

**AAB**

associazione **astrofili bisalta**

Associazione Astrofili

**BISALTA**

[www.astrofilibisalta.it](http://www.astrofilibisalta.it)



Cuneo, 30/11/2016

## Nuovi orizzonti in Astronomia

### Possibilità di ricerca amatoriale in campo astronomico

"Le verità scientifiche non si decidono a maggioranza." *(Galileo Galilei)*

*Ercole Viano  
Ass. Astrofili Bisalta*

# Esperienze per giovani astrofili



**Mappamondo orientato**

**Orologi solari**



**Ottica**

# Il mappamondo orientato

**Tutti i mappamondi in commercio sono costruiti con l'asse della Terra inclinato di  $23^{\circ}27'$  rispetto alla verticale**

**GLOBAL LOCAL**  
movimento per la liberazione dei mappamondi

Un progetto educativo e culturale che coinvolge l'astronomia, la geografia, la cartografia, la fotografia, l'intercultura in una visione di democrazia per il pianeta Terra  
Per insegnare il giorno e la notte, le stagioni, i fusi orari e le costellazioni visibili

**Il Progetto**  
*il progetto continua...*

Il Progetto ha ricevuto un riconoscimento dal Presidente della Repubblica Italiana Giorgio Napolitano: una **Medaglia Dedicata**

**Aderisci al progetto**

**Come costruire il mappamondo parallelo**

**Materiali**

**Appuntamenti e Novità**

**Foto**



**Esempio di mappamondo orientato correttamente**

# Orologi solari

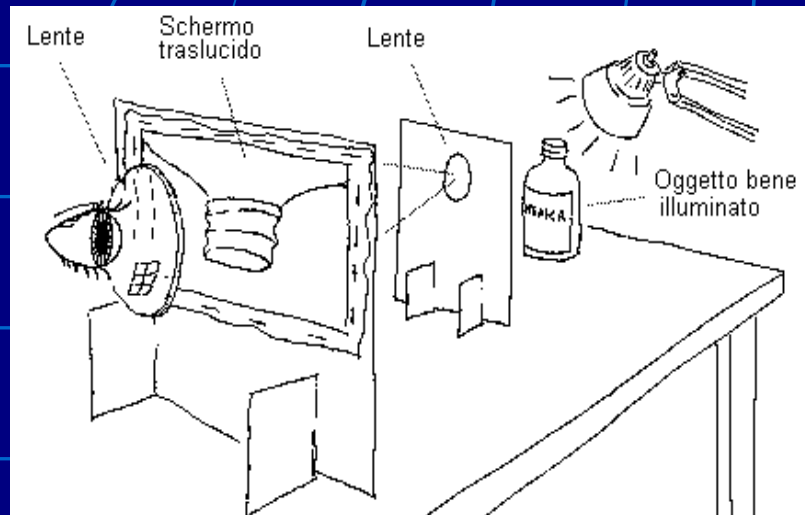
## Orologio solare equatoriale



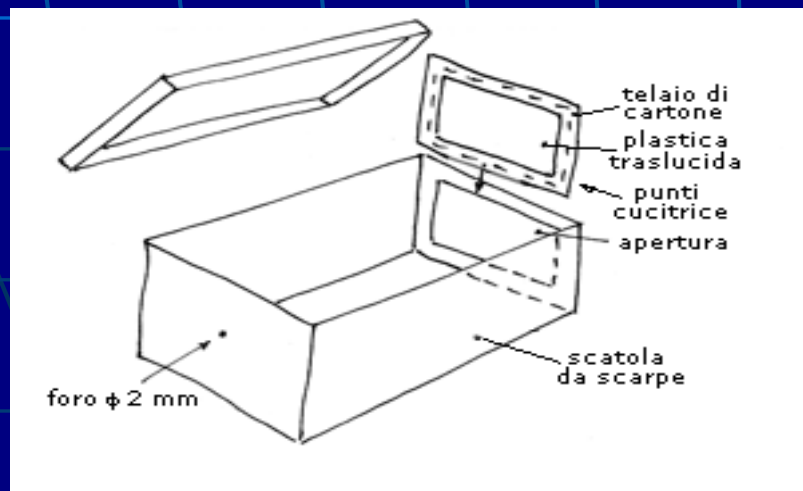
## Orologio solare verticale declinante



# Ottica



**Come funziona il telescopio rifrattore**



**Come funziona la macchina fotografica**

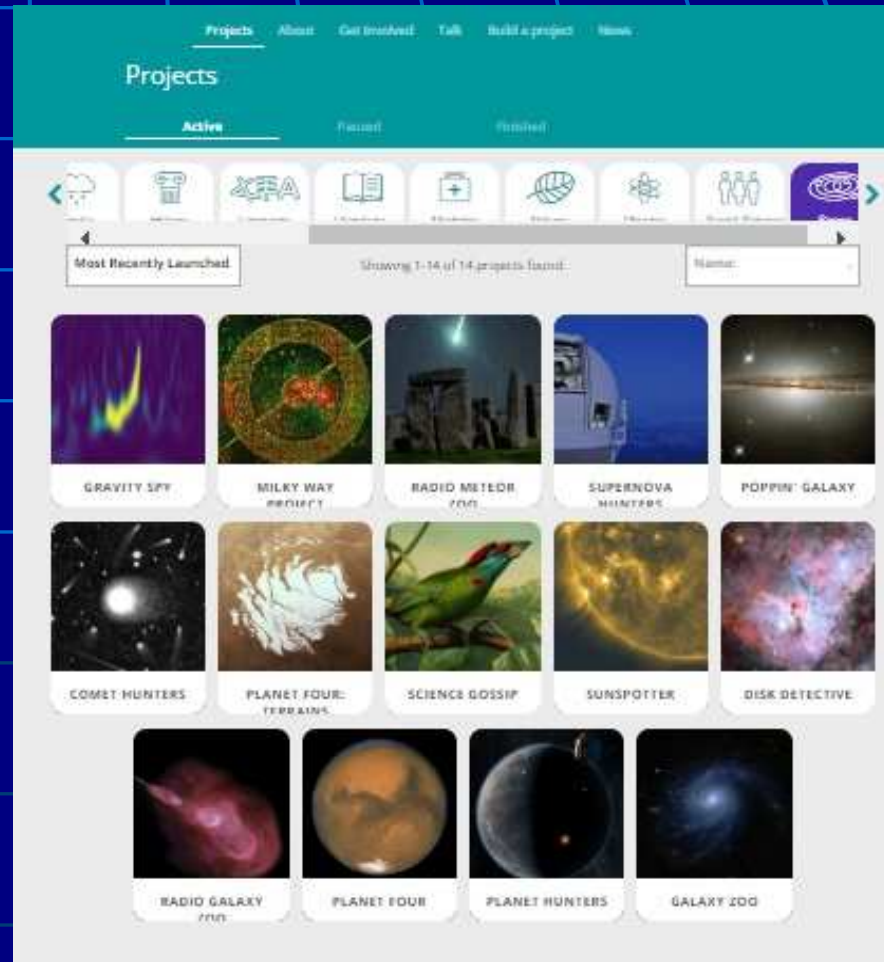
# Per iniziare...



[www.zooniverse.org](http://www.zooniverse.org)

## Calcolo distribuito

Esempio:  
SETI@home è un'esperimento scientifico che utilizza i computer connessi ad Internet per la Ricerca di Intelligenze Extraterrestri.



# Strumentazione minima

**Un telescopio di almeno ai 15 cm di apertura  
posto su una solida montatura equatoriale  
motorizzata ed una camera CCD**





# Camere digitali

La fotografia digitale offre la possibilità di ottenere dati oggettivi, utili dal punto di vista scientifico, facili da elaborare e scambiare con altri osservatori.

