

# The NVO Data Discovery Portal

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NASA/GSFC



# Portal Summary

- Astronomer access to VO:
  - Address science right away without worrying about downloads, data models, formats, protocols, ....
- Quick and convenient
- Comprehensive
- Lead users to other VO resources
  - Transition to CLI and GUI tools
- Distributed implementation among NVO organizations

All elements publicly available: Portal home page currently at <http://heasarc.gsfc.nasa.gov/vo/portal>



# Portal home

**Data Discovery with the NVO**

National Virtual Observatory

Hosted by:  
HEASARC  
NASA/GSFC

The NVO Data Discovery tools enable you to find and query datasets throughout the Virtual Observatory, to examine data of interactively through your web browser, and to retrieve catalogs and data for local analysis. You can begin your investigation at one of several starting points depending on what information you already have in hand: types of objects or phenomena (Registry), a specific list of objects or positions on the sky (Inventory, VIM), or a particular object or position (DataScope, Simple Query). Tabular data can be converted to VO-friendly formats with the Table Converter, and data discovery and retrieval services can be invoked and built into scripts with the VOClient command line interface.

**Search:**

- [Find data collections and catalogs by searching their descriptions \[Registry\]](#)
- [Query catalogs and collections by position \[Simple Query\]](#)
- [Count matches between catalog entries and given positions \[Inventory\]](#)
- [Integrate data from multiple positions and datasets \[VIM\]](#)
- [Collect all data at a given position \[DataScope\]](#)
- [Query the VO from the command line \[VOClient\]](#)

**Tools:**

- [View, sort and filter tables \[Table Viewer\]](#)
- [Convert tables to standard VO formats \[Table Converter\]](#)

For information on how to get started, try our [help page](#).

http://iraf-nvo.noao.edu/vo-cli/

# So why haven't we promoted it?

- Registry V1.0 transition
  - Adapting to protocols
  - Issues with new resources
- Reliability
  - Portal elements themselves
  - Services invoked
- Interoperability of elements
- Complexity
  - Balance between power and usability
  - User comprehension

Building something simple is hard.



# Registry transition

- Many more data resources registered with standardized interfaces (factor of 10 increase)
- Distinctions between resource and interface
- Known issues become more significant, new problems emerge.
- Complexity of new registry interface
  - New VOTable based format for conveying registry information.



# Reliability

- Portal services
  - Graceful failure modes.
  - Handling of large requests.
  - Formal testing
- External services
  - Finding actual failure modes
    - Often fail in ways not specified in standard
  - Failures due to overloading
  - Services down
    - Cannot always wait in a interactive environment
    - Service monitoring



# Interoperability of Portal Elements

- What information should be passed around?
  - List of positions
  - List of resources
  - *Provenance*
  - *Where to send results*
- Syntax
  - Mini-standard
- Propagate ideas to registry group.



# Complexity

- Hide complexity of VO
  - Jargon
  - Inconsistent terminology and interfaces
- Guide user expectations
  - Make intuitive what is possible
  - Make manifest what is unfeasible
- Address scaling of user requests
  - How many sources, how many resources?
- “Where can I go from here?”
- Documentation





# Future

New NVO  
home page  
concept

Welcome to the US National Virtual Observatory

http://www.us-vo.org/ Google

Apple Yahoo! Google Maps YouTube Wikipedia News (184) Popular

NVO  
NATIONAL VIRTUAL OBSERVATORY  
...the Universe at your fingertips

home  
what is the nvo?  
getting started  
the nvo book  
behind the scenes  
documents  
contact

The NVO enables new science through easy discovery, retrieval, and analysis of astronomical data.

Find data collections and catalogs by searching their descriptions  
[Registry](#)

Query catalogs and collections by position  
[Simple Query](#)

Count matches between catalog entries and given positions  
[Inventory](#)

Integrate data from multiple positions and datasets  
[VIM](#)

Collect all data at a given position  
[DataScope](#)

Query the VO from the command line  
[VOClient](#)

[Most VO services use a standard table format called VOTable. The VOTable format was established by the IVOA. This website provides methods for converting text tables to the VOTable format.](#)

Not sure how to start?  
Use the NVO Discovery Wizard!

- I know what kind of data I want
- I have the name of a table
- I have a list of objects.
- I want information on a single source or position
- I have multiple sets of targets
- None of the above, or I'm not sure

**What's New?** ★

- 2008 NVO Summer School Student Prizes
- NVO Newsletter Issue 2: June 2008
- NVO Book Available to Purchase
- NVO News Feed

**Community** 🌱

- Subscribe to the NVO Mailing List

**Help** ?

- Contact Us

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### Data Analysis and More...

Do more with NVO: [Browse and analyze spectra](#) · [Query Databases and Cross-Match Object Lists](#) · [Explore the Multiwavelength Sky in the Vicinity of Transient Events](#) · [Analyze or visualize your VOTable](#) · [Find, use, store, and edit sky footprints](#) · [Run secure, asynchronous services on the Grid](#) · [Make mosaics from images](#) · [Repair Image Coordinates](#) · [Perform Source Extraction and Object Identification by detecting objects in your own images and matching them with objects in the major survey catalogs](#)

Supported by the National Science Foundation  
Member of the International Virtual Observatory Alliance

Google<sup>®</sup> Custom search the NVO website

Privacy Policy | Public Data Access Policy | Acknowledging NVO



# FOLLOWING SLIDES FROM NVO SUMMER SCHOOL PORTAL TALK

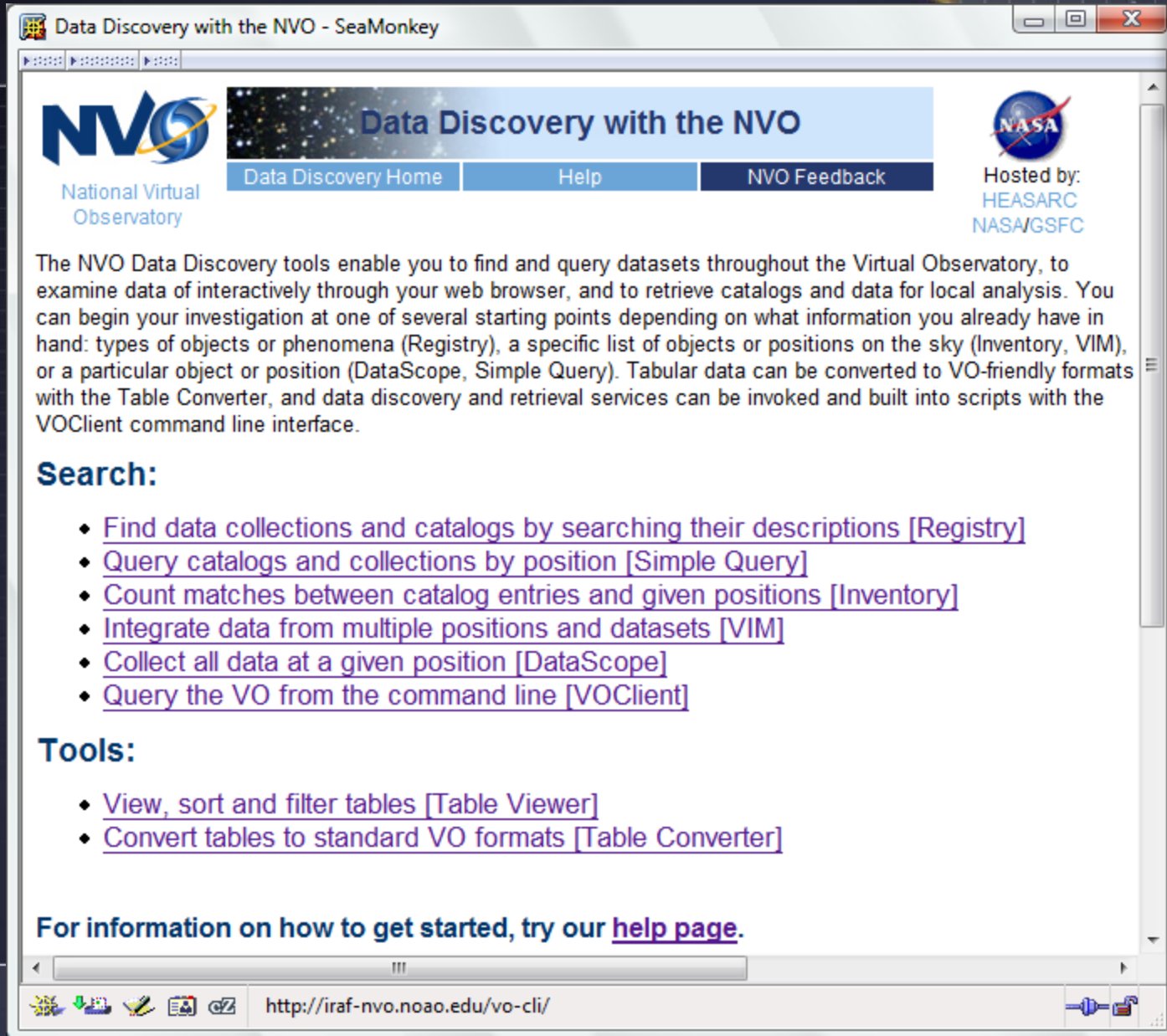


# Portal elements

- What kind of data is there? (registry)
- Poke around in a resource. (simple query)
- What resources are there at my positions? (inventory)
- Everything known about a given source (DataScope)
- How can I use my data in the VO ?(table converter and wizard)?
- How can I combine information from multiple resources? (Vim)
- But I don't want to have to use the web! (voclient)



