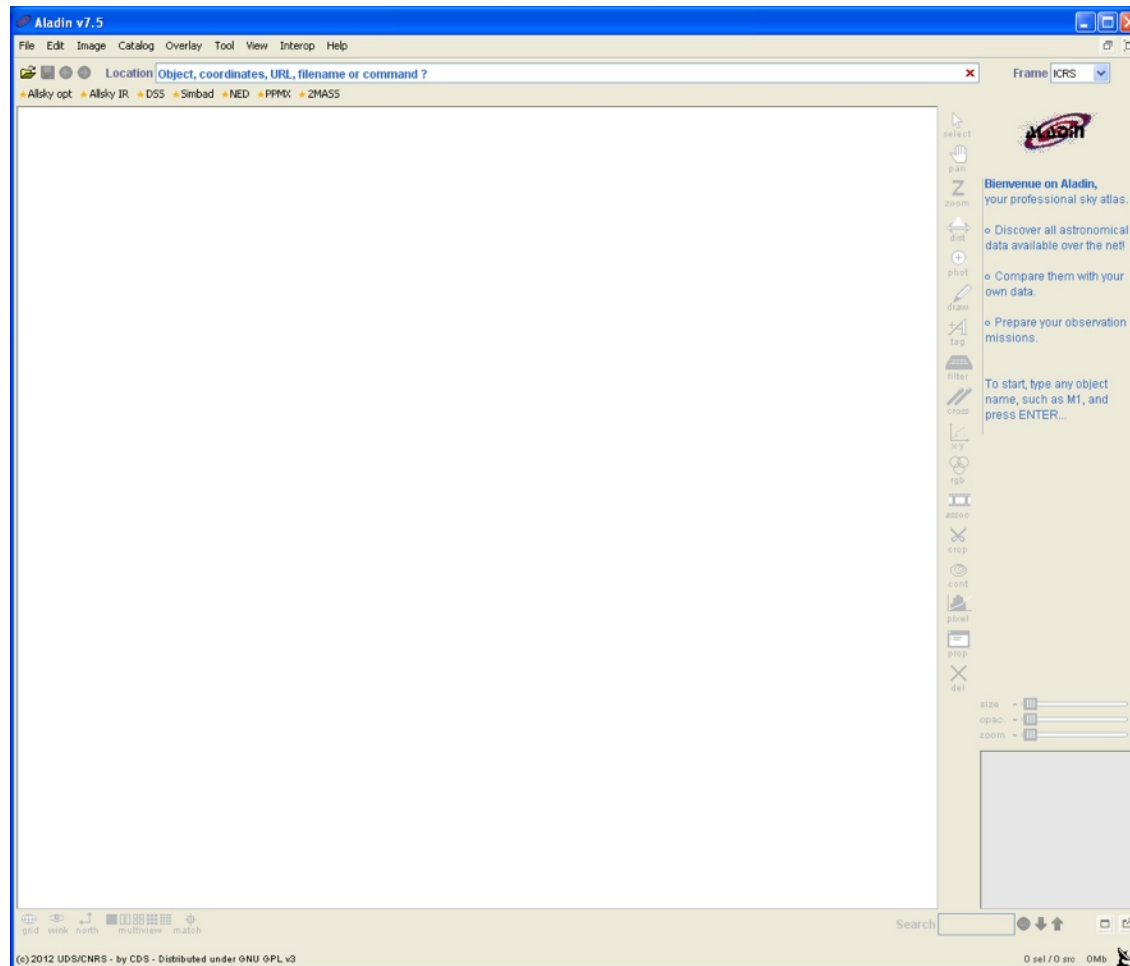


# The Time Dimension in Aladin

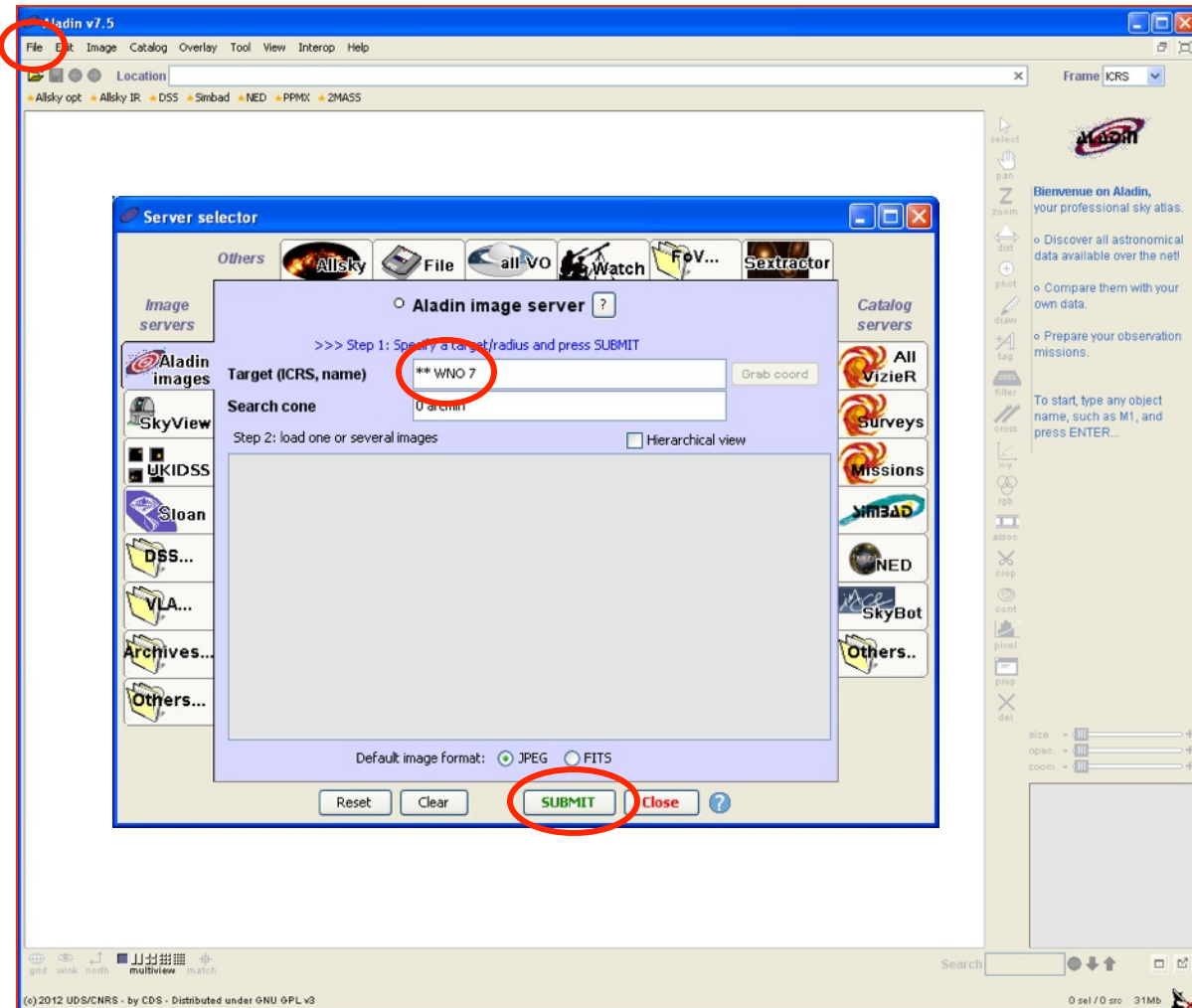
Example: The Binary Star \*\* WNO 7  
How to visualize star proper motion  
with Aladin

