

LSST Data Products

Workshop

Workflows e Plataformas Científicas: preparação para o LSST DR1

Julia Gschwend

26.03.2025



<https://lse-163.lsst.io/>

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Data Products Definition Document

2023-07-10
v3.9

Change version DocuShare

M. Jurić, T. Axelrod, A.C. Becker, J. Becla, E. Bellm, J.F. Bosch, D. Ciardi, A.J. Connolly, G.P. Dubois-Felsmann, F. Economou, M. Freeman, M. Gelman, R. Gill, M. Graham, L.P. Guy, Ž. Ivezić, T. Jenness, J. Kantor, K.S. Krughoff, K-T Lim, R.H. Lupton, F. Mueller, D. Nidever, W. O'Mullane, M. Patterson, D. Petravick, D. Shaw, C. Slater, M. Strauss, J. Swinbank, J.A. Tyson, M. Wood-Vasey, and X. Wu

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LSST will deliver three levels of data products and services. **Prompt** data products are computed and released within 24 hours of observation, and include images, difference images, catalogs of sources and objects

Data Products Definition... 1 / 76 54%



1



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3



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LSE-163

Latest Revision: 2023-07-10

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Data Products Definition Document

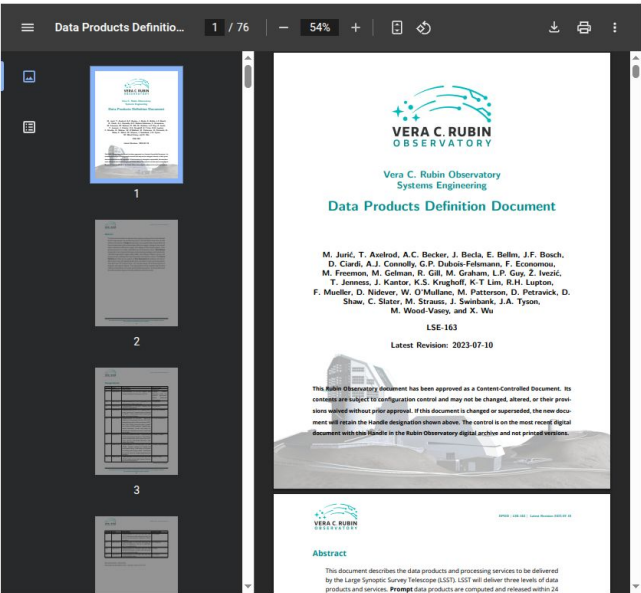
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Large Synoptic Survey Telescope

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Data Products Definitio...

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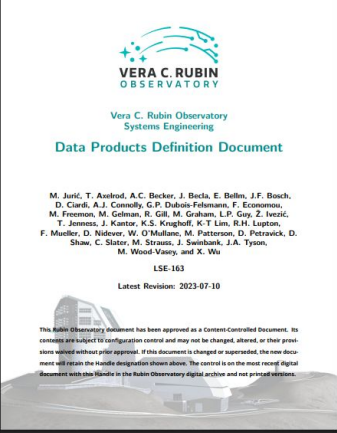
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2



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LSST
Large Synoptic Survey Telescope

Data Products Definition Document

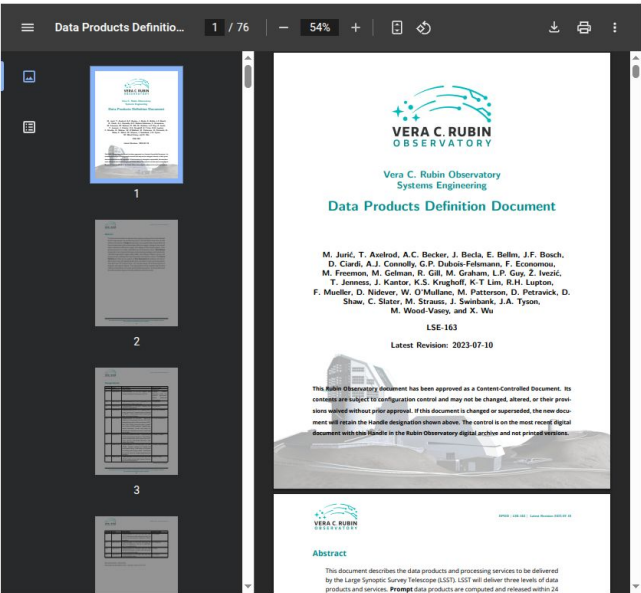
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Nomenclatura dos lotes de dados

DP = Data Preview

- DP0.1 = DESC DC2
- DP0.2 = DP0.1 reprocessado
- DP0.3 = Solar System
- DP1 = ComCam data
- DP2 = LSSTCam data

DR = Data Release

- DR1 = 6 meses de observações
- DR2 = 1 ano de observações
- DR3 = 1 ano após DR2
- DR4 = " " " DR3
- (...)
- DR11 = último release = 10 anos

Early Science with DP1, DP2 and Alert Production

RTN-011 update is in progress following a highly successful ComCam campaign

- DP1: Expect coadded images. Stretch goals: Forced source Catalogs, all Difference Image Analysis (DIA) data products
- DP2: Baseline is 100 sq deg to 10 yr depth in *ugrizy* plus a 1000 sq deg pilot survey to 1 year depth in *griz*
- Alerts to begin in SV phase at low latency, and then ramp up latency and sky coverage through

Rubin Early Science – Data Release Scenario									
	Jun 2021	Jun 2022	Jun 2023	Jun 2025 – Jul 2025	Mar 2026 – May 2026	Sep 2026 – Jan 2027	Sep 2027 – Jan 2028	Sep 2028 – Nov 2028	
	DP0.1	DP0.2	DP0.3	DP1	DP2	DR1	DR2	DR3	
	SC1 Simulated Sky Survey	Reprocessed SC2 Sky Survey	Solar System Simulation	CoreCam Data	LSST/Com Science Simulation Data	LSST First 6 Months Data	LSST Year 1 Data	LSST Year 2 Data	
Data Product									
Raw Images	●	●	-	●		●	●	●	
DRP Processed Visit Images and Source Catalogs	●	●	-	●		●	●	●	
DRP Coadded Images and Object Catalogs	●	●	-	●		●	●	●	
DRP Forced-Source Catalogs	●	●	-	●	●	●	●	●	
DRP Difference Images and DIA Catalogs	-	-	●	-	●	●	●	●	
DRP SSP Catalogs	-	-	●	-	●	●	●	●	

TABLE 1: Summary of Data Release data products expected in each data preview and early LSST data release. A dark teal dot denotes confirmed data products whereas a gray dot denotes data products that currently remain a stretch goal.

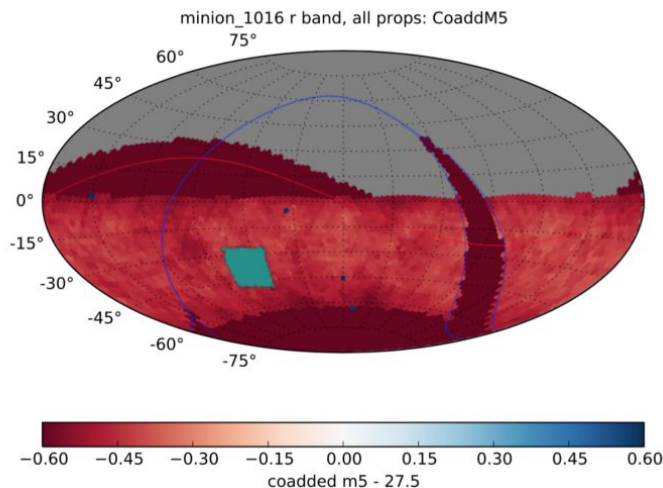
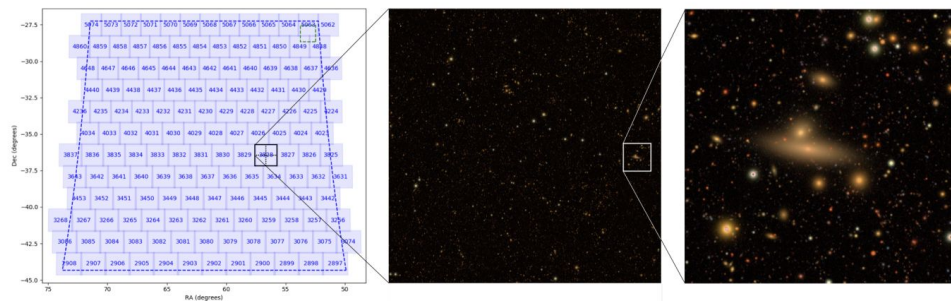
credits: Bob Blum's slides from 2025 AAS Town Hall

[illegible]

DP0.2 = DC2 reprocessado com LSST Science Pipelines

- Simulação fornecida pela colab. DESC
- DP0.2 substitui o DP0.1
- bandas: u, g, r, i, z, Y
- área: 300 deg²
- profundidade: ~ 5-year LSST
- Inclui
 - galaxies (with large-scale structure)
 - Type Ia supernovae
 - stars (10% of which are variable)
- não inclui
 - AGN
 - strong lenses
 - solar system objects
 - non-Ia extragalactic transients
 - diffuse features (e.g., tidal streams, intracluster light)

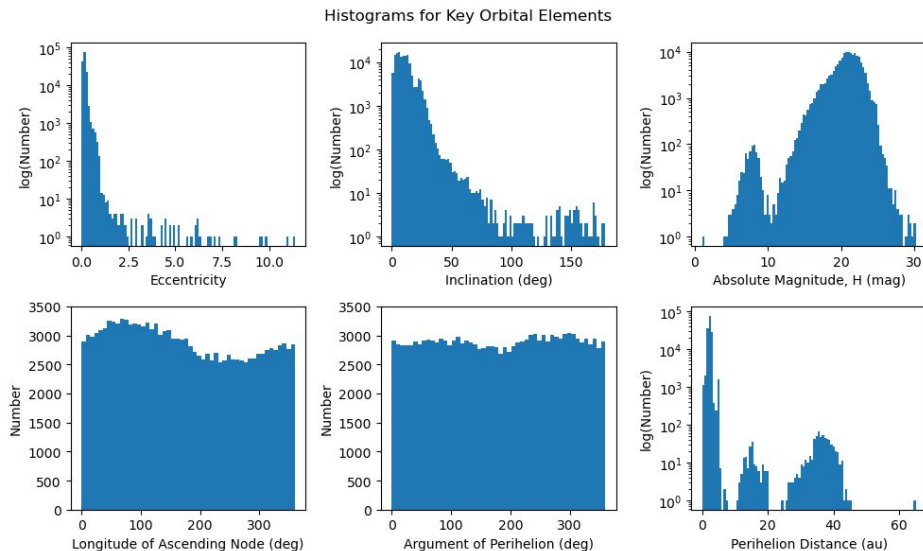
“The LSST DESC DC2 Simulated Sky Survey” ([arXiv:2010.05926 26](https://arxiv.org/abs/2010.05926))



DP0.3 = Solar System Objects

- Simulação criada pelos times Rubin Solar System Pipelines e Commissioning teams, com ajuda da colab. SSSC
- bandas: g, r, i, z
- 2 catálogos: 1-year LSST e 10-year LSST
- Objetos reais do MPC + objetos sintéticos adicionados
- Inclui
 - trans-Neptunian objects (TNOs)
 - main belt asteroids (MBAs)
 - interstellar objects (ISOs)
 - Hildas and Trojan asteroids
 - long-period comets
 - near-Earth objects (NEOs)

https://dp0-3.lsst.io/tutorials-dp0-3/rendered_nb_03_01.html





LSST Data Preview 0 Documentation

Data Preview 0 (DP0) is the first of three data previews during the period leading up to the start of Rubin Observatory Operations.

Goals of DP0: 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 scientists and students to begin early preparations for science with **simulated** LSST-like data sets.

DP0 users: The scientists and students who have RSP accounts and access to the DP0 data sets.

User resources

Participate in DP0. Get an RSP account and access the data. Attend virtual seminars. Get support.

DP0.2

Documentation and tutorials for simulated images and catalogs of extragalactic and galactic objects.

DP0.3

Documentation and tutorials for simulated catalogs of solar system objects.

Related documentation

- [Rubin Science Platform](#) — Learn how to use the Rubin Science Platform to access and analyze LSST data.
- [LSST Science Pipelines](#) — Learn about the Rubin LSST's Python data processing, measurement, and access software, which is pre-installed in the Rubin Science Platform.
- github.com/rubin-dp0 - GitHub repository of tutorial notebooks (including user contributions) for both DP0.2 and DP0.3.

<https://dp0-2.lsst.io/>

 Vera C. Rubin Observatory Documentation for Data Preview 0.2

Vera C. Rubin Observatory Documentation for Data Preview 0.2 » next »

On this page
Vera C. Rubin Observatory Documentation for Data Preview 0.2 (DP0.2)
Resources for DP0 users
DP0.2 data products
DP0.2 data access and analysis tools
Tutorials
DP0.2 Documentation project information

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

This site provides information about Rubin Observatory's Data Preview 0.2 (DP0.2), simulated LSST-like data products containing extragalactic and galactic objects.

For general information about the Data Preview 0 (DP0) program, see dp0.lsst.io.

An LSST-like simulation of solar system objects is also available at dp0-3.lsst.io.

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

Important
To access the DP0 data sets see the [getting started with DP0 checklist](#).

Resources for DP0 users

DP0 users are the 900 data rights holders who have accounts in the Rubin Science Platform (RSP) and access to the DP0 data sets. Use the [getting started with DP0 checklist](#) to become a DP0 user.

- DP0 User Homepage
 - Getting started with DP0 checklist

DP0.2 data products

The data set used for DP0.2 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)

<https://dp0-3.lsst.io/>

 Rubin Observatory DP0.3 DP0.3 Data Products DP0.3 Tutorials DP0.3 Documentation Project Information Rubin docs

ⓘ ⓘ

Vera C. Rubin Observatory Documentation for Data Preview 0.3 (DP0.3)

This site provides information about the Rubin Observatory's Data Preview 0.3 (DP0.3), which only contains simulated Solar System objects, and is completely independent of the simulated DP0.2 data set.

The DP0.3 data is available only via the Rubin Science Platform (RSP). For access, please follow the [getting started with DP0 checklist](#).

Credit: The DP0.3 data set was generated by members of the Rubin Solar System Pipelines and Commissioning teams, with help from the LSST Solar System Science Collaboration, in particular: Pedro Bernardinelli, Jake Kurlander, Joachim Moeyens, Samuel Cornwall, Ari Heinze, Steph Merritt, Lynne Jones, Siegfried Egg, Meg Schwamb, Grigori Fedorets, and Mario Juric.

Important
This website describes only the DP0.3 data products and tutorials. Visit dp0-2.lsst.io for information about the galactic and extragalactic simulated data products. Visit dp0.lsst.io for information about how to:

- get an RSP account to access the DP0 data (become a DP0 user),
- ask questions, get help, and report bugs, or to
- participate in virtual events (e.g., hands-on tutorials for DP0).

DP0.3 data products

The DP0.3 simulation only contains catalog data products for Solar System objects. For simulated Galactic and extragalactic data products, see the [documentation for DP0.2](#).

Be aware of these Known issues with the DP0.3 simulation.

DP0.3 Data Products
The Simulated Data Set
DP0.3 Data Products Definition Document (DPDD)

DP0.3 tutorials

Tutorials include hands-on executable tutorials and demonstrations based on science use-cases to help scientists and students learn to use the DP0.3 data products and the Rubin Science Platform.

DP0.3 Tutorials

 LineA

<https://dp0-2.lsst.io/tutorials-examples/index.html>

 Vera C. Rubin Observatory Documentation for Data Preview 0.2

Vera C. Rubin Observatory Documentation for Data Preview 0.2 » DP0.2 Tutorials

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Search

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- DP0.2 Tutorials
- Major Changes Log
- Portal tutorials
 - How-to tutorials
 - Science tutorials
- Notebook tutorials
- Command line tutorials
- API tutorials
- Spanish-language tutorials
- Contributed tutorials
- Portal usability test answer keys

DP0.2 Tutorials

These tutorials are for DP0 users using the Rubin Science Platform (RSP) deployed at the Interim Data Facility (IDF; the Google Cloud).

Before following these tutorials, users should:

1. have gotten their [RSP account](#) and be able to log in at [data.lsst.cloud](#),
2. be familiar with this list of [RSP Risks and Caveats](#),
3. have reviewed the basic introductions to the RSP's [Portal Aspect](#) or [Notebook Aspect](#), and
4. know their options for [getting support](#).

All RSP tutorials are created by Rubin staff and adhere to the set of guidelines and best practices described in [RTN-045](#), unless otherwise noted (e.g., the [Contributed tutorials](#)).

[Suggest a new tutorial topic.](#)

Major Changes Log

- [Log of Major Tutorial Updates](#)

Portal tutorials

A beginner-level overview for the Portal Aspect is provided in this [Introduction to the RSP Portal Aspect](#). More information can also be found in the [about firefly](#) page on the [Rubin Science Platform Documentation](#) page.

The tutorials below are step-by-step demonstrations of how to use the Portal Aspect for science investigations with the DP0 data set.

How-to tutorials

Short tutorials that focus on how to use one Portal function or tool, typically without scientific context or motivation - just simple examples for quick reference.

<https://dp0-3.lsst.io/tutorials-dp0-3/index.html>

 Rubin Observatory DP0.3 DP0.3 Data Products **DP0.3 Tutorials** DP0.3 Documentation Project Information Rubin docs ↗

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- Log of Major Tutorial Updates
- 01. Introduction to DP0.3: the [MPCORB](#) and [SSobject](#) catalogs (beginner)
- 02. Introduction to DP0.3: the [SSSource](#) and [DiaSource](#) tables (beginner)
- 03. Explore Trans-Neptunian Objects (TNOs) in DP0.3 (Intermediate)
- 04. Phase curve fit analysis (Intermediate)
- 05. Using user-supplied catalogs in DP0.3 (beginner)
- 01. Introduction to DP03
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- 04a. Introduction to Phase Curves
- 04b. Advanced Phase Curve Modeling
- 05. Near-Earth Objects
- 06. User Uploaded Tables
- 07. Interactive Catalog Visualization
- 01. Introduccion a DP03

DP0.3 Tutorials

These tutorials are for DP0 users using the Rubin Science Platform (RSP) deployed at the Interim Data Facility (IDF; the Google Cloud).

Before following these tutorials, users should have followed the [getting started with DP0 checklist](#) and be able to log in at [data.lsst.cloud](#).

It is also important to review the list of [risks and caveats](#) for the DP0-era RSP, and to know the options for [getting support](#).

All RSP tutorials are created by Rubin staff and adhere to the set of guidelines and best practices described in [RTN-045](#), unless otherwise noted (e.g., the [contributed tutorials](#)).

[Suggest a new tutorial topic.](#)

Major Changes Log

[Log of Major Tutorial Updates](#)

Portal tutorials

Step-by-step demonstrations of how to use the DP0.3 data products in the Portal Aspect.

01. Introduction to DP0.3: the [MPCORB](#) and [SSobject](#) catalogs (beginner)
02. Introduction to DP0.3: the [SSSource](#) and [DiaSource](#) tables (beginner)
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04. Phase curve fit analysis (Intermediate)
05. Using user-supplied catalogs in DP0.3 (beginner)

Notebook tutorials

After logging in to the Notebook Aspect of the RSP, click on the "Tutorials" menu item and select the desired tutorial notebook from the drop-down list. A

On this page

- Major Changes Log
- Portal tutorials
- Notebook tutorials
- Spanish-language tutorials
- Contributed tutorials

[Edit this page](#)

<https://sdm-schemas.lsst.io/dp02.html>



Data Preview 0.2

Data Preview 0.2 contains the image and catalog products of the Rubin Science Pipelines v23 processing of the DESC Data Challenge 2 simulation, which covered 300 square degrees of the wide-fast-deep LSST survey region over 5 years.

Updated: March 25, 2025

☐ Paginate Tables

Schema Browser

Data Preview 0.2

Object

Source

ForcedSource

DiaObject

DiaSource

ForcedSourceOnDiaObject

Visit

CcdVisit

CoadDPatches

MatchesTruth

TruthSummary

Change version

Object

Properties of the astronomical objects detected and measured on the deep coadded images.

CSV Search: 				
Column Name	Data Type	Unit	Description	
coord_dec	double	deg	Fiducial ICRS Declination of centroid used for database indexing	pos.eq
coord_ra	double	deg	Fiducial ICRS Right Ascension of centroid used for database indexing	pos.eq
deblend_nChild	int		Number of children this object has (defaults to 0)	
deblend_skipped	boolean		Deblender skipped this source	
detect_fromBlend	boolean		This source is deblended from a parent with more than one child.	
			True if source has no children and is in the inner region of a	



Data Preview 0.3

Data Preview 0.3 (ten-year version): Contains the catalog products of a Solar System Science Collaboration simulation of the results of SSO analysis of the wide-fast-deep data from the full LSST ten-year dataset.

Updated: March 25, 2025

☐ Paginate Tables

Schema Browser

Data Preview 0.3

SSObject

DiaSource

SSSource

MPCORB

Change version

SSObject

LSST-computed per-object quantities. 1:1 relationship with MPCORB. Recomputed daily, upon MPCORB ingestion.

CSV Search: 					
Column Name	Data Type	Unit	Description	UCD	Index
arc	float	d	Arc of LSST observations		
discoverySubmissionDate	double	d	The date the LSST first linked and submitted the discovery observations to the MPC. May be NULL if not an LSST discovery. The date format will follow general LSST conventions (MJD TAI, at the moment).		
firstObservationDate	double	d	The time of the first LSST observation of		

Enquetes

<https://forms.gle/G8pkAPCnsS8ghMSA9>



Necessidades de utilização de dados | BPG

Prezado(a)s,

Passados alguns meses da primeira enquête, gostaríamos de revisar especificamente as necessidades de utilização de dados de cada pesquisador do BPG.

Para mais detalhes sobre os dados, visite o documento [Data Products Definition Document \(DPDD\) - LSE-163](#) e as páginas oficiais de documentação do LSST:

- <https://dp0-2.lsst.io/> --> Estrelas e galáxias
- <https://dp0-3.lsst.io/> --> Sistema Solar

Obrigada pela sua participação!

Equipe LineA.

Obs:

Se precisar de ajuda para preencher, entre em contato conosco (julia@linea.org.br)!

julia@linea.org.br [Switch account](#)

* Indicates required question

Enquete objectLite columns - BPG

Instruções:

O catálogo de objetos do **LSST DR1** conterá **991 colunas**. Os IDACs disponibilizarão uma versão reduzida do catálogo chamada de **objectLite**. A lista de colunas que farão parte do catálogo **objectLite** ainda não foi definida, ela está sendo discutida pelos representantes dos IDACs dos 13 países participantes neste momento. Esta planilha tem a finalidade de coletar informações sobre quais colunas serão de interesse dos pesquisadores brasileiros e com isso contribuir para a discussão com uma **proposta preliminar para o objectLite**. Para mais detalhes sobre os dados, visite a página oficial de documentação do LSST: <https://dp0-2.lsst.io/>

Importante:

- A seleção que resultará desta enquête não será uma escolha definitiva, mas sim um ponto de partida.
- As colunas que não fizerem parte do **objectLite** também estarão disponíveis para uso pelos usuários do IDAC, porém com menos eficiência, pois serão consultadas do DAC USChile em tempo real.

