

EAN- European Astrosky Network
www.crabnebula.it/rc/menu_EAN.htm
Web-TV: www.livestream.com/eantv
eanweb@crabnebula.it

Edit by Rodolfo Calanca e Angelo Angeletti

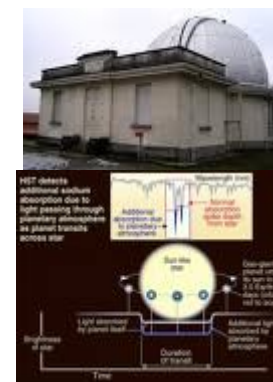
QUESTO DOCUMENTO E' IN ITALIANO E INGLESE
TERRE DEL CIELO – WORLDS OF THE SKY

A CAUSA DELLE PESSIME CONDIZIONI METEO LA DIRETTA WEB DEL 10 APRILE
E' STATA POSTICIPATA AL 05 GIUGNO!

05 GIUGNO: PROGRAMMA DELLA SERATA IN DIRETTA WEB DALLA STAZIONE OSSERVATIVA DI MERATE:
L'OSSERVAZIONE DEL TRANSITO DEL PIANETA EXTRASOLARE HAT-P-7b

Dalle ore **20:30 alle 21:30 UT**, gli astronomi di Brera descriveranno le attività dell'Osservatorio e mostreranno la strumentazione astronomica che sarà utilizzata per le osservazioni della serata.

Alle ore **21:30 UT**, inizieranno i lavori preparatori per la ripresa del transito dalla cupola del telescopio Ruths di 134 centimetri di diametro. Gli astronomi introdurranno il problema della “pluralità dei mondi”, che ha affascinato l'umanità fin dai tempi degli antichi Greci, descriveranno i transiti dei pianeti extrasolari e risponderanno alle domande del pubblico. Ampi commenti sulla curva di luce del pianeta in transito HAT-P-7b.



**WORLDS OF THE SKY event: please note that the event of 10th April
has been postponed to 05th June!**

**05th June: EXTRASOLAR TRANSIT ON WEB-TV and CHAT: www.crabnebula.it
HAT-P-7b EXTRASOLAR PLANET**

Dear Friends,

weather forecasts are still quite bad for Northern Italy and therefore we are forced to again post-pone the extra-solar planet transit observation we are organizing. We are sorry for these continuous program changes but of course you understand these are not dependent on us!

Observing Program on 05th June on the web-TV www.crabnebula.it/web/diretta_brera

05th JUNE:

20:30 - 21:30 UT: the astronomers they will describe the activities of the INAF Brera-Merate Observatory and they will show the instrumentation that will be used for the observations of the evening.

21:30 UT: we will connect us with the dome of the telescope RUTHS of 134 centimeters of diameter to follow on the web, the transit of the extrasolar planet HAT-P-7b. The astronomers will introduce the problem of the “Plurality of the Worlds”, that has fascinated the humanity since the times of the ancient Greek. The transits of the extrasolar planets will be described, he will respond to the questions of the public and it will be commented the light curved of the transit of HAT-P-7b

The LIVE ON THE WEB will finish to the **00:30 UT**

"WORLDS OF THE SKY" Project intends to approach the great but inexperienced public wishing to visit our Observatories as astronomy “fans” and to watch live an extra solar planet transit. In details, on next 05th June many Italian and European Observatories will place their instrumentation at public’s disposal to “observe” HAT-P-7b planet.

TERRE DEL CIELO – WORLDS OF THE SKY PROJECT

EXTRASOLAR PLANETARY TRANSITS OBSERVATION

Extra solar planet research began in 1995: at the moment we can enumerate about 450 successes. Certainly we are speaking about giant planets very close to their star, but we can suppose to find also planets looking like Earth and dreaming of extraterrestrial forms of life is an obvious consequence.

The discovery of Earth size extra solar planet should have enormous philosophic and cultural implication, so strong to justify capitals mankind is actually investing in this kind of research. Also an astronomy lover holding a convenient instrumentation (nowadays rather widespread) is possible to give his perceptible contribution to this kind of research. In the web site you can find all material allowing to “see” an extra solar planet transit.

Observing extra-Solar planet transits is a valuable scientific tool. However, even more than that, it is a fascinating way to look at other worlds. The existence of planets around other stars beyond our Sun has been conjectured since the beginning of human history, and the same idea has also been able to raise fundamental enthusiasms and criticisms in equal percentage. Philosophy, theology and even psychology have been involved to explain the importance of this recurrent idea in human history. Here, we review how since the Hellenistic era the hypothesis of many worlds developed and also describe an international event we are organizing with the aim to secure multi-site observations of a planet transit. An example of science in the internet era.

Dr Stefano Covino
Osservatorio Astronomico INAF
BRERA - Italy



Alcuni Osservatori Astronomici europei
EUROPEAN ASTRONOMICAL OBSERVATORIES
(Amateurs!)



IL PROGETTO TERRE DEL CIELO – WORLDS OF THE SKY

**PREVEDE L'OSSERVAZIONE DI NUMEROSI TRANSITI NEL CORSO
DEI PROSSIMI MESI!**

PARTECIPATE ANCHE VOI!