# Portal Home



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**Search:**

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**Tools:**

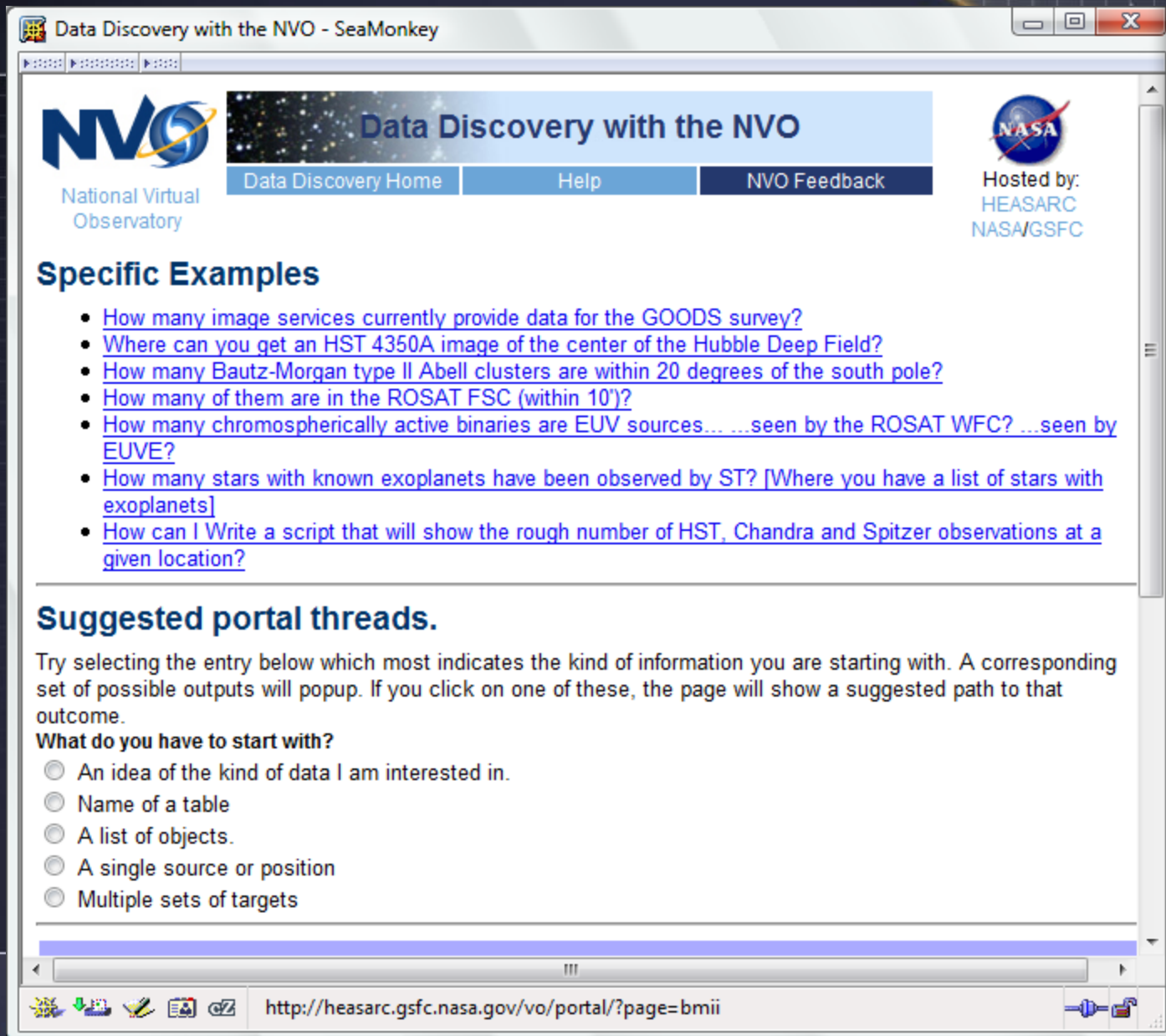
- ◆ [View, sort and filter tables \[Table Viewer\]](#)
- ◆ [Convert tables to standard VO formats \[Table Converter\]](#)

For information on how to get started, try our [help page](#).

http://iraf-nvo.noao.edu/vo-cli/



# Examples and Help



Data Discovery with the NVO - SeaMonkey

**NVO**  
National Virtual Observatory

**Data Discovery with the NVO**

Data Discovery Home Help NVO Feedback

Hosted by:  
HEASARC  
NASA/GSFC

## Specific Examples

- [How many image services currently provide data for the GOODS survey?](#)
- [Where can you get an HST 4350A image of the center of the Hubble Deep Field?](#)
- [How many Bautz-Morgan type II Abell clusters are within 20 degrees of the south pole?](#)
- [How many of them are in the ROSAT FSC \(within 10'\)?](#)
- [How many chromospherically active binaries are EUV sources... ..seen by the ROSAT WFC? ...seen by EUVE?](#)
- [How many stars with known exoplanets have been observed by ST? \[Where you have a list of stars with exoplanets\]](#)
- [How can I Write a script that will show the rough number of HST, Chandra and Spitzer observations at a given location?](#)

## Suggested portal threads.

Try selecting the entry below which most indicates the kind of information you are starting with. A corresponding set of possible outputs will popup. If you click on one of these, the page will show a suggested path to that outcome.

**What do you have to start with?**

- An idea of the kind of data I am interested in.
- Name of a table
- A list of objects.
- A single source or position
- Multiple sets of targets

http://heasarc.gsfc.nasa.gov/vo/portal/?page=bmii



# What kind of data is out there?

The screenshot shows a web browser window titled "VOTable Viewer - SeaMonkey". The page is the "NVO Registry" for the National Virtual Observatory. It features a search bar with the text "cataclysmic binaries" and buttons for "Search" and "Reset". Below the search bar, there are examples of search terms: "HEASARC, GALEX, redshift, Optical, far ultraviolet, M51". The page also includes a navigation menu with "Portal Home", "Search", "Publish", "Developers", "Help", and "Contact Us". A "Hosted By" section shows an image of a satellite and the text "Space Telescope Science Institute".

VOTable Viewer - SeaMonkey

**NVO** National Virtual Observatory

**NVO Registry**

Portal Home Search Publish Developers Help Contact Us

Hosted By  
Space Telescope Science Institute

**Find Astronomical Data Resources**

cataclysmic binaries

Advanced

Search Reset

Examples: HEASARC, GALEX, redshift, Optical, far ultraviolet, M51

# The active response page

Select

Search

Requery

Save

Sort

Page

Filter

The screenshot shows the VOTable Viewer interface in a browser window. The search query is 'cataclysmic binaries'. The results table has columns for 'select', 'browse / query', 'categories', 'shortName', 'title', 'description', and 'publisher'. The first row shows a result from CDS with the title 'IPHAS symbiotic stars candidates (Corradi+, 2008)'. The second row shows a result from CDS with the title 'Spectroscopy of 7 INTEGRAL X-ray sources (Chaty+, 2008)'. The third row shows a result from NASA/GSFC HEASARC with the title 'Byurakan/Hamburg/ROSAT Catalog of Optical IDs'. The fourth row shows a result from NASA/GSFC HEASARC with the title 'Chandra Galactic Central 150 Parsecs Source Catalog'.