Por favor, preencha com o seu nome na linha 2 e selecione a sua colaboração científica de maior atividade na linha 3, logo abaixo do seu nome. Em seguida, marque na sua coluna as checkboxes correspondentes às colunas do catálogo que serão úteis para a sua pesquisa.

A equipe LineA agradece a sua participação!

Principal colaboração científica:		Nome:
Count (fórmula):		Julia Gschwend
	DESC	
	24	
column_name	datatype unit description	
coord_dec	double deg Fiducial ICRS Declination of centroid used for database indexing	☒
coord_ra	double deg Fiducial ICRS Right Ascension of centroid used for database indexing	☒
deblend_nChild	int Number of children this object has (defaults to 0)	☐
deblend_skipped	boolean Debender skipped this source	☐
detect_fromBlend	boolean This source is deblended from a parent with more than one child.	☐
detect_isDeblendedModelSource	boolean True if source has no children and is in the inner region of a coadd patch and is in the inner region of a coadd tract and is not detected in a pseudo-filter (see config.pseudoFilterList) and is a deblended child	☐
detect_isDeblendedSource	boolean True if source has no children and is in the inner region of a coadd patch and is in the inner region of a coadd tract and is not detected in a pseudo-filter (see config.pseudoFilterList) and is either an unblended isolated source or a deblended child from a parent with	☐
detect_isIsolated	boolean This source is not a part of a blend.	☐
detect_isPatchInner	boolean True if source is in the inner region of a coadd patch	☐
detect_isPrimary	boolean True if source has no children and is in the inner region of a coadd patch and is in the inner region of a coadd tract and is not detected in a pseudo-filter (see config.pseudoFilterList)	☒
detect_isTractInner	boolean True if source is in the inner region of a coadd tract	☐

Plataformas científicas para exploração dos dados do LSST

Workshop

Workflows e Plataformas Científicas: preparação para o LSST DR1

Julia Gschwend

26.03.2025



DAC US/Cloud



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Find documentation for Rubin Observatory data, science platform services, and software.

Data previews

Data Preview 0 (DP0)

DP0 is the first of three data previews during the period leading up to the start of Rubin Observatory Operations. This site provides resources to delegates for exploring the DP0 datasets with the Rubin Science Platform.

Data documentation

DP0.3

Data Preview 0.3 (DP0.3)

DP0.3 provides a catalog of solar system objects from a simulated LSST ten-year wide-fast-deep survey by the Solar System Science

DP0.3 Tutorials

Tutorials for exploring the DP0.3 solar system object dataset on the Rubin Science Platform.



Rubin Science Platform Documentation

The Rubin Science Platform is an online service that enables you to access and analyze Rubin LSST data. This documentation will help you set up your user account and work with the Rubin Science Platform's software and services.

Sign up for an account

Learn how to request an account and log in.



User guides

Learn how to use the Rubin Science Platform's portal, notebook, and API services.

Support

Get additional help with the Rubin Science Platform and related Rubin Observatory projects.

Related documentation

- [Data Preview 0.2](#) — Learn about the DESC DC2 simulated dataset and get tutorials for analyzing data with the Rubin Science Platform.
- [LSST Science Pipelines](#) — Learn about the Rubin LSST's Python data processing, measurement, and access software, which you can use from the Rubin Science Platform.

Next [Rubin Science Platform Guides](#)

<https://www.lsst.org/scientists/international-drh-list>

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[Citing Rubin Obs.](#)

[Key Numbers](#)

[Understanding Data & Simulations](#)

**[Publications, Documents &
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International Data Rights Holder List

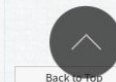
Below is a view of the current, live, international data rights holder database.

This list comprises all scientists who have provisional data rights because of their affiliation with an international in-kind contribution program. A program's LSST data rights will be finalized upon execution of its associated data rights agreement. This list will be refreshed annually: we'll be in touch with each international in-kind program's Program Manager to get those updates.

[Click here to access the data as a Google Sheet](#)

International LSST Data Rights Holders - Rubin Observatory

Program	Country	Full Name	Institution	PI/JA	Mentor
ARG-OIA	Argentina	Cabral, Juan	CONAE	JA	Domingu
ARG-OIA	Argentina	Baume, Gustavo	FCAGLP	PI	
ARG-OIA	Argentina	de Bortoli, Bruno	FCAGLP	JA	Baume, C
ARG-OIA	Argentina	Ennis, Ana	FCAGLP	JA	Feinstein
ARG-OIA	Argentina	Feinstein, Carlos	FCAGLP	PI	
ARG-OIA	Argentina	Mestre, Martin	FCAGLP	JA	Domingu
ARG-OIA	Argentina	Rodriguez, Jimena	FCAGLP	JA	Feinstein
ARG-OIA	Argentina	Bignone, Lucas	IAFE	JA	Pedrosa,
ARG-OIA	Argentina	Buccino, Andrea	IAFE	JA	Luna, Ju
ARG-OIA	Argentina	Cataldi, Pedro	IAFE	JA	Pedroza,
ARG-OIA	Argentina	Luna, Juan	IAFE	PI	
ARG-OIA	Argentina	Melita, Mario	IAFE	PI	
ARG-OIA	Argentina	Pedrosa, Susana	IAFE	PI	
ARG-OIA	Argentina	Tello-Huancan, Eduardo	IAFE	JA	Melita, M
ARG-OIA	Argentina	Alfaro, German	IATE	JA	Paz, Dan
ARG-OIA	Argentina	Baravalle, Laura	IATE	JA	Pedrosa,
ARG-OIA	Argentina	Benavides, Jose	IATE	JA	Pedrosa,
ARG-OIA	Argentina	Bornancini, Carlos	IATE	JA	Donoso,



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DP0.2 Image Search via ObsTAP

View: **UI assisted** Edit ADQL

Enter Constraints

☒ Observation Type and Source

Calibration Level

☐ 0 ☐ 1 ☐ 2 ☒ 3 ☐ 4

1 is raw data; 2 is PVIs; 3 includes coadds and difference images

Data Product Type

Image

Instrument Name

Collection

Data Product Subtype:

lsst.deepCoadd_calexp

"lsst." + Butler Repo Dataset type

☒ Location

Query Type **Observation boundary contains point**

56, -34.9

Try NED then Simbad

Search

Row Limit: 50000

Title: iova.ObsCore - data

Populate and edit ADQL

Output Column Selection and Constraints

27 of 37 columns selected [Reset Column Selections & Constraints](#)

☐	Name char	constraints char	unit char	ucd char	description char	datatype char	arraysize char	utype char
☒	dataprodu			meta.code.class	Data product (file content) primary	char	128*	ObsDataset.dataProdu
☒	dataprodu_subt			meta.code.class	Data product specific type	char	64*	ObsDataset.dataProdu
☒	calib_level			meta.code;obs.calib	Calibration level of the observation:	int		ObsDataset.calibLevel
☒	lsst_band			meta.id;instr.filter	Abstract filter band designation	char	10	
☒	em_min		m	em.wl;stat.min	start in spectral coordinates	double		Char.SpectralAxis.Cove
☒	em_max		m	em.wl;stat.max	stop in spectral coordinates	double		Char.SpectralAxis.Cove
☒	lsst_tract			meta.id	Upper level of LSST coadd skymap	long		
☒	lsst_patch			meta.id.part	Lower level of LSST coadd skymap	long		
☒	lsst_filter			meta.id;instr.filter	Physical filter designation from the	char	10	
☒	lsst_visit			meta.id;obs	Identifier for a specific LSSTCam po	long		
☒	lsst_detector			meta.id;part;instr.det	Identifier for CCD within the LSSTCa	long		
☒	lsst_ccdvisitid			meta.id;part;obs	Identifier for visit+CCD; useful in JO	long		
☒	t_exptime		s	time.duration;obs.exposure	Total exposure time	double		Char.TimeAxis.Coverag
☒	t_min		d	time.start;obs.exposure	Start time in MJD	double		Char.TimeAxis.Coverag
☒	t_max		d	time.end;obs.exposure	Stop time in MJD	double		Char.TimeAxis.Coverag
☒	s_ra		deg	pos.eq.ra	Central Spatial Position in ICRS; Rig	double		Char.SpatialAxis.Cover



<https://data.lsst.cloud/portal>

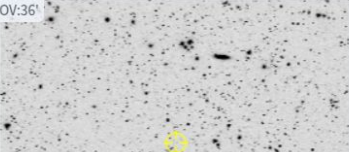
DP0.2 Images
DP0.2 Catalogs
DP0.3 Catalogs
General TAP
Upload
Background Monitor
Logout

Coverage
Data Product: ivoa.ObsCore - data

More
File Contents

HDU (#1): IMAGE
<
>
1 / 3

deepCoadd_calexp - r - DC2-4025-22 (#t...
FOV: 36'



Active Chart
Details



ivoa.ObsCore - data X

I <
1
of 1
> I
(1 - 6 of 6)

	dataprod_type	dataprod_subtype	calib_level	lsst_band	em_min	em_max	lsst_tract	lsst_patch	lsst_filter	lsst_visit	lsst_detector	lsst_ccdvisitid	t_exptime	t_min	t_max	s_ra	s_dec	s_fov	obs_id
	char	char	integer	char	(m) double	(m) double	long	long	char	long	long	long	(s) double	(d) double	(d) double	(deg) double	(deg) double	(deg) double	char
☒	image	lsst.deepCoadd_calexp	3	r	5.52e-7	6.91e-7	4025	22								56.064627564717874	-34.95744498343264	0.32996910150465525	DC2-4025-22
☐	image	lsst.deepCoadd_calexp	3	g	4.02e-7	5.52e-7	4025	22								56.064627564717874	-34.95744498343264	0.32996910150465525	DC2-4025-22
☐	image	lsst.deepCoadd_calexp	3	z	8.18e-7	9.22e-7	4025	22								56.064627564717874	-34.95744498343264	0.32996910150465525	DC2-4025-22
☐	image	lsst.deepCoadd_calexp	3	i	6.91e-7	8.18e-7	4025	22								56.064627564717874	-34.95744498343264	0.32996910150465525	DC2-4025-22
☐	image	lsst.deepCoadd_calexp	3	y	9.7e-7	1.06e-6	4025	22								56.064627564717874	-34.95744498343264	0.32996910150465525	DC2-4025-22
☐	image	lsst.deepCoadd_calexp	3	u	3.3e-7	4e-7	4025	22								56.064627564717874	-34.95744498343264	0.32996910150465525	DC2-4025-22

<https://data.lsst.cloud/portal>

Results

DP0.2 Images

DP0.2 Catalogs

DP0.3 Catalogs

General TAP

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LSST DP0.2 DC2 Tables

Table Collection (Schema): dp02_dc2_catalogs (tables: 11)
Data Preview 0.2 contains the image and catalog products of the Rubin Science Pipelines v23 processing of the DESC Data Challenge 2 simul...
Table Collection (Schema) count: 3

Use Image Search (ObsTAP)

Enter Constraints

☒ Spatial

no target found

Shape Type: ☒ Cone Shape ☐ Polygon Shape

Coordinates or Object Name
Examples: '62, -37' '60.4-35.1' '4h11m59s -32d51m59s equ j2000' '239.2 -47.6 gal'
'NGC 1532' (NB: DC2 is a simulated sky, so names are not useful)

Radius
10 arcseconds
Valid range between: 1" and 360000"

Position Columns: coord_ra, coord_dec (from the selected table on the right)

☐ Temporal

☐ Object ID Search

Try NED then Simbad

Tables: dp02_dc2_catalogs.Object
Properties of the astronomical objects detected and measured on the deep coadded images.

dp02_dc2_catalogs.Object
Properties of the astronomical objects detected and measured on the deep coadded images.

dp02_dc2_catalogs.Source
Properties of detections on the single-epoch visit images, performed independently of the Object detections on coadded images.

dp02_dc2_catalogs.ForcedSource
Forced-photometry measurements on individual single-epoch visit images and difference images, based on and linked to the entries in the O...

dp02_dc2_catalogs.DiaObject
Properties of time-varying astronomical objects based on association of data from one or more spatially-related DiaSource detections on i...

dp02_dc2_catalogs.DiaSource
Properties of transient-object detections on the single-epoch difference images.

dp02_dc2_catalogs.ForcedSourceOnDiaObject
Point-source forced-photometry measurements on individual single-epoch visit images and

Output Column Selection

	Name	Unit
☐	coord_dec	char
☐	coord_ra	char
☐	deblend_nC	
☐	deblend_ski	
☐	detect_fromi	
☐	detect_isDeb	
☐	detect_isDeb	
☐	detect_isIso	
☐	detect_isPat	
☐	detect_isPrim	
☐	detect_isTractInn	
☐	footprintArea	pixel
☐	g_ap03Flux	nJy
☐	g_ap03Flux_flag	
☐	g_ap03FluxErr	nJy
☐	g_ap06Flux	nJy
☐	g_ap06Flux_flag	
☐	g_ap06FluxErr	nJy

Reset Column Selections & Constraints

	datatype	arraysize	utype	xtype	principal	size	column_index
roid u	double				0		
centric	double				0		
as (de	int				0		
boolean					0		
paren	boolean				0		
d is in	boolean				0		
d is in	boolean				0		
id.	boolean				0		
on of a	boolean				0		
True if source has no children and is in	boolean				0		
True if source is in the inner region of a	boolean				0		
Number of pixels in the source's detecti	int				0		
Flux within 3.0-pixel aperture. Forced c	double				0		
General Failure Flag. Forced on g-band	boolean				0		
Flux uncertainty within 3.0-pixel apert	double				0		
Flux within 6.0-pixel aperture. Forced c	double				0		
General Failure Flag. Forced on g-band	boolean				0		
Flux uncertainty within 6.0-pixel apert	double				0		

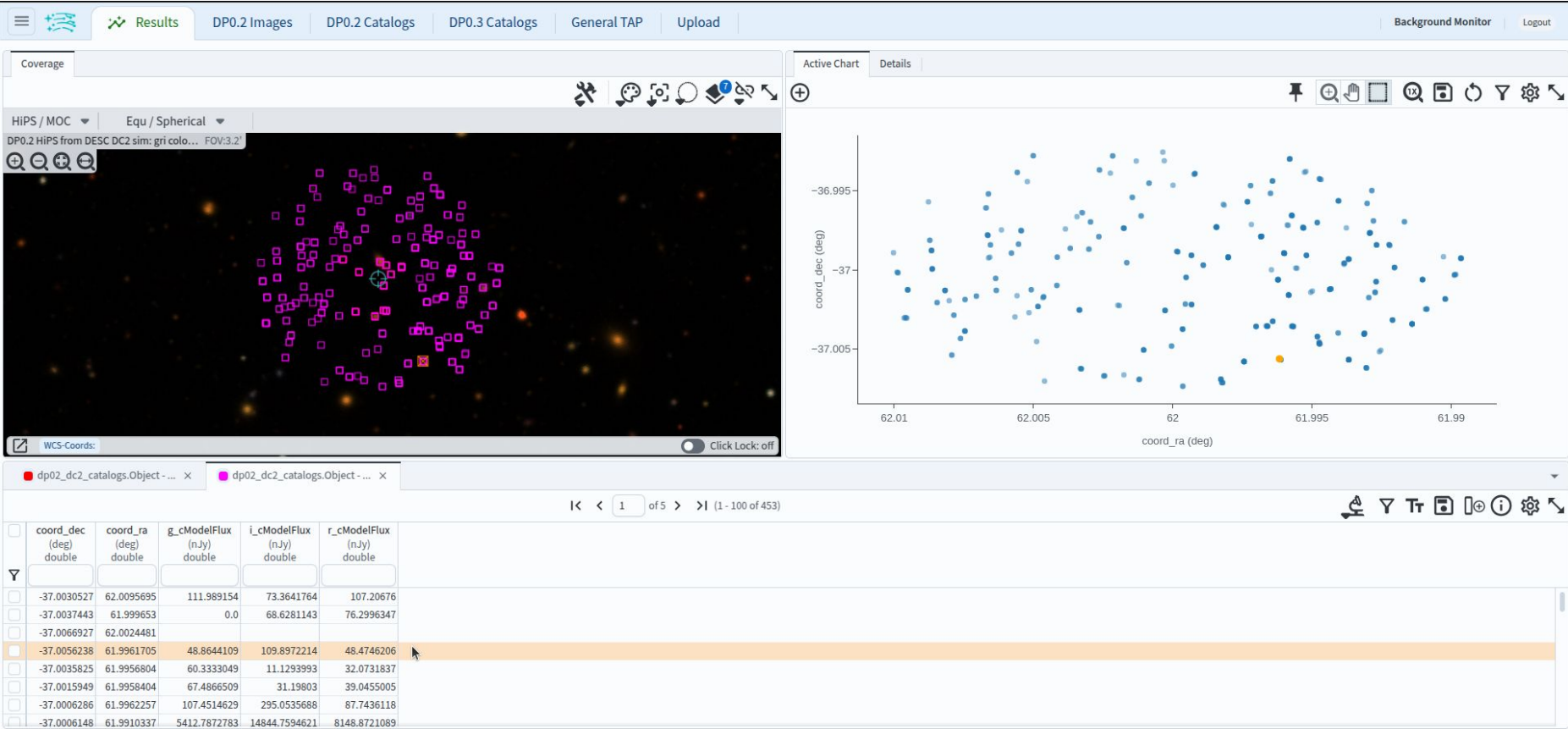
Search

Row Limit: 50000

Title: dp02_dc2_catalogs.Object...

Populate and edit ADQL

<https://data.lsst.cloud/portal>



<https://data.lsst.cloud/portal>




[Results](#)
[DP0.2 Images](#)
[DP0.2 Catalogs](#)
[DP0.3 Catalogs](#)
[General TAP](#)
[Upload](#)

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LSST DP0.3 SSO Tables

Table Collection (Schema): [dp03_catalogs_10yr](#) (tables: 4)
Data Preview 0.3 (ten-year version): Contains the catalog products of a Solar System Science Collaboration simulation of the results of S...

Table Collection (Schema) count: 3

Tables: dp03_catalogs_10yr.SSObject
LSST-computed per-object quantities. 1:1 relationship with MPCORB. Recomputed daily, upon MPCORB ingestion.

View: **UI assisted** Edit ADOLEnter Constraints

☒ Spatial  Spatial searches require identifying table columns containing equatorial coordinates. Please provide column names.

Spatial Type: ☒ Single Object ☐ Multi-object

Shape Type: ☒ Cone Shape ☐ Polygon Shape

4h08m00.00s -37d00m00.0s Equ J2000

Try NED then Simbad

62.00000, -37.00000 Equ J2000 or 4h08m00.00s, -37d00m00.0s Equ J2000

Radius

10	arcseconds ↕
----	--------------

Valid range between: 1" and 360000"

Position Columns: **unset** (from the selected table on the right)

Lon Column Lat Column

☐ Temporal ☐ Object ID Search 

Output Column Select

dp03_catalogs_10yr.SSObject
LSST-computed per-object quantities. 1:1 relationship with MPCORB. Recomputed daily, upon MPCORB ingestion.

LSST-computed per-object quantities. 1:1 relationship with MPCORB. Recomputed daily, upon MPCORB ingestion.

dp03_catalogs_10yr.DiaSource
Table to store 'difference image sources' - sources detected at SNR ≥ 5 on difference images.

dp03_catalogs_10yr.SSSource
LSST-computed per-source quantities. 1:1 relationship with DiaSource. Recomputed daily, upon MPCORB ingestion.

Name	char	LSST-computed per-object quantities. 1:1 relationship with MPCORB. Recomputed daily, upon MPCORB ingestion. end. The columns are described at https://mirrors.ubc.ca/arc									
Y											
☐	arc	dp03_10yr.DiaSource Table to store 'difference image sources' - sources detected at SNR >=5 on difference images.									
☐	discoverySubr	dp03_catalogs_10yr.SSSource LSST-computed per-source quantities. 1:1 relationship with DiaSource. Recomputed daily, upon MPCORB ingestion.									
☐	firstObservation										
☐	flags										
☐	g_Chi2										
☐	g_G12		mag		Best fit G12 slope parameter (g band)	float					
☐	g_G12Err		mag	stat.error	Uncertainty of G12 (g band)	float					
☐	g_H		mag		Best fit absolute magnitude (g band)	float					
☐	g_H_gG12_Cov		mag**2	stat.covariance	H-G12 covariance (g band)	float					
☐	g_HErr		mag	stat.error	Uncertainty of H (g band)	float					
☐	g_Ndata				The number of data points used to fit	int					
☐	i_Chi2			stat.fit.chi2	Chi^2 statistic of the phase curve fit	float					
☐	i_G12		mag		Best fit G12 slope parameter (i band)	float					
☐	i_G12Err		mag	stat.error	Uncertainty of G12 (i band)	float					
☐	i_H		mag		Best fit absolute magnitude (i band)	float					
☐	i_H_iG12_Cov		mag**2	stat.covariance	H-G12 covariance (i band)	float					
☐	i_HErr		mag	stat.error	Uncertainty of H (i band)	float					
☐	i_Ndata				The number of data points used to fit	int					

Search

Row Limit: 50000

 Title: dp03 catalogs 10yr.SSOBJ...

Populate and edit ADOL



<https://data.lsst.cloud/portal/app/onlinehelp/>

 Firefly

⏏

⏏

<

>

📄

<<

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Tables

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About Firefly



Firefly is a framework of archive components, built by [IPAC](#). It provides an interactive web user interface for astronomers. It provides three major components: a table display, FITS/HiPS image visualization, and 2D plots. All three highly interactive components can work together using the same data model or separately to provide any combination of interactivity among them. Firefly components provide an easy way to add interactivity to an otherwise static web page.

Firefly development by IPAC at Caltech has been supported by NASA, principally through [IRSA](#), and by the National Science Foundation, through the [Vera C. Rubin Observatory](#). Firefly is open-source software, available on GitHub ([Caltech-IPAC/firefly](#)) and DockerHub ([ipac/firefly](#)).

The documentation here describes the components in generic terms. If you have specific questions about a specific implementation of Firefly, you may have to consult the documentation specifically associated with that implementation.

