

Acessando catálogos modernos em Astronomia: dicas e práticas

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Introdução

- Catálogo: conjunto de objetos astronômicos + suas informações
- Surveys astronômicos produzem catálogos de dados gigantescos → baixar e trabalhar apenas com os objetos e informações interessados
- Buscas em tabelas de bancos de dados; mais eficaz = SQL (Structured Query Language)
- Exemplos: SDSS e TOPCAT (VO/ADQL)

SDSS website + tools links

Skyserver: <http://skyserver.sdss.org/dr12>

SLOAN DIGITAL SKY SURVEY
SkyServer DR12

Home | Data | Schema | Education | Astronomy | SDSS | Contact Us | Download | Site Search | Help | History **NEW!**

SciServer Altair v1.9.1
NEW: **SciServer Altair v1.9.1** is now available! The update includes a new SkyServer CrossMatch tool using **SkyQuery** services, as well as links to the new **SAW** web application, several bugfixes, a new RStudio image in **SciServer Compute** and an improved SciServer **Login-Portal**.

Welcome to the DR12 site!!!
This website presents data from the Sloan Digital Sky Survey, a project to make a map of a large part of the universe. We would like to show you the beauty of the universe, and share with you our excitement as we build the largest map in the history of the world.

News
The site hosts data from **Data Release 12 (DR12)**. What's new in DR12, what's new on this site and known problems. **More...**

SDSS is supported by
NSF
Microsoft

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Site Traffic
Privacy Policy

Data Access
Navigate
Quick Look | Explore
Finding Chart
Image List
Search
IQS | SQS | IRSQS
SQL Search
Cross-ID
CasJobs

Education
For Educators
Lesson Plans
Middle School
High School
College Lab Activities
Instructor Guides
Student/Public Research
Galaxy Zoo
Zooniverse
Voyages

Links
sdss.org
Data Release 12
SDSS-III Science
Science Archive Server
About Astronomy
About the SDSS
About SkyServer
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Credits

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Cooking with Sloan
SQL Tutorial
About the Database
Schema Browser
Sample SQL Queries
Data Release Papers

Contact Us

name	type	epoch	RA	DEC	radius
SDSS	D	2002	16.5625	34.7375	0.5
SDSS	D	2002	16.5625	34.7375	1.0
SDSS	D	2002	16.5625	34.7375	1.5
SDSS	D	2002	16.5625	34.7375	2.0
SDSS	D	2002	16.5625	34.7375	2.5
SDSS	D	2002	16.5625	34.7375	3.0
SDSS	D	2002	16.5625	34.7375	3.5
SDSS	D	2002	16.5625	34.7375	4.0
SDSS	D	2002	16.5625	34.7375	4.5
SDSS	D	2002	16.5625	34.7375	5.0

Casjobs – acesso SQL ao SDSS



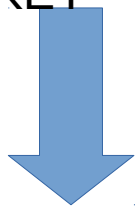
- Criar uma conta no servidor SDSS para salvar dados buscados
- Obter e buscar em centenas de parâmetros do SDSS
- Buscas são realizadas no servidor casjobs
- Uso da linguagem SQL

Bases de dados SQL

- Conjunto de tabelas que contém dados e informações
- Tabelas (TABLE):
 - Coluna: campo de atributo para os dados
 - Linha: são as entradas; tipicamente, cada objeto de um catálogo corresponde a uma linha
 - PRIMARY KEY: uma coluna com valores únicos, usada para identificar objeto, ordenar, relacionar tabelas, etc.
 - Every database has a name; every table has a name

Exemplo:

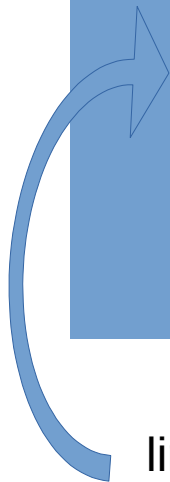
PRIMARY
KEY



coluna



objid	u	g	r	i	z
1	19.67	20.20	19.55	21.22	21.17
2	18.42	19.64	19.55	20.88	20.97
3	18.99	20.08	19.79	20.32	21.12
4
...



linha

Linguagem SQL

- Criar, organizar e realizar buscas (queries) em bancos de dados
- Estrutura básica:
 - SELECT – determina que informação obter (qual(is) coluna(s) de uma tabela(s))
 - FROM – de qual tabela(s)
 - WHERE – condições/restrições (quais linhas (objetos) obter)
 - Opcional:
 - ORDER BY – buscas não são ordenadas por padrão
- PS: SQL não reconhece maiúscula/minúscula nem espaços

Exemplo:

- Nome da tabela é PhotoObj

```
SELECT objid, r
FROM PhotoObj
WHERE u < 19 AND r > 19.2
ORDER BY objid
```

objid	r
2	19.55
3	19.79
...	...

Dicas de SELECT

- Select all columns

```
SELECT *
```

- Select a column, but giving it a new name

```
SELECT objid as ID
```

- Select first N lines

```
SELECT TOP N objid, r
```

- Select with simple operations (+ - * / %)

```
SELECT (u - r) as color
```

- Select using functions

```
SELECT count(r) as no_obj, avg(r), min(z)
```

- Select data to save onto another table

```
SELECT objid, r INTO MyTable
```

Dicas de FROM

- VIEWS podem ser definidas (como são algumas na base de dados SDSS) para representar sub-tabelas de TABLES.
- Ex: Galaxy – todas as informações fotométricas, mas só para objetos (linhas) classificados como galáxias.
- Use VIEW sempre que possível (por exemplo, ao invés de PhotoObjAll). Funciona da mesma forma que TABLE no FROM:

```
FROM Galaxy
```

Dicas de WHERE

- Operations (+ - * / %)

WHERE (u - r) > 2

- Logical operations: AND / OR

WHERE u > 20 AND (r < 19 OR i < 19)

- Value ranges

WHERE r BETWEEN 18 AND 19

2 ou mais tabelas

- Para selecionar ou impor restrições em mais de uma tabela, inclua todas no FROM. Inclua 'contexto' de TABLES se necessário
- Inclua o nome da tabela, seguido de um 'ponto' antes de cada coluna em SELECT e WHERE
- É possível definir 'alias' para TABLES

Exemplo:

```
SELECT TOP 10 Galaxy.ObjID, Galaxy.ra, Galaxy.dec,  
    SpecObj.z, s.zerr, p.u, p.g, p.r, p.i, p.z INTO  
    Catalog  
FROM  
    Galaxy as p, SpecObj as s  
WHERE  
    p.r < 19  
ORDER BY p.objid
```

NÃO vai funcionar, 3 erros!

1) As duas tabelas não estão relacionadas: SQL deve saber explicitamente quando uma linha de uma tabela corresponde a outra linha em outra tabela, caso se refiram ao mesmo objeto. Esse procedimento é chamado JOIN.

Maneira mais fácil é usar a PRIMARY KEY, nesse caso, o SDSS object ID.

