

# Virtual Observatories in the East Asia - Japan, China, Taiwan and Korea

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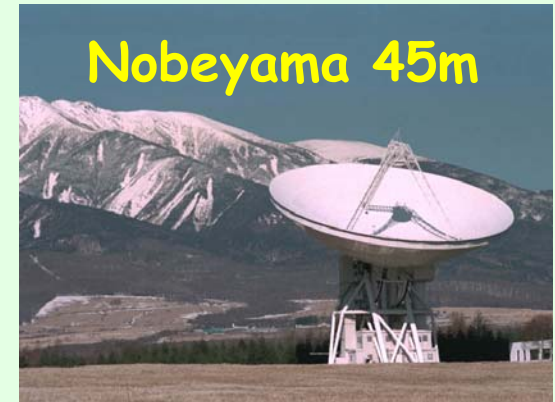
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# Astronomical Resources in NAOJ

- **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**





# Data Resources in JAXA/ISAS

- **ASCA** X-ray astronomy satellite
- **YOHKO** solar physics satellite
- **Ginga** X-ray astronomy satellite
- **HALCA** VLBI satellite
- **Geotail** geomagnetosphere satellite
- **Akebono** aurora observation satellite
- **AKARI** Infrared satellite
- **SUZAKU** X-ray satellite
- **HINODE**

*Optical Solar  
Satellite*

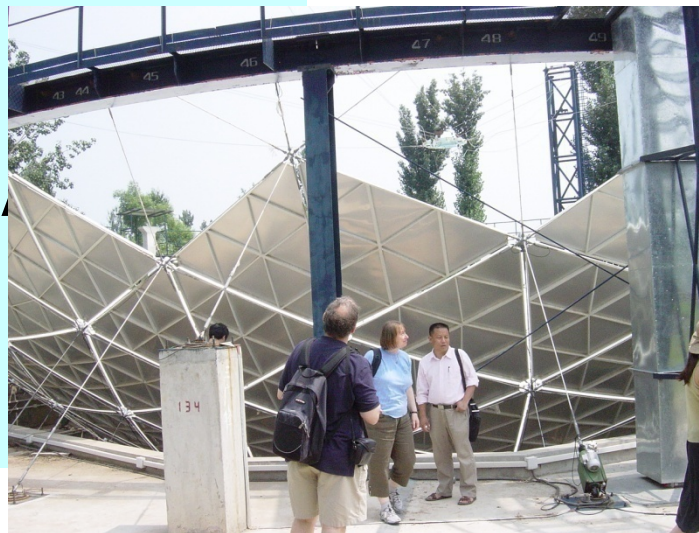
August 23, 2007



# Chinese Resources



- **Miyun** radio telescope
- **LAMOST**: 4000+ fibers
- **FAST**: Chinese SKA
- etc.

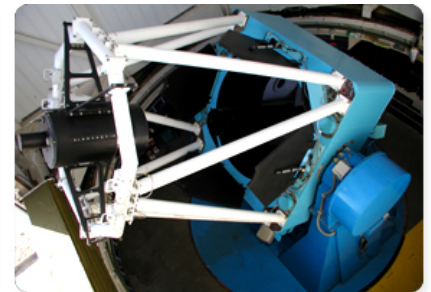


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# Korean Resources



- Taeduk Radio Astronomy Obs.:  
14 m dish
- Bohyunsan Optical Astronomy Obs.:  
1.8 m mirror
- Korean Astr. Data Center





