R&D and new services

Portal, annotations, Aladin all-sky,
cross-match, semantic Web, new interfaces, ...

CDS Scientific Council

Thomas Boch
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Outline

- Web 2.0
  - Mashup (Portal, Mobile portal)
  - User space
  - Annotations
- Semantics
- Persistence
- New Interfaces
- Aladin HEALPix
- Cross-match

CDS Portal

- "Mash-up" of CDS services
  - Search in and access to CDS services through a uniform interface
  - Facilitate workflow between services
- Web interface: no installation needed - http://cdsportal.u-strasbg.fr/
- Testbed
  - for new technologies: *AJAX, GWT, Flex*
  - to explore links between data
- Version 1.0 released in October 2010

CDS Home Page | Simbad | VizieR | Aladin | Catalogs | Dictionary | Biblio | Tutorials | Developers

CDS Portal

Portal My data — demo Preferences Logout

Target: horsehead nebula GO

J2000 position for horsehead nebula: 05 40 58.99 -02 27 29.9

Object identifiers, measurements and bibliography for horsehead nebula

- Object type: Dark Cloud (nebula)
- More SIMBAD data for horsehead nebula
- 299 bibliographic references
- 8 objects within 2'
- Display map around horsehead nebula
- Display SimPlay interactive map around horsehead nebula

Images for horsehead nebula

- Display region in Aladin (Web Start)

Aladin Images

Survey	Band	Wavelength (µm)	Size	Epoch	Resolution	Download
DENIS	I	0.79	12.5' x 12.4'	1998-12-08	0.9" / pixel	FITS
DENIS	J	1.23	12.5' x 12.7'	1998-12-08	0.9" / pixel	FITS
DENIS	K	2.16	12.6' x 12.7'	1998-12-08	0.9" / pixel	FITS
2MASS	K	2.16	8.5' x 17.0'	1998-10-30	0.9" / pixel	FITS
2MASS	H	1.65	8.5' x 17.0'	1998-10-30	0.9" / pixel	FITS
2MASS	J	1.24	8.5' x 17.0'	1998-10-30	0.9" / pixel	FITS
SERC	ER	0.63	12.9' x 12.9'	1990-12-22	1.0" / pixel	FITS JPEG
SERC	ER	0.63	12.9' x 12.9'	1988-12-30	1.0" / pixel	FITS JPEG

Display grayscale image

Catalogues for horsehead nebula

- 0 catalogues with 'horsehead nebula' keyword
- 27 catalogues around horsehead nebula

Vizier catalogues

Name	Description	Local density	Wavelength	Popularity	Coverage map
J/MNRAS/375/1220 Query	BVI photometry of young stars in 10 clusters (Mayne+, 2007) [ReadMe]	103	optical/IR	53	
I/297 Query	NOMAD Catalog (Zacharias+ 2005) [ReadMe]	53	optical/IR	87	
I/284 Query	The USNO-B1.0 Catalog (Monet+ 2003) [ReadMe]	51	optical	91	
I/305 Query	The Guide Star Catalog, Version 2.3.2 (GSC2.3) (STScI, 2006) [ReadMe]	49	optical	86	
J/MNRAS/356/89 Query	sigma Ori low-mass stars (Kenyon+, 2005) [ReadMe]	39	optical	42	
I/252 Query	The USNO-A2.0 Catalogue (Monet+ 1998) [ReadMe]	36	optical	84	
I/271 Query	The GSC 2.2 Catalogue (STScI, 2001) [ReadMe]	34	optical	87	
II/246 Query	2MASS All-Sky Catalog of Point Sources (Cutri+ 2003) [ReadMe]	34	IR	100	
Eso Query	ESO Science Archive Catalog (ESO, 2002) [ReadMe]	32	optical	70	
Denis Query	The DENIS database (DENIS Consortium, 2005) [ReadMe]	27	IR	89	

Page 1 of 3 — Displaying 1 - 10 of 27

Mobile version

- Access essential information from your smartphone: http://cdsportal.u-strasbg.fr/mobile

Mobile version

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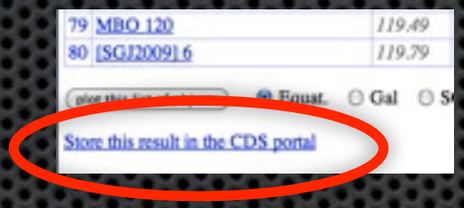
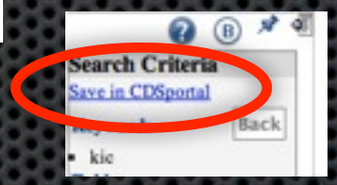
User storage space

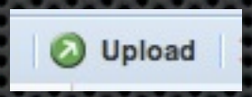
- Each user is provided with a personal storage space
  - Save SIMBAD results



  - Save VizieR results



  - Upload lists of positions



- Relies on the open-source iRODS distributed file system
- Bridges the gap between services
  - *e.g. VizieR output can be seamlessly reused to query SIMBAD*
- Possibility to store personal preferences, ...