**OSSERVATE ALCUNI DEI TRANSITI ELENCATI
IN QUESTO DOCUMENTO CON LA VOSTRA
STRUMENTAZIONE!**

**Il materiale per le procedure di acquisizione si può scaricare dalla pagina:
www.crabnebula.it/web/doc_transits/index.htm**

**ALL EUROPEAN AMATEURS ARE WARMLY
INVITED TO SHOOT THE TRANSITS WITH PROPER
TELESCOPES!**

"WORLDS OF THE SKY" DOCUMENTS AND MATERIALS PROJECT:

Tutorial Software "TRel", (designed to detect extrasolar transits) reference guide:

www.crabnebula.it/web/doc_transits/2010_eng_Transits_TUTORIAL.pdf

"TRel" Download: www.crabnebula.it/web/doc_transits/index.htm

EXTRASOLAR PLANET TRANSITS OBSERVATION

Minimum requirements of the instrumentation

The magnitude of the stars displaying transiting planets usually ranges between 8 and 12. Therefore, it's not necessary to use huge telescopes to detect and study the light curve of a transit with high precision results; nonetheless, first-rate optics, mechanics and electronics are required. Here are some (hopefully useful) suggestions for the choice and use of a suitable equipment:

- Telescopes with diameters larger than 15 cm (reflectors, refractors or Schmidt-Cassegrain) can be profitably used. Focal length should not be increased too much, in order to easily find, within the sensor field, the reference stars needed for differential photometry. When necessary, add a high-quality, low-vignetting focal reducer.
- The optimum focal length should range between 1 and 2 metres. For instance, a SBIG ST-8 CCD (a 9.2 mm x 13.8 mm sensor), used with a 1-metre focal length, produces a field size 31' x 47', reduced to 15' x 24' when focal length increases to 2 metres. With this type of CCD, and using a 1-metre focal length, we can always find one or more reference stars within the chosen field.
- The telescope must have an equatorial mounting and be permanently mounted.
- Alignment of the polar axis must be as careful as possible, in order to avoid even the slightest field rotation (such an event can easily occur when the telescope follows a star for several hours).
- The telescope should be equipped with a first-rate motorized drive. Stellar discs can never be blurred, else precision of photometric measurements will rapidly deteriorate.
- An auto-drive device is highly recommended. Without it, exposure times must be reduced, because in this case the driving precision relies only on the telescope drive (remember, however, that a minimum exposure time of 60 seconds is required).
- A CCD camera with good photometric performance should have a very low readout noise (i.e. the uncertainty associated to the reading of a matrix photo-element).

A short summary of digital imaging of the Transit

Here are some remarks on the process of acquiring digital frames of the transit.






- Always wait for the instrumentation to thermally stabilize before starting a working session.
- Set the **MINIMUM** integration time via the **atmospheric scintillation** formula. Make sure to insert the correct data for telescope aperture and air mass in the field. Exposure times can always be increased, provided you have a good telescope drive - better still, an auto-drive device. However, always bear in mind the remarks in the following.
- **NO SATURATED PIXELS WHATSOEVER ARE ALLOWED IN YOUR IMAGES.** To attain a high photometric precision, **the ADU level of the brightest pixel in the frame must be kept, more or less, at 25000 ADU (for a 16 bit-CCD camera) or 1800 ADU (for a 12-bit CCD or digital camera).** In case the exposure time obtained from the atmospheric scintillation formula is too long – which in turn would saturate the star's image – there are two ways to keep it below the saturation threshold: 1) by interposing a filter (R, V, I or neutral) to attenuate the incoming light flux and reach, at least, the minimum integration time; 2) by defocusing the star's image twice or thrice the FWHM (Frequency Width at Half Maximum).
- Once exposure time has been determined, perform some test imaging on the chosen stellar field, checking (using Astroart or MaxIm) the S/N (signal-to-noise) ratio for the parent star as well as for the reference ones. For the uncertainty of measurements to stay below 0.002 magnitudes, the S/N ratio should be at least 500. If the S/N ratio is less than the required minimum value, we should expect to attain a lower photometric precision.
- Frames are to be taken about every two minutes. Imaging must start – at least – half an hour before transit begins and must end not earlier than half an hour after the transit is over.
- Quality of flat fields decisively influences photometric accuracy. Making a lot of flats (up to several tens) and averaging has the effect to reduce Poisson noise. For the same reason, a great number of dark and bias frames is needed.

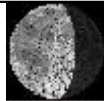

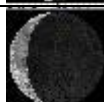

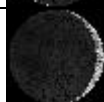
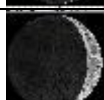
TERRE DEL CIELO – WORLDS OF THE SKY PROJECT
OSSERVAZIONE TRANSITI PIANETI EXTRASOLARI
EXTRASOLAR PLANET TRANSITS OBSERVATION

APRILE- MAGGIO – GIUGNO 2010- 2010 APRIL – MAY - JUNE

Web site data: <http://var2.astro.cz/ETD/index.php> (Czech Astronomical Society)

