PROPER MOTION OF THE BARNARD'S STAR

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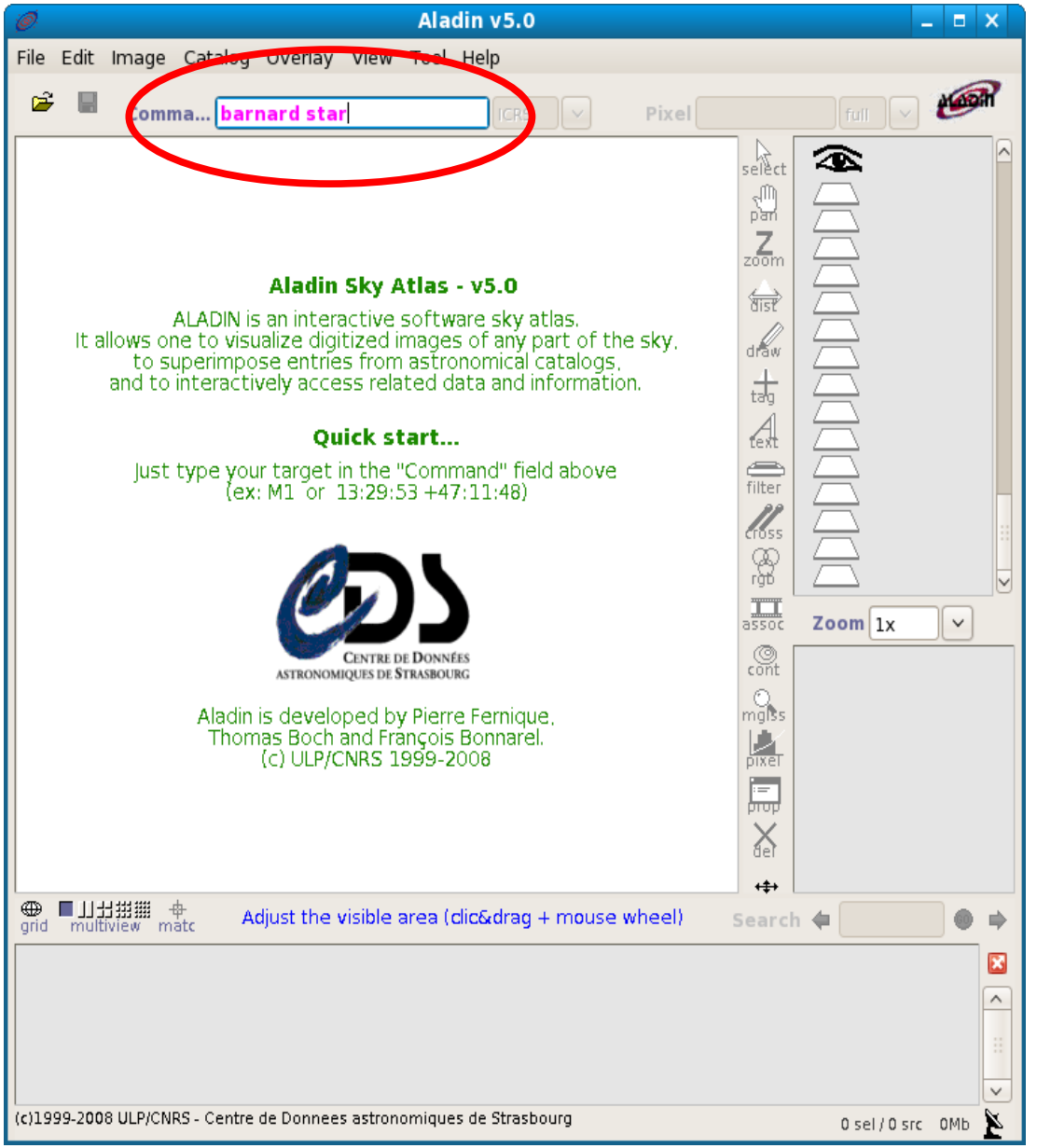
View the Barnard's star

Open Aladin

In the “command” field insert “barnard star”

Click “enter”