Simbad VizieR Aladin Catalogs Dictionary Biblio Tutorials Developers

Show my data at the CDS Portal

Portal My data — demo Preferences Logout

My saved tables

Query Simbad | Query VizieR | Upload | Delete

	Target	Catalogue	File	Output	Plotter	Creation date	Comment	Origin	Nb rows
	<No target>	<No catalog>	example.vot	Download	Plot !	Ven 10 jul 11:49:02 2009	<No comment>	Upload	34
	<No target>	II/261/rb	II_261_rb-090708	Download	Plot !	Mer 8 jul 13:22:38 2009	GOODS	VizieR	32048
✓	M84	II/282/sdss6	M84-II_282_sdss6-090708	Download	Plot !	Mer 8 jul 10:12:12 2009	<No comment>	VizieR	29
	M86		M86-090708	Download	Plot !	Mer 8 jul 10:05:54 2009	<No comment>	VizieR	565
	<No target>	<No catalog>	simbad.vot	Download	Plot !	Mar 30 jui 14:11:22 2009	<No comment>	Upload	20
	<No target>	VI/70A/catalog	V_70A_catalog-090622	Download	Plot !	Lun 22 jui 14:44:11 2009	<No comment>	VizieR	3803
	12 20 18.10 -	<No catalog>	122018.10064116.0-simbad-2arcmi	Download	Plot !	Ven 19 jui 16:28:54 2009	<No comment>	Simbad	2
	<No target>	II/125/main	II_125_main-090617	Download	Plot !	Mer 17 jui 22:57:04 2009	all IRAS !!!	VizieR	245889
	<No target>	I/239/tyc_main	I_239_tyc_main-090612	Download	Plot !	Ven 12 jui 17:38:16 2009	All TYCHO !!!	VizieR	1058332
	HD 741	I/86A/primary	HD741-I_86A_primary-090609	Download	Plot !	Mar 9 jui 22:23:04 2009	<No comment>	VizieR	6963

Page 1 of 9 — Displaying 1 - 10 of 89

You are currently using 353 MB (70%) of your 500 MB

Query Simbad by list of positions

I_Apj_463_26_tableb1-090523

Total number of rows: 660

Radius: 2 arcmin — Query Simbad

Output:

Go to Simbad Web page

Save result in portal

Close this window

Query VizieR by list of positions

M84-II_282_sdss6-090708

Total number of rows: 29

Radius: 2 arcmin

Favorite catalogue: B/denis

Catalogue — Query VizieR

Close this window

Select the output format

VOTable

Tab-Separated-Values

Comma-Separated-Values

Download

Close this window

Upload a VOTable

VOTable: ta/NGC3372/NGC3372.xml — Browse...

Target: (optional)

Comment: (optional)

Upload

Close this window

SIMBAD annotations (1/3)

- http://cdsannotations.u-strasbg.fr/doc
- Euro-VO AIDA project
  - Assessment of Web 2.0 usage in a data center
- *"The annotations service allows the users to make comments and notify errors on the data available through CDS services."*
- In production since March 2010

SIMBAD annotations (2/3)

- Some statistics:
  - 710 annotations by 108 users
    - 230 error notifications
    - 480 simple comments
    - 0 spam !
- Also deployed for VizieR catalogues since March 2011

SIMBAD annotations (3/3)

SIMBAD query result

other query modes : Identifier query | Coordinate query | Criteria query | Reference query | Basic query | Script submission | Output options | Help

Object query : CD-23 12840 — C.D.S. - SIMBAD4 rel 1.181 - 2011.06.27CEST15:49:23

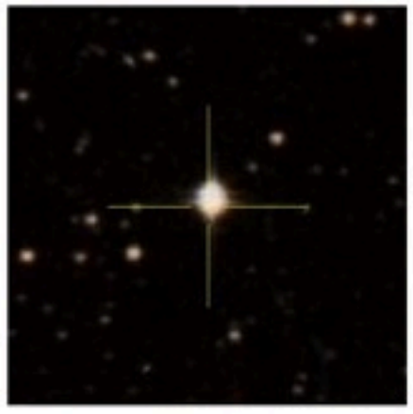
Available data : Basic data • Identifiers • Plot & images • Bibliography • Measurements • External archives • Notes • Annotations

Basic data :

CD-23 12840 -- Double or multiple star

query around with radius 2 arcmin

Other object types:	** () ,* (CD) ,IR (IRAS)
ICRS coord. (ep=J2000) :	16 18 37.302 -24 05 22.51 (~) [~ ~ ~] B 2000A&A...361.1143T
FK5 coord. (ep=J2000 eq=2000) :	16 18 37.302 -24 05 22.51 (~) [~ ~ ~] B 2000A&A...361.1143T
FK4 coord. (ep=B1950 eq=1950) :	16 15 36.70 -23 58 06.3 (~) [~ ~ ~] B 2000A&A...361.1143T
Gal coord. (ep=J2000) :	352.0639 +18.4436 (~) [~ ~ ~] B 2000A&A...361.1143T
Proper motions *mas/yr* [error ellipse]:	-5 -24 [~ ~ ~] D 2000A&A...361.1143T
Fluxes (2) :	B 12.96 [~] D ~
	V 12.04 [~] D ~