Geographical coord: Long.: 13° E; lat.: 43° N

DATE (GG/MM/AA)	Begin INIZIO (UT/h,A)	FASE CENTRALE Center (UT/h,A)	End FINE (DATE/UT/h,A)	Fraction Moon illumi- nated FRAZ. ILLUMINA TA LUNA	Moon elon- gation ELONG. LUNA	Moon Phase	Planet OGGETTO
14.04.2010	19:20 (61°,SE)	19:51 (66°,SE)	14.04 20:22 (70°,SE)	0%	130°		GJ436b
05.05.2010	20:43 (45°,E)	22:20 (62°,E)	05.05 23:57 (80°,E)	53%	82°		HD149026b
09.05.2010	21:59 (85°,NW)	23:10 (76°,NW)	10.05 00:03 (67°,NW)	17%	122°		HAT-P-3b
13.05.2010	21:19 (63°,SW)	21:50 (57°,W)	13.05 22:21 (52°,W)	0%	111°		GJ436b
14.05.2010	21:53 (49°,E)	22:31 (56°,E)	14.05 23:10 (63°,E)	0%	114°		TrES-3b

DATE (GG/MM/AA)	Begin INIZIO (UT/h,A)	Center FASE CENTRALE (UT/h,A)	End FINE (DATE/UT/h,A)	Fraction Moon illumi- nated FRAZ. ILLUMINA TA LUNA	Moon elon- gation ELONG. LUNA	Moon Phase	Planet OGGETTO
02.06.2010	19:45 (39°,E)	21:33 (58°,E)	02.06 23:21 (78°,E)	69%	70°		TrES-4b
05.06.2010	19:57 (32°,SE)	21:54 (51°,NE)	05.06 23:55 (71°,NE)	41%	123°		HAT-P-7b
07.06.2010	21:55 (68°,NW)	22:57 (58°,NW)	07.06 23:59 (48°,NW)	23%	119°		HAT-P-3b
09.06.2010	20:38 (83°,W)	21:48 (70°,W)	09.06 22:59 (58°,W)	8%	111°		HAT-P-12b
14.06.2010	20:19 (41°,E)	21:34 (54°,E)	14.06 22:49 (68°,E)	8%	123°		TrES-1b
15.06.2010	21:18 (55°,NE)	22:3 (62°,NE)	15.06 22:48 (70°,NE)	15%	112°		TrES-2b

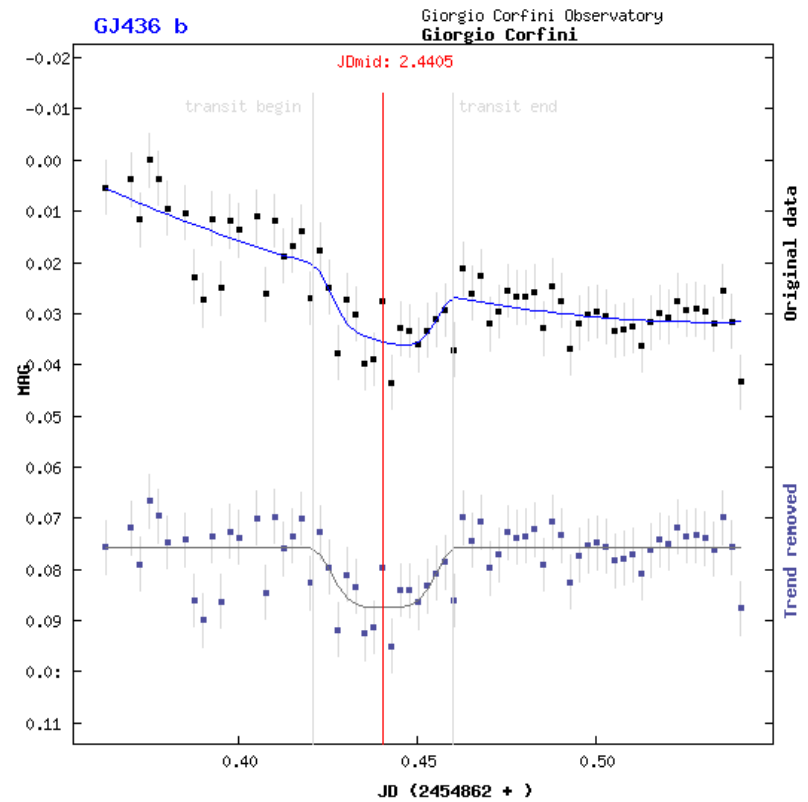
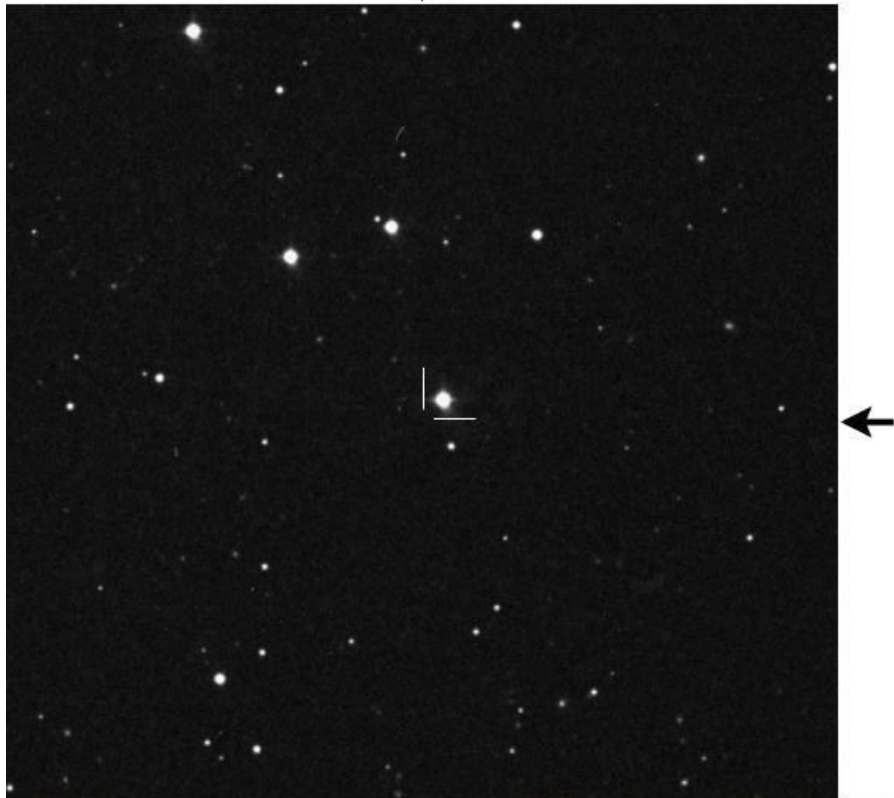
IMPORTANT: **5th June: Public observation extrasolar planetary transit by HAT-P-7b, Brera_Merate INAF Astronomical Observatory**

