

# CubeAccess prototype on Bodega collection

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# Bodega collection

Set of CO cubes for galaxies observed at Pico Veleta Spain

Archived and served by IAA , Granada, Spain by J.E Ruiz, IAA and SVO

Collection ported to CDS by courtesy of IAA.

# Scenario

- Galaxy discovery via HEALPIX allSKY map in Aladin (built from 2D average maps of the cubes)
- DataLinks for these galaxies
  - Retrieval
  - Updated SIA2 metadata (2013 Working draft)
  - AccessData (cutout, average maps, position velocity maps, spectra... )
    - STC-S syntax and old POS,SIZE,BAND syntax both work.
  - Etc ...

# Bodega Healpix Allsky map : nothing is visible (too small images)

Aladin v7.5 \*\*\* PROTOTYPE VERSION (based on v7.549) \*\*\*

File Edit Image Catalog Overlay Footprint Tool View Interop Help

Location [ ] Frame XY im...

Optical DSS Simbad NED +

bodegaALLSKY

Server selector

Others Allsky File all VO Watch FoV... Tools...

Image servers

- Aladin images
- SkyView
- UKIDSS
- Sloan
- SWarp
- DSS...

Catalog servers

- All VizieR
- Surveys
- Missions
- SimBAD
- NED
- MOC

User data access (image/table/script/dir) ?

Specify a filename or an URL and press the SUBMIT button

C:\Users\bonnarel\Documents\Aladin\bodegaALLSKY\ [Browse...]

Warning: Aladin is running in low memory configuration (28MB)

0 sel / 0 src 18fps / 35Mb

04:12:53.19 +07:00:58.3  
180° x 180°

01:31  
28/09/2013

# Bodega cubes footprints

Aladin v7.5 \*\*\* PROTOTYPE VERSION (based on v7.549) \*\*\*

**Properties of the plane "bodegaALLSKY"**

PlaneID: bodegaALLSKY  
Format: HEALPix CDS tessellation  
Transparency: -2.147483648E9  
C:\Users\bonnarel\Documents\Aladin\bodegaALLSKY

**HEALPix tessellation properties**  
Best pixel resolution: 805.2mas  
Tile format: FITS true pixels (BITPIX=32)  
Tile width: 512 pix (2^9)  
HEALPix NSide: 262144 (2^18)

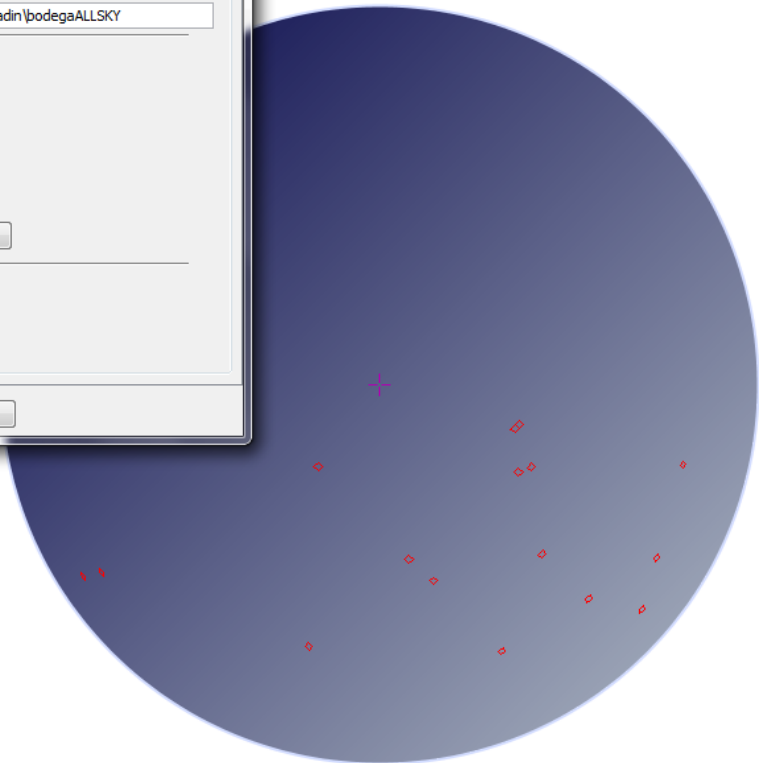
Get preview (jpeg)

HEALPix Coordsys: ICRS

More info:  Footprint  Progenitors

**Used projection**  
.projection center: 04 12 53.19 +07 00 58.3  
.method: SINUS  
.frame: Default

Apply Close



160" x 160"

Stack controls:

- the icon: show/hide a plane
- size: change object size
- zoom: adjust field size.
- Opacity: adjust transparency.

