



Collaborative data-driven science

Use of Containers in SciServer

*Long Term Access to Large Scientific Data Sets:
the SkyServer and Beyond*

<http://www.sciserver.org>

*For the SciServer team:
Gerard Lemson and Jai Won Kim*



sciserver.org



The screenshot shows the SciServer website (sciserver.org) displayed in a web browser window. The page features a dark blue header with the SciServer logo and a globe icon. Below the header is a large banner with the text "A new vision for science" and "A collaborative research environment for large-scale data-driven science". The main content area includes a section for "SciServer Altair v1.10.2" and a "Login to SciServer" button. The page is organized into several sections with icons and descriptions:

- About**: Bringing the Analysis to the Data
- Tools**: A modular system of independent components.
- Support**: Workshop supporting material, online documentation, provide feedback, report bugs.
- Outreach**: Building relationships with universities, institutes, and government organizations.
- Science**:
 - Full datasets
 - Common formats
 - Common sets of interfaces
- News**

At the bottom, it is mentioned that SciServer is administered by idies and Johns Hopkins University, and funded by the National Science Foundation (NSF).

SciServer is administered by
idies
JOHNS HOPKINS UNIVERSITY

SciServer is funded by National Science Foundation award ACI-1261715

NSF

SciServer: Motivation and History

- ▶ Started with the SDSS SkyServer
- ▶ Built in a few months in 2001
- ▶ Goal: instant access to rich content
- ▶ Idea: bring the analysis to the data
- ▶ Interactive access at the core
- ▶ Much of the scientific process is about data
 - Data collection, data cleaning, data archiving, data organization, data publishing, mirroring, data distribution, data analytics, data curation...

SkyServer

Object Explorer

SDSS J131027.46+182617.4

Look up common name

Type	SDSS Object ID
GALAXY	1237668296598749280
RA, Dec	Galactic Coordinates (l, b)
Decimal	Sexagesimal
197.61446, 18.43817	l b 13:10:27.46, +18:26:17.40
197.61446, 18.43817	330.66079

Imaging **WARNING:** This object's photometry may be unreliable. See the photometric flags.

Flags: DEBLEND_DEGENERATE PSF_FLUX_INTERP DEBLENDED_AT_EDGE
BAD_MOVING_FIT BINNED1 INTERP COSMIC_RAY NODEBLEND CHILD BLEND

Magnitudes			
u	g	r	i
16.52	14.95	14.00	13.32

Magnitude uncertainties			
err_u	err_g	err_r	err_i
0.01	0.00	0.00	0.02

Cross-ID

Spec Summary

Fit Parameters

Optical Spectra SpecObjID= 2947691243863304192

Interactive spectra

IR Spec Summary

SLOAN DIGITAL SKY SURVEY III
SkyServer DR10

Home Tools Schema Education Astronomy SDSS Contact Us Download Site Search Help

SQl Search

This page allows you to directly submit a SQL (Structured Query Language) query to the SDSS database server. You can modify the default query as you wish, or cut and paste a query from the SDSS Schema Queries page.

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. If no query is set, it is restricted by a timeout or number of rows returned; please use the [Galaxy basic query service](#).

SQL Query:

```

-- This query does a JOIN between the imaging (PhotoObj) and spectra
-- tables and includes the necessary columns in the SELECT to upload
-- the results to the SDSS Archive Server for FITS file retrieval.
SELECT PhotoObj.objid, PhotoObj.ra, PhotoObj.dec,
       spectra.spectrograph, spectra.wave, spectra.z,
       spectra.zError, spectra.zWarning,
       spectra.zPhoto, spectra.zPhotoError,
       spectra.zPhotoWarning
FROM PhotoObj JOIN spectra ON PhotoObj.objid = spectra.objid
WHERE
    (photoObj.ra <= 19.5 AND photoObj.ra >= 19.5)
    AND (photoObj.dec <= 20.0 AND photoObj.dec >= 20.0)

```

Submit Check Syntax Only Output Format: HTML XML CSV JSON VOTABLE FITS

To find out more about the database schema use the [Schema Browser](#).

For an introduction to the Structured Query Language (SQL), please see the [Searching for Data How To](#) tutorial. In particular, please read the [Optimizing Queries section](#).

The inclusion of the Imaging and spectra columns for SDSS added in your query (as in the default query on this page), will ensure that when you press Submit, the appropriate button(s) are displayed on the query results page to allow you to upload the necessary information to the SDSS to retrieve the fits files corresponding to your SDSS query. The "mag" columns needed for upload to the SDSS are run, r, run, g, r, i.

obj list page 1 page 2

14660917302852544 J092759.09+085242.4	265726579694063616,141.95 J092759.22+194202.9	534863786490750976,141.95 J092759.25+013821.8	219426979040984340 J092759.45+261928.2	5327060013399058408 J092759.7-002249.8
2581808120858699776 J092800.20+233229.6	1434564481966434304 J092800.05+363217.4	2183241747138635776 J092800.34+304533.4	218437231886923152 J092800.38+275310.5	143456613123875968 J092800.58+364012.4
534865712636099584 J092800.85+010417.4	2183242022018542720 J092800.92+500213	2113480501170825218 J092801.16+1516.8	2185432249126740864 J092801.19+301154.1	21854229093279804788 J092801.28+312214.9
63996291750715008 J09281.58+045041.8	863889511144548352 J092801.58+524052.9	1346680172197554175 J092801.68+070737.6	1703678449548407298 J092801.72+342437.9	534872857461680128 J092801.82+505820.4
21854850258667412 J09281.83+321334.1	2184375343526209538 J092802.04+271531.9	2185430874739206144 J092802.17+304536.7	2184271439677384704 J092802.17+261C50.4	5228442585270848632 J092802.47+372636.1

Parameters
scale: 0.4 arcsec/pix
opt:

Get Image

Drawing options

- Grid
- Label
- Photometric objects
- Objects with spectra
- Invert Image

Advanced options

- APOGEE Spectra
- SDSS Outlines
- SDSS Bounding Boxes
- SDSS Fields
- SDSS Masks
- SDSS Plates

CAS Jobs

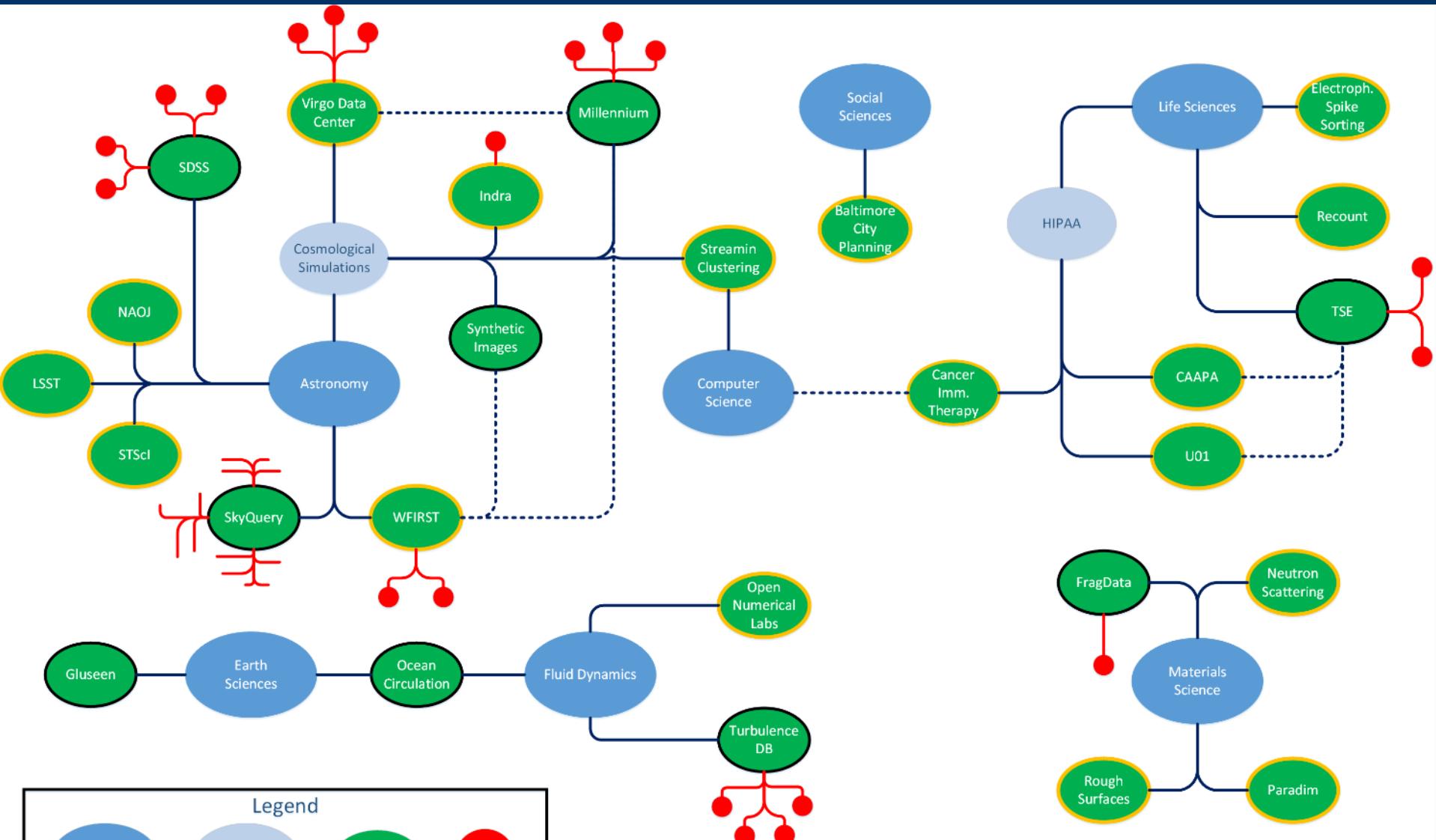
Two screenshots of the SciServer interface are shown side-by-side.

Left Screenshot: A window titled "SDSS Query / CasJobs" showing the "PMStar" table schema. The table contains approximately 21,157,643 rows (~2,069,208 kB). The schema includes columns: objID, night, obsID, ccd, and brightStar. A note states: "Proper motion of a star (point source) in the Deep PM catalog." Below the schema is a detailed description of the columns and their meanings, including the definition of "brightStar".

Right Screenshot: A window titled "CasJobs" showing the "SubmitJob.aspx" page. It displays a SQL query that has been submitted and completed successfully. The query selects top 40 objects from the photoobj table, joins it with the fgetnearbyobjeq table, and filters by p.g between 14 and 18. The results are displayed as a table with columns: ra, dec, u, g, r, i, z.

Goal of SciServer

- ▶ Interactive science on petascale data
- ▶ Create scalable open numerical laboratories
- ▶ Use commonly shared building blocks
- ▶ Major national and international impact
- ▶ Large footprint across many disciplines



Our Data Sets

- ▶ Sloan Digital Sky Survey (150TB)
- ▶ Over 50 other astronomy catalogs (100TB)
- ▶ Turbulence simulations (500TB)
- ▶ Cosmological N-body simulations (1,200TB)
- ▶ Various materials science data (~50TB)
- ▶ Oceanography (~50TB)
- ▶ Genomics (~200TB open data, 600TB HIPAA)

SciServer Single Sign-in X idies@34dbf9101d0a:~/wor | compute.sciserver.org | alpha01.sciserver.org + ▾

portal.sciserver.org/login-portal

home blogs RACM JPQL Query COMPMS ASCOM cache JHU NNX NDS Meetings Stats IVOA BigData Data Integration Coding Personal xmatch Deep Learning VirgoDC bosun Mother Jones

SciServer

Collaborative data-driven science
Single Sign-on Portal

CasJobs SciDrive SkyQuery Compute SkyServer Home

Log In

If you have an existing CasJobs account and are using the Login Portal for the first time, please [Register](#).

