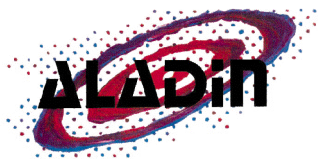


Aladin, a visualization tool for the VO



Thomas Boch [CDS – Strasbourg]

boch@astro.u-strasbg.fr



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SC4DEVO-3 – July 28-29 2005



Introduction

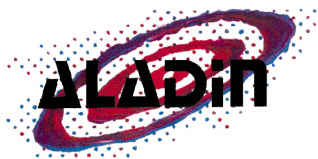
Aladin provides an easy access to both astronomical images and catalogues (distributed resources)

- Developed in Java (Java 1.1.4+ compatible)
- Available :
 - As a signed applet (no installation required) running in any browser
 - As a standalone application without limitation
 - Through Java Web Start (*soon*)



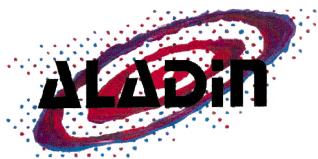
Introduction (2)

- Development started in 1997
 - Initial purpose : visualize catalogues data and images at CDS
- Today :
 - All astronomical data available from astronomer's desktop
 - Toolkit to compare and correlate them



Aladin, a VO portal – VO compliance

- Supports **FITS** images (plans to support FITS extensions)
- Loads **VOTable** catalogues (*Tab Separated Value* format also supported)
- Access to **SIAP** (**S**imple **I**mage **A**ccess **P**rotocol) servers (and *IDHA*)
- Access to **ConeSearch** servers
- Use of **UCDs**, **U**nified **C**ontent **D**escriptors (to localize RA/DEC columns, and in filters)
- Save and export catalogue planes as **VOTable** files



Aladin, a VO portal - Challenges

- Aladin addresses typical VO challenges:
 - Locating data of interest
—→ **GLU registry**
 - Browsing and accessing distributed datasets
—→ **MetaData tree + VO compliance**
 - Exploring and visualizing multiwavelength data
—→ **Multiview, Multiprojection, colour composition, blinking, filters, contours, ...**



GLU system

- Home-grown registry system (developed by P. Fernique)
- Aladin uses the GLU to:
 - Automatically find data servers
 - Automatically build query forms
 - Find out nearest mirror site
 - Convert requests to suit syntax of distant server
- Users can add their own entries to describe their servers



GLU system (2)

Server selector

Choose an image server or a data server and fill in the associated form drawn below

Image servers:

- Aladin server
- SSS...
- SkyView
- SDSS**
- VLA...
- Others...
- Others:
- MyData

SDSS DR3 images

Fill in all these fields and press the SUBMIT button

Target

Radius in deg.

*** SUBMIT *** History Reset Clear Close

```
%ActionName          SDSSDR3
%Description          SDSS DR3 images
%Owner               CDS'aladin
%DistribDomain       ALADIN
%VersionNumber       1111152881
2005/03/18 14:34:41
%Url
http://casjobs.sdss.org/vo/DR3SIAP/SIAP.asmx/getSiap?POS=$1,$2&SIZE=$3&FORMAT=image/fits
%Param.Description    $1=Right Ascension
%Param.Description    $2=Declination
%Param.Description    $3=Radius in deg
%Param.DataType       $1=Target(RAd)
%Param.DataType       $2=Target(DEd)
%Param.DataType       $3=Field(RADIUSd)
%Param.Value          $3=0.17
%ResultDataType       Mime(sia/xml)
%Aladin.Label         SDSS
```



MetaData Tree

- Offers a hierarchical tree of available images for a region of the sky
- Relies on a XML (VOTable) description of the dataset
- Allows smart browsing and selection of data



MetaData Tree (2)

Data Tree

- cdfs
 - Aladin
 - 2MASS
 - K
 - H
 - J
 - GOODS-WFI
 - ICLWP
 - V89
 - B99
 - RC162
 - U38
 - GOODS-ACIS
 - LR.1-10REV
 - HR.1-10REV
 - GOODS-ISAAC
 - J
 - H
 - KS
 - GOODS-HST-ACS
 - F775W
 - epoch1
 - epoch2
 - epoch3
 - epoch4
 - epoch5
 - CDF-SOUTH-TILE-NORM2-9
 - CDF-SOUTH-TILE-NORM2-4
 - CDF-SOUTH-TILE-NORM2-15
 - CDF-SOUTH-TILE-NORM2-10
 - CDF-SOUTH-TILE-NORM2-8
 - CDF-SOUTH-TILE-NORM2-3
 - CDF-SOUTH-TILE-NORM2-14
 - CDF-SOUTH-TILE-NORM2-7
 - CDF-SOUTH-TILE-NORM2-2
 - CDF-SOUTH-TILE-NORM2-13
 - CDF-SOUTH-TILE-NORM2-6
 - CDF-SOUTH-TILE-NORM2-1
 - CDF-SOUTH-TILE-NORM2-12
 - CDF-SOUTH-TILE-NORM2-5
 - CDF-SOUTH-TILE-NORM2-11
 - F606W
 - F435W
 - F850LP
 - SERC
 - J
 - AAO
 - R