GJ436b

<http://var2.astro.cz/EN/tresca/transit-detail.php?id=1261494774>

GJ436 b (Leo)

RA (J2000): 11 42 10.01, DE (J2000): +26 42 37,
V = 10.68 mag, dV = 0.009 mag, duration = 62 minutes
Per = d, T0(HJD) =

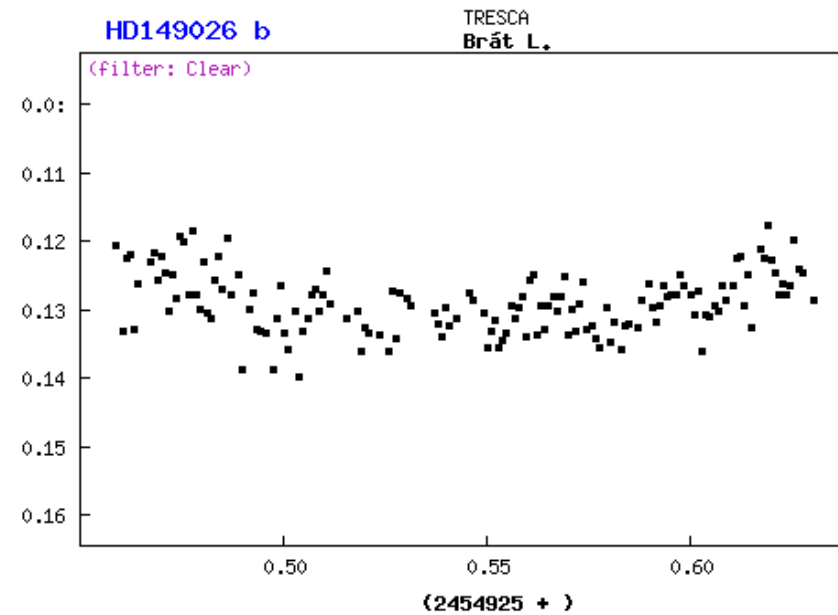
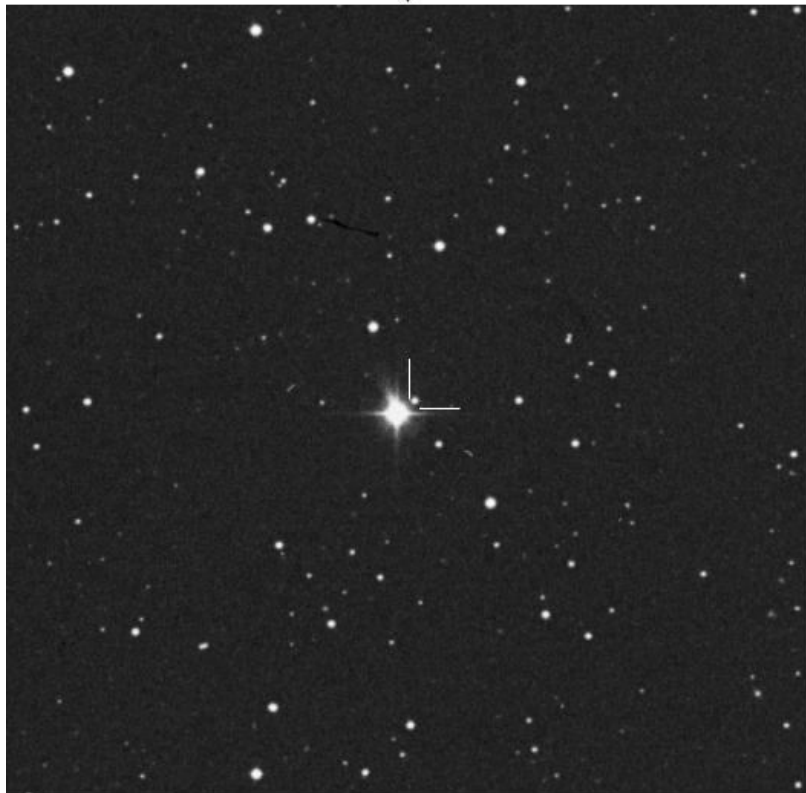