The vue is drawn according to the projection of a reference plane.

For changing the reference, click on its check box.

bodegaALLSKY M  
bodegaALLSKY

epoch - [ ] +  
size - [ ] +  
opac. - [ ] +  
zoom - [ ] +

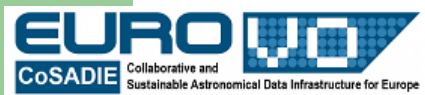
Frame: XY image  
+180 +90  
-90 -180  
04:12:53.19 +06:37:30.4  
180° x 180°

grid wink north multiview match

Warning: Aladin is running in low memory configuration (26MB)

0 sel / 0 src 23fps / 37Mb

FR 01:34 28/09/2013



# Centering the view on object ngc 1022

The screenshot displays the Aladin v7.5 software interface. The title bar reads "Aladin v7.5 \*\*\* PROTOTYPE VERSION (based on v7.549) \*\*\*". The menu bar includes "File", "Edit", "Image", "Catalog", "Overlay", "Footprint", "Tool", "View", "Interop", and "Help". The address bar shows "Location: **ngc 1022**". Below the address bar, there are tabs for "Optical", "DSS", "Simbad", and "NED", along with a "+" icon. The main window displays a star field centered on NGC 1022, with a red crosshair marking the center. The field is labeled "bodegaALLSKY" in the top left corner. The bottom status bar shows "160° x 160°".

On the right side, there is a "Stack controls" panel with the following options:

- select
- pan
- zoom
- dist
- phot
- draw
- tag
- filter
- cross
- xy
- rgb
- assoc
- crop
- epoch
- cont
- pbrel
- prop
- del

Below the stack controls, there are sliders for "epoch", "size", "opac.", and "zoom". At the bottom right, there is a small diagram of the field with a red dot at the center, labeled "Frame: ICRSd" and "039.63625 -06.67739 180° x 180°".

At the bottom of the window, there is a search bar and a status bar showing "0 sel / 0 src 25fps / 33Mb".



# Zoom on the NGC 1022 Average image in Healpix representation

## Progenitor button makes OBsID appear in Access window

The screenshot displays the Aladin v7.5 software interface. The main window shows a dark blue sky with a red diamond-shaped region. A zoomed-in view of a star cluster (NGC 1022) is visible within this region. Two windows are open over the main view:

- Properties of the plane "bodegaALLSKY"**:
  - PlaneID: bodegaALLSKY
  - Format: HEALPix CDS tessellation
  - Transparency: -2.147483648E9
  - Path: C:\Users\bonnarel\Documents\Aladin\bodegaALLSKY
  - HEALPix tessellation properties:
    - Best pixel resolution: 805.2mas
    - Tile format: FITS true pixels (BITPIX=32)
    - Tile width: 512 pix (2^9)
    - HEALPix NSide: 262144 (2^18)
  - HEALPix Coordsys: ICRS
  - Buttons: Get preview (jpeg), Footprint, Progenitors
  - Used projection:
    - .projection center: 04 12 53.19 +07 00 58.3
    - .method: SINUS
    - .frame: Default
  - Buttons: Apply, Close
- Access to original images**:
  - ngc1022
  - Buttons: Load orig. images, Close

The right sidebar contains a 'Stack controls' panel with various icons (select, pan, zoom, dist, phot, draw, tag, filter, crop, epoch, cont, opac, zoom, pixel, prop, del) and a 'bodegaALLSKY' layer selection area. At the bottom right, a small map shows the location of the zoomed-in area on the sky, with coordinates 039.63625 -06.67739 and a size of 20.93' x 11.8'.

Warning: Aladin is running in low memory configuration (20MB)

Taskbar showing system icons, search bar, and system tray with date 28/09/2013 and time 01:38.

# DataLinks for this ObsID : fixed links and IVOA services

Aladin v7.5 \*\*\* PROTOTYPE VERSION (based on v7.549) \*\*\*

File Edit Image Catalog Overlay Footprint Tool View Interop Help

Location

Optical DSS Simbad NED +

bodegaALLSKY

Access to original images

ngc1022

Server selector

Others Allsky File all VO Watch FoV... Tools...