Load the second image

Load Aladin image server

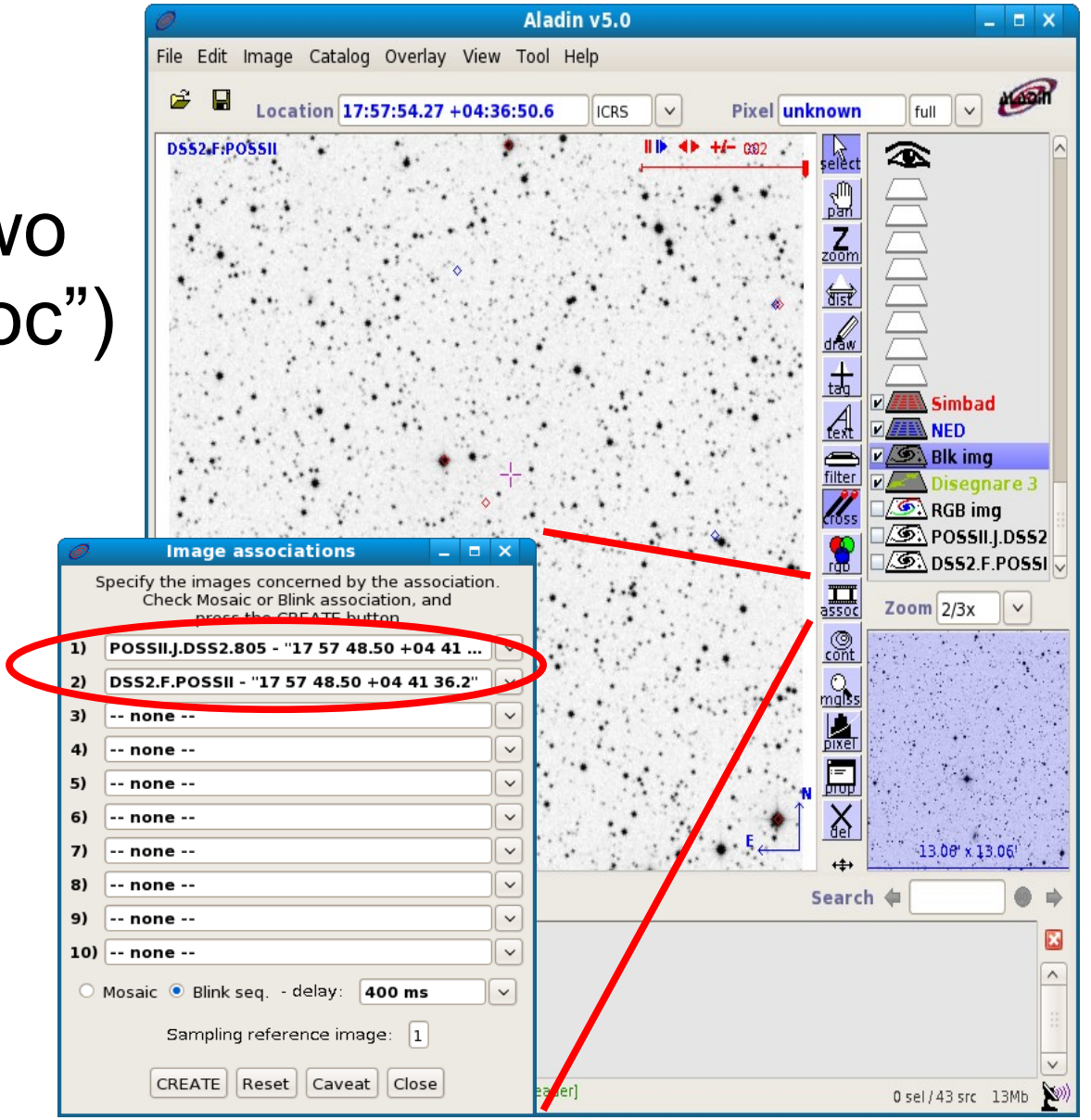
Click “submit” to view the list of available images

Select “POSS II J” and click “submit”

View the shift

Create a blink sequence with the two images (button “assoc”)

Note the shift of the Barnard's star between the two images



Compute the proper motion

Create a composite image to evaluate the shift

Compute the time interval between the two images

Compute the proper motion (units of "/year)