Log in to an existing SciServer account.

User name Password

SciServer Compute Data Storage Policy

SciServer Non-Commercial Use Policy

SciServer tools and services may only be used for non-commercial purposes. Logging in and using the SciServer system implies your acknowledgement and acceptance of this policy.

Submit

0

Containers in SciServer : SciServer/Compute

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IRC ON FREENODE #RACKSPACE | DEVELOPER FORUM

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DEVELOPER BLOG

NEWS AND INSIGHTS FROM RACKSPACE DEVELOPERS



How did we serve more than 20,000 IPython notebooks for Nature readers?

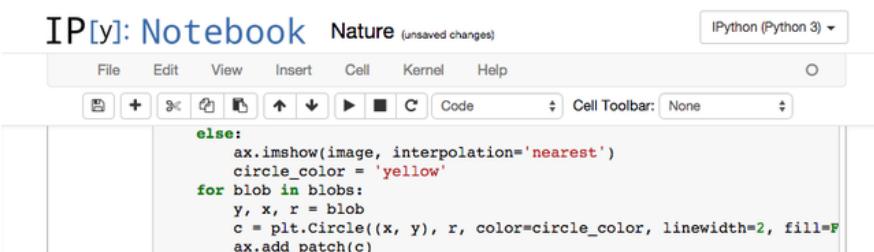


Kyle Kelley | January 28, 2015

[docker](#) / [python](#)

The IPython/Jupyter notebook is a wonderful environment for computations, prose, plots, and interactive widgets that you can share with collaborators. People use the notebook [all over the place](#) across [many varied languages](#). It gets used by [data scientists](#), researchers, analysts, developers, and people in between.

As I alluded to in a writeup on [Instant Temporary Notebooks](#), we (combination of IPython/Jupyter and Rackspace) were prepping for a big demo as part of a [Nature article on IPython Notebooks](#) by Helen Shen. The impetus behind the demo was to show off the IPython notebook to readers in an interactive format. What better way than to [provide a live notebook server to readers on demand](#)?



POPULAR POSTS

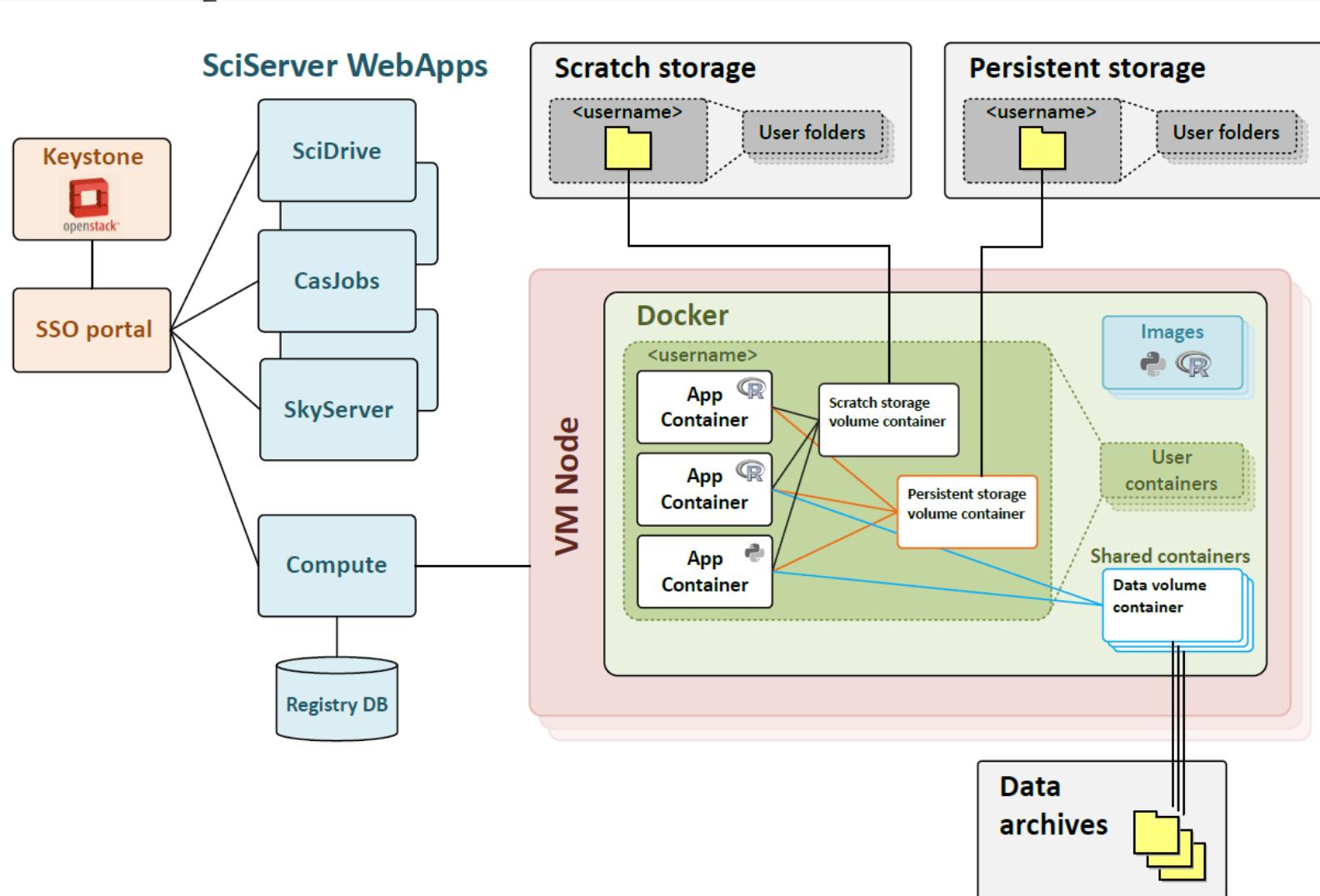
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- [Neutron Networking: Neutron Routers and the L3 Agent](#)
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- [Ansible and Docker](#)
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CATEGORIES

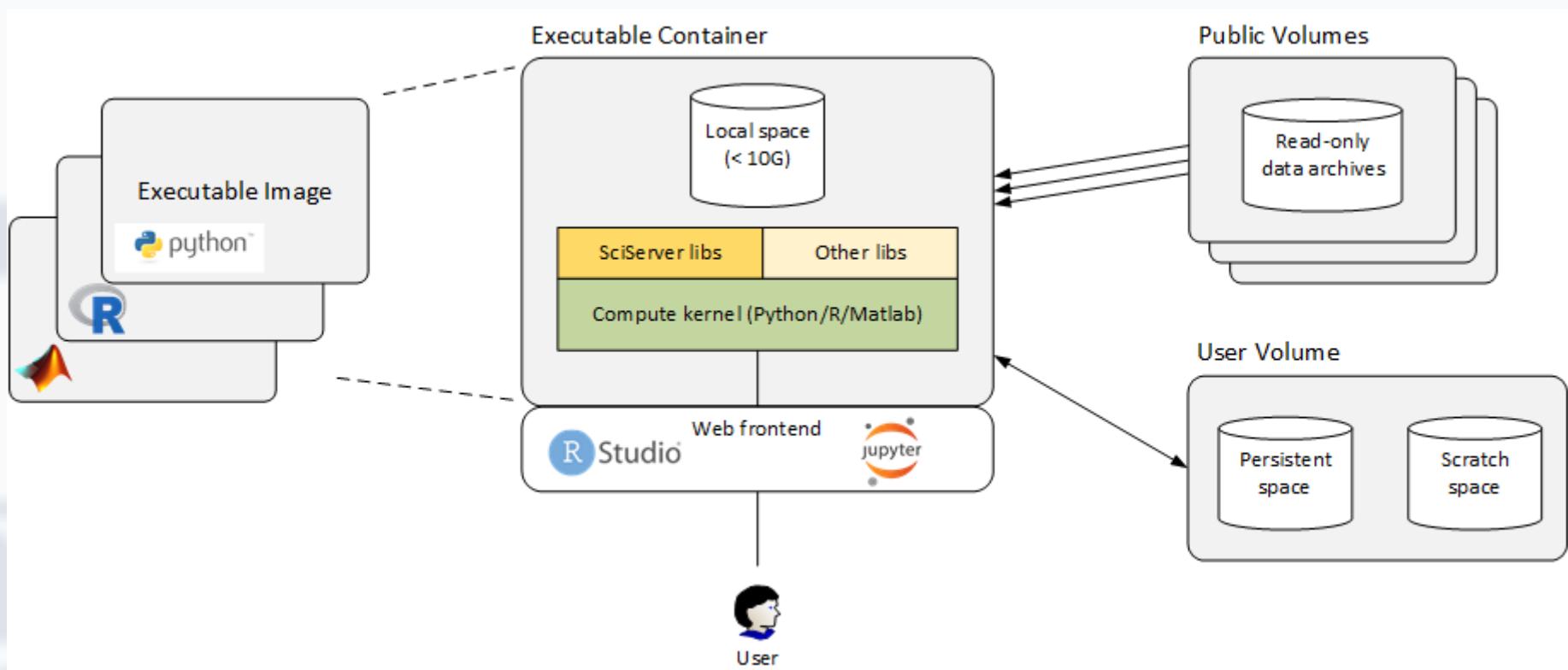
[Openstack](#)[DevOps](#)[Community](#)[Developer Experience](#)[Security](#)[Deployment](#)[SDKs](#)[Tools](#)