2) A tabela obtida na busca não pode conter 2 colunas com nomes idênticos, mesmo que sejam de tabelas originalmente diferentes. No exemplo, a tabela Catalogo teria 2 colunas com o mesmo nome: z

3) o Casjobs não aceita misturar nomes de Tables/Views completos (Galaxy, SpecObj, etc) quando alias são dados (Galaxy as p, SpecObj as s). **Ou seja, quando alias para Tables/Views são dados, você deve usar apenas os alias nos SELECT/WHERE**

Exemplo corrigido:

```
SELECT TOP 10 p.ObjID, p.ra, p.dec,  
             s.z as redshift, s.zerr as redshift_err, p.u,  
             p.g, p.r, p.i, p.z INTO Catalogo  
FROM  
     Galaxy as p, SpecObj as s  
WHERE  
     p.objid = s.bestobjid  
     AND p.r < 19  
ORDER BY p.objid
```

Flags

Coluna / Parâmetro que contém valores para indicar certas condições ou classificações de objetos:

- Flags simples (valor 'inteiro'):

Ex: PhotoObj.type

name	value	description
UNKNOWN	0	Unknown: Object type is not known.
COSMIC_RAY	1	Cosmic-ray track (not used).
DEFECT	2	Defect: Object is caused by a defect in the telescope or processing pipeline. (not used)
GALAXY	3	Galaxy: An extended object composed of many stars and other matter.
GHOST	4	Ghost: Object created by reflected or refracted light. (not used)
KNOWNOBJ	5	KnownObject: Object came from some other catalog (not the SDSS catalog). (not yet used)
STAR	6	Star: A a self-luminous gaseous celestial body.
TRAIL	7	Trail: A satellite or asteroid or meteor trail. (not yet used)
SKY	8	Sky: Blank sky spectrogram (no objects in this arcsecond area).
NOTATYPE	9	NotAType:

- Flags “sofisticados” (bit flag / hexadecimal) (permite mais de uma “classificação” associada a um objeto.

Ex: PhotoObj.PrimTarget

name	value	description
TARGET_QSO_HIZ	0x00000001	
TARGET_QSO_CAP	0x00000002	
TARGET_QSO_SKIRT	0x00000004	
TARGET_QSO_FIRST_CAP	0x00000008	
TARGET_QSO_FIRST_SKIRT	0x00000010	
TARGET_GALAXY_RED	0x00000020	
TARGET_GALAXY	0x00000040	
TARGET_GALAXY_BIG	0x00000080	
TARGET_GALAXY_BRIGHT_CORE	0x00000100	
TARGET_ROSAT_A	0x00000200	
TARGET_ROSAT_B	0x00000400	
TARGET_ROSAT_C	0x00000800	
TARGET_ROSAT_D	0x00001000	
TARGET_STAR_BHB	0x00002000	
TARGET_STAR_CARBON	0x00004000	

Exemplo:

```
SELECT TOP 10 p.ObjID, p.ra, p.dec, s.z as redshift,  
    s.zerr as redshift_err, p.u,  
    p.g, p.r, p.i, p.z INTO Catalogo  
FROM  
    PhotoObj as p, SpecObj as s  
WHERE  
    p.objid = s.bestobjid  
    AND p.r < 19 AND  
    p.type = 3 AND  
    (p.primTarget & 0x00000020 > 0)  
ORDER BY p.objid
```

Casjobs – importar tabela

skyserver.sdss.org/CasJobs/TableImport.aspx

SDSS Query / CasJobs

Help Tools Query History MyDB **Import** Groups Output Profile Queues SkyServer Logout

Table Import

- Copy/Paste data (all formats) may not exceed **2000 characters** .
- VOTable and DataSet files may not exceed **97656 kB**.
- CSV (ASCII Comma-Separated Values) files may not exceed **97656 kB**.
- First line **must** have column names, optionally with "#" as first character.
- If importing into an existing table, column order in the table to be imported must match my table column order.

Import into

Format

Data Type

Copy & paste import

File import

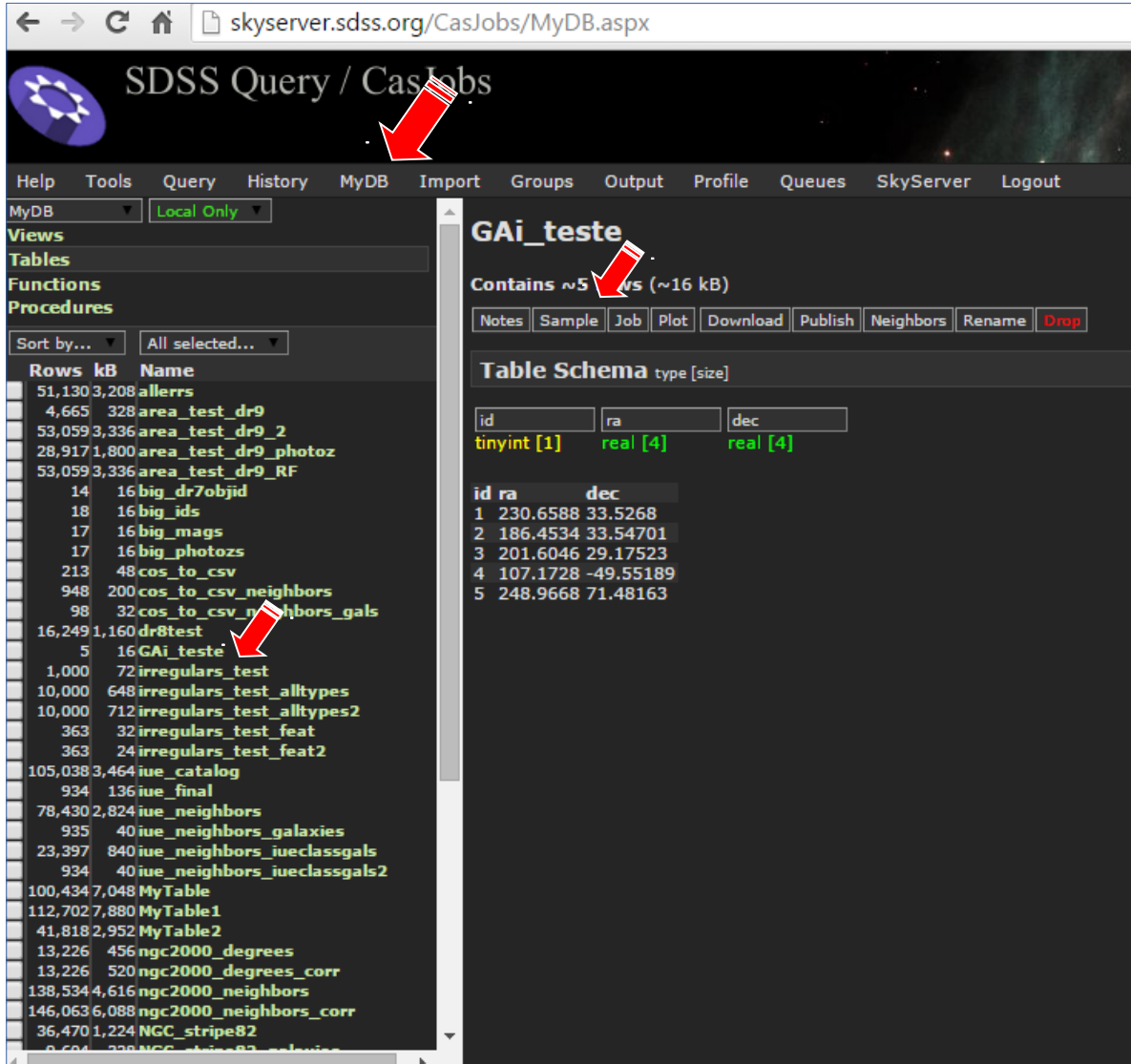
Data

```
id ra dec
1 230.6588 33.5268
2 186.4534 33.54701
3 201.6046 29.17523
4 107.1728 -49.55189
5 248.9668 71.48163
```

Import

Contact

Casjobs – tabelas do usuário



The screenshot shows the SDSS Query / CasJobs interface. The browser address bar displays `skyserver.sdss.org/CasJobs/MyDB.aspx`. The page title is "SDSS Query / CasJobs". The navigation menu includes: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. The "MyDB" dropdown is set to "Local Only".