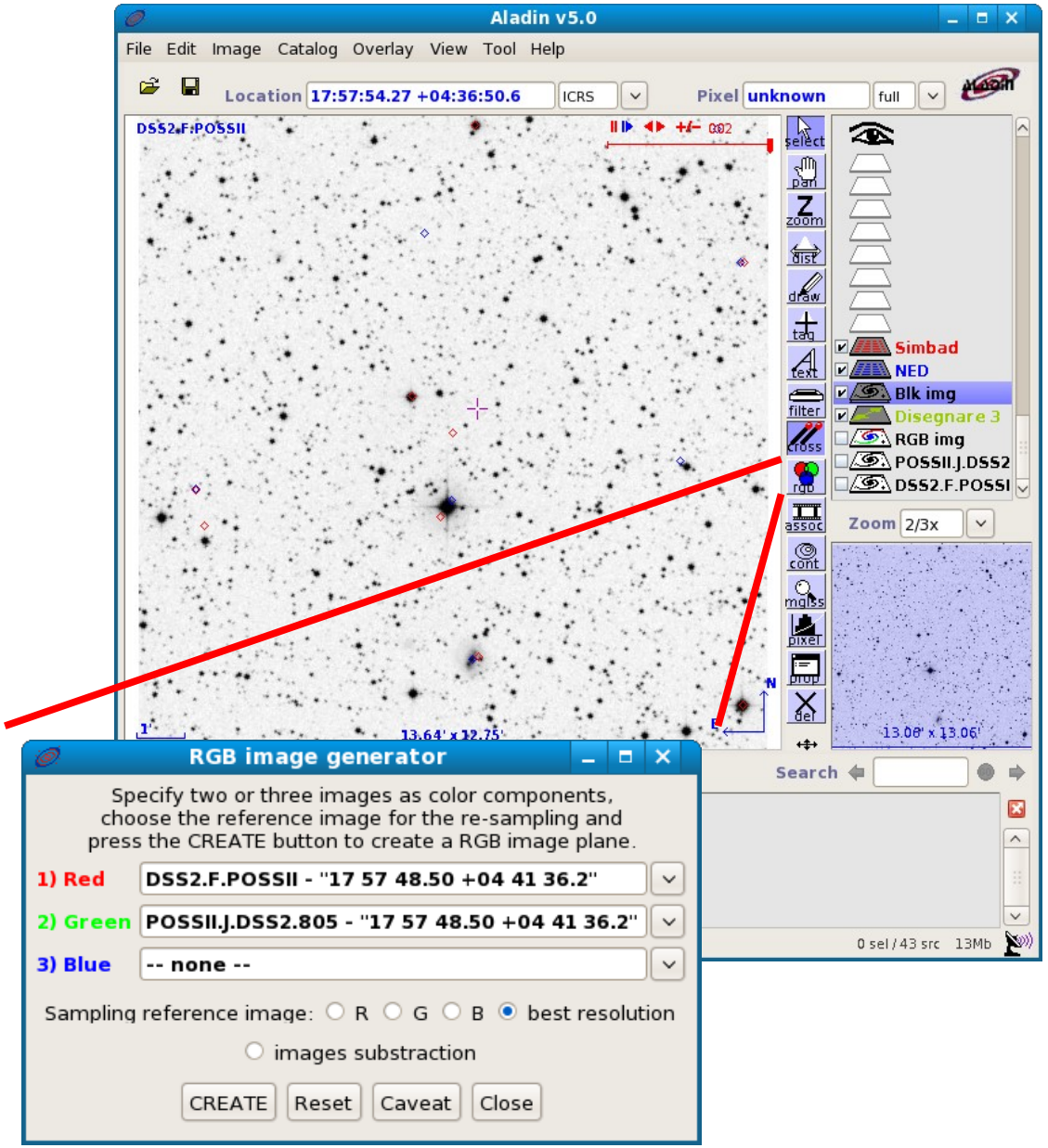
Compare the result with the Simbad one

Create the composite image

Click the button “RGB”