Compute Architecture

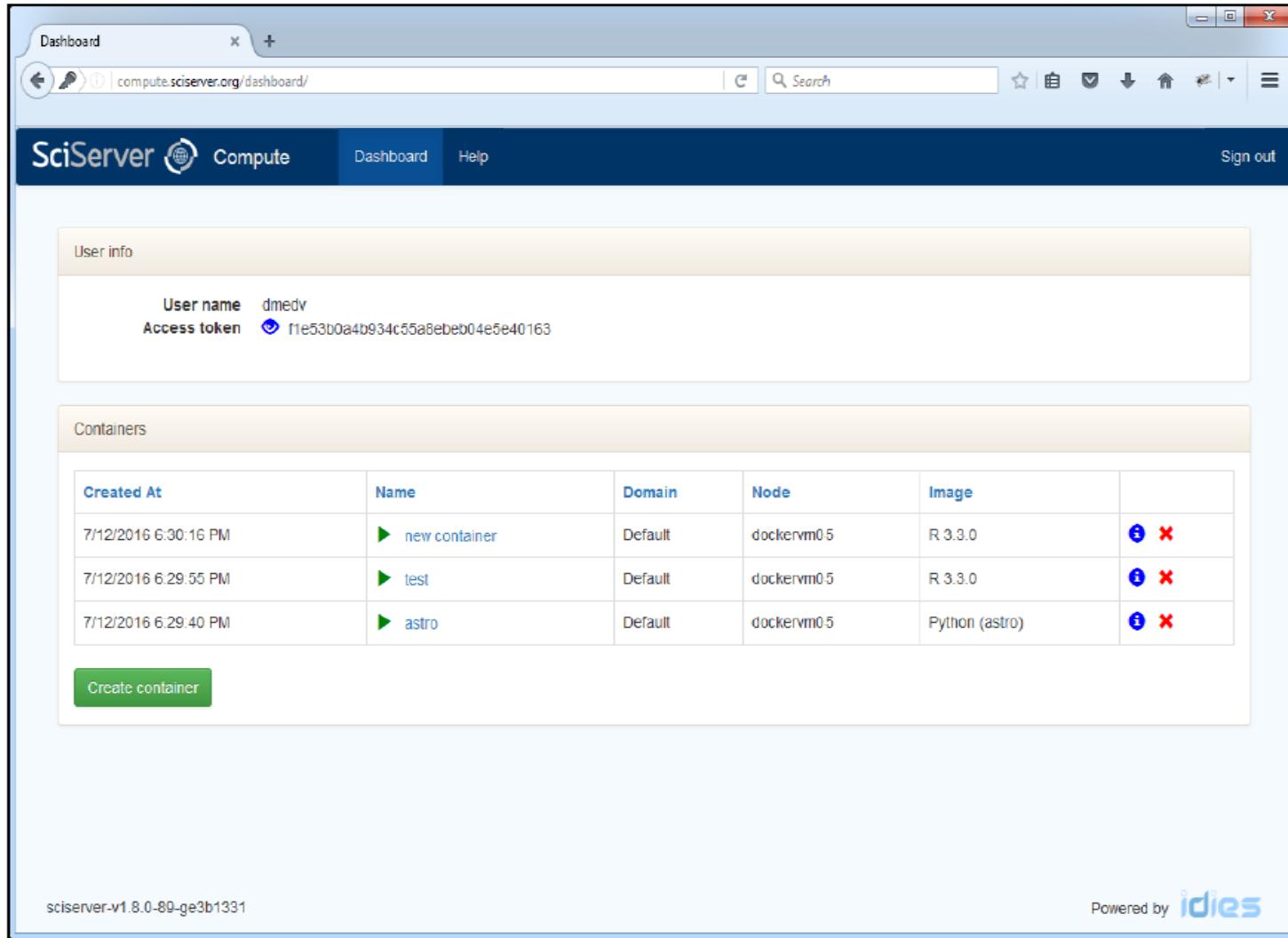




docker set-up



Compute Dashboard



The screenshot shows the SciServer Compute Dashboard interface. At the top, there is a header bar with the SciServer logo, a search bar, and various navigation icons. Below the header, the main content area is divided into sections:

- User info:** Displays the user name (dmedv) and an access token (f1e53b0a4b934c55a8eb04e5e40163).
- Containers:** A table listing three containers created on 7/12/2016. The columns are: Created At, Name, Domain, Node, Image, and Actions (with edit and delete icons). The data is as follows:

Created At	Name	Domain	Node	Image	Action
7/12/2016 6:30:16 PM	▶ new container	Default	dockervm0.5	R 3.3.0	
7/12/2016 6:29:55 PM	▶ test	Default	dockervm0.5	R 3.3.0	
7/12/2016 6:29:40 PM	▶ astro	Default	dockervm0.5	Python (astro)	

- Create container:** A green button at the bottom left of the container section.

At the bottom of the page, there is footer text: "sciserver-v1.8.0-89-ge3b1331" and "Powered by  idies".

SciServer User Dashboard Dashboard X + V

← → ⌂ alpha01.sciserver.org/compute/#

SciServer Compute Dashboard Help Sign out

ALPHA

User info

User name gerard
Access token 

Containers

Created At
2017-08-01 12:06:47.0
2017-07-31 07:13:48.0
2017-07-13 09:54:34.0

Create container

Create a new container

Container name: Cosmology

Domain: Interactive Docker Compute Domain

Image: Python

User volumes

Persistent
 Scratch

Public volumes

SDSS DAS
 Virgo
 Indra Simulations
 paradigmgroup
 Recount
 Mede
 WFIRST - Archive SIT
 FinTechAI
 Ocean Circulation
 City

Create

develop

Powered by:   

Home x compute.sciserver.org | alpha01.sciserver.org | Container Analysis Environn + v

apps.sciserver.org/dockervm13/53324e72-75e1-11e7-9f9f-00155d9cfe01/tree

 jupyter

Files Running Clusters

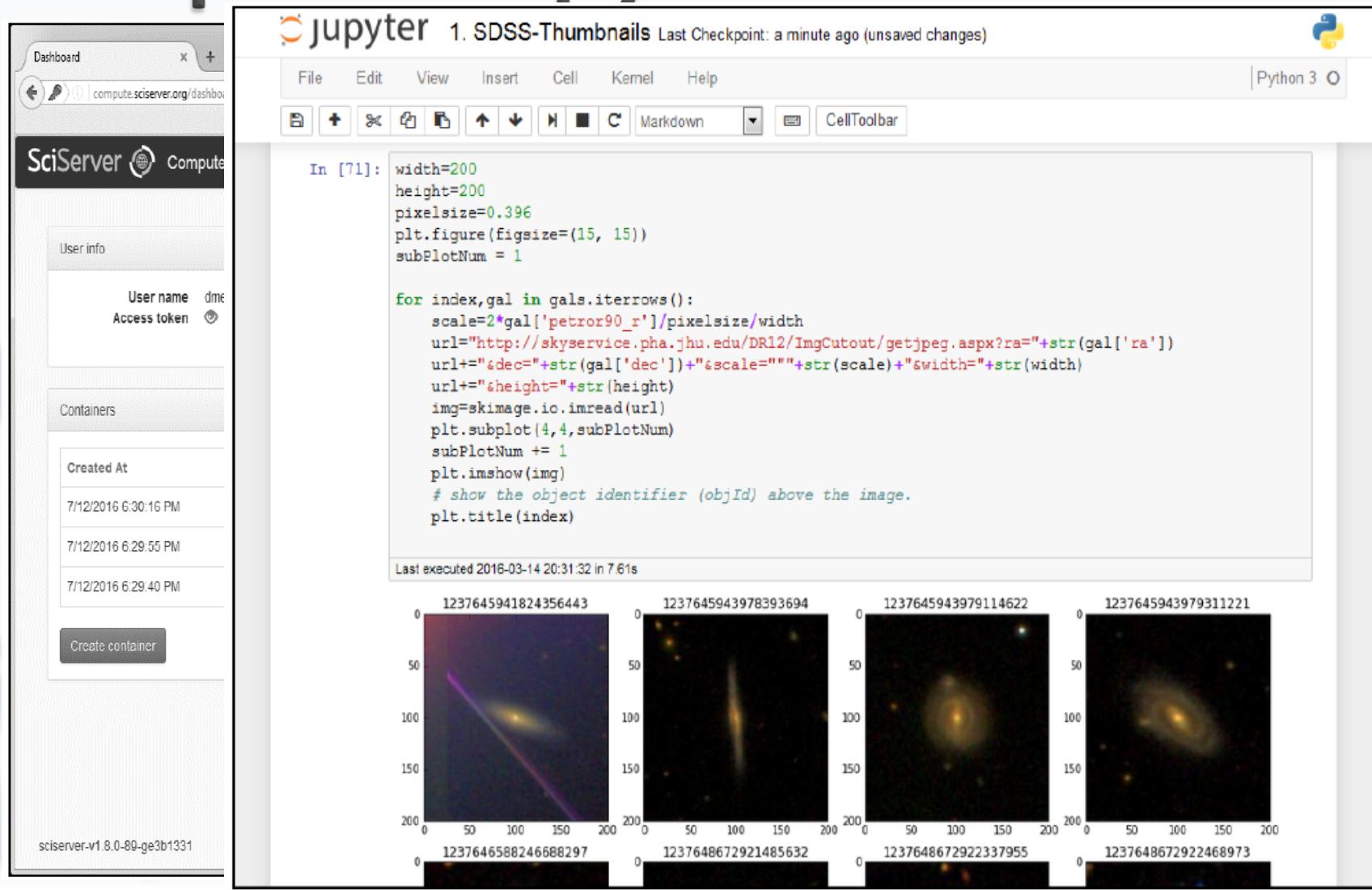
Select items to perform actions on them.

Upload New v 

<input type="checkbox"/>		Name ↑	Last Modified ↑
<input type="checkbox"/>		indra	7 days ago
<input type="checkbox"/>		persistent	19 days ago
<input type="checkbox"/>		scratch	10 days ago
<input type="checkbox"/>		StartHere.ipynb	a month ago

0

Compute : Jupyter Notebook



The screenshot shows the SciServer Compute Jupyter Notebook interface. On the left is a sidebar with 'User info' (User name: dme, Access token), 'Containers' (Created At: 7/12/2016 6:30:16 PM, 7/12/2016 6:29:55 PM, 7/12/2016 6:29:40 PM), and a 'Create container' button. The main area is a Jupyter notebook cell titled 'In [71]'. The code generates a 4x4 grid of SDSS thumbnails. Each thumbnail has a title above it and a unique ID below it.

```
width=200  
height=200  
pixelsize=0.396  
plt.figure(figsize=(15, 15))  
subPlotNum = 1  
  
for index,gal in gals.iterrows():  
    scale=2*gal['petror90_r']/pixelsize/width  
    url="http://skyservice.pha.jhu.edu/DR12/ImgCutout/getjpeg.aspx?ra="+str(gal['ra'])  
    url+="&dec="+str(gal['dec'])+"&scale='"+str(scale)+"&width="+str(width)  
    url+="&height="+str(height)  
    img=skimage.io.imread(url)  
    plt.subplot(4,4,subPlotNum)  
    subPlotNum += 1  
    plt.imshow(img)  
    # show the object identifier (objId) above the image.  
    plt.title(index)
```

Last executed 2016-03-14 20:31:32 in 7.61s

Thumbnail Index	Title	ID
1	1237645941824356443	1237645941824356443
2	1237645943978393694	1237645943978393694
3	1237645943979114622	1237645943979114622
4	1237645943979311221	1237645943979311221
5	123764588246688297	123764588246688297
6	1237648672921485632	1237648672921485632
7	1237648672922337955	1237648672922337955
8	1237648672922468973	1237648672922468973

JupyterLab Alpha Preview

Dashboard JupyterLab Alpha Preview https://apps.sciserver.org/dockervm01/e14d0d2c-3bc1-48da-881c-feff4140eb32/lab Gerard

File Notebook Editor Terminal Console Help

Files

Presentations > UPenn20170222

Name	Last Modified
1-intro.ipynb	a day ago
2. Stripe82-coadd.ipynb	7 hours ago
3. plot_neighbors_phot...	7 hours ago
FragData - Analysis - E...	5 hours ago
FragData - Database D...	5 hours ago
FragData - Plotting Cra...	5 hours ago
FragData_Analysis_Fra...	5 hours ago
FragData_Analysis_Fra...	5 hours ago
FragData_Analysis_Plo...	5 hours ago
HernquistProfiles.ipynb	5 hours ago
cycles.py	5 hours ago
FragData.py	5 hours ago
img_scale.py	7 hours ago
matplotlibrc	7 hours ago

Running

Commands

Launcher

Launcher

Notebook 1

Query SDSS Data Release 12, save thumbnails to SciDrive

This notebook shows you how to use SciServer compute to communicate with the other components of SciServer. You will learn how to:

1. Single-sign-on authentication through Keystone tokens
2. import special purpose libraries written for SciServer actions
3. Querying relational databases registered in CasJobs (SciServer's database frontend and batch query engine)
4. Manipulating query results in python code (visualization)
5. Storing results on local scratch disk as an HDF5 file for later reuse
6. Based on query result retrieve images from persists store, available to notebook because the docker container was created with a link to the corresponding volume container and show the images on the screen.
7. Write images to the sharable, dropbox-like SciDrive. There they can be found through the UI interface and shared with colleagues.
8. Store public URLs to thimbnails together with other data to table in one's private database, MyDB

1. Sign in to SciServer

All SciServer tools (CasJobs, SciDrive, iPython Notebooks, etc.) use the same single-sign-on system, so you only need to remember one password.