Server selector

Choose an image server or a data server and fill in the associated form drawn below

Image servers:

Aladin

VOdemo

SSS...

SkyView

VLA...

Others...

Ovm data:

MyData

Aladin image database

Step 1: Specify a target radius and press SUBMIT

Target: cdfs

Radius: 30 arcmin

Step 2: load one or several images

☐	2MASS	J (IR J)	8.6 'x17.1 '	981122
☐	2MASS	J (IR J)	8.6 'x17.1 '	981122
☐	GOODS-WFI	ICLWP (optical I)	8.2 'x8.2 '	DEEP2C
☐	GOODS-WFI	ICLWP (optical I)	39.4 'x41.3 '	DEEP2C
☐	GOODS-WFI	V89 (optical V)	38.1 'x37.3 '	DEEP2C
☐	GOODS-WFI	V89 (optical V)	8.2 'x8.2 '	DEEP2C
☐	GOODS-WFI	B99 (optical B)	36.2 'x33.3 '	DEEP2C
☐	GOODS-WFI	B99 (optical B)	8.2 'x8.2 '	DEEP2C
☐	GOODS-WFI	RC162 (optical R)	37.9 'x38.5 '	DEEP2C
☐	GOODS-WFI	RC162 (optical R)	8.2 'x8.2 '	DEEP2C
☐	GOODS-WFI	U38 (optical U)	37.6 'x38.4 '	DEEP2C

Data servers:

VizieR Catalogs

Surveys in VizieR

Missions in VizieR

Simbad

NED

Others..