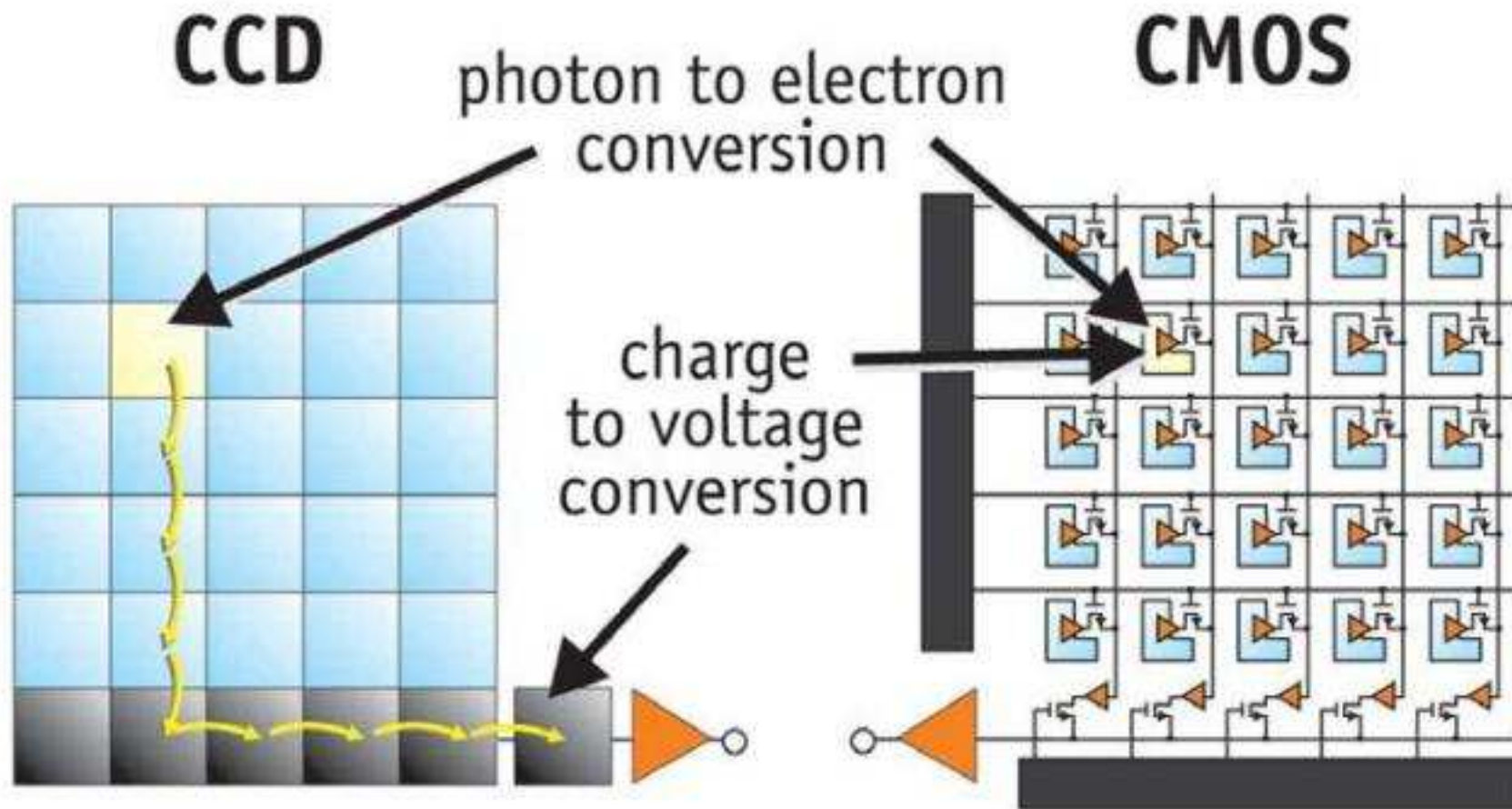


Camera reflex digitale a colori  
sensore CMOS.



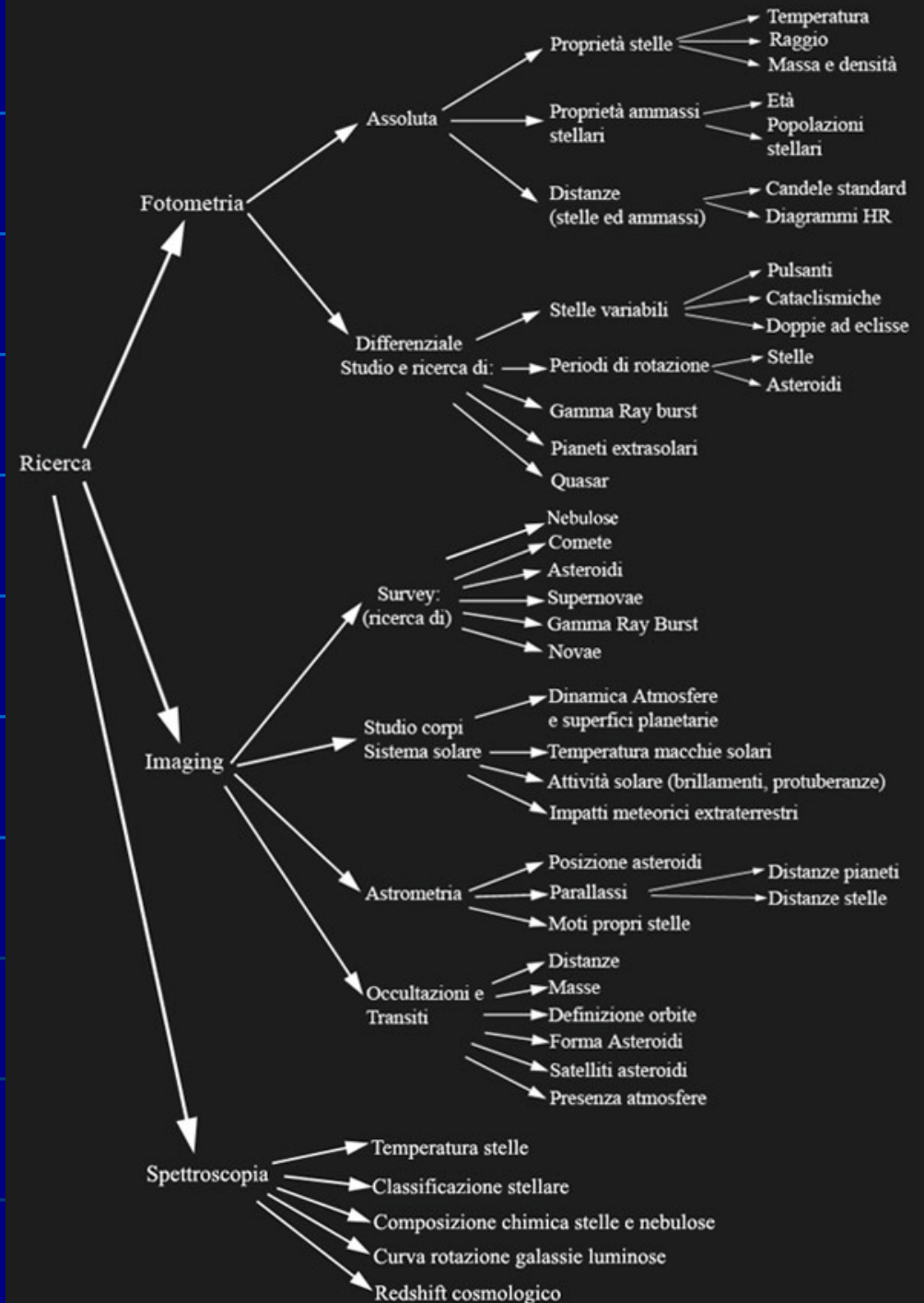
Camera CCD dotata di sensore  
monocromatico, caratterizzato da  
una elevata efficienza quantica e un  
rumore termico estremamente  
basso.

# Sensori a confronto



E' possibile fare ricerca astrofisica a livello amatoriale?

Principali progetti che si possono condurre con strumentazione amatoriale.



... Dove?



-0.62442, 53.99313

# Asteroidi e comete

Seguire nel tempo l'evoluzione  
Possibilità di scoperte a livello  
amatoriale

Potentially Hazardous  
Asteroids: PHA = 1740



## Minor Planets Discover

THIS MONTH:	215
THIS YEAR:	44425
ALL TIME:	723367

## Near-Earth Objects Discovered

THIS MONTH:	103
THIS YEAR:	1693
ALL TIME:	15307

## Comets Discovered

THIS MONTH:	0
THIS YEAR:	36
ALL TIME:	3945

# A Near-Earth Asteroid Census

Each image represents 100 objects

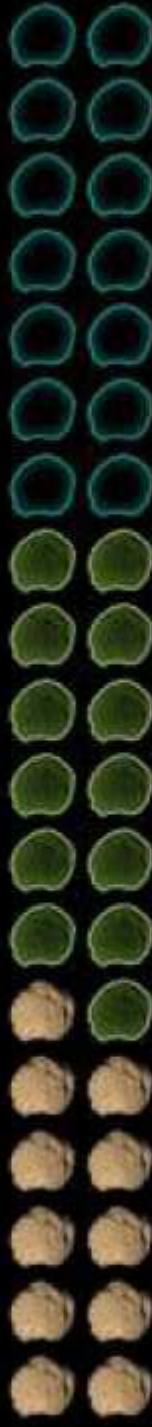
- Known Asteroids
- New Predicted Total (WISE)
- Old Predicted Total (pre-WISE)