SIMBAD annotations (3/3)

SIMBAD query result

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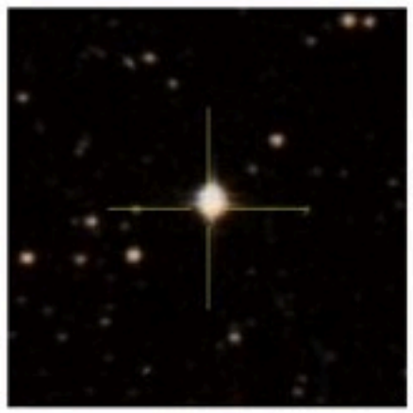


Other object types:	** () ,* (CD) ,IR (IRAS)
ICRS coord. (ep=J2000) :	16 18 37.302 -24 05 22.51 (~) [~ ~ ~] B 2000A&A...361.1143T
FK5 coord. (ep=J2000 eq=2000) :	16 18 37.302 -24 05 22.51 (~) [~ ~ ~] B 2000A&A...361.1143T
FK4 coord. (ep=B1950 eq=1950) :	16 15 36.70 -23 58 06.3 (~) [~ ~ ~] B 2000A&A...361.1143T
Gal coord. (ep=J2000) :	352.0639 +18.4436 (~) [~ ~ ~] B 2000A&A...361.1143T
Proper motions *mas/*	
Fluxes (2) :	

Annotations :

Annotations allow a user to add a note or report an error concerning the astronomical object and its data. It requires registration to post a note.
See description .
The list of all annotations to SIMBAD objects can be found here .

display existing annotations (1)

add an annotation to this object

report an error concerning the data of this object

SIMBAD annotations (3/3)

SIMBAD query result

other query modes : Identifier query | Coordinate query | Criteria query | Reference query | Basic query | Script submission | Output options | Help

Object query : CD-23 12840

Available data : Basic data • Identifiers • Plot &

Basic data :

CD-23 12840 -- Double or multi

Other object types: ** () ,*

ICRS coord. (ep=J2000) : 16 18 37.

2000A&A..

FK5 coord. (ep=J2000 eq=2000) : 16 18 37.

2000A&A..

FK4 coord. (ep=B1950 eq=1950) : 16 15 36.

Gal coord. (ep=J2000) : 352.0639

Proper motions *mas/*

Fluxes (2) :

Annotations :

Annotations allow a u

astronomical object a

See description .

The list of all annotati

display existing annot

add an annotation to t

report an error concer

mperrin (Marshall Perrin) on Apr 22nd, 2011 at 1:44

CD-23 12840

PDS 415 = CD -23 12840 = is also the same object as IRAS 16156-2358. See Vieira et al. 2003 AJ 126, Table 1.

There are in fact two distinct stars here, so the records should not be merged. But the PDS 415 designation should not resolve to only the southern source:
The table in Vieira et al. specifically identifies the northern component as the counterpart to the IRAS source and the Herbig Ae star which is the subject of their study. (And recent observations at Gemini and CARMA confirm the majority of the infrared excess is due to the northern star. Paper in prep...)