On the left sidebar, under "Tables", a list of tables is shown with columns "Rows", "kB", and "Name". A red arrow points to the "GAI_teste" table in this list.

Rows	kB	Name
51,130	3,208	allerrs
4,665	328	area_test_dr9
53,059	3,336	area_test_dr9_2
28,917	1,800	area_test_dr9_photoz
53,059	3,336	area_test_dr9_RF
14	16	big_dr7objid
18	16	big_ids
17	16	big_mags
17	16	big_photozs
213	48	cos_to_csv
948	200	cos_to_csv_neighbors
98	32	cos_to_csv_neighbors_gals
16,249	1,160	dr8test
5	16	GAI_teste
1,000	72	irregulars_test
10,000	648	irregulars_test_alltypes
10,000	712	irregulars_test_alltypes2
363	32	irregulars_test_feat
363	24	irregulars_test_feat2
105,038	3,464	iue_catalog
934	136	iue_final
78,430	2,824	iue_neighbors
935	40	iue_neighbors_galaxies
23,397	840	iue_neighbors_iueclassgals
934	40	iue_neighbors_iueclassgals2
100,434	7,048	MyTable
112,702	7,880	MyTable1
41,818	2,952	MyTable2
13,226	456	ngc2000_degrees
13,226	520	ngc2000_degrees_corr
138,534	4,616	ngc2000_neighbors
146,063	6,088	ngc2000_neighbors_corr
36,470	1,224	NGC_stripe82
9,604	328	NGC_stripe82_colorize

The main content area displays the details for the "GAI_teste" table. It indicates "Contains ~5 rows (~16 kB)". Below this, there are buttons for "Notes", "Sample", "Job", "Plot", "Download", "Publish", "Neighbors", "Rename", and "Drop".

The "Table Schema" section shows the following columns and data types:

id	ra	dec
tinyint [1]	real [4]	real [4]

Below the schema, a preview of the table data is shown:

id	ra	dec
1	230.6588	33.5268
2	186.4534	33.54701
3	201.6046	29.17523
4	107.1728	-49.55189
5	248.9668	71.48163

Casjobs – página de query

The screenshot shows the SDSS Query / CasJobs interface. The browser address bar displays `skyserver.sdss.org/CasJobs/SubmitJob.aspx`. The page header includes the SDSS logo and the text "SDSS Query / CasJobs". A red arrow points to the "Query" menu item in the navigation bar. Below the navigation bar, there are fields for "Context" (set to "DR12"), "Table (optional)" (set to "MyTable_0"), and "Task Name" (set to "My Query"). The main area contains a SQL query:

```
1 -- select all columns from the 'Gai_teste_neighbors', plus redshift info
2 SELECT gai.*, s.z AS redshift, s.zerr AS redshift_err
3 -- save into 'Gai_teste_neighbors_gals' table
4 INTO mydb.Gai_teste_neighbors_gals
5 -- access the neighbors table and the SDSS Spectroscopy data table
6 FROM mydb.Gai_teste_neighbors AS gai, SpecObj AS s
7 -- JOIN the neighbors and SpecObj using the id key, plus select only galaxies
8 WHERE gai.matched_id = s.bestobjid AND s.class = 'GALAXY'
```

Below the query, there are buttons for "Syntax OK", "Syntax", "Plan", "Quick", and "Submit". A blue box highlights the "Submit Query" button.

Unless INTO is specified, queried table name

Defines in which database context query will be run

Submit Query

Casjobs – resultados/sample

GAI_teste_neighbors_gals

Contains ~3 rows (~16 kB)

Notes Sample Job Plot Download Publish Neighbors Rename Drop

Table Schema type [size]

id	ra	dec	search_id	matched_id	redshift	redshift_err
tinyint [1]	real [4]	real [4]	int [4]	bigint [8]	real [4]	real [4]

id	ra	dec	search_id	matched_id	redshift	redshift_err
1	230.6588	33.5268	1	1237661871345828147	0.1252955	1.161392E-05
2	186.4534	33.54701	2	1237665228379717646	0.001063667	1.507756E-05
3	201.6046	29.17523	3	1237665429166096390	0.01729698	3.746957E-06

Casjobs – Download da Tabela

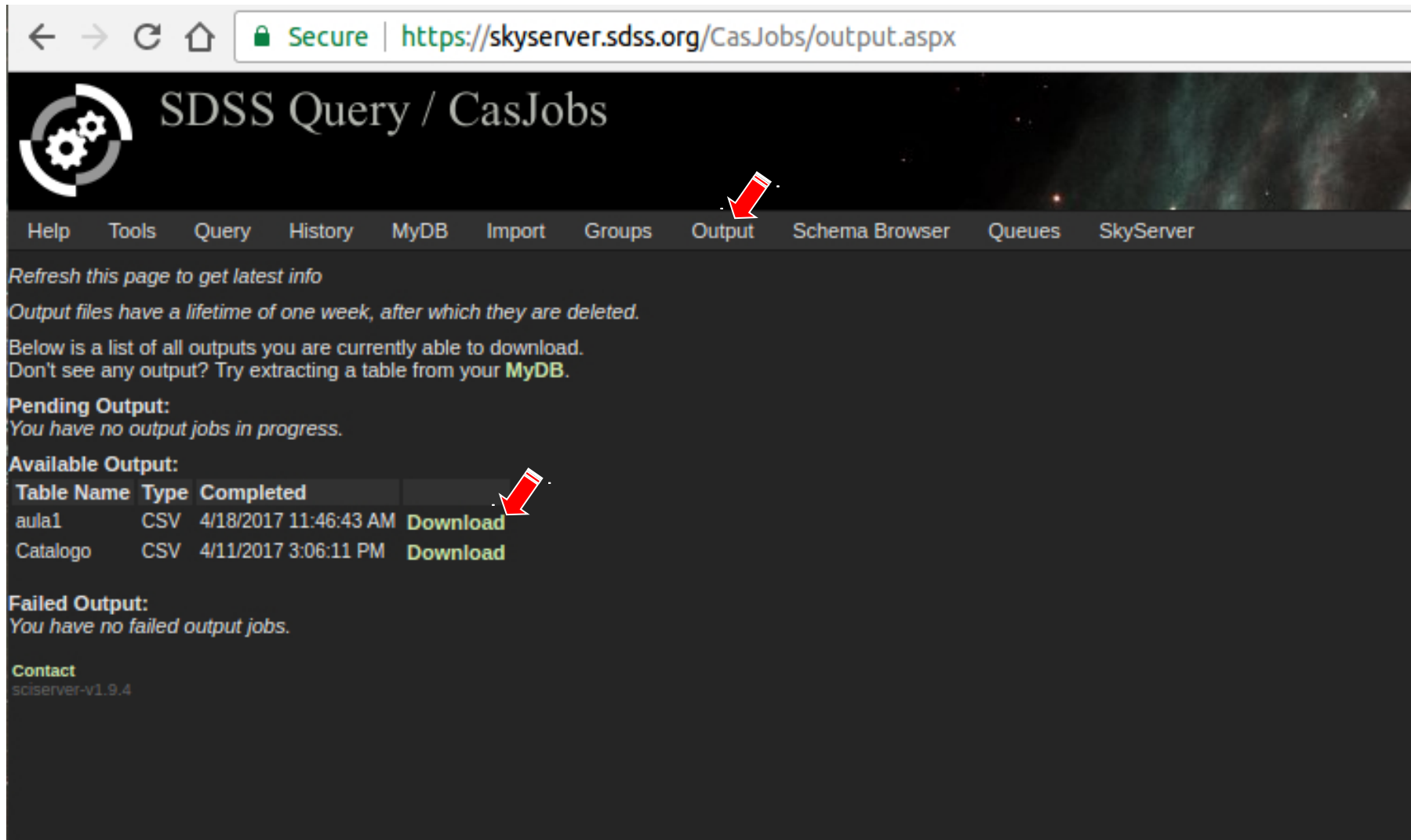
The screenshot shows the SDSS Query / CasJobs web interface. The browser address bar displays <https://skyserver.sdss.org/CasJobs/MyDB.aspx>. The page title is "SDSS Query / CasJobs". The navigation menu includes: Help, Tools, Query, History, MyDB, Import, Groups, Output, Schema Browser, Queues, and SkyServer. The "MyDB" menu is expanded, showing "Local Only".