HD149026b

<http://var2.astro.cz/EN/tresca/transit-detail.php?id=1238972537>

HD149026 b (Her)

RA (J2000): 16 30 29, DE (J2000): +38 20 50,
V = 8.15 mag, dV = 0.003 mag, duration = 194.4 minutes
Per = d, T0(HJD) =

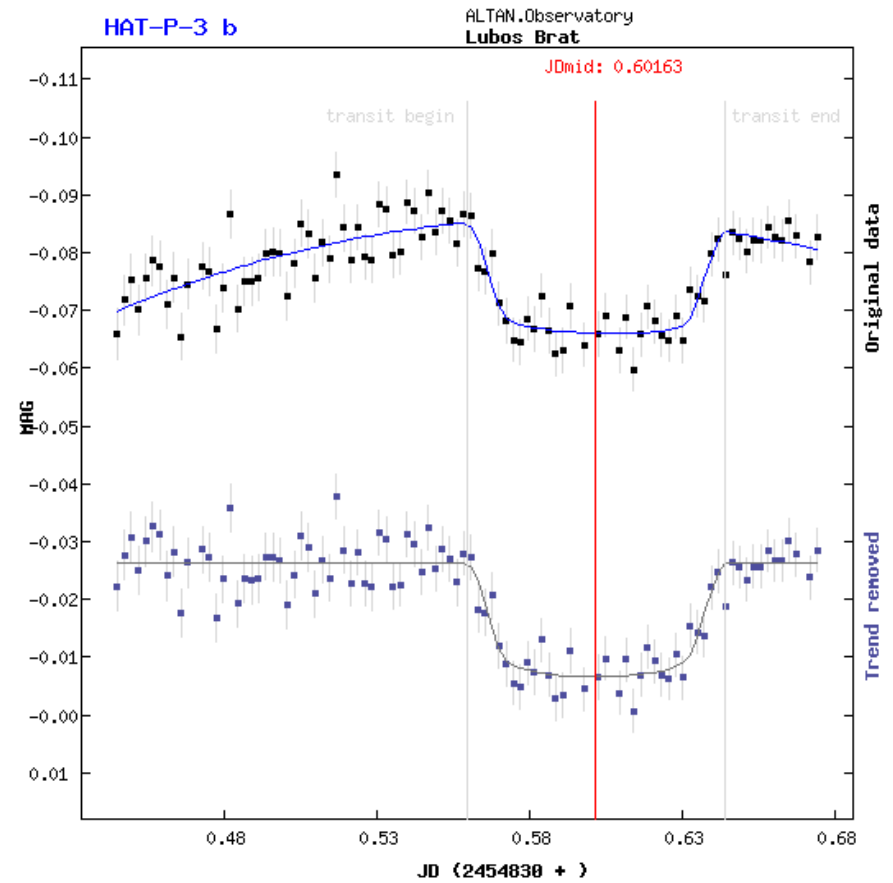
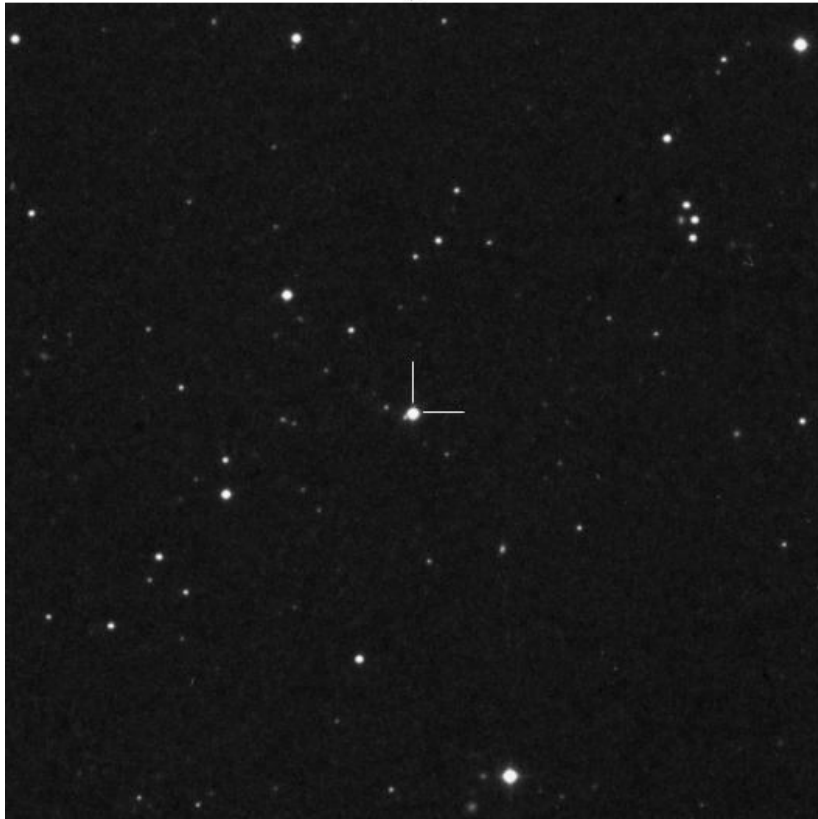