select	browse / query	categories	shortName	title	description	publisher	
<input type="checkbox"/>	<a href="#">Full Record</a> <a href="#">More Info</a> <a href="#">Search Me</a>	Web Page HTTP Request Catalog	JIA+A/480/409	IPHAS symbiotic stars candidates (Corradi+, 2008)	As the present study was progressing, we started a campaign of spectroscopic follow-up of the H(alpha) emitters detected by IPHAS. Accordingly a dozen candidate symbiotic stars, selected as described in the ... <a href="#">(more)</a>	CDS	Infra
<input type="checkbox"/>	<a href="#">Full Record</a> <a href="#">More Info</a>	Web Page HTTP Request	JIA+A/484/783	Spectroscopy of 7 INTEGRAL X-ray sources (Chaty+, 2008)	We performed an intensive study of a sample of thirteen INTEGRAL sources, through multi-wavelength optical to NIR photometric and spectroscopic observations, using EMMI and SofI instruments at the ESO-NTT ... <a href="#">(more)</a>	CDS	Gan Opti
<input type="checkbox"/>	<a href="#">Full Record</a> <a href="#">More Info</a> <a href="#">Search Me</a>	Catalog	BH ROSAT Opt.	Byurakan/Hamburg/ROSAT Catalog of Optical IDs	This table contains the Byurakan/Hamburg/ROSAT Catalog (BHRC) of the optical identifications of X-ray sources. The BHRC includes all 2791 X-ray sources from the ROSAT Faint Source Catalog (ROSAT-FSC, CDS ... <a href="#">(more)</a>	NASA/GSFC HEASARC	X-ra
<input type="checkbox"/>	<a href="#">Full Record</a> <a href="#">More Info</a> <a href="#">Search Me</a>	Catalog	ChandraGC150	Chandra Galactic Central 150 Parsecs Source Catalog	The Chandra Catalog of X-Ray Sources in the Central 150 Parsecs of the Galaxy lists X-ray sources detected in a shallow Chandra survey of the inner 2 by 0.8 degrees of the	NASA/GSFC HEASARC	X-ra

# Registry Advanced Search

The screenshot shows a web browser window titled "NVO Registry Advanced Search - SeaMonkey". The page header features the NVO logo (National Virtual Observatory) on the left and the text "NVO Registry" in the center. Below the header is a navigation menu with links for "Portal Home", "Search", "Publish", "Developers", "Help", and "Contact Us". On the right side, it says "Hosted By" with an image of a satellite and the text "Space Telescope Science Institute".

The main content area is titled "Find Astronomical Data Resources" and includes the text "Available VO Resource Metadata tags are listed [here](#)." Below this is a search input field containing the query "title like '%galex%'". To the left of the input field is the label "Custom Predicate".

Below the search field is the text "--AND/OR--". Underneath is a "Capability Type" dropdown menu with a list of options: "Cone Search", "Simple Image Access (SIAP)", "Simple Spectral Access (SSAP)", and "Open Sky Node".

The browser's status bar at the bottom shows "Done" and various system icons.





# Poke around.

- Pick searchable service and click search button.
- Do all sky search if appropriate, or limited positional search.
- Filter results



# Send results to the table viewer (SimpleQuery)

Simple Query - SeaMonkey

 **NVO Portal Services: Simple Data Query**  Hosted by: HEASARC NASA/GSFC

[Portal Home](#) [New Query](#) [Registry](#) [Inventory](#) [DataScope](#) [VIM](#) [Scripting](#) [Help](#) [NVO Feedback](#)

## Query a single NVO resource

**Query a resource ...**

Position(s):



Radius:  degree

I/O Identifier:



# Another active results screen

VOTable Viewer (sq.sh) - SeaMonkey

 **Query Results: ChrAcBin** 

National Virtual Observatory Hosted by: HEASARC NASA/GSFC

Portal Home | Modify Query | New Query | Scripting | Help | NVO Feedback

Graph | Export to ...

Results 1-20 of 206 Show 20 results per page Previous 1 2 3 4 5 6 7 8 9 10 11 Next

Text boxes under columns select matching rows [Apply Filter](#) [Clear Filter](#)

unique_id	name	ra	dec	vmax	spect_type	orbital_period	Search_Offset
65	5 CET	0:08:11	-2:26:52	6.07	WF/K1III	96.439	191.545
57	33 PSC	0:05:20	-5:42:26	4.61	K0III	72.93	351.646
62	13 CET A	0:35:14	-3:35:34	5.2	{F7V}/G4V	2.08200	570.636
48	BD CET	0:22:46	-9:13:49	7.89	K1III	35.100	649.956
73	SZ PSC	23:13:23	2:40:32	7.2	F8IV/K1IV	3.965866	716.998
68	AZ PSC	22:58:52	0:18:57	7.3	K0III	47.121	917.016
64	AY CET	1:16:36	-2:30:01	5.47	WD/G5III	56.824	1158.437
77	UV PSC	1:16:55	6:48:42	8.99	G4-6V/K0-2V	0.861048	1221.437
71	BI CET	1:22:50	0:42:42	8.08	G5V/G5V:	0.515782	1243.277
78	AR PSC	1:22:56	7:25:09	7.24	K2V/?	14.300	1318.125
89	IM PEG	22:53:02	16:50:27	5.6	K2III-II	24.65	1414.399
106	ZETA AND	0:47:20	24:16:01	4.06	/K1III	17.7692	1610.478
115	EZ PEG	23:16:53	25:43:09	9.53	G5V-IV/K0IV:	11.6598	1664.612
39	FK AQR	22:38:42	-20:37:22	9.05	DM2E/DM3E	4.08322	1718.277
128	II PEG	23:55:04	28:38:00	7.2	K2-3V-IV	6.724183	1719.475
126	KT PEG	23:39:31	28:14:47	7.04	G5V/K6V	6.201986	1720.15
118	KU PEG	23:05:29	26:00:33	7.9	G8II	1411.	1748.477
63	FF AQR	22:00:35	-2:44:33	9.34	SDO-B/G8IV-III	9.207755	1798.048
120	BD+25 161	1:04:07	26:35:12	8.4	G2V	91.9:	1844.459
24	UV FOR	1:46:41	24:00:56	7.07	K0IV	15.05	2417.420

# Chromospherically Active Binaries with G stars brighter than $v=8$

VOTable Viewer (sq.sh) - SeaMonkey

Back Forward Reload Stop <http://heasarc.gsfc.nasa.gov/vo/squery//query.sh#Table|filterText%3D%27C5%3A%3C7%2C6%3A%27> Search Print

Home Bookmarks mozilla.org mozillaZine mozdev.org

**NVO** National Virtual Observatory

**Query Results: ChrAcBin**

Portal Home Modify Query New Query Scripting Help NVO Feedback

Hosted by: HEASARC NASA/GSFC

Graph Export to ...

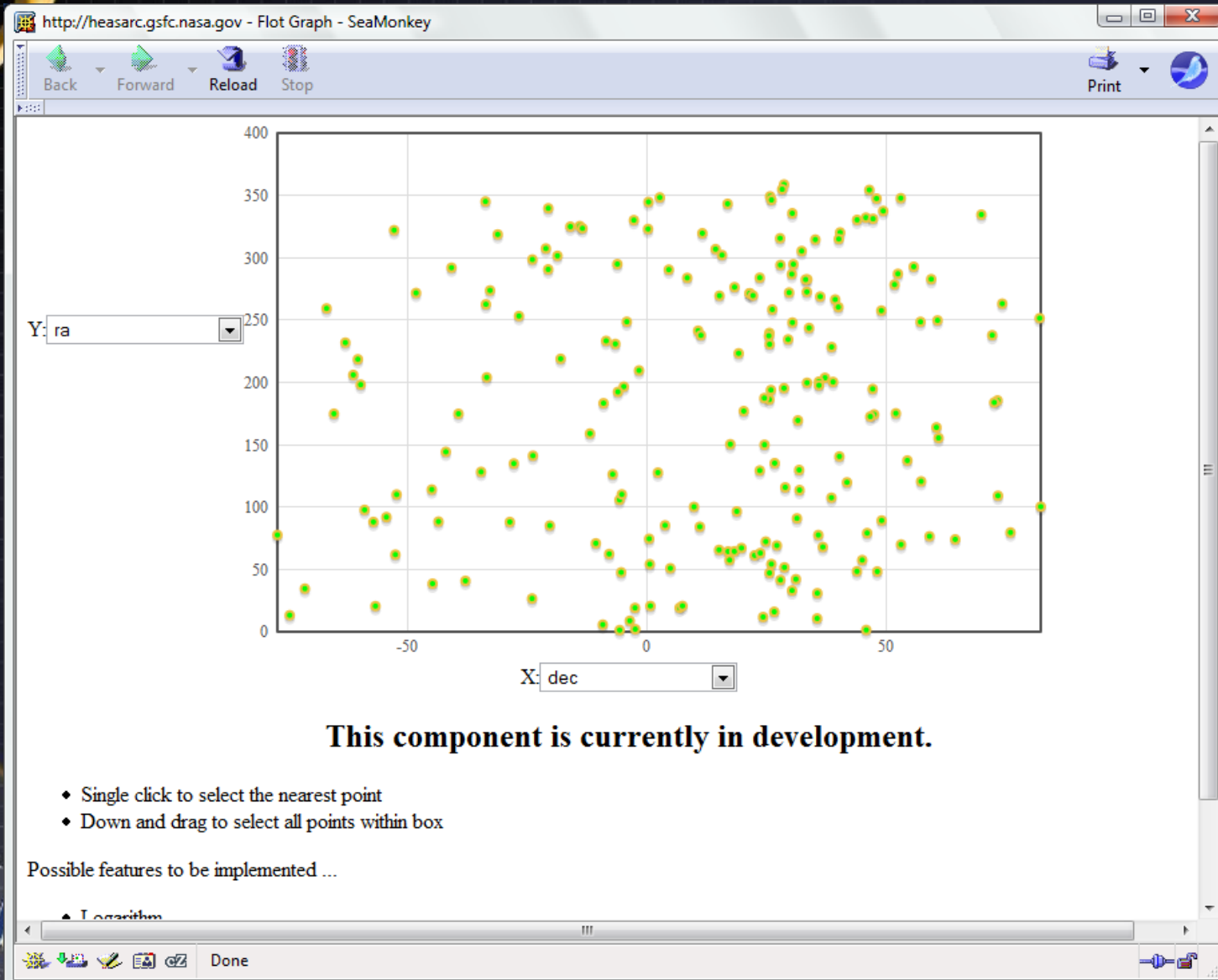
Results 1-14 of 14 (206 before filtering) Show 20 results per page

