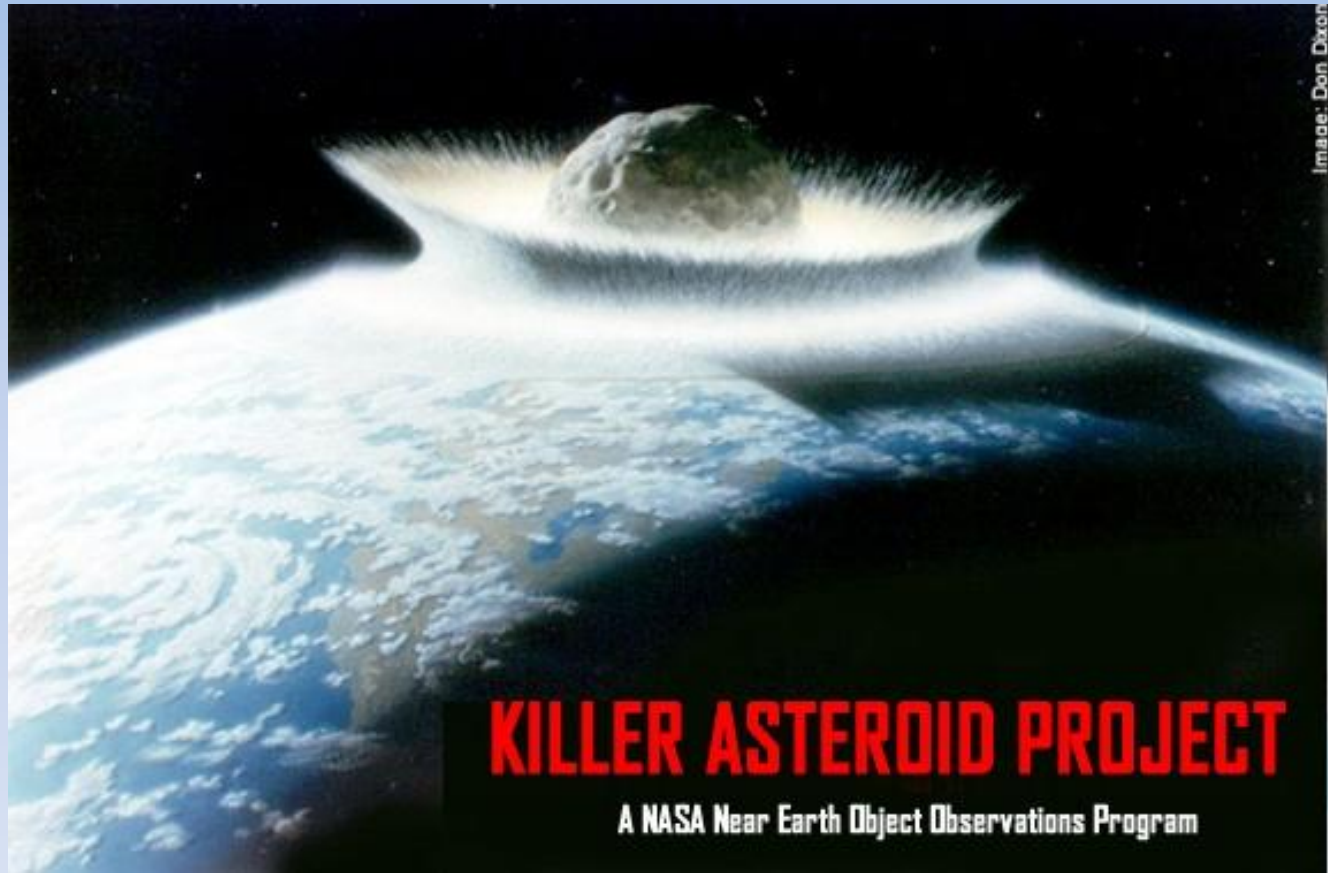


International Astronomical Search Collaboration
Online Student-Based Discovery Programs

ПРОСЛЕДЯВАНЕ И ОТКРИВАНЕ НА НОВИ АСТЕРОИДИ

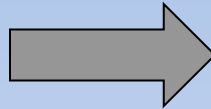
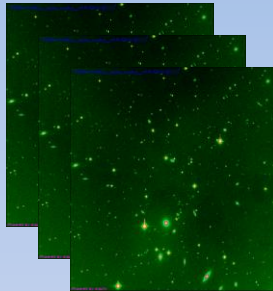
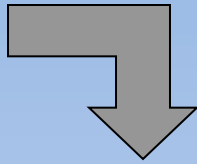
1 април 2012 – 1 април 2013



Др Веселка Радева

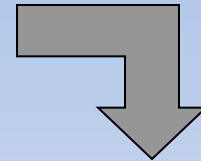
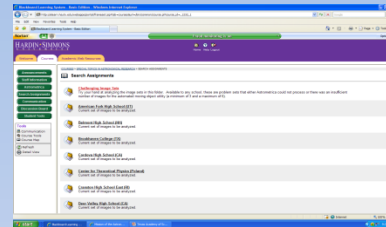
Димчо Каракашев, Ивелин Георгиев Станислав Щерев, Вергил Йотов, Деница Съйнова, Итай Грудев, Цанко
Йорданов, Борислав Неделчев, Иван Попов, Неделчо Ласков, Петър Даскалов
Астрономическа обсерватория и планетариум "Николай Коперник", Варна