# Korean VLBI Network (KVN)

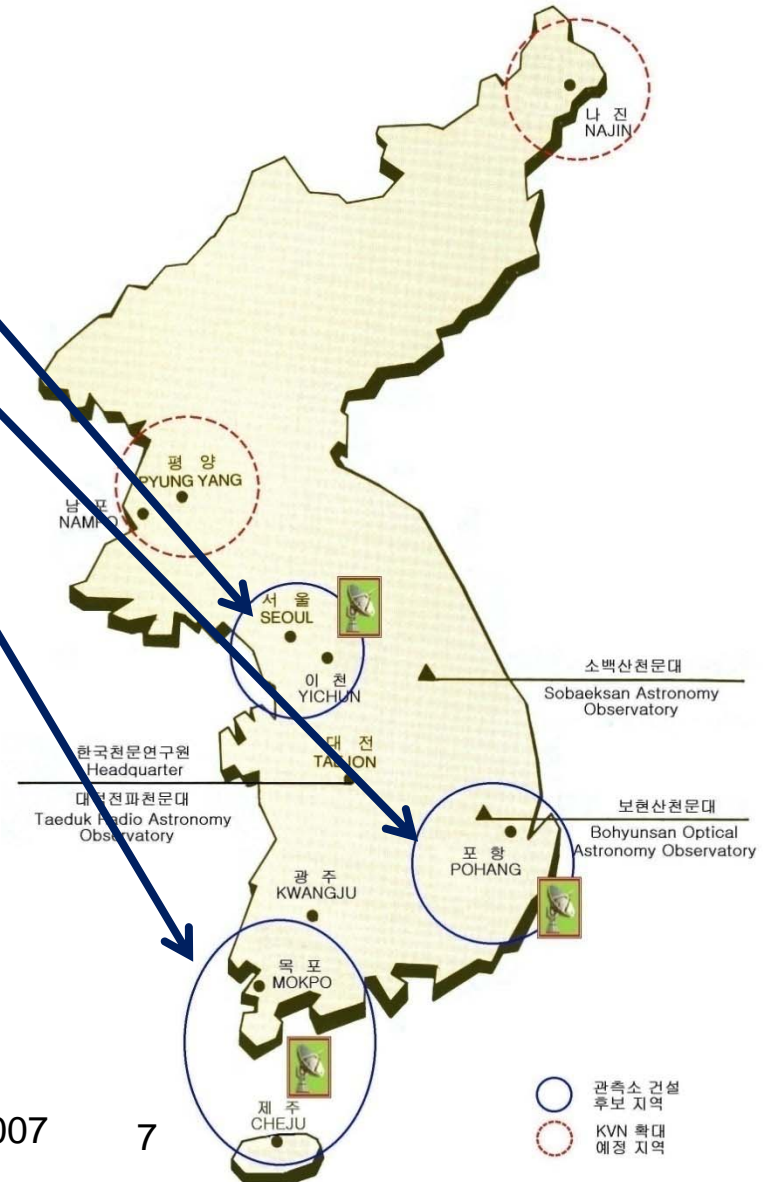


- One near Seoul
- One at Pohang area
- One at Jeju Island

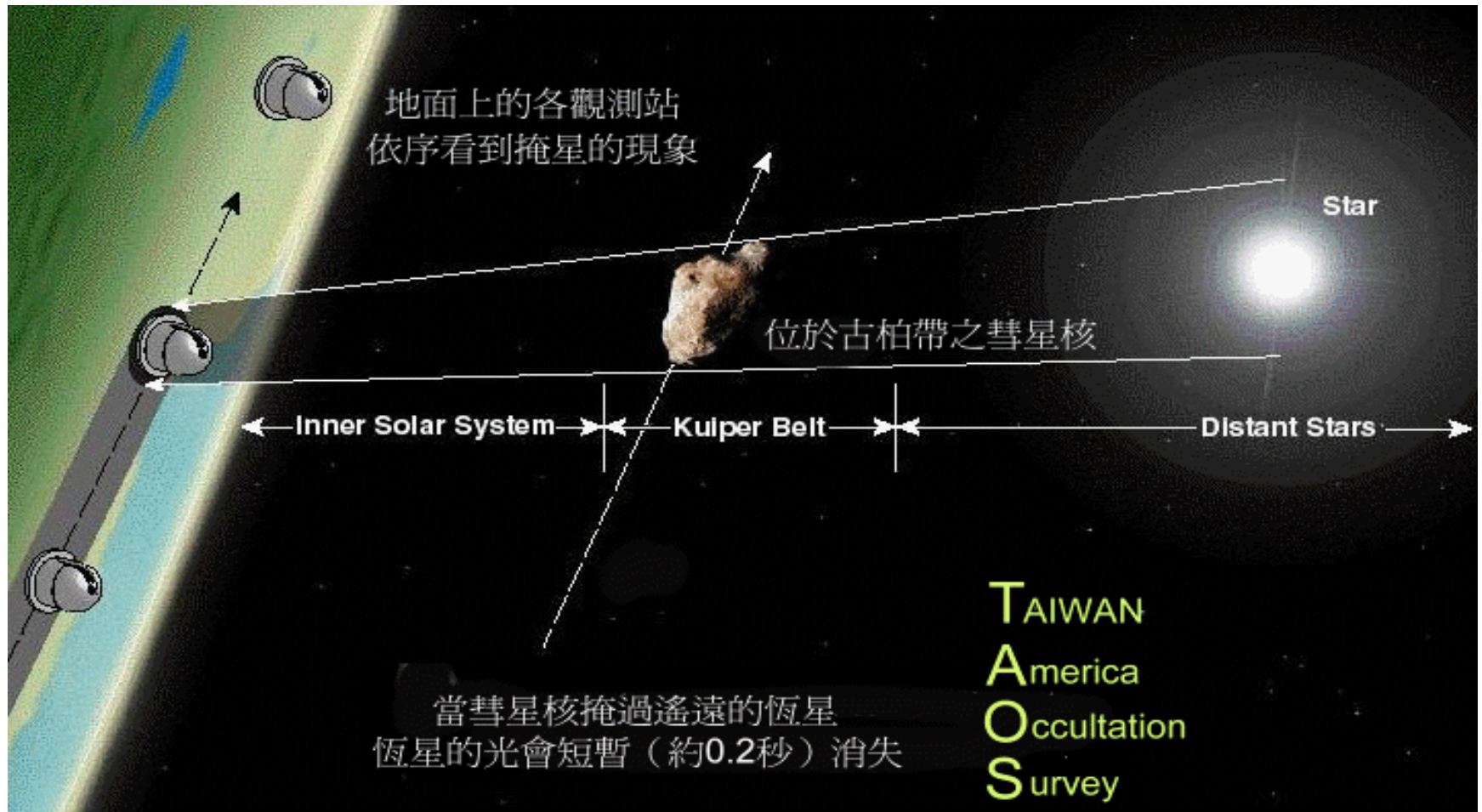
**KVN site:** Open to universities and research institutes for invitation

Near Completion

Plan to collaborate with Japanese VLBI network



# TAOS (Taiwan-America Occultation Survey) project





# TAOS



- International Collaboration
- Detection of KBOs + asteroids
- Four telescopes in Taiwan
- 2K x 2K CCD in every 0.2 sec  
→ 15-100 GB per night
- Plan to generate catalogues
- Plan to publish the catalogues via VO