Text boxes under columns select matching rows [Apply Filter](#) [Clear Filter](#)

unique_id	name	ra	dec	vmax	spect_type	orbital_period	Search_Offset	«
				<7	G*			
44	42 CAP	21:41:32	-14:02:50	5.17	G2IV	13.1740	2221.413	
173	LAMBDA AN	23:37:33	46:27:29	3.7	G8IV-III	20.5212	2803.091	
76	HR 1023	3:23:38	4:52:55	6.38	G1III:	287.201	3064.87	
170	AR LAC	22:08:40	45:44:31	6.09	G2IV/K0IV	1.983222	3113.424	
70	V711 TAU	3:36:47	0:35:16	5.7	G5IV/K1IV	2.83774	3251.955	
129	UX ARI	3:26:35	28:42:55	6.38	G5V/K0IV	6.43791	3421.849	
51	EI ERI	4:09:40	-7:53:31	6.96	G5IV	1.947227	3762.162	
172	ALPHA AUR	5:16:41	45:59:53	0.08	G1III/K0III	104.0214	4950.097	
193	OMICRON D	18:51:12	59:23:17	4.64	G9III	138.420	5011.327	
181	HR 2054	5:57:04	49:01:46	6.47	G8III	83.19	5371.233	
4	V824 ARA	17:17:25	-66:56:56	6.63	G5IV/K0V-IV	1.681652	5648.817	
9	HR 4980	13:12:55	-59:49:00	6.16	G0V/G0V	4.23342	7111.436	
32	TY PYX	8:59:42	-27:48:56	6.84	G5IV/G5IV	3.198584	7719.202	
140	XI UMA B	11:18:10	31:31:45	4.87	G5V	3.9805	8817.182	
unique_id	name	ra	dec	vmax	spect_type	orbital_period	Search_Offset	«

Done

# Plotting



# What's nearby?

- Go to inventory as result of search.



# Inventory

NVO Inventory Service - SeaMonkey



## NVO Inventory Service



[NVO Portal Home](#)

[For Developers](#)

[Help for Users](#)

[Contact Us](#)

*This service helps the user find VO data for a region of the sky or matching a list of sources. There are three basic steps: First the user defines a sky area or source list and is given a list of matching VO datasets; then they can choose a specific dataset for detailed comparison; and finally, they can download the matching data records or send them to outside services for further processing or analysis. The 'dataset list' parameter is optional and only for those who have already defined a list of catalogs of interest.*

### Enter Search Constraints

Location:

Source Table:    
Currently using anonymous upload table

Search Radius:

Dataset List:

New inputs

Correlation radius

Limit services to be checked

### Further Processing

Download table as

Send table to

Select a dataset, then:

Look at matches

User table contains 25 sources

[Located](#)

[Archive](#)

[Table](#)

[Matched](#)



# Inventory results

Select for examination

Size of catalog

Number of inputs matched

NVO Inventory Service - SeaMonkey

Further Processing

Download table as: ASCII Table [Go]

Send table to: TableViewer [Go]

Select a dataset, then: Find Matching Records


User table contains 25 sources

	Table	Located At	Archive Subset	Table Record Count	Matched Sources
<input type="radio"/>	The UCAC2 Bright Star Supplement <i>UCAC Bright Star Supplement</i>	VIZIER	<i>Astrometric</i>	430000	25
<input type="radio"/>	Positions and Proper Motions Catalog	HEASARC	STAR CATALOG	468861	25
<input type="radio"/>	2nd Cat. of Radial Velocities with Astrometric Data <i>The catalogue of radial velocities of galactic stars with high precision astrometric data, the 2nd version (CRVAD-2)</i>	VIZIER	<i>Spectroscopic</i>	54907	25
<input type="radio"/>	Master Optical Catalog	HEASARC	MASTER CATALOG	4363156	25
<input type="radio"/>	Catalogue of Stellar Spectral Classifications <i>The catalog of MK Spectral Types</i>	VIZIER	'External'	283486	25
<input type="radio"/>	Hipparcos Main Catalog	HEASARC	STAR CATALOG	118218	25
<input type="radio"/>	Hipparcos Input Catalog	HEASARC	STAR CATALOG	118209	25
<input type="radio"/>	Chromospherically active binaries <i>Hipparcos astrometric and radial velocity data</i>	VIZIER	<i>Journal/MNRAS</i>	237	25
<input type="radio"/>	Smithsonian Astrophysical Observatory Star Catalog	HEASARC	STAR CATALOG	258944	25
<input type="radio"/>	Bright Star Catalogue, 5th Revised Ed. <i>The main part of the Catalogue</i>	VIZIER	<i>Combined</i>	9110	25
<input type="radio"/>	Bright Star Catalog	HEASARC	STAR CATALOG	9110	25
<input type="radio"/>	Chromospherically Active Disks				




# View matches

NVO Inventory Service - SeaMonkey



## NVO Inventory Service



National Virtual Observatory      Infrared Science Archive

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### Further Processing

Download table as:

Send table to:

<ivo://CDS/VizieR//294/lucac2bss>

*The table below is "positional join" of the user's table with the selected catalog. The first set of columns come from the user table and after the blank column from the selected catalog. It is often the case that one record in the user table will match multiple entries in the selected catalog, in which case the data from the user table is replicated in multiple records here. These are both identified by having the same "matchid" and, in the display here, by having the same background color.*

matchid_u	unique_id_u	name_u	ra_u	dec_u	vmax_u	spect_type_u	orbital_period_u	Search_Offset_u	ra	dec	ID	RAdeg
0	57	33 PSC	1.33375	-5.7075	4.61	K0III	72.93	351.646	1.333920	-5.707618	50048861	1.33392
1	62	13 CET A	8.81167	-3.59278	5.2	{F7V}/G4V	2.08200	570.636	8.811936	-3.592839	50052611	8.81193
1	62	13 CET A	8.81167	-3.59278	5.2	{F7V}/G4V	2.08200	570.636	8.812015	-3.592849	50052612	8.81201
2	64	AY CET	19.15083	-2.50028	5.47	WD/G5III	56.824	1158.437	19.151200	-2.500368	50052677	19.15119
3	89	IM PEG	343.25958	16.84111	5.6	K2III-II	24.65	1414.399	343.259441	16.841194	50072798	343.25944
4	106	ZETA AND	11.83458	24.26722	4.06	/K1III	17.7692	1610.478	11.834689	24.267178	50073028	11.83468
5	44	42 CAP	325.38625	-14.0475	5.17	G2IV	13.1740	2221.413	325.386914	-14.047611	50048581	325.38691
6	134	6 TRI	33.09292	30.30306	4.94	F5/K0III	14.7339	2620.252	33.094019	30.303440	50079692	33.09401
6	134	6 TRI	33.09292	30.30306	4.94	F5/K0III	14.7339	2620.252	33.092834	30.303067	50079691	33.09283
7	173	I AMRDA AN	354.39125	46.45806	3.7	G8IV-III	20.5212	2803.091	354.391010	46.458152	50133584	354.39101

# Build up information on a list of sources: VIM

Actions

VIM: Visual Integration and Mining - SeaMonkey

NVO National Virtual Observatory

VIM: Visual Integration and Mining

\*Restart Vim NVO Portal Home Help Contact Us

Hosted By

Position list is from: **Chromospherically Active Binary Stars Catalog**

This page is <http://envoy5.caor.caltech.edu:8888/?benchID=80603772266877551397698189505212>