> 1000 m



500–1000 m



300–500 m



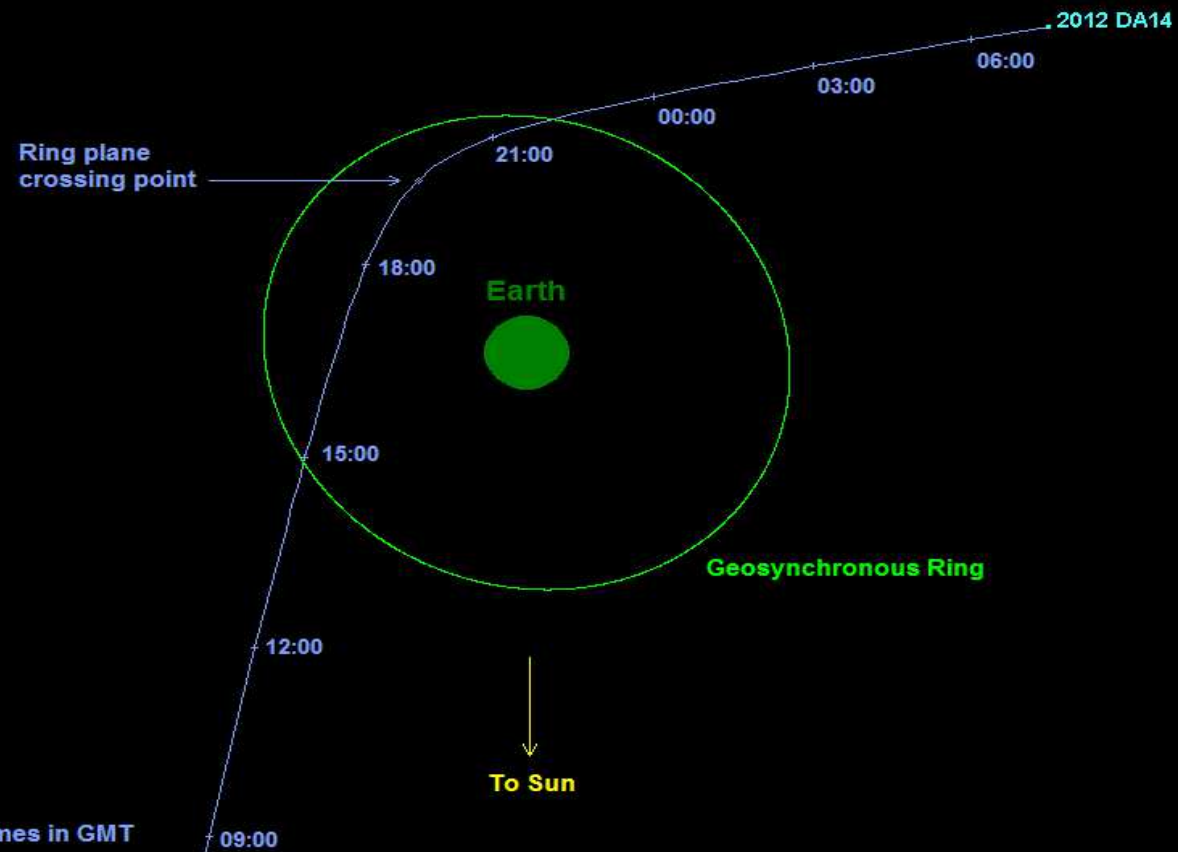
100–300 m



< 100 m

# Asteroidi pericolosi

**Asteroid 2012 DA14: Close Approach to Earth, Feb. 15, 2013  
Projected into the Ecliptic Plane**



P. Chodas (NASA/JPL)

# Ripresa e riduzione astrometrica

Astrometrica for Windows

File Edit Astrometry Images Tools Internet Windows Help

Image - TOUTQ.fit

Object Verification

Display  
Zoom 6x Center Object Freq. 1

Information  
TOUTQ.fit  
2012 12 11 87499 (20:59:59 UT)  
RA = 01 13 28.84 De = +00 10 03.3 V = 10.7

Object Designation  
[4179] Toutatis [04179]

Note

PSF - Fit  
x = 319.85  
y = 287.63  
SNR = 124.6  
Flux = 526676  
FWHM = 6.4"  
Fit RMS = 0.067

Centroid

Accept

Reject

Data Reduction Results

Image	Detections	Ref. Stars	Ref./Ast.	Fit Order	dRA	dDe	Ref./Phot.	dmag	Zero Pt.
TOUTQ.fit	193	34	34	4	0.20"	0.18"	32	0.15mag	24.96mag

PPMXL Fit Order: 4 V mag Astrometrica.cfg



# Riduzione astrometrica di somma di immagini

The screenshot displays the 'Astrometrica for Windows' interface. The main window shows a 'Stacked Image - 2013 EV108a001.fit + 44' with various objects marked. A red circle highlights a specific object, which is shown in a magnified view in the 'Object Verification' window. This window includes a 'PSF - Fit' plot and a table of parameters for the selected object.

**Object Verification Parameters:**

- Display: Zoom 6x, Center Object, Freq. 1
- Information: 2013 EV108a001.fit, 2013 03 21.89841 (21:33:43 UT), RA = 11 48 55.11 De = +31 43 01.3 V = 19.0
- Object Designation: 2013 EV108, K13EA8V
- Note: K - stacked image
- PSF - Fit: x = 291.14, y = 252.67, SNR = 12.9, Flux = 374, FWHM = 4.8", Fit RMS = 0.122
- Buttons: Centroid, Accept, Reject

**Data Reduction Results Table:**

Image	Stars	Ref. Stars	Ref./Ast.	Fit Order	dRA	dDe	Ref./Phot.	dmag	Zero Pt.
2013 EV108a001.fit	48	28	28	3	0.14"	0.09"	28	-0.26mag	25.46mag
2013 EV108a002.fit	48	27	27	3	0.10"	0.10"	27	-0.24mag	25.48mag

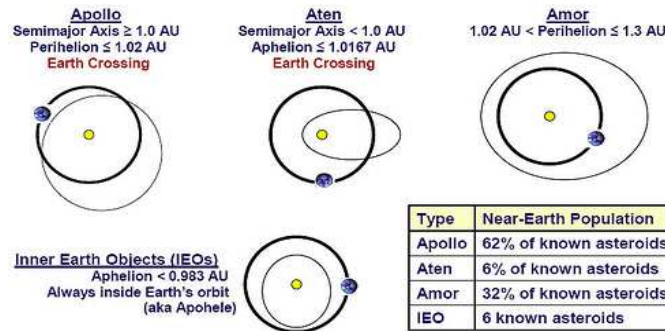
# Dati dell'asteroide confermato dal Minor Planet Center

2013 FA8

## Orbit

Orbit type: Apollo

Potentially Hazardous Asteroid

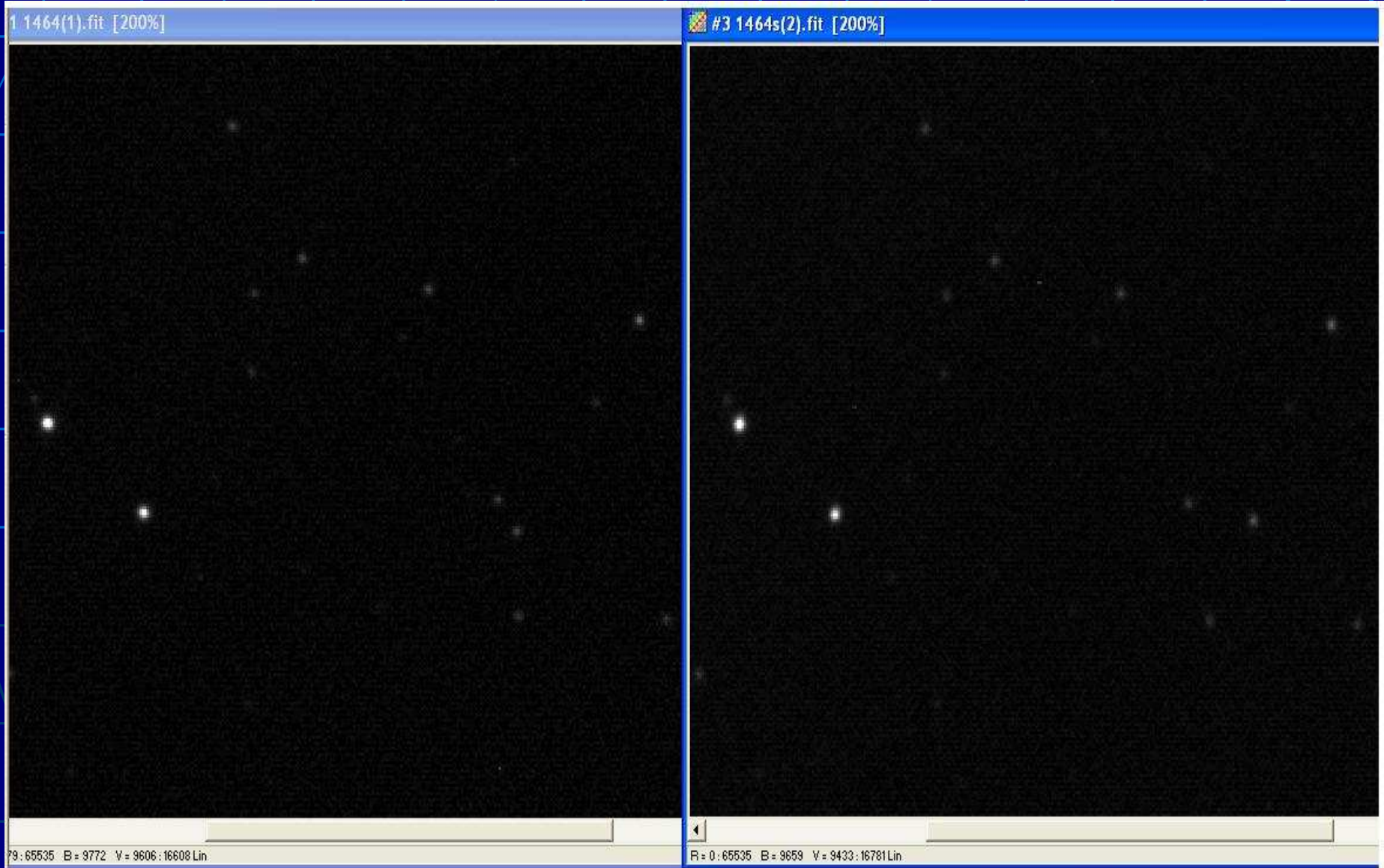


[Interactive Orbit Sketch](#)

