Facultad de Ciencias Matemáticas y Naturales
SEMANA de las CIENCIAS
Química - Biología - Física - Matemáticas

UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS
Facultad de Ciencias Matemáticas y Naturales

Visualización de datos astronómicos de la SDSS.

María A . Moreno

Noviembre 2023

Contenido

Contenido

La SDSS

Laura S. Cortes, Maria A. Moreno

The Sloan Digital Sky Survey has created the most detailed three-dimensional maps of the Universe ever made, with deep multi-color images of one third of the sky, and spectra for more than three million astronomical objects. Learn and explore all phases and surveys—past, present, and future—of the SDSS.

Figure 1: https://www.sdss4.org/

Map

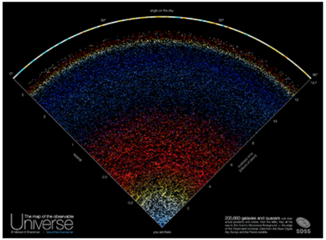
Map of the Universe

SDSS researchers and developers led by Brice Ménard of Johns Hopkins University have created [the most detailed and accurate map] of the universe ever devised, from near-Earth asteroids to distant quasars. You can explore the map, read about each feature, and download a poster showing the entire map.

You can also read about how Ménard and his colleagues created this new map from the [press release from Johns Hopkins University].

Visit mapoftheuniverse.net

Mapoftheuniverse.net



The SDSS map of the universe (click for a larger version)

Figure 2: `https://mapoftheuniverse.net`

Contenido

Qué es el SciServer:

About SciServer

SciServer is a fully integrated cyberinfrastructure system encompassing related tools and services to enable researchers to cope with scientific big data. SciServer enables a new approach that will allow researchers to work with Terabytes or Petabytes of scientific data, without needing to download any large datasets.

Figure 3: https://sciserver.org/about/

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Actividad 1: Creando Una cuenta en el SciServer:

- Revisar el manual en el git del curso https://github.com/Almarm-r/VISUALIZACION_SDSS_-SEMANA-DE-LA-CIENCIA_2023-.git

Actividad 1: Creando Una cuenta en el SciServer:

- Revisar el manual en el git del curso https://github.com/Almarm-r/VISUALIZACION_SDSS_-SEMANA-DE-LA-CIENCIA_2023-.git
- Ingresar en https://apps.sciserver.org/login-portal

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SciServer:

En la pagina de inicio podemos ver algunas opciones para trabajar .

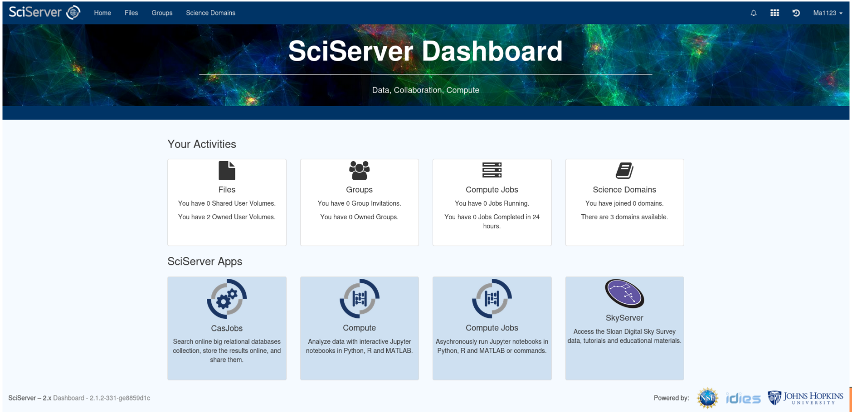
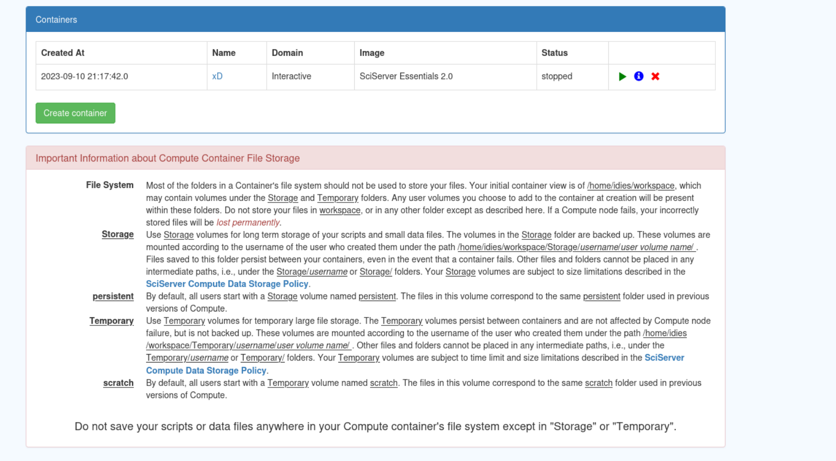


Figure 4: Incio SciServer

Compute



Containers

Created At	Name	Domain	Image	Status	
2023-09-10 21:17:42.0	xD	Interactive	SciServer Essentials 2.0	stopped	

Create container

Important Information about Compute Container File Storage

File System Most of the folders in a Container's file system should not be used to store your files. Your initial container view is of /home/idies/workspace, which may contain volumes under the Storage and Temporary folders. Any user volumes you choose to add to the container at creation will be present within these folders. Do not store your files in workspace, or in any other folder except as described here. If a Compute node fails, your incorrectly stored files will be *lost permanently*.

