 9am-11am US Pacific

Presented by
the Rubin Observatory Community Engagement Team



U.S. DEPARTMENT OF
ENERGY

Agenda

Today's speaker(s): we will have many speakers today!

9:00am – DP0.2 Review

- Users Committee Report 22B
- what's new since June 2022?
 - *data products released*
 - *documentation updates*
 - *new and improved tutorials*
 - *delegate-contributions*
 - *RSP functionality upgrades*
- what's happening in 2023?

9:30am – Delegate 60s Flash Talks

- uses a different Google Slides deck
- all are welcome to participate, ask for the link!!

Then: breakouts if there is time

- open call for topics
- join a room, have fun!

Potential breakout topics

Room	Topic	Facilitator
	<i>italics means it's a suggestion</i>	<i>make co-host</i>
main	general Q&A	
1	stellar classification	Bob
	<i>? new delegate co-working / networking</i>	
	<i>? fixes for the "tutorial-notebooks/" directory</i>	
	<i>? variability / transients</i>	
	<i>? large scale structure</i>	
	<i>? synthetic source injection</i>	
	<i>? new: Section 4 of NB 07a</i>	
	<i>? new: NBs 09a, 09b (custom coadds)</i>	

Rubin Users Committee Report, 22B

The Rubin Users Committee is charged with soliciting feedback from the science community (LSST “users”) about the LSST data products and Rubin Science Platform, and recommending improvements in their twice-yearly reports that are delivered to the Rubin Operations director.

Charge: rdo-051.lsst.io

Website: lsst.org/scientists/users-committee

Reports: available in the Rubin Community Forum (tag = “users-committee”)

Meetings: first ~hour open to community members to attend

Contact: via the Rubin Community Forum (Community.lsst.org; direct message to individuals or to the @Users-Committee group) or via email to RubinObs-Users-Committee@lists.lsst.org

The Rubin Users Committee looks forward to hearing from the Rubin science community.

Igor Andreoni

Dominique Boutigny

Alejandra Muñoz Arancibia

Alessandra Corsi

Qingling Ni

Markus Rabus

Francisco Javier Sanchez Lopez

Matthew Holman*

V. Ashley Villar

Anja von der Linden

Matthew P. Wiesner*

Michael Wood-Vasey

**Chair.*

Rubin Users Committee Report, 22B

- We congratulate the Rubin Team on their continued success with engaging the user community.
- The notebooks and documentation for the DP0 user materials are generally very well done and quite helpful. We encourage their continued improvement.
- We recommend the project provide simulated data sets for other science communities, such as the solar system groups, so that they can best prepare for commissioning and operations.
- We recommend the brokers or project provide a set of simulated alert packets based on DP0.2 DC2 data to provide concrete examples of alerts.
- We recommend that the project actively engage with the community to anticipate the need for ToO observations and to establish workable policies related to ToO observations.
- We recommend the project provide a characterization and validation report for DP0.2.

Data products released since June

ForcedSourceOnDiaObject: Forced photometry on the individual PVIs at the locations of all DiaObjects.

MatchesTruth: Matches between TruthSummary and Object tables, including match statistics.

TruthSummary: Summary properties of objects from the DESC DC2 truth catalog (see arXiv:2101.04855).

DP0.2 data products

The data set used for DP0 is the 300 deg² of simulated, LSST-like images and catalogs generated by the Dark Energy Science Collaboration (DESC) for their [Data Challenge 2](#) (DC2).

- [DP0.2 Data Products](#)
 - [The DESC DC2 Data Set](#)
 - [DP0.2 Data Products Definition Document \(DPDD\)](#)



Reminder!!

All DP0.2 data products descriptions are available in the documentation at dp0-2.lsst.io.

Documentation updates at dp0-2.lsst.io

The DP0.2 data release documentation is your primary resource for all DP0.2 information. It is also under continuous development as DP0 progresses.

Vera C. Rubin Observatory Documentation for Data Preview 0.2 (DP0.2)

This site provides information about the Rubin Observatory's Data Preview 0.2 (DP0.2).