When you open your Docker container from the SciServer Compute dashboard page, the current token will be written in the file /home/idies/keystone.token. You can find your token on your Compute dashboard, under your username.

The code block below reads the token and stores it in a local variable, then prints its value along with your login name.

Since your token may expire, you should sometimes refresh the token as you work. You can do this by refreshing the Dashboard, and then rerunning the next block of code.

```
In [1]: import SciServer.LoginPortal as Login  
token=Login.getToken()  
token
```

JupyterLab



RStudio

Dashboard RStudio JupyterLab Alpha Preview

Secure | https://apps.sciserver.org/dockervm03/8f2a9241-9e37-4443-8197-1c8f75adb8a4/

File Edit Code View Plots Session Build Debug Profile Tools Help

query_CAS.r HandleTrees.r

Source on Save Import Dataset

Run Source

1 `## galaxyTree()`

2 `#`

3 `# retrieve galaxytrees from database and plot them ala Delucia & Blaizot 2000`

4 `#`

5 `galaxyTree<-function(root="0", tableName="MRscPlanck1", context="Henriques2011") {`

6 `sql=paste("`

7 `select p.fofsubhaloid as fof`

8 `, p.snapnum`

9 `, 1 + p.galaxyid-",root," as id`

10 `, 1 + p.descendantId-",root," as descendant`

11 `, p.lastprogenitorId-",root," as lastprogenitor`

12 `, p.stellarmass as mass`

13 `, p.B_Dust-p.V_Dust as color`

14 `, p.V_Dust as mag`

15 `, p.sfr`

16 `, p.type`

17 `from ",tableName," d`

18 `, ",tableName," p`

19 `where d.galaxyId=",root,"`

20 `and n.galaxyId between d.galaxyId and d.lastprogenitorId`

21 `and n.galaxyId between d.galaxyId and d.lastprogenitorId`

22 `and n.galaxyId between d.galaxyId and d.lastprogenitorId`

23 `and n.galaxyId between d.galaxyId and d.lastprogenitorId`

1:1 (Top Level) R Script

Console

Copyright (C) 2016 The R Foundation for Statistical Computing
Platform: x86_64-redhat-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some help, 'help()' for on-line help,
'help.start()' for the full browser-based help.
Type 'q()' to quit.

x=runif(100)
y=runif(100)
plot(x,y)

Environment History

Import Dataset Global Environment

Values

x num [1:100] 0.156 0.455 0.191 0.644 0.909 ...
y num [1:100] 0.578 0.0646 0.2444 0.8028 0.2667 ...

Files Plots Packages Help Viewer

Zoom Export

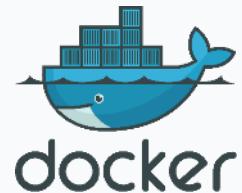
Plot showing the relationship between x and y. The x-axis ranges from 0.0 to 1.0, and the y-axis ranges from 0.0 to 1.0. The data points are scattered, showing a positive correlation.

Home | idies@34dbf9101d0a:~ | compute.sciserver.org | alpha01.sciserver.org | Container Analysis Environn + ⌂

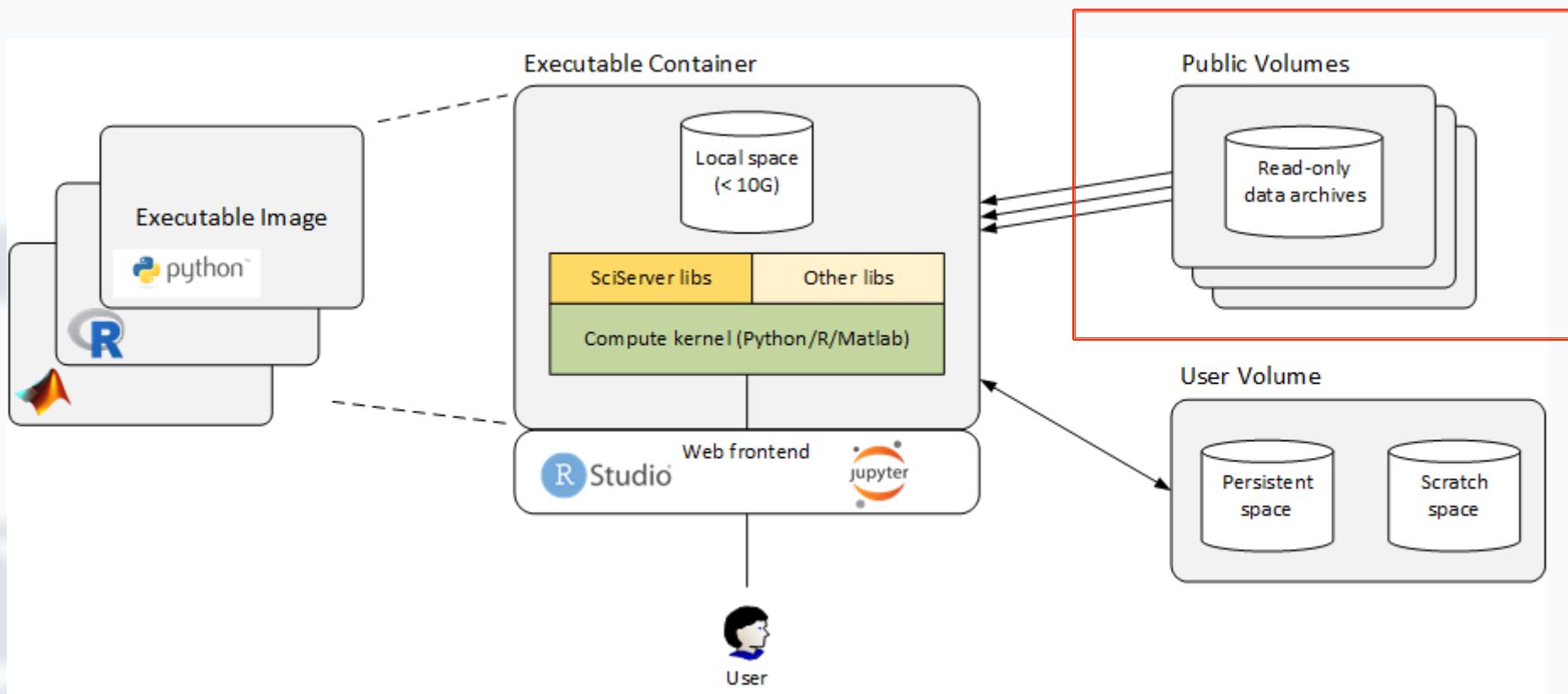
apps sciserver.org/dockervm13/53324e72-75e1-11e7-9f9f-00155d9cfe01/terminals/2

jupyter

```
[idies@34dbf9101d0a /]$ cd
[idies@34dbf9101d0a ~]$ cd workspace/persistent/
[idies@34dbf9101d0a persistent]$ pwd
/home/idies/workspace/persistent
[idies@34dbf9101d0a persistent]$ dir
3yr-Review          MR-DB\ querying.ipynb      Untitled.ipynb
AAA_DEMOS           New\ Microsoft\ Word\ Document\ (2).docx  Untitled1.ipynb
AS.171.205          Notebooks\ @\ github
Altair\ Tryout.ipynb Presentations
AltairTutorial       Projects
BIN                 RStudio
BUFFER              SRC
Courses              SRC_TEST
DEMO                SciScript-Python
DOC                 SkyQuery.ipynb
Examples_SciScript-R.ipynb TEST
GIT                 TestJSONFormats.ipynb
HTTPS\ Test.ipynb   Turbulence
[idies@34dbf9101d0a persistent]$ █
```



docker set-up: public data



Create a new container

X

Container name

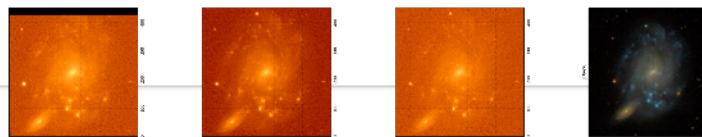
Please enter a name...

User name

Access token

Image

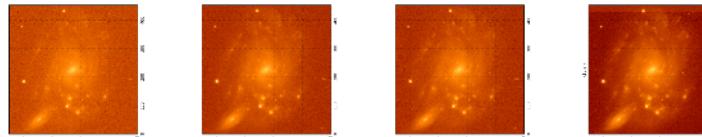
Python (astro)



▼

User volumes

Persistent



Scratch

Public volumes

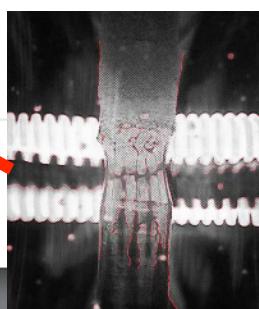
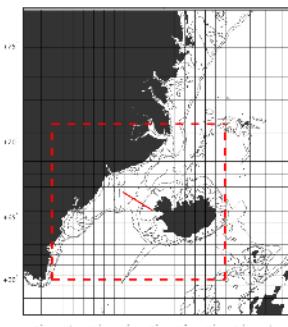
SDSS DAS

Recount

AS.171.205

Ocean Circulation

paradigmgroup



Create

Some existing use cases

SDSS: CAS + DAS

jupyter 2. Stripe82-coadd-Copy1 Last Checkpoint: 3 minutes ago (unsaved changes)