Figure 1. Near Earth Asteroid Orbit Types

epoch	2013-04-18.0	semimajor axis (AU)	1.9283638	<u>uncertainty</u>	4
epoch JD	2456400.5	mean anomaly (°)	32.80483	reference	MPO 265053
perihelion date	2013-01-18.87134	mean daily motion (°/day)	0.36806150	observations used	131
perihelion JD	2456311.37134	aphelion distance (AU)	3.228	oppositions	1
argument of perihelion (°)	280.22853	period (years)	2.68	arc length (days)	50
ascending node (°)	166.07646	P-vector [x]	0.06409679	first opposition used	2013
inclination (°)	3.10868	P-vector [y]	0.93551391	last opposition used	2013
eccentricity	0.6740518	P-vector [z]	0.34742672	residual rms (arc-secs)	0.34
perihelion distance (AU)	0.6285466	Q-vector [x]	-0.99785837	<u>perturbers coarse indicator</u>	M-v
		Q-vector [y]	0.05552951	<u>perturbers precise indicator</u>	003Eh
		Q-vector [z]	0.03457101	first observation date used	2013-03-18.0

# Ricerca nuovi asteroidi



*C/2013 R1 Lovejoy*



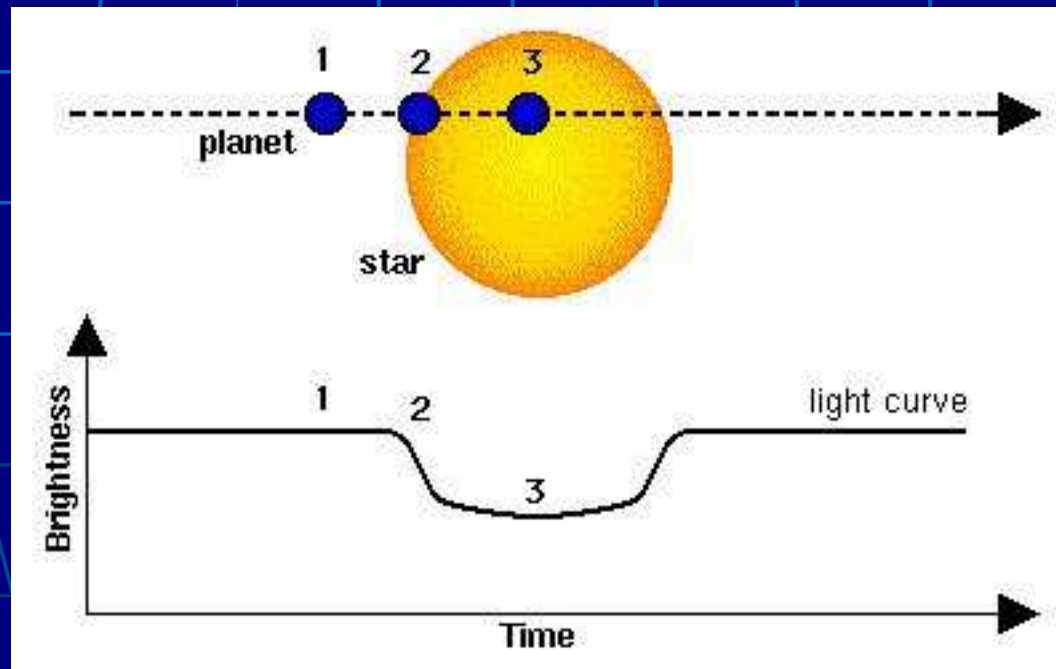
# Pianeti extrasolari

Pianeti non appartenenti al Sistema solare,  
orbitanti attorno ad una stella diversa dal Sole  
1992: prima scoperta confermata

3541 pianeti extrasolari conosciuti in 2656 sistemi  
diversi (al 12/11/2016)

# Rilevazione di un pianeta extrasolare con il metodo del transito

## Fotometria differenziale





# Variable Star and Exoplanet Section

of Czech Astronomical Society



B.R.N.O.



MEDUZA



TRESCA



HERO



### NEWS

- RSS feed
- Comments
- YouTube channel
- Facebook

### OBSERVING CAMPAIGNS

**NEW**

Expired Campaigns

### OBSERVING PROJECTS

- B.R.N.O. - eclipsing binaries
- MEDUZA - intrinsic variables
- TRESCA - exoplanets
- HERO - high energy objects



### OBSERVERS LOG

User-defined objects

### ABOUT US

- Leadership
- Actions
- Perseus Bulletin
- J. Silhan price "The Observer of the year"
- Membership conditions

## TRESCA Project - Exoplanets

Exoplanet Transit Database > **ETD**

Our transit observations >

Welcome to TRESCA web page about transiting exoplanets and its observation.



TRESCA is an acronym from words TRansiting ExoplanetS and Candidates.

More than 50 exoplanets has an orbit oriented in space in direction to the Earth and we can see dark planet body transiting in front of stellar disc. During this transits, observed brightness of the parent star decreases of about 0.003 - 0.04 mag.

- [Transit observations](#) (on-line reports)
- [Send transit observation to database](#) (on-line automatic protocol)
- **ETD - Exoplanet Transit Database**
- Transit predictions
- Table of known transiting exoplanets
- **Gliese** - czech popular journal on exoplanets

No user logged in  
- LOGIN -  
Observer registration

> [Minima predictions](#) <

> [Exoplanet transits](#) <

#### [New minima in B.R.N.O.:](#)

- [CSS\\_J031204.2+302609 Ari](#) (František Lomoz)
- [CSS\\_J030933.9-300228 Ari](#) (František Lomoz)
- [CSS\\_J030950.6+302419 Ari](#) (František Lomoz)
- [MASS\\_J23334239-0129396 Psc](#) (František Lomoz)
- [GSC 05251-00240 Psc](#) (František Lomoz)
- [GSC05251-00240 Psc](#) (František Lomoz)
- [GSC 05251-00240 Psc](#) (František Lomoz)
- [GSC 05165-00276 Ari](#) (František Lomoz)
- [VESPA V47 Del](#) (František Lomoz)
- [VESPA V39 Del](#) (František Lomoz)

#### [New transits in TRESCA:](#)

- [XO-3 b](#) (M. Michel)
- [WASP-77 b](#) (F. Lomoz)
- [HAT-P-51 b](#) (Soulignac)

# TrES-3b

MaxIm DL Pro 5 - Photometry - TrES-3 b001.fit

File Edit View Analyze Process Filter Color Plug-in Window Help

100%

-3 b085.fit | TrES-3 b086.fit | TrES-3 b087.fit | TrES-3 b088.fit | TrES-3 b089.fit | TrES-3 b090.fit | TrES-3 b091.fit | TrES-3 b092.fit | TrES-3 b093.fit | TrES-3 b094.fit | TrES-3 b095.fit | TrES-3 b096.fit | TrES-3 b097.fit | TrES-3 b098.fit | Photometry - TrES-3 b001.fit

Photometry - TrES-3 b001.fit

Photometry

Image list

- TrES-3 b001.fit
- TrES-3 b002.fit
- TrES-3 b003.fit
- TrES-3 b004.fit
- TrES-3 b005.fit
- TrES-3 b006.fit
- TrES-3 b007.fit
- TrES-3 b008.fit
- TrES-3 b009.fit
- TrES-3 b010.fit
- TrES-3 b011.fit
- TrES-3 b012.fit
- TrES-3 b013.fit
- TrES-3 b014.fit

Tagged objects

- Obj1 (402,377)
- Ref1 (461,388)
- Ref2 (198,313)
- Ref3 (281,190)

Time/identification field

Date/time from FITS

Exclude

Time of Image (Mid-exp.)

2013-06-26 23:31:35.3  
JD 2456470.480271

View Plot...