Françoise Genova/Caroline Bot  
Updated June 2012

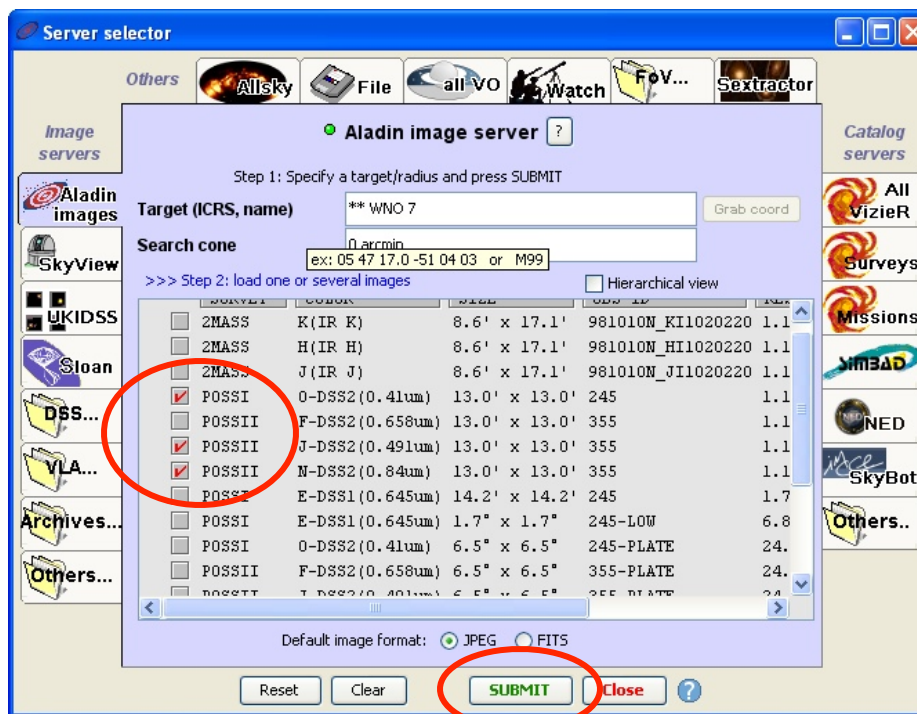
Start Aladin, either with the standalone software installed on your machine from <http://aladin.u-strasbg.fr/java/nph-aladin.pl?frame=downloading> or from the