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Server Options

Image

- ☒ Recommended (Weekly 2025_09)
- ☐ Release r28.0.1
- ☐ Weekly 2025_12
- ☐ Weekly 2025_11
- ☐ Daily 2025_03_25
- ☐ Daily 2025_03_24
- ☐ Daily 2025_03_23
- ☐ Select uncached image (slower start):

Recommended (Weekly 2025_09) ▼

Options

- ☒ Small (1.0 CPU, 4Gi RAM)
- ☐ Medium (2.0 CPU, 8Gi RAM)
- ☐ Large (4.0 CPU, 16Gi RAM)
- ☐ Enable debug logs
- ☐ Reset user environment: relocate .cache, .conda, .eups, jupyter, .local, and .user_setups

Start

<https://data.lsst.cloud/nb/>

The screenshot displays the data.lsst.cloud notebook interface. On the left, a file explorer sidebar shows the directory structure: /, DATA (2 months ago), idleculler (2 years ago), **notebooks** (3 months ago, highlighted with a purple box), notebooks_csti (3 months ago), and WORK (2 months ago). The main workspace on the right is titled 'Notebook' and contains four Python environment icons: LSST, Python 3 (ipykernel), pzserver-dev, and rail. Below this is a 'Console' section with the same four environment icons. At the bottom, there is an 'Other' section with icons for a shell, a menu, a purple 'M', a Python logo, and a printer. The top of the interface features a menu bar with options: File, Edit, View, Run, Kernel, Rubin, Tutorials, Tabs, Settings, and Help. The bottom status bar shows 'Simple' mode, a tab count of 1, memory usage of 1.97 / 4.00 GB, and the session name 'Weekly 2025_09 [F40258bc...]' (sciplot-lab:w_2025_09) Small (1.0 CPU, 4Gi RAM) data.lsst.cloud. The 'Launcher' tab is active, and a '0' notification badge is visible in the bottom right corner.

<https://data.lsst.cloud/nb/>

File Edit View Run Kernel Rubin Tutorials Tabs Settings Help

gschwend@gschw... pzserver_tutorial.ip... DP02_01_Introduct... DP02_03c_Big_dee... Launcher upload_example.cs...

notebook is read-only LSST

Name Modified

data	3 months ago
DP02_09_Custom_Coadds	3 months ago
DP02_11_User_Packages	3 months ago
DP02_01_Introduccion_a_DP02_ES.ipynb	3 months ago
DP02_01_Introduction_to_DP02.ipynb	3 months ago
DP02_02a_Introduction_to_TAP.ipynb	3 months ago
DP02_02b_Catalog_Queries_with_TAP.ipynb	3 months ago
DP02_02c_Image_Queries_with_TAP.ipynb	3 months ago
DP02_03a_Image_Display_and_Manipulation.ipynb	3 months ago
DP02_03b_Image_Display_with_Firefly.ipynb	3 months ago
DP02_03c_Big_deepCoadd_Cutout.ipynb	3 months ago
DP02_04a_Introduction_to_the_Butler.ipynb	3 months ago
DP02_04b_Intermediate_Butler_Queries.ipynb	3 months ago
DP02_05_Source_Detection_and_Measurement.ipynb	3 months ago
DP02_06a_Interactive_Image_Visualization.ipynb	3 months ago
DP02_06b_Interactive_Catalog_Visualization.ipynb	3 months ago
DP02_07a_DiaObject_Samples.ipynb	3 months ago
DP02_07b_Variable_Star_Lightcurves.ipynb	3 months ago
DP02_08_Truth_Tables.ipynb	3 months ago
DP02_10_Deblender_Data_Products.ipynb	3 months ago
DP02_12a_PSF_Data_Products.ipynb	3 months ago
DP02_12b_PSF_Science_Demo.ipynb	3 months ago
DP02_13a_Image_Cutout_SciDemo.ipynb	3 months ago
DP02_14a_Injecting_Synthetic_Sources.ipynb	3 months ago

VERA C. RUBIN OBSERVATORY

Introduction to Jupyter Notebooks for Data Preview 0.2

Contact author: Melissa Graham
Last verified to run: 2024-12-17
LSST Science Pipelines version: Weekly 2024_50
Container size: medium
Targeted learning level: beginner

Description: An introduction to using Jupyter Notebooks and Rubin Python packages to access LSST data products (images and catalogs).

Skills: Execute Python code in a Jupyter Notebook. Use the TAP service to retrieve Object catalog data. Use the Butler to retrieve and display a deepCoadd image.

LSST Data Products: TAP dp02_dc2_catalogs.Object table. Butler deepCoadd image.

Packages: lsst.rsp.get_tap_service, lsst.rsp.retrieve_query, lsst.daf.butler, lsst.afw.display, lsst.geom, pandas, matplotlib

Credit: Originally developed by Melissa Graham and the Rubin Community Science Team in the context of the Rubin DP0.1.

Get Support: Find DP0-related documentation and resources at dp0.lsst.io. Questions are welcome as new topics in the [Support - Data Preview 0 Category](#) of the Rubin Community Forum. Rubin staff will respond to all questions posted there.

1.0. Introduction

Simple 1 4 LSST | Idle Mem: 2.60 / 4.00 GB Weekly 2025_09 [f40258bc...] (sciplat-lab:w_2025_09) Small (1.0 CPU, 4Gi RAM) data.lsst.cloud Mode: Command Ln 1, Col 1 DP02_01_Introduction_to_DP02.ipynb 0

<https://data.lsst.cloud/nb/>

File Edit View Run Kernel Rubin Tutorials Tabs Settings Help

gschwend@gschw... pzserver_tutorial.ip... DP02_01_Introduc... DP02_03c_Big_dee... Launcher X upload_example.cs X

Code v git Notebook notebook is read-only LSST

/ notebooks / tutorial-notebooks /

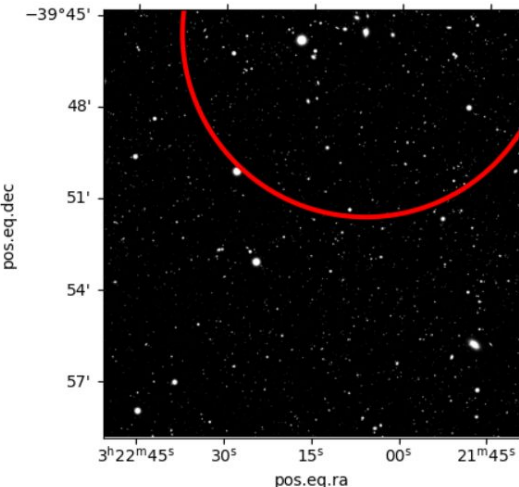
Name	Modified
data	3 months ago
DP02_09_Custom_Coadds	3 months ago
DP02_11_User_Packages	3 months ago
DP02_01_Introduccion_a_DP02_ES.ipynb	3 months ago
DP02_01_Introduction_to_DP02.ipynb	3 months ago
DP02_02a_Introduction_to_TAP.ipynb	3 months ago
DP02_02b_Catalog_Queries_with_TAP.ipynb	3 months ago
DP02_02c_Image_Queries_with_TAP.ipynb	3 months ago
DP02_03a_Image_Display_and_Manipulati...	3 months ago
DP02_03b_Image_Display_with_Firefly.ipynb	3 months ago
DP02_03c_Big_deepCoadd_Cutout.ipynb	3 months ago
DP02_04a_Introduction_to_the_Butler.ipynb	3 months ago
DP02_04b_Intermediate_Butler_Queries.ip...	3 months ago
DP02_05_Source_Detection_and_Measure...	3 months ago
DP02_06a_Interactive_Image_Visualization...	3 months ago
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DP02_07a_DiaObject_Samples.ipynb	3 months ago
DP02_07b_Variable_Star_Lightcurves.ipynb	3 months ago
DP02_08_Truth_Tables.ipynb	3 months ago
DP02_10_Deblender_Data_Products.ipynb	3 months ago
DP02_12a_PSF_Data_Products.ipynb	3 months ago
DP02_12b_PSF_Science_Demo.ipynb	3 months ago
DP02_13a_Image_Cutout_SciDemo.ipynb	3 months ago
DP02_14_Injecting_Synthetic_Sources.ipynb	3 months ago

```
anchor_bbox = anchor_image.getBBox()

aperture = SkyCircularAperture(coord, r=radius)
pix_aperture = aperture.to_pixel(WCS(anchor_image.getWcs()).getFitsMetadata())
pix_aperture.plot(color='r', lw=3)

Last executed at 2025-03-25 21:40:00 in 7.74s
```

[19]: (<matplotlib.patches.Circle at 0x7a076189de50>,)



pos.eq.ra

pos.eq.dec

Simple 1 4 LSST | Idle Mem: 2.60 / 4.00 GB Weekly 2025_09 [f40258bc...] (scipat-lab:w_2025_09) Small (1.0 CPU, 4Gi RAM) data.lsst.cloud Mode: Command Ln 1, Col 1 DP02_03c_Big_deepCoadd_Cutout.ipynb 0

<https://data.lsst.cloud/nb/>

File Edit View Run Kernel Rubin Tutorials Tabs Settings Help

gschwend@gschwend-nl x pzserver_tutorial.ipynb x DP03_01_Introduction_t x Launcher x upload_example.csv x +

notebooks / tutorial-notebooks /

Name	Modified
DP02_00b_Interactive_Image_Visualization...	3 months ago
DP02_06b_Interactive_Catalog_Visualizati...	3 months ago
DP02_07a_DiaObject_Samples.ipynb	3 months ago
DP02_07b_Variable_Star_Lightcurves.ipynb	3 months ago
DP02_08_Truth_Tables.ipynb	3 months ago
DP02_10_Deblender_Data_Products.ipynb	3 months ago
DP02_12a_PSF_Data_Products.ipynb	3 months ago
DP02_12b_PSF_Science_Demo.ipynb	3 months ago
DP02_13a_Image_Cutout_SciDemo.ipynb	3 months ago
DP02_14_Injecting_Synthetic_Sources.ipynb	3 months ago
DP02_15_Survey_Property_Maps.ipynb	3 months ago
DP03_01_Introduccion_a_DP03_ES.ipynb	3 months ago
DP03_01_Introduction_to_DP03.ipynb	3 months ago
DP03_02_Main_Belt_Asteroids.ipynb	3 months ago
DP03_03_Trans-Neptunian_Objects.ipynb	3 months ago
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DP03_07_Interactive_Catalog_Visualizatio...	3 months ago
LICENSE	3 months ago
Y: mobu.yaml	3 months ago
NOTICE	3 months ago
README.md	3 months ago

Introduction to the DP0.3



Contact author(s): Bob Abel, Douglas Tucker, and Melissa Graham
Last verified to run: 2024-12-17
LSST Science Pipelines version: Weekly 2024_50
Container size: medium
Targeted learning level: beginner

Description: An overview of the contents of the DP0.3 moving object catalogs.

Skills: Use the TAP service and ADQL to access the DP0.3 tables.

LSST Data Products: TAP dp03_catalogs.

Packages: `lsst.rsp.get_tap_service`

Credit: The DP0.3 data set was generated by members of the Rubin Solar System Pipelines and Commissioning teams, with help from the LSST Solar System Science Collaboration, in particular: Pedro Bernardinelli, Jake Kurlander, Joachim Moeyens, Samuel Cornwall, Ari Heinze, Steph Merritt, Lynne Jones, Siegfried Eggl, Meg Schwamb, and Mario Jurić.

Mario Jurić provided essential assistance in the initial stages of creating this notebook. The notebook authors would also like to acknowledge help from Leanne Guy, Pedro Bernardinelli, Sarah Greenstreet, Megan Schwamb, Brian Rogers, Niall McElroy, and Jake

Simple 1 0 LSST | Disconnected Mem: 216.35 / 4096.00 MB Weekly 2025_09 [f40258bc...] (sciplot-lab:w_2025_09) Small (1.0 CPU, 4Gi RAM) data.lsst.cloud Mode: Command Ln 1, Col 1 DP03_01_Introduction_to_DP03.ipynb

<https://data.lsst.cloud/nb/>

File Edit View Run Kernel Rubin Tutorials Tabs Settings Help

gschwend@gschw... pzserver_tutorial.ip... DP03_01_Introduct... DP03_04a_Introdu... Launcher upload_example.cs x

notebook is read-only LSST

Code git

```
plt.xlabel('Number')
plt.yscale('log')
plt.legend()
plt.show()
```

Last executed at 2025-03-25 22:07:04 in 607ms

The figure is a histogram showing the distribution of semi-major axes for three categories of celestial objects. The x-axis is labeled 'Semi-major axis [au]' and ranges from 0 to 60. The y-axis is labeled 'Number' and is on a logarithmic scale from 10⁰ to 10². The legend indicates three series: Main Belt asteroids (blue), Jupiter Trojans (orange), and TNOs (grey). The Main Belt asteroids show a sharp peak at approximately 4 au. The Jupiter Trojans show a sharp peak at approximately 5 au. The TNOs show a broad distribution starting around 35 au and extending to 60 au.

Semi-major axis [au]	Main Belt asteroids	Jupiter Trojans	TNOs
4	~80	~100	0
5	~10	~100	0
35	0	0	~1
40	0	0	~10
45	0	0	~5
50	0	0	~3
55	0	0	~1
60	0	0	~1

Figure 2: Histograms of semi-major axis for Main Belt asteroids (blue), Jupiter Trojans (orange), and trans-Neptunian

Simple 1 1 LSST | Idle Mem: 912.07 / 4096.00 MB Weekly 2025_09 [F40258bc...] (scipat-lab:w_2025_09) Small (1.0 CPU, 4Gi RAM) data.lsst.cloud Mode: Command Ln 1, Col 1 DP03_04a_Introduction_to_Phase_Curves.ipynb



rubin-dp0

For repositories related to Rubin Observatory's Data Preview 0.

79 followers

<http://dp0-2.lsst.io>

Overview

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Popular repositories

tutorial-notebooks

Public

Tutorial Jupyter Notebooks for Data Preview 0, created and maintained by the Rubin Observatory Community Science Team.

Jupyter Notebook ☆ 39 🍴 20

delegate-contributions-dp01

Public

Jupyter Notebook ☆ 9 🍴 1

little-demos

Public

For short informal demonstrations of the Rubin Science Platform with Data Preview 0.

Jupyter Notebook ☆ 2

delegate-contributions-dp02

Public

This repository is for DP0 delegates to contribute and share DP0.2-related materials (e.g., code, analysis tools, tutorials).

Jupyter Notebook ☆ 14 🍴 5

delegate-contributions-dp03

Public

This repository is for DP0 delegates to contribute and share DP0.3-related materials (e.g., code, analysis tools, tutorials).

Jupyter Notebook ☆ 3 🍴 1

Support

Public

Submit Github Issues related to DP0

☆ 1 🍴 3

People



Top languages

Jupyter Notebook

<https://github.com/rubin-dp0/delegate-contributions-dp02>

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> README.md

> force_photometry_example.ip...

delegate-contributions-dp02 / forced_photometry_at_location / force_photometry_example.ipynb

morsony Add files via upload 809fb8b · 3 years ago History

Preview Code Blame 2531 Lines (2531 loc) · 185 KB Raw Copy Download

Forced Photometry Measurements at a Given Location

Brian Morsony
Last modified 10/25/2022

Introduction

This notebook is an example of using fake sources to do force photometry at a given location. It works by loading an image from the butler, adding a fake source at the desired coordinates, doing source detection on the modified image, then doing photometry on the original image (with the fake source)

This works, but is slow if you want to do a full 5-year lightcurve. Ideally, it should be possible to do photometry only on the added source, not all the sources in the image, but I haven't figure that out yet.

This notebook is based largely on the "fake_source_injection_multicolor" notebook written by Jeff Carlin. The fake source injection and image processing routines are borrowed from that code.

Rubin Science Platform - API Aspect

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Rubin Science Platform

Portal

Discover data in the browser



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Notebooks

Process and analyze LSST data with Jupyter notebooks in the cloud



[Learn more about notebooks.](#)

APIs

Learn how to programatically access data with Virtual Observatory interfaces



<https://data.lsst.cloud/api-aspect>

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Rubin Science Platform APIs

Integrate Rubin data into your analysis tools with APIs.

To access most APIs you need an [access token](#). See our guide [Creating user tokens](#) to learn more.

Table Access Protocol

You can access catalog data using the Table Access Protocol (TAP) service with popular tools such as [TOPCAT](#) (GUI) and [pyvo](#) (Python package). The TAP endpoint is:

`https://data.lsst.cloud/api/tap`

See our tutorial [Authenticating from TOPCat outside the Science Platform](#) to learn more about accessing TAP datasets from your own computer.

Documentation

Learn more about the APIs in the [Rubin Science Platform API Aspect guide](#).

[Acceptable use policy](#)



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Creating user tokens

[Token scopes](#)

[Tutorial: Authenticating from TOPCat outside the Science Platform](#)

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[Notebooks](#)

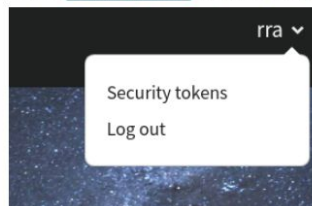
[API](#)

Creating user tokens

If you want to use a Science Platform API service from a local system, you can create a new user token.

Follow these steps to create a user token.

1. Open the [Rubin Science Platform](#) in a web browser.
2. Select [Security tokens](#) from the user drop-down menu at the upper right.



3. Click on [Create Token](#) under User Tokens.

Tokens

[Search token change history](#)

User Tokens

[Create Token](#)

4. Choose a token name, scopes, and expiration. Usually you will want to name the token after the application you will use it with.

On this page

[Next steps](#)

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<https://data.lsst.cloud/support>



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Get help with the Rubin Science Platform

Besides the [documentation](#), you can get help from Rubin Observatory staff. Here are the ways to ask for help.

Data Preview 0 science questions

For questions about the Data Preview dataset (DESC DC2) and analyzing that data (such as with the LSST Science Pipelines), create a new topic in the [Data Preview 0 Support category](#) of the Community forum.

[Create a science support topic in the forum](#)

Rubin Science Platform technical support and feature requests

For technical issues or feature requests related to the Rubin Science Platform itself (the Portal, Notebooks, and API services such as TAP) create a GitHub issue in the [rubin-dp0/Support](#) repository.

[Create a GitHub issue](#)

Rubin Science Platform - Community Forum

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<https://community.lsst.org/>

ABERTO AO
PÚBLICO



Community forum



Welcome to the Vera C. Rubin Observatory LSST Community Forum

Welcome to the main portal for user support and community engagement for the [Rubin Observatory](#) and its Legacy Survey of Space and Time (LSST). Everyone is welcome to sign up or log in (upper right). Follow the instructions below to ask a question, join a discussion, and stay informed. For more information about this Forum see the [user guide](#), [community guidelines](#), [how-to topics](#), [Meta](#) category, or run the [interactive Forum tutorial](#).



Ask a question

Create a new Topic in the [Support](#) category to ask questions and get help, then [mark the solution](#). Confidential support is also available.



Join a discussion

Make new Topics and reply to posts in any category to discuss Rubin science, help answer questions, collaborate, share results, or advertise events.



Stay informed

Watch the [News](#) and [Announcements](#) categories to get email notifications. [Search the Forum](#) to find answers and information. [Join a group](#).

all categories ▾

all tags ▾

Categories

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See 2 new or updated topics

Category	Topics	Latest
News News and announcements from Rubin Observatory.  Data Services	225	 New user permissions and availability of posts  Meta  6 Jan 23
Support Ask questions and get help with using the LSST software, services and data.	1.0k 27 unread 3 new	 Call for Input on Community Alert Filters for ANTARES Broker  Science 5 3h

<https://community.lsst.org/>

The screenshot shows the LSST Community Forum homepage. At the top left is the VERA C. RUBIN OBSERVATORY logo. The main header is "Community forum" with a search icon, a menu icon, and a user profile icon. Below the header is a large dark navigation bar with buttons: "Support", "Rubin Science Platform", "all tags", "all", and "Latest". A callout box points to this bar. Below the navigation bar are three sections: "Ask a question", "Ask a question", and "Stay informed". Below these is a smaller dark navigation bar with buttons: "all categories", "all tags", and "Categories". A second callout box points to this bar. Below the second bar are sections for "News" and "Support". At the bottom right, there is a user profile for "ANTARES Broker" with a "Science" tag and a "5 3h" status.

VERA C. RUBIN
OBSERVATORY

Community forum

Support ▸ Rubin Science Platform ▸ all tags ▸ all ▸ Latest

Ask a question

Ask a question

Stay informed

all categories ▸ all tags ▸ Categories

Support ▸ Data Preview 0 ▸ all tags ▸ all ▸ Latest

ANTARES Broker
Science

Rubin Science Assembly

Rubin Science Assembly, Thu 07 March 2024: (Re-)Introduction to DP0.2 and DP0.3
Science Announcements dp0, science_assembly

 **jeffcarlin** LSST Mar '24

All are invited to join this week's **Rubin Science Assembly**. (See [this topic](#) for more info on Rubin Science Assemblies.)

(Re-)Introduction to DP0.2 and DP0.3

This week's presenter Jeff Carlin will provide an overview of Data Preview 0, data access, related documentation, and communication tools. The session is meant to be an introduction for new delegates, and/or a refresher for existing delegates.

Thursday, March 7 at 9am Pacific (📍 [March 7, 2024 2:00 PM](#)).

Zoom connection: [ls.st/dp0-events](#)

New delegates are welcome! See the [Getting started with Data Preview 0 checklist](#) for info about becoming a delegate and accessing DP0 data.

Additional resources:

- [Data Preview 0 documentation](#)
- [Full schedule of upcoming Rubin Science Assemblies](#)

1 👍 🔗 🚩 📌 🗨️ Reply

created	last reply	1	711	1	1	4
 Mar '24	 Mar '24	reply	views	user	like	links

**Rubin Science Assembly**
Date: 07 March 2024
Type: presentation
Host: Jeff Carlin

Jeff Carlin
(Re-)Introduction to DP0.2 and DP0.3





Rubin Science Assemblies

Thursday mornings at 9:00am Pacific.

Connection info: ls.st/dp0-events

Weekly virtual sessions on learning to use the Rubin data products, pipelines, and services, run by the Rubin [Community Science team](#). All are welcome; students are especially encouraged. New to Rubin? Drop in and let Rubin staff help you get started.

Format

Alternates between tutorials and drop-in office hours, with the occasional presentation.

- **Tutorial** - A hands-on demonstration of data analysis in the Rubin Science Platform.
- **Drop-in office hour** - Get help, ask questions, or co-work with Rubin staff and attendees.
- **Presentations** - A talk, typically without a hands-on component.



DP0

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DP0 Science Assembly Recordings

Date	Topic
2022-07-08	DP0.2 Kick-Off Info Session
2022-07-08	Introduction to the DP0.2 Time-Domain Data Products
2022-07-22	Catalog Data with the TAP Service
2022-07-22	Time-Domain Catalogs in the TAP Service
2022-08-05	Visualizing Image Data
2022-08-19	Data Access with the Butler
2022-09-16	Source Detection and Measurement
2022-09-30	Data Visualization (beginner)
2022-10-14	Survey Property Maps by Martín Rodríguez Monroy

Schedule and recordings for 2025

Thursday mornings at 9:00am Pacific.

Assemblies with tutorials or presentations are recorded (links below).