At Fri Aug 29 19:18:17 2008: Bench write enabled

- Fetch Data
- Catalogs
- Mine Data
- Table Columns
- Utility
- Help and Documentation

```
# where is the VIM
vim = "/envoy5/hc

# where is Java
javacmd = "/usr/k

# where are the v
workdir = "/envoy

# name of this wc
benchmark = "8060

# some lines of t
```

Bench has 25 sources: below is from 1 to 25

sources_ra	sources_dec	sources_VIM_SOURCE_ID
1.33375 00h 05m 20.10s	-5.70750 -05d 42m 27.0s	_33_PSC
8.81167 00h 35m 14.80s	-3.59278 -03d 35m 34.0s	_13_CET_A
19.15083 01h 16m 36.20s	-2.50028 -02d 30m 1.0s	AY_CET
343.25958 22h 53m 2.30s	16.84111 +16d 50m 28.0s	IM_PEG
11.83458 00h 47m 20.30s	24.26722 +24d 16m 2.0s	ZETA_AND
325.38625 21h 41m 32.70s	-14.04750 -14d 02m 51.0s	_42_CAP

Current table



# Cross-correlate with USNOB

VIM: Visual Integration and Mining - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://envoy5.cacr.caltech.edu:8888/

Most Visited Getting Started Latest Headlines

VOTable Viewer (sq.sh) x VOTable Viewer (sq.sh) x VOTable Viewer (sq.sh) x VIM: Visual Integration and Mining x

NVO National Virtual Observatory

VIM: Visual Integration and Mining

\*Restart Vim NVO Portal Home Help Contact Us

Hosted By

Position list is from: **Chromospherically Active Binary Stars Catalog**

This page is <http://envoy5.cacr.caltech.edu:8888/?benchID=76994849785717238918705597542196>

Fetch Data > Proximity search found 37 matches

Catalogs >

Mine Data >

Table Columns >

Utility >

Help and Documentation >

```
# where is the VIM
vim = "/envoy5/nc

# where is Java
javacmd = "/usr/k

# where are the v
workdir = "/envoy

# name of this wo
benchmark = "7699

# some lines of f
```

Bench has 23 sources: below is from 1 to 23

sources_ra	sources_dec	sources_VIM_SOURCE_ID	USNOB_Count
8.81167 00h 35m 14.80s	-3.59278 -03d 35m 34.0s	_13_CET_A	1
19.15083 01h 16m 36.20s	-2.50028 -02d 30m 1.0s	AY_CET	1
325.38625 21h 41m 32.70s	-14.04750 -14d 02m 51.0s	_42_CAP	1
354.39125 23h 37m 33.90s	46.45806 +46d 27m 29.0s	LAMBDA_AN	1
50.91250	4.88222	HR_1023	2

Done

Number of matches for each entry

# Compare tables

VIM: Visual Integration and Mining - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://envoy5.cacr.caltech.edu:8888/

Most Visited Getting Started Latest Headlines

VOTable Viewer (sq.sh) VOTable Viewer (sq.sh) VOTable Viewer (sq.sh) VIM: Visual Integration and Mining

Bench has 23 sources: below is from 1 to 23

sources_ra	sources_dec	sources_VIM_SOURCE_ID	USNOB_RA	USNOB_DEC
8.81167 00h 35m 14.80s	-3.59278 -03d 35m 34.0s	_13_CET_A	8.81201 00h 35m 14.88s	-3.59282 -03d 35m 34.1s
19.15083 01h 16m 36.20s	-2.50028 -02d 30m 1.0s	AY_CET	19.15120 01h 16m 36.29s	-2.50037 -02d 30m 1.3s
325.38625 21h 41m 32.70s	-14.04750 -14d 02m 51.0s	_42_CAP	325.38692 21h 41m 32.86s	-14.04761 -14d 02m 51.4s
354.39125 23h 37m 33.90s	46.45806 +46d 27m 29.0s	LAMBDA_AN	354.39101 23h 37m 33.84s	46.45815 +46d 27m 29.4s
50.91250 03h 23m 39.00s	4.88222 +04d 52m 56.0s	HR_1023	50.91244 03h 23m 38.99s 50.91246 03h 23m 38.99s	4.88238 +04d 52m 56.6s 4.88210 +04d 52m 55.6s
332.17000 22h 08m 40.80s	45.74222 +45d 44m 32.0s	AR_LAC	332.17007 22h 08m 40.82s	45.74226 +45d 44m 32.1s
54.19708 03h 36m 47.30s	0.58778 +00d 35m 16.0s	V711_TAU	54.19527 03h 36m 46.86s 54.19706 03h 36m 47.30s	0.58810 +00d 35m 17.1s 0.58776 +00d 35m 15.9s
51.64750 03h 26m 35.40s	28.71528 +28d 42m 55.0s	UX_ARI	51.64746 03h 26m 35.39s	28.71509 +28d 42m 54.3s
62.41958 04h 09m 40.70s	-7.89222 -07d 53m 32.0s	EI_ERI	62.42039 04h 09m 40.89s	-7.89285 -07d 53m 34.3s
57.51833 03h 50m 4.40s	44.96806 +44d 58m 5.0s	HR_1176	57.51841 03h 50m 4.42s	44.96786 +44d 58m 4.3s
79.17250 05h 16m 41.40s	45.99806 +45d 59m 53.0s	ALPHA_AUR	79.17206 05h 16m 41.30s	45.99903 +45d 59m 56.6s
282.80042 18h 51m 12.10s	59.38833 +59d 23m 18.0s	OMICRON_D	282.80041 18h 51m 12.10s	59.38835 +59d 23m 18.0s

Done

Some rows match more than one input entry.

# Larger scale requests

Status box

Position list is from: **Chromospherically Active Binary Stars Catalog**

This page is <http://envoy5.cacr.caltech.edu:8888/?benchID=76994849785717238918705597542196>

Fetch Data  
Catalogs  
Mine Data  
Table Columns  
Utility  
Help and Documentation

**Made 23 cutouts with 1 surveys**  
elapsed time 102 seconds

```
# where is the VIM
vim = "/envoy5/hc

# where is Java
javacmd = "/usr/b

# where are the v
workdir = "/envoy

# name of this wo
benchmark = "7699

# some lines of b
```

Bench has 23 sources: below is from 1 to 23

sources_ra	sources_dec	sources_VIM_SOURCE_ID	USNOB_Count
8.81167 00h 35m 14.80s	-3.59278 03d 35m 34.0s	_13_CET_A	1

Done



# Image gallery with VIM

VIM: Visual Integration and Mining - Mozilla Firefox







File Edit View History Bookmarks Tools Help

http://envoy5.cacr.caltech.edu:8888/

VOTable Viewer (sq.sh) x VOTable Viewer (sq.sh) x VOTable Viewer (sq.sh) x VIM: Visual Integration an... x