Mouse click tags as:

(none)

Ref Mag

Untag

Act on all images

Use star matching

Snap to centroid

Close

Information

Cursor

Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	
Average	Bgd Avg
Std Dev	Bgd Dev
Centroid	
FWHM	Flatness

Mode Aperture  Display in Arcsec Calibrate <<

Magnitude Calibration

Intensity 548576 Extract from image

Exposure 60.00 Set from FITS


Magnitude 10 Apply

Spatial Calibration

Pixel scale X 1.313 FITS scale not available

Set... Y 1.313 Diagonal

Screen Stretch



Minimum 1500 Maximum 2151.9 Manual

Update >>

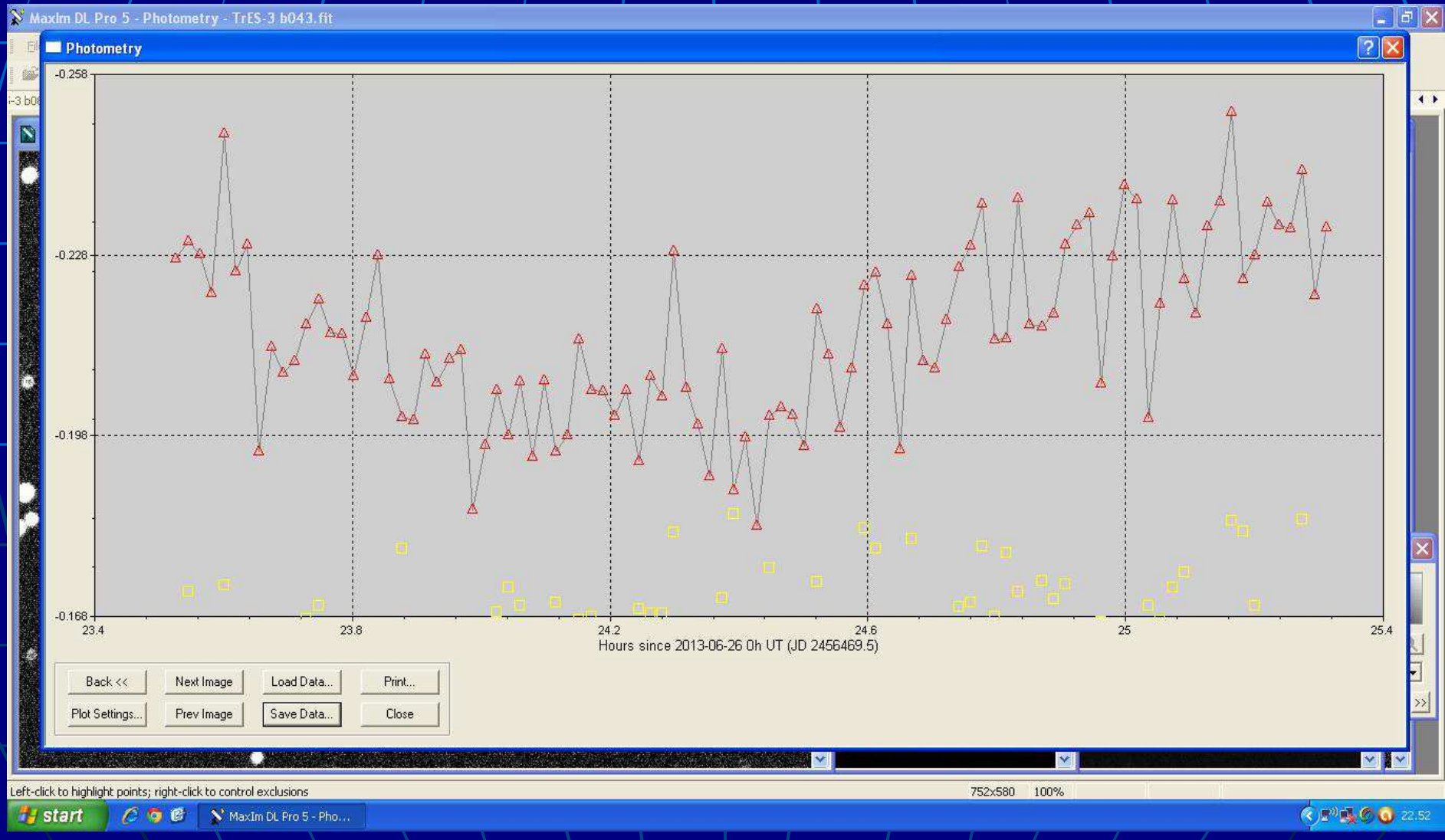
For Help, press F1

752x580 100%

start MaxIm DL Pro 5 - Pho... Graficook.JPG - Paint 22:55



# Grafico che evidenzia la caduta di luce



# Stelle variabili

Stelle che, per una qualche ragione, mutano la loro luminosità nel tempo.

**AAVSO Home**

The International Variable Star Index

Search Submit Register Log In Account About

Current Time: 24 Sep 2014 20:29:53 UTC Welcome, Guest. You are not logged in. [Log in](#)

[» Revise](#) [» New Search](#)

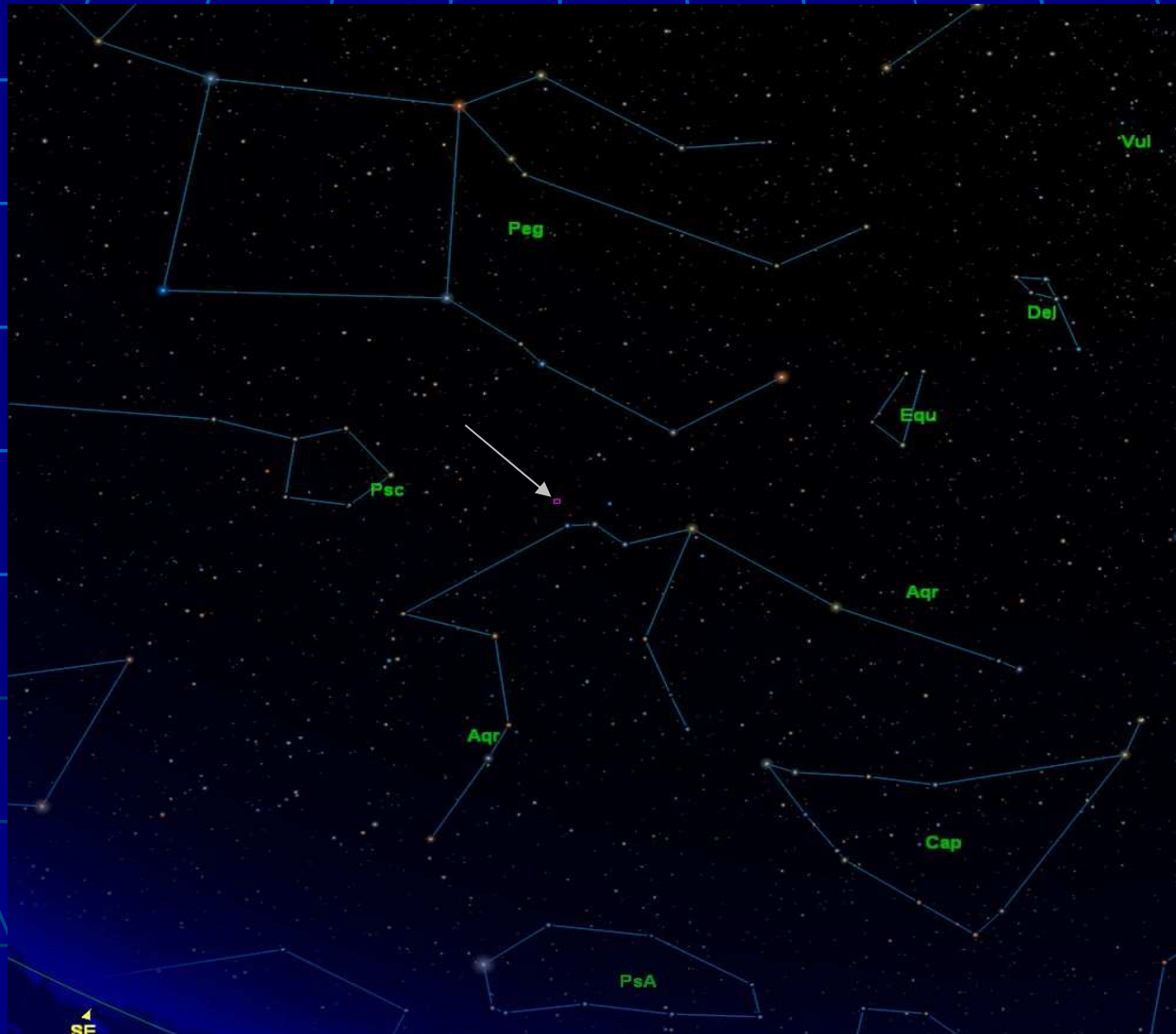
### Latest Details ?

Log in to retrieve additional aliases from SIMBAD.