- Jan 09, tutorial: [How to join user-uploaded tables in RSP](#)
- Jan 16, drop-in office hour
- Jan 23, presentation: [Data Preview 0 Review: Thank You Delegates!](#)
- Jan 30, drop-in office hour
- Feb 06, presentation: [Looking forward to Data Preview 1](#)
- Feb 13, drop-in office hour
- Feb 20, tutorial: [How to use the Portal and Firefly's DS9-like functions](#)
- Feb 27, drop-in office hour
- Mar 06, tutorial: [How to use the ANTARES Alert Broker](#)
- ~~Mar 13~~, cancelled for staff event

Special series of science preparation seminars. Each seminar will start with a brief overview of the LSST goals and planned data products that are relevant to the science topic, and include a hands-on demonstration of how to access and analyze simulated data products via the Rubin Science Platform. There will be time for questions.

- Mar 20, tutorial: Dark Energy
- Mar 27, tutorial: Strong Lensing
- Apr 03, tutorial: Galaxies
- Apr 10, tutorial: Time Domain
- Apr 17, tutorial: Active Galactic Nuclei
- Apr 24, tutorial: Solar System
- May 01, tutorial: Stars & Milky Way

Regular assemblies will continue to alternate weeks of tutorials and drop-ins.

Próxima edição amanhã: tutorial temático p/ Strong Lensing

Community forum

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Rubin Science Assembly, Thu Mar 27 2025: [Science Preparation] Strong Lensing

Science Announcements

 **MelissaGraham**  LSST 2h

Date: Thursday March 27 2025, 9:00-10:00am PDT (🌐 Thursday at 1:00 PM)

Type: Presentation and tutorial

Hosts: Melissa Graham and Brian Nord

Zoom: ls.st/dp0-events

LSST Science Preparation Seminar - Strong Lensing

About the LSST science preparation seminar series: Each seminar will start with a *very brief* overview of the LSST science goals and planned data products that are relevant to each week's topic, and then move into a hands-on demonstration of how to access and analyze simulated versions of those data products via the Rubin Science Platform (RSP). The focus of these seminars is on how to access Rubin data, rather than how to do the science. These seminars use the simulated Data Preview 0 datasets (dp0.lsst.io .

All are welcome, with students particularly encouraged to attend. There will be time for Q&A.

Prior to attending it is recommended to get an account in the Rubin Science Platform: rsp.lsst.io.

Slides and tutorials are available at github.com/rubin-dp0/dp1-sci-prep-seminars.

The recording will be posted in this topic thread.

[Full description and schedule for Rubin Science Assemblies](#) .

[Reply](#)

Rubin Data Academy (antigo DP0 Virtual Summer School)

YouTube

Search

Rubin Data Academy - Mon June 17, A Session

Rubin Observatory
4.21K subscribers

Subscribed

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Session PDT Time Duration	Mon 17 Intro: Catalogs (TAP)	Session PDT Time Duration	Tue 18 Images / visualization	Wed 14 Free day	Session PDT Time Duration	Thu 20 Time-Domain	Session PDT Time Duration	Fri 21 Science Explorations
A 08:00 - 08:15	welcome (Greg) - announcements - Portal vs. notebook - troubleshooting	A 08:00 - 08:10	welcome (Greg) - announcements - troubleshooting		A 08:00 - 08:10	welcome (Greg) - announcements - troubleshooting	A 08:00 - 08:10	welcome (Greg) - announcements - troubleshooting
A 08:15 - 08:35	DP0.2 Portal 01 (Bright star color- magnitude diagram using Portal) (Greg)	A 08:10 - 08:35	DP0.2 NB 03a (Image display and manipulation in a notebook) (Christina)		A 08:10 - 9:00	DP0.2 NB Contr-2 (Extracting light curves of a variable star and a supernova) (Vincenzo)	A 08:10 - 09:00	DP0.2 NB 05 (source detection, using Firefly) (Douglas)
A 08:35 - 09:15	DP0.2 NB 01 (Intro to DP0.2: color- magnitude diagram using a notebook) (Douglas)	A 08:35 - 09:00	DP0.2 Portal 03 (viewing the host galaxy of a supernova) (Nandini)					
A 09:15 - 09:25	break	A 09:00 - 09:10	break		A 09:00 - 09:10	break	A 09:00 - 09:10	break
A 09:25 - 10:00	DP0.3 NB Contr-1 (Study of Solar System objects in DP0.3) (Jake)	A 09:10 - 09:35	DP0.3 NB05 (Study of near-Earth objects) (Sarah)		A 09:10 - 09:35	DP0.2 Portal 02 (light curve of a SN using Difference Image Analysis) (Gloria)	A 09:10 - 10:00	DP0.2 NB 14 (Synthetic source injection into images) (Jeff)
		A 9:35 - 10:00	DP0.2 NB 06b (interactive visualization of catalogs) (Fabio)		A 9:35 - 10:00	DP0.3 Portal 03 (Study of trans-Neptunian object orbits) (Greg)		
A 10:00 - 10:10	break	A 10:00 - 10:10	break		A 10:00 - 10:10	break	A 10:00 - 10:10	break
A 10:10 - 11:00	collaborative flash talks breakout rooms hack session	A 10:10 - 11:00	collaborative flash talks breakout rooms hack session		A 10:10 - 11:00	collaborative flash talks breakout rooms hack session	A 10:10 - 11:00	collaborative flash talks breakout rooms hack session
B 19:00 - 19:15	welcome (Greg) - announcements - Portal vs Notebook - troubleshooting	B 19:00 - 19:10	- welcome (Greg) - announcements - troubleshooting		B 19:00 - 19:05	- welcome (Greg) - announcements - troubleshooting		
B 19:15 - 19:50	DP0.2 NB 01 (Intro to DP0.2: color- magnitude diagram using a notebook) (Douglas)	B 19:10 - 19:35	DP0.2 Portal 03 (viewing the host galaxy of a supernova) (Gloria)		B 19:05 - 19:45	DP0.2 NB 05 (source detection, using Firefly) (Douglas)		
B 19:50 - 20:25	DP0.3 NB Contr-1 (Study of Solar System objects in DP0.3) (Jake)	B 19:35 - 20:10	DP0.2 NB 03a (Image display and manipulation in a notebook) (Christina)		B 19:45 - 20:20	DP0.2 NB Contr-2 (Extracting light curves of a variable star and a supernova) (Jeff)		
B 20:25 - 20:35	break	B 20:10 - 20:20	break		B 20:20 - 20:30	break		
B 20:35 - 21:00	collaborative flash talks breakout rooms hack session	B 20:20 - 21:00	collaborative flash talks breakout rooms hack session		B 20:30 - 21:00	collaborative flash talks breakout rooms hack session		



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Support

Video recordings

For information about the topics covered in each of these sessions, see the [agenda](#) in the section above this one.

Monday, June 17, Session A

Monday, June 17, Session B

Tuesday, June 18, Session A

Tuesday, June 18, Session B

Thursday, June 20, Session A

Thursday, June 20, Session B

Friday, June 21, Session A

Accessibility

The CST will make this virtual workshop as accessible as we can for those attending. If there are any accommodations that would facilitate your participation, the registration form will include an anonymous request form.

On this page

[Post Academy Update](#)

[Overview](#)

[Registration form](#)

[Science Organizing Committee](#)

[Agenda](#)

[Video recordings](#)

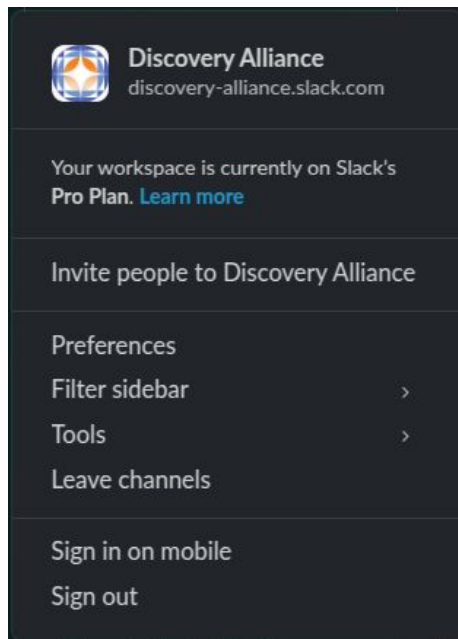
[Accessibility](#)

[Contact](#)

[Edit this page](#)

<https://discovery-alliance.slack.com>

INCLUSÃO DE
MEMBROS FEITA
PELAS LIDERANÇAS
DAS SC



Discovery Alliance
discovery-alliance.slack.com

Your workspace is currently on Slack's Pro Plan. [Learn more](#)

Invite people to Discovery Alliance

Preferences

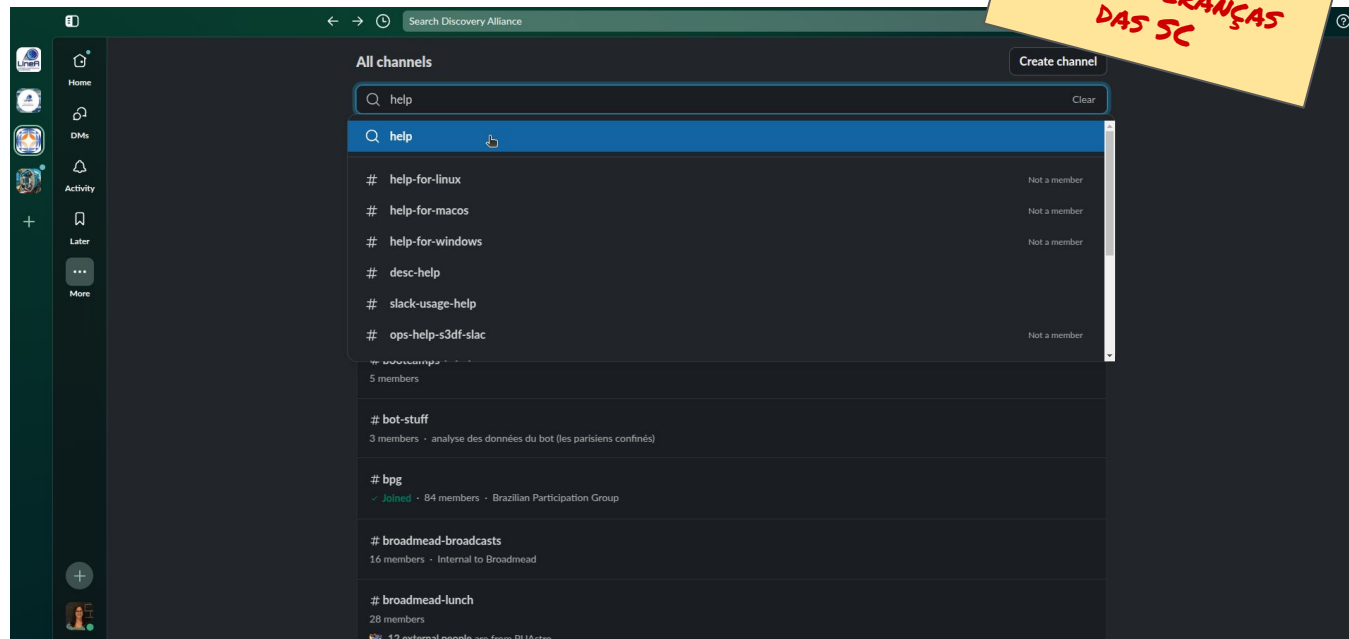
Filter sidebar >

Tools >

Leave channels

Sign in on mobile

Sign out



Search Discovery Alliance

All channels

Search help Clear

Search help

- # help-for-linux Not a member
- # help-for-macos Not a member
- # help-for-windows Not a member
- # desc-help
- # slack-usage-help
- # ops-help-s3df-slac Not a member

bot-stuff
3 members · analyse des données du bot (les parisiens confinés)

bpg
✓ Joined · 84 members · Brazilian Participation Group

broadmead-broadcasts
16 members · Internal to Broadmead

broadmead-lunch
28 members
12 external people are from PUAstro

<https://discovery-alliance.slack.com>

The screenshot shows a Slack interface for a workspace named "Discovery Alliance". On the left sidebar, the "Discovery..." menu is open, showing a list of channels including "#bpg", "#idac-coordination-group", and several external connections. The main channel view is for "#bpg". The top bar shows the search bar and a date separator for "June 19th, 2024". The first message is from Julia Gschwend, posted at 1:12 PM, with the text: "Convite: Brainstorm sobre Dataverse com a Manuela Klanovicz Ferreira, a mais nova bolsista técnica do INCT do e-Universo. 20/06 (amanhã) 9h BRT :zoom-logo: Link para o Zoom". The second message is from Ana Chies Santos, posted at 10:42 AM, with the text: "Second Announcement, Galaxy Memoirs, Inferring their past from their present: open for abstract submission. Dear Friends and Colleagues, We are delighted to announce that abstract submission is now open for the conference 'Galaxy Memoirs; Inferring their past from their present', which will take place in Búzios, Brazil on 10-15th August, 2025. The deadline to submit abstracts is the 15th February. Scientific rationale Clues to a galaxy's past are encoded in its current appearance, and by hunting down these clues, we can infer much about the life histories of these objects. Detailed studies of small numbers of individual systems are complemented by large demographic surveys, and both approaches can be connected to galaxies' high-redshift progenitors. Current cutting-edge instrumentation is being used to obtain a wealth of multi-dimensional information on morphology, kinematics, stellar populations, and eas properties, both within individual galaxies and across the population: the next generation". The bottom of the screen shows a message input field with a "Message #bpg" placeholder and a rich text editor toolbar.

Discovery... ▾

- Home
- Unreads
- Threads
- Huddles
- Drafts & sent
- Team
- # bpg
- # idac-coordination-group
- External Connections
- # 3rd-interpython-works...
- # lincc-hub
- # Neven Caplar DiRAC I...
- # roman-desc-sims
- # roman-desc-sims-datas...
- + Add external people
- Starred
- # Alex Malz (he/him), Eri...
- # desc-pz
- # desc-pz-rail
- # issc
- # issc-announce
- # lincc-dataformats
- # lincc-frameworks-lsdb
- # lincc-tech-talks
- + More unread...

#bpg

Messages Add canvas Files Bookmarks +

June 19th, 2024 ▾

Julia Gschwend 1:12 PM
[@channel] avisos 📢

Convite: Brainstorm sobre Dataverse com a Manuela Klanovicz Ferreira, a mais nova bolsista técnica do INCT do e-Universo.
20/06 (amanhã)
9h BRT
:zoom-logo: [Link para o Zoom](#)

A Manuela terminou recentemente o seu doutorado onde fez um estudo sobre reprodutibilidade de pesquisas científica, usando o LIneA como caso de exemplo na sua pesquisa. Agora que já identificou os nossos problemas (e as nossas qualidades) no assunto, ela vai desenvolver um projeto aqui conosco para implementar um repositório público de resultados científicos, um projeto que já iniciamos no passado, mas que acabou ficando na geladeira nos últimos anos.

Todos(as) são bem vindos(as), especialmente cientistas que disponibilizam ou desejam disponibilizar resultados de publicações online de modo que possam ser convertidas em citações através de doi/handle.

Monday, January 13th ▾

Ana Chies Santos 10:42 AM
Second Announcement, Galaxy Memoirs, Inferring their past from their present: open for abstract submission

Dear Friends and Colleagues,

We are delighted to announce that abstract submission is now open for the conference "Galaxy Memoirs; Inferring their past from their present", which will take place in Búzios, Brazil on 10-15th August, 2025. **The deadline to submit abstracts is the 15th February.**

Scientific rationale
Clues to a galaxy's past are encoded in its current appearance, and by hunting down these clues, we can infer much about the life histories of these objects. Detailed studies of small numbers of individual systems are complemented by large demographic surveys, and both approaches can be connected to galaxies' high-redshift progenitors. Current cutting-edge instrumentation is being used to obtain a wealth of multi-dimensional information on morphology, kinematics, stellar populations, and eas properties, both within individual galaxies and across the population: the next generation

B I [link icon] [list icon] [list icon] [list icon] [code icon] [image icon]

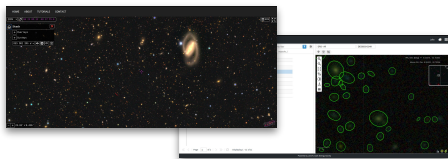
Message #bpg

+ Aa [emoji icon] [mention icon] [link icon] [image icon]

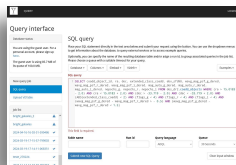
IDAC Brasil



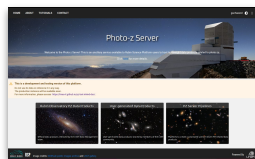
Brazilian IDAC User Interfaces



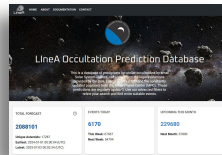
Sky Viewer / Target Viewer
Image visualization
and catalog overlay



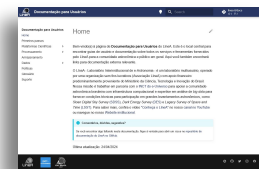
User Query Tool
SQL/ADQL
MyDB



PZ Server



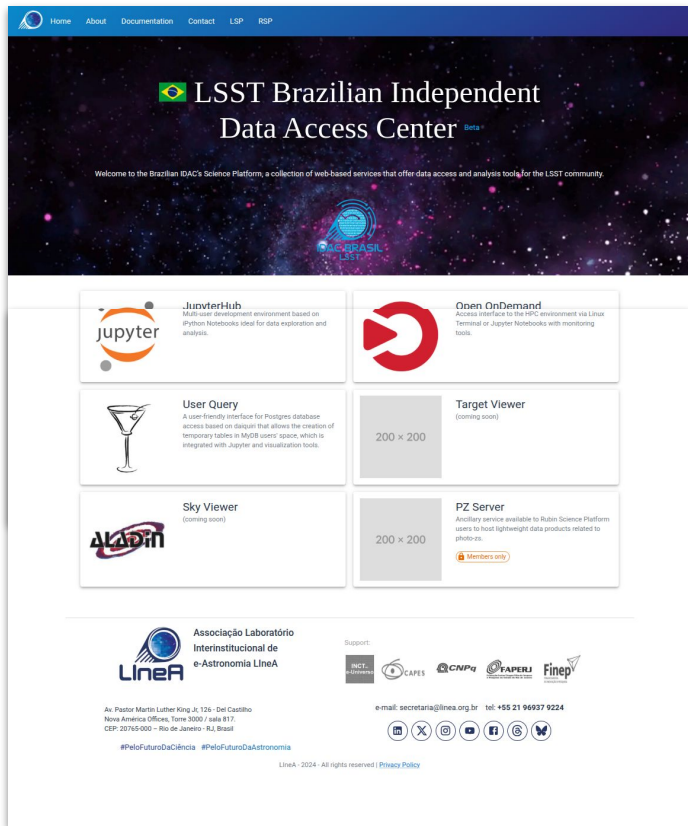
Solar System Portal



Documentation Site
user manuals
tutorials

Microsserviços IDAC:

Um subconjunto do LIneA Science Platform



LSST Brazilian Independent Data Access Center Beta

Welcome to the Brazilian IDAC's Science Platform, a collection of web-based services that offer data access and analysis tools for the LSST community.

JupyterHub
Multi-user development environment based on Jupyter Notebooks ideal for data exploration and analysis.

Onen OnDemand
Access interface to the HPC environment via Linux Terminal or Jupyter Notebooks with monitoring tools.

User Query
A user-friendly interface for PostgreSQL database access based on desktop that allows the creation of temporary tables in MySQL users' space, which is integrated with Jupyter and visualization tools.

Target Viewer
(coming soon)

Sky Viewer
(coming soon)

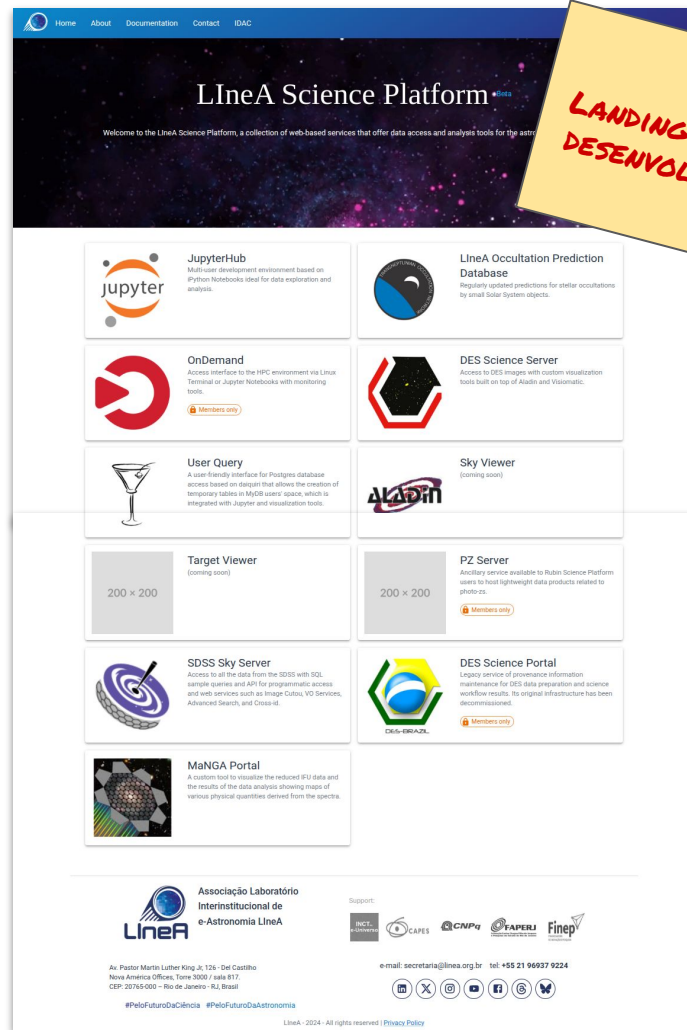
PZ Server
Auxiliary service available to Rubin Science Platform users to host lightweight data products related to photos.

Associação Laboratório Interinstitucional de e-Astronomia LIneA
Av. Pastor Martin Luther King Jr. 126 - Del Castilho
Nova América Offices, Torre 3000 / sala 817
CEP: 20765-000 - Rio de Janeiro - RJ, Brasil
#PeloFuturoDaCiência #PeloFuturoDaAstronomia

Support: INCT, CAPES, CNPq, FAPERJ, Finep

e-mail: secretaria@linea.org.br tel: +55 21 96937 9224

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LIneA Science Platform Beta

Welcome to the LIneA Science Platform, a collection of web-based services that offer data access and analysis tools for the astronomy community.

JupyterHub
Multi-user development environment based on Jupyter Notebooks ideal for data exploration and analysis.

LineA Occultation Prediction Database
Regularly updated predictions for stellar occultations by small Solar System objects.

OnDemand
Access interface to the HPC environment via Linux Terminal or Jupyter Notebooks with monitoring tools. Members only

DES Science Server
Access to DES images with custom visualization tools built on top of Aladin and Visumatic.

User Query
A user-friendly interface for PostgreSQL database access based on desktop that allows the creation of temporary tables in MySQL users' space, which is integrated with Jupyter and visualization tools.