The left sidebar contains a tree view of database objects. The "Tables" section is expanded, showing a list of tables with their row counts and sizes. The table "aula1" is selected, indicated by a red arrow. The table details for "aula1" are shown in the main panel:

- Table Name: aula1
- Contains: ~245 rows (~16 kB)
- Buttons: Notes, Sample, Job, Plot, Download, Publish, Rename, Drop
- Table Schema: u (real [4]), g (real [4]), r (real [4]), z (real [4]), i (real [4])
- Table Download: From here you may download your table in a particular format. First choose the file format you'd like, then click 'Go'.
- Format: Comma Separated Values
- Use custom query:
- Query: `SELECT * FROM aula1`
- Go button

Red arrows point to the "MyDB" menu, the "aula1" table in the sidebar, the "Download" button, and the "Go" button.

Casjobs – Download da Tabela



The screenshot shows a web browser window with the URL <https://skyserver.sdss.org/CasJobs/output.aspx>. The page title is "SDSS Query / CasJobs". A navigation menu includes "Help", "Tools", "Query", "History", "MyDB", "Import", "Groups", "Output", "Schema Browser", "Queues", and "SkyServer". The "Output" menu item is highlighted with a red arrow. Below the menu, there is a message: "Refresh this page to get latest info" and "Output files have a lifetime of one week, after which they are deleted." A list of available outputs is shown, with a red arrow pointing to the "Download" link for the "aula1" table.

Refresh this page to get latest info

Output files have a lifetime of one week, after which they are deleted.

Below is a list of all outputs you are currently able to download.
Don't see any output? Try extracting a table from your **MyDB**.

Pending Output:
You have no output jobs in progress.

Available Output:

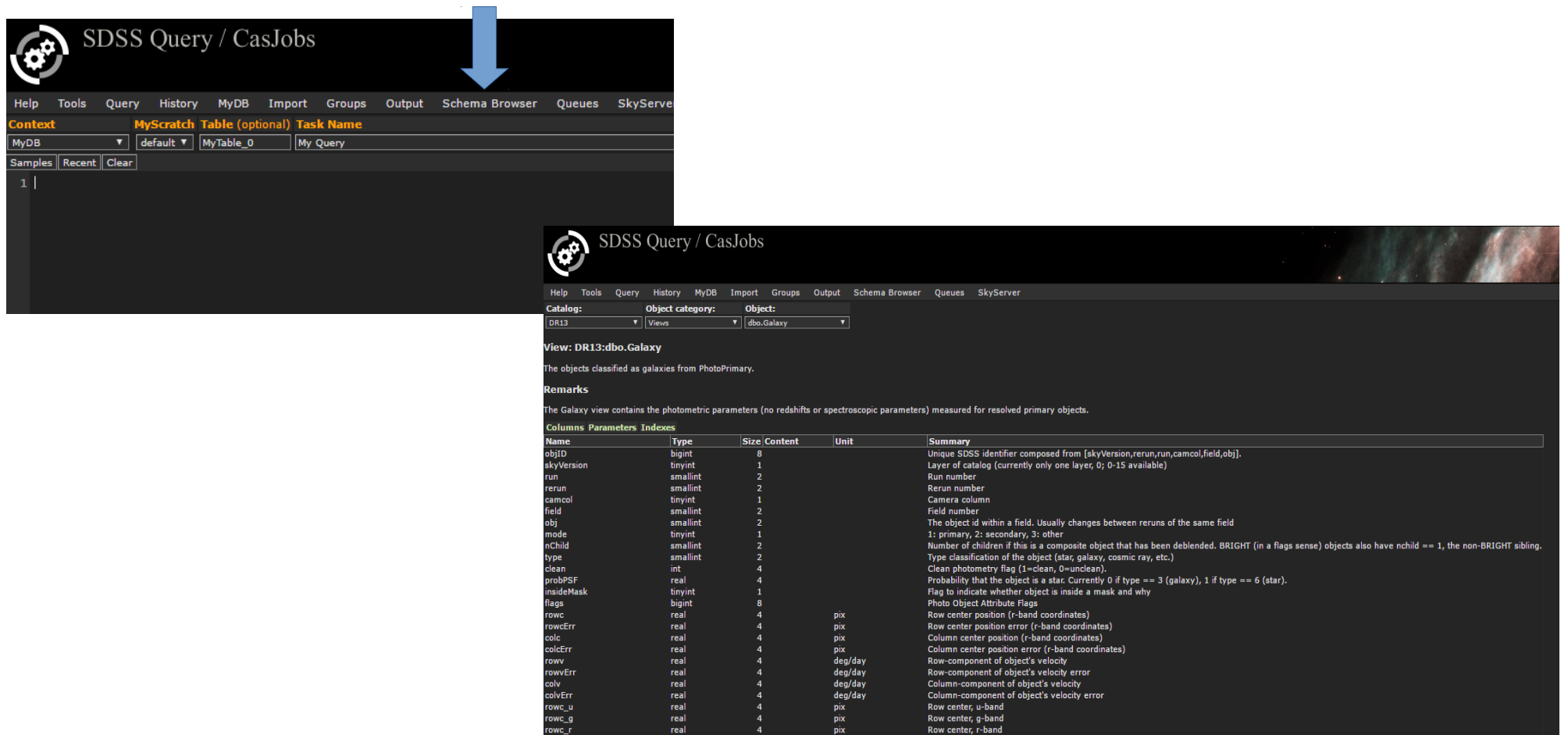
Table Name	Type	Completed	
aula1	CSV	4/18/2017 11:46:43 AM	Download
Catalogo	CSV	4/11/2017 3:06:11 PM	Download

Failed Output:
You have no failed output jobs.

Contact
sciserver-v1.9.4

Schema Browser

Como e onde consultar todos os nomes para tabelas e colunas na base dados do SDSS - Schema Browser



SDSS Query / CasJobs

Help Tools Query History MyDB Import Groups Output Schema Browser Queues SkyServer

Context MyScratch Table (optional) Task Name

MyDB default MyTable_0 My Query

Samples Recent Clear

1 |

SDSS Query / CasJobs

Help Tools Query History MyDB Import Groups Output Schema Browser Queues SkyServer

Catalog: DR13 Object category: Views Object: dbo.Galaxy

View: DR13:dbo.Galaxy

The objects classified as galaxies from PhotoPrimary.