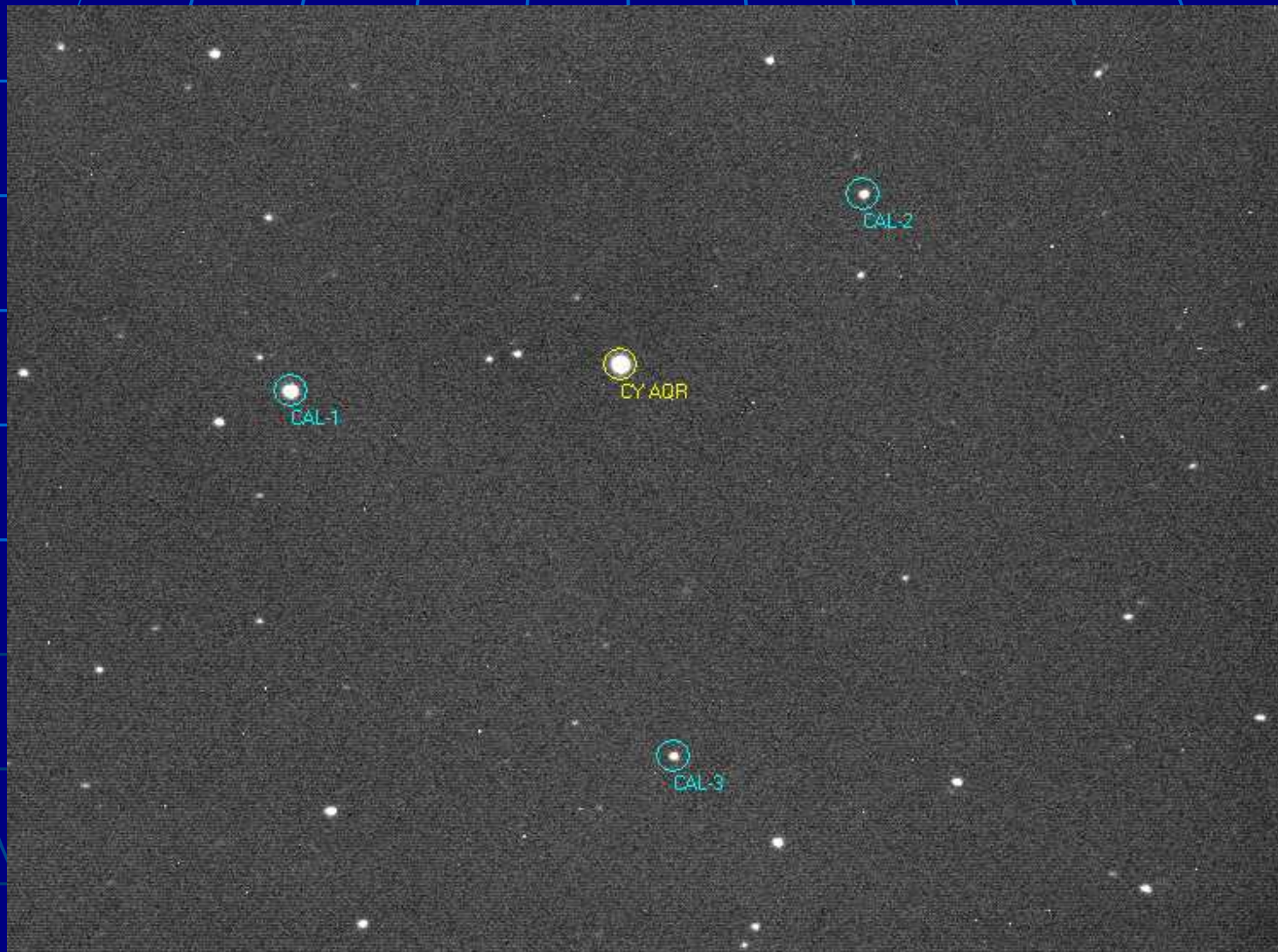
Name	<input checked="" type="checkbox"/> <b>CY Aqr</b>
AAVSO UID	000-BCQ-585 (4282 observations)
Constellation	Aquarius <a href="#">» Sequence</a>
J2000.0	22 37 47.85 +01 32 03.8 (339.44938 +1.53439) <a href="#">» Search nearby</a>
B1950.0	22 35 14.77 +01 16 25.6
Galactic coord.	69.232 -46.923
Other names (Internal only)	<i>Please note that aliases shown in grey link to obsolete records.</i> AAVSO 2232+01 AN 391.1934 ASAS J223748+0132.1 BD+00 4900 HIP 111719
Variability type	SXPHE <span>?</span>
Spectral type	A2-A8
Mag. range	10.42 - 11.20 V <span>?</span>
Discoverer	--

(Not logged in) [» Add name](#)

# CY Aqr

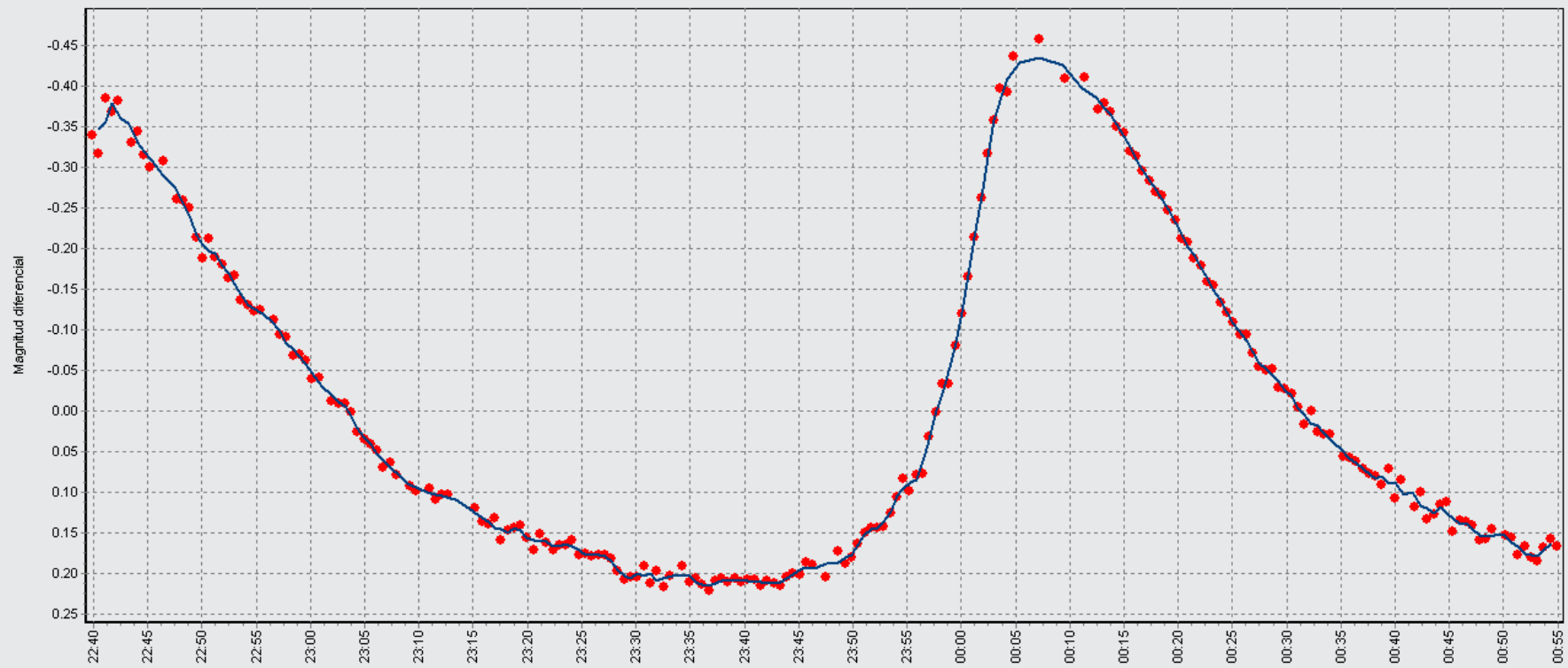


# Immagine di riferimento



# Curva di luce che evidenzia un periodo di 90'

CY Aqr

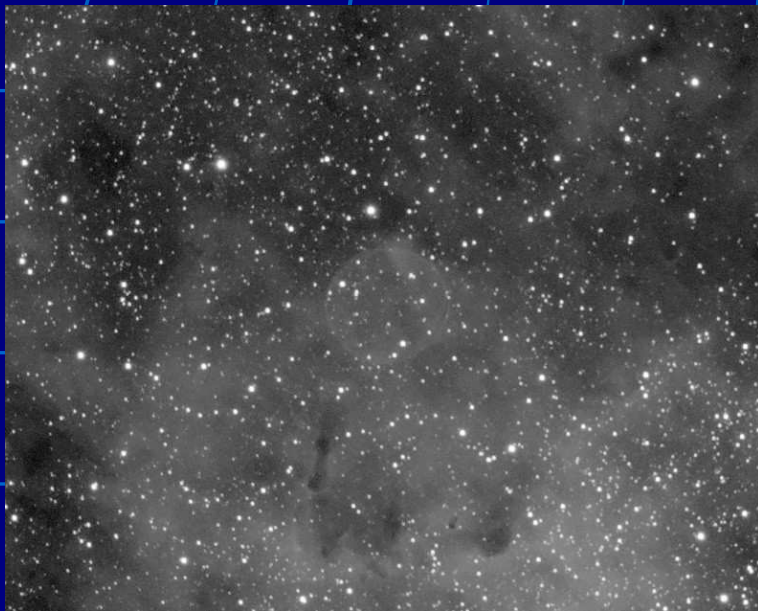


Fecha UT: 23/09/2014 +

FotoDif (19/01/2010)