Astronomical Research Institute

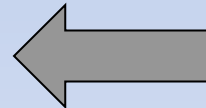
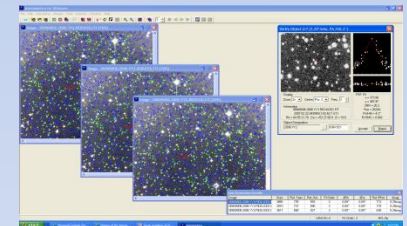


IASC Program Flow Diagram

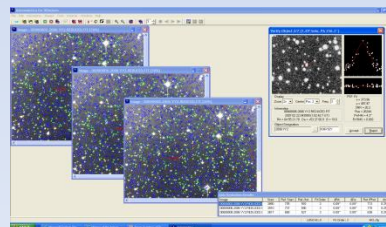
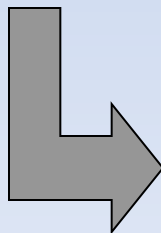
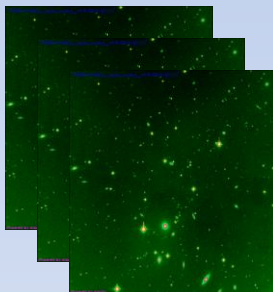
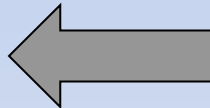
Hardin-Simmons University



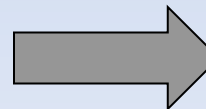
Astrometrica



Sierra Stars Observatory



HSU & *Astrometrica*



Minor Planet Center (Harvard)

0.61 м

ОБСЕРВАТОРИЯТА

0.82 м



If your school would like to participate in the IASC search campaigns, contact the IASC Director, Dr. J. Patrick Miller by email at iasc@sierrastars.org. Campaigns are held every 80 days prior to the date.



32" Prime Focus Telescope
Astronomical Research Institute



50" RCT Telescope
Western Kentucky University



24" Nighthawk CC06 Telescope
Sierra Stars Observatory



32" Schulman Telescope
Mt. Lemmon SkyCenter



32" Ritchey–Chrétien Telescope
Tarleton State University

Astrometrica

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- ▶ **NASA WISE Search**
- ▶ **Asteroid Search**
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- ▶ **Discoveries & Observations**

Astrometrica software, installation guide, & instructions with practice image sets.

Astrometrica Software & Files

Download these files onto the Desktop.

[Astrometrica File](#)

[Configurations File](#)

Quick Start Guide

Download this guide to set-up and use Astrometrica.

[Quick Start Guide](#)

Instructions & Practice Image Sets for Asteroid Searches

Download these files to practice Astrometrica and asteroid searches.

[Instructions for Automated & Manual Searches](#)

[Guide on True & False Signatures](#)

[Practice Image Sets \(6\)](#)

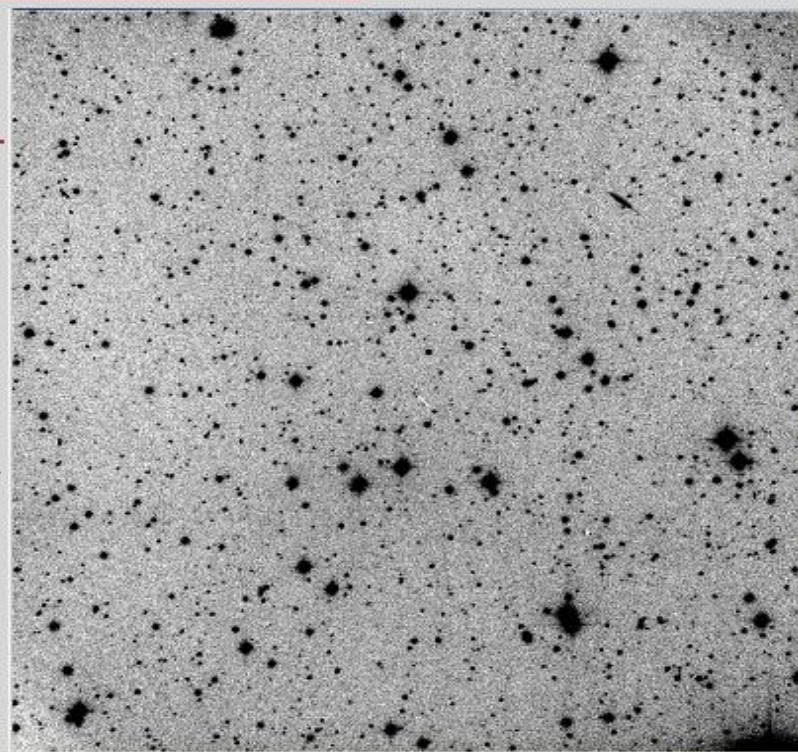
Instructions for NEO Confirmations

Download these files to practice Astrometrica and NEO confirmations.