File Edit View Insert Cell Kernel Help

CellToolbar

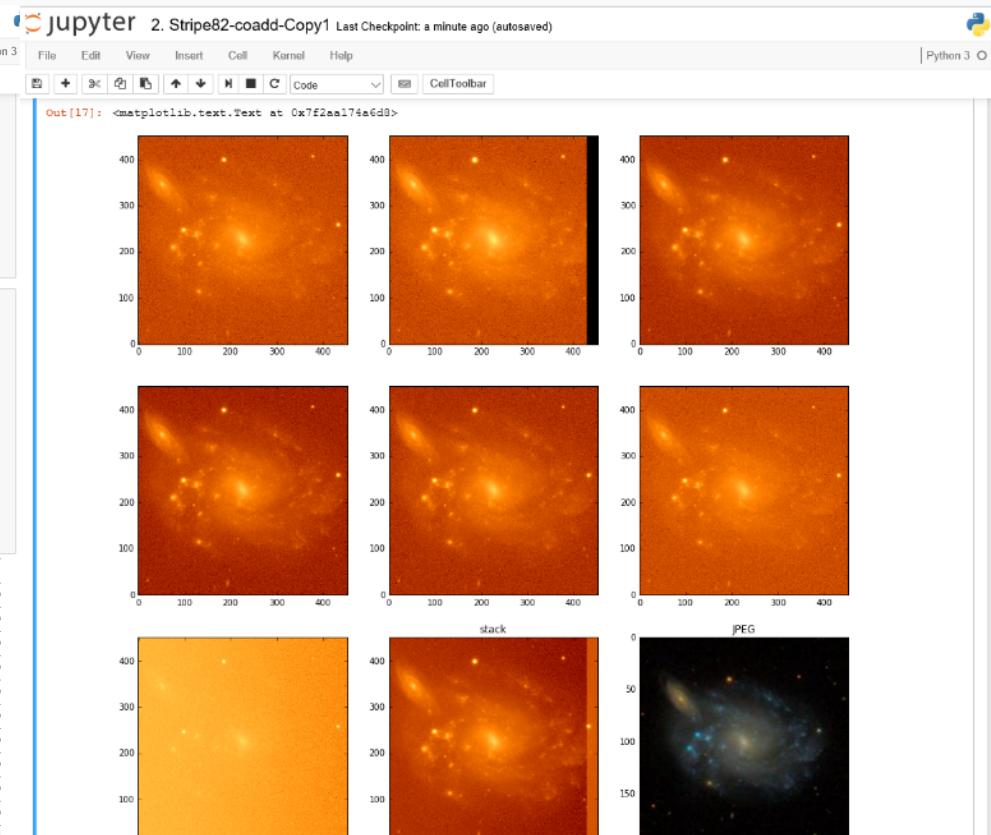
```
import sciportal.login.portalapi as login
token=login.getToken()
import pandas
import tables
import numpy as np
import astropy
from astropy.io import fits
from astropy import wcs
import skimage.io
import urllib
import os
import matplotlib
import matplotlib.pyplot as plt
```

In [18]:

```
sql="""
SELECT a.objid as head, c.objid2 as match, b.matchcount,
p.fieldid as head_field, d.fieldid as match_field,
dbo.fGetUr1fitsFrame(d.fieldid, 'g') as fits_g,
dbo.fGetUr1fitsFrame(d.fieldid, 'r') as fits_r,
dbo.fGetUr1fitsFrame(d.fieldid, 'z') as fits_z,
p.ra, d.ra as match_ra, p.dec, d.dec as match_dec
, p.petror90_r
from (select top 1 * from galaxy where objId=8658194378960928809) a
join matchhead b on a.objid=b.objid      -- join with matchhead
join photoobj p on a.objid=p.objid       -- get matchhead photoobj
join match c on c.objid1=b.objid         -- join with all the matches
join photoobjall d on c.objid2=d.objid   -- get match photoobj
order by d.fieldid                      -- order by matchhead objid
"""
queryResponse = SciServer.CasJobs.executeQuery(sql, "Stripe82", token=token)
obs = pandas.read_csv(queryResponse, index_col=None)
obs[:10]
```

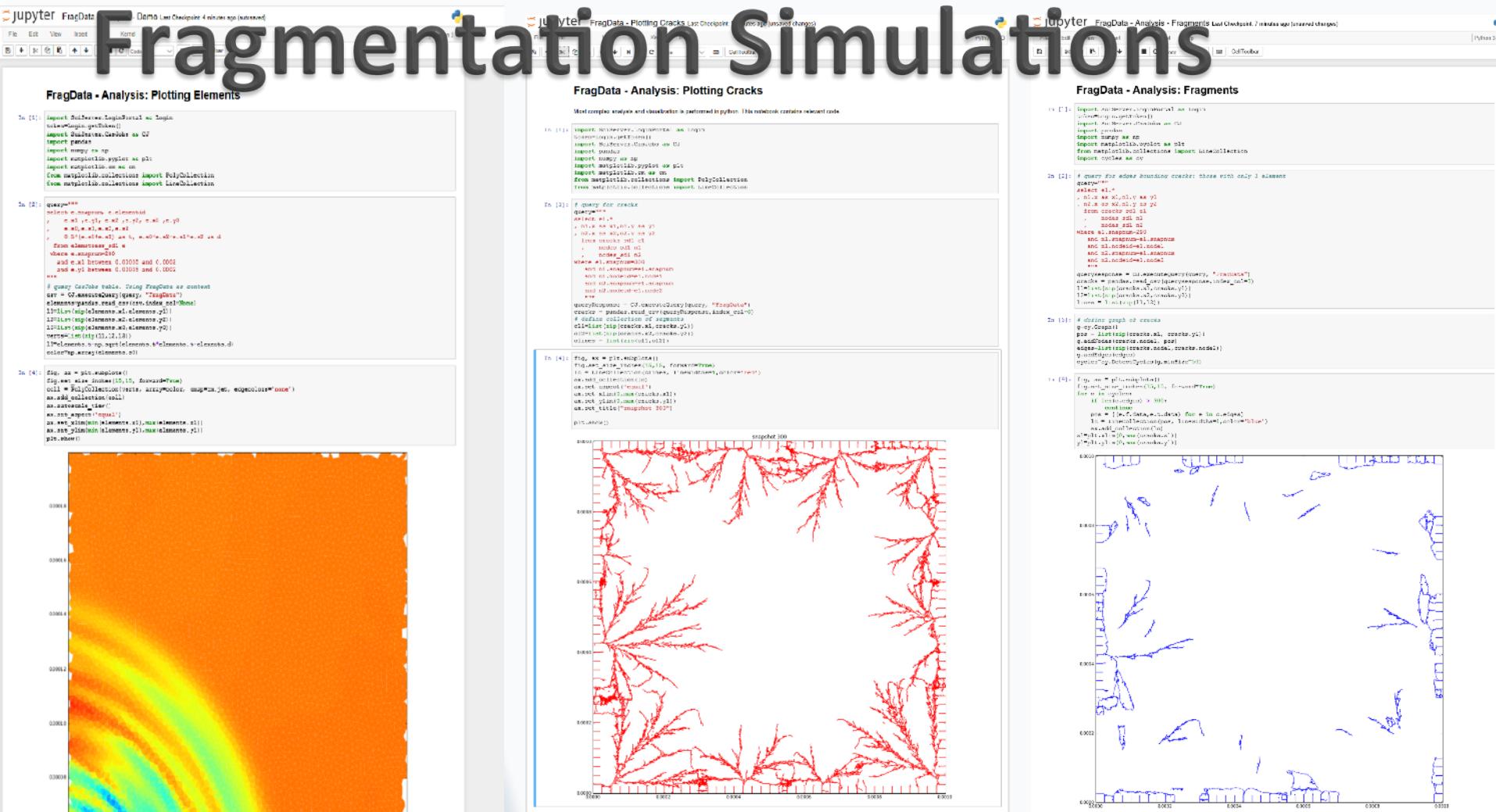
Out[18]:

	head	match	matchcount	head_field	match_field	fits_g
0	8658194378960928809	8658194430499553320	57	8658194378960928768	8658194430499553280	http://das.sdss.org/imaging/5622/40/corr/
1	8658194378960928809	8658194477742948377	57	8658194378960928768	8658194477742948352	http://das.sdss.org/imaging/5633/40/corr/
2	8658194378960928809	8658194516375371821	57	8658194378960928768	8658194516375371776	http://das.sdss.org/imaging/5642/40/corr/
3	8658194378960928809	8658194585083510793	57	8658194378960928768	8658194585083510784	http://das.sdss.org/imaging/5658/40/corr/
4	8658194378960928809	8658194804163018771	57	8658194378960928768	8658194804163018752	http://das.sdss.org/imaging/5709/40/corr/
5	8658194378960928809	8658194954470752297	57	8658194378960928768	8658194954470752256	http://das.sdss.org/imaging/5744/40/corr/
6	8658194378960928809	8658195018907910161	57	8658194378960928768	8658195018907910144	http://das.sdss.org/imaging/5759/40/corr/
7	8658194378960928809	8658195044651040803	57	8658194378960928768	8658195044651040768	http://das.sdss.org/imaging/5765/40/corr/
8	8658194378960928809	8658195066151239724	57	8658194378960928768	8658195066151239680	http://das.sdss.org/imaging/5770/40/corr/
9	8658194378960928809	8658195113395748890	57	8658195113395748864	8658195113395748864	http://das.sdss.org/imaging/5781/40/corr/