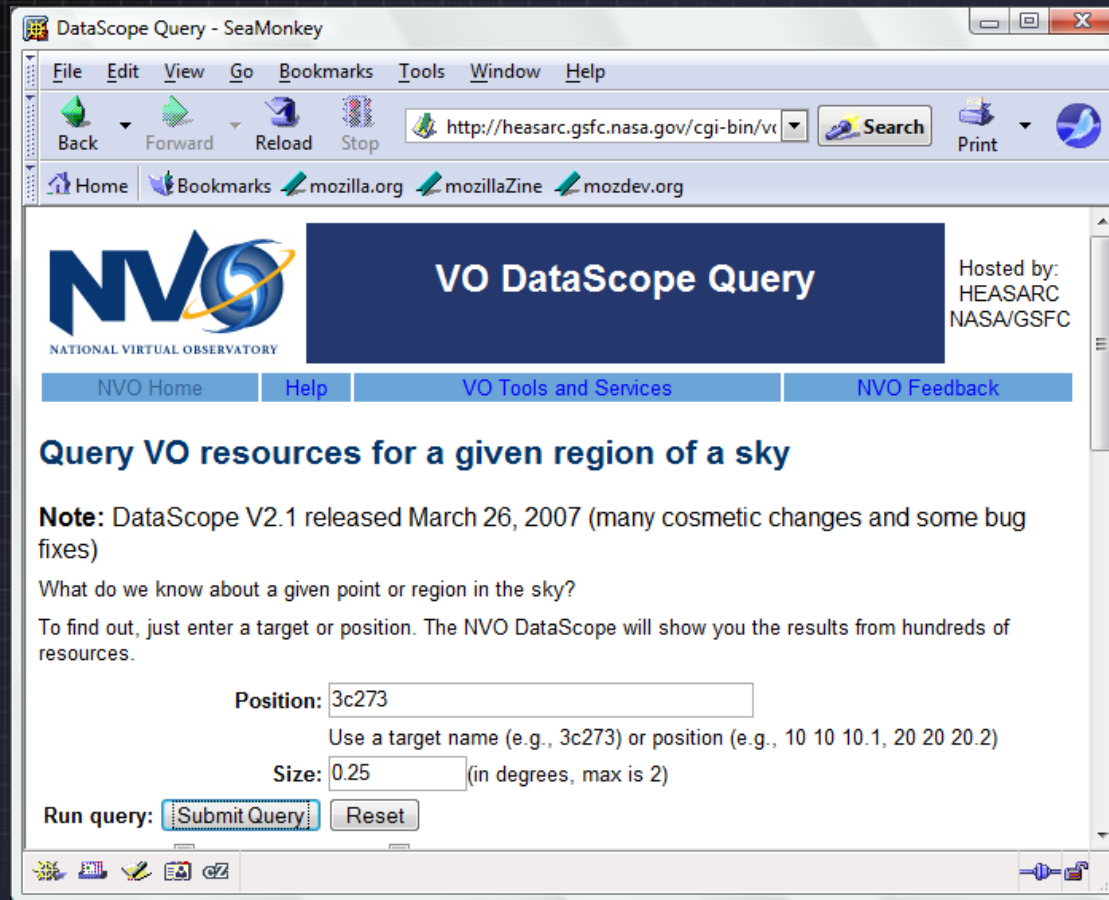
benchmark = "7695  
# some lines of t

**Bench has 23 sources: below is from 1 to 23**

sources_ra	sources_dec	sources_VIM_SOURCE_ID	USNOB_RA	USNOB_DEC	skyview_145_PSPC2int
8.81167 00h 35m 14.80s	-3.59278 -03d 35m 34.0s	_13_CET_A	8.81201 00h 35m 14.88s	-3.59282 -03d 35m 34.1s	
19.15083 01h 16m 36.20s	-2.50028 -02d 30m 1.0s	AY_CET	19.15120 01h 16m 36.29s	-2.50037 -02d 30m 1.3s	
325.38625 21h 41m 32.70s	-14.04750 -14d 02m 51.0s	_42_CAP	325.38692 21h 41m 32.86s	-14.04761 -14d 02m 51.4s	
354.39125 23h 37m 33.90s	46.45806 +46d 27m 29.0s	LAMBDA_AN	354.39101 23h 37m 33.8s	46.45815 +46d 27m 29.0s	
50.91250 03h 23m 39.00s	4.88222 +04d 52m 56.0s	HR_1023			
332.17000 22h 08m 40.80s	45.74222 +45d 44m 32.0s	AR_LAC			
54.19708 03h 36m 47.30s	0.58778 +00d 35m 16.0s	V711_TAU	54.19706 03h 36m 47.30s	0.58776 +00d 35m 15.9s	

Done

# What's known about a given source?



The screenshot shows a web browser window titled "DataScope Query - SeaMonkey". The address bar contains the URL "http://heasarc.gsfc.nasa.gov/cgi-bin/vr". The browser's menu bar includes "File", "Edit", "View", "Go", "Bookmarks", "Tools", "Window", and "Help". The toolbar features "Back", "Forward", "Reload", "Stop", "Search", and "Print" buttons. The bookmarks bar shows "Home", "Bookmarks", "mozilla.org", "mozillaZine", and "mozdev.org".

The main content area displays the "NVO" logo (National Virtual Observatory) and the title "VO DataScope Query". It is hosted by HEASARC, NASA/GSFC. Navigation links include "NVO Home", "Help", "VO Tools and Services", and "NVO Feedback".

The page content includes the heading "Query VO resources for a given region of a sky" and a note: "Note: DataScope V2.1 released March 26, 2007 (many cosmetic changes and some bug fixes)".

The text asks: "What do we know about a given point or region in the sky? To find out, just enter a target or position. The NVO DataScope will show you the results from hundreds of resources."

There are two input fields: "Position:" with the value "3c273" and "Size:" with the value "0.25". A note below the position field says "Use a target name (e.g., 3c273) or position (e.g., 10 10 10.1, 20 20 20.2)". A note below the size field says "(in degrees, max is 2)".

At the bottom, there are "Run query:" buttons for "Submit Query" and "Reset".

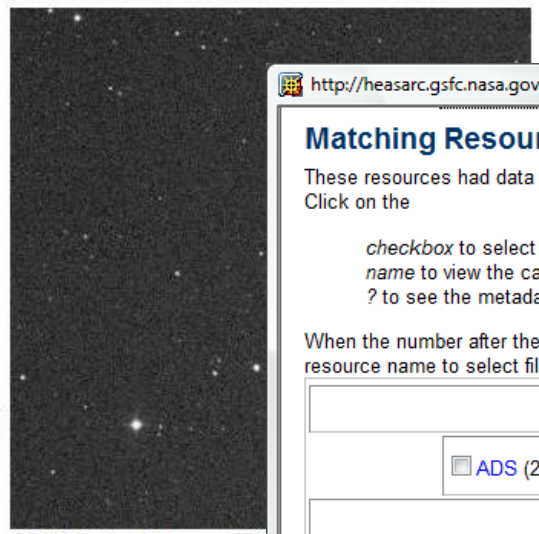


Data found(234) No data (339) Errors(19) Waiting(0) 100% complete  
Position:3c273 Resources/hits: 592/55481 Cache age:6.586 hours

Summary Resources Data Table No Data Still Processing Errors Help

### Summary of Request and Selections

Request parameters	
Target: 3c273	
12 29 06.70	02 03 08.6
187.277916	2.052388
Size:	0.25



DSS1 Optical Image of Region 3c273

No resources currently selected

#### Analysis Options

- Aladin Applet
- Aladin script
- Save as tar

Back Forward Reload Stop Print



Done

### Matching Resources

These resources had data in the specified region. Click on the

checkbox to select the data for download or name to view the catalog data and select file ? to see the metadata for the resource.

When the number after the name is given as nn/mm resource name to select files within such resources

ADS (200) ?     NED(image) ?

Multi	<input type="checkbox"/> ADIL (0/1) ?	<input type="checkbox"/> Aladin (0/28) ?	<input type="checkbox"/> CADC (0/218) ?	<input type="checkbox"/> CADC/HST (0/196) ?	<input type="checkbox"/> DSS ESO (0/8) ?
	<input type="checkbox"/> ESO SAF SIAP (38) ?	<input type="checkbox"/> HST/SIAP/PREVIEW (0/109) ?	<input type="checkbox"/> HST/SIAP/PREVIEW (0/109) ?	<input type="checkbox"/> MAST Scrapbook (0/41) ?	<input type="checkbox"/> MAST-Scrapbook (0/34) ?
Optical	<input type="checkbox"/> 3CR Snap SIAP (0/8) ?	<input type="checkbox"/> CADC/MACHO (0/5) ?	<input type="checkbox"/> DSS (0/1) ?	<input type="checkbox"/> DSS2 (0/3) ?	<input type="checkbox"/> HAlpha (0/1) ?
	<input type="checkbox"/> HST Previews (0/360) ?	<input type="checkbox"/> HST.APPP (0/10) ?	<input type="checkbox"/> NEAT (0/1) ?	<input type="checkbox"/> NOAO (0/4) ?	<input type="checkbox"/> SDSS (0/5) ?
	<input type="checkbox"/> SDSSDR2-Color (1) ?	<input type="checkbox"/> SDSSDR2-G (0/6) ?	<input type="checkbox"/> SDSSDR2-I (0/6) ?	<input type="checkbox"/> SDSSDR2-R (0/6) ?	<input type="checkbox"/> SDSSDR2-U (0/6) ?
	<input type="checkbox"/> SDSSDR2-Z (0/6) ?	<input type="checkbox"/> SDSSDR3-Color (1) ?	<input type="checkbox"/> SDSSDR3-G (0/6) ?	<input type="checkbox"/> SDSSDR3-I (0/6) ?	<input type="checkbox"/> SDSSDR3-R (0/6) ?
	<input type="checkbox"/> SDSSDR3-U (0/6) ?	<input type="checkbox"/> SDSSDR3-Z (0/6) ?	<input type="checkbox"/> SDSSDR4 (0/30) ?	<input type="checkbox"/> SDSSDR4-Color (1) ?	<input type="checkbox"/> SDSSDR5 (0/30) ?