DP0.2 Release Date: June 30, 2022

Data Preview 0 (DP0) is the first of three data previews during the period leading up to the start of Rubin Observatory Operations. The goals of DP0 are to serve as an early integration test of the Legacy Survey of Space and Time (LSST) Science Pipelines and the Rubin Science Platform (RSP), and to enable a limited number of astronomers and students to begin early preparations for science with the LSST.

Important

New to DP0? Welcome! See the [Getting started with DP0 checklist](#). Anyone with Rubin data rights may submit a request to participate in DP0 using this [form](#).

Term definitions are provided on the [Rubin Observatory Glossary & Acronyms webpage](#).

Resources for DP0 delegates

DP0 delegates are the 600 data rights holders who have RSP accounts for access to the DP0 data set.

- [DP0 Delegate Homepage](#)
- [Getting started with DP0 checklist](#)
- [Guidelines and expectations](#)
- [Rubin Science Platform accounts](#)
- [Rubin Community Forum](#)
- [Kick-off info session](#)
- [DP0 virtual seminars](#)
- [Suggested delegate activities](#)
- [Getting support](#)
- [Code of conduct](#)
- [Citation policies](#)

On this page

- [Vera C. Rubin Observatory Documentation for Data Preview 0.2 \(DP0.2\)](#)
- [Resources for DP0 delegates](#)
- [DP0.2 data products](#)
- [DP0.2 data access and analysis tools](#)
- [Tutorials](#)
- [Documentation project information](#)

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DP0.2 data access and analysis tools

The Rubin Science Platform (RSP) is the web-based service for Rubin data access and analysis. Step-by-step instructions for RSP use are provided.

- **Data Access and Analysis Tools**
 - [Rubin Science Platform \(RSP\)](#)
 - [RSP usage: risks and responsibilities](#)
 - [Portal Aspect](#)
 - [Notebook Aspect](#)
 - [API Aspect](#)
 - [Data processing tools](#)

Tutorials

Tutorials include hands-on executable tutorials and demonstrations based on science use cases for learning to use the RSP and the LSST Science Pipelines.

- **DP0.2 Tutorials**
 - [Portal tutorials](#)
 - [Notebook tutorials](#)
 - [Contributed tutorials](#)

Documentation updates at dp0-2.lsst.io

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Clear access point for new delegates to join.

The top of the main landing page now has a direct link to the participation request form.

This is the place to send your colleagues who want to get involved with Rubin's DP0.

Documentation updates at dp0-2.lsst.io

Recordings of the Delegate Assemblies are usually available by the following week.

From the main landing page, click on “DP0 virtual seminars” (below), and find links to recordings in the schedule (right).

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Schedule and planned content of DP0 Delegate Assemblies		
Date	First Hour	Second Hour
2022-07-08	DP0.2 Kick-Off Info Session (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)	general Q&A; extended Firefly demo; template contamination & nuclear transients; and making scientifically useful RGB images
2022-08-19	Data Access with the Butler (beginner-intermediate)	general Q&A
2022-09-02	NO ASSEMBLY (long weekend)	none
2022-09-16	Source Detection and Measurement (beginner)	breakouts
2022-09-30	Data Visualization (beginner)	breakouts
2022-10-14	Survey Property Maps by Martín Rodríguez Monroy	breakouts
2022-10-28	Nuclear Transients by Decker French & Forced Photometry by Brian Morsony	breakouts
2022-11-18	Analysis of DIA sources by Vincenzo Petrecca	breakouts
2022-12-09	DP0 2022 Year In Review with Delegate Flash Talks!	breakouts
2023-01-20	Delegate Presenter: Bob Abel	breakouts
2023-02-03	TBD: open for a volunteer presenter	breakouts

All will be welcome to participate in the “DP0 2022 Year In Review: Delegate Flash Talks!” session on 2022-12-09. Details to be circulated.

Documentation updates at dp0-2.lsst.io

Notebook Aspect how-tos, FAQs, and troubleshooting tips are regularly updated in response to emergent issues.

From the main landing page, click on “Notebook Aspect” (below), and find links to this info (right).

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 - API Aspect
 - ADQL Recipes
 - Python Functions
 - Data processing tools

Notebook Aspect

The Notebook Aspect of the RSP provides Python-based access to DP0.2 data products via a custom implementation of web-based JupyterLab Notebooks ([JupyterLab documentation](#)), as well as a command-line interface.