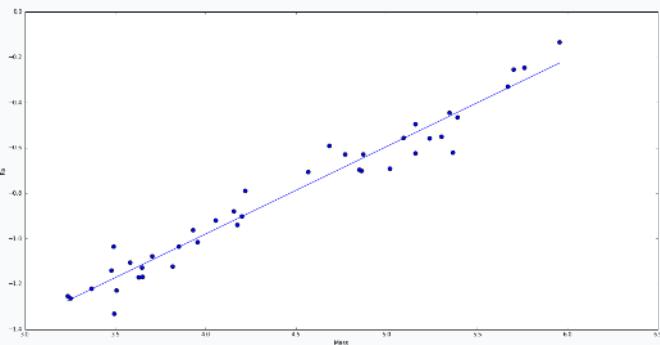
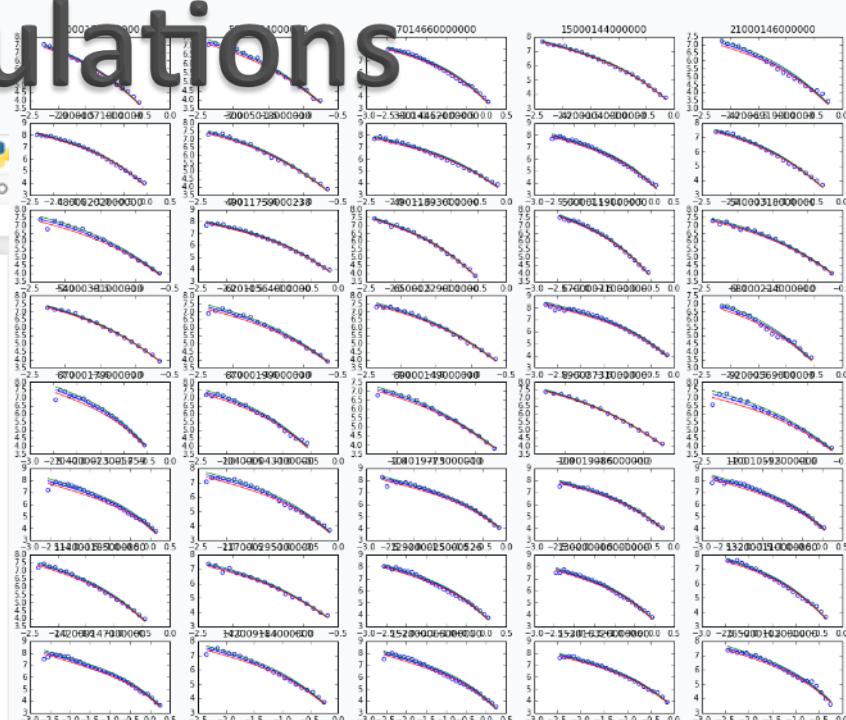
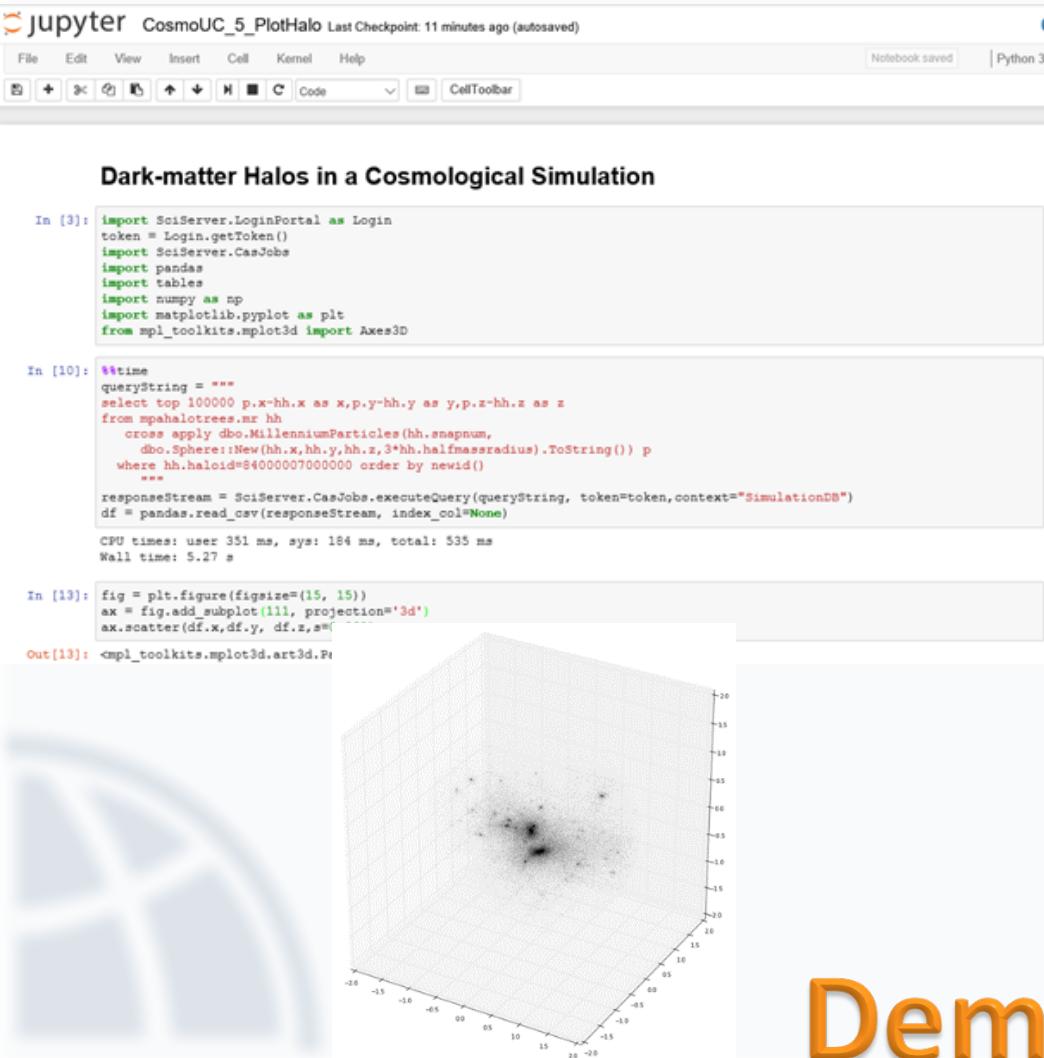
Demo

Fragmentation Simulations



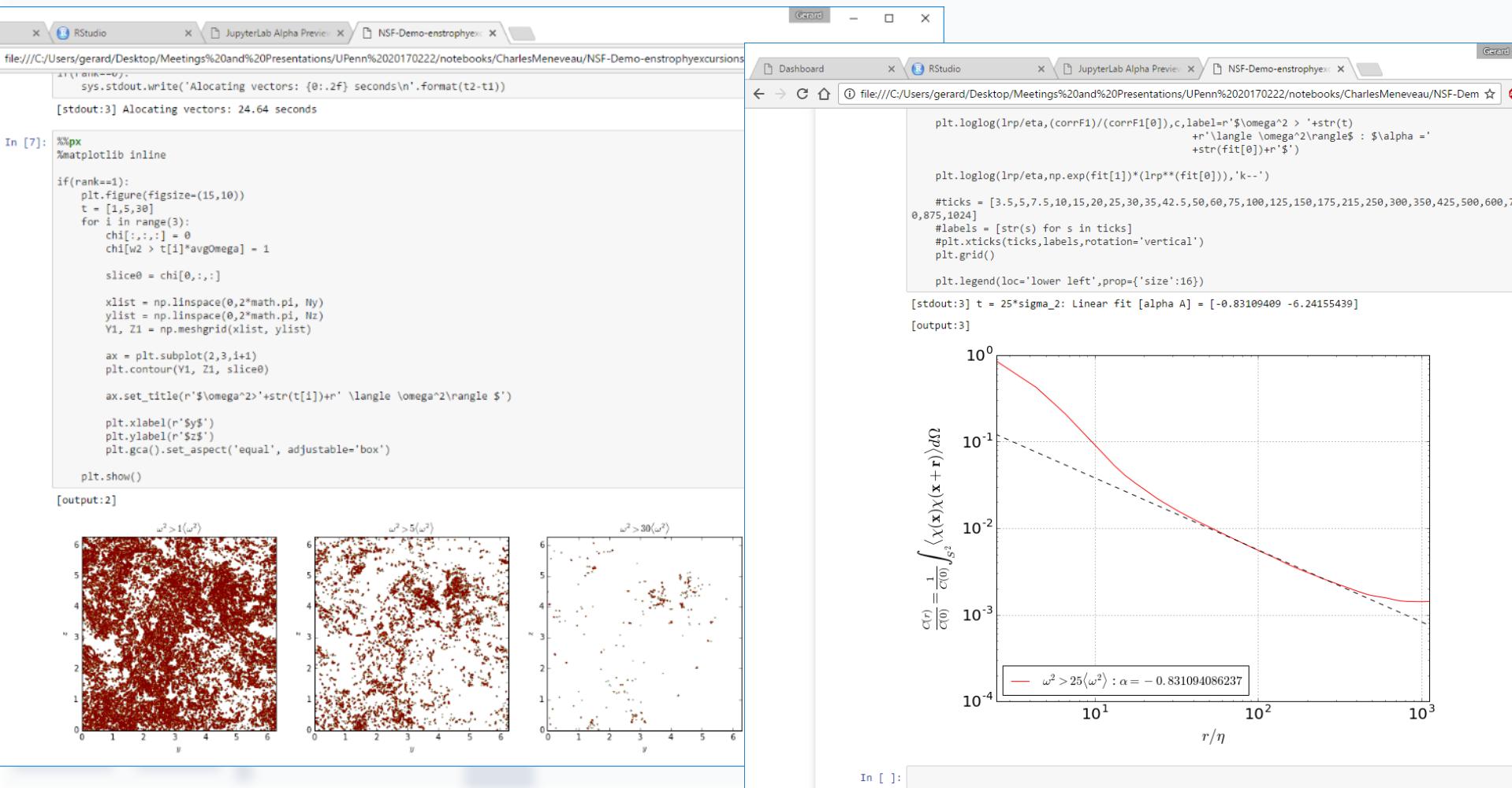
Demo

Cosmological simulations



Demo

Isotropic Turbulence



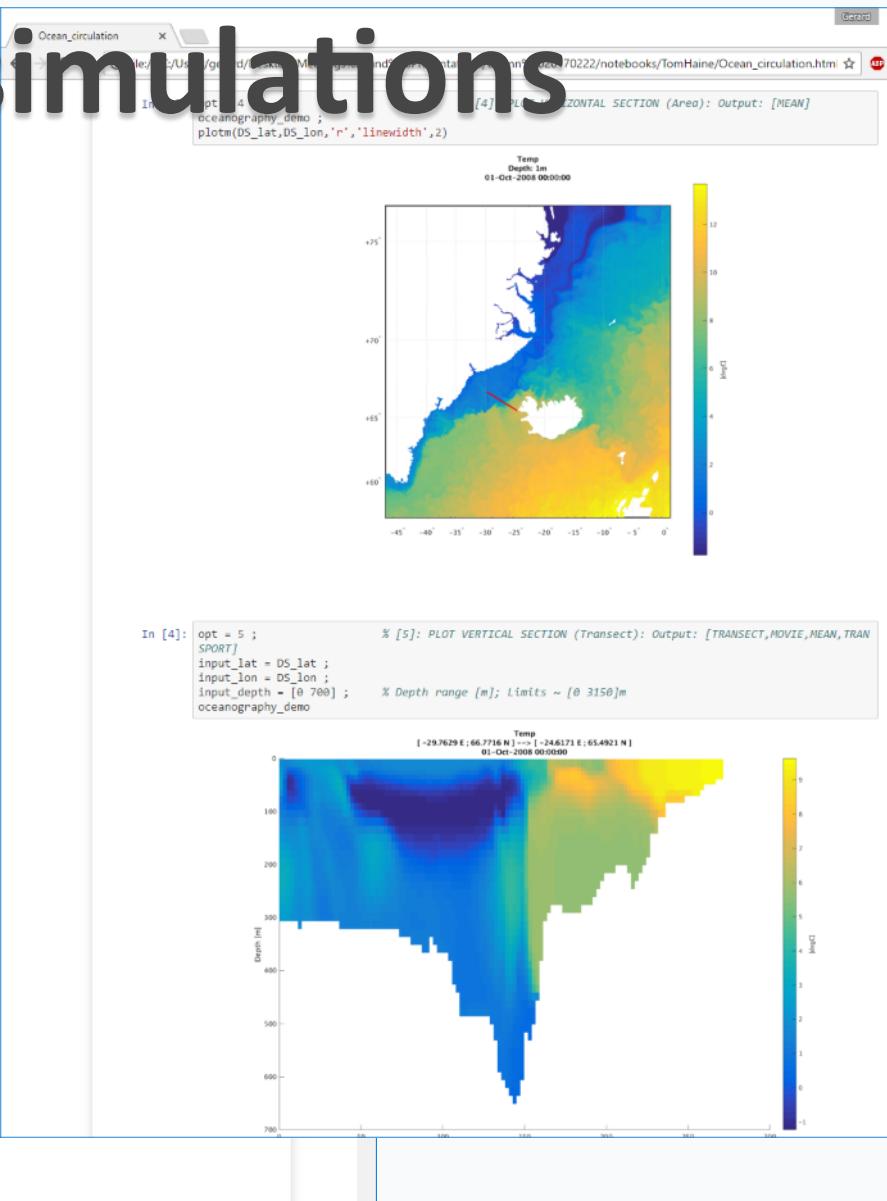
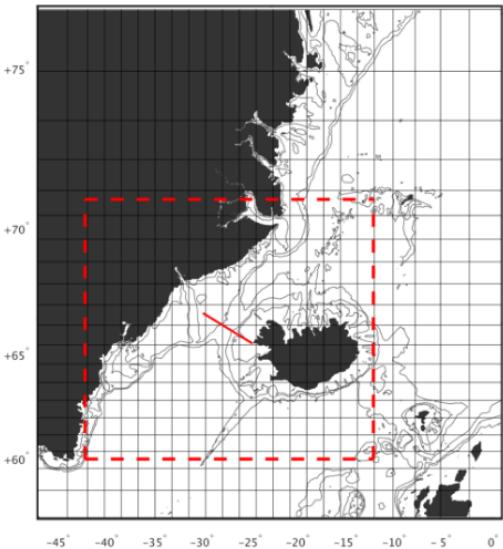
Oceanography simulations

```
In [1]: cd .. / run/
fieldvars = {'Temp'} ;
input_lat = [ 56.8 76.5 ] ;
input_lon = [ -47 1.4 ] ;
input_depth = 0 ;
input_time = {'01-Oct-2008 00:00:00' '01-Oct-2008 00:00:00'} ;
tstep = 0.25*4 ;
DS_lat = [ 65.4857 66.7672 ] ;
DS_lon = [ -24.5991 -29.7641 ] ;

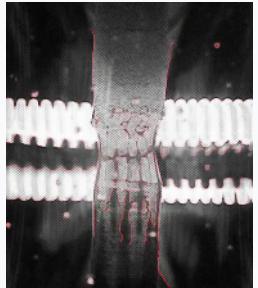
% variables_list.txt contains fu
% [lat1 lat2] Limits ~ [56.8 7
% [lon1 lon2] Limits ~ [-47 1.4]
% Depth range [m]; Limits ~ [0 3
% dd-mmm-yyyy HH:MM:SS (from Sep
% [days] minimum available is 0.
% Denmark Strait section Latitud
% Denmark Strait section Longitu
```



```
In [2]: opt = 1 ; % [1]: PLOT GRID and BATHYMETRY: Output: [GRID,BATHY]
oceanography_demo ;
plotm(DS_lat,DS_lon,'r','linewidth',2)
```