Select the two images

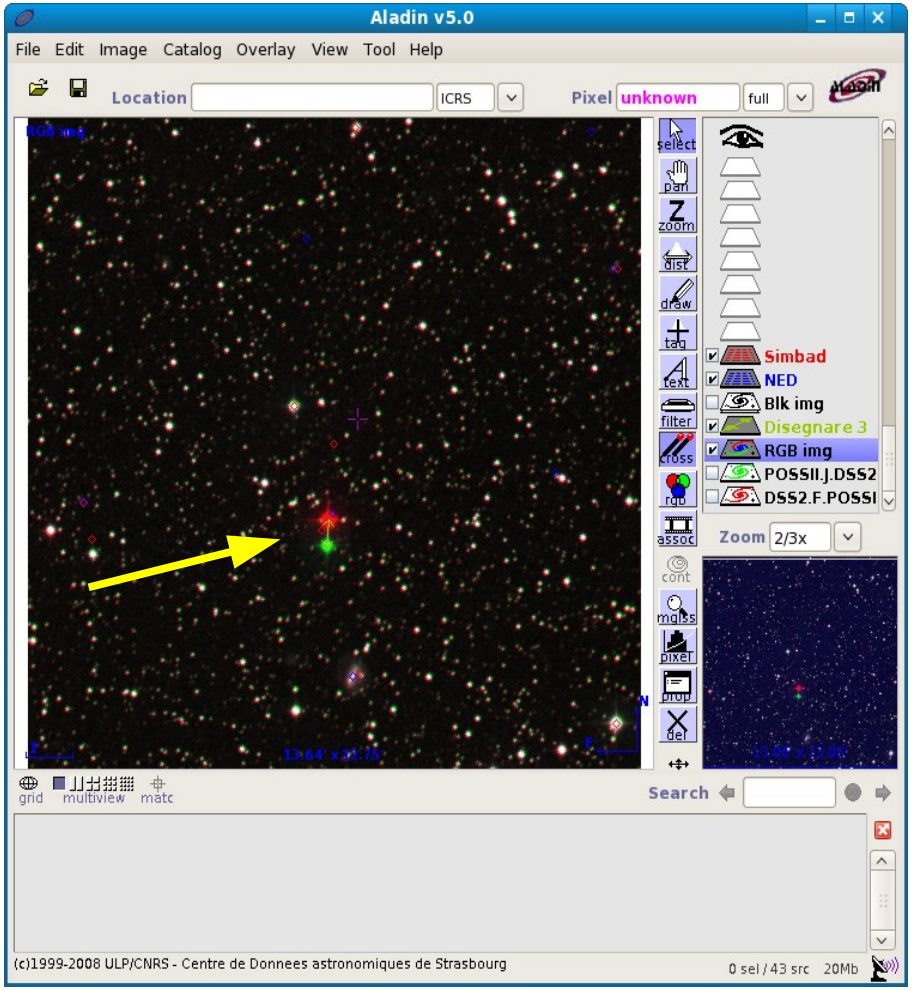
Click “CREATE”



Create the composite image

The two different positions of the Barnard's star appear one in red and the other one in green