Image servers

- Aladin images
- SkyView
- UKIDSS
- Sloan
- SWarp
- DSS...
- VLA...
- Archives...
- Proto...
- Others...

Catalog servers

- All vizier
- Surveys
- Missions
- Simbad
- NED
- MOC
- SkyBot
- Others..

User data access (image/table/script/dir) ?

Specify a filename or an URL and press the SUBMIT button

C:\Users\bonnarel\Documents\Aladin\bodegaALLSKY\

Obsid: ivo://cds/bodega/ngc1022

- Retrieval 0.0" x 0.0"
- Cutout [64,64,8;192,192,24]
- Average cube map
- Position lambda map [1,1;256,256]
- Dynamic AccessData
- SIA2 Query

Reset Clear SUBMIT Close ?

Warning: Aladin is running in low memory configuration (29MB)

0 sel / 0 src 63fps / 34Mb

FR 01:39 28/09/2013



# Cube average has been retrieved (fixed link)

The screenshot displays the Aladin v7.5 interface. A 'Data Info Frame' window is open, showing the following data:

Field name	Value
Obsid	ivo://cds/bodega/ngc1022
Semantics	Average cube map
Service Type	AccessData function Average
reference	http://paladin.u-strasbg.fr:...
format	application/fits
size	4000000

Below the table are buttons for 'Stick', 'FoV in stack', 'LOAD', and 'Close'. A 'Server selector' window is also open, showing a tree view of data options:

- Obsid: ivo://cds/bodega/ngc1022
  - Retrieval 0.0" x 0.0"
  - Cutout [64,64,8;192,192,24]
  - Average cube map**
  - Position lambda map [1,1;256,256]
  - Dynamic AccessData
  - SIA2 Query

The 'SUBMIT' button is highlighted in the 'Server selector' window. The main interface shows a search bar and navigation controls. A warning at the bottom left states: 'Warning: Aladin is running in low memory configuration (25MB)'. The system tray at the bottom shows the date and time: 01:40, 28/09/2013.

# ImageDM metadata for the cube: SIA2Query response

Data Info Frame

Display

CUBE\_CO\_NGC1022

Field name	UType	Value
Score	im:Query.Score	1
AssocID	im:Association.ID	None
AcRef	im:Access.Reference	http://alinda.u-strasbg.fr/Cubengc1022.dic
Format	im:Access.Format	image/fits
DataModel	im:Dataset.DataModel	ImageDM
DataLength	im:Dataset.Length	1600000
ImageNaxes	im:DataSet.Image.Naxes	3
ImageNaxis	im:DataSet.Image.Naxis	256 256 25
Title	Observation/Identifier	CUBE_CO_NGC1022
Title	im:DataID.Title	CUBE_CO_NGC1022
Creator	im:DataID.Creator	ivo://iaa/
ObservingProgramName	im:DataID.Collection	vo://iaa/bodega/
CreatorDID	im:DataID.CreatorDID	ivo://iaa/bodega#ngc1022/
CreatorVersion	im:DataID.Version	1.0
Instrument	im:Provenance.ObsConfig.Instrument	PicoVeleta
PublisherDID	im:Curation.PublisherDID	ivo://cds/
SpaceFrameName	im:CoordSys.SpaceFrame.Name	ICRS
TimeFrameName	im:CoordSys.TimeFrame.Name	TT
SpatialLocation	im:Char.SpatialAxis.Coverage.Location.Coord	39.636 -6.677deg
SpatialExtent	im:Char.SpatialAxis.Coverage.Bounds.Extent	1.3'
SpatialCalibration	im:Char.SpatialAxis.Accuracy.CalibrationStatus	Calibrated
SpatialResolution	im:Char.SpatialAxis.Resolution.RefVal	0.6"
TimeLocation	im:Char.TimeAxis.Coverage.Location.Coord	2008-11-01T10:36:06.3d
SpectralAxisUcd	im:Char.SpectralAxis.Ucd	em;freq
SpectralLocation	im:Char.SpectralAxis.Coverage.Location.Coord	1450000.0Hz
SpectralExtent	im:Char.SpectralAxis.Coverage.Bounds.Extent	500000.0Hz
SpectralStart	im:Char.SpectralAxis.Coverage.Bounds.Limits...	1200000.0Hz
SpectralStop	im:Char.SpectralAxis.Coverage.Bounds.Limits...	1700000.0Hz
SpectralCalibration	im:Char.SpectralAxis.Accuracy.CalibrationStatus	CALIBRATEDm
FluxAxisUcd	im:Char.FluxAxis.Ucd	phot.flux.density
MappingSpatialProjection	im:Data.Mapping.SpatialAxis.Algorithm	SIN
MappingCrval	im:Data.Mapping.RefValue	129.000000 129.000000 -46.0
MappingCrpix	im:Data.Mapping.RefPix	39.636249 -0.677499 -250000.0
MappingCdMatrix	im:Data.Mapping.CDMatrix	-0.0000833333 0.000000 0.000000 0.000 0.0...