# Analisi di immagini astronomiche

Immagine originale che ha permesso l'identificazione della nuova nebulosa da parte di Dan Jurasevich, utilizzando un rifrattore apocromatico TEC da 160mm e una camera CCD SBIG STL-11000,



l'immagine realizzata da Keith Quattrocchi utilizzando filtri a banda stretta (H-alpha, SII ed OIII) ed un telescopio da 40 cm



# Meteore

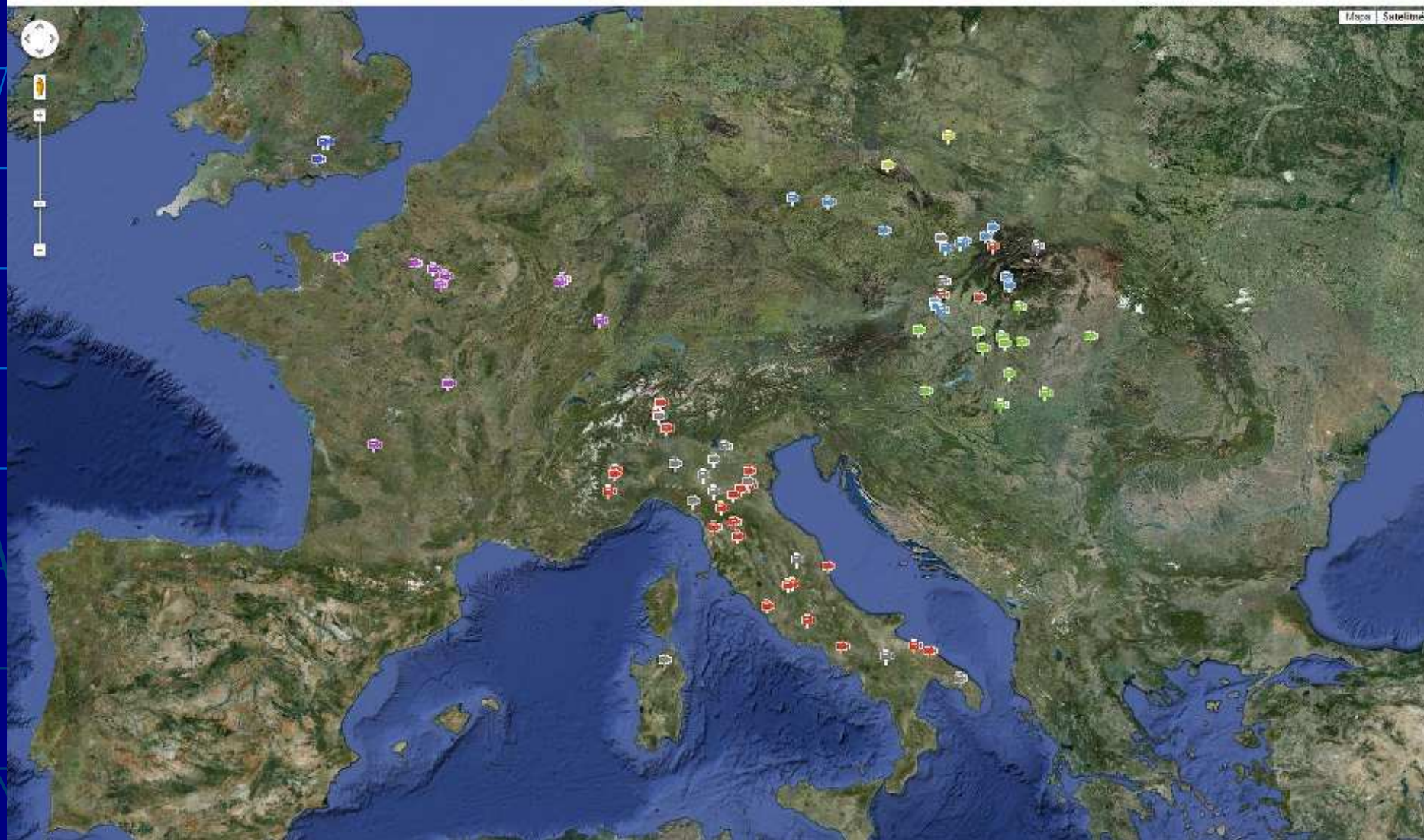
La nostra associazione partecipa  
attivamente alla rete italiana IMTN e al  
network europeo EDMOND

Rete di sorveglianza semi automatica del  
cielo notturno, per la registrazione  
sistematica di meteore, bolidi e altri  
fenomeni di svariata natura

Calcolo di orbite di bolidi o meteore  
attraverso triangolazioni delle riprese  
effettuate dalle varie postazioni

