



Italy: VO Edu on a nation-wide scale

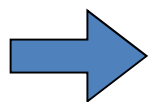
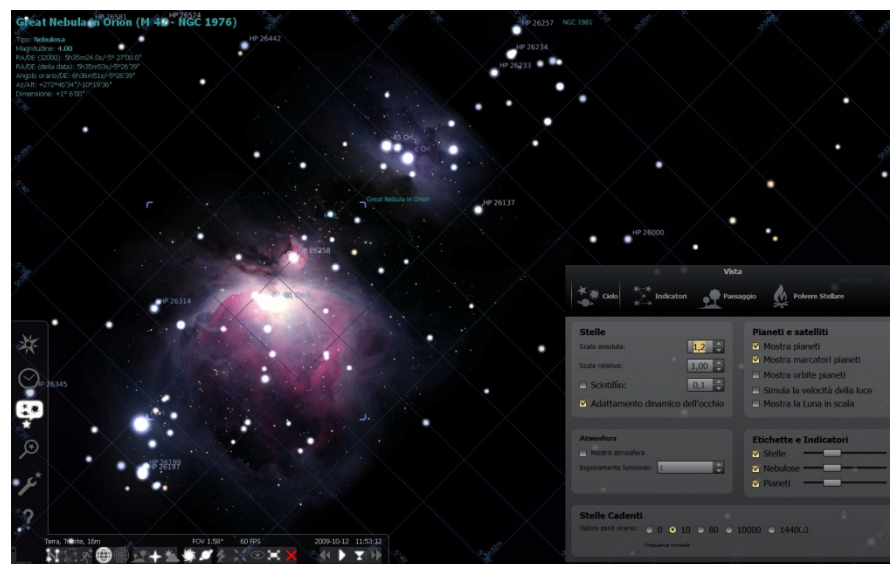
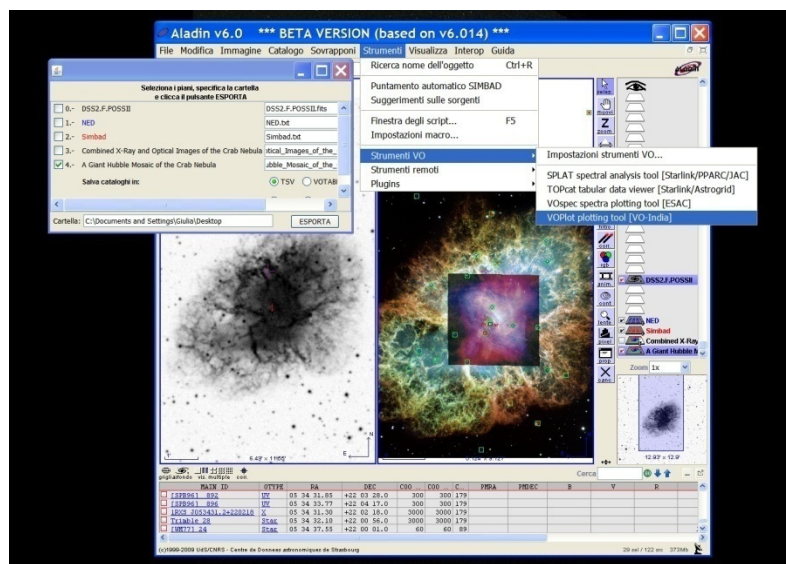
G. Iafrate – INAF Astronomical Observatory of Trieste



EuroVO for schools

Professional software custom modified:

Aladin, Stellarium, Simplay












































Library of Use Cases: wwwas.oats.inaf.it/aidawp5

Developed with the contribution of teachers and students



Download usage examples



1. The sky (apparent motion, coordinates, constellations, light pollution)   

2. The stars (color and luminosity: the Hertzsprung-Russell diagram)   
3. The shape of galaxies (the Hubble morphological sequence)    
* download a galaxy set: hubble_1.zip, hubble_2.zip, hubble_3.zip, hubble_4.zip
4. The Pleiades open cluster (parallax, HR-diagram)    
5. Proper motion of the Barnard's star    
6. Confirmation of an apparent supernova    
* download the image ngc6946.fits
7. Distance of the Andromeda galaxy (variable stars: cepheids)    
8. Distance of the Crab Nebula    
(linear and angular size, expansion velocity of the nebula)
9. Asteroids in the Solar System  
(asteroids distribution, orbital elements, risonances)
10. Planetary conjunctions  
(conjunctions, the Star of Bethlehem and the end of the world in 2012)
11. Introduction to Stellarium for preschoolers   
(Celestial sphere, light pollution, constellations)
12. Planetary motion
(Geocentric and heliocentric models, retrograde motion, Kepler's Laws) 
13. The Moon
(Orbit of the Moon, sidereal and synodic period, phases, eclipses) 
14. The constellations of the Zodiac
(Orbit of the Moon, zodiac constellations, history and origin of the zodiac, precession of equinoxes) 
15. The Messier catalog
(An exploration of the objects in the sky: galaxies, nebulae, supernova remnants, star and globular clusters)



Use Cases



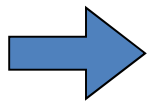
Developed with the contribution of teachers and students

Available in several languages

General presentation of the astronomical problem

Step by step guide on how to use the VO software tools needed to solve the problem