Within the RSP Notebook Aspect users can query and retrieve data sets, manipulate and display images, calculate derived properties, plot results, reprocess data with the [LSST Science Pipelines](#), and most other analyses you can imagine performing with Python on astronomical images and catalogs.

A stable software environment is provided and maintained for users, which includes many commonly-used packages and the [LSST Science Pipelines](#). For DP0, this environment will only support Python 3. To view a list of packages available to you in the Notebook Aspect of the RSP, type `pip list` in a terminal.

- Introduction to the RSP Notebook Aspect
 - How to log in, navigate, and log out of JupyterLab
 - How to use the JupyterLab terminal
 - How to use a Jupyter notebook
 - How to use the Tutorial Notebooks
 - Jupyter notebook frequently asked questions
 - Troubleshooting tips

Documentation updates at dp0-2.lsst.io

Easy references for ADQL recipes and python functions from the tutorials are now available.

E.g., from the main landing page, click on “ADQL Recipes” or “Python Functions” (below) to see the list (right) and access the recipes and functions (far right).

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They're for you to copy-paste into your notebooks.

ADQL Recipes

- ADQL Recipes
 - General Advice
 - Exploring tables
 - Cone Search
 - Convert fluxes to magnitudes
 - Table joins
 - TruthSummary and MatchesTruth table joins
 - Individual objects

Python Functions

- Python Functions
 - Cutout coadd
 - Cutout calexp
 - Remove figure

Convert fluxes to magnitudes

As above, retrieve the coord_dec and coord_ra columns from the Object table for objects within a 0.05 degree radius of RA = 62, Dec = -37, and also retrieve the g-band AB magnitude and magnitude error. The scisql functions used below can be applied to any flux column.

```
SELECT coord_dec, coord_ra,
scisql_nanojanskyToAbMag(g_calibFlux) AS g_calibMag,
scisql_nanojanskyToAbMagSigma(g_calibFlux, g_calibFluxErr) as g_calibMagErr
FROM dp02_dc2.catalogs.Object
WHERE CONTAINS(POINT('ICRS', coord_ra, coord_dec),
CIRCLE('ICRS', 62, -37, 0.05)) = 1
```

Cutout coadd

In the future, the RSP will have an image cutout service and this function will not be necessary. A demonstration of its use can be found in tutorial notebook 03a, Image Display and Manipulation.

```
import lsst.geom as geom
from lsst.daf.butler import Butler
butler = Butler('dp02', collections='2.21/runs/DP0.2')

def cutout_coadd(butler, ra, dec, band='r', datasetType='deepCoadd',
                skymap=None, cutoutSideLength=31, **kwargs):
    """
    Produce a cutout from a coadd at the given ra, dec position.
    Adapted from DC2 tutorial notebook by Michael Wood-Vasey.

    Parameters
    -----
    butler: lsst.daf.persistence Butler
        Service providing access to a data repository
    ra: float
        Right ascension of the center of the cutout, in degrees
    dec: float
        Declination of the center of the cutout, in degrees
    band: string
        Filter of the image to load
    datasetType: string [deepCoadd]
        Which type of coadd to load. Doesn't support 'calexp'
    skymap: lsst.afw.skyMap.SkyMap [optional]
        Pass in to avoid the butler read. Useful if you have lots of them.
    cutoutSideLength: float [optional]
        Size of the cutout region in pixels.

    Returns
    -----
    MaskedImage
    """
    rdec = geom.SpherePoint(ra, dec, geom.degrees)
    cutoutSize = geom.Extent(cutoutSideLength, cutoutSideLength)
    if skymap is None:
        skymap = butler.get("skyMap")
    tractInfo = skymap.findTract(rdec)
    patchInfo = tractInfo.findPatch(rdec)
    xy = geom.Point(tractInfo.getUcs()).skyToPixel(rdec)
    bbox = geom.Box(xy - cutoutSize // 2, cutoutSize)
    patch = tractInfo.getSequentialPatchIndex(patchInfo)
    coaddId = ['tract': tractInfo.getId(), 'patch': patch, 'band': band]
    parameters = {'bbox': bbox}
    cutout_image = butler.get(datasetType, parameters=parameters,
                              dataId=coaddId)

    return cutout_image
```

Documentation updates at dp0-2.lsst.io

A log of the major tutorial updates is now available for users, and access to delegate-contributed notebooks is now linked to the tutorials page.