Stick FoV in stack LOAD Close

Aladin

Frame ICRSd

Mouse controls:  
o Left: source selection.  
o Middle: quick panning.

Server selector

Others AllSky File all-VO Watch FoV... Tools...

Image servers

Catalog servers

- All VizieR
- Surveys
- Missions
- SimBAD
- NED
- MOC
- SkyBot
- Others..

User data access (image/table/script/dir) ?

Specify a filename or an URL and press the SUBMIT button

Browse...

```
Creator: ivo://iaa/  
Collection: null null  
CUBE_CO_NGC1022 0.0" x 0.0"
```

Reset Clear SUBMIT Close ?

16"

1.568" x 92.5"

1.28" x 1.28"

grid wink north multiview match

Warning: Aladin is running in low memory configuration (8MB)

0 sel / 0 src 63fps / 65Mb

FR 01:42 28/09/2013

# Aladin opened a menu based on accessData method. CUTOUT syntax in STC-S

Data Info Frame

Display

CUBE\_CO\_NGC1022

Field name	UType	Value
Score	im:Query.Score	1
AssocID	im:Association.ID	None
AcRef	im:Access.Reference	http://alinda.u-strasbg.fr/Cubengc10...
Format	im:Access.Format	image/fits
DataModel	im:Dataset.DataModel	ImageDM
DataLength	im:Dataset.Length	1600000
ImageNaxes	im:DataSet.Image.Naxes	3
ImageNaxis	im:DataSet.Image.Naxis	256 256 25
Title	Observation/Identifier	CUBE_CO_NGC1022
Title	im:DataID.Title	CUBE_CO_NGC1022
Creator	im:DataID.Creator	ivo://iaa/
ObservingProgramName	im:DataID.Collection	vo://iaa/bodega/
CreatorDID	im:DataID.CreatorDID	ivo://iaa/bodega#ngc1022/
CreatorVersion	im:DataID.Version	1.0
Instrument	im:Provenance.ObsConfig.Instrument	PicoVeleta
PublisherDID	im:Curation.PublisherDID	ivo://cds/
SpaceFrameName	im:CoordSys.SpaceFrame.Name	ICRS
TimeFrameName	im:CoordSys.TimeFrame.Name	TT
SpatialLocation	im:Char.SpatialAxis.Coverage.Locatio...	39.636 -6.677deg
SpatialExtent	im:Char.SpatialAxis.Coverage.Bounds...	1.3'
SpatialCalibration	im:Char.SpatialAxis.Accuracy.Calibrati...	Calibrated
SpatialResolution	im:Char.SpatialAxis.Resolution.RefVal	0.6"
TimeLocation	im:Char.TimeAxis.Coverage.Location....	2008-11-01T10:36:06.3d
SpectralAxisUcd	im:Char.SpectralAxis.Ucd	em;freq
SpectralLocation	im:Char.SpectralAxis.Coverage.Locati...	1450000.0Hz
SpectralExtent	im:Char.SpectralAxis.Coverage.Bounds...	500000.0Hz
SpectralStart	im:Char.SpectralAxis.Coverage.Bounds...	1200000.0Hz
SpectralStop	im:Char.SpectralAxis.Coverage.Bounds...	1700000.0Hz
SpectralCalibration	im:Char.SpectralAxis.Accuracy.Calbra...	CALIBRATEDm
FluxAxisUcd	im:Char.FluxAxis.Ucd	phot.flux.density
MappingSpatialProjection	im:Data.Mapping.SpatialAxis.Algorithm	SIN
MappingCrval	im:Data.Mapping.RefValue	129.000000 129.000000 -46.0
MappingCrxpix	im:Data.Mapping.RefPix	39.636249 -0.677499 -250000.0
MappingCdMatrix	im:Data.Mapping.CDMatrix	-0.000083333 0.000000 0.000000 0.0...

