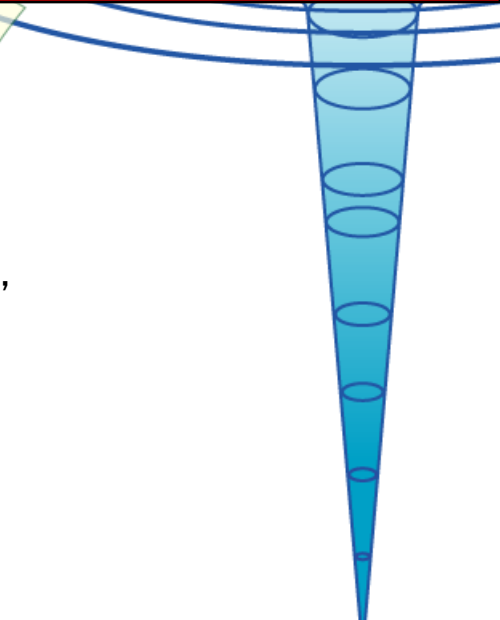


Recent Progress of Japanese Virtual Observatory

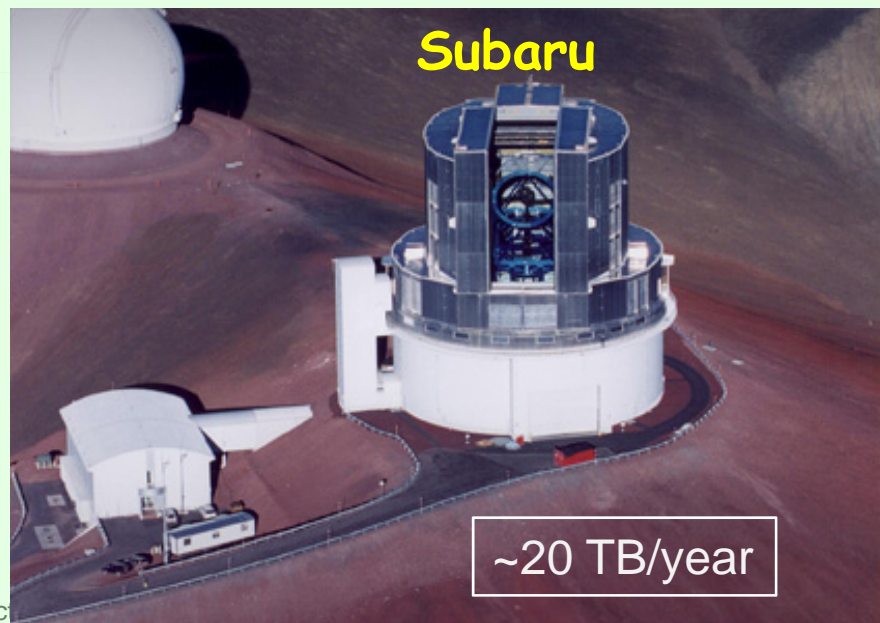
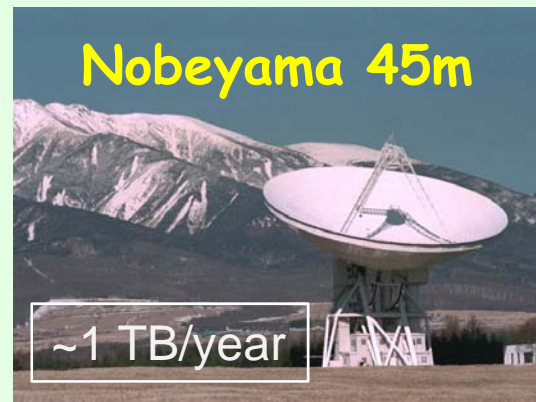
Masatoshi Ohishi / NAOJ, Sokendai & NII
大石雅寿 / 国立天文台, 総合研究大学院大学,
国立情報学研究所

masatoshi.ohishi@nao.ac.jp



Data Resources in NAOJ

- **Subaru** 8.2m Optical-Infrared Telescope
- **Kiso** 105cm Schmidt Camera
- **Okayama** 188cm Optical Telescope
- **Nobeyama 45m** Radio Telescope
- **Nobeyama Millimeter Array**
- **Nobeyama Radioheliograph**
- **VSOP**
- **VERA**
- **ALMA**