From the main landing page, click on “DP0.2 Tutorials” (below).

Tutorials

Tutorials include hands-on executable tutorials and demonstrations based on science use cases for learning to use RSP and the LSST Science Pipelines.

- [DP0.2 Tutorials](#)
 - [Portal tutorials](#)
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Use this link (below) to access the log (right).

What's New? See the [Log of Major Tutorial Updates](#).

Log of Major Tutorial Updates

How to find version histories

Notebook tutorials

All Jupyter Notebook tutorial headers contain the date “last verified to run”. If the date in the file you are using does not match the date shown in that file in the “prod” branch of the [tutorial-notebooks repository](#), your version is out of date. Follow the instructions for what to do if notebooks do not automatically update in the [Troubleshooting tips](#).

A full history for all tutorial notebooks can be accessed in GitHub via this [direct link to the commit log for the tutorial-notebooks repository](#).

The full history for any given tutorial notebook can be accessed via GitHub by going to the notebook of interest (e.g., the [introduction to DP0.2 notebook](#)), and clicking on “history” (near upper-right).

Portal tutorials

All Portal tutorials contain the date last verified to run near the top of their page.

All tutorials for the Portal aspect are kept in the [dp0-2_lsst_io repository](#). The full history for any given Portal tutorial can be accessed via GitHub by going to the Portal tutorial of interest (e.g., the [beginner Portal tutorial](#)), and clicking on “history” (near upper-right).

Major Updates Log

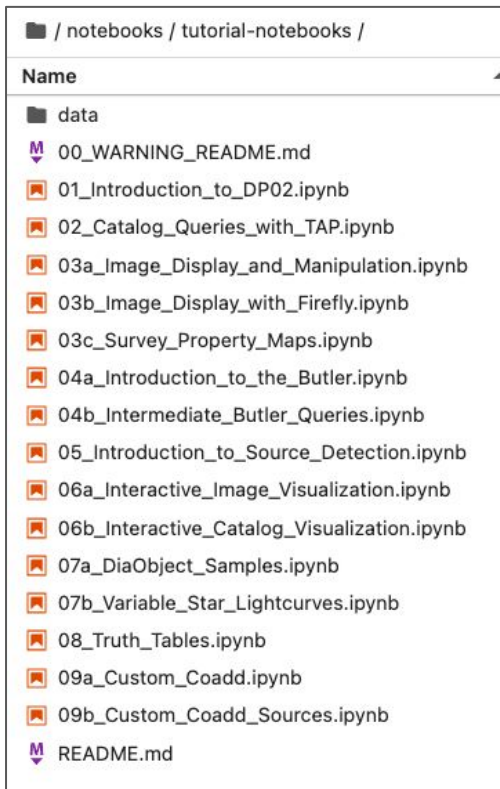
Oct 26 2022

Notebook 03a (image display) updated to replace use of `objectTable` via the butler with a TAP query.

Notebook 07a (DiaObject samples) updated to use the recently released `ForcedSourceOnDiaObject` table.

Notebooks 09a and 09b (`custom.coadds`) added.

New and improved tutorials



Tutorial notebooks updates since June 2022:

- 03a minor updates to use TAP instead of Butler
- 03c new tutorial on Survey Property Maps (*thanks to Eli Rykoff!*)
- 04b new tutorial exploring and intermediate-level use of the Butler
- 07a major updates to show use of the **ForcedSourceOnDiaObject** table
- 08 new tutorial for using the MatchesTruth and TruthSummary tables
- 09a new tutorial showing how to create custom coadds
- 09b new tutorial showing how to do source detection on custom coadds

Additional updates are in the works for both the notebook and portal tutorials.