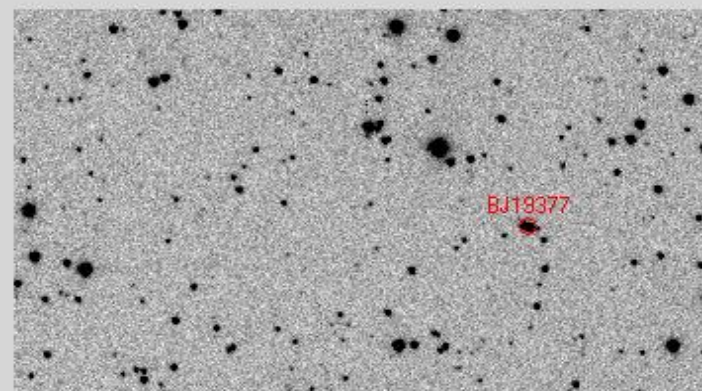
[Instructions for Accessing Image Sets](#)

[Instructions on How to Stack & Track Image Sets](#)

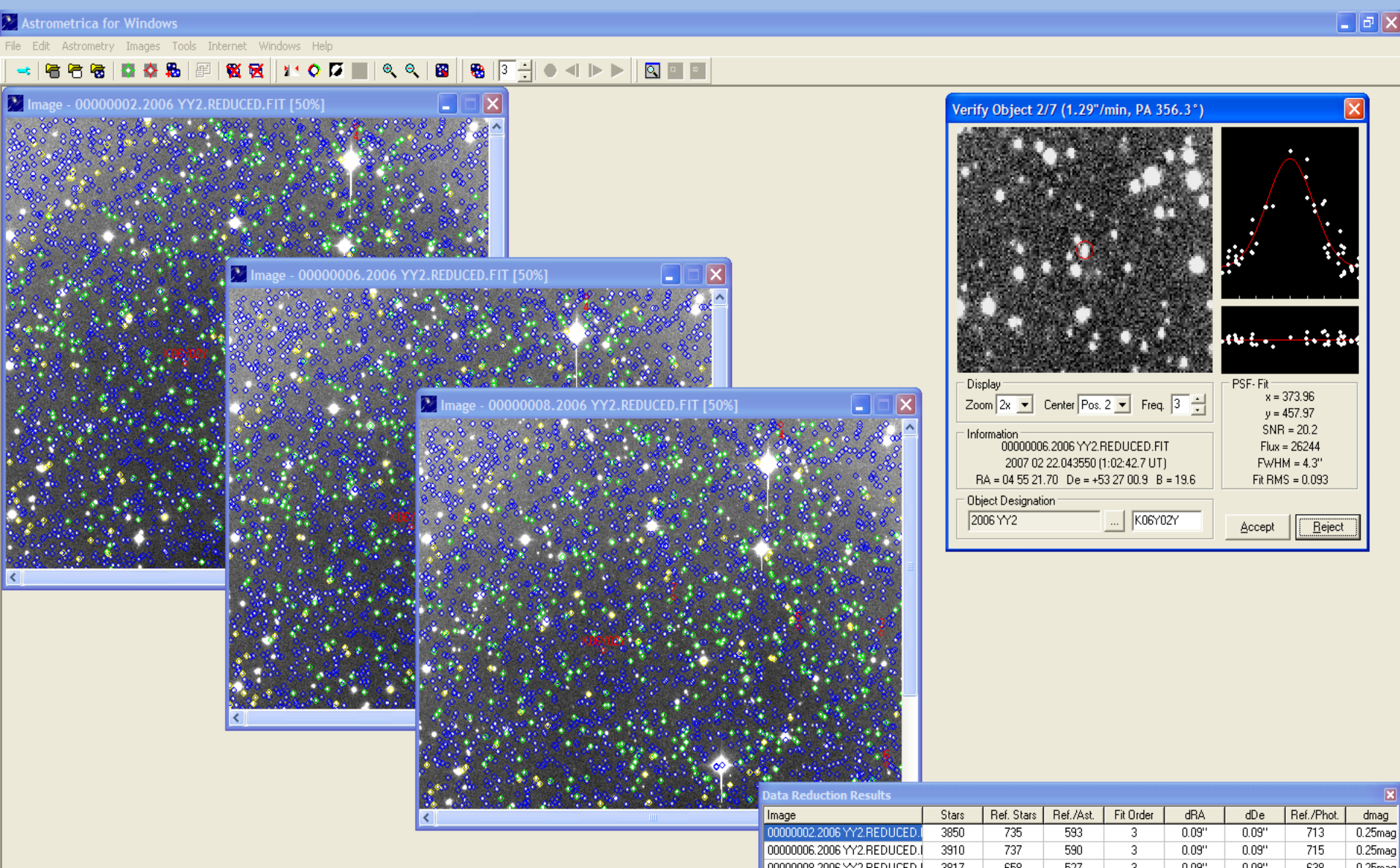
[PowerPoint Presentation on Stack & Track](#)



Astrometrica image



Using *Astrometrica*, the students run the “moving object utility” followed by a deep search into the images with the “blink utility”.