HAT-P-3b

<http://var2.astro.cz/EN/tresca/transit-detail.php?id=1230610896>

HAT-P-3 b (UMa)

RA (J2000): 13 44 23, DE (J2000): +48 01 43,
V = 11.86 mag, dV = 0.014 mag, duration = 123.5 minutes
Per = d, T0(HJD) =

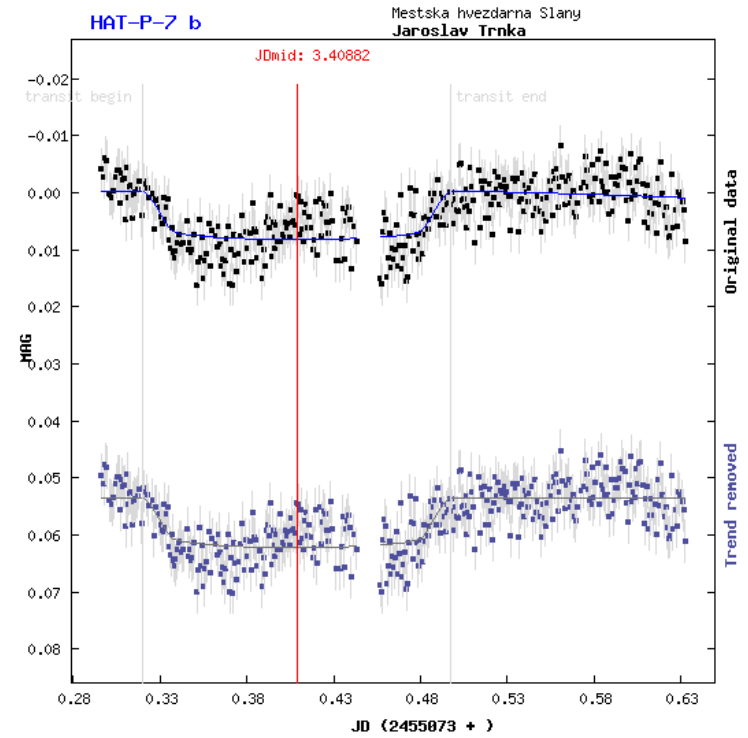


HAT-P-7b

<http://brucegary.net/AXA/HATP7/hatp7.htm>

HAT-P-7 b (Cyg)

RA (J2000): 19 28 59.37, DE (J2000): +47 58 10.5,
V = 10.5 mag, dV = 0.007 mag, duration = 243 minutes
Per = d, T0(HJD) =

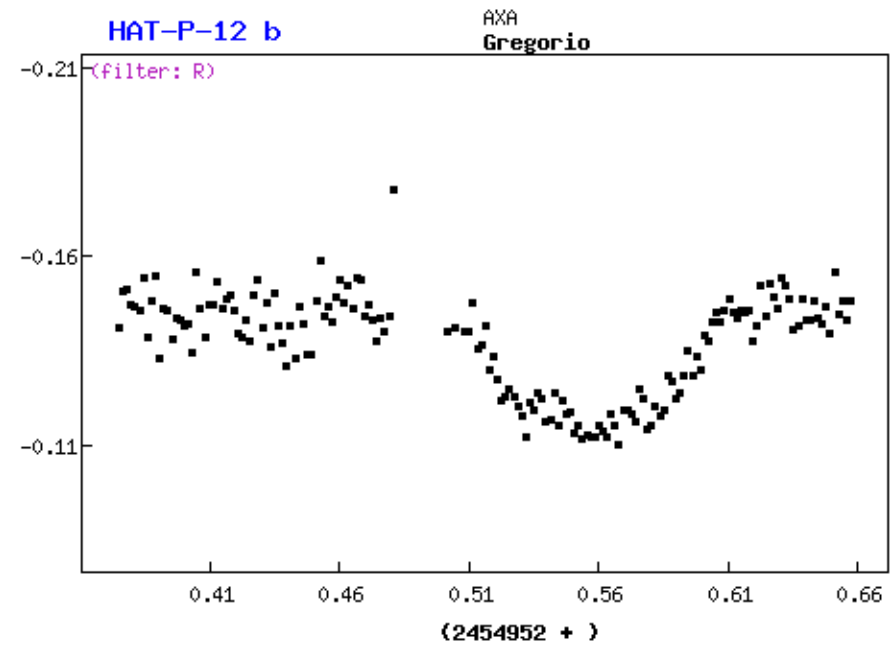
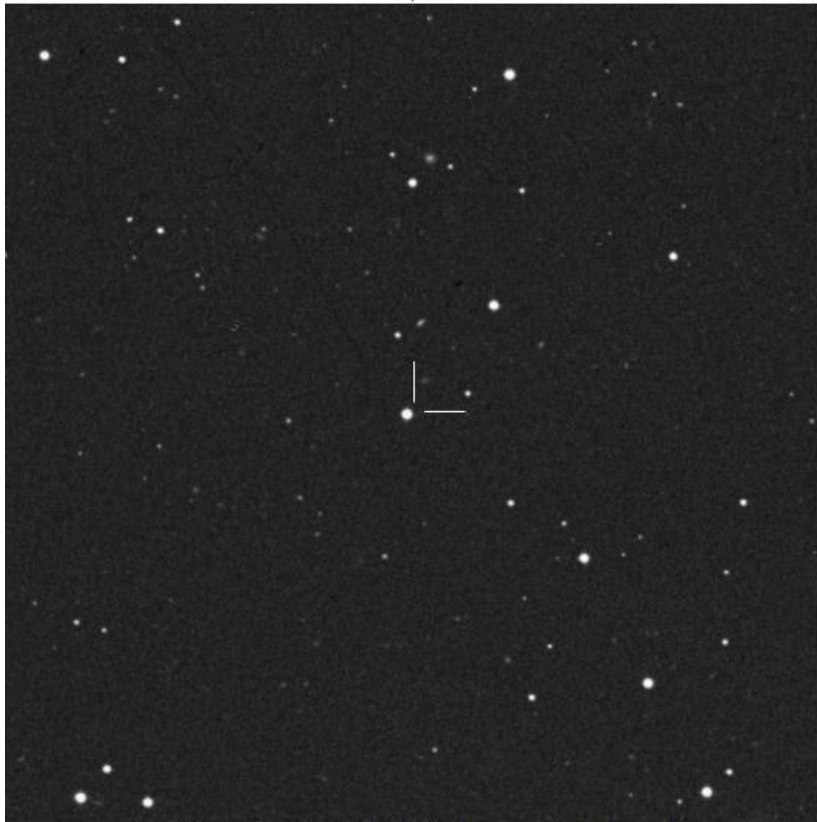