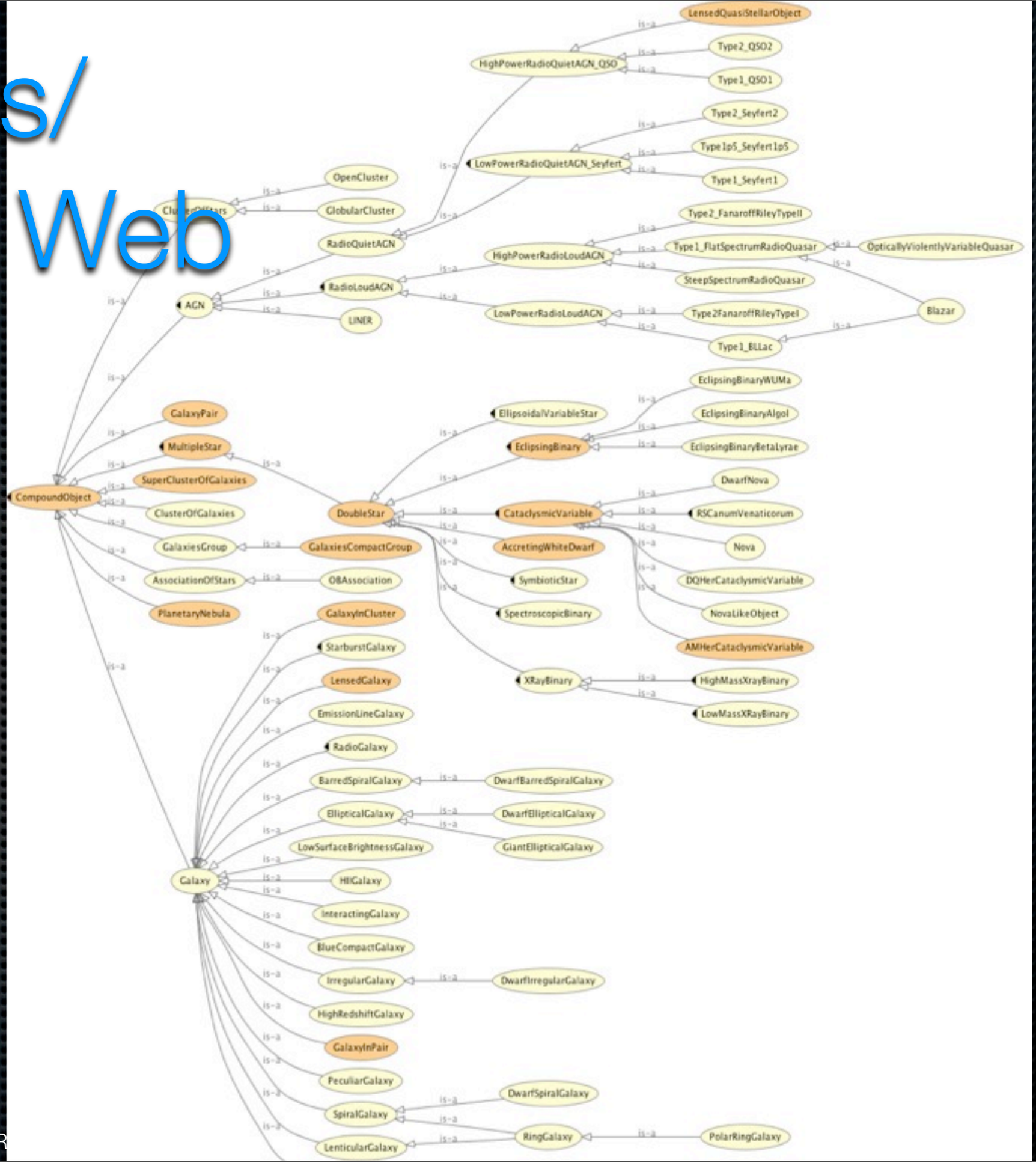
At the very least, I sugggest the two stars' SIMBAD entries should be linked with an association record.

Thanks a lot for your input. CD-23 12840 is resolved in UCAC3, 2MASS, and DENIS. The north star is detected in the MIR by Akari. Most of the IRAS flux certainly comes from the north star, PDS 415; however, strictly speaking, it is not resolved in IRAS. So the CD AND IRAS objects have been put together as a double star, with hierarchical links towards PDS 415 and UCAC3 132-181409.