FoV

SUBMIT Data Tree Reset Clear Close

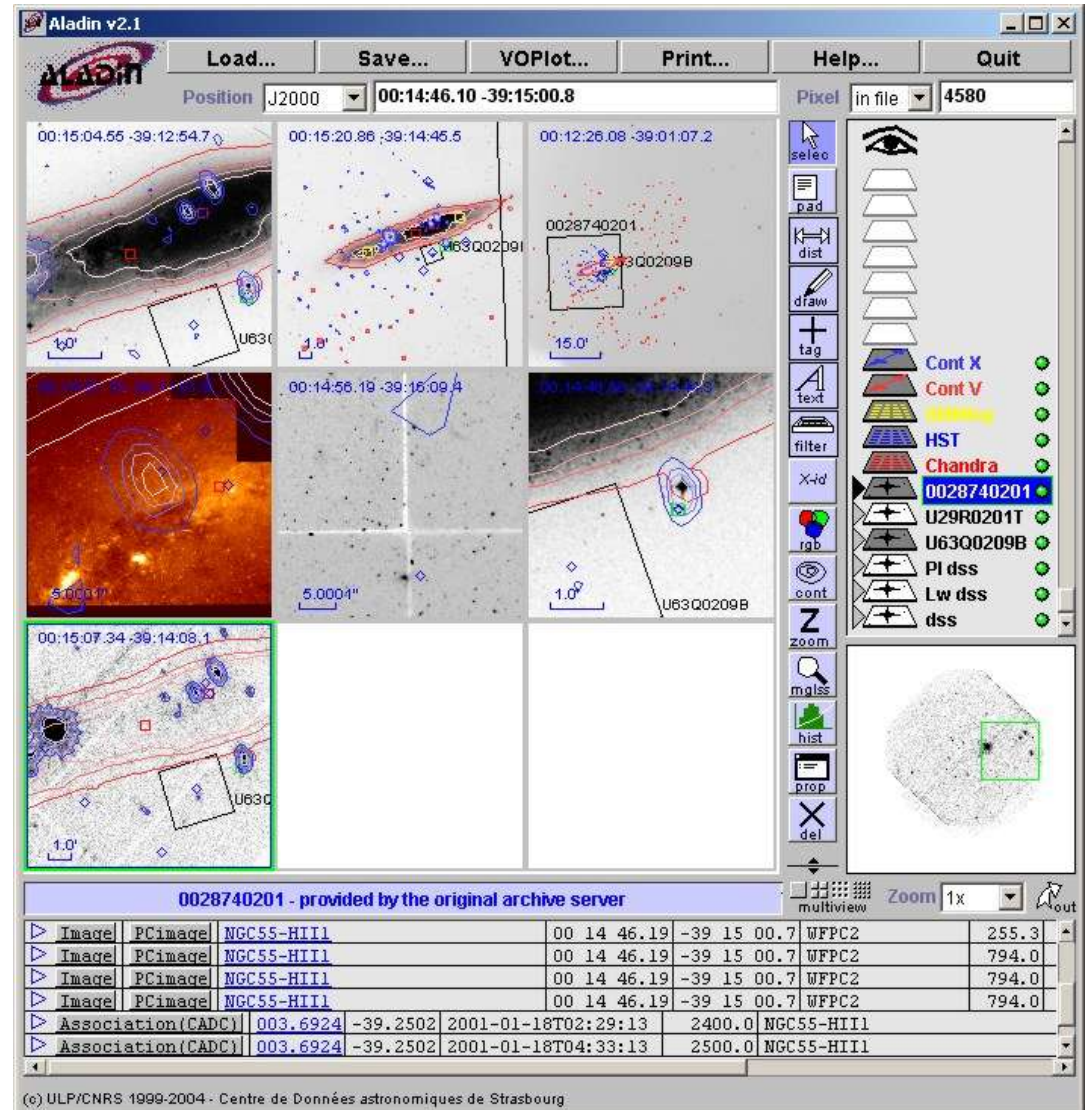
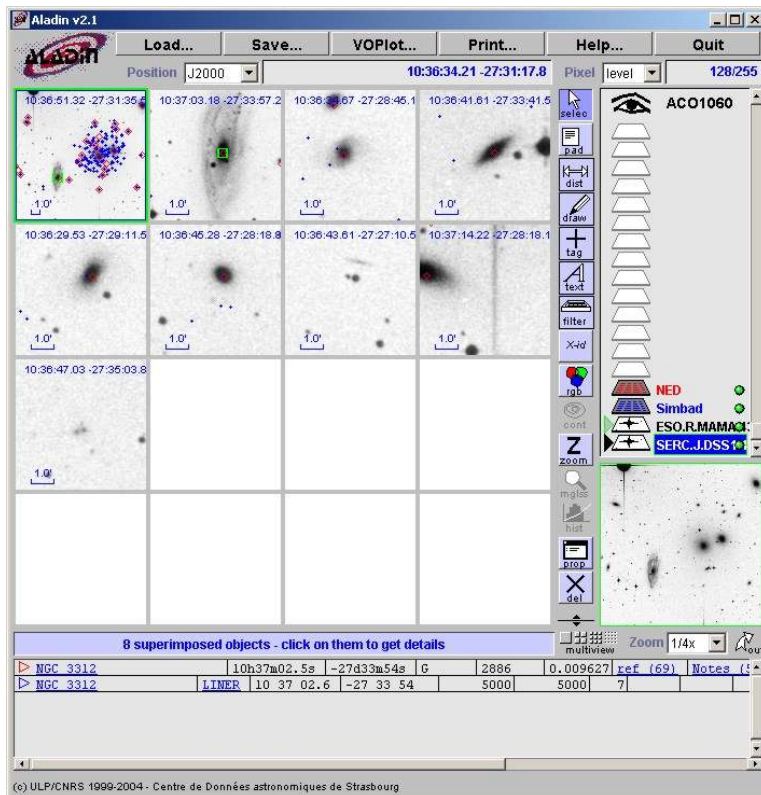