JVO Official Operations



- March 2008 ~
- Web-based interfaces
 - Menu: easy to find
 - Simple query, Image viewer, SED plotter, HDS spectrum viewer
 - Links to external resources: ADS, VizieR
 - Quick multiple catalog query (**x 150**)
 - Subaru SuprimeCAM on-demand calibration and mosaicing

[About Acknowledgement](#)

[News](#)

Version 0.2 is open since
2007-07-01

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[\[Logout\]](#)

Service Contents

Data Search

- ◆ Quick Search
- ◆ Search on a single VO Service
- ◆ Parallel search on multiple VO Services
- ◆ Xmatch Search
- ◆ JVOQL Search

Subaru

- ◆ Suprime-Cam

JVO Space

- ◆ Home

Service Search

- ◆ Keyword Search
- ◆ Category Search
- ◆ Advanced Search

Astronomical Tools

- ◆ Source Extractor
- ◆ HyperZ

Workflow

- ◆ Workflow Editor (Script)
- ◆ Workflow Editor
- ◆ Workflow Monitor

Admin

- ◆ Admin

<http://jvo.nao.ac.jp/portal/>

Simple Interface to Multiple Catalog Query

JVO JAPANESE VIRTUAL OBSERVATORY ver.20070904 Masatoshi Ohishi
ohishi:jvo

[Top](#) | [Search](#) | [VO Services](#) | [Subaru](#) | [Analysis](#) | [Workflow](#) | [JVO Space](#)

[\[Logout\]](#)

=> Location: [Top Page](#) > [Search](#) > [Quick Search](#)

Quick Search

Name or Coordinate	Samples: 34.5 -5.0	<input type="text"/>
Coordinate Frame		J2000 (FK5)
Search Region Radius	<input type="text"/>	deg
Wavelength Band	<input type="checkbox"/> All <input type="checkbox"/> Radio <input type="checkbox"/> IR <input type="checkbox"/> Optocal <input type="checkbox"/> X-ray <input type="checkbox"/> Gamma-ray <input type="checkbox"/> U <input type="checkbox"/> B <input type="checkbox"/> V <input type="checkbox"/> Rc <input type="checkbox"/> Ic <input type="checkbox"/> u' <input type="checkbox"/> g' <input type="checkbox"/> r' <input type="checkbox"/> i' <input type="checkbox"/> z' <input type="checkbox"/> J <input type="checkbox"/> H <input type="checkbox"/> Ks	
Brightness Range	brighter than: <input type="text"/>	Mag_AB fainter than: <input type="text"/>
Object type specific criteria	ALL AGN GRB	
<input type="button" value="Submit"/> <input type="button" value="Clear"/> <input type="button" value="Check SQL"/>		

Pop-up Menu for various functions

JVO VOTable Viewer - Mozilla Firefox

ファイル(F) 編集(E) 表示(V) 履歴(S) ブックマーク(B) ツール(T) ヘルプ(H)

http://jvo.nao.ac.jp/dev/portal/viewer.do

JVO JAPANESE VIRTUAL OBSERVATORY ver.20070915 Tanaka Masahiro (tanaka:admin) [Logout]