Резултати: 2012-2013 година

Наблюдателни кампании

1. Pan-STARRS Asteroid Search Campaign: 10.03.2014 – 14.04.2013
2. International Asteroid Search Campaign: 13.02.2013 – 20.03.2013
3. **Pan-Bulgarian Search Campaign: 07.01.2013 – 09.02.2013**
4. International Asteroid Search Campaign: 25.10.2012 – 29.11.2012
5. . International Asteroid Search Campaign: 14.08.2012 – 13.09.2012
6. International Asteroid Search Campaign: 02.05.2012 – 10.06.2012
7. International Asteroid Search Campaign: 28.04.2012 – 02.05.2012
8. International Asteroid Search Campaign : 23.03.2012 – 27.04.2012



Екип: Вергил Йотов, Деница Съйнова, Итай Грудев, Цанко Йорданов, Борислав Неделчев, Иван Попов, Станислав Щерев, Неделчо Ласков, Петър Даскалов, Ивелин Георгиев



Астероиди, които сме обработили за периода април 2012 – март 2013

2003 DC14, 2013 AE4, OGS6175, P1068EB, UD9EE19, UD1BD04, P106AXX, 13SFAK, TOV81K, UDA17B8, 2013 CF129, 2006 FJ9, P106CQS, 2003 CN17, 2013 DB1, UDA17B8, 2013 CF129, 2006 FJ9, P106CQS, 2003 CN17, 2003 CN17, 2012 JR17, 2012 JR17, P104ODI, 2012 QO10, 2012 QQ50, 2012 UD, 2012 TO231, TV88160, 2012 UK171, TV0E133, 2012 VF46, 2012 VC37, 2012 VH46, 2012 VF82, TV94ECB, 2012 WS3, 2012 WQ, 2012 TA79, 2012 UX27, 2012 UD, 3908, 2012 US136, 2012 TP274, 2012 US9, P104TTQ, TV9135F, 2012 UW68, TV10B4A, 2012 VV76, 2012 VH77, 2012 VF46, 2BH0041, 2BH0041, 2012 UA34, TVPS2A0, TVPS291, TVPS292, TVPS293, TVPS29C, TVPS29D, TVPS29J, TVPS29L, TVPS2FY, TVPS2FZ, TVPS2G0, TVPS2G1, TVPS2G2, TVPS2G5, TVPS2G5, TVPS2ME, TVPS2MG, TVPS2MF, TVPS2MH, TVPS2ML, TVPS2UR, TVPS2US, TVPS2UT, TVPS2UV, TVPS2UU, TYB76B3, 2012 XE112, UABE6B1, 2006 WR1, UA3C27A, 2013 AA32, 2062, 2013 AT76, 2013 BY45, 2013 AF69, UAB861C, 2012 YQ3, 2012 YQ1, 2013 AG60, 2013 AV60, UB01B9C, 2013 AV60, P105PEX, 2013 AM60, 2013 BC74, 2012 XE17, 2012 YK7, UA338F3, 2012 QR50, 2012 XH55, 2013 AW60, 2013 AQ72, P105PEW, 2013 AV60, 2013 BV15, 2012 VJ82, 2012 PP28, UA802ED, 2013 AN20, 2012 XR134, 2010 BB, 2007 YK, 12711, 2013 AB53, 2013 AW52, 2012 XS111, 2012 YQ1, 2012 VJ82, UA86BD5, 2012 XG55, 2005 CF41, 1999 CV3, 1998 QE2, 2013 AA2, 2002 RC118, 2013 AG76, P105RFG, 2012 YL6, UABEB45, UA804C5, 2013 AB32, 2012 MM11, 2013 AD32, 2013 AW52, 3908, P105RFH, P105RFG, 2012 XP111, UA3309D, \ 2013 AJ11, UA874C5, 2011 BB45, P105E53, 2001 CP44, 2013 AJ91, UB901C6, UAB93E6, UABF261, 2012 YP6, P105BSU, 2011 BA45, 2009 HB82, 2013 BE19, 2005 GW119, 2013 BC18, UABBB3F, CE89524, 2013 AO20, 2012 YN6, 2012 XH55, 2008 EQ7, 2013 AY52, 1994 VA1, 2012 XS93, UABBA8E, LB4020, 2012 XD55, 2013 AS27, 2013 AV60, 2012 VJ46, 1991 AM, 2005 DD, UC95B57, 28J0022, 2000 CR101, 2000 NL10, 2003 NC, 2007 EJ26, 2012 LD1, 2012 LE11, 2012 LG11, 2012 NN, 2012 OB1, 2012 PA, 2012 LJ6, 2008 XE2, P1041FE, TQ135E, TQ91389, TR1AC69, 2007 EJ26, FX134, 1999PJ1, 2002XG4, 2012MA7, 2012 OB1, 2012 OD1, 2012 PJ6, 2012 PM28, 2012 PP28, 2012 PP29, P104965, и много други...

**Над 400 наблюдателни полета,
600 проследени астероида с изчислени екваториални
координати, 2 потвърдени открития:
над 10 открити нови непроследени астероида**



НОВИ АСТЕРОИДИ: 2012 - 2013

2012 WR и 2012 WQ

Итай Грудев и Веселка Радева

Dr. Veselka Radeva and her student I. Grydev from the Student Astronomy Club (Astronomical Observatory) in Bulgaria have two discoveries. The follow-ups were taken by Dr. Galin Borisov from the National Astronomical Observatory - Rozhen (Bulgaria). This was the first time that follow-ups of student discoveries were coordinated by the students. Congratulation!! Nice job!!