on-line link <http://aladin.u-strasbg.fr/java/nph-aladin.pl>



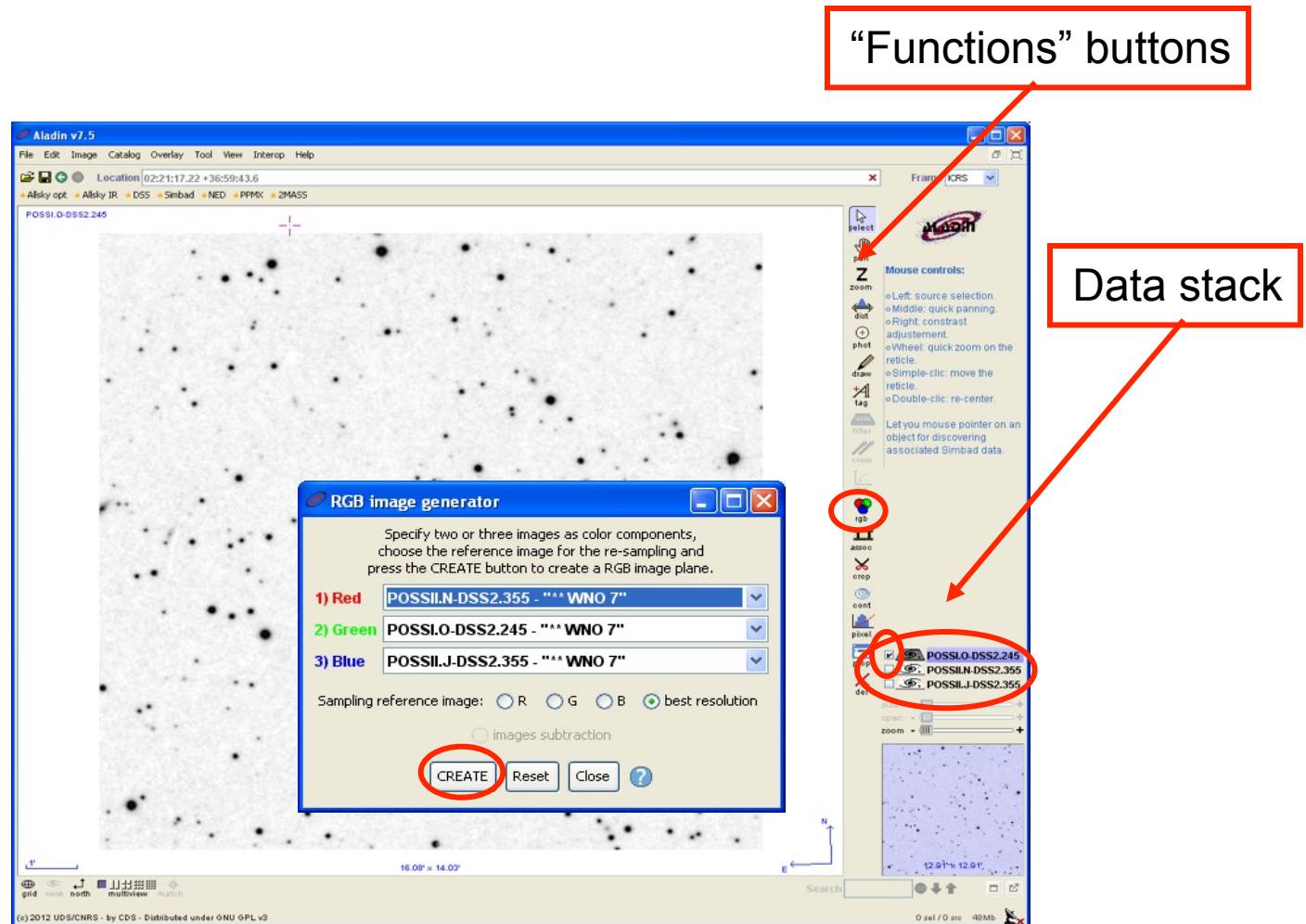
- Click on **File**, then **Open**, which will open the Aladin image server
- Type « **\*\* WNO 7** » in the **Target** box
- Click on **SUBMIT**