# VO Projects in the world

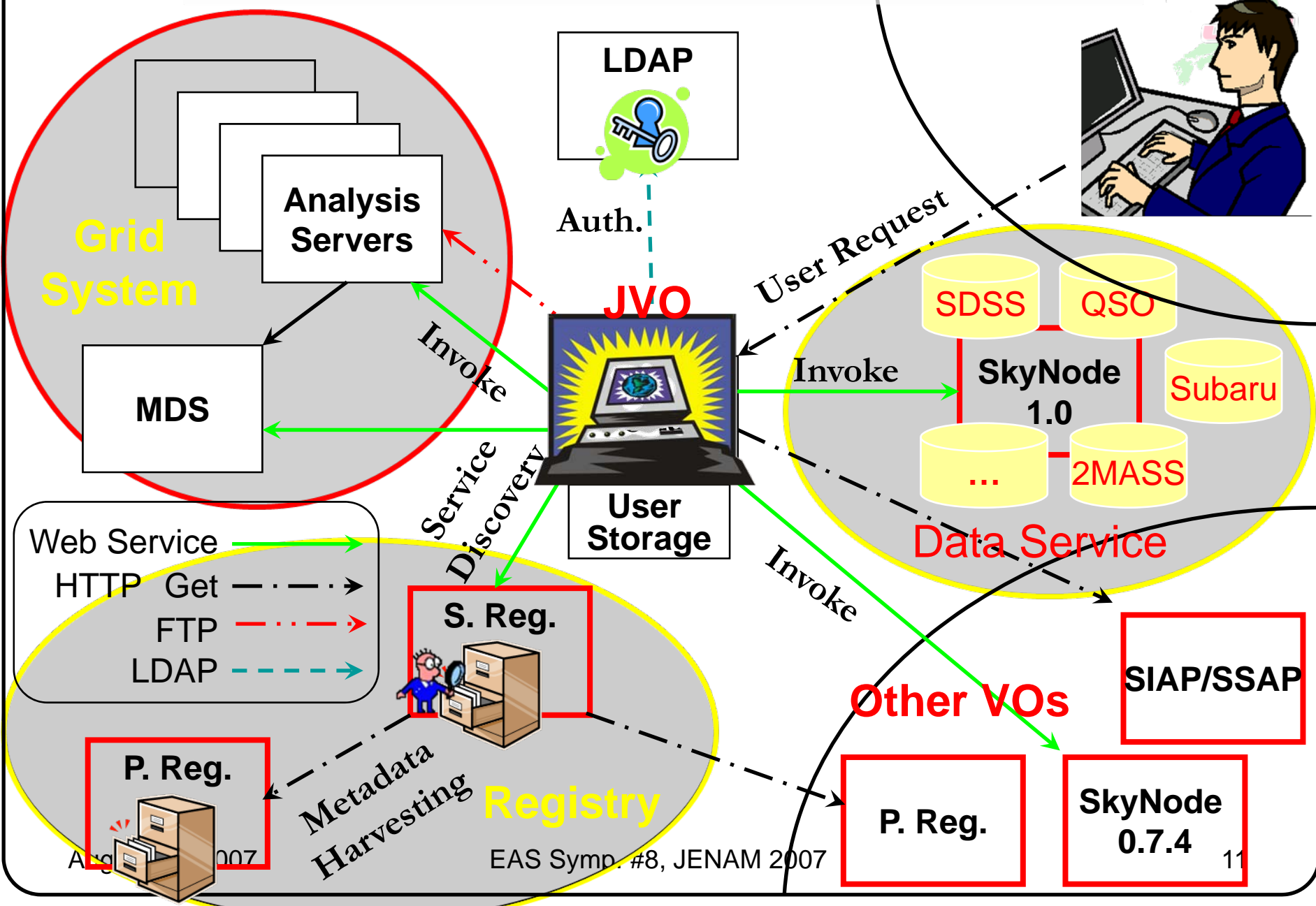


- 15 countries and a region (EU)
- International Virtual Observatory Alliance (IVOA)  
Standards to interoperate VOs

Taiwan is hesitated to join the IVOA due to the political issue



# Overview of the JVO Portal Service













# Service Search Result

[Status](#) | [Registry](#) | [Search](#) | [Workflow](#) | [Result](#) | [Database](#) | [QSO](#) | [DataViewer](#) | [Link](#) | [MemoryMonitor](#) | [Logout](#)

Select Service[s] Select the checked service and go to the search page.

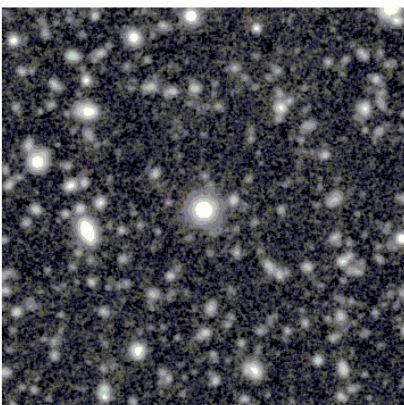
No.	Check	ID	Title	Type	Access URL	Country
0	<input type="checkbox"/>	<a href="#">More Info</a>	XMM-Newton Science Archive Open SkyNode	SkyNode	<a href="#">URL</a>	
1	<input type="checkbox"/>	<a href="#">More Info</a>	Rosat	SkyNode	<a href="#">URL</a>	
2	<input type="checkbox"/>	<a href="#">More Info</a>	Rosat	SkyNode	<a href="#">URL</a>	
3	<input type="checkbox"/>	<a href="#">More Info</a>	XMM-Newton Science Archive Open SkyNode	SkyNode	<a href="#">URL</a>	
4	<input type="checkbox"/>	<a href="#">More Info</a>	ASCA SkyNode Service	SkyNode	<a href="#">URL</a>	
5	<input type="checkbox"/>	<a href="#">More Info</a>	Canadian Network for Observational Cosmology Image	SLAP/SSAP	<a href="#">URL</a>	
6	<input type="checkbox"/>	<a href="#">More Info</a>	Chandra X-Ray Observatory Data Archive	SLAP/SSAP	<a href="#">URL</a>	
7	<input type="checkbox"/>	<a href="#">More Info</a>	XMM-Newton Archive Interoperability System	SLAP/SSAP	<a href="#">URL</a>	
8	<input type="checkbox"/>	<a href="#">More Info</a>	ROSAT All Sky Survey	SLAP/SSAP	<a href="#">URL</a>	unknown

Select Service[s] Select the checked service and go to the search page.