Top | Search | VO Services | Subaru | Analysis | Workflow | JVO Space

=> Location: Top Page > Astro Tools > Sextractor

Save Filter Metadata Graphic Search Appearance Sky Map & SED Color-Color Plot

Total 11136 records page: 1 2 3 4 5 6 7 8 9 10 << < > >>

Alias Name	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13		
group ID	check	download	ID	NAME	RA	DEC	POS_ERR	LINK_REF	CAT_ID	BAND_NAME	BAND_CENTER	BAND_UNIT	FLUX	FLUX_ERR	FLUX_UNIT	FLUX_SRCH
0	<input type="checkbox"/>		187		10.386402	41.354465	5e-05	Link	twomass	J	1.26	um	16.646	0.153	mag	0.000357921
1	<input type="checkbox"/>		188		10.386402	41.354465	5e-05	Link	twomass	H	1.6	umg	16.217		mag	0.000342286
2	<input type="checkbox"/>		189		10.386402	41.354465	5e-05	Link	twomass	Ks	2.15	umg	15.404		mag	0.000459754
3	<input checked="" type="checkbox"/>		190		10.390114	41.358994	1.94444e-05	Link	twomass	J	1.26	um	15.689	0.076	mag	0.000864147
4	<input type="checkbox"/>		191		10.390114	41.358994	1.94444e-05	Link	twomass	H	1.6	umg	14.864	0.091	mag	0.00119012
5	<input type="checkbox"/>		192		10.390114	41.358994	1.94444e-05	Link	twomass	Ks	2.15	umg	14.452	0.072	mag	0.00110491
6	<input type="checkbox"/>		193		10.390861	41.331158	5.83333e-05	Link	twomass	J	1.26	um	16.515	0.143	mag	0.00040382
7	<input type="checkbox"/>		194		10.390861	41.331158	5.83333e-05	Link	twomass	H	1.6	umg	15.856	0.155	mag	0.000477298
8	<input type="checkbox"/>		195		10.390861	41.331158	5.83333e-05	Link	twomass	Ks	2.15	umg	15.303	0.151	mag	0.000504575
9	<input type="checkbox"/>		196		10.39146	41.355534	7.5e-05	Link	twomass	J	1.26	um	16.742	0.167	mag	0.000327633
group ID	check	download	ID	NAME	RA	DEC	POS_ERR	LINK_REF	CAT_ID	BAND_NAME	BAND_CENTER	BAND_UNIT	FLUX	FLUX_ERR	FLUX_UNIT	FLUX_SRCH
10	<input type="checkbox"/>		197		10.39146	41.355534	7.5e-05	Link	twomass	H	1.6	umg	15.604	0.153	mag	0.00060199
11	<input type="checkbox"/>		198		10.39146	41.355534	7.5e-05	Link	twomass	Ks	2.15	umg	15.648	0.203	mag	0.00036722
12	<input type="checkbox"/>		199		10.394434	41.388809	5.55556e-05	Link	twomass	J	1.26	um	16.693	0.155	mag	0.000342758
13	<input type="checkbox"/>		200		10.394434	41.388809	5.55556e-05	Link	twomass	H	1.6	umg	17.266		mag	0.000130253

完了

Quick Image viewer, SED plotter, etc

JVO VOTable Viewer - Mozilla Firefox

ファイル(F) 編集(E) 表示(V) 履歴(S) ブックマーク(B) ツール(T) ヘルプ(H)

http://jvo.nao.ac.jp/dev/portal/viewer.do

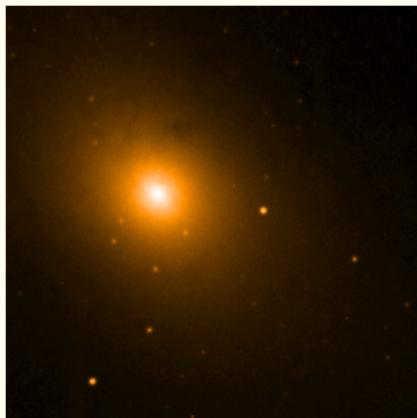
JVO VOTable Viewer JVO Plot

JVO Top | Search | VO Services | Subaru | Analysis | Workflow | JVO Space [Logout]
JAPANESE VIRTUAL OBSERVATORY ver.20070915 Tanaka Masahiro (tanaka.admin)