Stick FoV in stack LOAD Close

Access to original images

Frame ICRSd

ngc1022

Basic controls:  
-Type any object name or coordinates for moving on

Server selector

Others Allsky File all VO Watch FoV... Tools...

Image servers

SIA2 EtaCarOIII Cube AccessData ?

Fill in all these fields and press the SUBMIT button

ID - Data Set ID: ngc1022

FUNCTION: copy - simple cutout

CUTOUT: E ICRS 39.636 -6.677 0.005 SpectralInterval 1300000 1500000 Hz

POS:

SIZE:

BAND:

COORD SYSTEM:

Reset Clear SUBMIT Close ?

Search

1.28" x 1.28"

Warning: Aladin is running in low memory configuration (14MB)

0 sel / 0 src 63fps / 49Mb

FR 01:46  
28/09/2013

# Cube cutout in action

Aladin v7.5 \*\*\* PROTOTYPE VERSION (based on v7.549) \*\*\*

File Edit Image Catalog Overlay Footprint Tool View Interop Help

Location 039.63258 -06.67755 Frame ICRSd

Optical DSS Simbad NED +

4004861.880

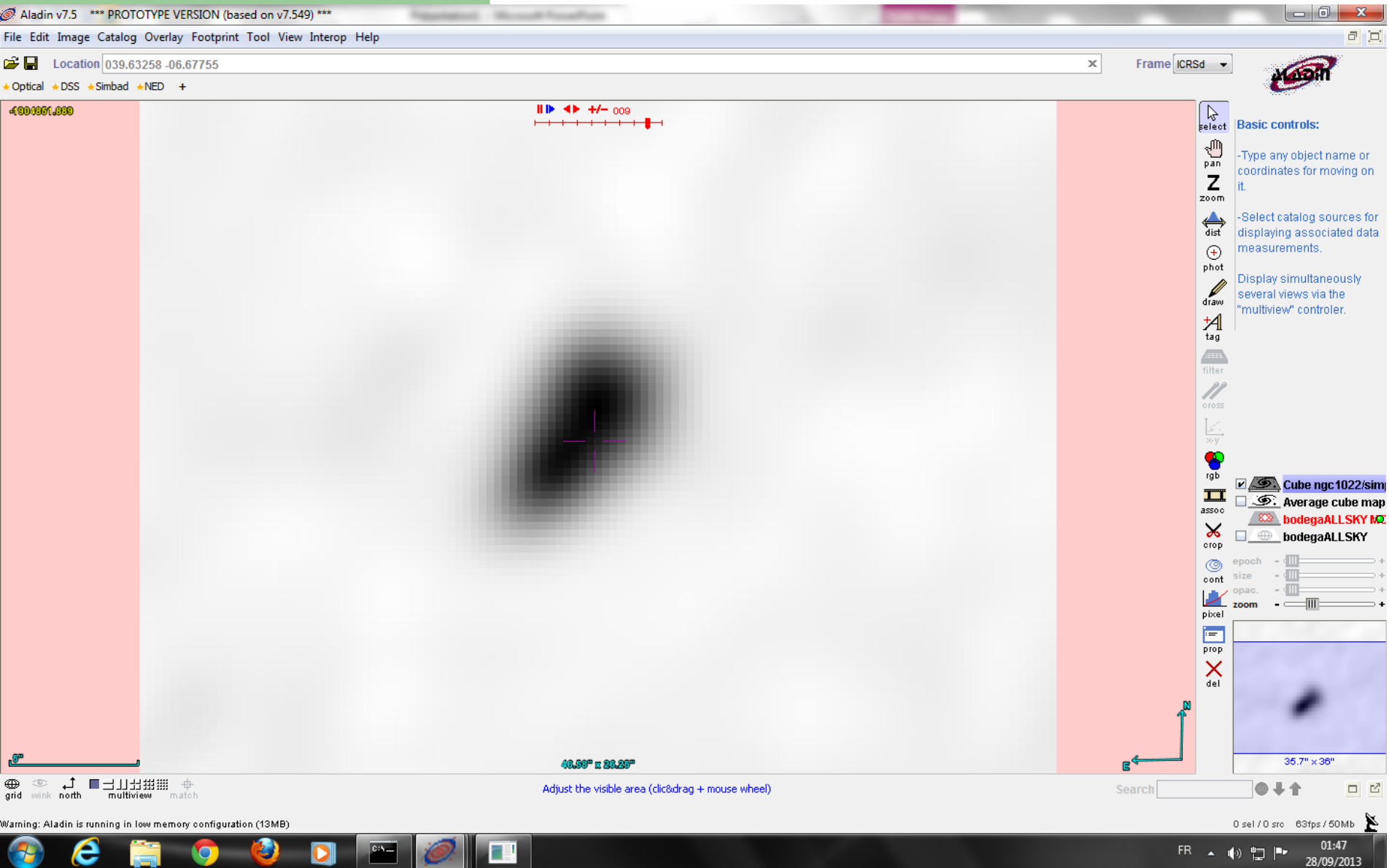
46.56" x 28.25"