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Aladin toolkit

- Multiview mode

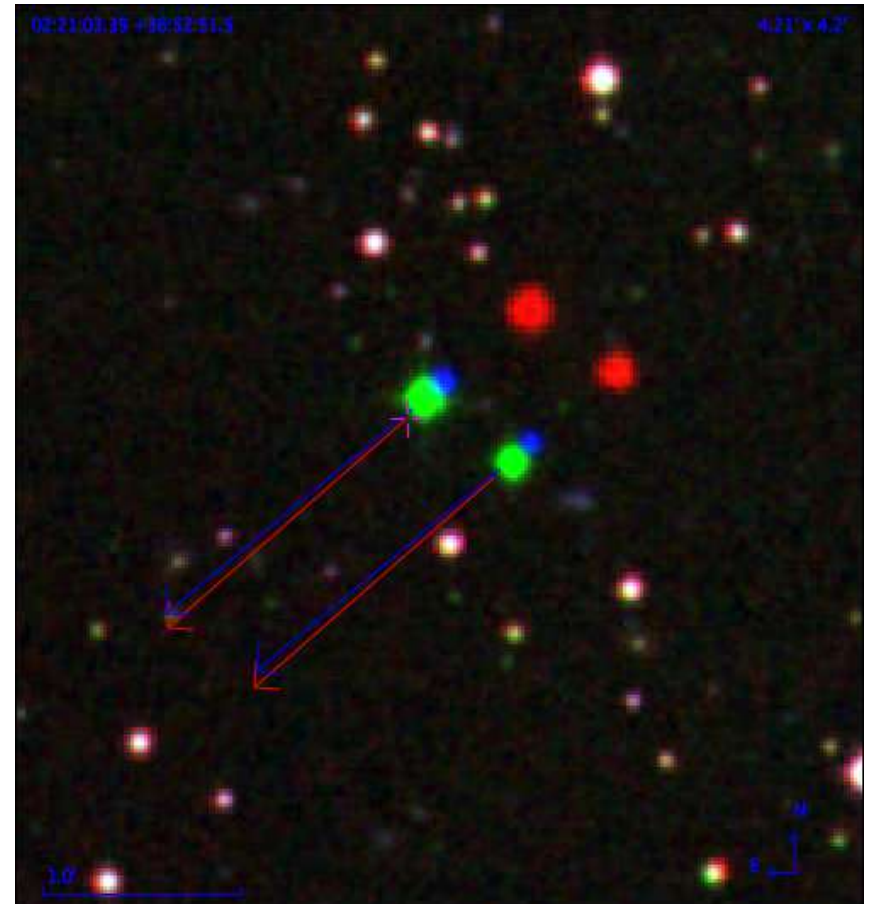


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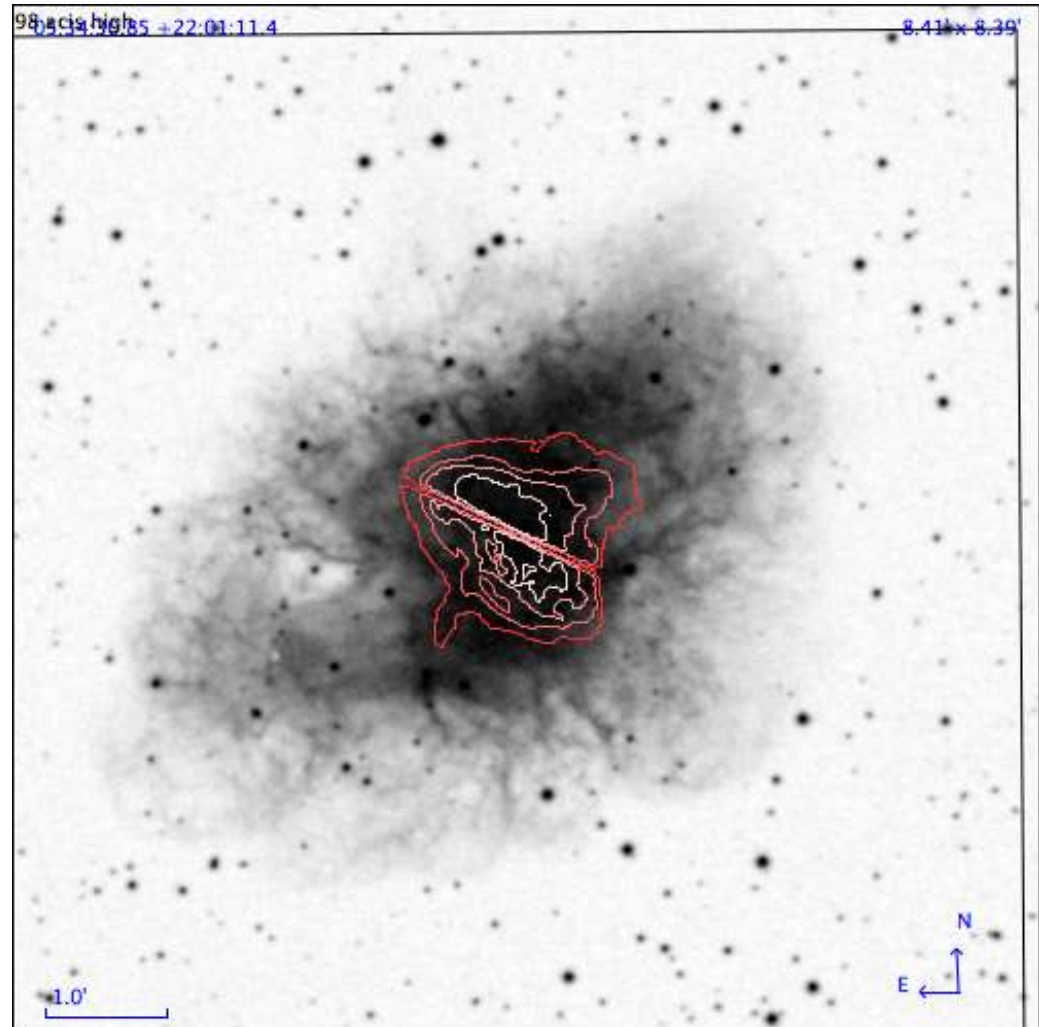
Aladin toolkit (2)