=> Location: Top Page > Astro Tools > Sextractor

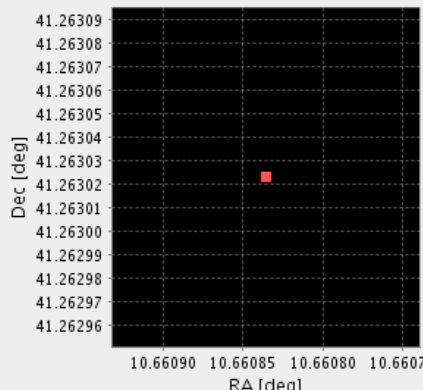
Save Filter Metadata Graphic Search Appearance Sky Map & SED Color-Color Plot

Group ID: - + Update
group id = 0



00h42m38.600640 +41d15m46.88280
size = 8.0 arcmin
image from archive.eso.org


Position Map



Dec [deg]
41.26309
41.26308
41.26307
41.26306
41.26305
41.26304
41.26303
41.26302
41.26301
41.26300
41.26299
41.26298
41.26297
41.26296

RA [deg]
10.66090 10.66085 10.66080 10.66075

Flux Density [Jy]



ME BAND_CENTER	BAN
1.26	um
1.6	um
2.15	um
1.26	um
1.6	um
2.15	um
1.26	um
1.6	um
2.15	um
1.26	um
1.6	um
2.15	um
1.26	um


完了

Link to external resources

JVO VO Table Viewer

ファイル(F) 編集(E) 表示(S)

← → ↻ × 家



⇒ Location: Top Page >

Save Filter Metadata

- ◆ Search Around
 - ◇ service id:
 - ◇ table:
- ◆ VizieR
- ◆ ADS Search

5	<input type="checkbox"/>
6	<input checked="" type="checkbox"/>
7	<input type="checkbox"/>
8	<input type="checkbox"/>
9	<input type="checkbox"/>

group ID check download


完了

http://vizier.nao.ac.jp - VizieR Detailed Page - Mozilla Firefox

ファイル(F) 編集(E) 表示(S) 履歴(S) ブックマーク(B) ツール(T) ヘルプ(H)



VizieR Detailed Page



[CDS](#) - [Simbad](#) - [VizieR](#) - [Aladin](#) - [Catalogues](#) - [Nomenclature](#) - [Biblio](#) - [Tutorial](#) - [Developer's corner](#)

Local Services (日本語): [ADAC homepage](#) - [Catalogue service](#) - [Catalog ftp](#) - [Nomenclature](#) - [SMOKA](#) - [Big output](#) -


Local Services (in English): [ADAC homepage](#) - [Catalogue service](#) - [Catalog ftp](#) - [Nomenclature](#) - [SMOKA](#) - [DSS etc. images](#) - [DSS wide field](#) - [Nobeyama R.O. data](#) - [NASA ADS mirror](#) - [Big output](#) -

If you have any questions on this mirror server, please send E-mail to data_center@dbc.nao.ac.jp.
このミラーサーバに関するご質問は data_center@dbc.nao.ac.jp へ

[2MASS All-Sky Catalog of Point Sources \(Cutrit+ 2003\)](#) ([ReadMe](#)) -c=10.390861 41.331158, eq=J2000, rs=0.005

The Point Source catalogue of 470,992,970 sources. Please [acknowledge the usage of the 2MASS All-Sky Survey](#); see also the [2MASS Pages](#).
(470992970 rows)

Column	Value	Explain
--------	-------	---------

 [Aladin Image](#) *Start **AladinJava** for a view of the optical sky centered on this source*