Sky Viewer
(coming soon)

Target Viewer
(coming soon)

PZ Server
Auxiliary service available to Rubin Science Platform users to host lightweight data products related to photos. Members only

SDSS Sky Server
Access to all the data from the SDSS with SQL sample queries and API for programmatic access and with services such as Image Cutout, VO Services, Advanced Search, and Cross-Id.

DES Science Portal
Legacy service of provenance information maintenance for DES data preparation and science workflow results. Its original infrastructure has been decommissioned. Members only

MaNGA Portal
A custom tool to visualize the reduced FITS data and the results of the data analysis showing maps of various physical quantities derived from the spectra.

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Support: INCT, CAPES, CNPq, FAPERJ, Finep

e-mail: secretaria@linea.org.br tel: +55 21 96937 9224

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LANDING PAGE EM DESENVOLVIMENTO

Ferramentas de visualização



<https://scienceserver.linea.org.br/>

DES DR2
DISPONÍVEL PARA
CIÊNCIA E
TREINAMENTO

HOMEABOUTTUTORIALSCONTACT

LineA Science Server



DES Data Release



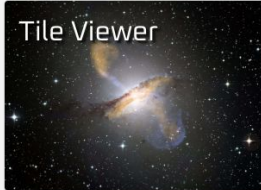
Sky Viewer



Target Viewer



Tile Viewer



User Query



LIneA is supported by

CAPES

CNPq
Conselho Nacional de Desenvolvimento Científico e Tecnológico

FAPERJ
Fundação de Amparo à Pesquisa do Estado do Rio de Janeiro

Finep
Fundação de Amparo à Pesquisa do Estado de Pernambuco

INCT
e-Universe

Powered by 

Sky viewer

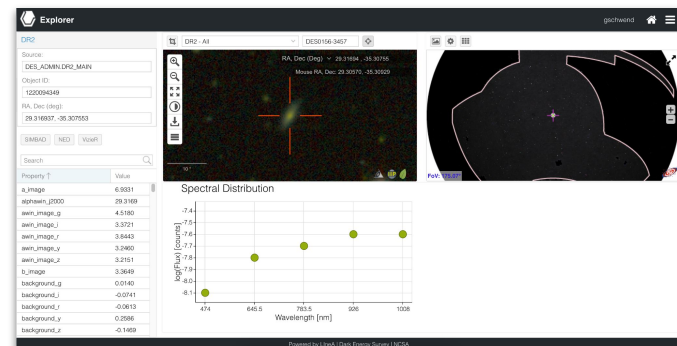
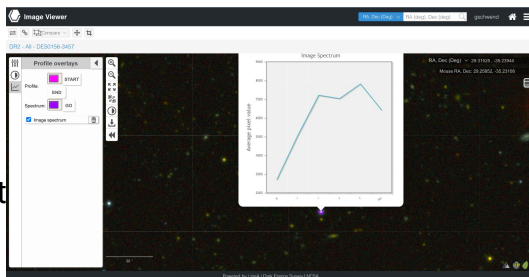
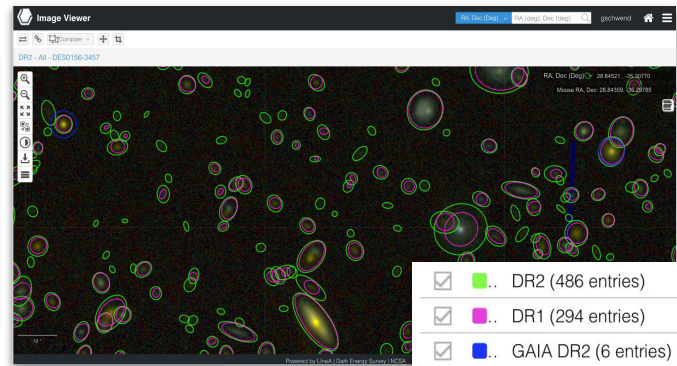
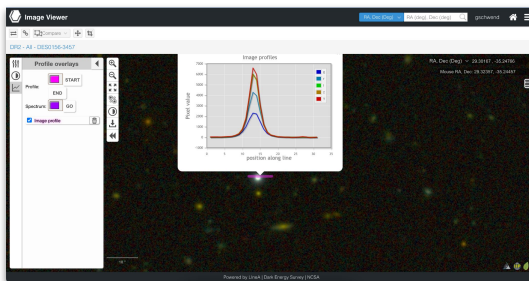
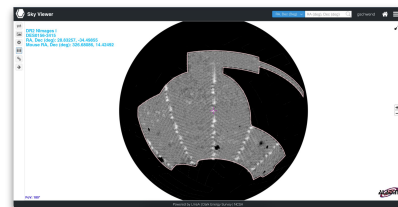
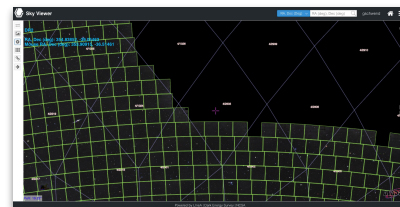
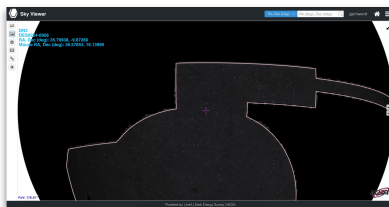
(+ Image Viewer and Explorer)

Main functionalities

- Display whole sky image
- Display coadd images individually
- Display images of other surveys
- Display healpix maps
- Overlay catalogs on top of images
- Light profile
- SED (low resolution, 5 mags)

Useful for

- Comparing between images or catalogs from different releases or surveys
- Exploring, visually, a given target and its neighborhood



Novo Sky Viewer

EM FASE DE
DESENVOLVIMENTO

The screenshot displays the Novo Sky Viewer web application. At the top, a navigation bar includes links for HOME, ABOUT, TUTORIALS, and CONTACT. Below this, a search bar shows the ICRS coordinates 04 08 35.53 -37 06 27.6. A left sidebar contains a 'Stack' panel with a list of surveys. The 'LSST DP0.2 IRG at LineA' survey is currently selected and highlighted in blue. Other surveys listed include 2MASS colored, ALLWISE color, DECaPS DR2 color, DES DR2 IRG at LineA, DSS colored, DSS2 Red (F+R), Density map for Gaia EDR3 (I/350/gaiaedr3), Fermi color, GALEXGR6_7 NUV, GLIMPSE360, Halpha, IRAC color I1,I2,I4 - (GLIMPSE, SAGE, SAGE-SMC, SINGS), IRIS colored, Mellinger colored, PanSTARRS DR1 color, PanSTARRS DR1 g, SDSS9 band-g, SDSS9 colored, and VTSS-Ha. The main viewing area shows a dense field of stars against a black background. A small crosshair is visible in the center of the field. At the bottom left, a zoom control shows a magnification of 30.00' x 12.81'. The ALADIN logo is located in the bottom right corner of the application area.

HOME ABOUT TUTORIALS CONTACT

ICRS 04 08 35.53 -37 06 27.6

Stack

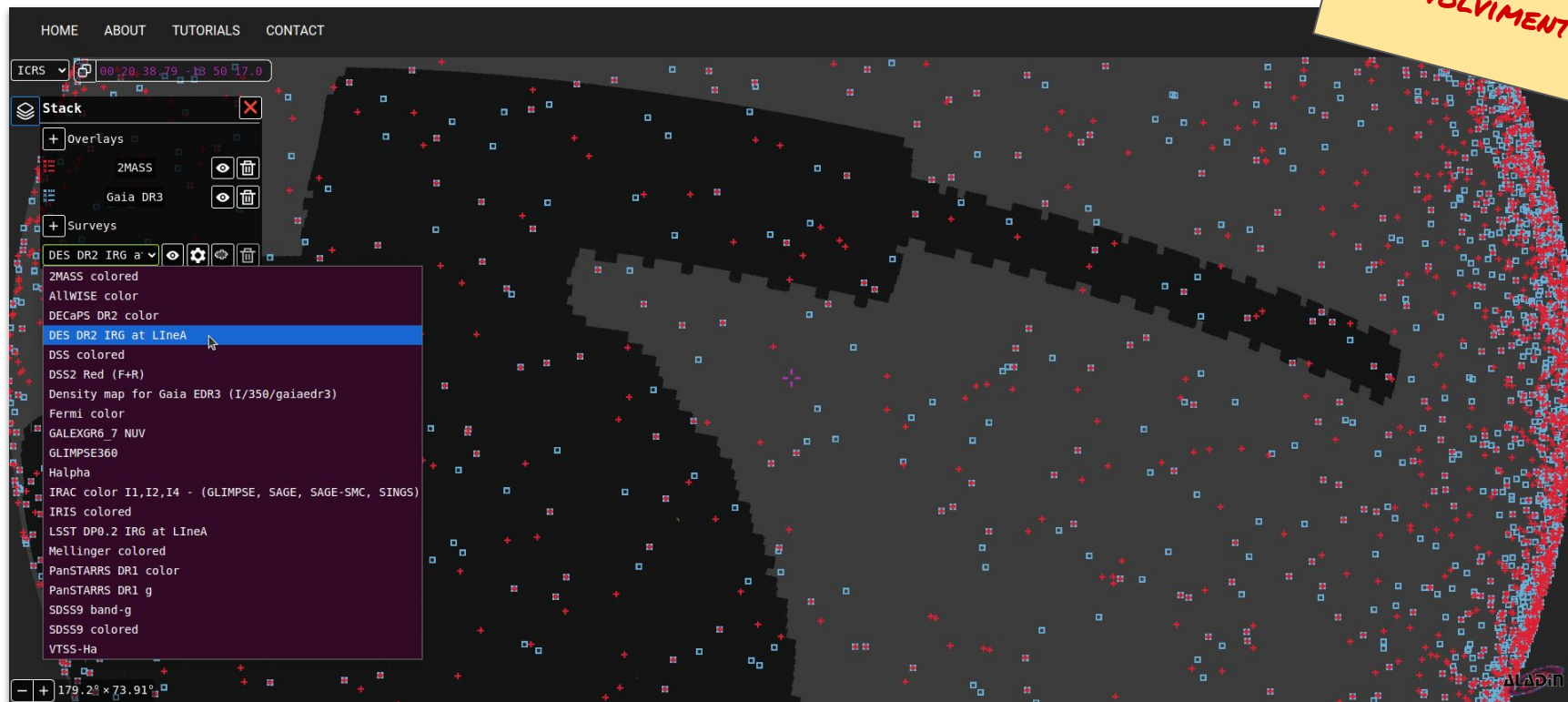
- + Overlays
- + Surveys
- LSST DP0.2 IRG at LineA
- 2MASS colored
- ALLWISE color
- DECaPS DR2 color
- DES DR2 IRG at LineA
- DSS colored
- DSS2 Red (F+R)
- Density map for Gaia EDR3 (I/350/gaiaedr3)
- Fermi color
- GALEXGR6_7 NUV
- GLIMPSE360
- Halpha
- IRAC color I1,I2,I4 - (GLIMPSE, SAGE, SAGE-SMC, SINGS)
- IRIS colored
- LSST DP0.2 IRG at LineA
- Mellinger colored
- PanSTARRS DR1 color
- PanSTARRS DR1 g
- SDSS9 band-g
- SDSS9 colored
- VTSS-Ha

30.00' x 12.81'

ALADIN

Novo Sky Viewer

EM FASE DE
DESENVOLVIMENTO



Target viewer

Main functionalities

- Upload a list of targets
- Create cutouts
- Rating, reject, add comments
- + Image Viewer functionalities

Useful for

- Explore a small sample of targets (maximum 10k objects)
- Visual inspection of "special" objects (e.g., strong lensing systems, interacting galaxies, globular clusters)
- Investigation of "problematic" objects (e.g., extreme color outliers, objects with very large photo-z errors)

The image displays the Target Viewer interface, which includes a table of objects, a visual inspection window, and an 'Add Target List' dialog.

Table of Objects (example NGC galaxies):

ID	RA (deg)	Dec (deg)	id	Rating	Reject	Comments
1	0	6.74292	-1.78728	114	☆☆☆☆☆	
2	1	6.81751	-1.78007	118	☆☆☆☆☆	
3	2	6.87527	-1.51352	120	☆☆☆☆☆	
4	3	6.96837	-1.81067	124	☆☆☆☆☆	
5	4	10.65307	-1.52880	227	☆☆☆☆☆	
6	5	11.52241	-1.72344	245	☆☆☆☆☆	
7	6	12.67453	-1.91053	271	☆☆☆☆☆	
8	7	14.13552	-1.77186	307	☆☆☆☆☆	
9	8	15.49110	-1.93625	351	☆☆☆☆☆	
10	9	16.66120	-1.22044	442	☆☆☆☆☆	
11	10	18.81852	-1.62604	446	☆☆☆☆☆	
12	11	21.11932	-1.64125	519	☆☆☆☆☆	

Add Target List Dialog:

Buttons: Upload, Database

Form fields:

- List Name:
- Folder:
- Release:
- ☐ Public

Text: The target positions must be filled in CSV format: manually, in the text area below, or by a file that can be a raw .csv or a compressed one in the formats .zip or .tar.gz.

File upload: Browse...

Text: The attachment size limit is 50Mb.

Coordinates:

Buttons: Cancel, Submit

Visual Inspection Window:

Top: Target Viewer, DR2 - All, DES00025-0207

Left: Rating: 5, Reject, Comments

Right: RA, Dec (Deg) 11.52241, -1.72344; Mouse RA, Dec (R,B)

Bottom: Powered by LineA | Dark Energy Survey | NSCA

Visual Inspection Window (YSA1 - All):

Top: YSA1 - All, DES00025-0249

Left: Rating: 0, Reject, Comments

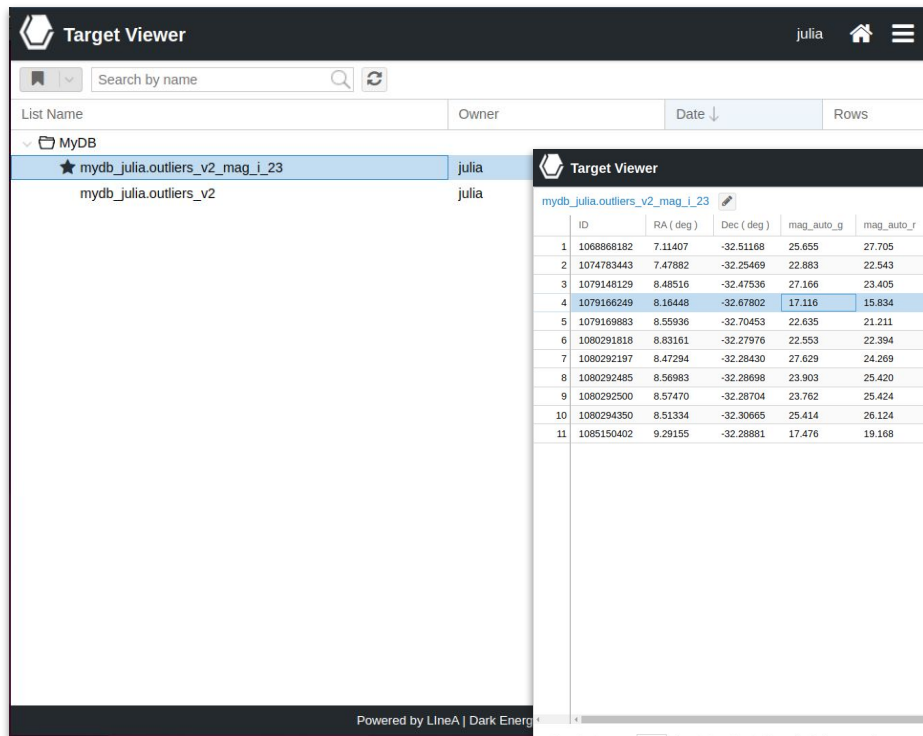
Right: RA, Dec (Deg) 32.64807, -41.58217; Mouse RA, Dec: 32.65718, -41.58410

Bottom: Powered by LineA | Dark Energy Survey | NSCA

Novo Target Viewer

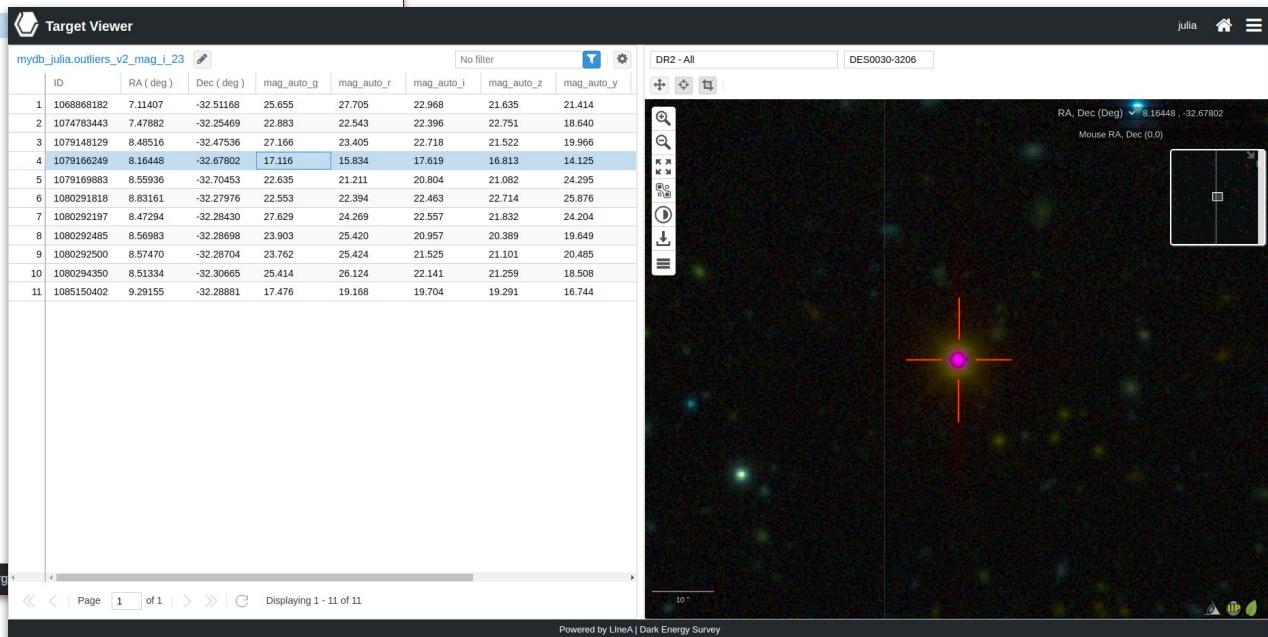
Integrado ao MyDB

EM FASE DE
DESENVOLVIMENTO



The screenshot shows the Target Viewer application interface. At the top, there's a header with the application name and a user profile 'julia'. Below the header is a search bar with the text 'Search by name'. A table lists targets with columns: List Name, Owner, Date, and Rows. The first target is 'mydb_julia.outliers_v2_mag_i_23' owned by 'julia'. Below this, a detailed view of the target 'mydb_julia.outliers_v2' is shown, displaying a table of astronomical data.

ID	RA (deg)	Dec (deg)	mag_auto_g	mag_auto_r	mag_auto_i	mag_auto_z	mag_auto_y
1	106868182	7.11407	-32.51168	25.655	27.705	22.968	21.414
2	1074783443	7.47882	-32.25469	22.883	22.543	22.396	18.640
3	1079148129	8.48516	-32.47536	27.166	23.405	22.718	19.966
4	1079166249	8.16448	-32.67802	17.116	15.834	17.619	16.813
5	1079169883	8.55936	-32.70453	22.635	21.211	20.804	21.082
6	1080291818	8.83161	-32.27976	22.553	22.394	22.463	22.714
7	1080292197	8.47294	-32.28430	27.629	24.269	22.557	21.832
8	1080292485	8.56983	-32.28698	23.903	25.420	20.957	20.389
9	1080292500	8.57470	-32.28704	23.762	25.424	21.525	21.101
10	1080294350	8.51334	-32.30665	25.414	26.124	22.141	21.259
11	1085150402	9.29155	-32.28881	17.476	19.168	19.704	19.291



The screenshot shows a detailed view of the target 'mydb_julia.outliers_v2_mag_i_23'. The interface includes a table of astronomical data, a search bar, and a large astronomical image. The image shows a star field with a central star highlighted by a red crosshair. The image is labeled 'DR2 - All' and 'DES0030-3206'. The image also shows a mouse cursor at RA, Dec (0.0).

ID	RA (deg)	Dec (deg)	mag_auto_g	mag_auto_r	mag_auto_i	mag_auto_z	mag_auto_y
1	106868182	7.11407	-32.51168	25.655	27.705	22.968	21.414
2	1074783443	7.47882	-32.25469	22.883	22.543	22.396	18.640
3	1079148129	8.48516	-32.47536	27.166	23.405	22.718	19.966
4	1079166249	8.16448	-32.67802	17.116	15.834	17.619	16.813
5	1079169883	8.55936	-32.70453	22.635	21.211	20.804	21.082
6	1080291818	8.83161	-32.27976	22.553	22.394	22.463	22.714
7	1080292197	8.47294	-32.28430	27.629	24.269	22.557	21.832
8	1080292485	8.56983	-32.28698	23.903	25.420	20.957	20.389
9	1080292500	8.57470	-32.28704	23.762	25.424	21.525	21.101
10	1080294350	8.51334	-32.30665	25.414	26.124	22.141	21.259
11	1085150402	9.29155	-32.28881	17.476	19.168	19.704	19.291

<https://classroom.google.com/c/NDkzMTA0MzEyODA1/m/NDcyNjUxMDQxNTAw/details>



Curso 1: Science Server



Laboratório Interinstitucional de e-Astronomia • 8 de abr. de 2022 (editado: 5 de mar.)

Curso desenvolvido e aplicado por Adriano Pieres, pós doutorando do LineA.

Data de aplicação: 10, 12 e 17 de agosto de 2021



Minicurso Science Server - ...

Vídeo do YouTube • 1 hora 58 minut



Minicurso Science Server - ...

Vídeo do YouTube • 2 horas 3 minut



Minicurso Science Server - ...

Vídeo do YouTube • 1 hora 43 minut



Science Server Curso Gradu...

PDF



Comentários da turma



Adicionar comentário para a turma...



User Query e TAP Service



<https://userquery.linea.org.br/>

Services ▾Database Tables ▾QueryTarget ViewerManagement ▾AdminJulia ▾



LineA User Query

An interface to query LineA's database and create user-generated tables.

Overview

The User query service based on *daiquiri* is a user-friendly interface that allows one to query the database to create temporary tables.

User-generated tables are managed by MySQL and can be immediately accessed on LineA JupyterHub using *dblinea*. Also, if a table contains equatorial coordinates and a unique identifier column, it automatically becomes a list of targets, so the respective images from DES DR2 can be visualized using the Target Viewer service on DES Science Server.

Picture credits: <https://rubin.canto.com/v/gallery>



Data Access

Interface to perform queries on the database.