- Filtering capabilities
 - Select a subset of data
 - Modify the visual appearance of sources



Aladin toolkit (3)

- Iso-contours



Aladin toolkit (4)

- RGB color composition

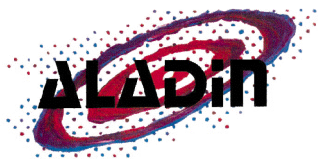


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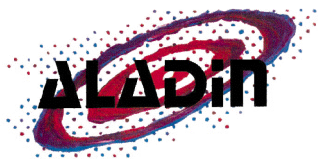
Aladin toolkit (5)

- Other tools :
 - Blinking mode
 - Image (re)calibration
 - Catalogue (re)calibration
 - Positional cross-matcher
 - Cut graph along a segment
 - Adjustment of image dynamic : transfer functions (log, sqrt, pow2)



Collaboration with other applications

- **ExtApp** Java interface
 - Defines possible interaction between Aladin and another Java tool
 - VOTable exchange oriented
 - Symmetrical interface : Aladin implements it, the external application also has to implement it
- Used for collaboration with VOPlot
- Easy to implement (Java)



ExtApp

```
public abstract interface ExtApp {  
    public abstract void loadVOTable(ExtApp app,  
    InputStream in);  
  
    public abstract void setVisible(boolean flag);  
  
    public abstract String execCommand(String cmd);  
  
    public abstract void showVOTableObject(String oid  
    []);  
  
    public abstract void selectVOTableObject(String  
    oid[]);  
}
```



Script mode

- Alternative to GUI mode
- Allows batch processing of repetitive tasks (first step towards workflows)
 - ie generation of sky charts
- Let other applications control Aladin

```
#!/usr/bin/perl
open(ALADIN,"| java -jar Aladin.jar");
print ALADIN "grid\n";
foreach $obj ("M1","M104","NGC2024") {
    print ALADIN "reset; get aladin,Vizier(GSC1.2),simbad $obj;\n";
    print ALADIN "sync; zoom 2/3x; reverse; save $obj.bmp\n";
}
print ALADIN "quit\n";
close ALADIN;
```



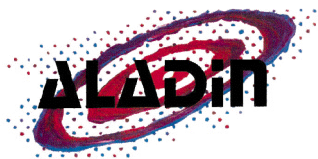
Demo !

- Demo plan
 - AllVO button
 - Metadata tree
 - Collaboration with VOPlot
 - Script mode
 - Aladin toolkit



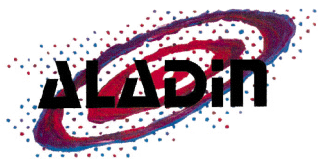
Ongoing development

- VisIVO/Aladin integration (collaboration with INAF)
- Overlay of detector footprints (collaboration with ESO)
- Visualisation of solar system data (collaboration with IMCCE)
- Link with AstroGrid infrastructure (MySpace, workflows)



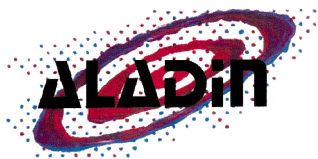
Next steps

- Access to Web Services
 - At the time being, Aladin can only access data provided by CGI HTTP servers
 - SkyNode, emerging standard to access catalogues data
- How to bridge the gap between VO and “traditional” astronomer toolkit ?
 - Study possible links between Aladin and IDL, IRAF, MIDAS, ...



Links

- Aladin main page :
<http://aladin.u-strasbg.fr>
- Aladin manual :
<http://aladin.u-strasbg.fr/java/aladin.pdf>
- Aladin FAQ :
<http://aladin.u-strasbg.fr/java/FAQ.htx>



Questions ?

- ...



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