RAJ2000	010.390861 deg	(ra) Right ascension (J2000)
DEJ2000	+41.331158 deg	(dec) Declination (J2000) (dec)
errMaj	0.21 arcsec	(err_maj) Major axis of position error ellipse
errMin	0.18 arcsec	(err_min) Minor axis of position error ellipse
errPA	164 deg	[0,180] (err_ang) Position angle of error ellipse major axis (E of N)
2MASS	00413380+4119521	(designation) Source designation (Note 1)
Jmag	16.515 mag	(j_m) J selected default magnitude (Note 2)
Jcmsig	0.143 mag	(j_cmsig) J default magnitude uncertainty (Note 3)
e_Jmag	0.143 mag	(j_msigcom) J total magnitude uncertainty (Note 4)
Jsnr	8.4	(j_snr) J Signal-to-noise ratio
Hmag	15.856 mag	(h_m) H selected default magnitude (Note 2)
Hcmsig	0.155 mag	(h_cmsig) H default magnitude uncertainty (Note 3)

完了

Quick Multiple Catalog Search

Toward higher access efficiency to
“Frequently Used DBs” -- ~ 10^9 records

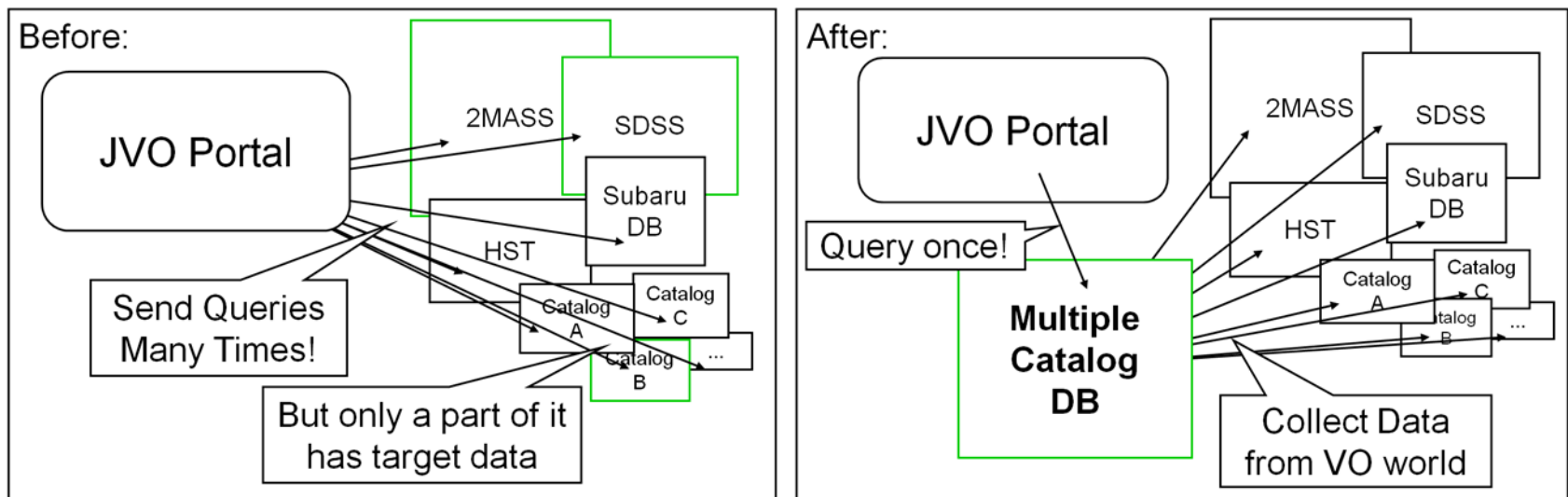


Table Design

Extract the minimum set of meta data from each DB:

Position, Wavelength & Intensity

Other info is shown as LINKs to reference

column	description
Object information	
id	Object ID
name	Object name
Position information	
ra	Right Ascension
dec	Declination
pos_err	Position error
htm	HTM index
Wavelength information	
band_name	band name
band_unit	band unit
Flux information	
flux	flux
flux_err	flux error
flux_unit	flux unit
flux_srch	flux in Jy
Reference information	
link_ref	Link to reference
org_id	ID in original catalog
cat_id	Catalog ID