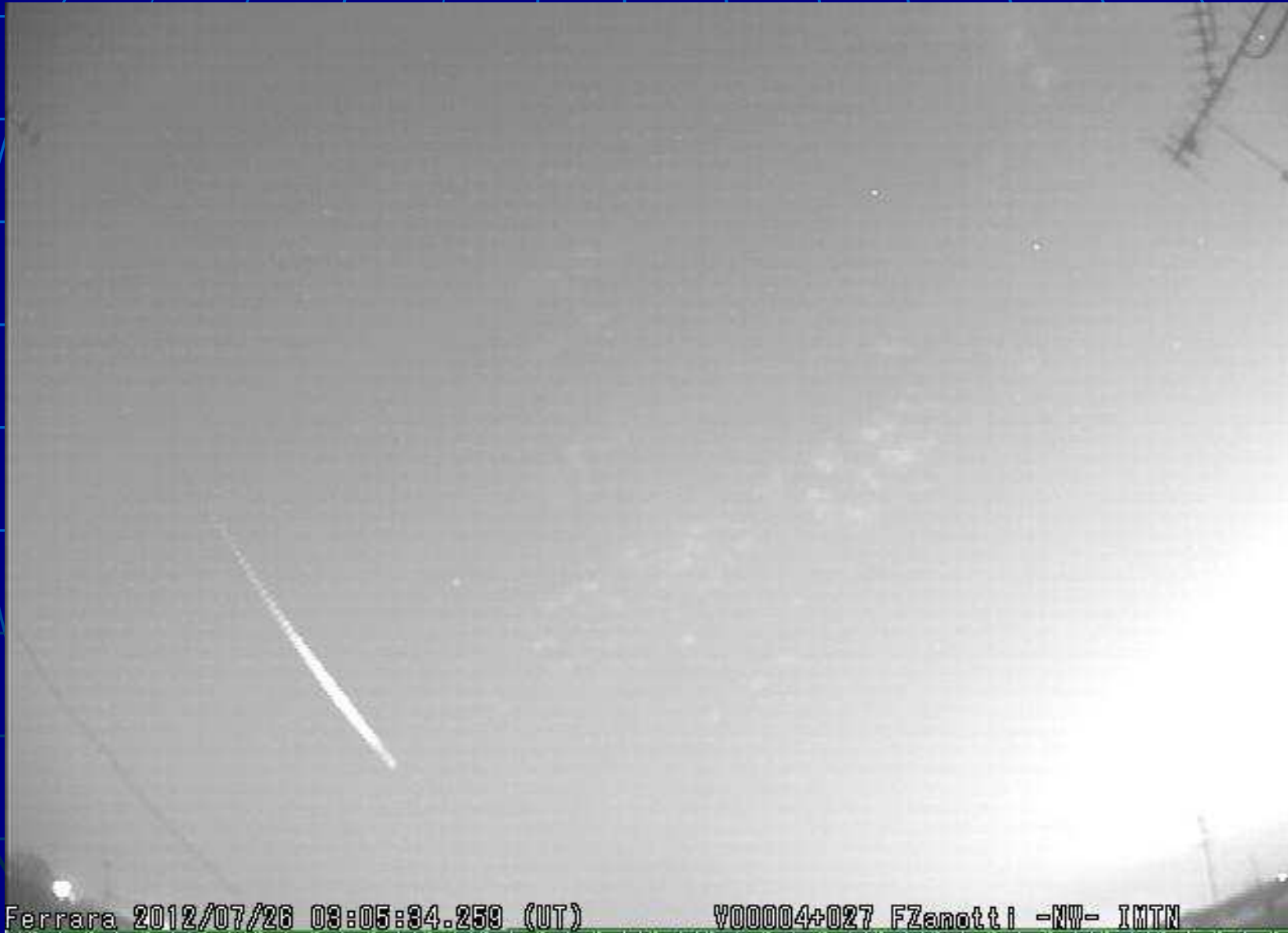
# EDMOND

EDMOND / European viDeo Meteor Observation Network

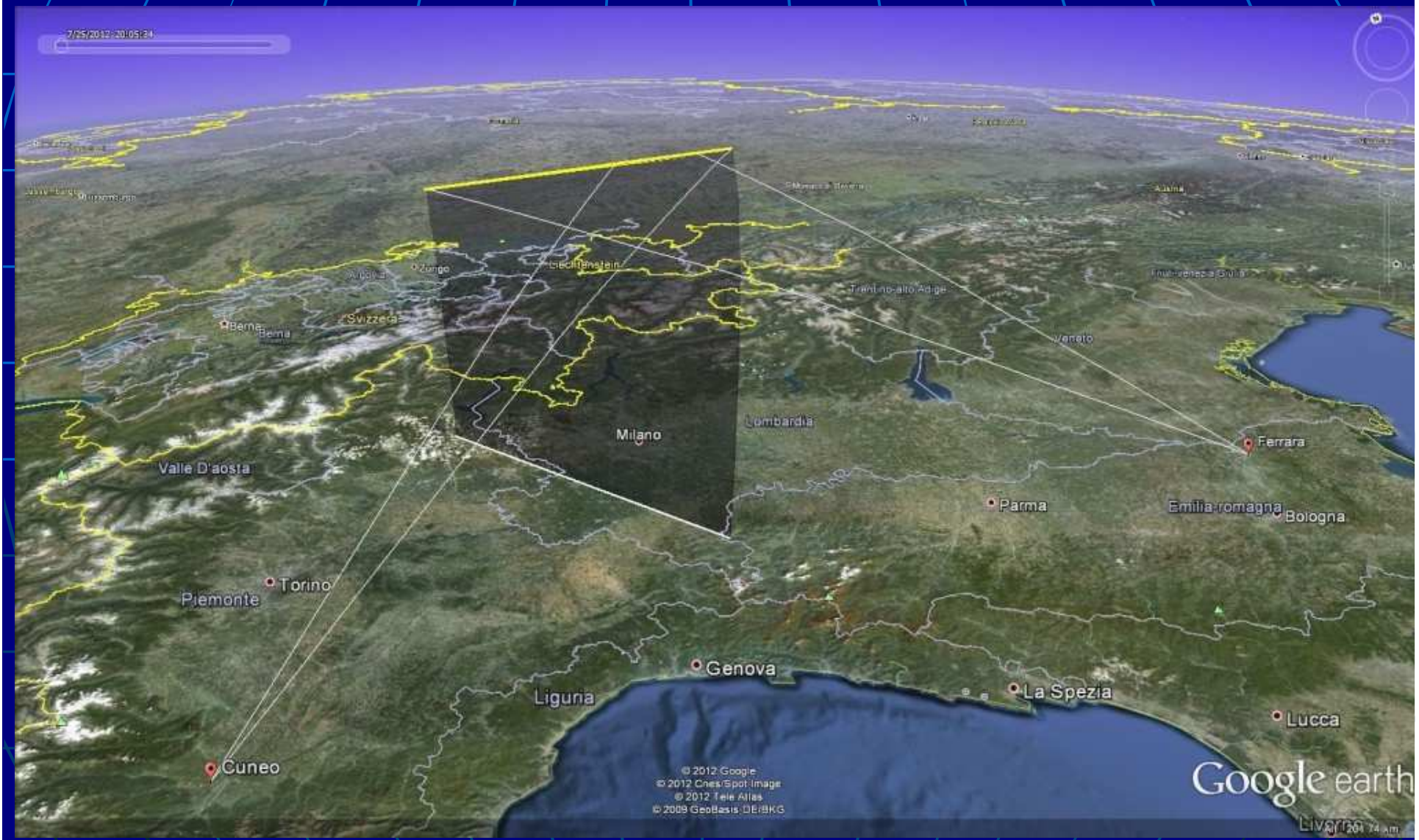




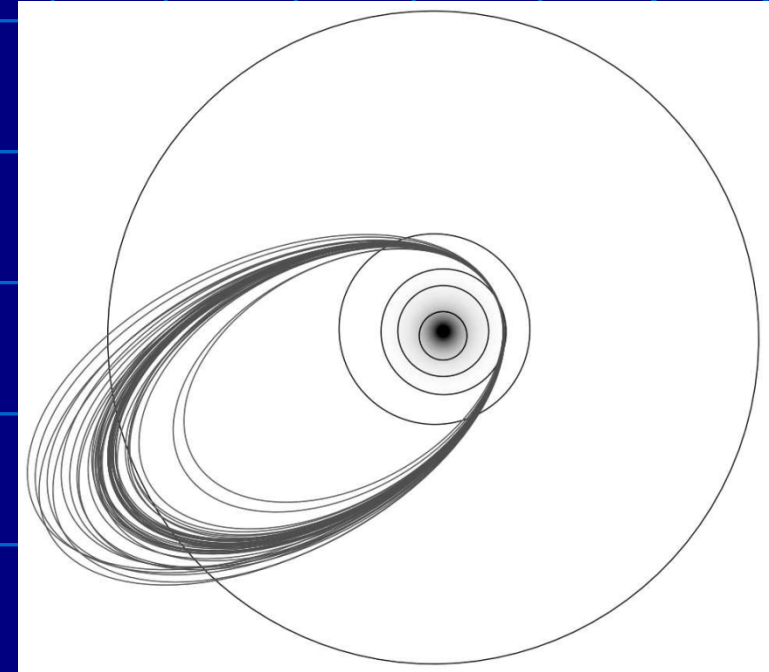
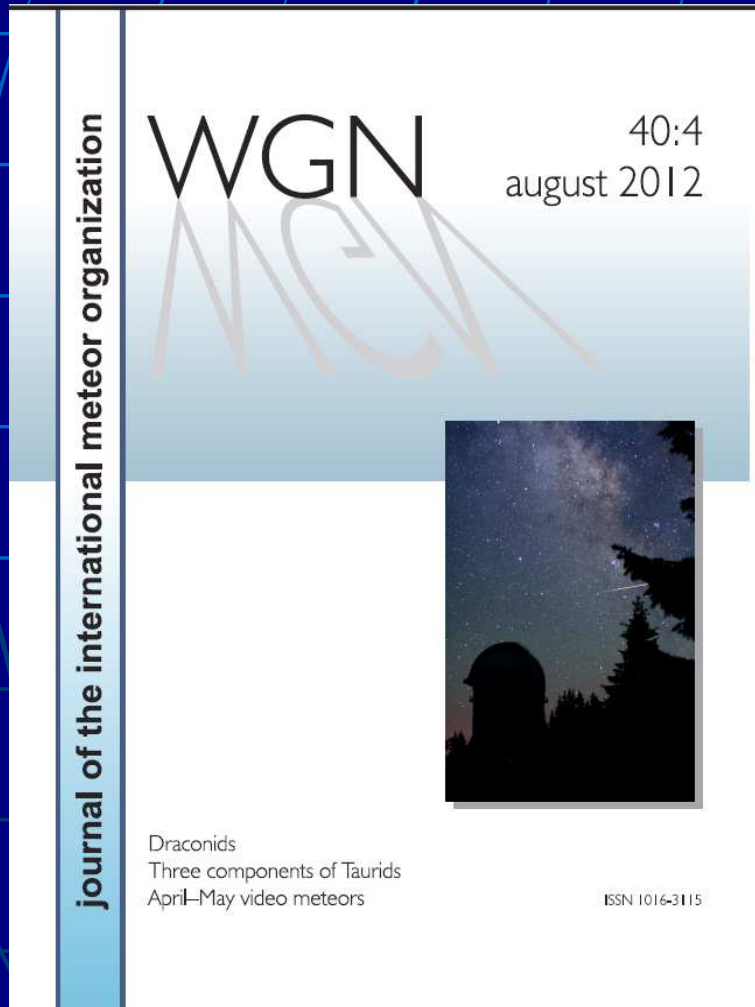
# Registrazione della traccia



# Triangolazione Cuneo-Ferrara



# Draconidi 2011



WGN, THE JOURNAL OF THE IMO 40:4 (2012)

117

## Draconids

### Video observation of Draconids 2011 from Italy

*Juraj Tóth<sup>1</sup>, Roman Piff<sup>2</sup>, Jakub Koukal<sup>2</sup>, Przemysław Żołądek<sup>3</sup>, Mariusz Wiśniewski<sup>3</sup>, Štefan Gajdoš<sup>1</sup>, Ferruccio Zanotti<sup>4</sup>, Diego Valeri<sup>4</sup>, Paolo De Maria<sup>4</sup>, Martin Popek<sup>2</sup>, Sylvie Gorková<sup>2</sup>, Jozef Világi<sup>1</sup>, Leonard Kornoš<sup>1</sup>, Dušan Kalmančok<sup>1</sup> and Pavol Zigo<sup>1</sup>*

The joint observation of Draconids 2011 by one all-sky video camera of the Slovak Video Meteor Network (SVMN), cameras of the Central European Meteor Network (CEMeNt), the Polish Fireball Network and local Italian Meteor and TLE Network in the night of October 8–9 brought hundreds of detected meteors over Italy. Due to the problematic weather situation in Central Europe, several groups had to move up and locate their video equipment in the Northern Italy to become a part of a ground-based observational Draconids 2011 campaign. This enthusiasm and effort resulted in valuable observations, of which results are presented in this brief paper.



**Grazie per l'attenzione!**

**AAB**

associazione **astrofili bisalta**

Associazione Astrofili

**BISALTA**

[www.astrofilibisalta.it](http://www.astrofilibisalta.it)