### Data Viewer

[Status](#) | [Registry](#) | [Search](#) | [Workflow](#) | [Result](#) | [QSO](#) | [DataViewer](#) | [Usage](#) | [Logout](#)

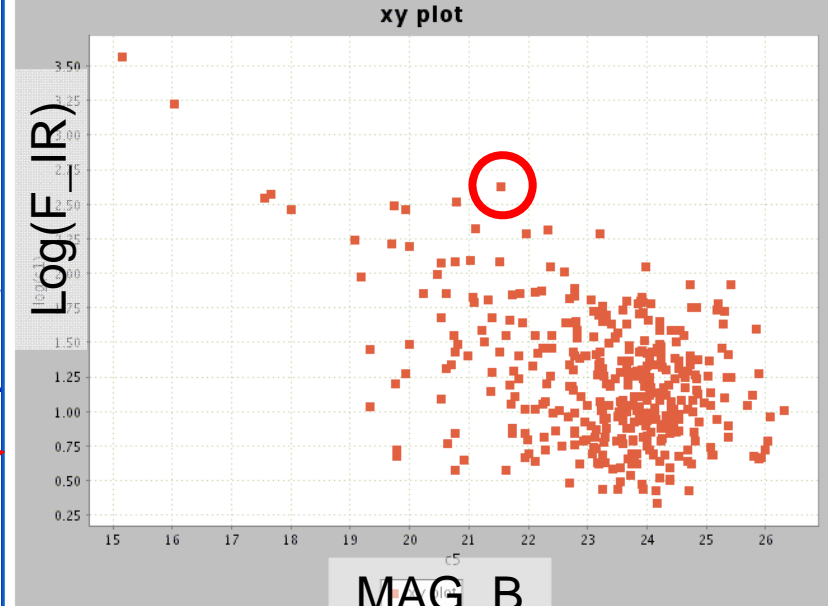
Name	Origin	Scale	Contrast
tmp0	http://jvo.nao.ac.jp/	hist	min = 0.0 max = 0.0 auto = true



Scale :    
 Contrast :     
   
 VOTable :

### xy plot

X expression:    
 Y expression:    
 bin number:    
 Invert X:    
 Invert Y:



### VOTable View

[Status](#) | [Registry](#) | [Search](#) | [Workflow](#)

Metadata:

MESSAGE:

FROM: 0 MAX: 20 SCROLL: 1

SELECT: c0,c1,c2,c3,c4,c5,c6,c7,c8,c9,c10,c11,c12,c13

FILTER:

ORDER:

800 records, 1 2 3 4 5 6 7 8 9 10

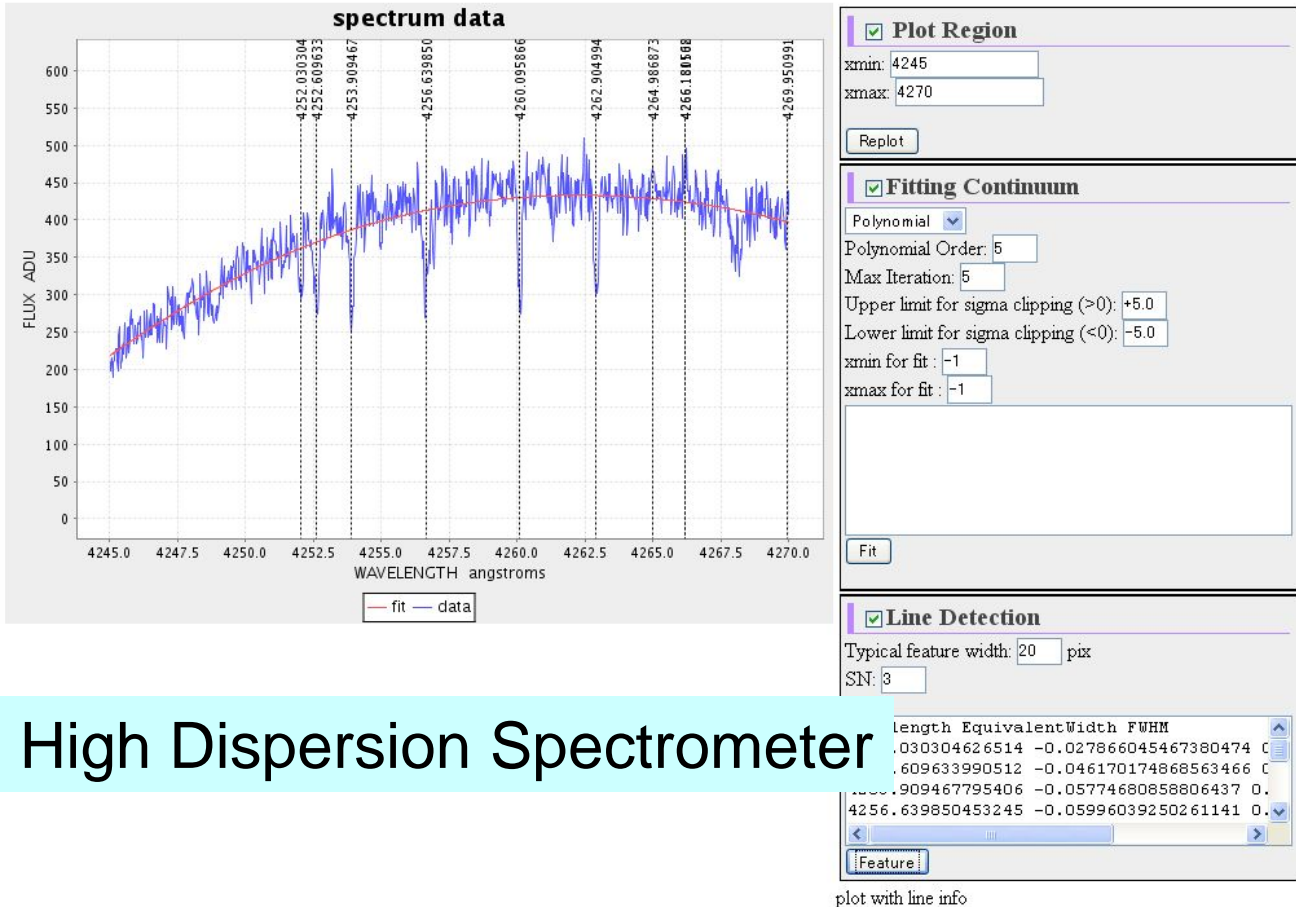
#	Alias Name	C0	C1	C2	C3	C4	C5	C6
0	<input type="checkbox"/> <a href="#">Download</a>	IR.OBJECT	IR.FLUX_ISO_45	IR.RA	IR.DEC	OPT.NUMBER	OPT.MAG_AUTO_B	OPT.MAG_AUTO_C
1	<input type="checkbox"/> <a href="#">Download</a>	SWIRE2_J021648.87-045812.0	3663.32006835938	34.2036514282227	-4.97001981735229	SXDS-RC-088303	15.1500997543335	14.792591
2	<input checked="" type="checkbox"/> <a href="#">Download</a>	SWIRE2_J021705.98-045953.3	422.559997558594	34.2749404907227	-4.99815988540649	SXDS-RC-092411	21.533899307251	20.075701
3	<input type="checkbox"/> <a href="#">Download</a>	SWIRE2_J021704.82-045409.2	370.059997558594	34.2701187133789	-4.90256977081299	SXDS-RC-125356	17.6541996002197	17.301091