Storage Use Storage volumes for long term storage of your scripts and small data files. The volumes in the Storage folder are backed up. These volumes are mounted according to the username of the user who created them under the path /home/idies/workspace/Storage/*username*/*user volume name*/ . Files saved to this folder persist between your containers, even in the event that a container fails. Other files and folders cannot be placed in any intermediate paths, i.e., under the Storage/*username* or Storage/ folders. Your Storage volumes are subject to size limitations described in the **SciServer Compute Data Storage Policy**.

persistent By default, all users start with a Storage volume named persistent. The files in this volume correspond to the same persistent folder used in previous versions of Compute.

Temporary Use Temporary volumes for temporary large file storage. The Temporary volumes persist between containers and are not affected by Compute node failure, but is not backed up. These volumes are mounted according to the username of the user who created them under the path /home/idies/workspace/Temporary/*username*/*user volume name*/ . Other files and folders cannot be placed in any intermediate paths, i.e., under the Temporary/*username* or Temporary/ folders. Your Temporary volumes are subject to time limit and size limitations described in the **SciServer Compute Data Storage Policy**.

scratch By default, all users start with a Temporary volume named scratch. The files in this volume correspond to the same scratch folder used in previous versions of Compute.

Do not save your scripts or data files anywhere in your Compute container's file system except in "Storage" or "Temporary".

Figure 5: Contenedor

Actividad 2: Crear el contenedor de memoria

- Entrar en el manual de la actividad 2 de git https://github.com/Almarm-r/VISUALIZACION_SDSS_-SEMANA-DE-LA-CIENCIA_2023-.git

Acceder a JupyterNotebook

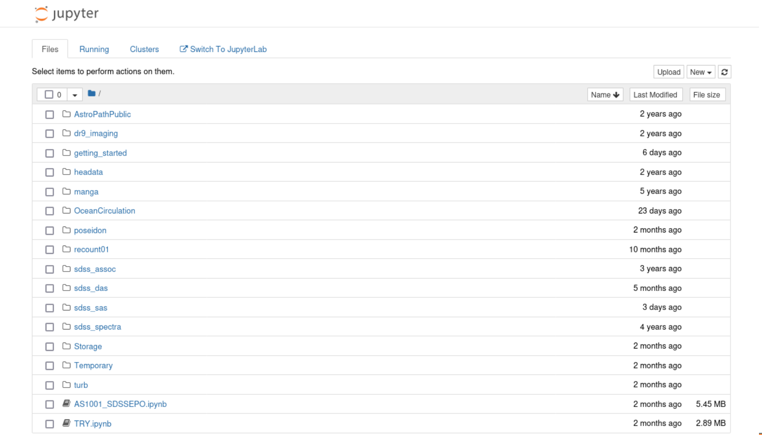


Figure 6: Jupyter interface

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Contenido

Ubicación

Podemos tomar dos caminos

- Radial search:Buscar a partir de un punto especifico
- Rectangular search: Buscar dentro de una sección rectangular.

Revisa el siguiente link: https://skyserver.sdss.org/dr17/

Radial search :

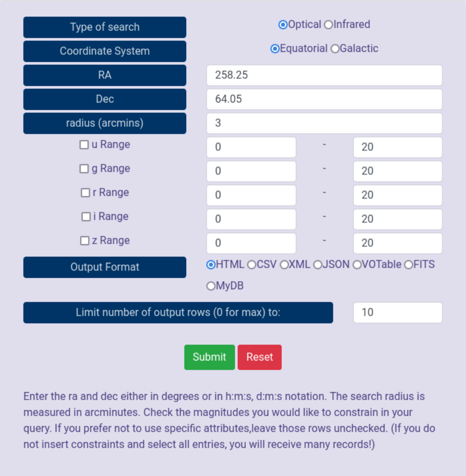

Figure 7: Formato de busqueda radial

Rectangle search

Figure 8: Formato de busqueda rectangular

Imaging search

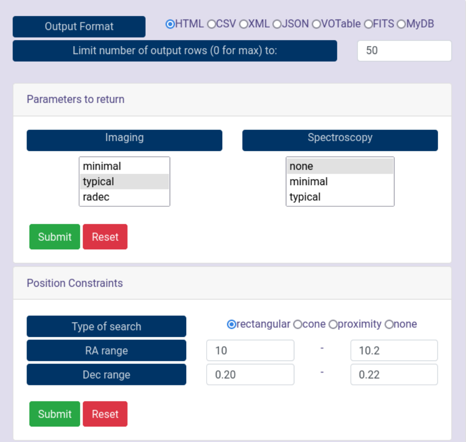

Figure 9: Formato de búsqueda por imagenes.

Spectroscopic Search

Figure 10: Formato de búsqueda espectroscópico

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Lenguaje SQL

Para las bases de datos estructuradas existe una manera rápida de filtrar la información. En el caso de la SDSS podemos hacerlo a través de SQL

Your SQL command was:

```
SELECT  TOP 10 p.objid,
   p.run, p.rerun, p.camcol, p.field, p.obj,
   p.type, p.ra, p.dec, p.u,p.g,p.r,p.i,p.z,
   p.Err_u, p.Err_g, p.Err_r,p.Err_i,p.Err_z
   FROM fGetNearbyObjEq(258.25,64.05,3) n,   PhotoPrimary p
   WHERE n.objID=p.objID
```

Figure 11: Petición ejemplo SQL

Actividad 3: Accedamos a algunos datos

- De los métodos que acabamos de revisar elegir uno y ubicar datos
- Obtener la petición en SQL