Some DataScope windows



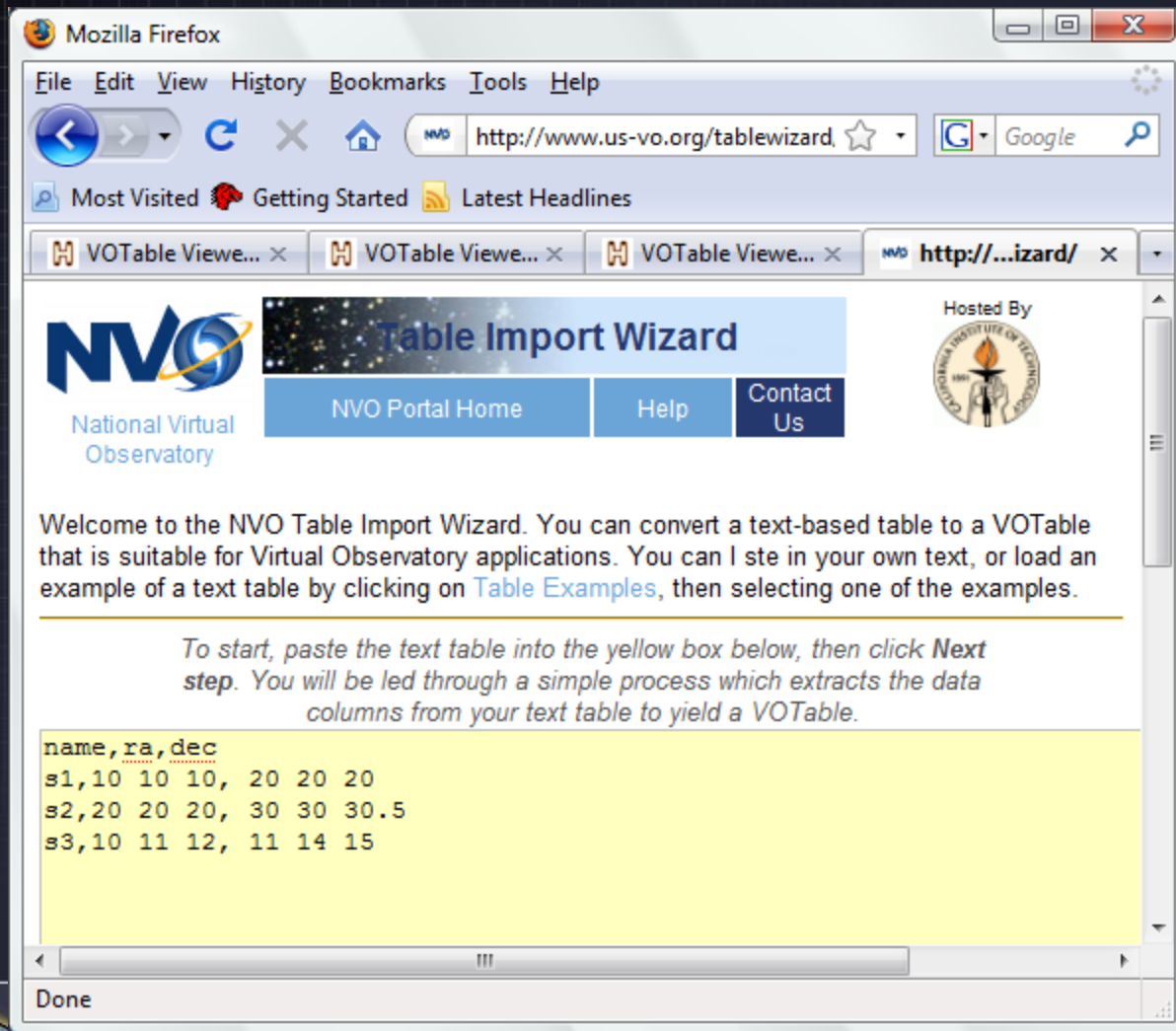


# Handling user input lists

- User created lists
- Lists downloaded from non-VO sources



# Table Wizard



Mozilla Firefox

File Edit View History Bookmarks Tools Help


http://www.us-vo.org/tablewizard

Most Visited Getting Started Latest Headlines

VOTable View... x VOTable View... x VOTable View... x http://...izard/ x

**NVO**  
National Virtual Observatory

**Table Import Wizard**

Hosted By  


NVO Portal Home Help Contact Us

Welcome to the NVO Table Import Wizard. You can convert a text-based table to a VOTable that is suitable for Virtual Observatory applications. You can list in your own text, or load an example of a text table by clicking on [Table Examples](#), then selecting one of the examples.

*To start, paste the text table into the yellow box below, then click **Next step**. You will be led through a simple process which extracts the data columns from your text table to yield a VOTable.*

```
name, ra, dec
s1, 10 10 10, 20 20 20
s2, 20 20 20, 30 30 30.5
s3, 10 11 12, 11 14 15
```

Done



Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.us-vo.org/tablew

Most Visited Getting Started Latest Headlines

VOTable Viewer (...) VOTable Viewer (...) VOTable Viewer (...) http://...izard/ x

- When finished, click on **Next step** below.

name	ra	dec
s1	10 10 10	20 20 20
s2	20 20 20	30 30 30.5
s3	10 11 12	11 14 15

**Important:** If your table is divided by a separator (eg comma-separated values), [Click here](#) to select that character.

Done

Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.us-vo.org/tablew

Most Visited Getting Started Latest Headlines

VOTable Viewer (...) VOTable Viewer (...) VOTable Viewer (...) http://...izard/ x

parts are present (eg 22 5/ 53.2 or -00:23:43)

- When finished, click on **Next step** below.

s1	10 10 10	20 20 20
s2	20 20 20	30 30 30.5
s3	10 11 12	11 14 15

[Next step](#)

**Important:** If your table is divided by a separator (eg comma-separated values), [Click here](#) to select that character.

Developed with the support of the [National Science Foundation](#) Member

Done



Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.us-vo.org/tab

VOTable Viewer... VOTable Viewer... VOTable Viewer... http://...zard/

```
<?xml version="1.0"?>
<VOTABLE version="1.1" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xsi:noNamespaceSchemaLocation="http://www.ivoa.net/xml/VOTable
/VOTable/v1.1">
  <RESOURCE name="imported table">
    <TABLE name="imported table">
      <DESCRIPTION>
        name,ra,dec
      </DESCRIPTION>
      <FIELD name="Object Name" datatype="char" arraysize="" ucd="meta.id"/>
      <FIELD name="Right Ascension" datatype="float" ucd="pos.eq.ra"/>
      <FIELD name="Declination" datatype="float" ucd="pos.eq.dec"/>
      <DATA>
        <TABLEDATA>
          <TR>
            <TD>s1</TD>
            <TD>152.54166666666666</TD>
            <TD>20.338888888888889</TD>
          </TR>
          <TR>
            <TD>s2</TD>
            <TD>305.08333333333333</TD>
            <TD>30.508472222222224</TD>
          </TR>
          <TR>
            <TD>s3</TD>
```

Done

The table wizard creates the VOTable for you, but currently you need to manually stripe it into a file or other service to use it.



# Table converter

The screenshot shows a Mozilla Firefox browser window titled "NVO Table Ingest Service - Mozilla Firefox". The address bar contains the URL `http://irsa.ipac.caltech.edu/applications/TblIngest/`. The page features the NVO logo (National Virtual Observatory) on the left and the IRSA logo (Infrared Science Archive) on the right. A navigation bar includes links for "NVO Portal Home", "For Developers", "Service Help", and "Contact Us". The main heading is "Upload Table / Source List". Below this, there is a text input field containing the file path `C:\Users\admin\Documents\test.inp` and a "Browse..." button. Underneath the input field are "Upload" and "Reset" buttons. A descriptive paragraph states: "This service converts the user's input into tables (VOTable XML and flat ASCII) that can be used by other VO services. When necessary, name resolution (NED and SIMBAD) and coordinate transformation are applied." The status bar at the bottom of the browser window shows "Done".