[Query »](#)



Documentation

Details and Instructions on how to use the query interface.

[View details »](#)



Science Server

Visualization tools to explore astronomical images and catalogs.

[Open »](#)

<https://userquery.linea.org.br/>

 Services - Database Tables - **Query** Target Viewer Management - Admin Julia -

Query interface

Database status

You are using 90.1 kB of your quota of 2.0 GB.

New query job

SQL query

Upload VOTable

Job list

teste-funcionamento

test_for_target_viewer

2025-02-24-17-54-36-469805

2025-02-24-17-53-00-347956

read_mydb

2025-01-08-18-58-30-775981

View verbose job list

SQL query

Place your SQL statement directly in the text area below and submit your request using the button. You can use the dropdown menus to get information about the database, to query external services or to access example queries.

Optionally, you can specify the name of the resulting database table and/or assign a run id, to group associated queries in the job list. Please choose a queue with a suitable timeout for your query.

Database - Columns - Simbad - VizieR -

Examples -

EXAMPLES

DES DR2 Pure sample of 1000 bright galaxies in i band

DES DR2 Checking star-galaxy classification by color-color diagram

DES DR2 CMD of a pure sample of 1000 bright galaxies in i band

DES DR2 Magnitude errors for mag_auto

DES DR2 Sample of 1000 bright stars

A double click will replace the content of the query field with the example.

SQL query

```
1 -- MAGNITUDE ERRORS FOR MAG_AUTO
2
3 SELECT top 1000 mag_auto_g, magerr_auto_g,
4 mag_auto_r, magerr_auto_r,
5 mag_auto_i, magerr_auto_i,
6 flags_g, flags_r, flags_i,
7 nepochs_g, nepochs_r, nepochs_i
8 FROM des_dr2.main
9 WHERE flags_g < 4
10 AND flags_r < 4
11 AND flags_i < 4
12 AND nepochs_g >= 1
```

Table name

Run id

Query language
ADQL

Queue
30 Seconds

Submit new SQL Query

Clear input window

<https://userquery.linea.org.br/>



Services ▾

Database Tables ▾

Query

Target Viewer

Management ▾

Admin

Julia ▾

Download the results of a request

Please use the [Query interface](#) to submit your search. All result tables can be downloaded in different formats, including CSV as listed on the Download tab of the Query interface.

Download formats

Comma-separated Values	A text file with a line for each row of the table. The fields are delimited by a comma and enclosed by double quotes. Use this option for a later import into a spreadsheet application or a custom script. Use this option if you are unsure what to use.
IVOA VOTable XML file	A XML file using the IVOA VOTable format. Use this option if you intend to use VO compatible software to further process the data.
FITS File	Standard format for astronomical tables.



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Support:



e-mail: secretaria@linea.org.br tel: **+55 21 96937 9224**



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Services - Database Tables - Query Target Viewer

Management - Admin Julia -

DES DR2 Main (des_dr2.main)

Description

(paragraph adapted from the [DES DR2 paper](#))

"DR2_MAIN includes all the main quantities extracted from the coadd pipeline and important information about the objects. That table also includes MAG_AUTO and WAVG_MAG_PSF, associated uncertainties, as well as the corresponding dereddened magnitudes along with star/galaxy separation columns."

Reference

Find details about DES and its second data release on:

- [DES DR2 paper](#)
- [DES website](#)
- [DES Data Management website](#)
- [DES DR2 page on Astro Data Lab](#)

Attribution

This project used public archival data from the Dark Energy Survey (DES). Funding for the DES Projects has been provided by the U.S. Department of Energy, the U.S. National Science Foundation, the Ministry of Science and Education of Spain, the Science and Technology Facilities Council of the United Kingdom, the Higher Education Funding Council for England, the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign, the Kavli Institute of Cosmological Physics at the University of Chicago, the Center for Cosmology and Astro-Particle Physics at the Ohio State University, the Mitchell Institute for Fundamental Physics and Astronomy at Texas A&M University, Financiadora de Estudos e Projetos, Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro, Conselho Nacional de Desenvolvimento Científico e Tecnológico and the Ministério da Ciência, Tecnologia e Inovação, the Deutsche Forschungsgemeinschaft and the Collaborating Institutions in the Dark Energy Survey.

The Collaborating Institutions are Argonne National Laboratory, the University of California at Santa Cruz, the University of Cambridge, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas-Madrid, the University of Chicago, University College London, the DES-Brazil Consortium, the University of Edinburgh, the Eidgenössische Technische Hochschule (ETH) Zürich, Fermi National Accelerator Laboratory, the University of Illinois at Urbana-Champaign, the Institut de Ciències de l'Espai (IEEC/CSIC), the Institut de Física d'Altes Energies, Lawrence Berkeley National Laboratory, the Ludwig-Maximilians Universität München and the associated Excellence Cluster Universe, the University of Michigan, the National Optical Astronomy Observatory, the University of Nottingham, the Ohio State University, the OzDES Membership Consortium, the University of Pennsylvania, the University of Portsmouth, SLAC National Accelerator Laboratory, Stanford University, the University of Sussex, and Texas A&M University.

Based in part on observations at Cerro Tololo Inter-American Observatory, National Optical Astronomy Observatory, which is operated by the Association of Universities for Research in Astronomy (AURA) under a cooperative agreement with the National Science Foundation.

Access

You can access this table using the [query interface](#) and download the results afterwards.

Digital object identifier

You can use the following DOI to cite this table in a publication:

<https://doi.org/https://iopscience.iop.org/article/10.3847/1538-4365/ac00b3>

License



This dataset is published under the [Public Domain Mark](#).

LineA

Services - Database Tables - Query Target Viewer

Management - Admin Julia -

Columns

Name	Type	UCD	Unit	Description
coadd_object_id	long	meta.id meta.main		Unique identifier for the coadded objects
tilename	char	obs.field		Identifier of each one of the tiles on which the survey is gridded
hpix_32	long	pos.healpix phys.size		Healpix identifier for its 32 grid size, in a NESTED schema
hpix_64	long	pos.healpix phys.size		Healpix identifier for its 64 grid size, in a NESTED schema
hpix_1024	long	pos.healpix phys.size		Healpix identifier for its 1024 grid size, in a NESTED schema
hpix_4096	long	pos.healpix phys.size		Healpix identifier for its 4096 grid size, in a NESTED schema
hpix_16384	long	pos.healpix phys.size		Healpix identifier for its 16384 grid size, in a NESTED schema
ra	double	pos.eq.ra	deg	Right ascension, with quantized precision for indexing (DELTAWIN_J2000 has full precision but not indexed)
dec	double	pos.eq.dec	deg	decl., with quantized precision for indexing (DELTAWIN_J2000 has full precision but not indexed)
alhawin_j2000	double	pos.eq.ra	deg	Right ascension for the object, J2000 in ICRS system (full precision but not indexed)
deltawin_j2000	double	pos.eq.dec	deg	decl. for the object, J2000 in ICRS system (full precision but not indexed)
galactic_l	double	pos.galactic.lon	deg	Galactic Longitude

<https://userquery.linea.org.br/>

LineA

Services - Database Tables - Query Target Viewer

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GAIA DR3 (gaia_dr3.source)

Description

(paragraph extracted from the [DR3 Documentation release](#) int/archive/documentation/GDR3/)

EXECUTIVE SUMMARY

The third Gaia data release, Gaia DR3, contains the astrometry and broad-band photometry already published as part of Gaia EDR3 and introduces a large variety of new data products:

- A much expanded radial velocity survey, as well as magnitudes of sources in the GRVS band, and a spectral line broadening parameter vbroad;
- Mean BP, RP, and RVS spectra for a large subset of sources;
- A much expanded collection of variable sources, covering 24 variability types;
- Photometric time series for all variable sources;
- The Gaia Andromeda Photometric Survey which contains the photometric time series for all sources (variable and non-variable) in a 5.5 deg radius field around M31;
- Object classification, including a self-organised map (SOM) of poorly classified sources;
- Astrophysical parameters (APs) from mean BP/RP spectra, including Markov-Chain Monte Carlo (MCMC) samples;
- Astrophysical parameters from mean RVS spectra;
- Chemical abundances from mean RVS spectra;
- Diffuse interstellar band parameters from mean RVS spectra;
- Non-single star solutions;
- QSO and galaxy candidates, including redshifts, QSO host detections, and QSO host and galaxy light profiles;
- Solar system objects (SSO), including reflectance spectra derived from epoch BP/RP spectra;
- Total galactic extinction maps at various HEALPix levels;
- Archived photometric science alerts.

Reference

Find details about Gaia and its third data release on:

- [Gaia DR on ESA's documentation page](#)
- [Gaia DR3 release page](#)
- [Gaia DR3 Documentation release](#)
- [Data model document \(from DR1\)](#)

Attribution

If you have used Gaia DR3 data in your research from this site, please use the following acknowledgement:

This work has made use of data from the European Space Agency (ESA) mission Gaia (<https://www.cosmos.esa.int/gaia>), processed by the Gaia Data Processing and Analysis Consortium (DPAC, <https://www.cosmos.esa.int/web/gaia/dpac/consortium>). Funding for the DPAC has been provided by national institutions, in particular to the institutions participating in the Gaia Multilateral Agreement.

Access

You can access this table using the [query interface](#) and download the results afterwards.

Digital object identifier

You can use the following DOI to cite this table in a publication:
https://doi.org/https://gaia.aip.de/metadata/gaia/dr3/gaia_source

License



This dataset is published under the [Gaia Data License](#).

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Services - Database Tables - Query Target Viewer

Management - Admin Julia -

Columns

Name	Type	UCD	Unit	Description
solution_id	long	meta.version		Solution Identifier
designation	char	meta.id meta.main		Unique source designation (unique across all Data Releases)
source_id	long	meta.id meta.main meta.ref		Unique source identifier (unique within a particular Data Release)
random_index	long	meta.code		Random index for use when selecting subsets
ref_epoch	double	meta.ref time.epoch	yr	Reference epoch
ra	double	pos.eq.ra meta.main	deg	Right ascension
ra_error	float	stat.error pos.eq.ra	mas	Standard error of right ascension
dec	double	pos.eq.dec meta.main	deg	Declination
dec_error	float	stat.error pos.eq.dec	mas	Standard error of declination
parallax	double	pos.parallax.trig	mas	Parallax
parallax_error	float	stat.error pos.parallax.trig	mas	Standard error of parallax
parallax_over_error	float	stat.snr pos.parallax.trig		Parallax divided by its standard error
pm	float	pos.pm pos.eq	mas.yr ⁻¹	Total proper motion

<https://userquery.linea.org.br/>

EM BREVE:
SDSS,
LSST DPO.2 OBJECT
E DPO.3 SSOBJECT

LineA

Services - Database Tables - Query Target Viewer

Management - Admin julia -

2MASS (twomass.psc)

Description

(paragraph adapted from the [The Two Micron All Sky Survey](#))

The Two Micron All Sky Survey (2MASS) project is designed to close the gap between our current technical capability and our knowledge of the near-infrared sky. In addition to providing a context for the interpretation of results obtained at infrared and other wavelengths, 2MASS is providing direct answers to immediate questions on the large-scale structure of the Milky Way and the Local Universe. The optimal use of the next generation of infrared space missions, such as HST/NICMOS, the Space Infrared Telescope Facility (SIRTF), and the Next Generation Space Telescope (NGST), as well as powerful ground-based facilities, such as Keck I, Keck II, and Gemini, require a new census with vastly improved sensitivity and astrometric accuracy than that previously available.

To achieve these goals, 2MASS has uniformly scanned the entire sky in three near-infrared bands to detect and characterize point sources brighter than about 1 mJy in each band, with signal-to-noise ratio (SNR) greater than 10, using a pixel size of 2.0". This has achieved an 80,000-fold improvement in sensitivity relative to earlier surveys.

2MASS used two highly-automated 1.3-m telescopes, one at Mt. Hopkins, AZ, and one at CTIO, Chile. Each telescope was equipped with a three-channel camera, each channel consisting of a 256x256 array of HgCdTe detectors, capable of observing the sky simultaneously at J (1.25 microns), H (1.65 microns), and Ks (2.17 microns).

The University of Massachusetts (UMass) was responsible for the overall management of the project, and for developing the infrared cameras and on-site computing systems at both facilities. The Infrared Processing and Analysis Center (IPAC) is responsible for all data processing through the Production Pipeline, and construction and distribution of the data products. The 2MASS project involves the participation of members of the Science Team from several different institutions. The 2MASS project is funding by the National Aeronautics and Space Administration (NASA) and the National Science Foundation (NSF).

Attribution

If you have used 2MASS data in your research from this site, please use the following acknowledgement:

This publication makes use of data products from the Two Micron All Sky Survey, which is a joint project of the University of Massachusetts and the Infrared Processing and Analysis Center/California Institute of Technology, funded by the National Aeronautics and Space Administration and the National Science Foundation.

Database access and other data services are provided by the Associação Laboratório Interinstitucional de e-Astronomia (LineA) with the financial support from INCT do e-Universo (Processo n.º 465376/2014-2).

Access

You can access this table using the [query interface](#) and download the results afterwards.

License



This dataset is published under the [Public Domain Mark](#).

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Services - Database Tables - Query Target Viewer

Management - Admin julia -

Columns

Name	Type	UCD	Unit	Description
ra	double	pos.eq.ra meta.main	deg	J2000 right ascension with respect to the ICRS
decl	double	pos.eq.dec meta.main	deg	J2000 declination with respect to the ICRS
err_maj	float	phys.angleSize.smaAxis	arcsec	Semi-major axis length of the one sigma position uncertainty ellipse
err_min	float	phys.angleSize.sminAxis	arcsec	Semi-minor axis length of the one sigma position uncertainty ellipse
err_ang	short	pos.posAng instr.skyLevel	deg	Position angle on the sky of the semi-major axis of the position uncertainty ellipse (East of North)
designation	char	meta.id meta.main		Sexagesimal, equatorial position-based source name in the form: hhmmssss+ddmmss[ABC...].
j_m	float	meta.ref phys.size.radius em.IR.J	mag	Default J-band magnitude, or if the source is not detected in the J-band, the 95% confidence upper limit derived from a 4" radius aperture measurement taken at the position of the source on the Atlas Image.
j_cmsig	float	stat.error phot.mag em.IR.J	mag	Corrected photometric uncertainty for the default J-band magnitude. If rd_flg[1]="2", this is the measurement error from the profile-fitting procedure, corrected to be consistent with observed repeatability statistics.
j_msigcom	float	meta.code.error phot.mag	mag	Combined, or total photometric uncertainty for the default J-band magnitude.

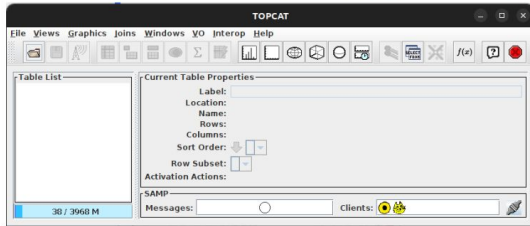
<https://userquery.linea.org.br/cms/services/scripted-access/>



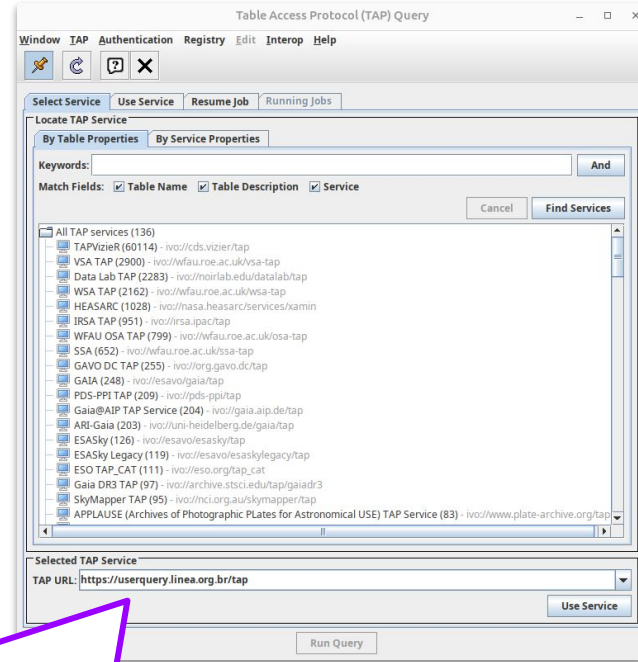
Accessing tables using TAP services

Topcat

First of all, you should have installed TopCat. Access TopCat's project page <https://www.star.bris.ac.uk/~mbt/topcat/> and follow instructions there for further information about how to install in your OS. Figure below shows the initial page of TopCat



In order to access TAP, click on "VO" and "Table Access Protocol (TAP) Query" as seen in the figure:



Selected TAP Service

TAP URL: <https://userquery.linea.org.br/tap>

<https://classroom.google.com/c/NDkzMTA0MzEyODA1/m/NzQzMDQzNjQzNjMy/details>



Curso 13: TOPCAT



Laboratório Interinstitucional de e-Astronomia • 30 de dez. de 2024 (editado: 5 de mar.)

Curso desenvolvido e aplicado por Marcela Vitti e Heleno Campos, bolsistas INCT do e-Universo

Data de aplicação: 12 de dezembro de 2024



[Curso] TOPCAT

Vídeo do YouTube • 2 horas 5 minut



Minicurso - TOPCAT.pdf

PDF



roteiro_estatistica_DES.pdf

PDF



roteiro_estatistica_dengue....

PDF



Atividade.pdf

PDF



data_desc.csv

Microsoft Excel



data_2000_2019.csv

Microsoft Excel



dados_exemplo_GAIA.csv

Microsoft Excel



dados_DES.csv

Microsoft Excel

 Comentários da turma



Adicionar comentário para a turma...



JupyterHub



<https://jupyter.linea.org.br/>

 Home Token

julia Logout



Server Options

Image

☒ Jupyter DataScience (22-10-2024)

Size

☒ Small (1.0 CPU, 4Gi RAM)
☐ Medium (2.0 CPU, 8Gi RAM)
☐ Large (4.0 CPU, 16Gi RAM)

Start my server

<https://jupyter.linea.org.br/>

The screenshot displays the JupyterLab web interface. The top menu bar includes File, Edit, View, Run, Kernel, Git, Tabs, Settings, and Help. The left sidebar contains a file browser with a search bar and a list of files and folders. The main area shows a grid of notebooks under the heading 'github/jupyterhub-tutorial'.

File Browser (Left Sidebar):

- Filter files by name
- / github / jupyterhub-tutorial /
- Name** | **Last Modified**
- minicurso | 20 days ago
- users-notebooks | 15 hours ago
- 1-primeiros-passos.ipynb | 20 days ago
- 2-acesso-a-dados.ipynb | 8 days ago
- 3-conda-env.ipynb | 20 days ago
- LICENSE | 2 years ago
- README.md | 4 months ago

Notebook Grid (Main Area):

github/jupyterhub-tutorial

Notebook

- Python 3 (ipykernel)
- ic-cluster
- Julia 1.8.5
- parsl-env
- photoz
- pz
- R
- rail
- tutorial

Console

- Python 3 (ipykernel)
- ic-cluster
- Julia 1.8.5
- parsl-env
- photoz
- pz
- R
- Python 3 (ipykernel)
- ic-cluster

Simple 0 5 photoz Launcher 1

<https://github.com/linea-it/jupyterhub-tutorial>

linea-it / jupyterhub-tutorial Public

<> Code

Issues 5

Pull requests

Actions

Projects 1

Security

Insights

Notifications

Fork 1

Star 2

main

1 Branch

0 Tags

Go to file

<> Code

 gschwend

Merge pull request #33 from linea-it/updating-hipscat-tutorial-to-use...

1ea6d38 · 4 months ago

178 Commits

images	update logo on the header	8 months ago
minicurso	replace linea.gov.br by linea.org.br everywhere	2 years ago
users-notebooks	Modifying hats_lsdb_tutorial to support new versions of ...	4 months ago
.gitignore	update gitignore file	2 years ago
1-primeiros-passos.ipynb	fix typos	7 months ago
2-acesso-a-dados.ipynb	solve merge conflict	5 months ago
3-conda-env.ipynb	fix typo	7 months ago
LICENSE	Initial commit	4 years ago
README.md	add link to linea docs site	7 months ago

README

MIT license

About

Jupyter Notebooks com tutoriais de apoio ao usuário do serviço LineA JupyterHub.

Readme

MIT license

Activity

Custom properties

2 stars

5 watching

1 fork

Report repository

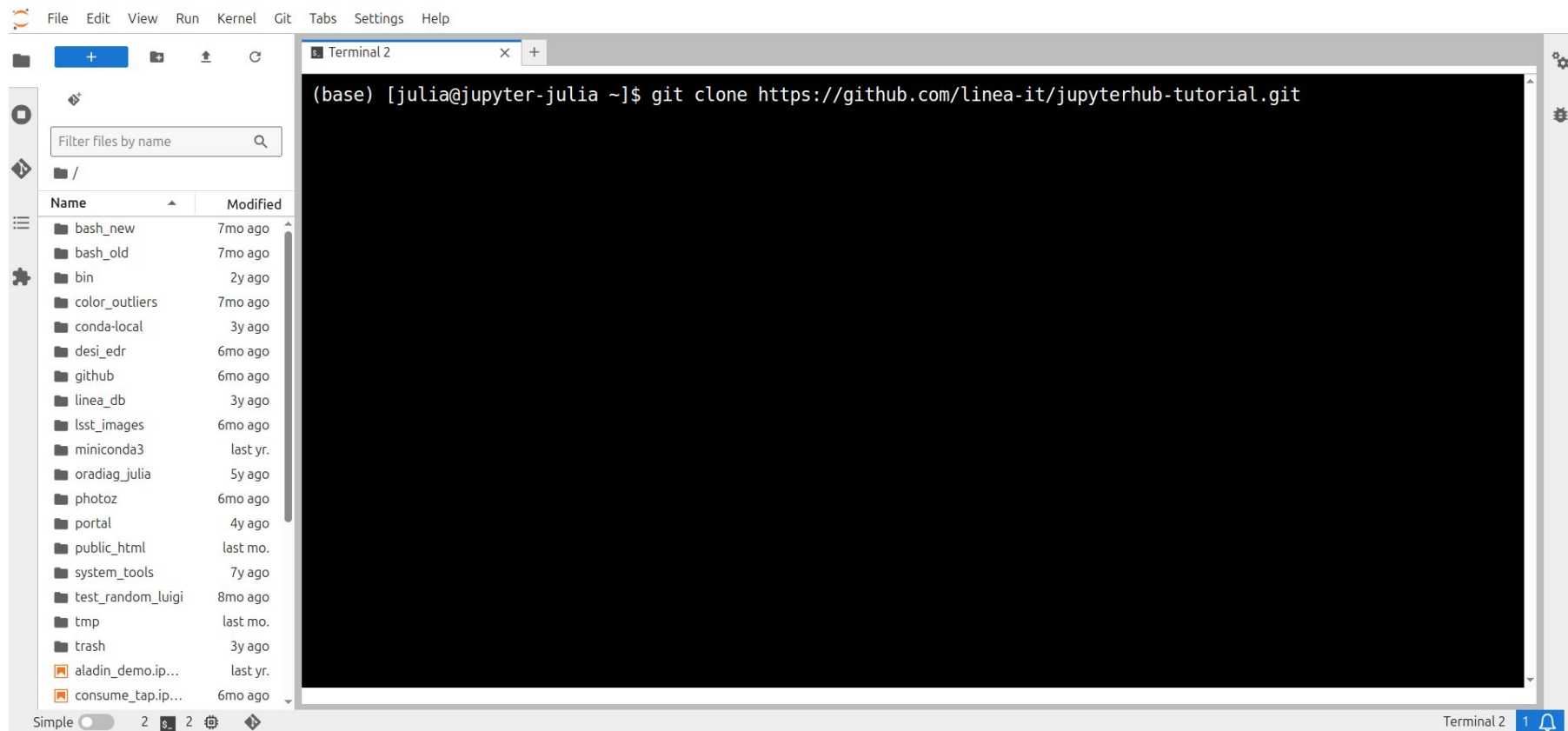
Releases

No releases published

Packages

No packages published

git clone <https://github.com/linea-it/jupyterhub-tutorial.git>



The screenshot shows a JupyterLab environment. On the left is a file browser with a search bar and a list of files and directories. On the right is a terminal window titled 'Terminal 2' showing the execution of a git clone command.