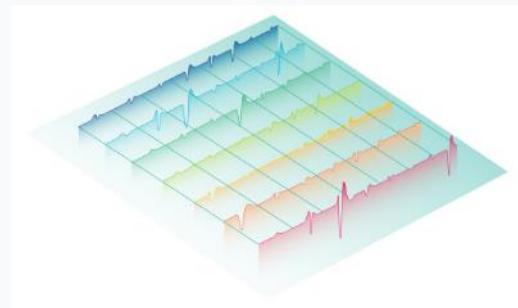


Other use cases

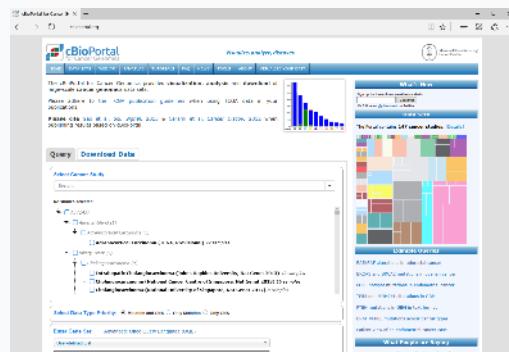
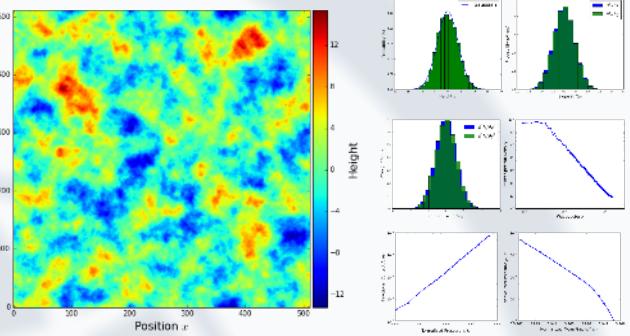


The screenshot shows the homepage of the Virgo data center. The header features the "VIRGO" logo. Below it, there's a main content area with sections like "About", "Institutions", "Resources", and "About the website". To the left, there's a sidebar with a navigation menu.

Virgo data center



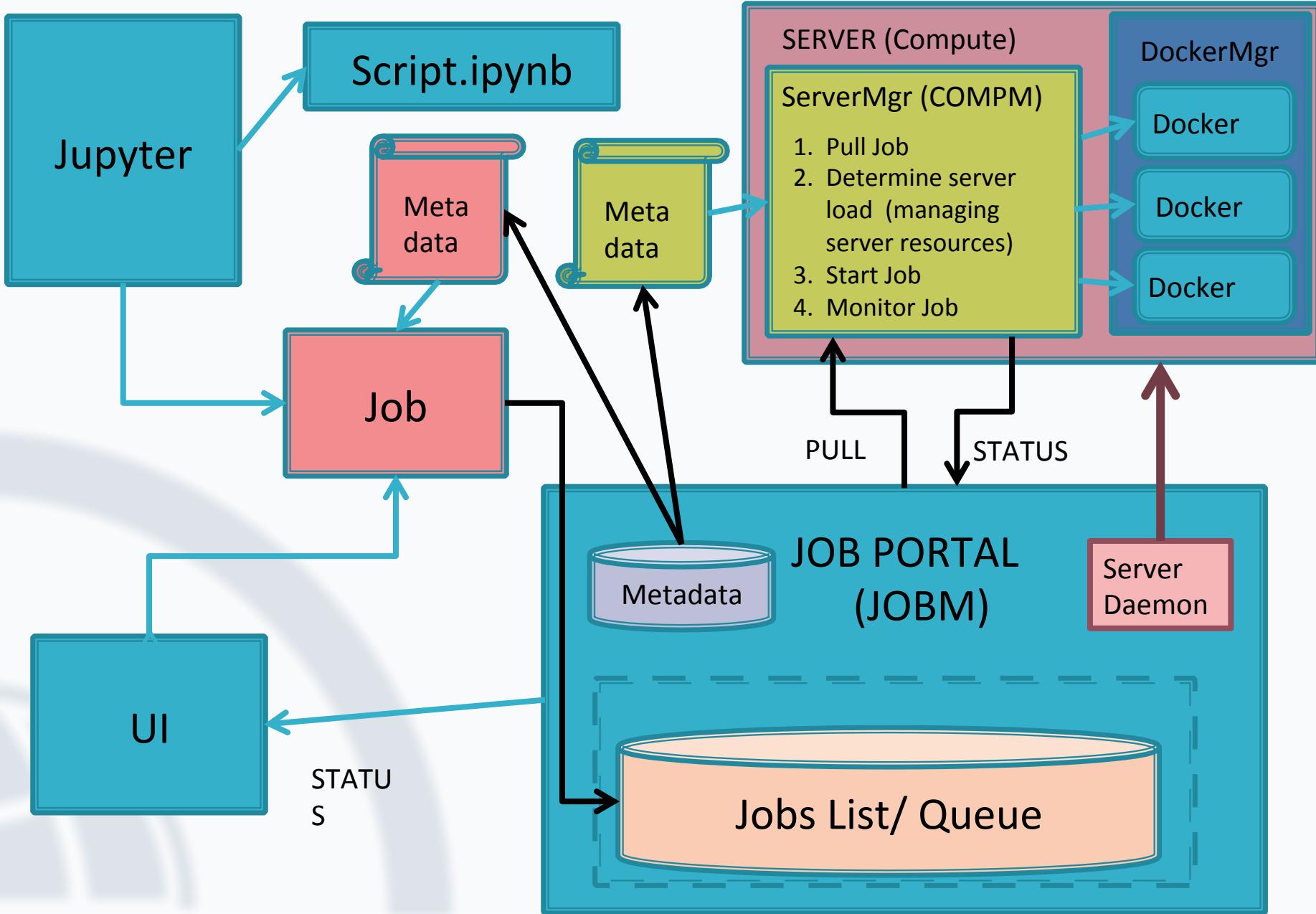
spike sorting



NIH  NATIONAL CANCER INSTITUTE
Consortium for Molecular and Cellular Characterization of Screen-Detected Lesions



Batch jobs



SciServer User Dashboard [+ ▾](#)

alpha01.sciserver.org/racm/dashboard

SciServer  **Dashboard**

Welcome gerard Sign out

Home Groups **Jobs** Files Queries Resources Profile Help

Jobs Management

Jobs List

Top # of jobs: 50

Start date:

End date:

Show open jobs only

10

Action	JobID	Submission	Started	Finished	Execution	Status
Cancel	115	2017-08-13 16:29:29 +0500	2017-08-13 16:29:32 +0500	2017-08-13 16:31:26 +0500	1m, 53.611s.	SUCCESS
Cancel	114	2017-08-13 16:24:08 +0500	2017-08-13 16:24:12 +0500	2017-08-13 16:26:45 +0500	2m, 32.165s.	SUCCESS
Cancel	99	2017-07-21 14:40:24 +0500	2017-07-21 14:48:37 +0500	2017-07-21 14:48:39 +0500	0.273s.	SUCCESS
Cancel	77	2017-07-11 16:37:42 +0500	2017-07-11 16:37:44 +0500	2017-07-11 16:37:49 +0500		CANCELED
Cancel	44	2017-07-11 14:12:20 +0500	2017-07-11 14:12:22 +0500	2017-07-11 14:12:23 +0500	0.268s.	SUCCESS
Cancel	14	2017-07-07 15:38:28 +0500	2017-07-07 15:38:31 +0500	2017-07-07 15:39:10 +0500	37.689s.	SUCCESS
Cancel	13	2017-07-07 15:36:26 +0500	2017-07-07 15:36:29 +0500	2017-07-07 15:36:30 +0500	0.271s.	SUCCESS
Cancel	12	2017-07-07 15:21:25 +0500	2017-07-07 15:21:29 +0500	2017-07-07 15:22:08 +0500	37.59s.	SUCCESS

Showing 1 to 8 of 8 entries 1 row selected

Previous Next

Job Details

Search:

Parameter	Value
JobID	115
Compute Domain	http://alpha01.sciserver.org/compute/api/domains/3/
File Volumes	Indra Simulations
Software environment	Python
Messages	
Results Folder	/home/idies/workspace/scratch/Jobs/20170813-172929_115/
Notebook Path	/home/idies/workspace/persistent/Projects/Indra/Test_Read.ipynb
Parameters	

```
/home/idies/workspace/scratch/Jobs/20170813-172929_115
```

Directories	Files	Size	Modified
.../20170813-172929_115/	Test_Read.ipynb	71.969 KB	Aug 13 17:31
	Test_Read original.ipynb	7.122 KB	Aug 13 17:29
	parameters.txt	1 B	Aug 13 17:29
	stderr.txt	282 B	Aug 13 17:31
	stdout.txt	0 B	Aug 13 17:29

SciServer User Dashboard | alpha01.sciserver.org/racm/dashboard

Run Jupyter Notebook

[Browse Notebooks](#)

/home/idiess/workspace/persistent/Projects/Indra/Test_Read.ipynb

[Expand All](#) [Collapse All](#)

- Cosmology
- Deep Learning
- eROSITA
- FileDB
- FinTechAI
- FITS
- FragData
- GlobusAuth
- Indra**
- LSST
- Millennium DB
- MRObs
- Oceanography

Files (.ipynb)	Size	Modified
CIC notebook.ipynb	8.128 KB	May 2 14:57
Read MR.ipynb	5.462 KB	Mar 31 11:16
ReadIndraSnapshots.ipynb	5.697 KB	May 2 9:16
ReadMillenniumSnapshots.ipynb	29.115 KB	May 2 14:00
Test_Read.ipynb	71.701 KB	Aug 13 10:56

Notebook Input Parameters:

```
param1 param2 param3
```

Job alias: [Run Notebook](#)