Portal tutorials

- 01. Bright Stars Color-Magnitude Diagram (beginner)
- 02. Explore a SNIa Lightcurve (intermediate)
- 03. View a SNIa Host Galaxy (intermediate)

Delegate contributions

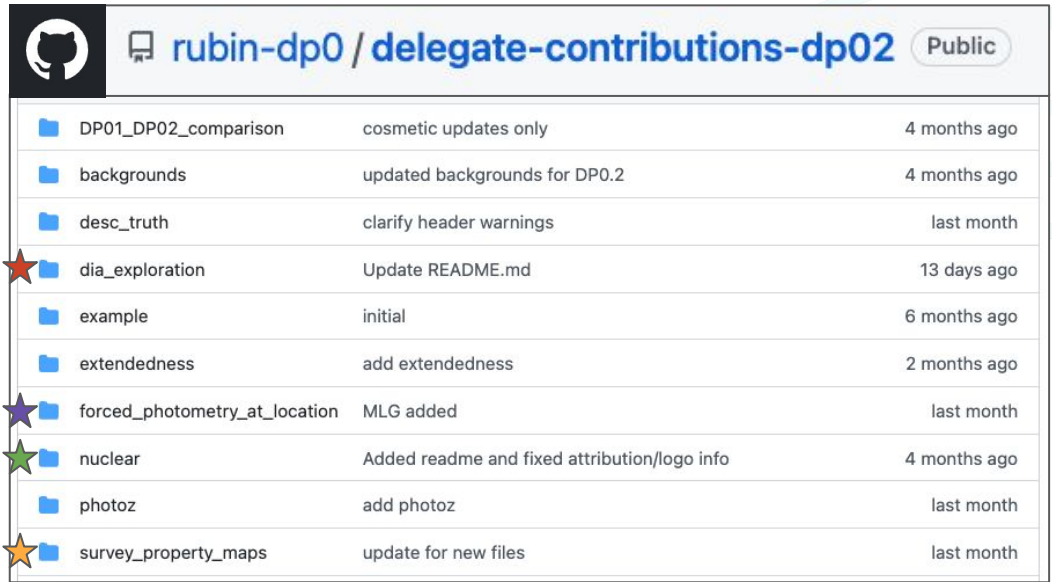
Delegate Assemblies

So far we have had 4 delegates present their work, with more planned for 2023. *Get in touch to volunteer!*

2022-10-14	★ Survey Property Maps by Martín Rodríguez Monroy	breakouts
2022-10-28	★ Nuclear Transients by Decker French & Forced Photometry by Brian Morsony ★	breakouts
2022-11-18	★ Analysis of DIA sources by Vincenzo Petrecca	breakouts

Delegate-Contributed Notebooks

Notebooks in nine different science topics have been shared so far, and all are welcome to contribute and use this material. *See the readme file for instructions & we're happy to help with git!*



Folder	Description	Last Updated
DP01_DP02_comparison	cosmetic updates only	4 months ago
backgrounds	updated backgrounds for DP0.2	4 months ago
desc_truth	clarify header warnings	last month
★ dia_exploration	Update README.md	13 days ago
example	initial	6 months ago
extendedness	add extendedness	2 months ago
★ forced_photometry_at_location	MLG added	last month
★ nuclear	Added readme and fixed attribution/logo info	4 months ago
photoz	add photoz	last month
★ survey_property_maps	update for new files	last month

RSP functionality upgrades

How to use the Tutorial Notebooks

The best way to learn how to use a Jupyter Notebook is to open the first of the tutorial notebooks which are provided in each user's home directory, and also available in the [tutorial-notebooks](#) repository in the "rubin-dp0" GitHub Organization (see also [Notebook tutorials](#)).

The "notebooks/tutorial-notebooks" directory should be read-only: As of Thu Sep 29 2022, the recommended image for the RSP's Notebook Aspect was updated to "Weekly 40", and for all **new RSP accounts** created on or after that day the "notebooks/tutorial-notebooks" directory will be read-only.

A read-only "notebooks/tutorial-notebooks" directory will *always* contain the most up-to-date versions of the tutorials. Notebooks can be edited and executed in this directory, but changes cannot be saved to this directory. Users wishing to edit, execute, *and save* versions of these notebooks should copy them to a different path in their home directory.

For all **existing RSP accounts** that were created before Thu Sep 29 2022, the "notebooks/tutorial-notebooks" directory will remain writable, but a warning file (00_WARNING_README.md) will appear if any other file in that directory has been changed, as a reminder to take action.