# Spectral Data from Subaru



Status | Registry | Search | Workflow | Result | QSO | DataViewer | Tools | SubaruAnalysis | VOSpace | MDS | Usage | Logout

Name	Origin	xmin	xmax
tmp0	<a href="http://jvo.nao.ac.jp/">http://jvo.nao.ac.jp/</a>	-1.0	-1.0



- queries
- display
- Baseline estimate
- Line detection
- VOSpec

## High Dispersion Spectrometer

User ID	User Name	Group	Last Login
ohishi	Masatoshi Ohishi	jvo	2007-01-22 17:48:56

Total memory = 425197kB Used memory = 84917kB (19%)



# Improvement of Work Flow system

## FY2006

- Improvement of WFDL
  - Shorten the volume of DL
  - Array definition
  - Awk-like description (loop description in a single line)
- Built-in functions
  - Available to register and use built-in functions
- Status and Log system

## FY2007

- Better User Interface
- WF Builder – Taverna / NAREGI

```
<?xml version="1.0" encoding="EDC-JP"?>
<workflow xmlns="http://jvo.sao.ac.jp/workflow/v0.5" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="http://jvo.sao.ac.jp/workflow/v0.5/workflow.xsd">
  <name>Galaxy ClusteringStudy05</name>
  <author>Taji Shirokoshi</author>
  <identifier>ivo://jvo.sao.ac.jp/workflow/sample/identifier</identifier>
  <create_date>2006/12/19 09:00:00</create_date>
  <update_date>2006/12/19 09:00:00</update_date>
  <description>Search for Galaxy Clustering around QSO</description>
  <status>OK</status>
  <variables>
    <variable name="sq1" type="String"/>
    <variable name="sq11" type="String"/>
    <variable name="sq12" type="String"/>
    <variable name="sq13" type="String"/>
    <variable name="sq14" type="String"/>
    <variable name="sq15" type="String"/>
    <variable name="sq16" type="String"/>
  </variables>
  <variable name="tableNameForQSO" type="String">
    <value>ivo://jvo/vizier/V11/235/qso_veron_2003</value>
  </variable>
  <variable name="tableNameForImage" type="String">
    <value>ivo://jvo/subaru/spms/spms_main_view</value>
  </variable>
  <variable name="magLimit" type="double">
    <value>21.0</value>
  </variable>
</workflow>
```

WF Editor

#	Command Name	Status	# of Execution	# of Failure	Elapsed Time
0	work_20070322152302223	executing	0	0	3 708 sec
0.0	SEQUENCE	executing	1	0	3 212 sec
0.0.0	executeQuery	success	1	0	1 883 sec
0.0.1	storeVOTable	success	1	0	0 029 sec
0.0.2	executeQuery	executing	1	0	1 268 sec
0.0.3	storeVOTable	not executed	0	0	-- sec
0.0.4	executeQuery	not executed	0	0	-- sec
0.0.5	storeVOTable	not executed	0	0	-- sec
0.0.6	executeQuery	not executed	0	0	-- sec
0.0.7	storeVOTable	not executed	0	0	-- sec
0.0.8	executeQuery	not executed	0	0	-- sec
0.0.9	storeVOTable	not executed	0	0	-- sec