Adjust the visible area (click&drag + mouse wheel)

Warning: Aladin is running in low memory configuration (13MB)

0 sel / 0 src 63fps / 50Mb

FR 01:47 28/09/2013



# BAND average map on the same cutout definition

The screenshot displays the Aladin v7.5 software interface. The main window shows a dark, circular band average map of NGC 1022, centered on a red crosshair. The map is surrounded by a red rectangular cutout. The interface includes a menu bar (File, Edit, Image, Catalog, Overlay, Footprint, Tool, View, Interop, Help), a toolbar with various icons, and a sidebar with a list of catalog servers (All VizieR, Surveys, Missions, SIMBAD, NED, MOC, SkyBot, Others..). A search panel on the left contains the following information:

- Location: ngc1022
- band\_average\_map - averages several bands
- E ICRS 39.636 -6.677 0.005 SpectralInterval 1300000 1500000 Hz

The search panel also features a 'SUBMIT' button and a 'Close' button. The bottom status bar shows the coordinates  $46.56'' \times 28.25''$  and a warning: "Warning: Aladin is running in low memory configuration (19MB)".



# Looking to the neighbourhood, choose the next galaxy

Aladin v7.5 \*\*\* PROTOTYPE VERSION (based on v7.549) \*\*\*

File Edit Image Catalog Overlay Footprint Tool View Interop Help

Location: 040.66383 -07.85494 Frame: ICRSd

Optical DSS Simbad NED +

bodegaALLSKY

[VV98] J024250.8-075913 (17.36,QSO)

039.63804 -06.67708  
33.76° x 18.84°

[VV98] J024250.8-075913 (17.36,QSO) [by Simbad]

Search

Warning: Aladin is running in low memory configuration (15MB)

0 sel / 0 src 167fps / 48Mb

FR 01:50 28/09/2013



# Discover what it is with SIMBAD. NGC 1084

Aladin v7.5 \*\*\* PROTOTYPE VERSION (based on v7.549) \*\*\*

File Edit Image Catalog Overlay Footprint Tool View Interop Help

Location: 041.49969 -07.57864 Frame: ICRSd

★ Optical ★ DSS ★ Simbad ★ NED +

bodegaALLSKY

20.93' x 9.656"

simbad - COO\_ERR\_MAJA - [mas] Coordinate error major axis

Search

MAIN ID	OTYPE	RA	DEC	COO ...	COO ...	C...	PMRA	PMDEC	B	V	R	J	H	K	SP T...	GA...	GA...	G...	BI...
NGC 1084	GinG...	02 45 59.926	-07 34 43.10						11.59	10.73	10.55	8.841	8.205	7.93		2.62	1.00	40	239

Warning: Aladin is running in low memory configuration (19MB)

1 sel / 11 src 48fps / 44Mb

# Dynamic AccessData link choice

Aladin v7.5 \*\*\* PROTOTYPE VERSION (based on v7.549) \*\*\*

File Edit Image Catalog Overlay Footprint Tool View Interop Help

Location: bodegaALLSKY

Optical DSS Simbad NED +

Access to original images: ngc1084

Server selector

Image servers

Others Allsky File all VO Watch FoV... Tools...