File Browser:

- Search: Filter files by name
- Location: /
- Table:

Name	Modified
bash_new	7mo ago
bash_old	7mo ago
bin	2y ago
color_outliers	7mo ago
conda-local	3y ago
desi_edr	6mo ago
github	6mo ago
linea_db	3y ago
lsst_images	6mo ago
miniconda3	last yr.
oradiag_julia	5y ago
photoz	6mo ago
portal	4y ago
public_html	last mo.
system_tools	7y ago
test_random_luigi	8mo ago
tmp	last mo.
trash	3y ago
aladin_demo.ip...	last yr.
consume_tap.ip...	6mo ago

Terminal 2:

```
(base) [julia@jupyter-julia ~]$ git clone https://github.com/linea-it/jupyterhub-tutorial.git
```

Acesso aos dados via JupyterHub: biblioteca Python *dblinea*



JupyterHub Tutorial

Notebook 2 - Acesso a dados

Contato: Julia Gschwend (julia@linea.org.br)

Última verificação: 08/10/2024

Bem vindo(a) ao LineA JupyterHub!

O LineA JupyterHub oferece acesso a dados públicos disponíveis online e a dados privados de levantamentos fotométricos cuja participação de cientistas brasileiros com *data rights* é apoiada pelo LineA. Neste notebook vamos exemplificar o acesso aos dados públicos do levantamento *Dark Energy Survey* (DES). Caso precise de ajuda, entre em contato pelo e-mail: helpdesk@linea.org.br

1. Sobre os dados



```
[3]: import matplotlib.pyplot as plt
import pandas as pd
from astropy import units as u
from astropy.coordinates import SkyCoord

from dblinea import DBBase

Leitura dos dados

A classe DBBase faz a conexão com o banco de dados e oferece algumas funcionalidades como veremos a seguir. Nos exemplos abaixo, vamos utilizar o objeto db para acessar os dados e metadados da tabela "main" do segundo release (DR2) do levantamento DES.

[4]: db = DBBase()

[5]: schema = "des_dr2"
tablename = "main"

O método get_table_columns retorna a lista de colunas disponíveis na tabela:

[6]: db.get_table_columns(tablename, schema=schema)

[6]: ['coadd_object_id',
'tilename',
'hpix_32',
'hpix_64',
'hpix_1024',
'hpix_4096',
'hpix_16384',
'ra',
'dec',
'alphawin_j2000',
'deltawin_j2000',
'galactic_l',
'galactic_b',
'xwin_image',
'ywin_image']
```

Acesso aos dados via JupyterHub: biblioteca Python *dblinea*

Exemplo 2: seleção de uma região circular com Q3C

Para selecionar uma região circular, basta informar as coordenadas do centro da seleção e um raio (em graus) nos argumentos da função `q3c_radial_query()`. Para um diâmetro de 1 grau, a query ficaria assim:

```
SELECT coadd_object_id, ra ,dec, flags_g, mag_auto_g_dered,  
mag_auto_r_dered,  
mag_auto_i_dered, magerr_auto_g, magerr_auto_r, magerr_auto_i,  
FROM DES_DR2.MAIN  
WHERE q3c_radial_query(ra, dec, 15.0, -33.7, 0.5)  
AND extended_class_coadd < 2
```

```
[16]: query_2 = f"SELECT coadd_object_id, ra ,dec, flags_g, mag_auto_g_dered, mag_auto_r_dered,  
query_2
```

```
[16]: 'SELECT coadd_object_id, ra ,dec, flags_g, mag_auto_g_dered, mag_auto_r_dered, mag_auto_i  
_dered, magerr_auto_g, magerr_auto_r, magerr_auto_i FROM des_dr2.main WHERE q3c_radial_qu  
ery(ra, dec, 15.0, -33.7, 0.5) AND extended_class_coadd < 2 '
```

```
[17]: %%time  
dados_exemplo_2 = db.fetchall_df(query_2)  
  
CPU times: user 956 ms, sys: 249 ms, total: 1.2 s  
Wall time: 2.42 s
```

```
[18]: dados_exemplo_2.head()
```

```
[18]:
```

	coadd_object_id	ra	dec	flags_g	mag_auto_g_dered	mag_auto_r_dered	mag_auto_i_dere
0	1128471439	14.926212	-34.195554	0	23.617884	23.387201	23.34470
1	1128470994	14.925798	-34.192268	0	24.126692	24.006340	24.06432
2	1128471035	14.937076	-34.192203	0	27.661129	26.805216	25.68766
3	1128471545	14.946218	-34.196531	0	26.732773	26.662535	25.27604
4	1128471283	14.947547	-34.194341	0	25.336414	26.046528	25.08989

Acesso aos dados via JupyterHub: biblioteca Python *dblinea*

3. LineA User Query

O **LineA User Query** é uma interface amigável para consultas ao banco de dados que possibilita a criação de tabelas temporárias com resultados imediatamente disponíveis para consulta na própria interface, visualização no **Target Viewer**, e para análise aqui no JupyterHub.

Todas as tabelas criadas por usuários no LineA User Query possuem *schema* composto pelo prefixo `mydb_` junto com o nome de usuário. O nome da tabela é definida pelo usuário no momento da sua criação, na execução da *query* no banco de dados.

Por exemplo, se o usuário **fulano** criou uma tabela chamada **faint_galaxies**, o acesso a esses dados será feito de forma semelhante aos dados que vimos acima. Uma *query* simples para trazer todos os dados da tabela seria:

```
SELECT * FROM mydb_fulano.faint_galaxies
```

e para criar um **pandas.DataFrame** com o conteúdo da tabela:

```
query = "SELECT * FROM mydb_fulano.faint_galaxies"  
df = db.fetchall_df(query)
```

Se você já criou uma tabela no User Query, descomente a célula abaixo e substitua os campos com seus dados:

```
[31]: #schema = "mydb_<seu nome de usuário aqui>"  
      #tablename = "<nome da tabela aqui>"  
      #query = f"SELECT * FROM {schema}.{tablename}"  
      #df = db.fetchall_df(query)  
      #df
```

Gostaria de sugerir alguma correção ou melhoria neste notebook?

EM BREVE: SERVIÇO
DE CUTOOUT E
INTEGRAÇÃO COM
VISUALIZADORES



Curso 2: Jupyter Notebook



Laboratório Interinstitucional de e-Astronomia • 8 de abr. de 2022 (editado: 5 de mar.)

Curso desenvolvido e aplicado por Julia Gschwend, cientista de dados do LIneA

Data de aplicação: 19, 24, 26 e 31 de agosto de 2021



Minicurso Jupyter Noteboo...

Vídeo do YouTube • 47 minutos



Minicurso Jupyter Noteboo...

Vídeo do YouTube • 1 hora 32 minut



Minicurso Jupyter Noteboo...

Vídeo do YouTube • 1 hora 12 minut



Minicurso Jupyter Noteboo...

Vídeo do YouTube • 1 hora 37 minut



Slides Minicurso Jupyter No...

PDF

 **Comentários da turma**



Adicionar comentário para a turma...



<https://classroom.google.com/c/NDkzMtA0MzEyODA1/m/NjE0MDI0MjY1MjQ5/details>



Curso 5: Jupyter Notebook (ed. 2023)



Laboratório Interinstitucional de e-Astronomia • 13 de jun. de 2023 (editado: 5 de mar.)

Curso desenvolvido e aplicado por Andressa Wille (UTFPR) e Gabriel de Oliveira (UFMS).

Data de aplicação: 7 de junho de 2023



Minicurso Jupyter Noteboo...

Vídeo do YouTube • 55 minutos



Astronomia extragaláctica -...

Vídeo do YouTube • 13 minutos



Minicurso-2023.pdf

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Comentários da turma



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Curso 10: Jupyter Notebook



Laboratório Interinstitucional de e-Astronomia • 18 de out. de 2024 (editado: 5 de mar.)

Curso desenvolvido e aplicado por Marcela Vitti e Heleno Campos, bolsistas INCT do e-Univero.

Data de aplicação: 26 de setembro de 2024



[Curso] Jupyter Notebook

Vídeo do YouTube • 2 horas 24 min



minicurso - Jupyter notebo...

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Comentários da turma



Adicionar comentário para a turma...



OnDemand



<https://ondemand.linea.org.br/>

<https://docs.linea.org.br/processamento/uso/openondemand.html>



OnDemand provides an integrated, single access point for all of your HPC resources.

Message of the Day



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Primeiros passos

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Processamento (HPC)

Cluster Apollo

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Slurm

Open OnDemand

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Job Script (exemplos)

Projeto EUBD - LNCC

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Open OnDemand

O Open OnDemand é uma interface que facilita a utilização do nosso ambiente de HPC constituído pelo Cluster Apollo. Para acessar é necessário possuir uma conta válida no LineA (saiba mais). O acesso ao Open OnDemand é através de <https://ondemand.linea.org.br/>.

Na **tela inicial** da plataforma, na parte superior, é possível visualizar um menu com os seguintes itens:

- **Files** - fornece uma interface para o seu diretório de usuário (*Home Directory*).
- **Jobs** - fornece uma interface para as telas "Active Jobs" e "Job Composer".
- **Clusters** - fornece um acesso para o terminal em um navegador da web.
- **Interactive Apps** - fornece acesso ao Jupyter Notebook.

Home Directory

O **Home Directory** possibilita a visualização do diretório de usuário, onde estão armazenados

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Home Directory

Mudando de Diretório

Acessando o Terminal

Criando, Transferindo e Movendo Arquivos

Jobs

Job Composer

JupyterLab

Criando Kernels Python

Vídeos tutoriais



<https://ondemand.linea.org.br/>

<https://docs.linea.org.br/processamento/uso/openondemand.html>

Open OnDemand

linea-it/docs

Criando Kernels Python

Os comandos a seguir devem ser executados no terminal em "LineA Shell Access".
Para acessar:

- Na pagina inicial do Open OnDemand, clique em: **Clusters -> LineA Shell Access**.

Siga os comandos abaixo:

- Vá para sua área SCRATCH, Instale e carregue o Miniconda:

```
cd $SCRATCH

curl -L -O https://repo.anaconda.com/miniconda/Miniconda3-latest-Linux-x86_64.sh
chmod +x Miniconda3-latest-Linux-x86_64.sh
./Miniconda3-latest-Linux-x86_64.sh -p $SCRATCH/miniconda

source miniconda/bin/activate

conda deactivate #Necessário para desativar o env "base"
```

- Crie, ative um venv conda e instale o *ipykernel*:

```
conda create -p $SCRATCH/kernelname
conda activate kernelname/

conda install -c anaconda ipykernel
```

- Configure o JUPYTER_PATH (obrigatório ser esse caminho abaixo):

```
JUPYTER_PATH=$SCRATCH/.local
echo $JUPYTER_PATH

python -m ipykernel install --user --name kernelname --path $JUPYTER_PATH
```

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PZ Server

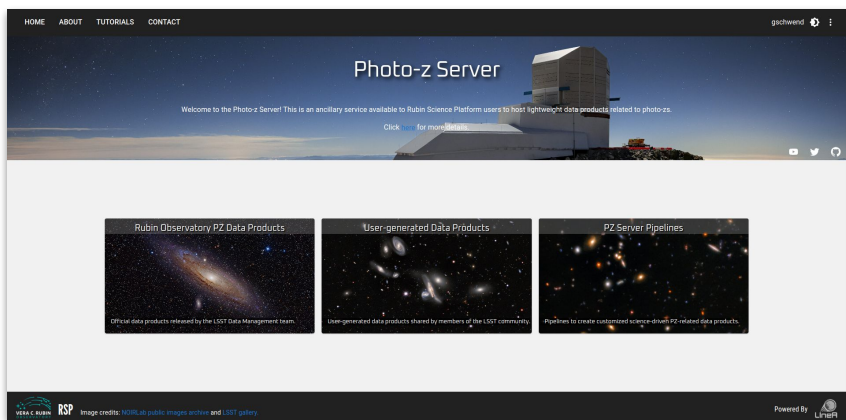


PZ Server overview

A specialized service for creating and hosting pz-related derived data products

<https://pzserver.linea.org.br>

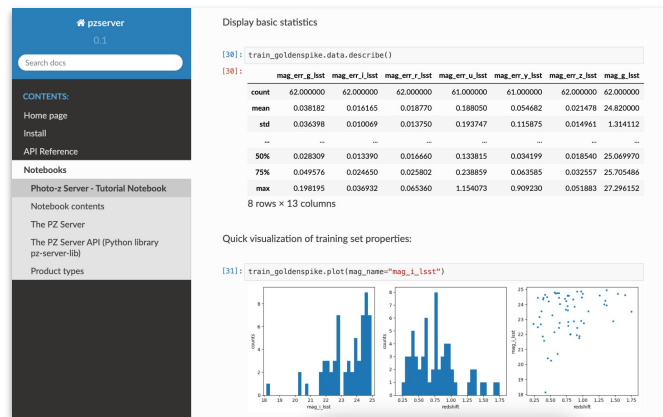
(test environment at <https://pzserver-dev.linea.org.br>)



Repo: [linea-it/pzserver_app](https://github.com/linea-it/pzserver_app)

<https://linea-it.github.io/pzserver/>

Python Library (API) \$ pip install pzserver



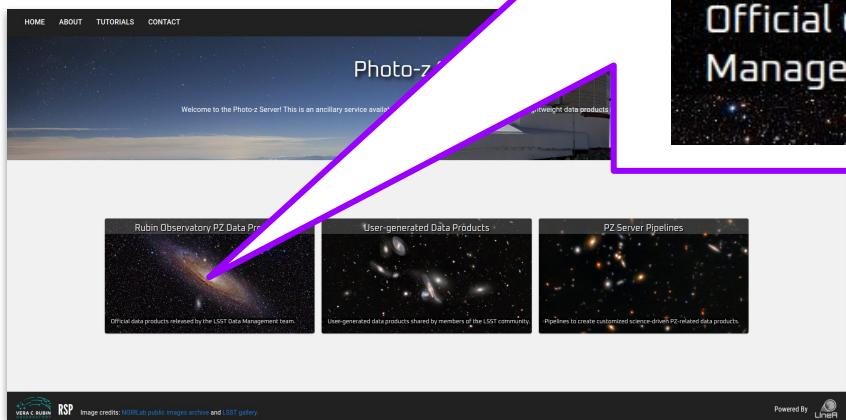
Repo: [linea-it/pzserver](https://github.com/linea-it/pzserver)

PZ Server overview

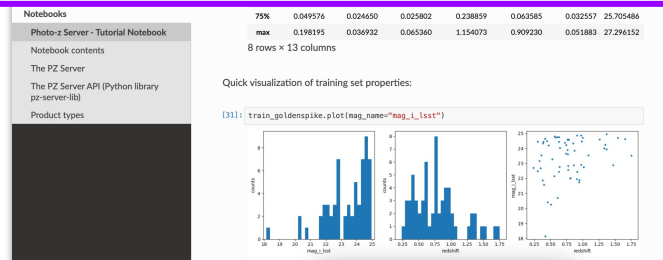
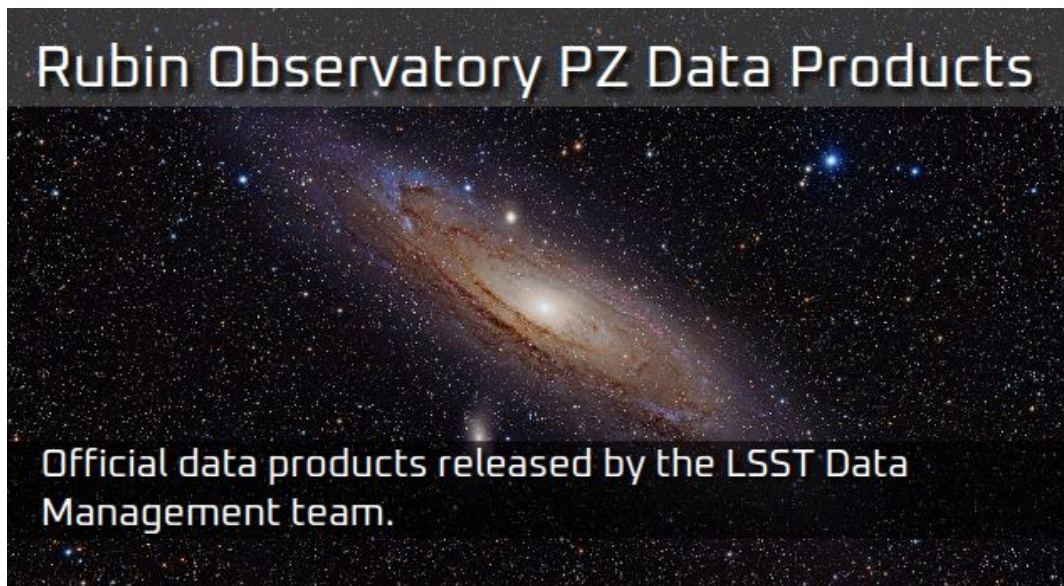
A specialized service for creating and hosting pz-related derived data products

<https://pzserver.linea.org.br>

(test environment at <https://pzserver-test.linea.org.br>)



Repo: [linea-it/pzserver_app](https://github.com/linea-it/pzserver_app)



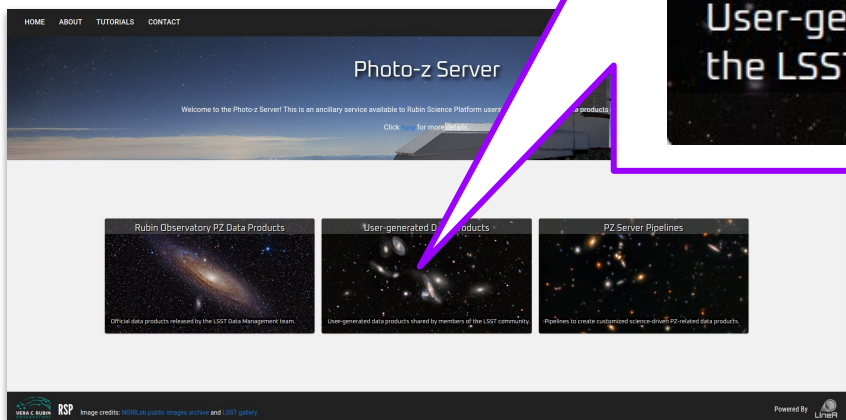
Repo: [linea-it/pzserver](https://github.com/linea-it/pzserver)

PZ Server overview

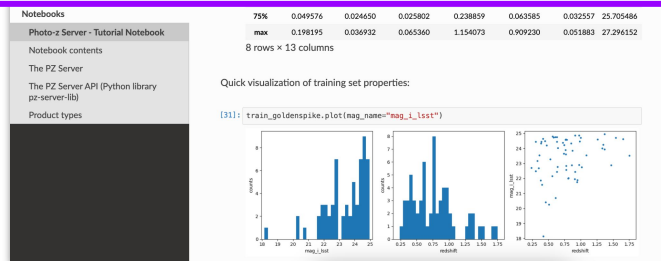
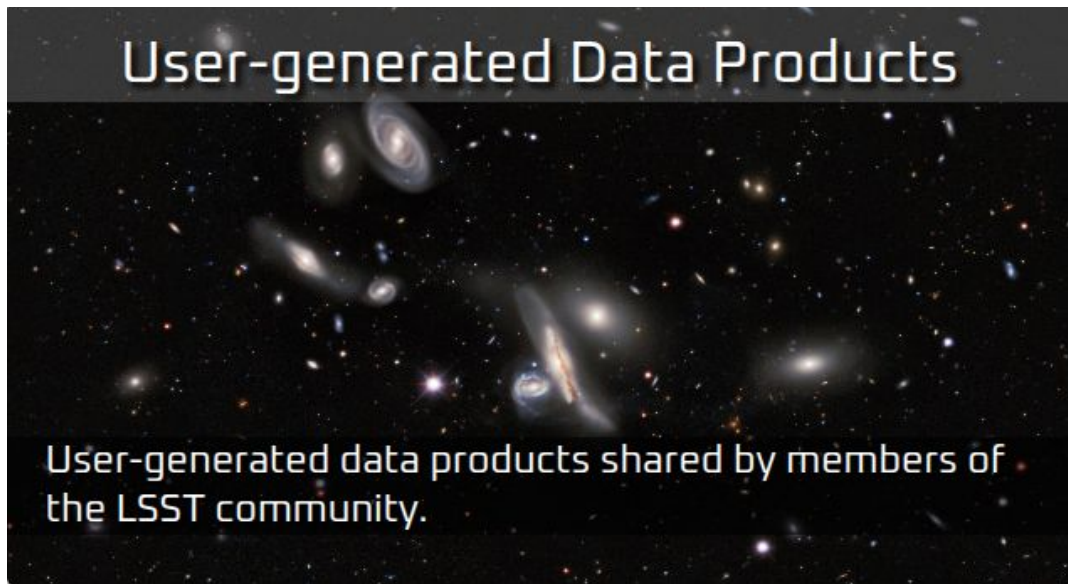
A specialized service for creating and hosting pz-related derived data products

<https://pzserver.linea.org.br>

(test environment at <https://pzserver-d>)



Repo: [linea-it/pzserver_app](https://github.com/linea-it/pzserver_app)



Repo: [linea-it/pzserver](https://github.com/linea-it/pzserver)

Browse, download and share data products + metadata

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< User-generated Data Products

Release 

Product Type 

Search 

Name	Release	Product Type	Uploaded By	Created at ↓	Download	Share	Delete	Edit
dp0 sample pre-processed	LSST DP0	Training Set	HeloisaMengisztiki	2024-03-19				
DR17 MaNGA Spectroscopic Redshifts		Spec-z Catalog	luigilcsilva	2024-03-14				
Simple pz training set	LSST DP0	Training Set	GloriaFA	2024-02-28				
DC2 Tiny true z sample		Spec-z Catalog	gschwend	2023-11-29				
Public Training Set DES DR2		Training Set	gschwend	2023-10-17				
Public spec-z compilation		Spec-z Catalog	gschwend	2023-10-17				
GAMA spec-z subsample		Spec-z Catalog	gschwend	2023-03-29				
VVDS spec-z subsample		Spec-z Catalog	gschwend	2023-03-29				
Goldenspike KNN		Validation Results	gschwend	2023-03-29				
Goldenspike FlexZBoost		Validation Results	gschwend	2023-03-29				



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NEW PRODUCT

Name	Release		Download	Share	Delete	Edit	
dp0 sample pre-processed	LSST DP0		⬇️	➦	🗑️	✎	
DR17 MaNGA Spectroscopic Redshifts			⬇️	➦	🗑️	✎	
Simple pz training set	LSST DP0		⬇️	➦	🗑️	✎	
DC2 Tiny true z sample			⬇️	➦	🗑️	✎	
Public Training Set DES DR2			⬇️	➦	🗑️	✎	
Public spec-z compilation	Spec-z Catalog	gschwend	2023-10-17	⬇️	➦	🗑️	✎
GAMA spec-z subsample	Spec-z Catalog	gschwend	2023-03-29	⬇️	➦	🗑️	✎
VVDS spec-z subsample	Spec-z Catalog	gschwend	2023-03-29	⬇️	➦	🗑️	✎
Goldenspike KNN	Validation Results	gschwend	2023-03-29	⬇️	➦	🗑️	✎
Goldenspike FlexZBoost	Validation Results	gschwend	2023-03-29	⬇️	➦	🗑️	✎

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Upload Product

1 Basic Information

2 Upload Files

3 Columns Association

4 Confirm

Please provide the basic information about the new data product.