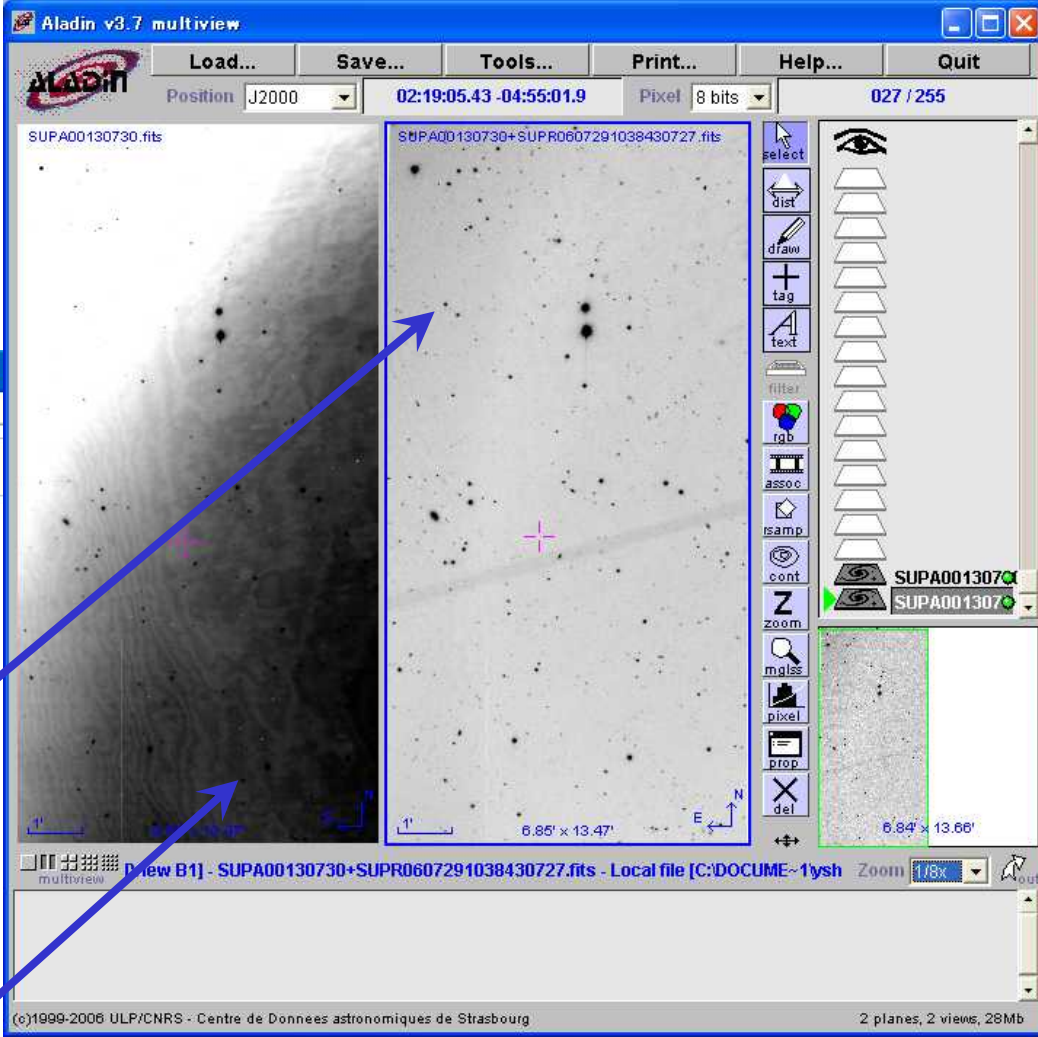
User ID	User Name	Group	Last Login
tanaka	Tanaka Masahiro	admin	2007-03-19 17:55:06

Total memory = 295305kB Used memory = 53549kB (18%)

Execution monitor

– Reduction **10s**  
 (Bias+Flat+Distortion+  
 Astrometry)

– Transfer **30s**



votable-viewer - Mozilla Firefox

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

## VOTable Viewer

Status | Registry | Search | Workflow | Result | QSO | DataViewer | Usage | Logout

Metadata:

MESSAGE: OK

FROM: 0 MAX: 20 SCROLL: 1

SELECT: c31,c32,c1,c2,c3,c4,c5,c6,c7,c8,c9,c10,c11,c1

FILTER:

ORDER:

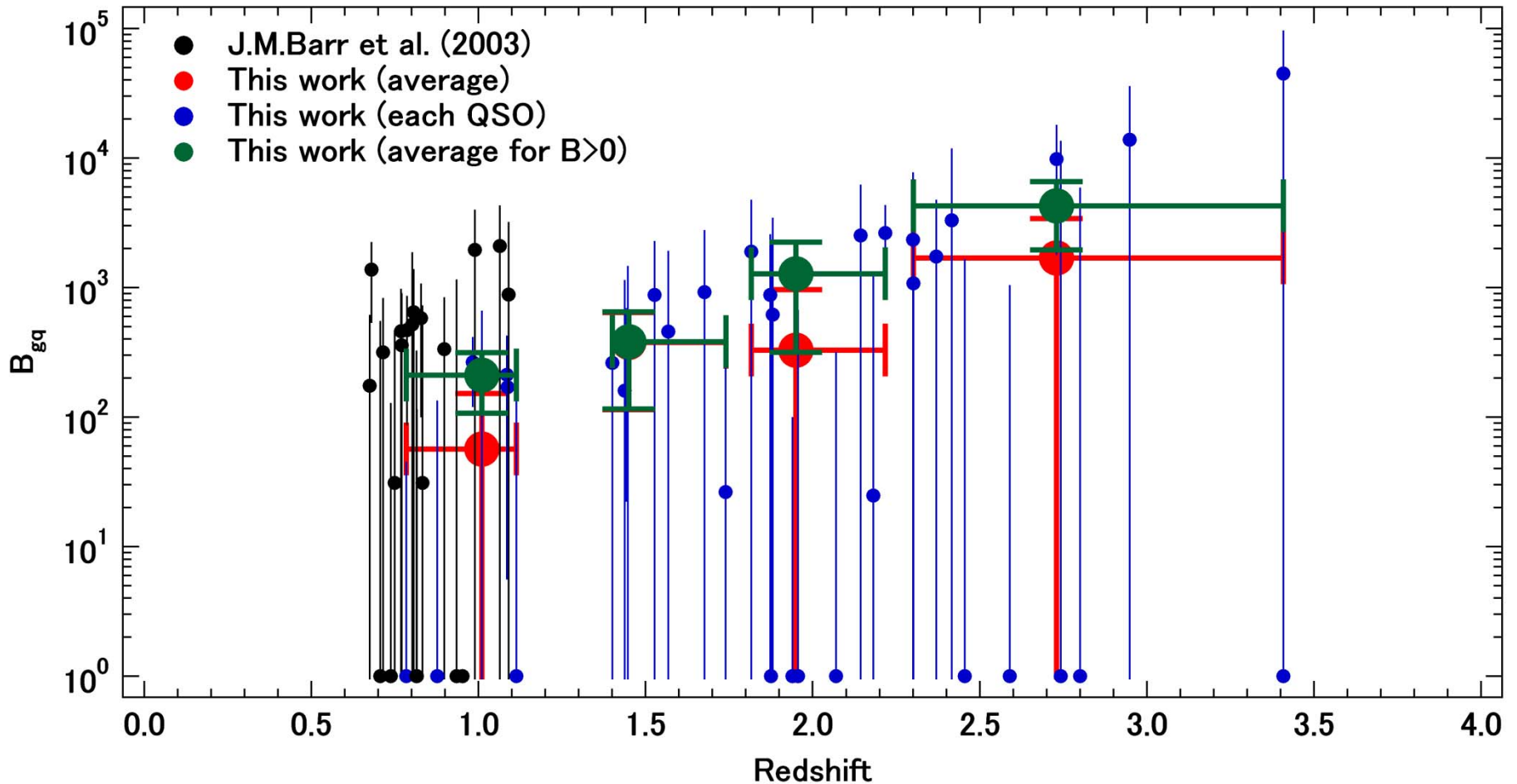
<< < < < > > > >

1000records,  
 1 2 3 4 5 6 7 8 9 10

**Data Reduction:**  
 ~24 hours → ~1 hour

	Alias Name	C31	C32	C1	C2	C3	C4	C5	
#	check	download	<input type="button" value="TO.ACCESS_REF_RA"/>	<input type="button" value="TO.ACCESS_REF_RA"/>	<input type="button" value="TO.PAW_ID"/>	<input type="button" value="TO.LO_START"/>	<input type="button" value="TO.OFFTIME"/>	<input type="button" value="TO.FILTER_ID"/>	<input type="button" value="TO.DETECTOR_ID"/>
0	<input type="checkbox"/>	<a href="#">Download</a>	<a href="#">Link</a>	SUPA00134470	2002-09-30 11:11:47.326	900.0	W-J-B	w67c1	
1	<input type="checkbox"/>	<a href="#">Download</a>	<a href="#">Link</a>	SUPA00134480	2002-09-30 11:27:47.082	900.0	W-J-B	w67c1	
2	<input type="checkbox"/>	<a href="#">Download</a>	<a href="#">Link</a>	SUPA00134490	2002-09-30 11:42:44.419	900.0	W-J-B	w67c1	

# Study on Environment around QSOs (Japan VO)





# China VO team (NAOC)



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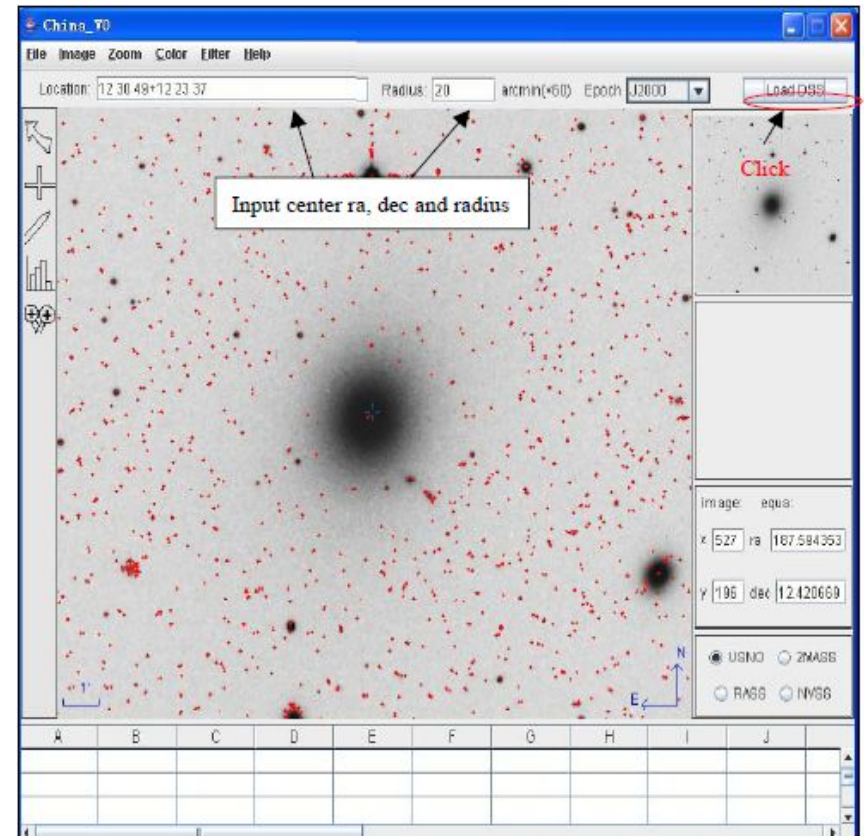
EAS Symp. #8, JENAM 2007

18

# Softwares by China VO



- **VOFilter** : VOTable  
→ OpenOffice data
- **VOIMPAT** :  
image processing  
and analysis tool
- **SkyMouse** :  
link tool between  
data and papers  
(ADS)