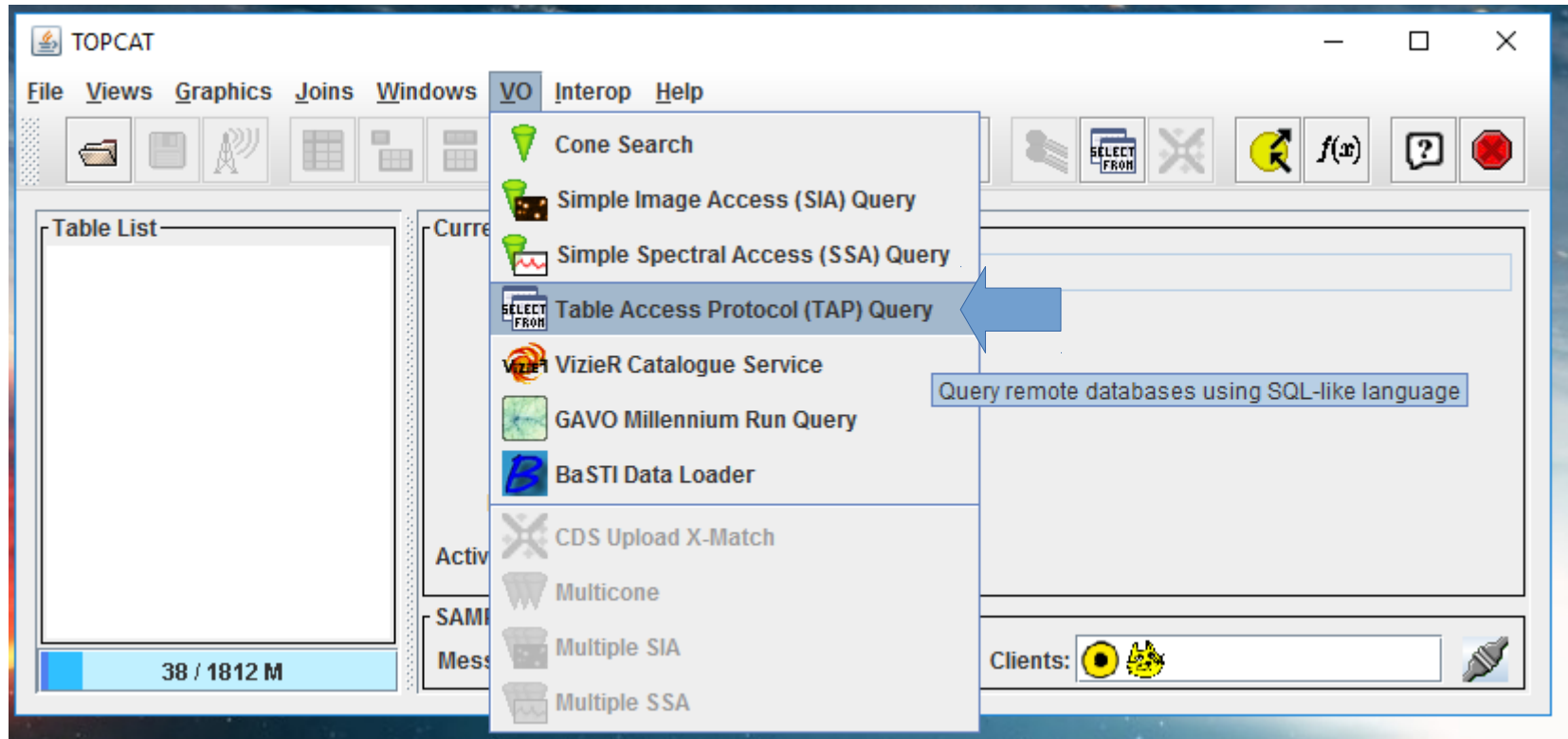
Remarks

The Galaxy view contains the photometric parameters (no redshifts or spectroscopic parameters) measured for resolved primary objects.

Columns Parameters Indexes

Name	Type	Size	Content	Unit	Summary
objID	bigint	8			Unique SDSS identifier composed from [skyVersion,run,run,camcol,field,obj].
skyVersion	tinyint	1			Layer of catalog (currently only one layer; 0; 0-15 available)
run	smallint	2			Run number
rerun	smallint	2			Rerun number
camcol	tinyint	1			Camera column
field	smallint	2			Field number
obj	smallint	2			The object id within a field. Usually changes between reruns of the same field
mode	tinyint	1			1: primary, 2: secondary, 3: other
nChild	smallint	2			Number of children if this is a composite object that has been deblended. BRIGHT (in a flags sense) objects also have nchild == 1, the non-BRIGHT sibling.
type	smallint	2			Type classification of the object (star, galaxy, cosmic ray, etc.)
clean	int	4			Clean photometry flag (1=clean, 0=unclean).
probPSF	real	4			Probability that the object is a star. Currently 0 if type == 3 (galaxy), 1 if type == 6 (star).
insideMask	tinyint	1			Flag to indicate whether object is inside a mask and why
flags	bigint	8			Photo Object Attribute Flags
rowc	real	4		pix	Row center position (r-band coordinates)
rowcErr	real	4		pix	Row center position error (r-band coordinates)
colc	real	4		pix	Column center position (r-band coordinates)
colcErr	real	4		pix	Column center position error (r-band coordinates)
rowv	real	4		deg/day	Row-component of object's velocity
rowvErr	real	4		deg/day	Row-component of object's velocity error
colv	real	4		deg/day	Column-component of object's velocity
colvErr	real	4		deg/day	Column-component of object's velocity error
rowc_u	real	4		pix	Row center, u-band
rowc_g	real	4		pix	Row center, g-band
rowc_r	real	4		pix	Row center, r-band

TOPCAT



TOPCAT

The screenshot shows the 'Table Access Protocol (TAP) Query' application window. The 'Locate TAP Service' section is active, with the 'By Table Properties' tab selected. The 'Keywords' field is empty, and the 'Match Fields' section has checkboxes for 'Table Name', 'Table Description', and 'Service', all of which are checked. A list of TAP services is displayed, including VOxAstro TAP, Personal SuperCOSMOS Science Archive (SSA), SuperCOSMOS, 3xmmdr6, 6dF DR2, 6dF DR3, Tohoku TAP, MACHO TAP, TAO, epn1 TAP, LATMOS TAP, STScI RegTAP, hfc1ar, hfc1t3, CDA, Gaia, SXDS_V1, BIRA-IASB TAP, IAA and CAB TAP, routinejup, and CSC. The 'Selected TAP Service' dropdown is set to 'Gaia (10)'. The 'TAP URL' field contains 'http://gaiatap.obsmp.fr/tap'. A 'Run Query' button is visible at the bottom.