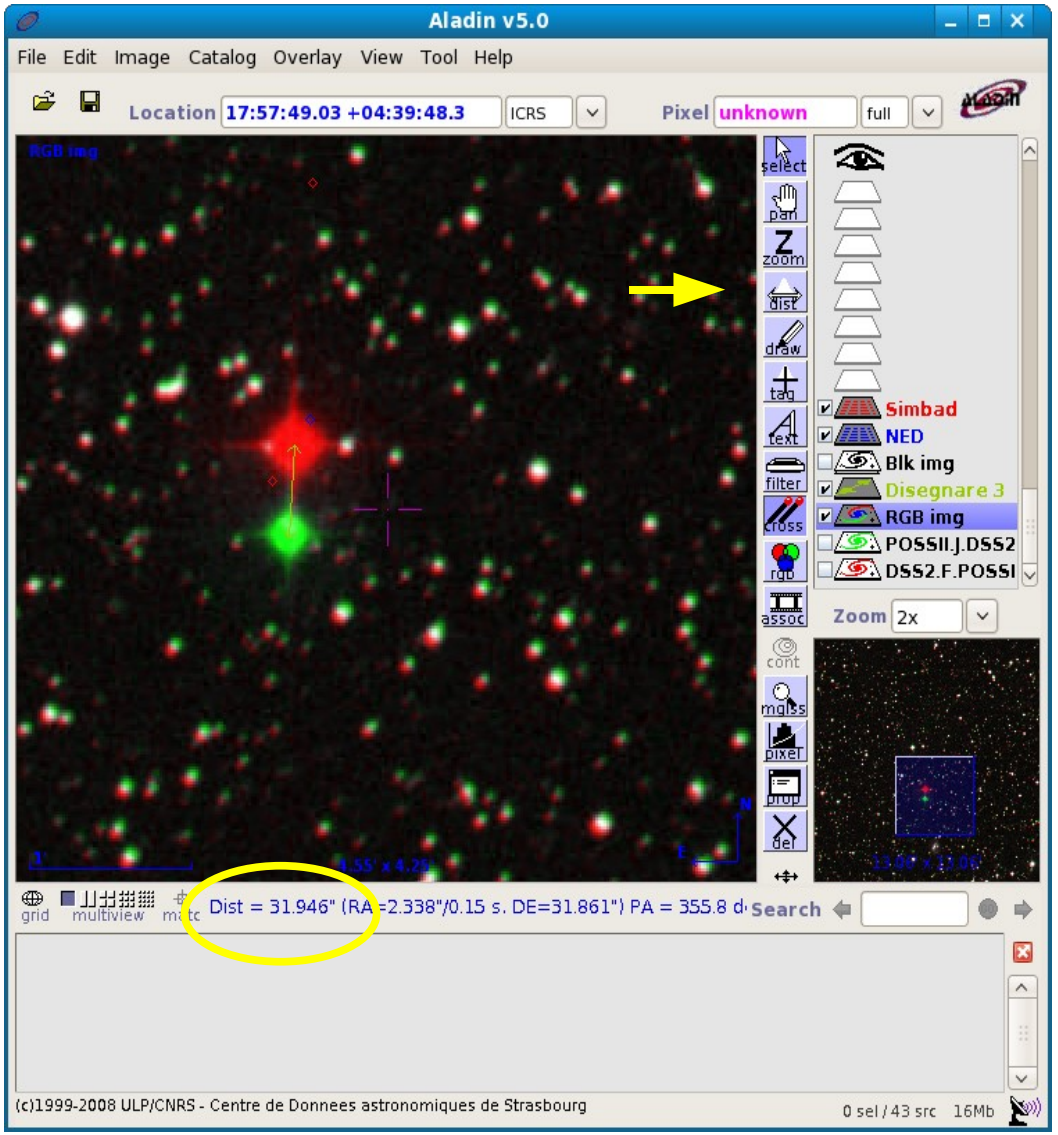
The other stars don't have an evident proper motion therefore they appear overlaid



Evaluate the distance

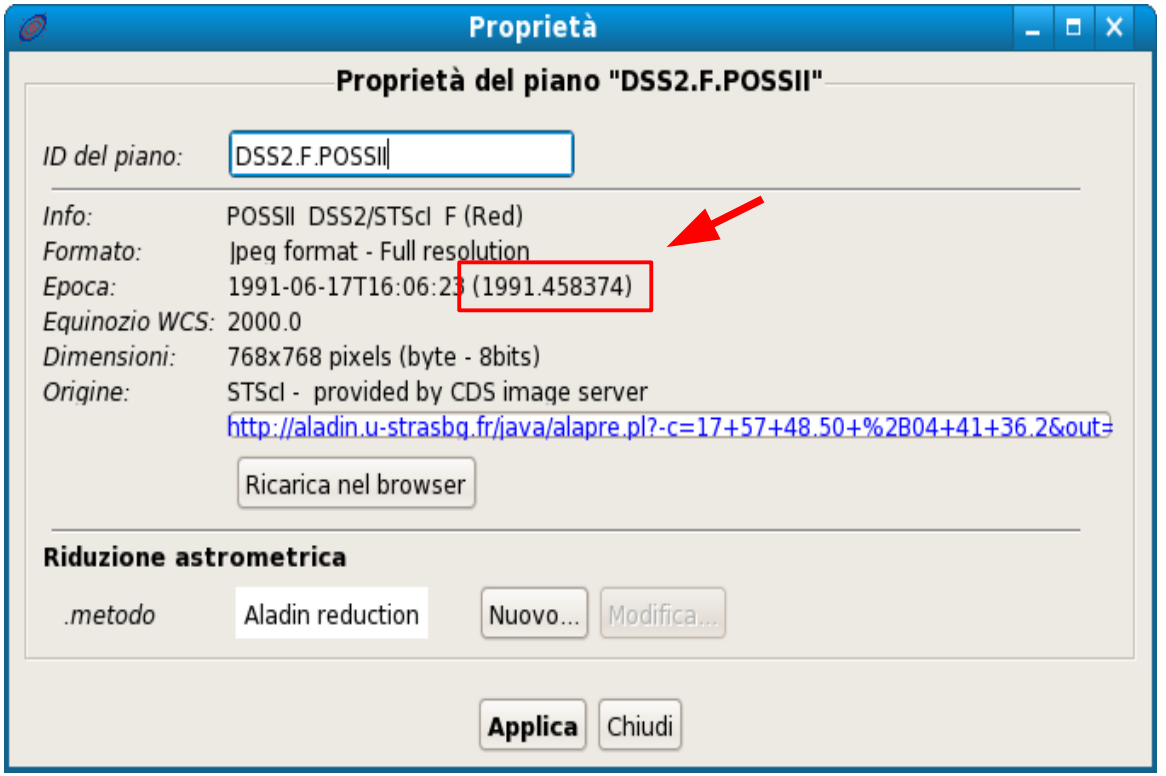
Click “dist” and draw the distance vector between the two stars