Edited by Cilou (Cecile Loup) on Apr 30th, 2011 17:46

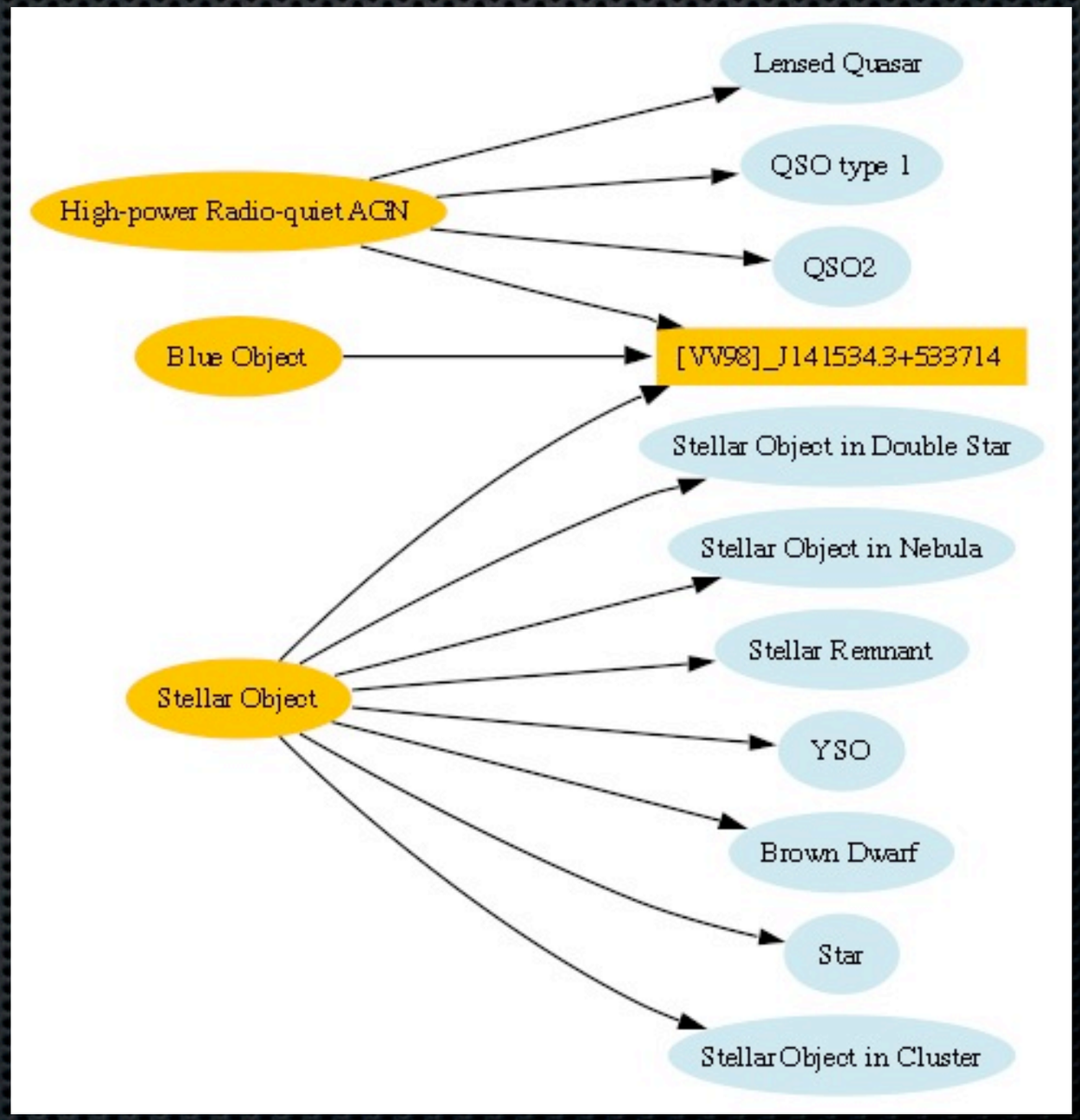
Ontologies/ Semantic Web

- Astronomical object types
- Hierarchy of concepts



Ontologies/Semantic Web

- Application : SIMBAD consistency checker
- Are multiple object types for one SIMBAD object consistent?



Storage, persistence

- R&D in this area has led to collaborate with IN2P3 and DICE to use iRODS at CDS for
  - CDS Portal
  - XMatch service
  - Table Access Protocol implementation in SIMBAD
  - VOSpace 2.0 implementation
- Clouds : which impact in the future ?

DICE : Data Intensive Cyber Environments, University of North Carolina

New interfaces and interactions

- Desktops, laptops are «traditional» tools to access to the data and the services but
  - smartphones are everywhere and Internet tablets will be everywhere in a near future
    - connected from everywhere is almost true ... and to everything should become true too
    - people are used to manipulate these Multitouch devices with the fingers (new kind of interaction which is also in progress on desktops and laptops)
- It is necessary to evaluate (at least) these new tools through tests and prototyping

CDS services with an Android Internet tablet

R&D and new services - CDS Scientific Council - June 29th 2011

Video illustrations

- Aladin at your fingertips
  - first video clip : example of navigation with the touchscreen and the virtual keyboard
  - second video clip : from Aladin to SIMBAD and then to Simplay
- Allsky lite (based on Healpix) prototyped for Android

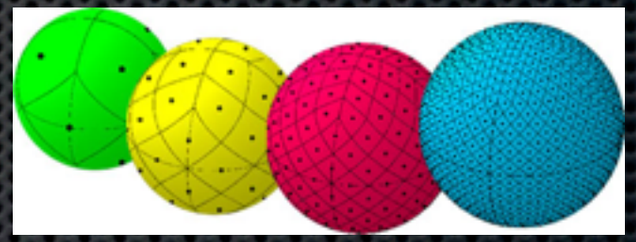
Aladin at your fingertips

Aladin at your fingertips (2)