HAT-P-12b

<http://var2.astro.cz/EN/tresca/transit-detail.php?id=1251749265>

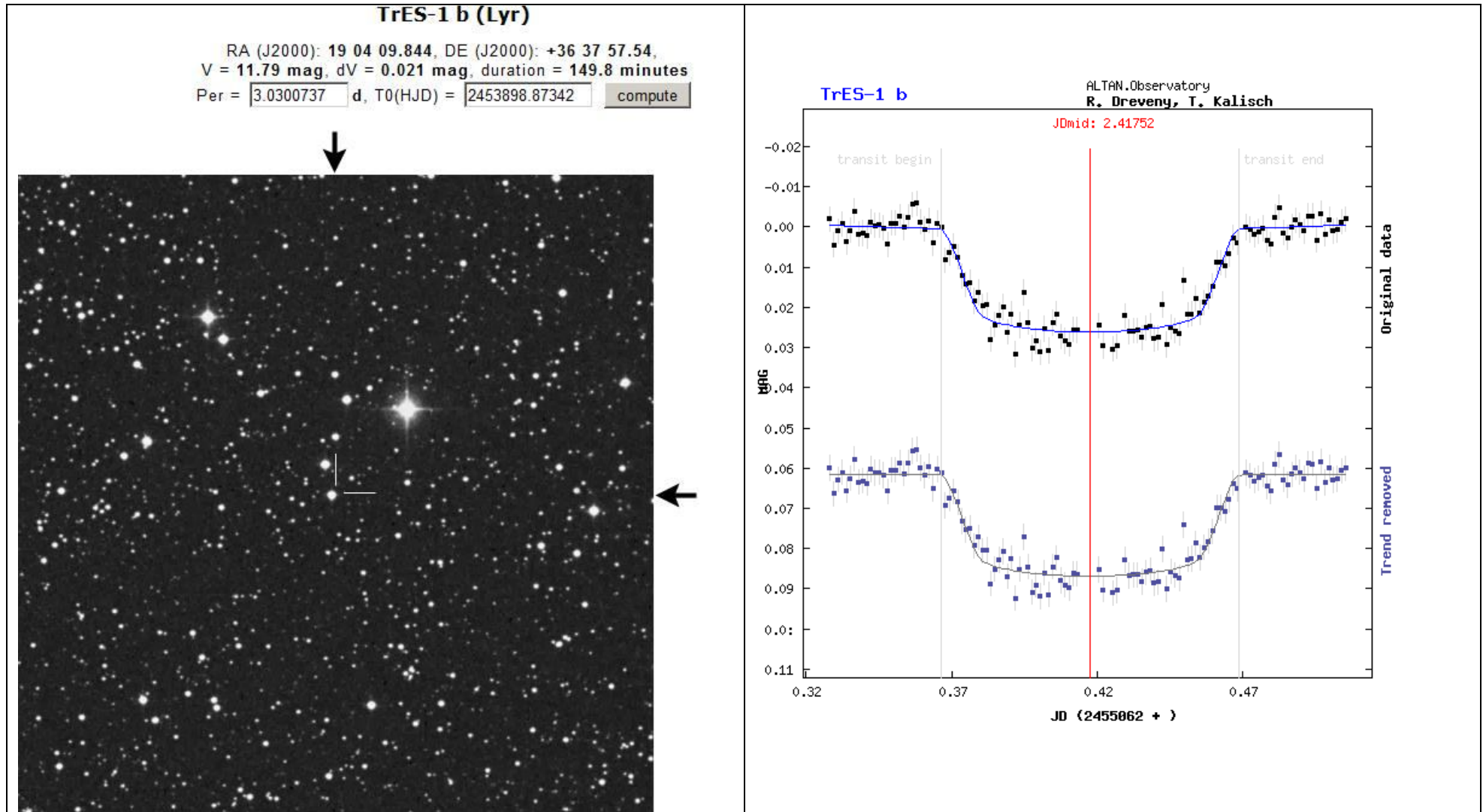
HAT-P-12 b (CVn)

