

How Do I...

Find star spectra from the SDSS's SEGUE survey?

The SDSS's SEGUE (Sloan Extension for Galactic Understanding and Exploration) is an extension of the original SDSS designed to map the plane of the Milky Way. SEGUE measures spectra of stars. You can access information the SEGUE spectra by running an SQL query on SkyServer. You can access the spectra themselves by using the Image List and Explore tools.

1. From the astronomers' main page, click on the SQL Search link – the second link in the first column. The page looks like this:

SkyServer DRS Search - Mozilla Firefox

http://cas.sdss.org/astro/en/tools/search/sql.asp

Sloan Digital Sky Survey / SkyServer

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DRS Tools

SQL Search

Please note: To be fair to other users, queries run from SkyServer search tools are restricted in how long they can run and how much output they return, by timeouts and row limits. Please see the Query Limits help page. To run a query that is not restricted by a timeout or number of rows returned, please use the CasJobs batch query service.

```
-- Please read the note above regarding query limits and spatial queries
select top 10 objid,ra,dec,u,g,r,i,z
from PhotoObj
where
  u between 0 and 19.6
  and g between 0 and 20
```

Submit Check Syntax Only? Output Format HTML XML CSV Reset

To find out more about the database schema use the Schema Browser.

For an introduction to the Structured Query Language (SQL), please see the SQL Intro help page. In particular, please read the Optimizing Queries section. If your query is timing out or running much slower than you think it should, please see also the the BookMark Lookup bug section of the SQL Intro.

Find: [redacted] Find Next Find Previous Highlight all Match case Phrase not found

Done

2. In the main window, type the following query:

```
SELECT s.bestobjid, s.ra, s.dec,           -- select ID, ra, dec of star,
       s.plate, s.mjd, s.fiberID         -- plate, MJD, fiber ID of spec observation

FROM plateX p, specObjAll s              -- from plate and spectrum tables

WHERE p.plate = s.plate                  -- this is the same object
     AND p.programtype > 0               -- not part of main survey
     AND p.programname like '%segue%'    -- part of SEGUE survey
     AND s.bestObjID > 0                 -- object also has photometric data
     AND s.specClass = 1                 -- object is a star
```

The query returns the object ID, RA, and dec of each star with a SEGUE spectrum. It also returns the plate number on which the spectrum was observed, the MJD when it was observed, and the fiber that the spectrum was observed with. The last three pieces of information will help you to retrieve the spectrum FITS file.

- To view the actual spectrum, use the Image List tool. From the astronomers' main page, click on **Image List**. You will see a screen like this:

The screenshot shows the SDSS DR5 Image List Tool interface. The browser window title is "SDSS DR5 Image List Tool - Mozilla Firefox". The address bar contains "http://cas.sdss.org/astro/en/tools/chart/list.asp". The page content includes a navigation menu with "Home", "Help", "Chart", "Navi", and "Expl". Below the menu is a table with columns "name" and "ra":

name	ra
274-51913-230	159.81
275-51910-275	161.05
275-51910-525	161.75
276-51909-19	164.05

Below the table is a "Parameters" section with a "scale" input set to "0.40" and a "Get Image" button. A "Drawing options" section contains several checkboxes: Grid, Label, PhotoObjs, SpecObjs, Targets, Outline, BoundingBox, Fields, Masks, Plates, and InvertImage. The main text area contains the following instructions:

This page is to generate image cutouts of SDSS images based upon a user defined list of object positions. In order to avoid congestion on the server, the list is currently limited to 1000 objects. If this is a problem, please submit your list in pieces.

If you're new to the Image List tool, please see the [Visual Tools main page](#) and [Getting Started with Image List](#).

For the description of the other options see the Help section of the [Finding Chart](#). The format of the list can be from the following choices:

- List of (ra,dec) pairs**
Always ra comes first, followed by dec. Both ra and dec can be in degrees or hh:mm:ss.s dd:mm:ss.s format. The separator can be any white space or a comma.
- List of (name,ra,dec) triplets**
The fields must always be in this order. The name can be any single alphanumeric string containing at most an underscore and a dot (like ABC_1234.32). Both ra and dec can be in degrees or hh:mm:ss.s dd:mm:ss.s format. The separator can be any white space or a comma.
- Same as above, with a single header line**
The formats (1) and (2) can also contain a single header line, containing the column names. The header must use the same separator as the data. The names ra and dec are mandatory.
- Lists in the IRSA Gator format**
For details see the IRSA website.

Authors: Jim Gray, Alex Szalay, Maria Nieto-Santesteban, Tamas Budavari, February 2004.