Allsky lite on Android Internet tablet

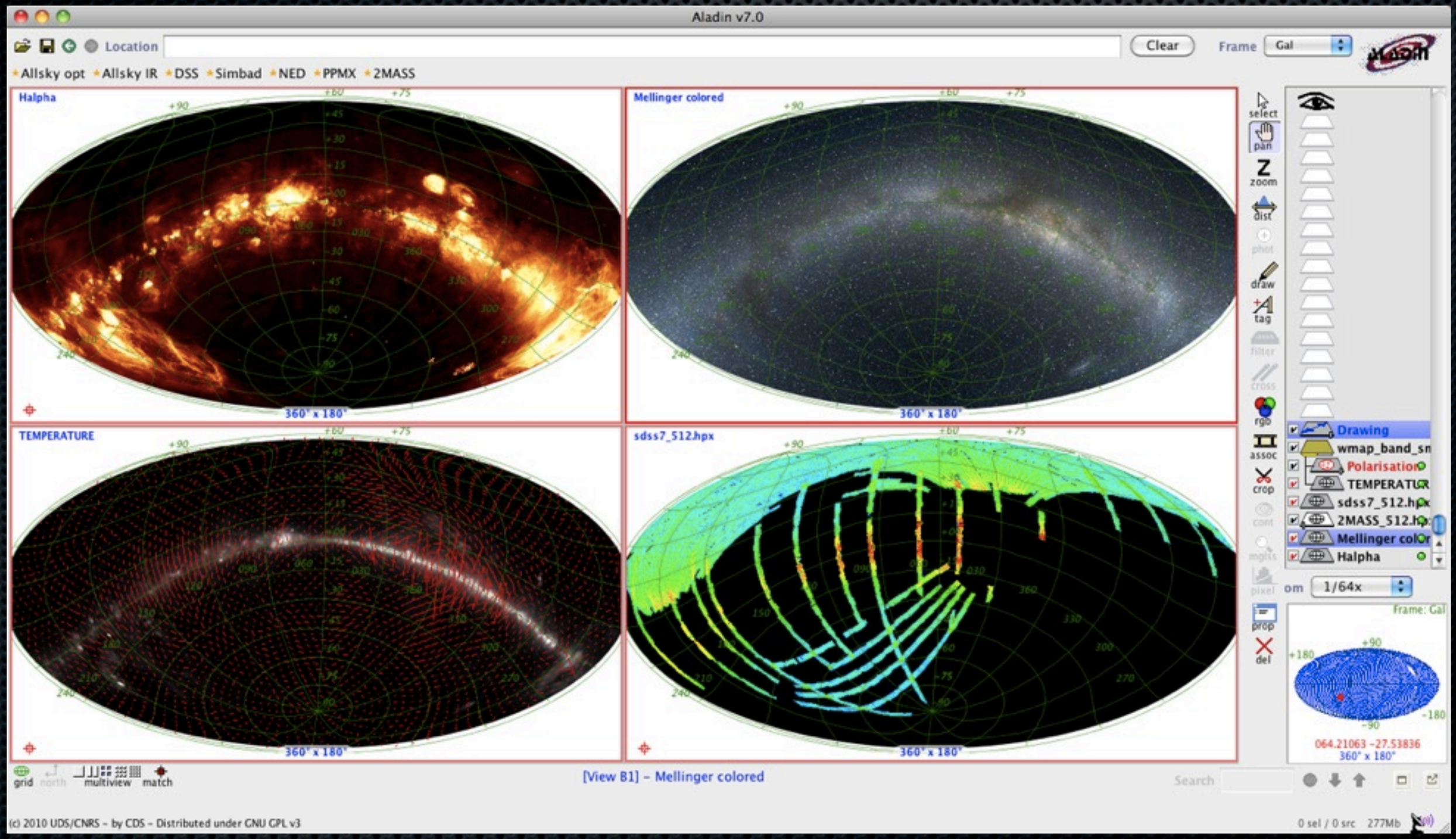
Aladin HEALPix mode (1/2)

- Aladin v7 released in December 2010
- Emphasis on all-sky data
  - hierarchical multi-resolution all-sky image surveys (using HEALPix tesselation)



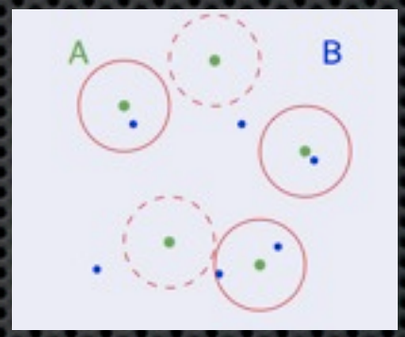
    - 2MASS, DSS color, IRAS, Spitzer, SHASSA (Hα), ...
  - HEALPix FITS files (WMAP, Planck)
  - visualization of polarization
  - catalogue density maps
  - all-sky progressive catalogues
    - SIMBAD, Tycho, 2MASS, PPMX, ...

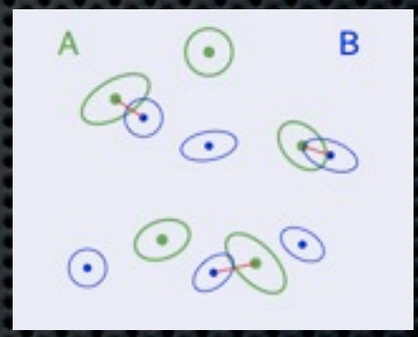
Aladin HEALPix mode (2/2)



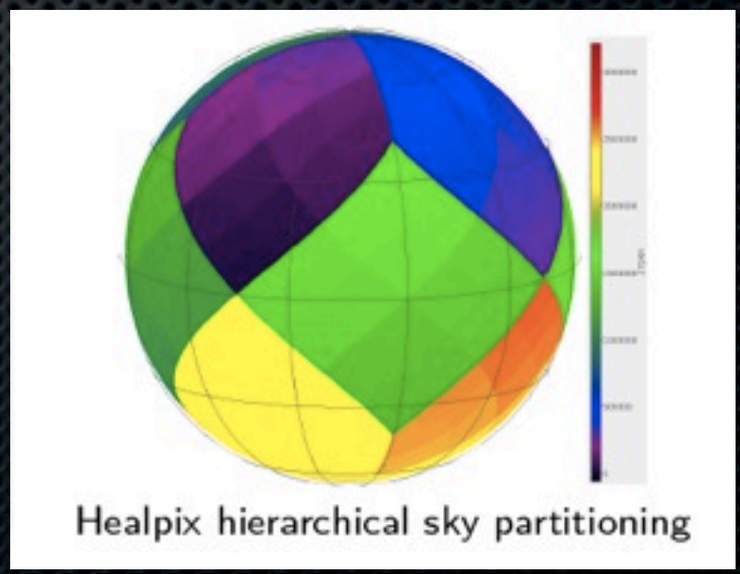
Cross-match service

- Purpose
  - Positional cross-identification of sources in 2 tables among:

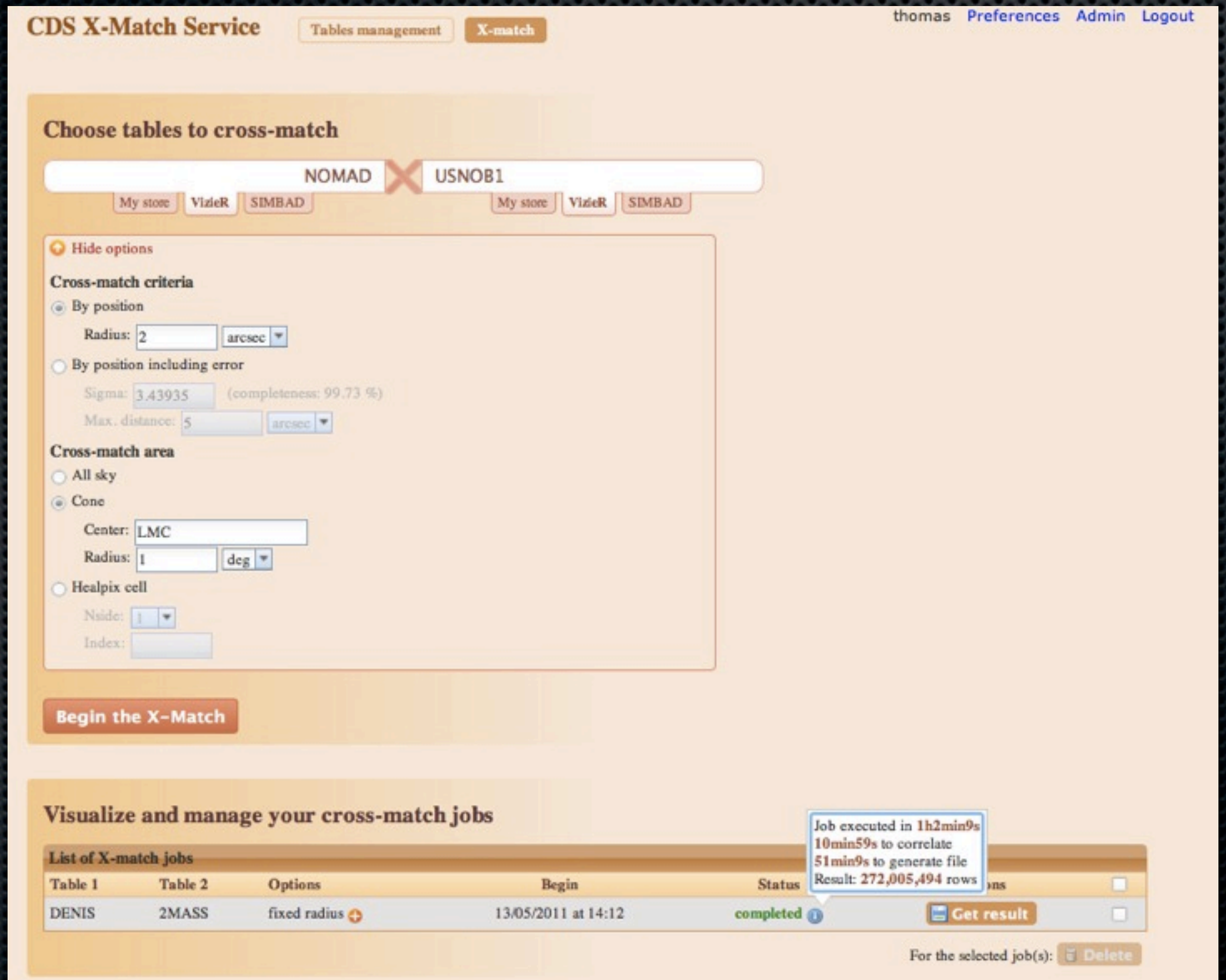




    - VizieR tables (including very large surveys)
    - SIMBAD
    - User-uploaded tables
- Focus on large-scale cross-match
- Beta test phase in coming weeks


Healpix hierarchical sky partitioning

Cross-match user interface



Cross-match performances

Cross-match at 5 arcsec :

Table 1	Table 2	Computation time	Result generation	Result size	Total time
SDSS *357M rows*	**2MASS** *470M rows*	7 min	11 min	**13 GB**	**18 min**
DENIS *355M*	**2MASS** *470M*	11 min	51 min	**58 GB**	**1 hour 2 min**
GLIMPSE *104M*	**NOMAD** *1.1 billion*	6 min	17 min	**19 GB**	**23 min**
SIMBAD *5M*	**USNOB1** *1 billion*	3 min	1 min	**1 GB**	**4 min**
SIMBAD *5M*	**PPMX** *18M*	20 seconds	20 seconds	**440 MB**	**40 sec**