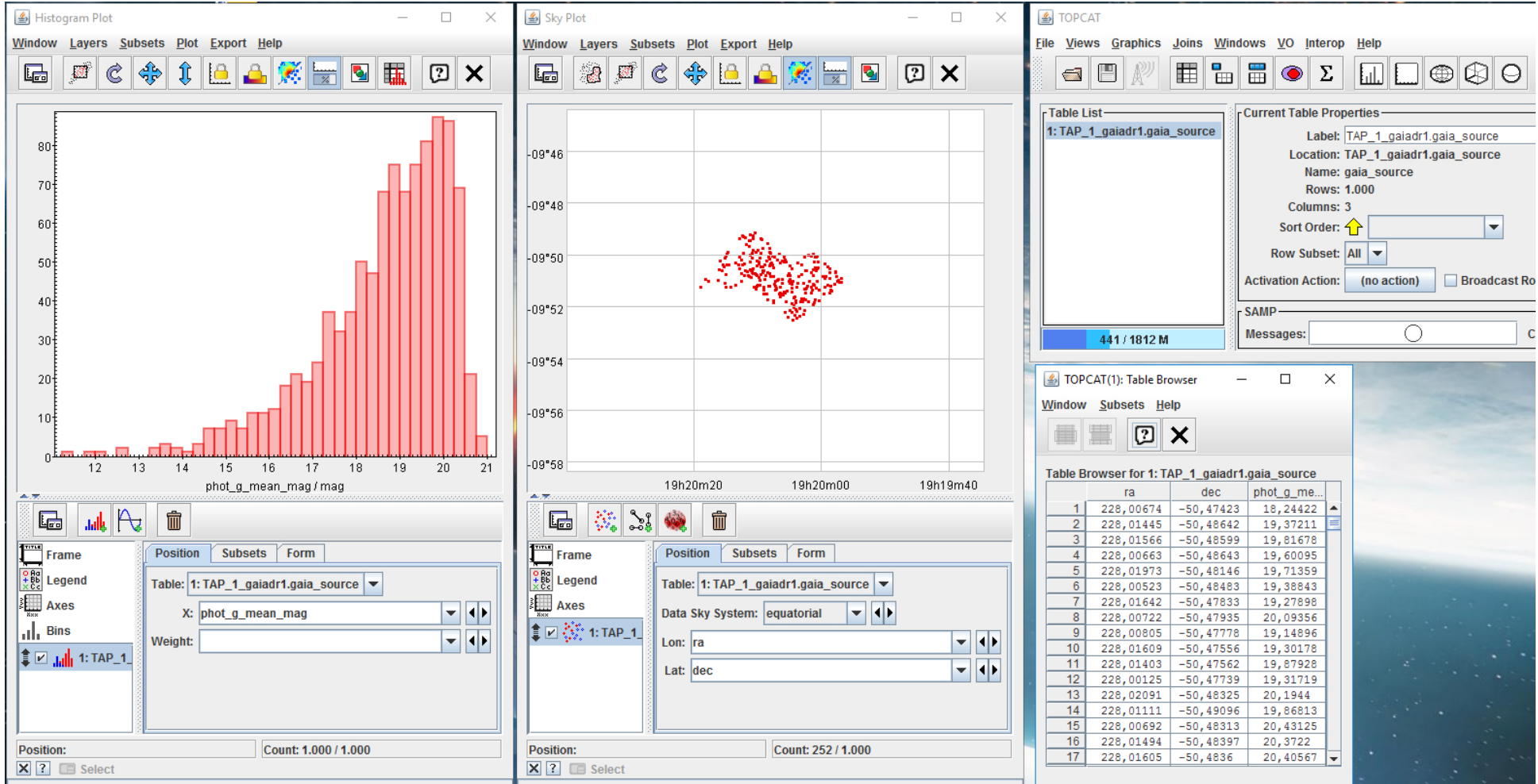
The screenshot shows the 'Table Access Protocol (TAP) Query' application window with the 'Metadata' section active. The 'Find:' field is empty. The 'Service' dropdown is set to 'Gaia (10)'. The 'Table' dropdown is set to 'gaiadr1.gaia_source'. The 'Columns' dropdown is set to 'phot_g_mean_mag'. The 'FKeys' and 'Hints' sections are empty. The 'Service Capabilities' section shows 'Query Language: ADQL-2.0', 'Max Rows: 2000 (default)', and 'Uploads: 20Mb'. The 'ADQL Text' section has 'Mode: Synchronous' and contains the following query:

```
SELECT
TOP 1000
ra, dec, phot_g_mean_mag
FROM gaiadr1.gaia_source
```

The 'Run Query' button is visible at the bottom.

Name	DataType	Indexed	Unit	Hints
ecl_lon	double	✓	deg	Ecliptic longitude
l	double	✓	deg	Galactic longitude
matched_observations	short	✓		Amount of observations
parallax	double	✓	mas	Parallax
parallax_error	double	✓	mas	Standard error of parallax
parallax_pmdec_corr	float	✓		Correlation between parallax and proper motion
parallax_pmra_corr	float	✓		Correlation between parallax and proper motion
phot_g_mean_flux	double	✓	eV/s	G-band mean flux
phot_g_mean_flux_error	double	✓	eV/s	Error on G-band mean flux
phot_g_mean_mag	double	✓	mag	G-band mean magnitude
phot_g_n_obs	int	✓		Number of observations
phot_variable_flag	char	✓		Photometric variability flag
pmdec	double	✓	mas/year	Proper motion in declination
pmdec_error	double	✓	mas/year	Standard error of proper motion in declination
pmra	double	✓	mas/year	Proper motion in right ascension
pmra_error	double	✓	mas/year	Standard error of proper motion in right ascension

TOPCAT



Atividades Práticas

Sequência vermelha

1) Fazer uma busca por galáxias em um dado campo contendo um aglomerado de galáxias: ~
ra=29.071; dec=1.051

The screenshot displays the SDSS Query / CasJobs interface. On the left, the 'DR13' search panel is visible, with parameters: name (empty), ra (29.070641 deg), dec (1.0508166 deg), and opt (G). A 'Search' button is present. Below the search panel are 'Drawing options' including Grid, Label, Photometric objects, Objects with spectra, Invert Image, and Advanced options (APOGEE Spectra, SDSS Outlines, SDSS Bounding Boxes, SDSS Fields, SDSS Masks, SDSS Plates).

The central panel shows a star field with a central object highlighted in green and labeled with coordinates [29.07064, 1.05082]. The field is framed by a blue border with cardinal directions N, S, E, W. A scale bar indicates 1 arcminute.

On the right, the 'Selected object' panel shows: ra 29.07064, dec 1.05082, and type GALAXY. Below this is the 'SDSS Query / CasJobs' interface with a navigation menu (Help, Tools, Query, History, MyDB, Import, Groups, Output, Schema Browser, Queues, SkyServer). The 'Context' section shows 'MyScratch Table (optional) Task Name' with 'DR12', 'default', 'MyTable_1', and 'My Query'. A 'Samples' section has 'Recent' and 'Clear' buttons. The main query area contains the following SQL code:

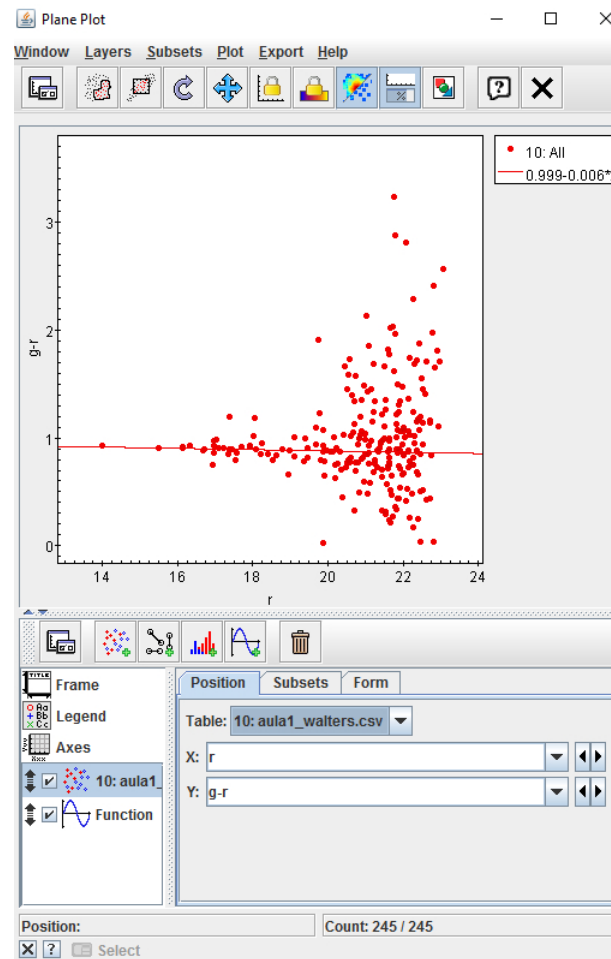
```
1 SELECT objid, dered_u as u, dered_g as g, dered_r as r, dered_z as z, dered_z as i into mydb.aula1 from Galaxy
2 WHERE (ra BETWEEN 29 AND 29.14) AND (dec BETWEEN 1 AND 1.1) AND clean = 1
```

Below the query are several interactive buttons: Quick Look, Explore, Recenter, Add to notes, and Show notes. At the bottom right, there is a small plot showing a spectral energy distribution (SED) with flux density versus wavelength.