It is recommended that owners of RSP accounts created prior to Thu Sep 29 2022 take action to make their "notebooks/tutorial-notebooks" directory read-only. See the FAQ on [How do I make sure my "notebooks/tutorial-notebooks" directory is read-only?](#) for more information about the recommended actions.

Users' "notebooks/tutorial-notebooks/" directories can now be made **read-only**.

It is **recommended** to make this directory read-only.

This will ensure users always have the most recent versions of the tutorial notebooks.

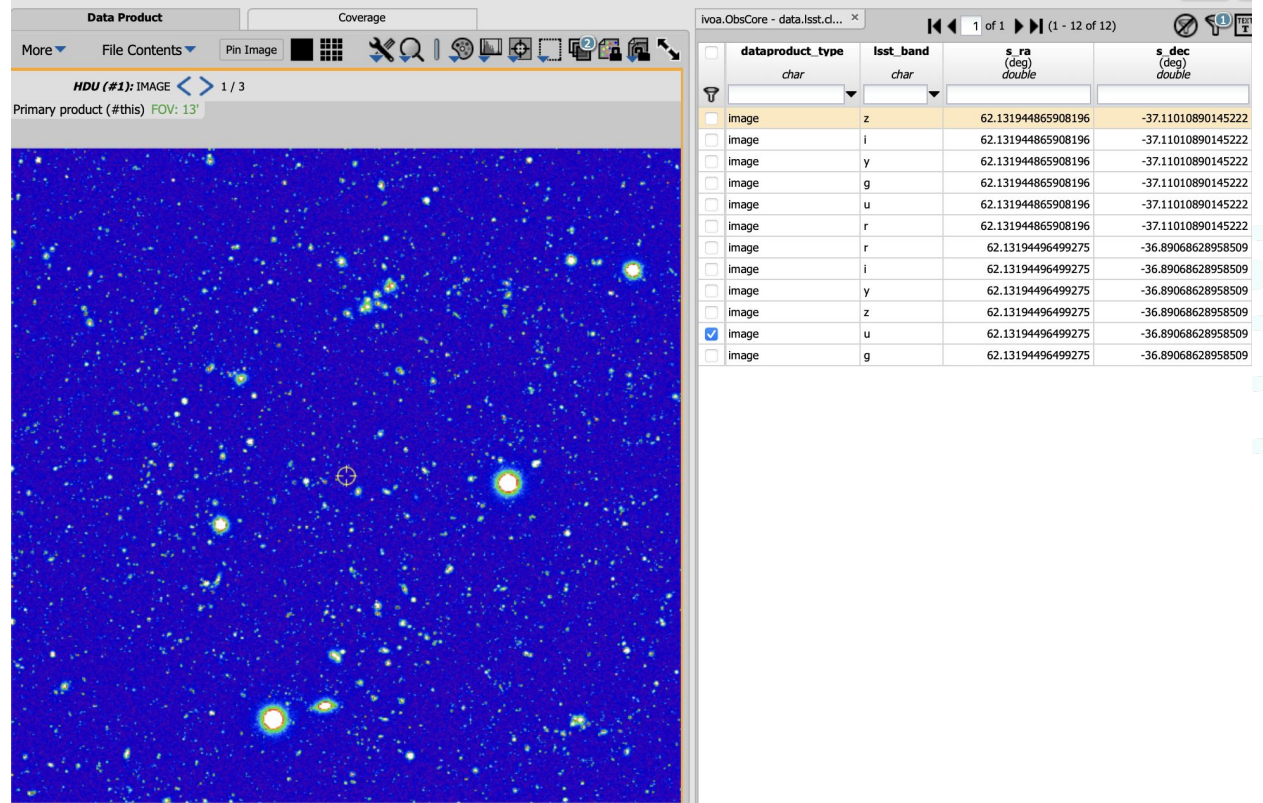
Instructions can be found at dp0-2.lsst.io.