Acceleration by means of Table Partitioning

Table design:

- Partitioning with HTM (Hierarchical Triangular Mesh)

- Upper level : level 6
: $8 \times 4^6 = 32768$ segments

- Tables are partitioned by Upper HTM level : 32768 tables

(by Tanaka-san)

Search radius	Result objects	Elaspted time (sec)			# of HTM conditions	
		Postgre SQL	Our method	ratio	Postgre SQL	Our method
arcmin	#					
1	2	6.460	0.042	154	32	32
10	165	3.807	0.030	127	16	16
60	6697	6.468	0.107	60	32	32
100	26720	2.016	0.307	6.6	4	16
180	57246	9.044	0.709	12.8	48	72

Access to the SuprimeCAM Data

- On-Demand Mosaicing of images and calibrations
- Pre-processed mosaic images are also accessible
- More than a few Tera bytes of data

Mostly used/downloaded from the JVO portal

JVO JAPANESE VIRTUAL OBSERVATORY ver.20080119 [Top](#) | [Search](#) | [VO Services](#) | [Subaru](#) | [Analysis](#) | [Workflow](#) | [JVO Space](#) [Logout]
 => Location: [Top Page](#) > [Subaru](#) > [SPCam](#) Masatoshi Ohishi (ohishi@jvo)

Suprime-Cam

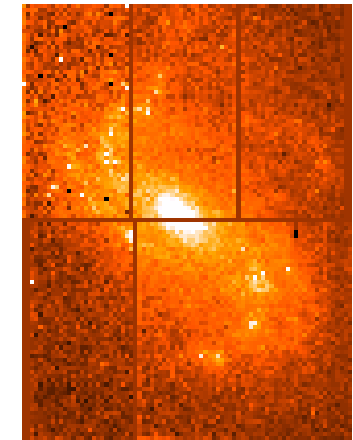
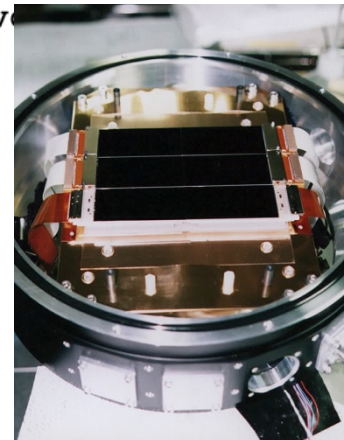
Object Name	Date	Reduction	Job Status	Command Queue
<input checked="" type="radio"/> mosaic.sh <input type="radio"/> cal-flat.sh				
RA <input type="text"/> Dec <input type="text"/> Size <input type="text"/> or OBJECT <input type="text"/>				
FILTER <input type="text" value="W-J-B"/>				
MAX FRAMES <input type="text" value="100"/> MAX humidity (%) <input type="text"/> MAX seeing (arcsec) <input type="text"/>				
Date (yyyy-mm-dd) From <input type="text"/> To <input type="text"/>				
<input type="checkbox"/> Skip Quality Check <input type="checkbox"/> Only Data Retrieval <input type="checkbox"/> Skip Mosaic				
Excluded exposures (exposure id, comma separated) <input type="text"/>				
<input type="button" value="Register"/>				

action=requestJobStatus&jobType=mosaic&offset=0&limit=5&days=1&serviceName=all: OK