Atividades Práticas

Sequência vermelha

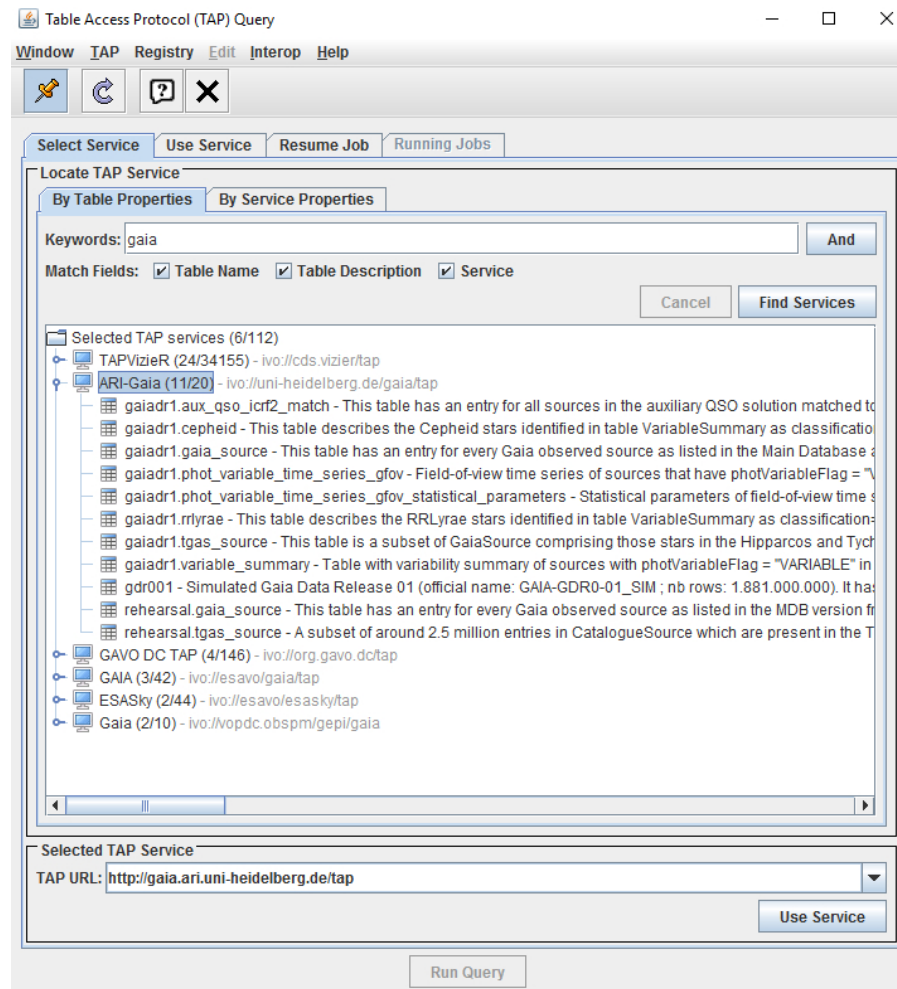
2) Download e depois Upload no Topcat



Atividades Práticas

Diagrama HR do GAIA

1) No Topcat, VO → TAP query; Examples →



Atividades Práticas

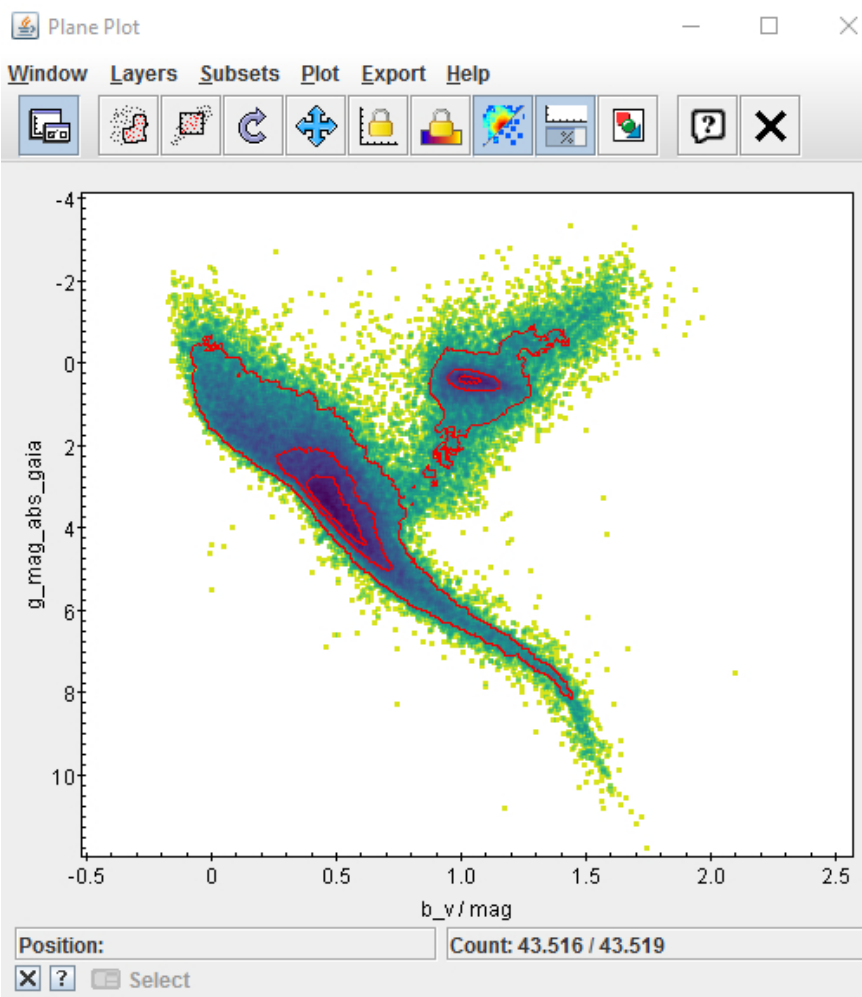
Diagrama HR do GAIA

2) Examples → Service Provided → color/mag

The screenshot displays the Table Access Protocol (TAP) Query interface. The main window is titled "Table Access Protocol (TAP) Query" and includes a menu bar with "Window", "TAP", "Registry", "Edit", "Interop", and "Help". Below the menu bar are several icons for navigation and execution. The interface is divided into several sections:

- Metadata:** A tree view on the left shows a hierarchy of data sources, including "gaiaedr1 (8)". A table on the right lists metadata for various columns, including "scan_direction_strength_k1", "scan_direction_mean_k4", "ra_pmra_corr", and "dec_parallax_corr".
- Service Capabilities:** A section below the metadata showing "Query Language: ADQL-2.0", "Max Rows: 100000 (default)", and "Uploads: 1000krow/".
- ADQL Text:** A text area containing an ADQL query:

```
SELECT TOP 50000
  gaia.source_id,
  gaia.hip,
  gaia.phot_g_mean_mag+5*log10(gaia.parallax)-10 AS g_mag_abs_gaia,
  gaia.phot_g_mean_mag+5*log10(hip.plx)-10 AS g_mag_abs_hip,
  hip.b_v,
  gaia.parallax
```
- Service-Provided:** A dropdown menu is open, showing a list of services. The selected service is "Gaia DR1 - Color and magnitude 1/2". Other visible services include "Gaia DR1 - Color and magnitude 2/2", "Gaia DR1 - Density by magnitude", and "Gaia DR1 - Pleiades density by parallax".