If you have any issues with your tutorial-notebooks directory not updating:

- ask for help during the breakout Q&A
- submit a GitHub Issue
 - github.com/rubin-dp0/Support
- report the problem in the Forum

RSP upgrades: Image Search (ObsTAP)

- New service implementing the VO ObsTAP standard
- Enables image search and display in the portal
-

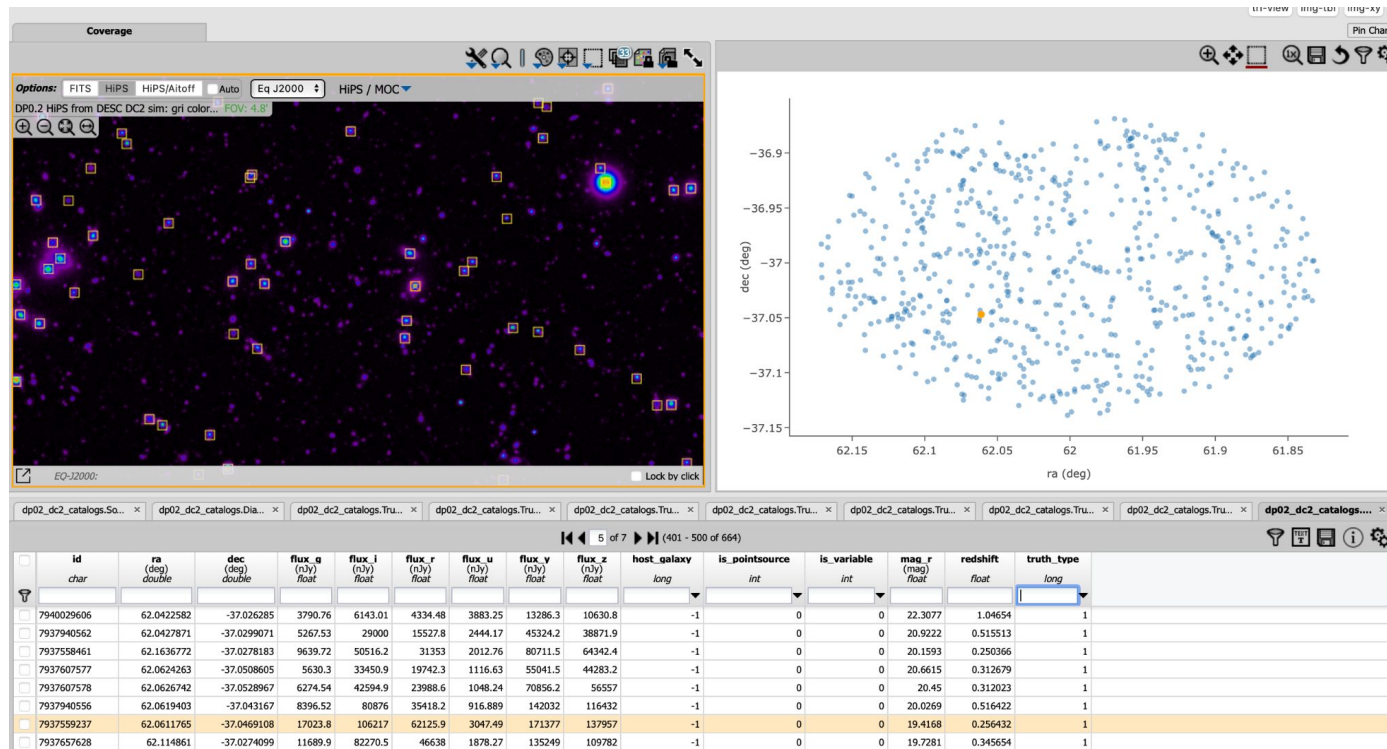


The screenshot displays the ObsTAP interface. On the left, a large image shows a star field with a central crosshair. The interface includes a 'Data Product' tab and a 'Coverage' tab. The 'Data Product' section shows 'HDU (#1): IMAGE' and 'Primary product (#this) FOV: 13°'. The 'Coverage' section shows a table of data products.