# Korea VO (KASI)



To provide data from

TRAO 14m

BOAO 1.8m

Yonsei survey

NEO patrol data

CO survey

KVN

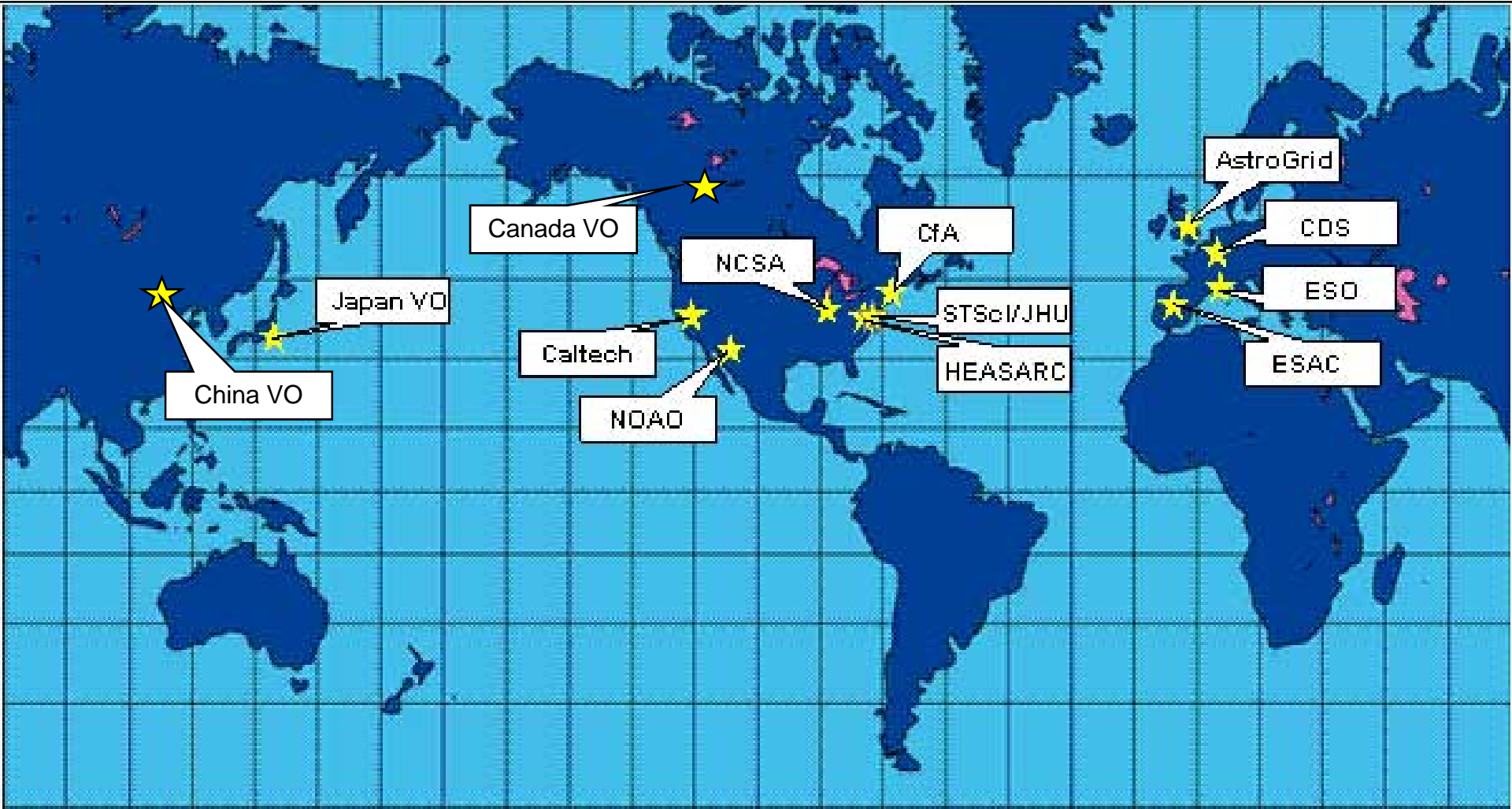
GALEX

and others





# Interconnected VO Data services in the World

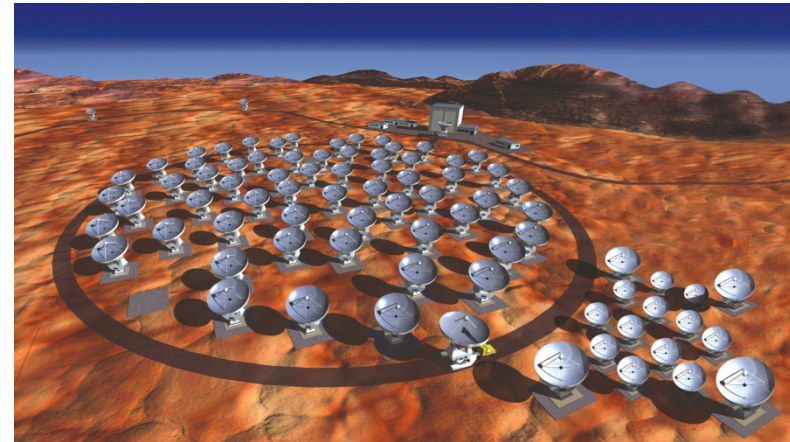






# New Moves

- **Japan VO** : R&D phase  
→ operations phase
- **ALMA Regional Center**
  - ALMA-J/T :  
Japan + Taiwan
  - VO functionalities to provide ALMA users with easy access not only to the ALMA data but other data archives



© NAOJ

# East Asia Core Observatory Association (EACOA)



East Asia Core Observatories Association (EACOA)

J

KOR

CHN

Taiwan

# Collaboration in East Asia



- Sharing the telescope time
- Collaborative construction of small size telescopes
- VLBI network (J / CHN / KOR)
- Sharing the available data & software resources through VOs to accelerate astronomical researches

***Merci !***