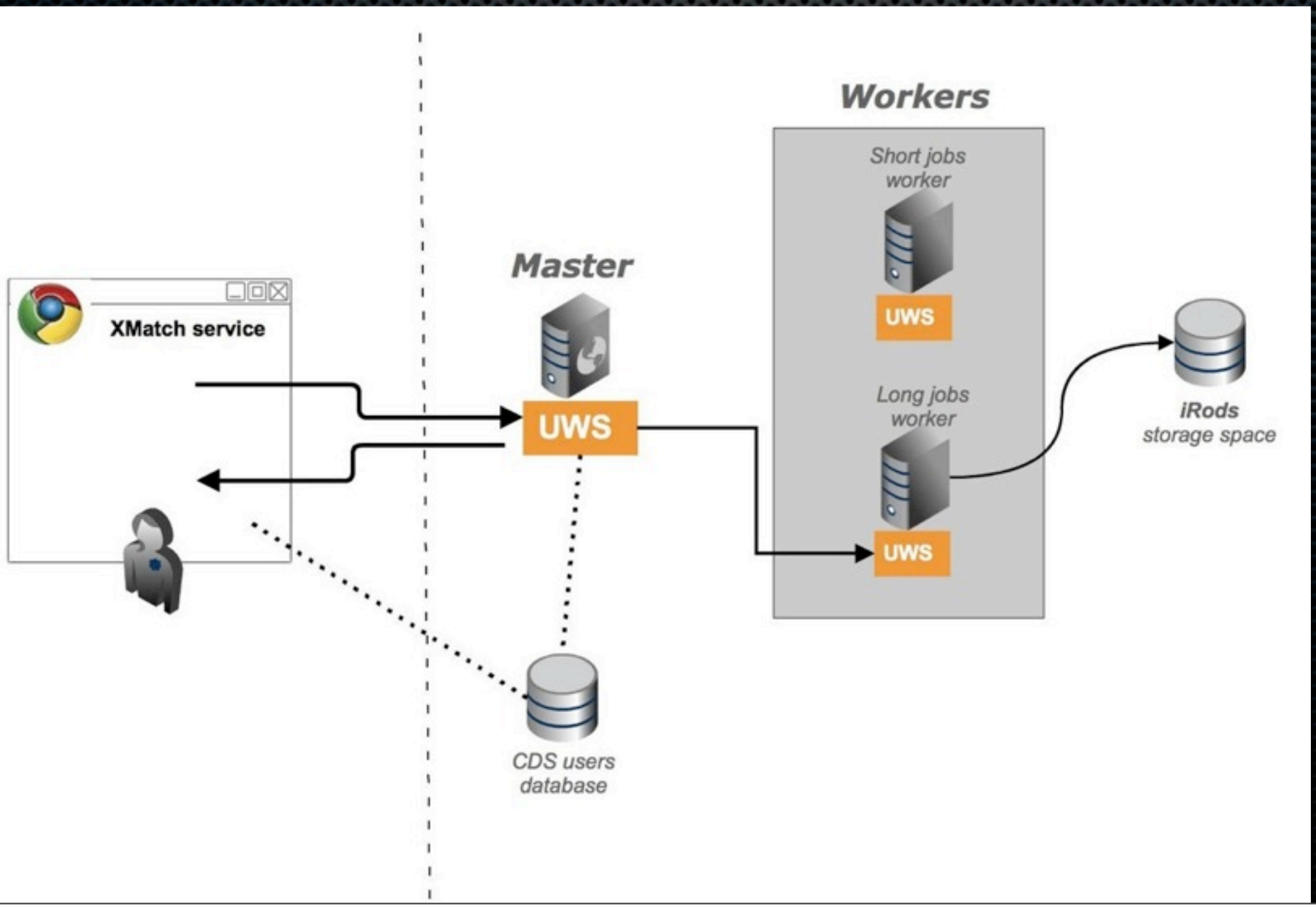
People involved

- **Portal**
  - Pascal Wassong
  - Thomas Boch
  - Sébastien Derrière
- **Annotations**
  - Brice Gassmann
  - Thomas Boch
  - Sébastien Derrière
- **Cross-match**
  - François-Xavier Pineau
  - Thomas Boch
  - Sébastien Derrière
- **Aladin all-sky**
  - Pierre Fernique
  - Anaïs Oberto
  - Thomas Boch
  - François Bonnarel
- **Storage and persistence**
  - Vincent Meslard
  - Cyril Pestel
  - André Schaaff
- **New interfaces and interactions**
  - Vincent Kaestlé
  - Maxime Royer
  - Pierre Fernique
  - André Schaaff

Planned developments

- Build modular, flexible, shareable widgets
- Make the portal "clever"
  - understand non-positional queries
    (using semantics, ontologies, Unified Content Descriptors, etc)

See Strategy talk

- Apprehend new links between contents
- Customization of user profile
- Finalize Allsky Lite and make it available on Android Market
- Explore the use of 3D screens
- Evaluate the use of Clouds in CDS services

Cross-match service architecture