- You now have a list of all the images available in the Aladin image server around \*\* WNO 7
- Choose three images by checking the boxes:
  - POSSI O-DSS2
  - POSSII J-DSS2
  - POSSII N-DSS2



- You get the image display with the three images in the data stack on the right. You can visualize each of them by ticking the small box on the left of the image name in the stack
- Create a colour composition from the three images by clicking on the **rgb** button in the “Functions” column



- You see that the position of the binary is different from one plate to the other (green, blue and red colors): the two stars move together with a large proper motion

The screenshot displays the Aladin v7.5 software interface. The main window shows a star field with a binary star circled in red. The 'Properties' dialog box is open, showing the following information:

**Properties of the plane "POSSI.O-DSS2.245"**

PlaneID: POSSI.O-DSS2.245

Info: POSSI ORIGIN O-DSS2

Format: JPEG

Epoch: 1951-11-02T06:44:59 (1951.83513004791)

WCS equinox: 2000.0

Size: 768x768 / encoding:byte (bitpix=8) / 576KB

Origin: PALOMAR OBSERVATORY

<http://aladin.u-strasbg.fr/cgi-bin/nph-Aladin++.cgi?out=image&po>

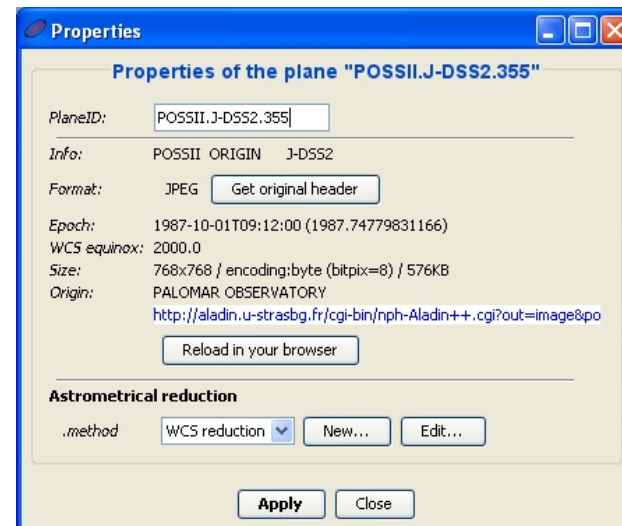
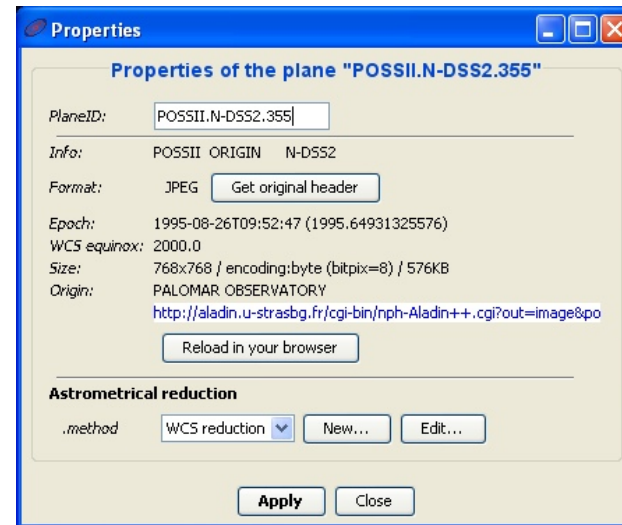
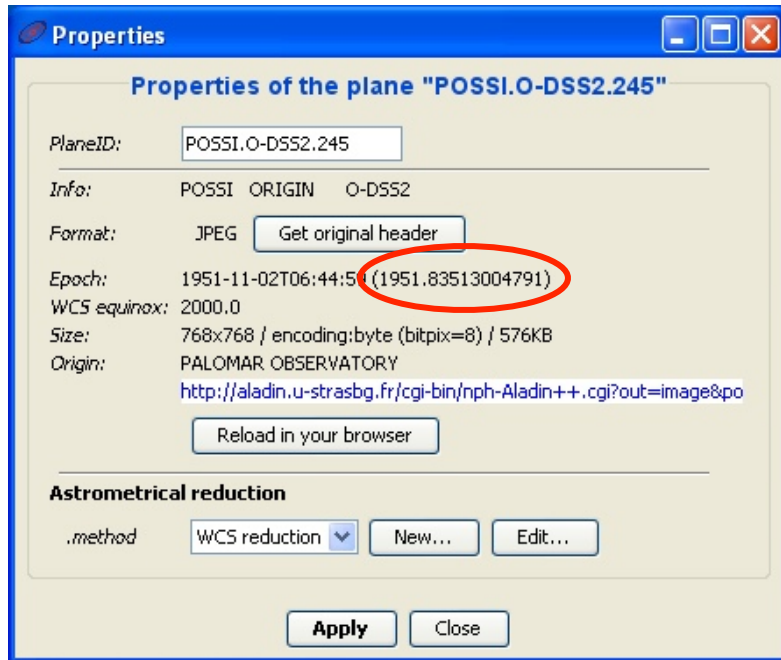
**Astrometrical reduction**

.method: WCS reduction

The 'Properties' dialog box is highlighted with a red border. The 'POSSI.O-DSS2.245' entry in the object list on the right is also circled in red. The main window shows a star field with a binary star circled in red. The status bar at the bottom indicates the image size is 16.08" x 14.03".