dataprodu... char	lsst_band char	s_ra (deg) double	s_dec (deg) double
<input type="checkbox"/>	image	z	62.131944865908196
<input type="checkbox"/>	image	i	62.131944865908196
<input type="checkbox"/>	image	y	62.131944865908196
<input type="checkbox"/>	image	g	62.131944865908196
<input type="checkbox"/>	image	u	62.131944865908196
<input type="checkbox"/>	image	r	62.131944865908196
<input type="checkbox"/>	image	r	62.13194496499275
<input type="checkbox"/>	image	i	62.13194496499275
<input type="checkbox"/>	image	y	62.13194496499275
<input type="checkbox"/>	image	z	62.13194496499275
<input checked="" type="checkbox"/>	image	u	62.13194496499275
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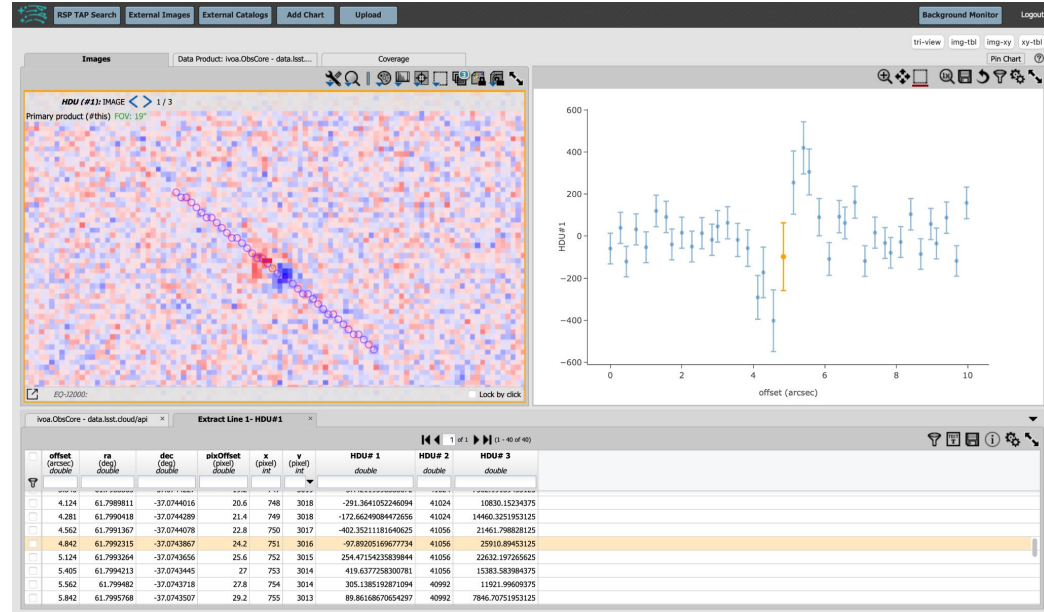
RSP upgrades: HiPS service

- New service provides HiPS files from our own processing that are used as by the portal to provide the background to catalog and coverage searches



RSP upgrades: other highlights

- (VO) Datalink microservices to drive portal functionality (and more coming!)
- Image cutout (VO SODA) service
- Behind the scenes: many improvements for reliability, monitoring and to support deployment of the RSP in other environments (summit, Data Facilities, etc)



2023: Identity migration

- Up to know we have been using Github as a temporary identity provider for data.lsst.cloud data preview delegates and project staff
- Early 2023 we will be rolling out our new identity system based on cilogon.org which allows users to sign up to the RSP with their institutional accounts (don't worry, you can still use Github if you prefer)
- This system is also needed to fulfil other RSP requirements, such as user group management, as well as support user onboarding process
- Already deployed on our staging environment

Select an Identity Provider

The University of Arizona ▾ ?

Log On

By selecting "Log On", you agree to the [privacy policy](#).

Select an Identity Provider

GitHub ▾ ?

Log On

By selecting "Log On", you agree to the [privacy policy](#).

2023: Virtual seminars continue

DP0 Virtual Seminars

- Stack Club will restart Fri Jan 13.
- Delegate Assemblies will restart Fri Jan 20.
 - *Delegate presenter Bob Abel.*
 - *Contact Melissa to volunteer to present.*
- Third Thursdays will restart Thu Jan 19.

Plus: We are considering “DP0 Summer School” to happen near the start of summer – details to be circulated.

As always, seminar schedules and connection info are posted at dp0-2.lsst.io/dp0-delegate-resources and circulated to the DP0 Delegates group via the Rubin Community Forum.