- Click on the small blue **Use query to fill form** link in the top left of the tool. Paste the following query into the textbox:

```
SELECT top 100 s.bestobjid as name, s.ra, s.dec      -- select ID, ra, dec of star only
FROM plateX p, specObjAll s                        -- from plate and spectrum tables
WHERE p.plate = s.plate                            -- this is the same object
  AND p.programtype > 0                             -- not part of main survey
  AND p.programname like '%segue%'                 -- part of SEGUE survey
  AND s.bestObjID > 0                               -- object also has photometric data
  AND s.specClass = 1                              -- object is a star
```

It is important to note that every query to the Image List tool must start with `SELECT name, ra, dec` (where name can be any parameter you want).

5. Click **Submit**, then **Send to List**. The results will look like this:

SDSS DR5 Image List Tool - Mozilla Firefox
File Edit View Go Bookmarks Tools Help del.icio.us
http://cas.sdss.org/astro/en/tools/chart/list.asp
Customize Links SDSS SkyServer DR4
obj list page 1 page 2 page 3 page 4
SDSS DR5
Home | Help | Chart | Navi | Expl |
Use query to fill form
name,ra,dec
587727226228965504,4
587727178988322845,4
587727178988322939,4
587727226765836318,4
Cut and paste ra/dec list
Parameters
scale 0.40 "/>pix
opt
Get Image
Drawing options
 Grid
 Label
 PhotoObjs
 SpecObjs
 Targets
 Outline
 BoundingBox
 Fields
 Masks
 Plates
 InvertImage
587727226228965504 J001812.41-101142
587727178988322845 J001817.82-101855.1
587727178988322939 J001817.82-102005.3
587727226765836318 J001820.5-093939.2
587727179525193818 J001824.03-095022
587727178988322852 J001825.21-102235.6
587727226228965542 J001826.34-100236
587727226765836404 J001826.97-094217.3
587727226228965460 J001826.16-100903.6
587727226228965462 J001826.94-100518.4
587727179525193745 J001830.96-095644.5
587727180062064686 J001831.02-093139.1
587727180062064692 J001832.89-092801
587727178988322892 J001833.17-102117.8
587727225692160066 J001833.43-102926.2
587727226229030918 J001833.5-100138.2
587727226229031000 J001835.5-100616.6
587727178988322953 J001835.81-102415.1
587727226229030931 J001836.74-100637.9
587727180062064763 J001839.15-092756.9
587727180062064822 J001839.96-092357.2
587727225692160014 J001840.43-102522.1
587727178988322915 J001840.49-101824
587727226765901905 J001841-093649.3
587727180062064825 J001842.69-093037.4
Done

- To see the spectrum, you will need to go to another tool called the **Explore** tool. Click on the SDSS object ID of a star whose spectrum you want to see – it is above the star’s image. A new window will open:

SDSS J001817.82-101855.1
STAR ra=4.574268, dec=-10.315307, ObjId = 587727178988322845

mode	PRIMARY
status	TARGET PRIMARY OK_STRIPE OK_SCANLINE PSEGMENT RESOLVED OK_RUN GOOD SET
flags	BINNED1 MANYPETRO
PrimTarget	TARGET_STAR_BHB TARGET_QSO_CAP
SecTarget	

run	rerun	camcol	field	obj	rowc	colc
1729	40	3	113	29	456.0	1024.2
u	g	r	i	z		
17.80	16.70	16.65	16.68	16.75		
fiberMag_r	petroMag_r	devMag_r	expMag_r	psfMag_r	modelMag_r	
17.01	16.69	16.65	16.65	16.65	16.65	
extinction_r	petroRad_r	parentId	nChild			
0.10	1.465	587727178988322844	0			

SpecObjID = 184027122128388096

plate	mjd	fiberId	z	zErr	zConf	specClass	ra	dec	fiberMag_r	objId
653	52145	302	-0.001	0.00012	1	STAR	4.57421	-10.31533	16.86	587727178988322845

zStatus	XCORR_EMLINE
zWarning	
PrimTarget	TARGET_STAR_BHB
SecTarget	
eClass	0.353
emZ	0.000
emConf	
xcZ	-0.001
xcConf	1

Cross-identifications

catalog	delta	propermotion	angle	blue	red
USNO	0.262	0.734	90.697	16.47	16.55

- Click on the spectrum to see a larger view of the spectrum. Spectral lines are marked in pink and green.
- To see the line strengths of various lines in the star, click on the **SpecLineIndex** link in the left-hand frame, under *SpecObj*. The name of each line identified in that spectrum is listed under *name*. The minimum and maximum rest wavelengths of the line are listed under *waveMin* and *waveMax*. The line’s equivalent width is listed under *ew*.