Run Shell Command

Shell command:

```
python /home/idiess/workspace/persistent/hello_world.py
```

Job alias: [Run Command](#)

sciserver-v1.8.3

Compute Domains

[Refresh](#)

Show 10 entries [Search](#)

Domain API Endpoint	Description
<input type="radio"/> http://alpha01.sciserver.org/compute/api/domains/2	Small Jobs Batch Domain
<input checked="" type="radio"/> http://alpha01.sciserver.org/compute/api/domains/3	Long Jobs Batch Domain

Showing 1 to 2 of 2 entries

Previous [1](#) Next

Software Environment

[Search](#)

Show 10 entries

Name	Description
<input type="radio"/> MATLAB	Image with MATLAB
<input type="radio"/> R	Image with R
<input checked="" type="radio"/> Python	Image with Python 2 and 3

Showing 1 to 3 of 3 entries

Previous [1](#) Next

Mounted File System Volumes

[Search](#)

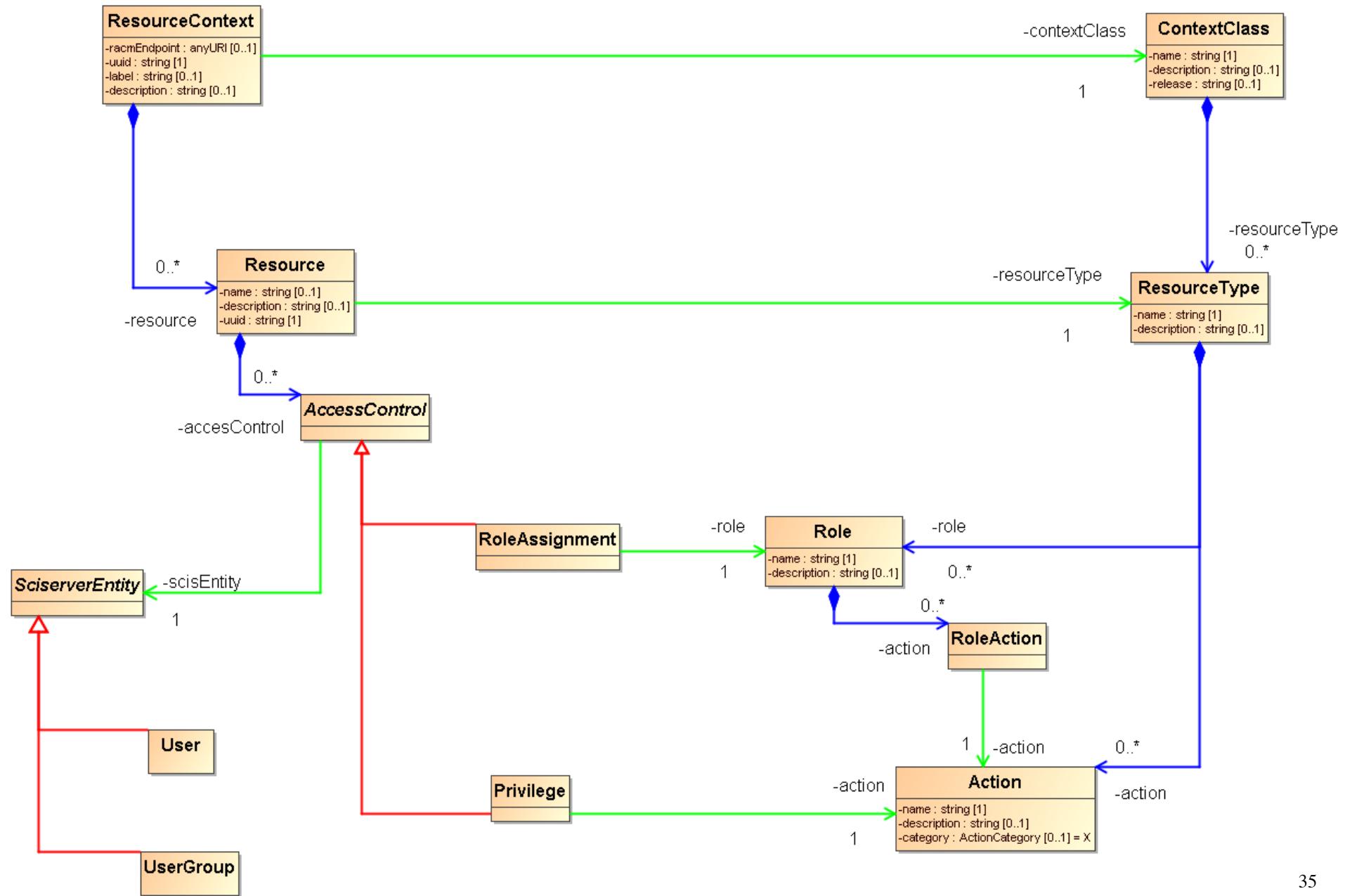
Show 10 entries

Name	Description
<input type="checkbox"/> Mede	Mede
<input type="checkbox"/> SDSS DAS	Volume container giving access to the SDSS DAS images and spectra
<input type="checkbox"/> Ocean Circulation	Ocean Circulation
<input type="checkbox"/> WFIRST - Archive SIT	WFIRST - Archive SIT
<input type="checkbox"/> FinTechAI	FinTechAI
<input checked="" type="checkbox"/> Indra Simulations	Indra Simulations
<input type="checkbox"/> paradigmgroup	paradigmgroup
<input type="checkbox"/> Virgo	Virgo
<input type="checkbox"/> Recount	Recount
<input type="checkbox"/> City	Baltimore City Project

Showing 1 to 10 of 10 entries

Previous [1](#) Next

RACM: Resource Access Control



Groups Management

My Groups

Show 10 entries

Search:

Group Name	Owner	Description
admin	_racm_	
COMPMAAdmin	_racm_	Group with right to register COMPMs
FinTechAI-Group	gerard	Group for participants in Jim Liew's FinTechAI project.
Gerards colleagues	gerard	... including his
Indra Simulations Group	gerard	Group with members of the Indra simulations collaboration. Members have access to volume containers with Indra simulation results.
Virgo Consortium	gerard	...
WFIRST - Archive SIT	gerard	Group with members of the WFIRST archive SIT. Will be given access to resources of that project such as volume containers.
Working-MEDE	ncarey	Working Group for MEDE Data Integration

Showing 1 to 8 of 8 entries 1 row selected

Previous 1 Next

[Create New Group](#)[Edit Selected Group](#)[Delete Selected Group](#)

Other Groups

Show 10 entries

Search:

Group Name	Owner	Description	Member Role	Member Status	Action ...
admin	_racm_		ADMIN	ACCEPTED	leave
city	budavari	City Project	MEMBER	ACCEPTED	leave
COMPMAAdmin	_racm_	Group with right to register COMPMs	ADMIN	ACCEPTED	leave
FinTechAI-Group	gerard	Group for participants in Jim Liew's FinTechAI project.	OWNER	OWNER	

SciServer User Dashboard [+ ▾](#)

alpha01.sciserver.org/racm/dashboard

Welcome gerard Sign out

SciServer Dashboard

Home Groups Jobs Queries Resources Profile Help

Group Name:

Description:

Available SciServer Users

Show 10 entries Search:

Username	email
apakras1	apakras1@jhu.edu
bac29	bcherin1@jhu.edu
bfalck	bridget.falck@astro.uio.no
budavari	budavari@jhu.edu
camyংchhetri	camy@jhu.edu
compmadmin	compmadmin@somewhere.org
davidelbert	elbert@jhu.edu
DavidW	zwang129@jhu.edu
dmedv	dmedv@jhu.edu
garboden	pgarbod1@jhu.edu

Showing 1 to 10 of 45 entries

Previous [1](#) [2](#) [3](#) [4](#) [5](#) Next

Group Members

Show 10 entries Search:

Username	email	Member Role	Member Status
bfalck	bridget.falck@astro.uio.no	ADMIN	ACCEPTED
gerard	glemonson1@jhu.edu	OWNER	OWNER
manu9	dwe@we.com	MEMBER	ACCEPTED

Showing 1 to 3 of 3 entries

Previous [1](#) Next

[Save](#) [Cancel](#)

	city	budavari	City Project	MEMBER	ACCEPTED	leave	
	COMPMAdmin	__racm__	Group with right to register COMPMs	ADMIN	ACCEPTED	leave	
	FinTechAI-Group	gerard	Group for participants in Jim Liew's FinTechAI project.	OWNER	OWNER		

SciServer User Dashboard | alpha01.sciserver.org/racm/dashboard

SciServer Dashboard

Home Groups Jobs Files Queries Resources Profile Help

Resource Management

Accessible Resources (Refresh)

Show **10** entries Search:

Context Class	RACM Context Link	Resource Type	Resource - Name	Resource - PubID	Action	
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	DockerImage	MATLAB	7	createContainer	
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	DockerImage	MATLAB	7	grant	<button>Grant</button>
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	DockerImage	Python	1	createContainer	
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	DockerImage	Python	1	grant	<button>Grant</button>
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	DockerImage	R	2	createContainer	
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	DockerImage	R	2	grant	<button>Grant</button>
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	VolumeContainer	City	42	grant	<button>Grant</button>
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	VolumeContainer	City	42	read	
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	VolumeContainer	City	42	write	
DockerComputeDomain	http://alpha01.sciserver.org/compute/api/domains/1/	VolumeContainer	FinTechAI	7	grant	<button>Grant</button>

Showing 1 to 10 of 112 entries

Previous **1** 2 3 4 5 ... 12 Next

Current status

- ▶ production version at <http://www.sciserver.org>
 - interactive notebooks only
 - all volumes public
- ▶ alpha version for close partners
 - groups management
 - resource access control for images and volumes
 - batch jobs, 2 queues
- ▶ alpha-2 version for 1 partner (SDSS/Manga)
 - database jobs (generalizing CasJobs to non-MS SQLServer RDBs)
- ▶ alpha-3 soon
 - improved file system access
 - volume sharing
- ▶ Sep/Oct update of production with these features
 - and updates to the dashboard UI!
- ▶ In the mean time: looking into use of HPC resources (MARCC) and GPU from notebooks/containers

Container Analysis Environ X +  nationaldataservice.atlassian.net/wiki/display/NDSC/Container+Analysis+Environments+-+Topics

Confluence Spaces People Log in Sign up

National Data Service Consortium

Pages Blog Gliffy Diagram

SPACE SHORTCUTS File lists Meeting notes (2)

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- Towards a National Data Service
- Technology Components
- Community
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 - Working Groups
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 - Container Analysis Environments
 - Container Analysis Environments
 - Container Analysis Environments
 - TAC Interoperability Task Force
 - Workshops & Venues
 - Development
 - Resources

Pages / ... / Container Analysis Environments Workshop

Container Analysis Environments - Topics

Created by Craig Willis, last modified on Aug 09, 2017

What would you like to get out of the workshop? What are the top 5 challenges that you current face supporting container-based environments?

Topic	
Container orchestration/scaling	✓
Processes for containerization of applications	
Managing images	✓
Continuous integration/testing strategies	
Shared storage across containers	✓
Security/permissions	✓
Licensing	
Interactive analysis environments	✓
Supporting X windows applications	
Batch job support	✓
Moving analysis to HPC environments	✓
Archiving and preservation of images	✓