Product Name *

Product Type *

Release

Description

CLEAR FORM

NEXT

Upload data products + metadata

Upload Product

1 Basic Information

2 Upload Files

3 Columns Association

4 Confirm

Please provide the basic information about the new data product.

Product Name *

Product Type *

Spec-z Catalog

Training Set

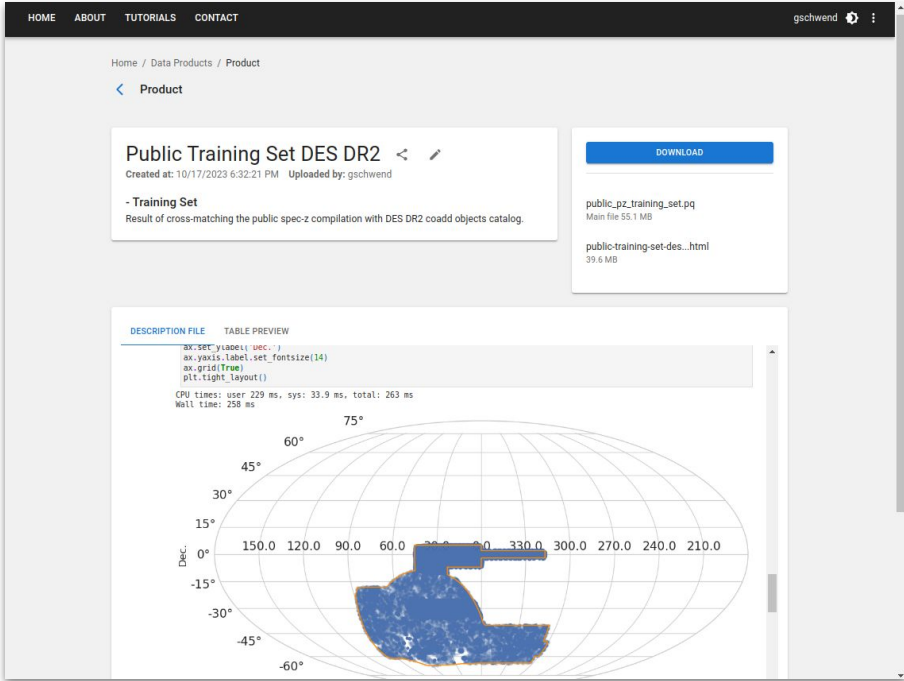
Training Results

Validation Results

Photo-z Table

Description

Data product details' page



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gschwend

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Public Training Set DES DR2

Created at: 10/17/2023 6:32:21 PM Uploaded by: gschwend

- Training Set

Result of cross-matching the public spec-z compilation with DES DR2 coadd objects catalog.

DOWNLOAD

public_pz_training_set.pq
Main file 55.1 MB

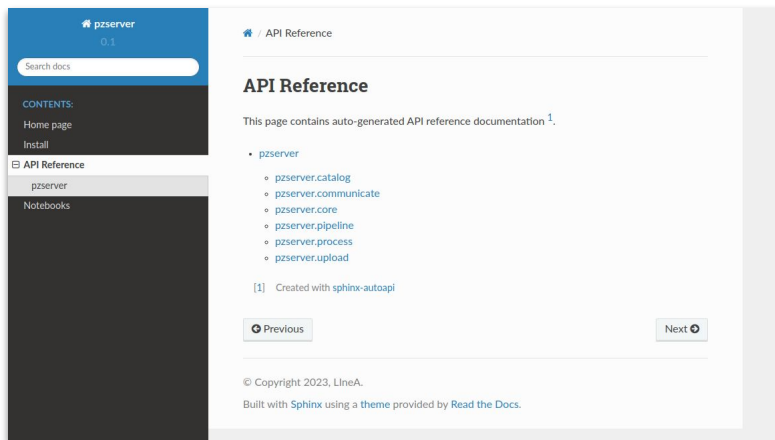
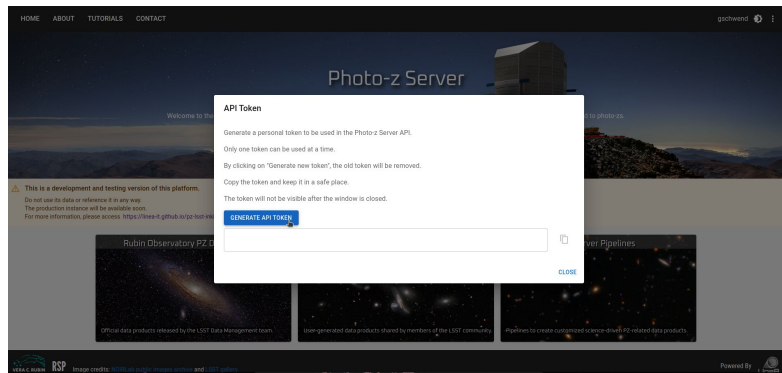
public-training-set-des_.html
39.6 MB

DESCRIPTION FILE

TABLE PREVIEW

coa...	ra	dec	z	err_z	flag...	surv...	flag...	mag...	mag...	mag...	mag...	mag...	mag...	mag...	mag...
101...	352...	-41...	0.21...	99	4	2DF	4	18.4...	17.2...	16.8...	16.5...	16.3...	0.00...	0.00...	0.00...
101...	352...	-41...	0.08...	99	4	2DF	4	18.5...	18.0...	17.8...	17.7...	17.6...	0.00...	0.00...	0.01...
101...	352...	-41...	0.09...	99	4	2DF	4	19.0...	18.1...	17.7...	17.4...	17.3...	0.00...	0.00...	0.00...
101...	352...	-41...	0.18...	99	3	2DF	3	18.6...	17.6...	17.2...	16.9...	16.8...	0.00...	0.00...	0.00...
101...	352...	-41...	0.04...	99	4	2DF	4	18.5...	18.2...	18.2...	18.0...	18.0...	0.00...	0.00...	0.01...
101...	352...	-41...	0.18...	99	4	2DF	4	18.7...	17.6...	17.2...	16.9...	16.8...	0.00...	0.00...	0.00...
101...	353...	-41...	0.07...	99	4	2DF	4	19.1...	18.7...	18.6...	18.5...	18.4...	0.00...	0.00...	0.01...
101...	353...	-41...	0.10...	99	4	2DF	4	17.7...	17.2...	16.9...	16.7...	16.6...	0.00...	0.00...	0.00...
101...	352...	-41...	0.14...	99	3	2DF	3	18.8...	18.0...	17.7...	17.5...	17.4...	0.00...	0.00...	0.00...
101...	353...	-41...	0.22...	99	4	2DF	5	18.2...	17.3...	17.0...	16.7...	16.7...	0.00...	0.00...	0.00...

pzserver Python API library for programmatic access

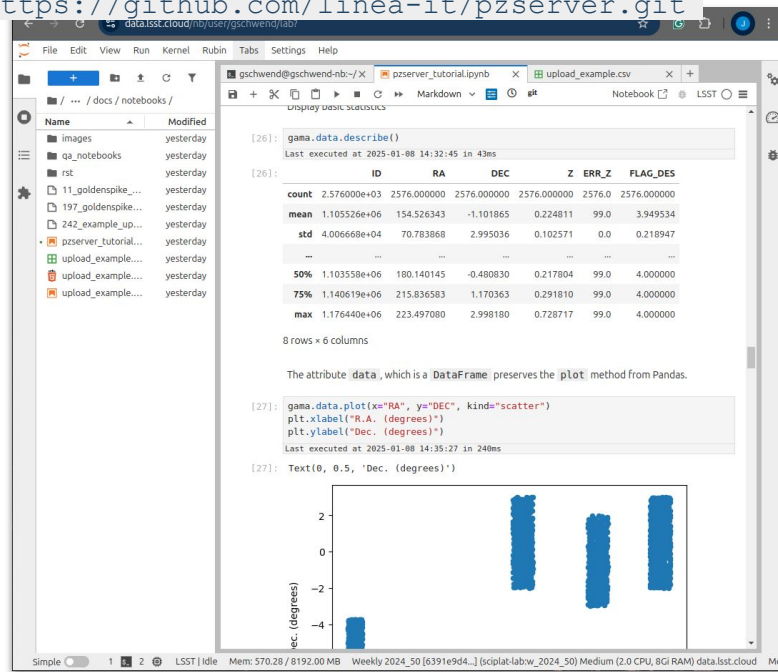


Installation:

```
$ pip install pzserver
```

Tutorial notebook:

```
$ git clone https://github.com/linea-it/pzserver.git
```

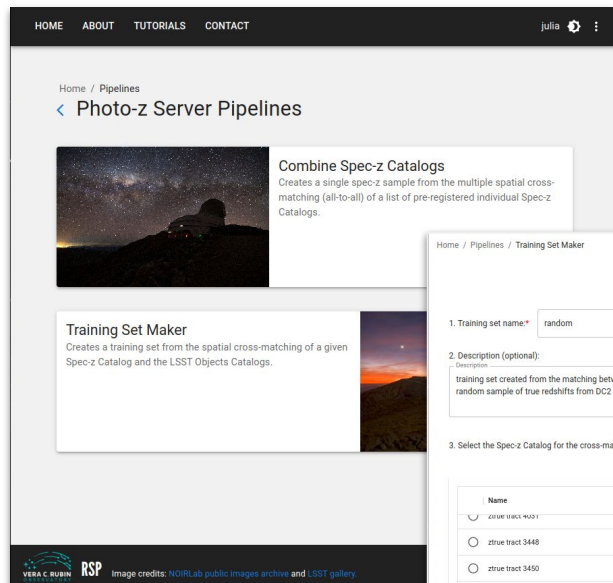


Training Set Maker



PZ Server pipelines

The *Training Set Maker* service



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Training Set Maker

1. Training set name*: random

2. Description (optional):
training set created from the matching between the last dp0.2 object catalog and a random sample of true redshifts from DC2 simulation

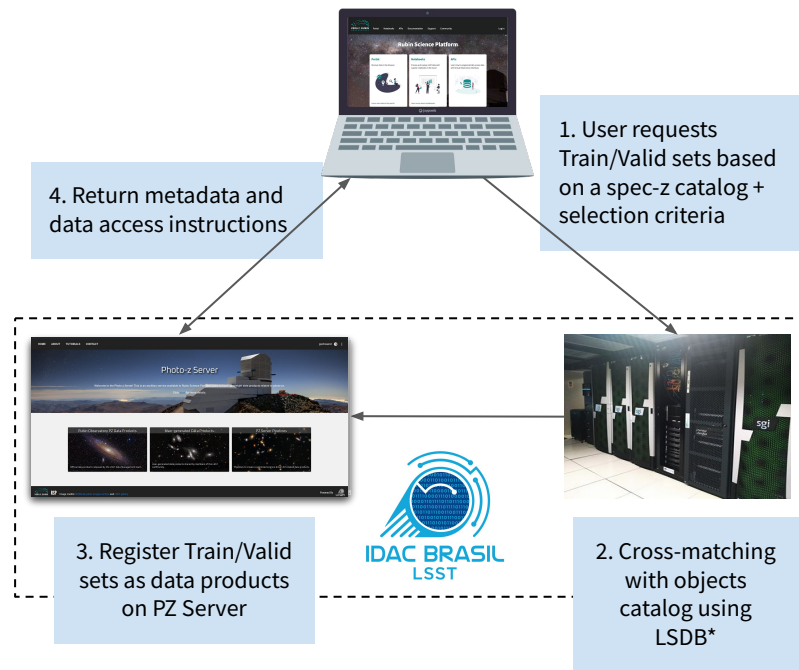
3. Select the Spec-z Catalog for the cross-matching: Search

Name	Uploaded By	Created at
ztrue tract 3448	gachwend	2025-01-03
ztrue tract 3450	gachwend	2025-01-03
ztrue tract 3833	gachwend	2025-01-03
DESI EDR	gachwend	2024-10-15
random truth z	gachwend	2024-09-12

1 row selected 1-10 of 30

4. Select the Objects catalog (photometric data): DPO.2

5. Select the cross-matching configuration choices:
The threshold distance in arcseconds beyond which neighbors are not added: 1.0



PZ Compute

PZ tables as federated datasets



PZ Compute

PZ Tables as federated datasets

Summary of PZ Compute stages

Stage I - Data acquisition

- Data transfer from USDF
- Organize/split into data partitions, data cleaning
- Download and store ancillary files

Stage II - Photo-z pre-processing

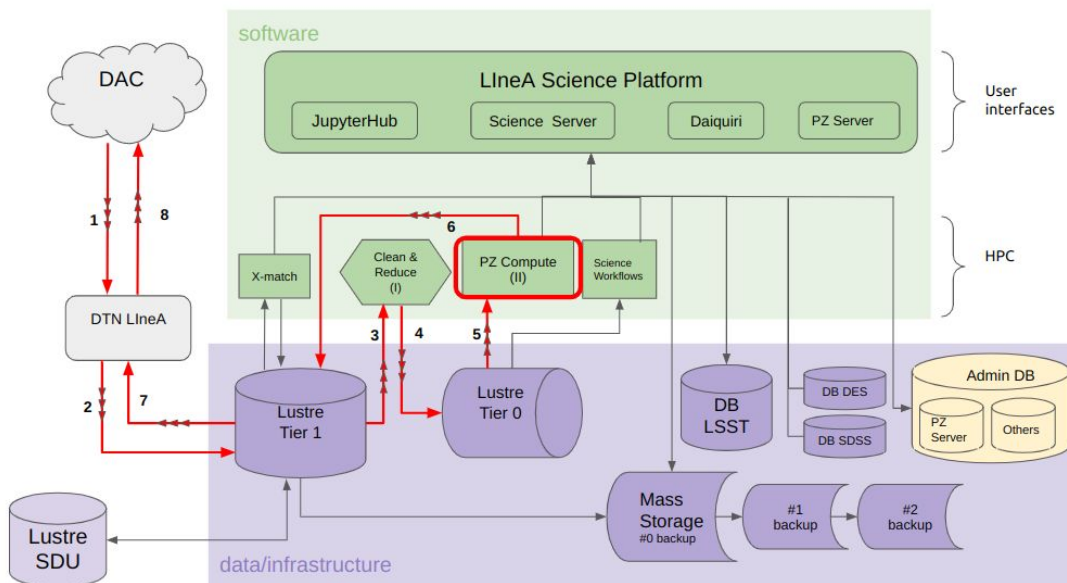
- Training PZ machine learning methods
- PZ scientific validation

Stage III - Photo-z computing

- Execute PZ codes (use RAIL as code wrapper)
- Validate results with Rubin PZ Coord.

Stage IV - Photo-z post-processing

- Data transfer from BR IDAC to USDF
- Register on RSP as a federated dataset.



[linea-it/pz-compute](https://github.com/linea-it/pz-compute)

Suporte ao usuário



Documentação para usuários



[linea-it/docs](https://docs.linea.org.br/)

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- Santos Dumont (LNCC)

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HPE Apollo 2000

Características gerais

O cluster HPE Apollo 2000 possui 16 nós computacionais com processadores Intel Xeon Skylake 5120, 14-cores, 2.2GHz. Com o sistema de *hyperthreading* ativado, o conjunto de máquinas Apollo 2000 oferece 448 cores e e provê cerca de 16 Tflops de capacidade computacional.

Em preparação para o LSST, para compor o *Brazilian Independent Data Access Center* (IDAC), o cluster Apollo está sendo ampliado com a aquisição de mais 12 nós (624 cores adicionais), e terá a sua capacidade expandida para um total ~85 Tflops antes do início das operações do levantamento.

Características atuais (2022-2023):

# Nodes	# Cores	Total de ram	Tflops	Instalado em
16	448	2TB	15.769	Abr-2019

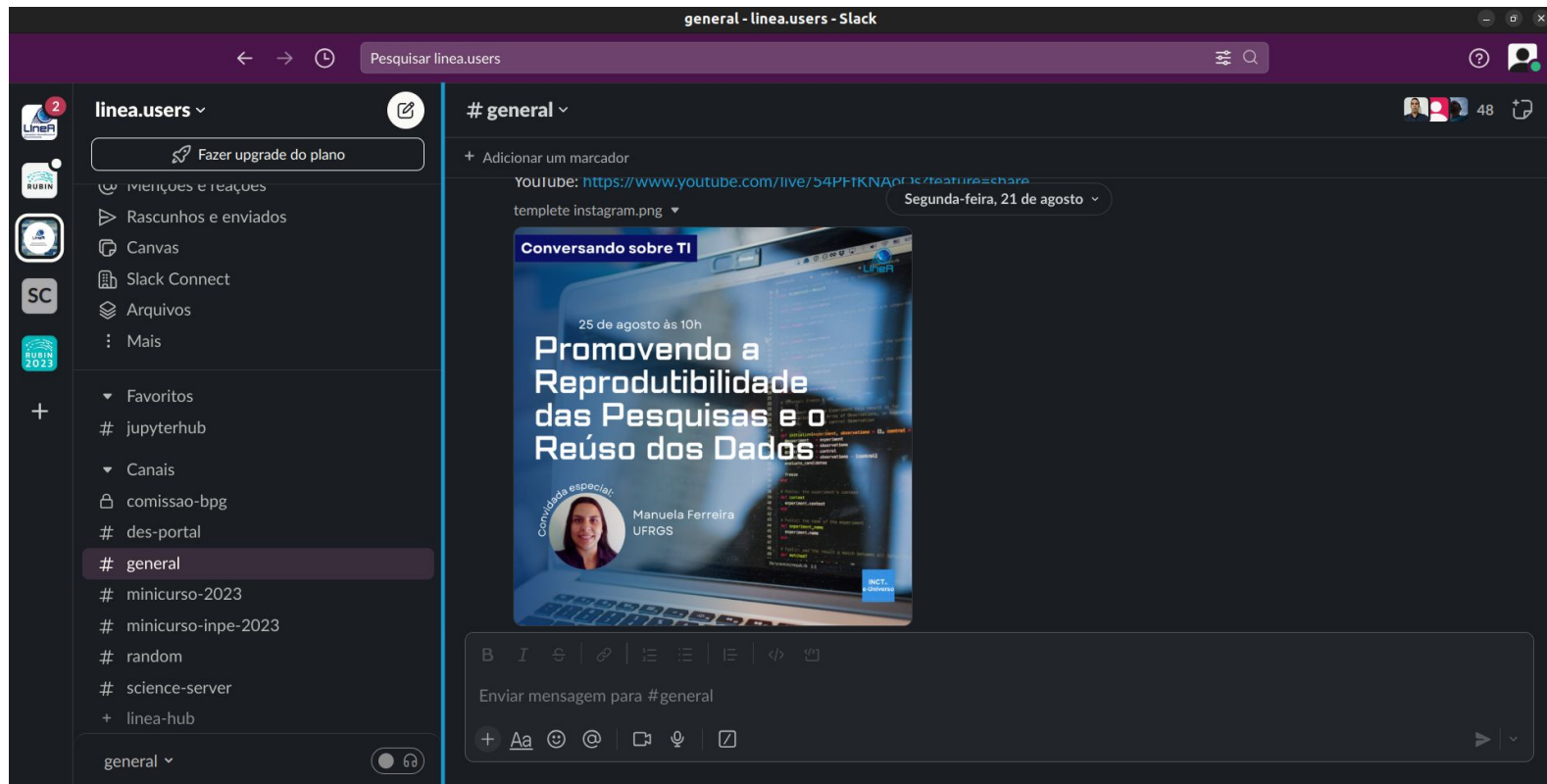
Armazenamento (Lustre FS)

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 - Armazenamento na área de scratch
 - Comandos úteis do Lustre FS
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 - Linux
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 - Exemplo 2 - calcula pi em C
 - Exemplo 3 - hello world mpi
- Monitoramento de jobs
- Remoção de jobs da fila ou em

Slack workspace linea.users

[link para acessar aqui](#)



Considerações Finais



Considerações Finais

- ❖ O ambiente de exploração de dados no Rubin Observatory já está disponível, inclusive para usuários internacionais.
- ❖ O ambiente de exploração de dado no IDAC Brasil está em desenvolvimento, parcialmente disponível e carente de feedback de usuários.
- ❖ O ambiente de HPC do LIneA já está disponível para o BPG e oferece ampla documentação e apoio personalizado ao usuário.
- ❖ O Rubin Observatory não oferecerá HPC para a comunidade. Os recursos oferecidos pelo Rubin Observatory para exploração serão limitados e a expectativa é de bastante concorrência, especialmente quando chegar o DP2.
- ❖ É muito importante que a comunidade brasileira comece a usar os serviços do RSP ,mesmo que a infraestrutura de lá não escale para atender aos casos científicos, e as plataformas do IDAC, ainda em versão BETA, para:
 - familiarização com os dados
 - identificar pontos fortes e pontos fracos para direcionar o desenvolvimento das plataformas do IDAC
- ❖ Antecedência é o chave! Quanto antes soubermos as necessidades de dados e recursos, maior será a chance de sucesso em apoiar o BPG.



Obrigada pela sua atenção!

Contato: julia@linea.org.br
<https://linea.org.br>

LIneA é apoiado por:

