

Outreach with multitouch screens

(Desktops, Smartphones, Internet tablets)

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IVOA meeting, Naples, 16-20 May 2011



Purpose

- Smartphones, multitouch Internet tablets (based on Apple iOS, Google Android, ...) are everywhere, multitouch screens are also in progress on desktops and laptops
 - People are used to manipulate with the fingers
- Feedback about recent work
 - Study about Aladin and the Multitouch
 - Experiments with multitouch Internet tablets and Smartphones (existing services, etc.)

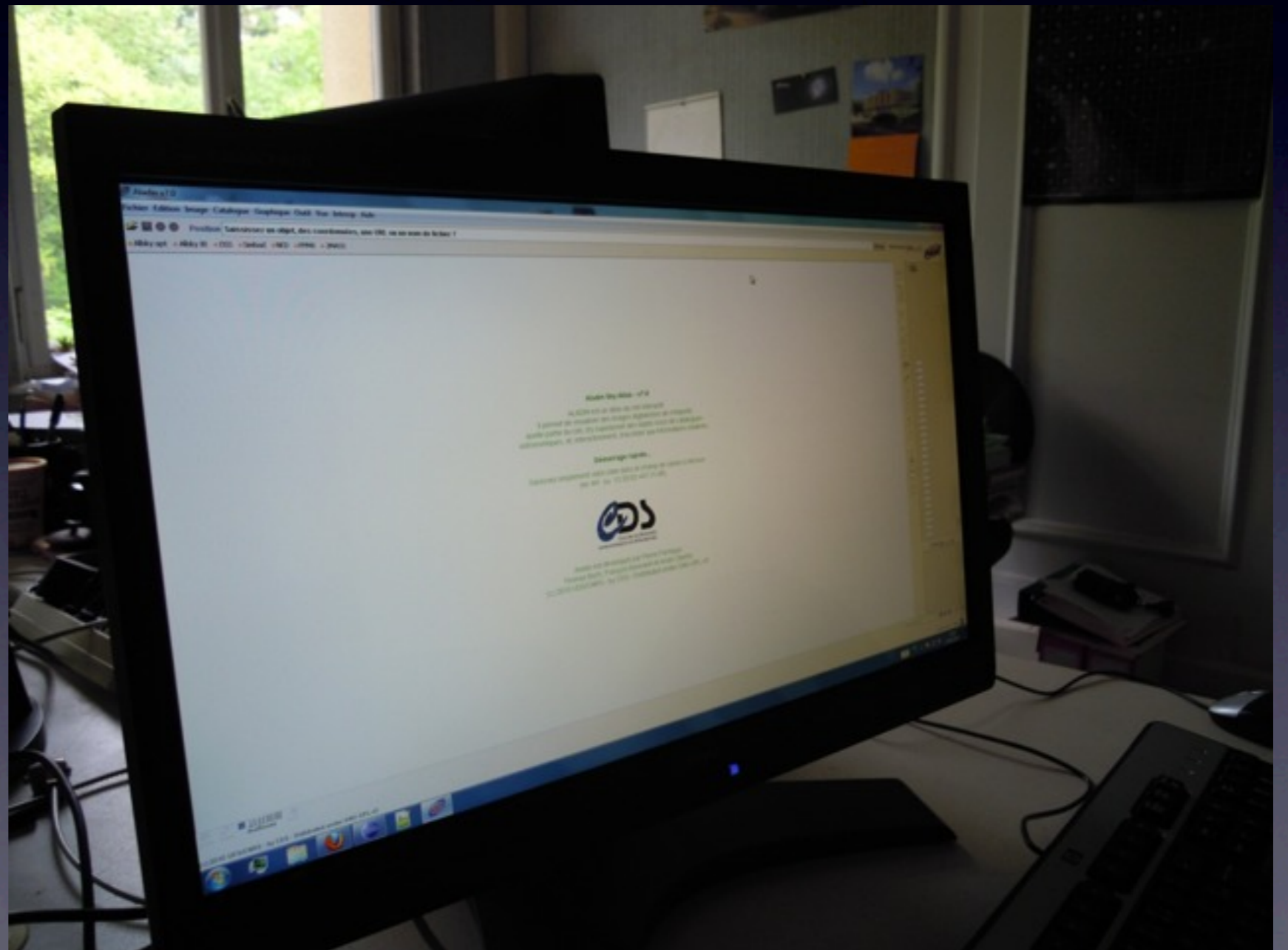
Study about Aladin and the Multitouch

- It is often possible to use an application designed for mouse-keyboard interaction with a multitouch screen but it is not always useful because it has not been designed for that !
- Multitouch is not platform independent (OS, softwares, screen drivers, ...)
- A few quick video clips to illustrate...

Study about Aladin and the Multitouch (2)

Configuration

- Windows 7 pro + 22 inches multitouch screen
- Aladin 7 without any changes



Video clips

- See video 1, video2, video3, video4

Study about Aladin and the Multitouch (3)

- It was easy to manipulate Aladin in the Allsky mode with the fingers for zooming, moving, ... the images
- Concerning the components like menus, buttons, ..., it is less accurate to select something than with the mouse (depends on the size and of the position (example : a small button near the border of the display))
- The native virtual keyboard is not easy to select in the Allsky mode (true also for other applications)

Next (possible) step

- Creation of a simplified version of the Aladin Allsky mode
 - remove of too advanced vocabulary, fonctionnalités, ...
 - more intuitive virtual keyboard access
 - ...
- Just as an interactive screen : nice for planetariums, schools, science museums, ...

Experiments with multitouch Internet tablets

- Aim : test the main CDS services on mobile devices, prototype new services and tools
 - Previously we worked already on iPhone and Android Smartphones through specific developments (CDS Portal , Vizmine)
- Some criterias : display performance, coherance of the display content, ability to be used with the fingers compared to the mouse, etc.
- Remark : Aladin is out of the scope because no Java Virtual Machine is available on iOS and Android
- Configuration: Archos 101 (480 g.), 10.1 inches (1024*600), ARM Cortex A8 1GHz, Android 2.2, Wifi

Remark about education

- «Electronic schoolbag» experiences are on going (mainly with Internet tablets)
- In this case it is possible to suppress the desktops in the school (no more dedicated rooms)
- Courses and tutorials can be made with this devices
- It will become mandatory to offer services and tools useable on this kind of matertial

Previous experiments with Smartphones

- CDS Portal on iPhone, iPod Touch, ... (T. Boch)



- Vizmine on Android (M. Royer, ,A. Schaaff)



Illustration

- Examples based on existing services
- The aim was to evaluate the need of dedicated versions (other design, presentation of the data, etc.)

VizieR

http://vizier.u-strasbg.fr/viz-bin/VizieR

CDS Centre de Données astronomiques de Strasbourg

Simbad VizieR Aladin Catalogs Dictionary Biblio Tutorials Resources

VizieR Service

Welcome to the new VizieR interface: [What's New \(comments welcome!\)](#) - [Help](#) - Return to the old VizieR version [here](#).

CDS Portal: search by position for available data in CDS services (Simbad, Aladin and VizieR).

Search Criteria

Preferences

max: 50

HTML Table

All columns

Compute

Mirrors

Find catalogs among 8940 available

Clear m51 Find...

Expand search Wavelength Mission Astronomy

Catalog, author's name, word(s) from title, description, etc. e.g.: AGN, Veron, I/239, or bibcodes...

1 2 3 4 5 6 7

@ # \$ % & * -

ALT ! " ' : ; /

ABC , . _

http://vizier.u-strasbg.fr/viz-bin/VizieR-2

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Simbad VizieR Aladin Catalogs Dictionary Biblio Tutorials Resources

Catalog Selection Page

Welcome to the new VizieR interface: [What's New \(comments welcome!\)](#) - [Help](#) - Return to the old VizieR version [here](#).

CDS Portal: search by position for available data in CDS services (Simbad, Aladin and VizieR).

8 catalogs found (obsoleted catalogs discarded)

Search Criteria

Keywords

m51

Tables

Enlarge

Preferences

max: 50

HTML Table

All columns

Compute

Mirrors

CDS, France

I/A+A/309/446	478 HII Regions in M51 (Petit+, 1996)	ReadMe+ftp
I/A+A/397/473	HST photometry of M51 cluster (Bik+, 2003)	ReadMe+ftp
I/AJ/135/1567	Bright star clusters in M51 (Hwang+, 2008)	ReadMe+ftp
I/ApJ/479/231	PNe in M51, M96 & M101 (Feldmeier+ 1997)	ReadMe+ftp
I/ApJ/582/170	M51 Planetary Nebula Candidates (Durrell+, 2003)	ReadMe+ftp
I/ApJ/601/735	M51 luminous X-ray sources (Terashima+, 2004)	ReadMe+ftp
I/ApJ/633/871	Positions and photometry of HII knots in M51 (Calzetti+, 2005)	ReadMe+ftp
I/MNRAS/394/2266	151 SN 2005cs one-year photometry (Pastorello+, 2009)	timeSerie Objects ReadMe+ftp

Footprints from VizieR

Galactic Ecliptic Equatorial [Help]

B/hst — HST Archived Exposures Catalog (STScI, 2007)

← Ion Galactic

VizieR (2)

- Rotation of the tablet to display more rows

http://vizier.u-strasbg.fr/viz-bin/VizieR-4

VizieR Result Page

J/A+A/309/446/table2 [HII Regions in M51 \(Petit-, 1996\)](#)
[Post annotation](#) Large catalogue of the HII [ReadMe+ftp](#)
regions observed in M51 (478 rows)

FullSource	CCM	Xpos	Ypos	Flux	eDiam	gDiam
		arcsec	arcsec	10-19W/m2	arcsec	arcsec
1	1	-178.76	-85.35	25	4.4	11.0
2	2	-176.92	-139.22	11		8.5
3	3	-170.22	-63.50	51	5.6	13.0
4	4	-168.43	36.38	5		9.6
5	5	-163.07	-123.78	128	5.8	10.6
6	6	-158.95	-136.33	74	5.3	14.5
7	7 72B	-156.79	-115.91	660	9.4	26.4
8	8 74A	-154.66	-65.84	267	8.1	18.7
9	9	-154.46	-85.04	22	2.6	12.4
10	10	-153.52	-127.42	113	4.9	10.8
11	11 77B	-153.11	-31.36	73	4.2	12.6
12	12	-152.09	2.85	73	4.0	16.8
13	13	-148.12	-11.76	64	5.2	11.1
14	14 78A	-147.06	-20.30	45	3.9	10.9
15	15	-146.02	-46.36	34	4.9	10.5
16	16	-145.51	-145.44	26	3.5	13.5
17	17	-144.86	-163.93	68	4.8	15.2
18	18	-141.71	57.82	11	2.8	9.2
19	19	-141.03	62.77	18	4.6	9.6
20	20 76A	-140.58	20.78	197	7.4	15.4
21	21	-139.80	-164.01	51	4.3	11.6
22	22	-139.08	-9.71	92	6.3	15.2
23	23 79	-138.21	29.97	181	5.7	12.9
24	24	-135.52	-192.52	310	7.1	12.2
25	25	-135.26	60.97	25	5.3	13.5
26	26 71A	-134.36	-180.11	1507	8.3	33.6
27	27 80A	-130.93	35.61	67	4.6	9.6
28	28	-130.11	44.51	14		10.0
29	29	-128.44	54.44	11	1.7	11.9
30	30 80	-128.08	28.66	168	4.2	13.8
31	31	-126.40	-196.24	118	5.9	11.6
32	32	-122.81	9.35	13	1.0	10.8
33	33	-122.48	-29.49	27	2.1	11.9
34	34 77A	-121.95	-5.68	66	2.4	13.9
35	35	-119.99	76.29	488	8.7	19.8
36	36	-119.25	-205.79	109	7.4	16.6
37	37	-115.74	-92.05	9		9.0
38	38	-115.13	73.06	117	3.6	8.4
39	39	-113.38	-138.26	22	2.4	7.5
40	40	-113.17	-124.48	45	4.0	13.4
41	41 68A	-111.82	-214.50	113	6.2	14.0
42	42	-111.26	-8.00	95	6.6	12.6
43	43	-111.17	-77.76	8		9.6
44	44	-110.88	31.00	26	4.0	10.3
45	45	-109.90	-151.48	43	2.7	13.0
46	46	-109.66	91.11	24	3.5	9.6
47	47 76	-108.88	-31.08	488	4.0	16.7
48	48	-108.55	-223.27	77	5.0	13.5
49	49	-108.31	-137.43	36	3.7	9.5

Simbad

- With also the use of the screen rotation to have a better display of the data (less zooming and scrolling)

http://simbad.u-strasbg.fr/simbad/sim-id?Ident=m51&NbI...

SIMBAD query result

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

Object query : m51 C.D.S. - SIMBAD4 rel 1.177 - 2011.04.12CEST10:33:53

Available data: [Basic data](#) • [Identifiers](#) • [Plot & images](#) • [Bibliography](#) • [Measurements](#) • [External archives](#) • [Notes](#) • [Annotations](#)

Basic data :

M 51 -- Seyfert 2 Galaxy query around with radius arcmin

Other object types: Sy2 () , G (APG, KHG, LEDA, 2MASX, MCG, TC, UGC, UZC, Z, [H92], [M98c], [SLK2004], [VDD93]), AGN ([VV2000c], [VV2003c], [VV2006c], [VV98c]), IR (IRAS, ISOSS, PSCz, [DML87]), X (RX, 1RXS, XMMU, [LPS2002]), * (BD, PLX), G1P (KPG, [T76]), Rad (4C, GB1), IG (VV), G1G ([CHM2007])

ICRS coord. (ep=J2000): 13 29 52.698 +47 11 42.93 (Infrared) [- - -] B [2006AJ....131.1163S](#)

FK5 coord. (ep=J2000 eq=2000): 13 29 52.698 +47 11 42.93 (Infrared) [- - -] B [2006AJ....131.1163S](#)

FK4 coord. (ep=B1950 eq=1950): 13 27 46.32 +47 27 10.6 (Infrared) [- - -] B [2006AJ....131.1163S](#)

Gal coord. (ep=J2000): 104.8516 +68.5607 (Infrared) [- - -] B [2006AJ....131.1163S](#)

Radial velocity / Redshift / cz: V(km/s) 465 [61] / z(-) 0.00155 [0.00020] / cz 465.0 [61.0] (-) D [1999PASP...111..438F](#)

Parallax mas: 7.8 [16.9] D [1995GCTP...C.....0V](#)

Morphological type: Sc D ~

Angular size (arcmin): 8.217 5.587 57 (-) (IR) C [2006AJ....131.1163S](#)

Fluxes (5):
B 8.96 [0.06] D [2007ApJS...173..185G](#)
V 8.36 [0.06] D [2007ApJS...173..185G](#)
J 6.401 [0.019] C [2006AJ....131.1163S](#)
H 5.653 [0.02] C [2006AJ....131.1163S](#)
K 5.496 [0.025] C [2006AJ....131.1163S](#)

essential notes:

- [NGC 5195](#) is a possible companion
- = M 51a in [2004ApJ...602..231C](#)
- See GALEX UV data in [GALEX data](#)

Hierarchy : number of linked objects whatever the membership probability is (see description [here](#)) :

parents : 1 children : 55 siblings : 137 Display criteria : All

Identifiers (45) :

M 51	2MASX J13295269+4711429	UGC 8493	[M98c] 132746.9+472716
APG 85A	MCG+08-25-012	UZC J132952.1+471144	[SLK2004] 853
APG 85	NAME WHIRLPOOL	VV 403	[T76] 85A
	NAME QUEFFTON MARK		

CDS Portal

Portal [My data](#) [Login](#) [Preferences](#) [Register](#)

Target:

J2000 position for m51: 13 29 52.698 +47 11 42.93

Object identifiers, measurements and bibliography for m51

- Object type: Seyfert 2 Galaxy
- Morphological type: Sc
- [More SIMBAD data for m51](#)
- [2351 bibliographic references](#)
- [485 objects within 2'](#)
- [Display map around m51](#)
- [Display SimPlay interactive map around m51](#)
- Related objects in bibliography:

Images for m51

- [Display region in Aladin \(Web Start\)](#)

- Performances are «good» for an interactive use (not very far from a laptop) but is not possible to link with Aladin

[Display SimPlay interactive map around m51](#)

[+ Related objects in bibliography:](#)

Images for m51

- [Display region in Aladin \(Web Start\)](#)

Survey	Band	λ (μm)	Size	Epoch	Resolution	Download
2MASS	J	1.24	8.5' x 17.0'	1998-05-27	0.9" / pixel	fits
2MASS	H	1.65	8.5' x 17.0'	1998-05-27	0.9" / pixel	fits
2MASS	K	2.16	8.5' x 17.0'	1998-05-27	0.9" / pixel	fits
POSSII	F	0.65	12.9' x 12.9'	1994-06-07	1.0" / pixel	orig fits
POSSII	F	0.65	12.9' x 12.9'	1994-06-03	1.0" / pixel	orig fits
POSSII	J	0.49	12.9' x 12.9'	1993-03-02	1.0" / pixel	orig fits
POSSII	J	0.49	12.9' x 12.9'	1994-06-02	1.0" / pixel	orig fits
POSSII	N	0.83	12.9' x 12.9'	1996-02-28	1.0" / pixel	orig fits

[Display grayscale image](#)

Catalogues for m51

- [8 catalogues with 'm51' keyword](#)
- [209 catalogues around m51:](#)

Simplay

(Flash Player)

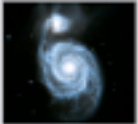
10:43

http://cdsweb.u-strasbg.fr/SimPlay/

Recherche

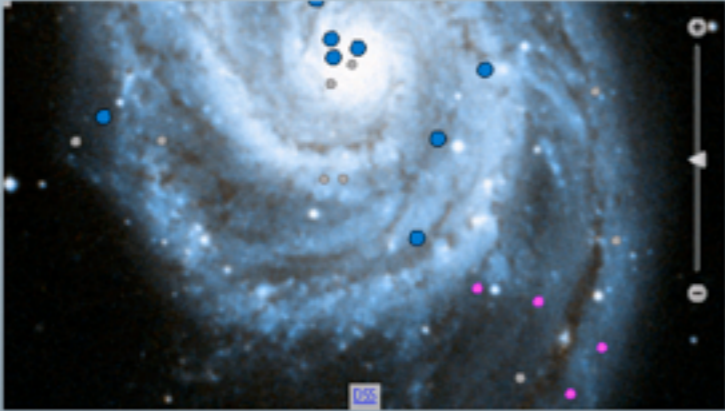
Cible : m51 ok

Exemples : M51 | 22 37 04.29 +34 24 58.5



m51

Plein écran | Préférences | Aide



Objets

Infos-bulles activées

sélectionner: tout | aucun

- Galaxie (18)
- Etoile (376)
- Nebuleuse (56)
- Région HII (492)
- Objet infrarouge (1)
- Objet UV
- Autre type (14)

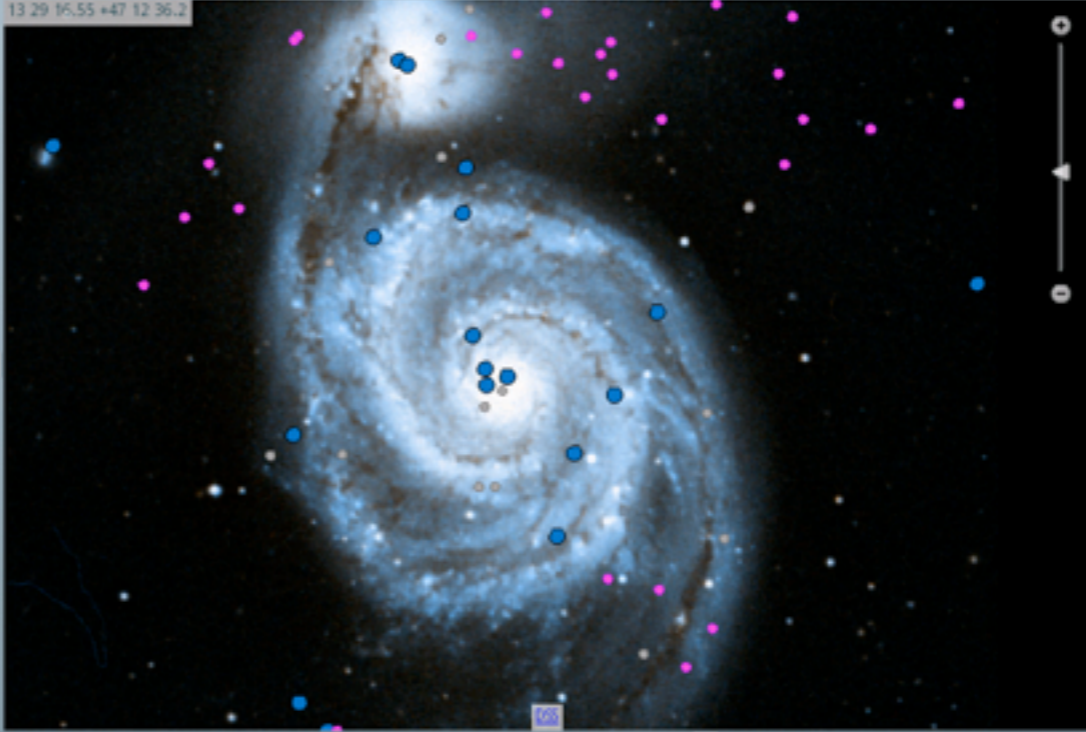
Données

TYPE	OTYPE	MAIN_ID	RA	DEC	B	V	R	J	K	SP_TYPE	PMRA	PMDEC
Autre type	Seyfert_2	M_51	13 29 52.698	+47 11 42.93	8.96	8.36		6.401	5.496			
Galaxie	FartofG	IRAS020081WR_314	13 29 55.54	+47 14 01.9								
Galaxie	RadioG	B3_1327+474C	13 29 54.90	+47 12 26.0								
Galaxie	FartofG	IRP971NGC_5194_1	13 29 40.78	+47 12 42.3								
Galaxie	FartofG	IRP971NGC_5194_2	13 29 44.14	+47 11 38.3								
Galaxie	FartofG	IRP971NGC_5194_3	13 29 47.26	+47 10 53.4								
Galaxie	FartofG	IRP971NGC_5194_4	13 29 48.69	+47 09 48.4								
Galaxie	FartofG	IRP971NGC_5194_5	13 29 53.89	+47 11 47.6								

10:44

http://cdsweb.u-strasbg.fr/SimPlay/

13 29 16.55 +47 12 36.2



Objets

Infos-bulles activées

sélectionner: tout | aucun

- Galaxie (18)
- Etoile (376)
- Nebuleuse (56)
- Région HII (492)
- Objet infrarouge (1)
- Objet UV
- Autre type (14)
- Radio, HI, Maser (15)
- Objet X (141)

Imprimer | Centrer l'image

Données

Dictionary

(Flash Player)

http://cdsweb.u-strasbg.fr/Dic9/

CDU Centre de Données astronomiques de Strasbourg

Simbad VizieR Aladin Catalogs Dictionary Biblio Tutorials Developers

Dictionary of Nomenclature of Celestial Objects

(Last update: 06-Apr-2011)

Informations

Form

Object class: a [object Object] Search

Result

Show only selected Show all Compare Print data table Choose columns Filter Help

Acronym	Use	Format (?)	OType (?)	Year	First author	Explanation
[ABC94]	[ABC94]	WW NN {IF} NN	Clump	1994	ADANTI S.+	Adanti + Battinelli + Capuzzo-Dolcetta+, 1994
[ACH99]	[ACH99]	{Knot} W {Knot} N	Knot	1999	APPLETON P.N.+	Appleton + Charmandaris + Horellou+, 1999
[ACL2005]	[ACL2005]	{QSO J0942-1104 abs} N.NNNN	Absorber	2005	AGAFONOVA I.I.+	Agafonova + Centurion + Levshakov+, 2005
[AEL81]	[AEL81]	{L}NNa	Part of G	1981	ALLOIN D.+	Alloin + Edmunds + Linblad+, 1981

Result stopped after 100 entries - Items showing: 200 (all) - No applying filter

http://cdsweb.u-strasbg.fr/Dic9/

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Simbad VizieR Aladin Catalogs Dictionary Biblio Tutorials Developers

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[ABC94]	[ABC94]	WW N {IF} N	Clump	1994	ADANTI S.+	Adanti + Battinelli + Capuzzo-Dolcetta+, 1994
<input checked="" type="checkbox"/> [ACH99]	[ACH99]	{Knot} W {Knot} N	Knot	1999	APPLETON P.N.+	Appleton + Charmandaris + Horellou+, 1999
<input checked="" type="checkbox"/> [ACL2005]	[ACL2005]	{QSO J0942-1104 abs} N.NNNN	Absorber	2005	AGAFONOVA I.I.+	Agafonova + Centurion + Levshakov+, 2005
[AEL81]	[AEL81]	{L}NNa	Part of G	1981	ALLOIN D.+	Alloin + Edmunds + Linblad+, 1981

More information

print choose columns

Details	[ACH99] (Appleton +)	[ACL2005] (Agafonova +)
Write	<<[ACH99] {Knot} W>> or <<[ACH99] {Knot} N>>	<<[ACL2005] {QSO J0942-1104 abs} N.NNNN>>
Object	Knot (SIMBAD class: PartofG = Part of a Galaxy)	Absorber (SIMBAD class: AbsLineSystem = Absorption Line system)
Remark	ISO and NRAO VLA observations	The absorption system towards

Result stopped after 100 entries - Items showing: 200 (all) - No applying filter

More information window...