“To measure” is a key activity in science: exercises

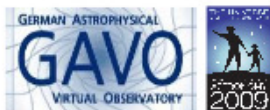
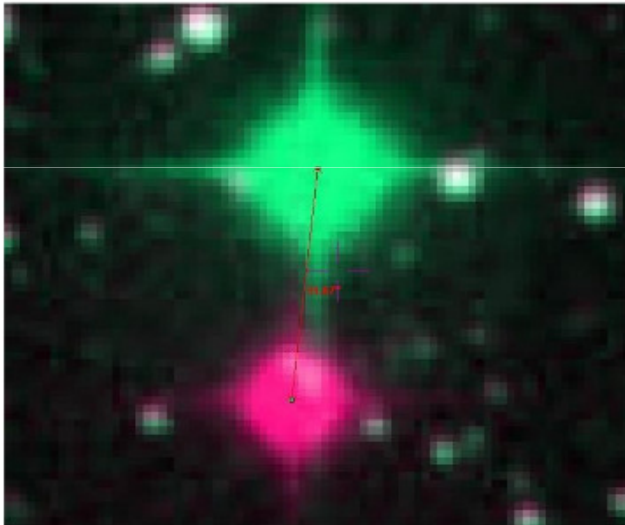


Examples: astrometry, photometry



How to use
the
Virtual Observatory

Proper Motion of Barnards Star



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florian@ari.uni-heidelberg.de

Aladin v7.5 *** BETA VERSION (based on v7.502) ***

File Modifica Immagine Catalogo Sovrapposti Strumenti Visualizza Interop Guida

Posizione 17:57:48.72 +04:39:56.1 Frame ICRS

Allsky opt Allsky IR DSS Simbad NED PPMX 2MASS

Mouse controls:
-Left: source selection.
-Middle: quick panning.
-Right: contrast adjustment.

Disegnare 1
Simbad
RGB img

Opac. -
zoom -

3.653' x 4.189'

13.94' x 13.09'

Cerca

(c) 2012 UDS/CNRS - by CDS - Distributed under GNU GPL v3 0 sel / 22 src 30Mb

<input type="checkbox"/>	2MASS	K (IR K)	8.6' x 17.1'	000528N_KI1010209	1.1"/pix	1997-05-28T10:16:50
<input type="checkbox"/>	2MASS	J (IR J)	8.6' x 17.1'	000528N_JI1010209	1.1"/pix	1997-05-28T10:16:50
<input type="checkbox"/>	POSSI	0-DSS2(0.41um)	13.0' x 13.0'	569	1.1"/pix	1950-07-09T07:40:12
<input checked="" type="checkbox"/>	POSSII	F-DSS2(0.658um)	13.1' x 13.1'	805	1.1"/pix	1991-06-16T07:48:00
<input type="checkbox"/>	POSSII	J-DSS2(0.491um)	13.1' x 13.1'	805	1.1"/pix	1988-05-12T09:54:00
<input type="checkbox"/>	POSSI	E-DSS1(0.645um)	14.2' x 14.2'	569	1.7"/pix	1950-07-09T06:45:00



Diffusion: workshops for teachers





Trieste: Esploracospo and SVAS



In Esploracospo we combine real (remote) and virtual observing:

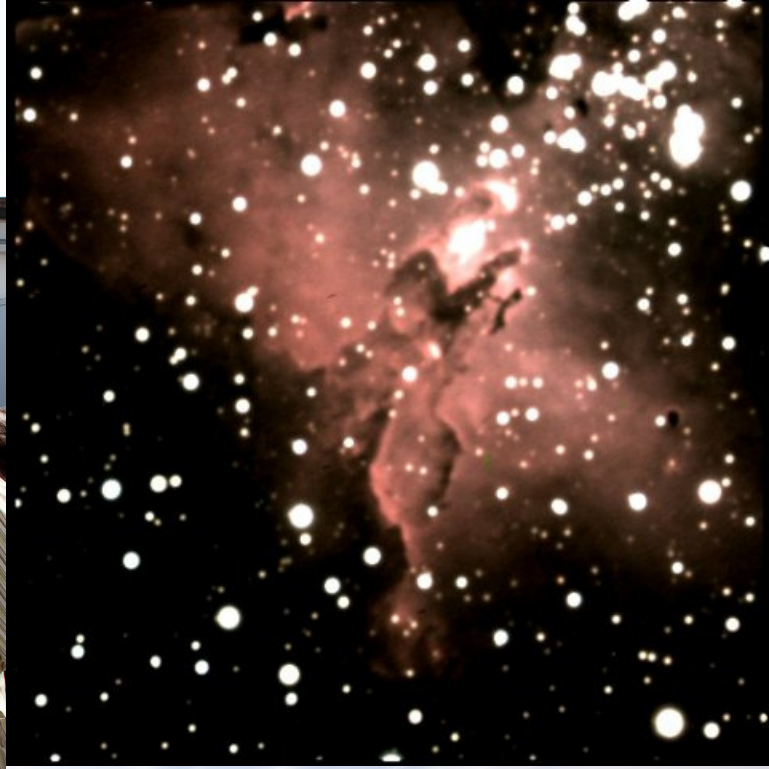
- images from SVAS telescopes
- tools and data from the VO
- images from our local archives

SVAS: two educational telescopes, for night observations (stars, nebulae, galaxies) and solar observations

SVAS telescopes can be managed remotely by students from school or from the Esploracospo laboratory at our institute

Students can not only take images by themselves but, most importantly, they can **analyze data** using VO tools







Italy: VO Edu on a nation-wide scale



Ministry of education funded a national project for astronomy education and outreach, led by INAF

VO and remote telescopes are two of the main pieces of the project

VO: -> diffusion on a national scale increasing the number of schools and students using it

-> diffusion through workshops for teachers organized in several cities



INAF telescope network