Plane Plot

Position Subsets Form

Level Count: 3

Smoothing: 7

Scaling: linear

Zero Point:

Plane Plot

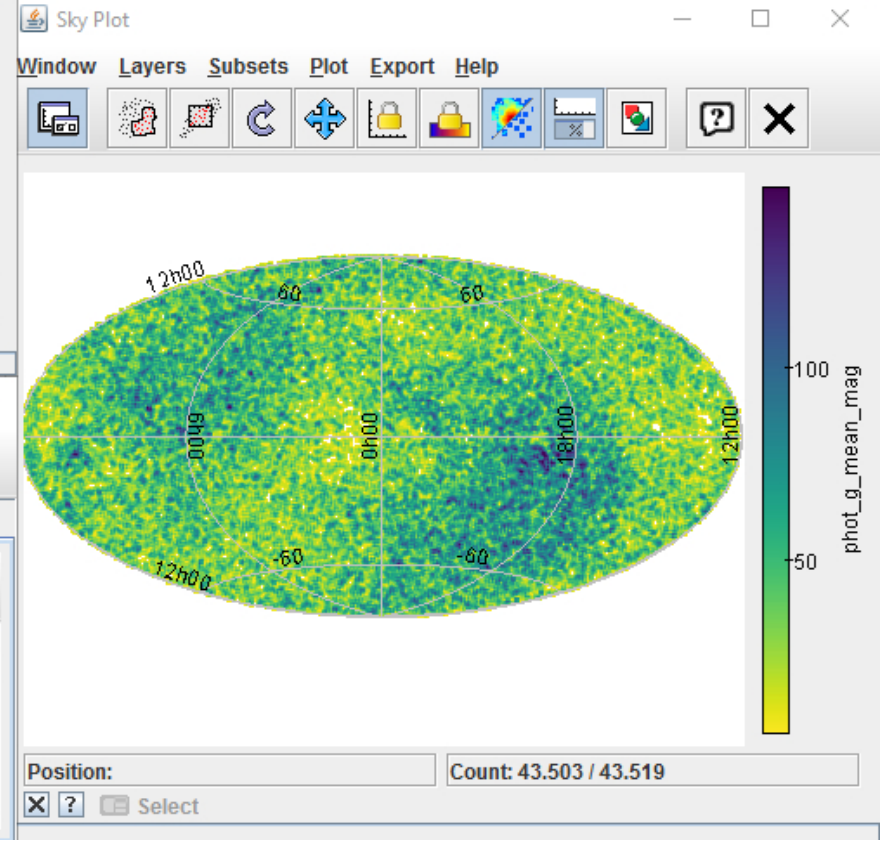
Position Subsets Form

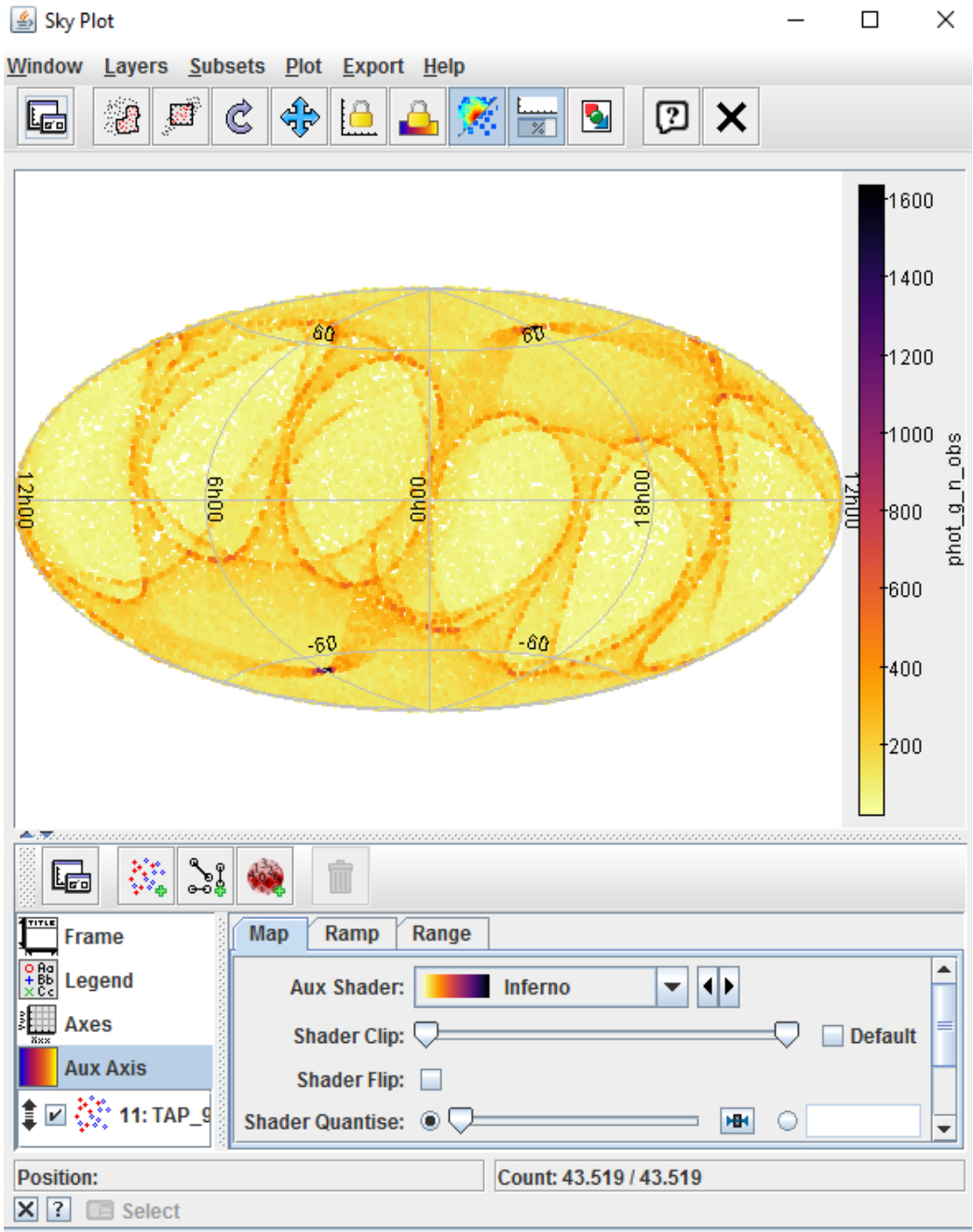
Shading

Mode: weighted

Weight: phot_g_mean_mag

Combine: sum





Atividade de Casa

Determinar o redshift (médio) do aglomerado da atividade 1 (sequência vermelha). Dicas:

- Faça uma busca no Casjobs por galáxias com espectros/redshifts medidos, no mesmo campo
- É possível 'JOIN' tabelas fotométricas e espectroscópicas com `Galaxy.objid = SpecObj.bestobjid`
- Pode-se relacionar os redshifts com os objetos da sequência vermelha, analisar o histograma de redshift, analisar uma projeção do campo radec, usando redshift como 'peso', etc

Casjobs/SQL dicas e ajuda

Advanced queries / neighbors search with variable radius:

<http://skyserver.sdss.org/CasJobs/aqueries.aspx>

- General help:

<http://skyserver.sdss.org/CasJobs/Guide.aspx>

- SQL Tutorials:

<http://skyserver.sdss.org/dr12/en/help/howto/search/>

http://skyserver.sdss.org/dr12/en/help/docs/sql_help.aspx

- SQL reference:

<http://www.w3schools.com/sql/>