До сега в IASC от български участници са открити 14 нови астероида!



2012 WQ

Orbit Diagram

Note: Make sure you have Java enabled on your browser to see the applet. This applet is provided as a 3D orbit visualization tool. The applet was implemented using 2-body methods, and hence **should not be used for determining accurate long-term trajectories (over several years or decades) or planetary encounter circumstances.** For accurate long-term ephemerides, please instead use our [Horizons system](#).

(2012 WQ)

(2012 WQ)

Earth

Mercury

Venus

Mars

Earth Distance: 2.96 AU
Sun Distance : 2.748 AU

Mar 30, 2013

Date



1 Day

☒ Date Label

☒ Planet Labels

☒ Distance

☒ Object Label

Center: Sun

Zoom:

Save Image

(2012 WQ)

Classification: Main-belt Asteroid

SPK-ID: 3620523

[[Ephemeris](#) | [Orbit Diagram](#) | [Orbital Elements](#) | [Physical Parameters](#)]

[show orbit diagram]

Orbital Elements at Epoch 2456260.5 (2012-Nov-29.0) TDB
Reference: [MPO248937](#) (heliocentric ecliptic J2000)

Element	Value	Uncertainty (1-sigma)	Units
e	0.0785282	n/a	
a	2.9632367	n/a	AU
q	2.7305391	n/a	AU
i	11.82960	n/a	deg
node	115.15487	n/a	deg
peri	317.23910	n/a	deg
M	357.40273	n/a	deg
t _P	2456273.9419585 (2012-Dec-12.44195850)	n/a	JED
period	1863.150565	n/a	d
	5.10	n/a	yr
n	0.19322110	n/a	deg/d
Q	3.1959343	n/a	AU

Orbit Determination Parameters

# obs. used (total)	17
data-arc span	27 days
first obs. used	2012-11-16
last obs. used	2012-12-13
# oppositions	1
two-body model	T
fit RMS	0.47
data source	MPC:mp1
producer	MPCMEL

Additional Information

T_{jup} = 3.229

[[Ephemeris](#) | [Orbit Diagram](#) | [Orbital Elements](#) | [Physical Parameters](#)]

Physical Parameter Table

Parameter	Symbol	Value	Units	Sigma	Reference	Notes
absolute magnitude	H	16.4	mag	n/a	MPO248937	

[[Ephemeris](#) | [Orbit Diagram](#) | [Orbital Elements](#) | [Physical Parameters](#)]

2012 WR

Minor Planet Ephemeris Service: Query Results

Below are the results of your request from the Minor Planet Center's Minor Planet Ephemeris Service. Ephemerides are for observatory code 071.

2012 WR

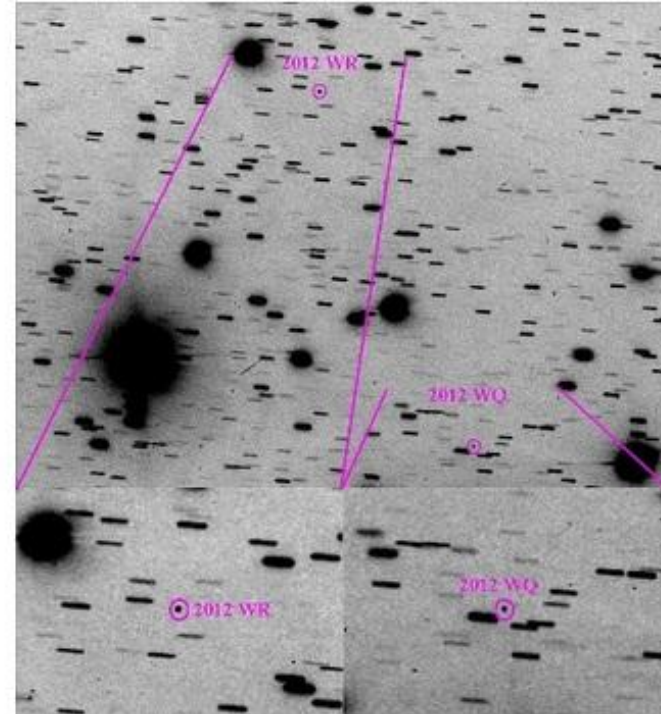
[Display all designations for this object](#)

Ephemeris is based on Generalized Väisälä elements based on observations 2012 Nov. 16-18.