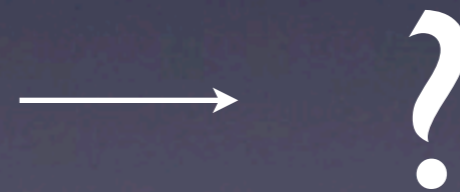
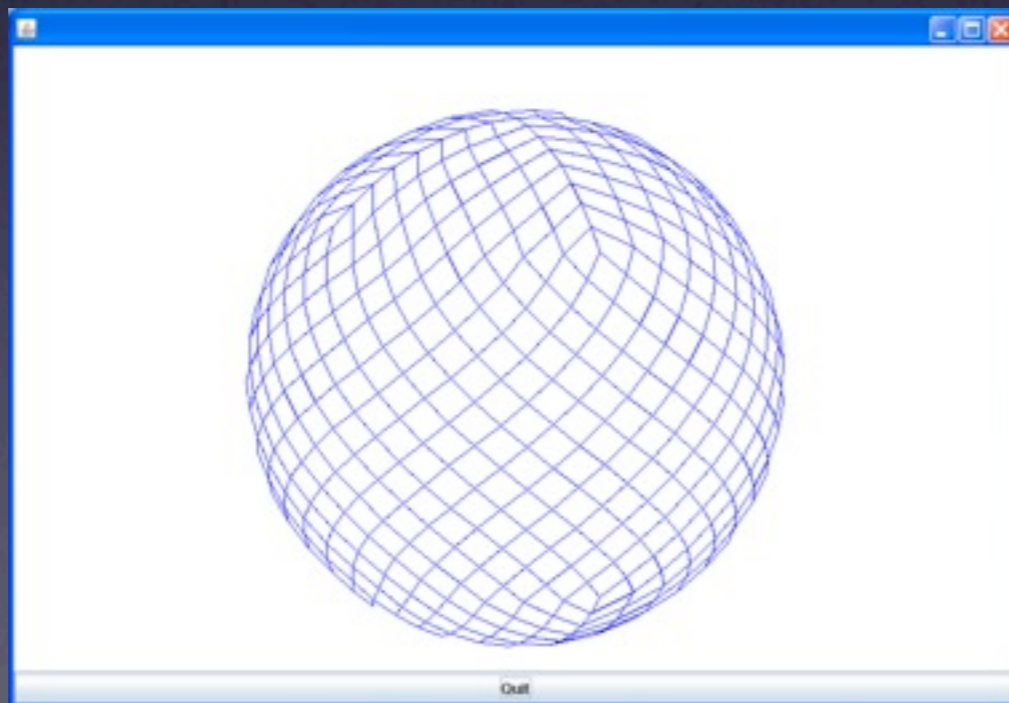
©ULP/CNRS Contact: ?

Remarks about this test

- Performances are good, it is not very far from a desktop or a laptop, like for these machines the quality of the network is the most important factor
- Even with a 10 inches multitouch mobile device
 - it is not really easy to do everything like with a mouse concerning the buttons, popups, ... it depends on the size of these elements but it is possible to zoom => it should be nice to detect the kind of device and to adapt the presentation (see for example CDS mobile portal) and to remove (or to inform clearly the user) links to tools which can't be used (example : link to Aladin)

New developments

- Ongoing work during a training periode : bottom up (see figure) work for the implementation of an Aladin Allsky mode «Lite» for Android
 - Reuse of a set of Java classes from Aladin
 - Use GPS, accelerometer, compass to refresh the display



Video clip...

Video clip

- See video5

Remark

- It will also work on Android smartphones if OpenGL (video performances) is available

Roadmap

- Use the feedback from the Android developments
- Study Aladin with Multitouch on Linux platforms
- Deeper experiments with HTML5
- Next updates during Pune Interop