Catalog servers

- All VizieR
- Surveys
- Missions
- Simbad
- NED
- MOC
- SkyBot
- Others..

User data access (image/table/script/dir) ?

Specify a filename or a URL and press the SUBMIT button

Browse...

- Obsid: ivo://cds/bodega/ngc1084
  - Retrieval 0.0" x 0.0"
  - Cutout [64,64,8;192,192,24]
  - Average cube map
  - Position lambda map [1,1;256,256]
  - Dynamic AccessData**
  - SIA2 Query

Reset Clear SUBMIT Close ?

Warning: Aladin is running in low memory configuration (17MB)

0 sel / 0 sto 56fps / 46Mb

FR 01:52 28/09/2013

# CUTOUT DEFINED IN POS SIZE BAND

Data Info Frame

Display

CUBE\_CO\_NGC1084

Field name	UType	Value
Score	im:Query.Score	1
AssocID	im:Association.ID	None
AcRef	im:Access.Reference	http://alinda.u-str...
Format	im:Access.Format	image/fits
DataModel	im:Dataset.DataM...	ImageDM
DataLength	im:Dataset.Length	2250000
ImageNaxes	im:DataSet.Image...	3
ImageNaxis	im:DataSet.Image...	300 300 25
Title	Observation/Ident...	CUBE_CO_NGC1084
Title	im:DataID.Title	CUBE_CO_NGC1084
Creator	im:DataID.Creator	ivo://iaa/
ObservingProgra...	im:DataID.Collection	ivo://iaa/bodega/
CreatorDID	im:DataID.Creator...	ivo://iaa/bodega#...
CreatorVersion	im:DataID.Version	1.0
Instrument	im:Provenance.Ob...	PicoVeleta
PublisherDID	im:Curation.Publis...	ivo://cds/
SpaceFrameNa...	im:CoordSys.Spac...	ICRS
TimeFrameName	im:CoordSys.Time...	TT
SpatialLocation	im:Char.SpatialAxi...	41.499 -7.578deg
SpatialExtent	im:Char.SpatialAxi...	1.5'
SpatialCalibration	im:Char.SpatialAxi...	Calibrated
SpatialResolution	im:Char.SpatialAxi...	0.6"
TimeLocation	im:Char.TimeAxis...	2008-11-01T02:23...
SpectralAxisUcd	im:Char.SpectralA...	em;freq
SpectralLocation	im:Char.SpectralA...	1490000.0Hz
SpectralExtent	im:Char.SpectralA...	500000.0Hz
SpectralStart	im:Char.SpectralA...	1240000.0Hz
SpectralStop	im:Char.SpectralA...	1740000.0Hz
SpectralCalibrati...	im:Char.SpectralA...	CALIBRATEDm
FluxAxisUcd	im:Char.FluxAxis.Ucd	phot.flux.density
MappingSpatialP...	im:Data.Mapping.S...	SIN
MappingCrval	im:Data.Mapping...	151.000000 151.0...
MappingCrpix	im:Data.Mapping...	41.4995837 -7.57...
MappingCdMatrix	im:Data.Mapping...	-0.0000833333 0.0...

Stick FoV in stack LOAD Close

Help

Frame ICRSd

Access to original images

ngc1084

select pan zoom

Server selector

Others Allsky File all VO Watch FoV... Tools...

Image servers

○ SIA2 ETaCarOIII Cube AccessData ?

Fill in all these fields and press the SUBMIT button

ID - DataSet ID	ngc1022
FUNCTION	copy - simple cutout
CUTOUT	
POS	41.50,7.579
SIZE	0.005,0.005
BAND	1500000.0;1600000.0
COORD SYSTEM	ICRS

Reset Clear SUBMIT Close ?

48.66" x 28.25"

36.7" x 36"

Warning: Aladin is running in low memory configuration (8MB)

0 sel / 0 src 143fps / 65MB

FR 10:35 29/09/2013

# Some feedback

- This is :
  - not SIA2 query followed by Cube DataAccess,
  - but DataLink then DataAccess and description by metadata
- Utypes list: some differences between Spectrum, Char2, ObsCore and ImageDM
  - Not always for good reasons: harmonisati
  - Restart from Char2 to understand the differences
- Mapping in the response ?
- AccessData in SIA2 : From ahref or via DataLink