K12W00R		[H=]															
Date	UT	R.A.	(J2000)	Decl.	El.	V	Sky Motion		Object		Sun	Moon					
	h m s						" / min	P.A.	Azi.	Alt.	Alt.	Phase	Dist.	Alt.			
2013 03 30	000000	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000001	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000002	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000003	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000004	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000005	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000006	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000007	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000008	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000009	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000010	05 12 49.8	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000011	05 12 49.9	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000012	05 12 49.9	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000013	05 12 49.9	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000014	05 12 49.9	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			
2013 03 30	000015	05 12 49.9	+18 23 36		69.6	22.2	0.88	076.5	135	-17	-40	0.91	144	+32			

«Екип от астрономи от НАО-Рожен, ръководен от доц.д-р Евгени Овчаров, проследиха два нови астероида и потвърдиха новото българско откритие в нощта на 18 срещу 19 ноември. Астероидите са открити от група български ученици, ръководени от д-р Веселка Радева от Астрономическата обсерватория във Варна. Младежите работят вече четвърта година по международна програма за търсене на астероиди. В новата международна наблюдателна кампания за последните 4 дена младежите и техния ръководител откриват 5 нови астероида. За да бъде потвърдено откритието на новите български астероиди, те трябва да бъдат проследени през следващите нощи. Потвърждаващите наблюдения на два от петте нови астероиди са направени от д-р Галин Борисов, астроном в НАО-Рожен, съвместно с доц. д-р Евгени Овчаров, Владимир Божилов и Даниел Чанлиев с 2м телескоп. Наблюдателната програма за нощта е включвала изключително интересни фотометрични и поляриметрични наблюдения на новооткрити нови звезди и блазари. Доц. Евгени Овчаров е предоставил част от наблюдателното време на колегата си от екипа д-р Галин Борисов за да потвърди два от новите астероиди, открити от българските ученици и студенти. Определени са изключително точно новите положения на двата нови астероида и данните са изпратени в Центъра за малки планети в Харвард, откъдето се обявяват откритията на новите астероиди 2012 WR и 2012 WQ. Ръководителят на Международната програма изпрати поздравление за откриването на двата нови астероида и за успешното сътрудничество между професионалните астрономия от НАО-Рожен с българските ученици и студенти. С наблюденията проведени на 2м телескоп в НАО-Рожен астрономите потвърдиха и по този начин направиха възможно откриването на още два нови български астероиди.» д-р Галин Борисов

БЛАГОДАРИМ ВИ!



Втората Пан-Българска Кампания

Asteroid Search - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Gmail: Имейл от Google Asteroid Search iasc.hsubx.edu - /Asteroid Search/Feb... Facebook Asteroid Search

file:///C:/A_IASC/Pan_BULGARIAN/webpage/Page593.htm

Most Visited NASA - top secret - Go... Asteroid 2012 DA14 Fly... CdR&CdL: Courbe de ... Explore our e-Science ... Уча.се - Бързо. Лесно... Davis | WeatherLink - ... Heavens-Above Home... SLOOH SpaceCamera ...

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Pan-Bulgaria Asteroid Search Campaign

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file:///C:/A_IASC/Pan_BULGARIAN/webpage/Page593.htm

Most Visited NASA - top secret - Go... Asteroid 2012 DA14 Fly... CdR&CdL: Courbe de ... Explore our e-Science ... Уча.се - Бързо. Лесно... Davis | WeatherLink - ... Heavens-Above Home... SLOOH SpaceCamera ...

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- Bulgaria Asteroid Search**
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Student Space Agency, Astronomical Observatory, Varna Image Set Assignments	NPMG, Sofia Image Set Assignments
Mathematical High School, "Dr. Peter Baron", Varna Image Set Assignments	Student Astronomical Society, Shumen University Image Set Assignments
Language High School, "Frederic Joliot-Curie", Varna Image Set Assignments	Konstantin Preslavsky University of Shumen Image Set Assignments
"Kliment Ochridski" High School, Varna Image Set Assignments	Student Astronomical Society, UCTM, Sofia Image Set Assignments
"Quark" Club, Shumen Image Set Assignments	"Ioan Exarh" High School, Varna Image Set Assignments
Astroclub "Orion", Shumen Image Set Assignments	



EN 11:37 PM 2/13/2013

Pan-STARRS Asteroid Search Campaign

March 10 through April 14, 2013

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Image Set Assignments

Chang-hua High School (Taiwan)
Image Set Assignments

National Dali Senior High School (Taiwan)
Image Set Assignments

Taichung Municipal Hui-Wen High School (Taiwan)
Image Set Assignments

National Lo-Tung Senior High School (Taiwan)
Image Set Assignments

Hermiston Astronomy Club (USA-OR)
Image Set Assignments

Sabino High School (USA-AZ)
Image Set Assignments

Ukiah High School (USA-CA)
Image Set Assignments

Edmonson County High School (USA-KY)
Image Set Assignments

The Governor's School (USA-VA)
Image Set Assignments

Mt. San Antonio College (USA-CA)
Image Set Assignments

Lee County High School (USA-GA)
Image Set Assignments

Delta State University (USA-MS)
Image Set Assignments

UH Maui College (USA-HI)
Image Set Assignments

Maui Prep Academy (USA-HI)
Image Set Assignments

Mililani Middle School (USA-HI)
Image Set Assignments

Kamehameha School (USA-HI)
Image Set Assignments

Stormarnschule Ahrensburg (Germany)
Image Set Assignments

Universidade Federal de São Carlos (Brazil)



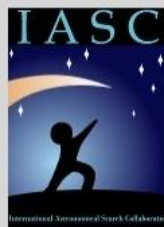
National Central University
Graduate Institute of Astronomy
Taiwan