- For each image the corresponding epoch appears in the **Properties** window



POSSI O: 1951.835  
 POSSII N: 1995.649  
 POSSII J: 1987.748

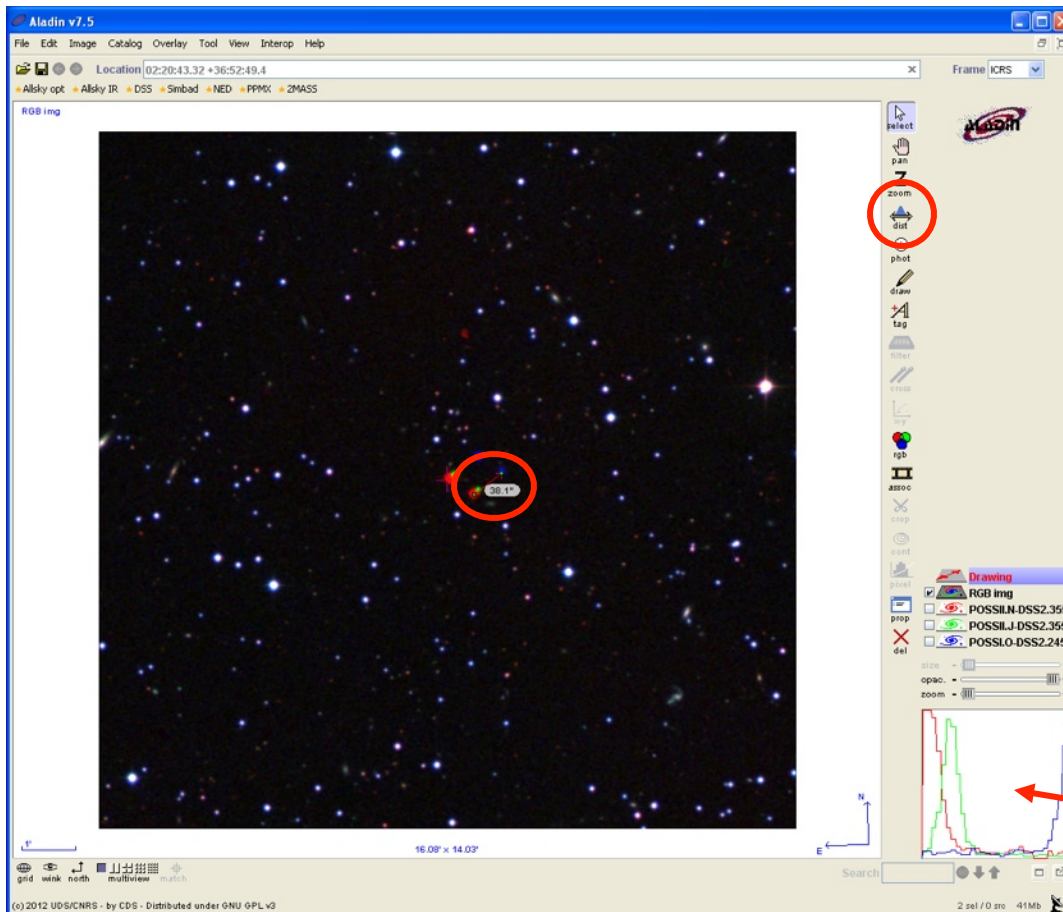
- To measure the angular distance between two positions, use the **dist** button and drag a double arrow between the two points with the left button of your mouse.
- The distance is printed near the arrow with more details at the bottom of the screen if you click on one of the arrowheads

Estimation of  
 \*\* WNO 7 proper motion:

$$38.1'' / (1995.649 - 1951.835) = 0.9''/\text{year}$$

You can delete the arrow by clicking on **"Drawing"** in the data stack and press on the **del** button

Pixel profile along the arrow for the three colours: the arrows are centered on the red and blue objects





To go further... you can compare this value to estimations from the literature stored in the SIMBAD database

- Click on **SIMBAD**
- Click on the square on one of the stars
- The line below the image contains information about the object, including the proper motion (PMRA and PMDEC). Moving the mouse above the columns gives you the detailed label and unit (mas/year)

The screenshot shows the Aladin v7.5 software interface. The main window displays a star field with a red circle around a star. The table below the image shows the following data:

MAIN ID	OTYPE	RA	DEC	COO ...	COO ...	PMRA	PMDEC	B	V	R	J	H	K
UCD11_302211+36533AR	**	02 21 03.97	+36 53 05.4	60.0	60.0	743.0	-557.0	14.3	13.31	12.4	9.37	8.78	8.56

**Proper motion in SIMBAD:**  
0.9”  
which is compatible with  
our estimation

**Hint:** The red lines on the  
image represent the star  
proper motion – which is  
large indeed

There are only 1328 objects  
in SIMBAD (in June 2012) with  
a proper motion larger than  
0.8” – you can try to find the  
number yourself using the  
**Criteria query** in SIMBAD