# Converter outputs



NVO Table Ingest Results - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://irsa.ipac.caltech.edu/cgi-bin/TblIngest/nph-tblIngest

Most Visited Getting Started Latest Headlines

VOTable View... x VOTable View... x VOTable View... x NVO Table Ing... x NVO Table In... x

 **NVO Table Ingest Service** 

National Virtual Observatory Infrared Science Archive

Service For Developers Service Help Contact Us

### test.inp

Download

[ASCII table](#)

[VOTable](#)

name	ra_u	dec_u	ra	dec
s1	10 10 10	20 20 20	152.5416667	+20.3388889
s2	20 20 20	30 30 30.5	305.0833333	+30.5084722
s3	10 11 12	11 14 15	152.8000000	+11.2375000

Send To

Table Viewer

Inventory Svc

Showing first 3 of 3 records

Done

# Wizard versus converter

- Wizard
  - is interactive
  - lets user see how conversion is done
  - requires data to be striped in and out.
- Converter
  - uses files
  - can send data to other services
  - will do name resolution of target names.
  - no interactive input, may get confused by complex files



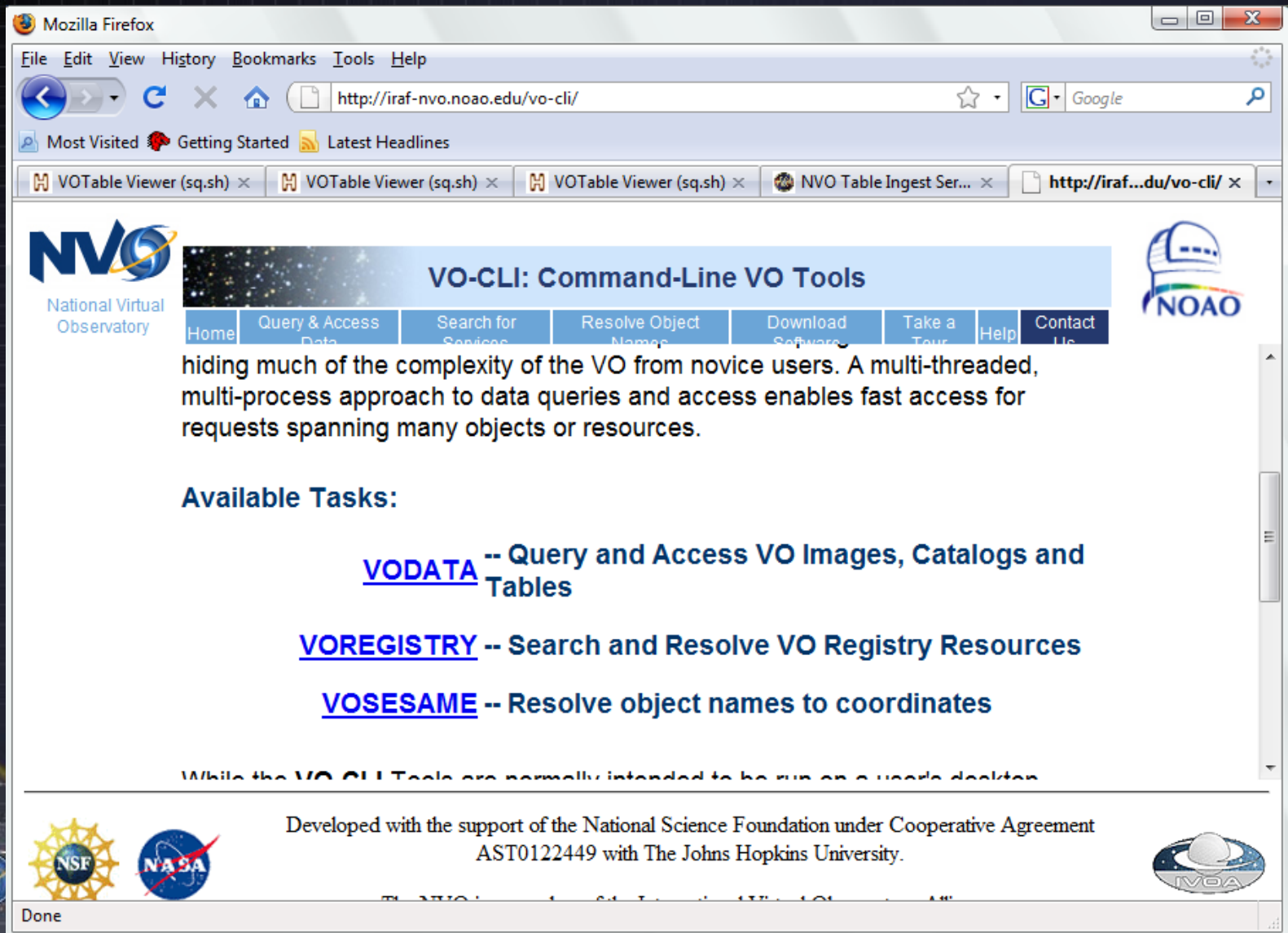
# Off the Web: VOClient

- Three main tasks:
  - VORegistry: query the registry for data resources
  - VOData: Query the data resources
  - VOSesame: Convert names to coordinates
- Can interchange lists of sources and data resources with portal Web pages.





# ... and it can be used from the Web too!



The screenshot shows a Mozilla Firefox browser window with the address bar displaying `http://iraf-nvo.noao.edu/vo-cli/`. The page content includes the NVO logo, a navigation menu with items like Home, Query & Access, Search for Services, Resolve Object Names, Download Software, Take a Tour, Help, and Contact Us, and a main text area describing the VO-CLI tools. At the bottom, there are logos for NSF, NASA, and IVOA, along with text about funding from the National Science Foundation and The Johns Hopkins University.

**NVO**  
National Virtual Observatory

## VO-CLI: Command-Line VO Tools

Home Query & Access Data Search for Services Resolve Object Names Download Software Take a Tour Help Contact Us

hiding much of the complexity of the VO from novice users. A multi-threaded, multi-process approach to data queries and access enables fast access for requests spanning many objects or resources.

**Available Tasks:**

- [VODATA](#) -- Query and Access VO Images, Catalogs and Tables
- [VOREGISTRY](#) -- Search and Resolve VO Registry Resources
- [VOESAME](#) -- Resolve object names to coordinates

While the VO-CLI Tools are normally intended to be run on a user's desktop,

Developed with the support of the National Science Foundation under Cooperative Agreement AST0122449 with The Johns Hopkins University.

NSF NASA IVOA

Done

# VORegistry Example

Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://iraf-nvo.noao.edu/vo-cli/voregistry/index.html

Most Visited Getting Started Latest Headlines

VOTable Viewer (sq.sh) x VOTable Viewer (sq.sh) x VOTable Viewer (sq.sh) x NVO Table Ingest Ser... x http://ira...index.html x

**NVO** National Virtual Observatory

**VORegistry: Search for VO Services**

Home Query & Access Data Search for VO Services Resolve Object Names Download Software Take a Tour Help Contact Us

**NOAO**

**Query:**

**Search Term:** HST Observations

Off  Verbose  V

**Options:**  OR terms  Exact resolution

**Mode:**  Resolve  Type:  A  B  C  D  E  F  G  H  I  J  K  L  M  N  O  P  Q  R  S  T  U  V  W  X  Y  Z

**Response:**

**Executing Cmd:** `voregistry -v HST Observations`

Type: CONE  
Title: Hubble Ultra Deep Field Catalog  
ShortName: UDF  
Subject: Survey Source  
Identifier: ivo://nasa.heasarc/hubbleudf  
ServiceURL: http://heasarc.gsfc.nasa.gov/cgi-bin/vo/cone/cone

-----

Type: Catalog  
Title: MIT/Amsterdam M31 Survey  
ShortName: M31 Stars/deep  
Subject: Star  
Identifier: ivo://nasa.heasarc/m31stars2  
ServiceURL:

Done

# VOData example

Query:

ShortName or Identifier: HST

Object Name or Position: ngc4258

Search size: 0.1

Verbosity:  Low  High

Output Format:  CSV  KML  ASCII  Raw  HTML  XML TSV

Constraints: Type: B

Executing Cmd: `vodata -v -V -rm 0.1 HST ngc4258`

```
# Service query 'HST' non-unique (2 found) ...
# Using CONE Resource HST -> ivo://archive.stsci.edu/hst
# Resolver: ngc4258 -> ngc4258 184.730000 47.310000
# Service: HST
# Title: Hubble Space Telescope
# No. of Objects: 1
# No. of Services: 1
# Search size: 0.001667 (degrees)
#
# Service          NRec   Typ Resource Title
# -----
HST                9      C  Hubble Space Telescope
#
# -----
#                9      (Records Found)
#                1      (Resources Queried)
#                0      (Failed Requests)
#                1      (Successful Requests)
#                (1 Results w/ Data)
#
# Approx Time: 00:00:05 (00:04 Resolution, 00:01 Query, 00:00 Acces
```

Result Directory Contents and Downloads: `voci32498`

# VOClient usage

- Use Web pages to see examples and try out usage.
- Use on the command line for repeated and operational use
  - Long commands
- VOClient can create lists for use in simple query, inventory or VIM.
- Download your own copy from: <http://iraf-nvo.noao.edu/vo-cli/downloads/index.html>



# After starting in the portal...

- TOPCAT or VOPLLOT: Display and manipulate tables of results
- Aladin: Compare images and tables
- Use specialized features of discovered resources
- Data mining in VIM, OpenSkyQuery, WESIX or other tools
- Publish results
- ...