International Astronomical
Search Collaboration
Abilene, TX



Max Planck Institute for
Extraterrestrial Physics
Garching, Germany



International Astronomical
Search Collaboration
Abilene, TX

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Image Set Assignments

[Team 16](#) Josephinum Hildesheim (Germany)
Image Set Assignments

[Team 17](#) SPACE Asteroid Search Team (India)
Image Set Assignments

[Team 18](#) Universidade Federal de São Carlos (Brazil)
Image Set Assignments

[Team 19](#) Edinburgh University Astronomy Society (Scotland)
Image Set Assignments

[Team 20](#) UKSEDS Asteroid Chasers (United Kingdom)
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Image Set Assignments

[Team 23](#) Friedrich-Koenig-Gymnasium Würzburg (Germany)
Image Set Assignments

Mililani Middle School USA - HI)
Image Set Assignments

Tudor Vianu National High School (Romania)
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Sacred Hearts Academy (USA - HI)
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Cordova High School (USA - CA)
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Yerkes Asteroid Search Team (USA - WI)
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Poland Asteroid Search Team (Poland)
Image Set Assignments

Team Hayabusa (Australia)
Image Set Assignments

[Astronomical Observatory & Planetarium \(Bulgaria\)](#)
Image Set Assignments

Young Harris College (USA - GA)
Image Set Assignments

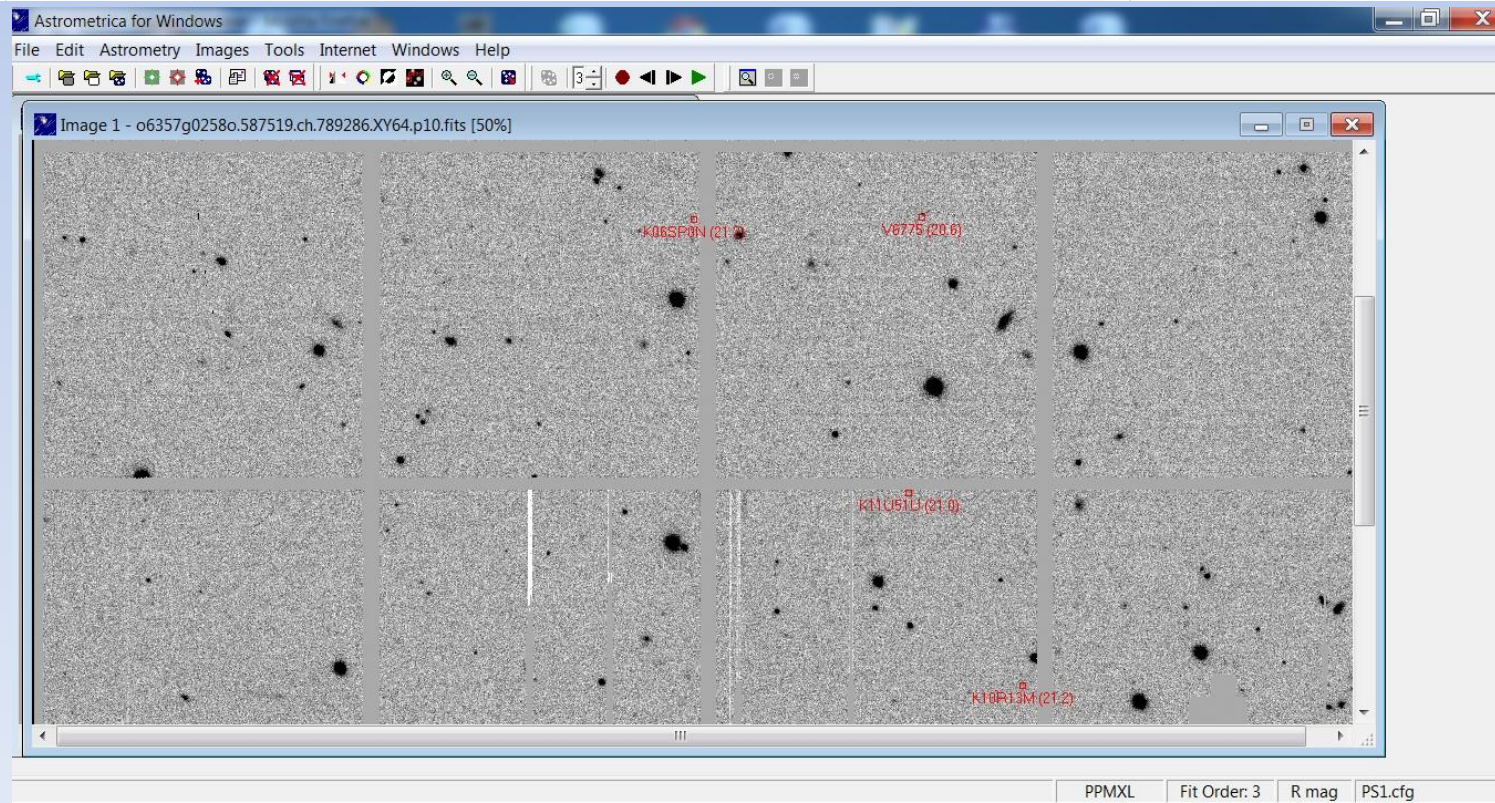
Pan-STARRS Asteroid Search Campaign

March 10 - April 14, 2013

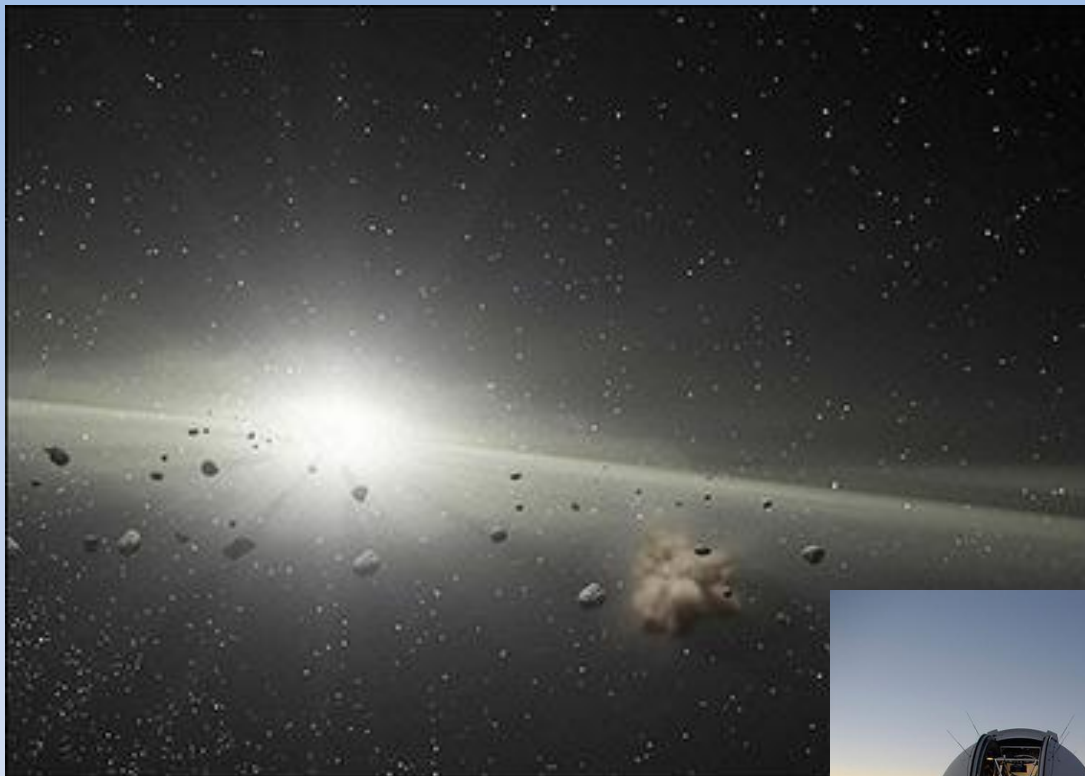
of Preliminary Asteroid Discoveries

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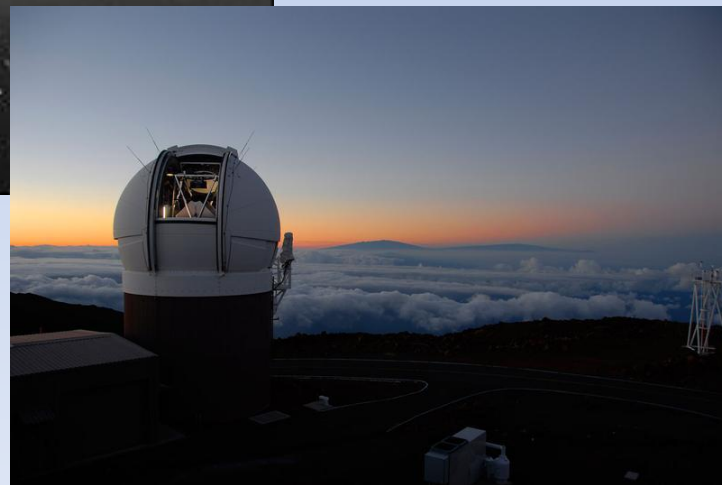
56	TVPS3FP	V. Radeva, D. Karakashev, & I. Georgiev	Student Space Agency, Astronomical Observatory
56	TVPS3FR	V. Radeva, D. Karakashev, & I. Georgiev	Student Space Agency, Astronomical Observatory
56	TVPS3FS	V. Radeva, D. Karakashev, & I. Georgiev	Student Space Agency, Astronomical Observatory
56	TVPS3FT	V. Radeva, D. Karakashev, & I. Georgiev	Student Space Agency, Astronomical Observatory
56	TVPS3FU	V. Radeva, D. Karakashev, & I. Georgiev	Student Space Agency, Astronomical Observatory
56	TVPS3FX	V. Radeva, D. Karakashev, & I. Georgiev	Student Space Agency, Astronomical Observatory



ДА ПОЖЕЛАЕМ УСПЕХ НА ВСИЧКИ БЪЛГАРСКИ УЧАСТНИЦИ В
КАМПАНИИТЕ ЗА ТЪРСЕНЕ И ПРОСЛЕДЯВАНЕ НА АСТЕРОИДИ!



Благодаря ви за вниманието 😊



This project is supported by NASA grants NNX07AR16G and EPO-07-813