Look at the distance: 32”



Evaluate the time interval

Right click on the plane of each image and open the image proprieties window



Compute the time interval (year):

1991.458374 - 1988.364502 = 3.093872 years

Compute the proper motion

The proper motion of the Barnard's star is given by:

$$proper\,motion = \frac{distance}{time} = \frac{32}{3.09} = 10.35\,''/year$$

Identifier		RA	DE	Type	Velocity	Redshift	Ref	Note	
1WGA J1757.8+0440		17 57 48.6	+04 40 16	XrayS	...	...	0	0	
V* V2500 Oph	BYDra	17 57 48.4983	+04 41 36.245		14.24	10.45	67	-798.71	10337.77
GAT 13	Star	17 57 51.89	+04 42 20.5						
1RXS J175749.5+043955	X	17 57 49.50	+04 39 55.0						

TIP: Carica direttamente immagini/cataloghi zip or gzip

4 sel / 43 src 20Mb

In the Simbad database we have
proper motion = $(0.798^2 + 10.337^2)^{1/2}$ = 10.36 "/year

Tangential velocity

Click on the name of the Barnard's star (V* V2500 Oph) to open the Simbad web page

MAIN ID	OTYPE	RA	DEC	COO ...	COO ...	C...	PMRA	PMDEC
1WGA J1757.8+0440		17 57 48.6	+04 40 16	XrayS	...	...	0	0
V* V2500 Oph	BYDra	17 57 48.4983	+04 41 36.245	14.24	10.45	67	-798.71	10337.77
GAT 13	Star	17 57 51.89	+04 42 20.5					
1RXS J175749.5+043955	X	17 57 49.50	+04 39 55.0					

The parallaxes is π = 0.549 ",
from wich r = 1/π = 1.82 pc

The tangential velocity is
v_t = proper motion · r = 90 km/s

V* V2500 Oph -- Variable of BY Dra type

Other object types:	EB* () , BY* () , * (AC2000,ASCC,BD, (Ci,G,LFT,LHS,LSPM,LTT,NLTT) , V* (
ICRS coord. (ep=2000 eq=2000) :	17 57 48.4983 +04 41 36.245 (~Unkn
FK5 coord. (ep=2000 eq=2000) :	17 57 48.498 +04 41 36.25 (~Unknow
FK4 coord. (ep=1950 eq=1950) :	17 55 22.71 +04 33 14.1 (~Unknown
Gal coord. (ep=2000 eq=2000) :	031.0087 +14.0627 (~Unknown) [1
Proper motions *mas/yr* [error ellipse]:	-798.71 10337.77 A [1.66 1.22 67]
Radial velocity / Redshift / cz :	km/s -106.8 [~] / z -0.000356 [~]
Parallaxes *mas*:	549.30 [1.58] A 1997A&A...323L..49
Spectral type:	M4Ve (C) ~
Fluxes (7) :	B 11.28 [~] C ~ V 9.54 [~] C ~ R 8.7 [~] E 2003AJ....125..984M I 7.9 [~] E 2003AJ....125..984M J 5.24 [~] C 2003yCat.2246....0C H 4.83 [~] C 2003yCat.2246....0C K 4.52 [~] C 2003yCat.2246....0C