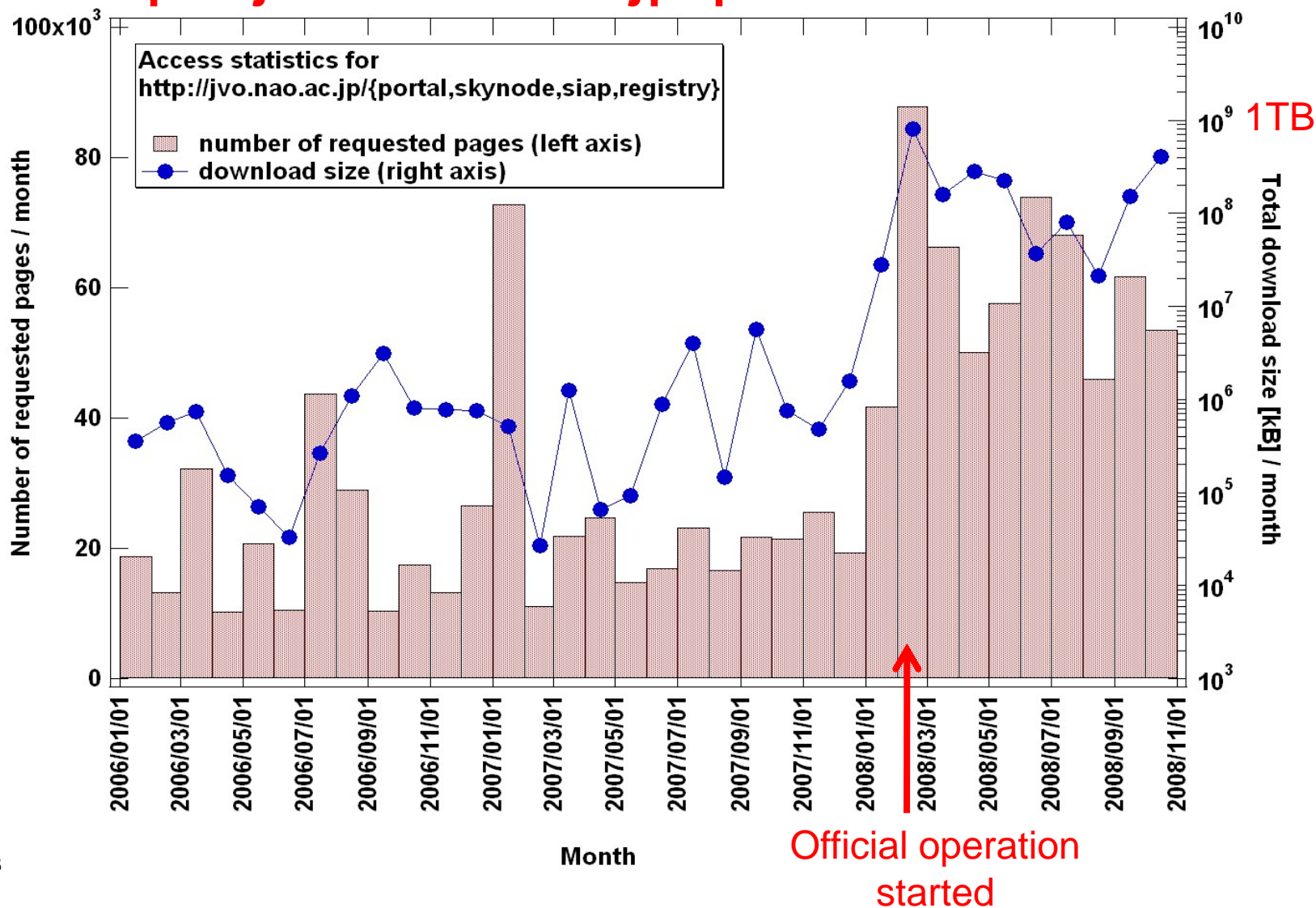
If you have any questions or requests on JVO, please contact us at:

help_desk@jvo



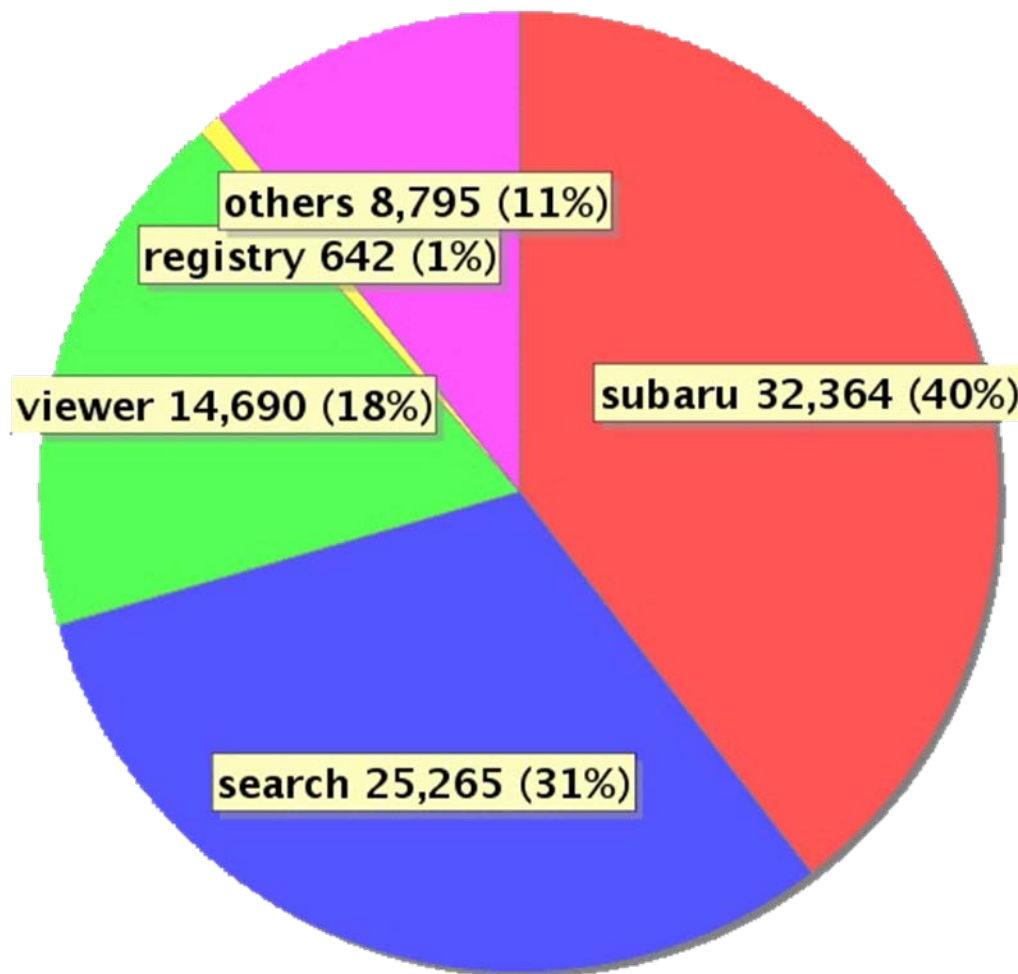
Access Statistics to the JVO system

<http://jvo.nao.ac.jp/portal/>



Access Statistics to the JVO system

<http://jvo.nao.ac.jp/portal/>



Long Term Future Plan for Astronomy in Japan

- Astronomy division of Science Council of Japan has discussed its future plan
 - Large telescopes: ALMA, 30-m class optical telescope, next generation X-ray, IR telescopes,,,
 - Theoretical studies, simulations
 - **Databased astronomy (Virtual Observatory)**
 - Gravitation wave astronomy, neutrino astronomy
 - and so on

ADASS 2009 @ Sapporo

October 4-7, 2009




Renaissance Sapporo Hotel

Sapporo Beer Garden

Supported by

- JSPS
“Core to Core Program” (2004~2009)



- MEXT Grant-in-Aid
“Information Explosion” (2001~) 

- National Institute for Informatics
“CSI Program” (2007~)



- NAOJ