RA (J2000): 13 57 33.684, DE (J2000): +43 29 37.35,
V = 12.8 mag, dV = 0.020 mag, duration = 140.3 minutes
Per = d, T0(HJD) =



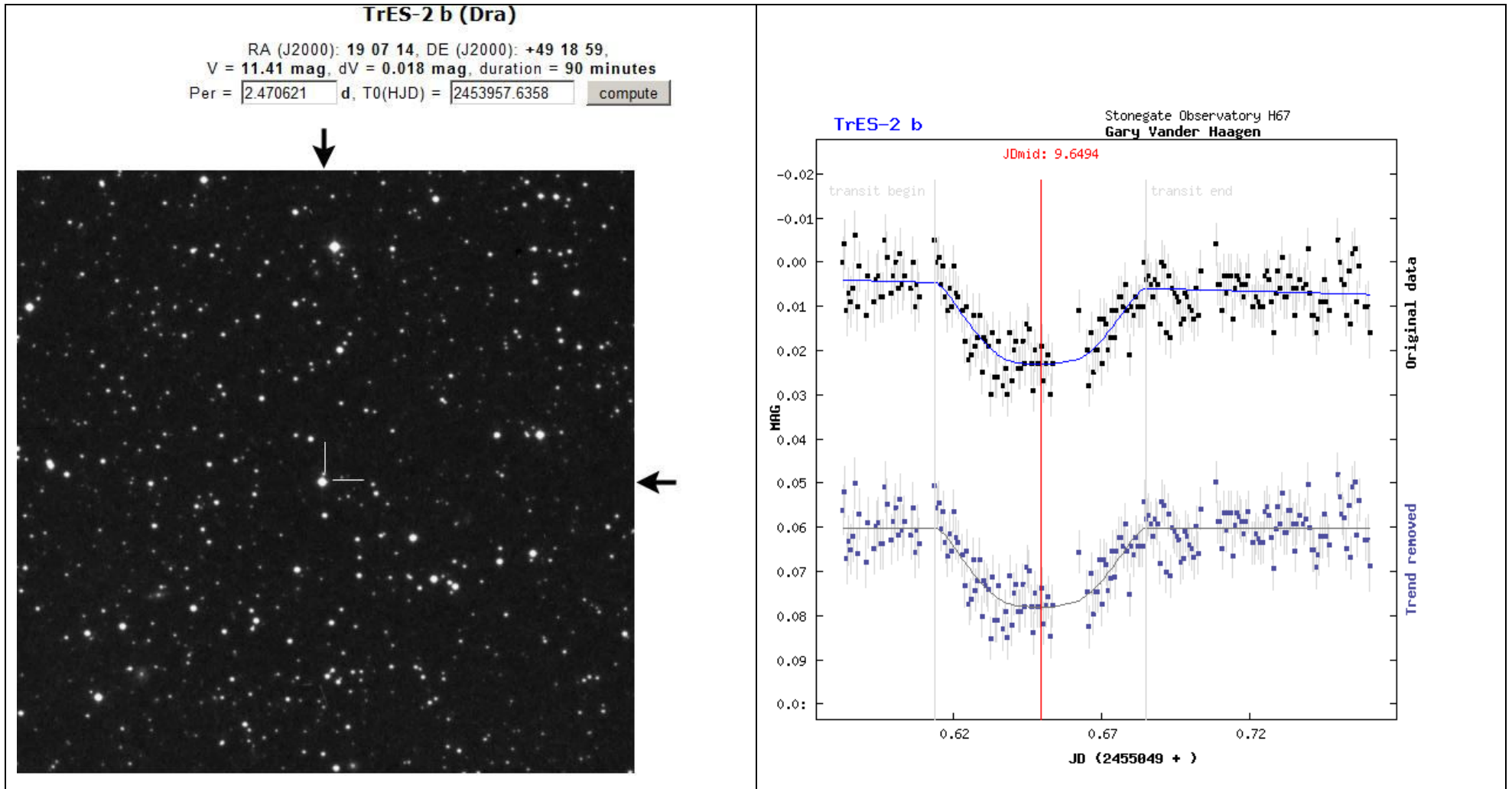
TrES-1b

<http://var2.astro.cz/EN/tresca/transit-detail.php?id=1250847262>



TrES-2b

<http://var2.astro.cz/EN/tresca/transit-detail.php?id=1249554171>

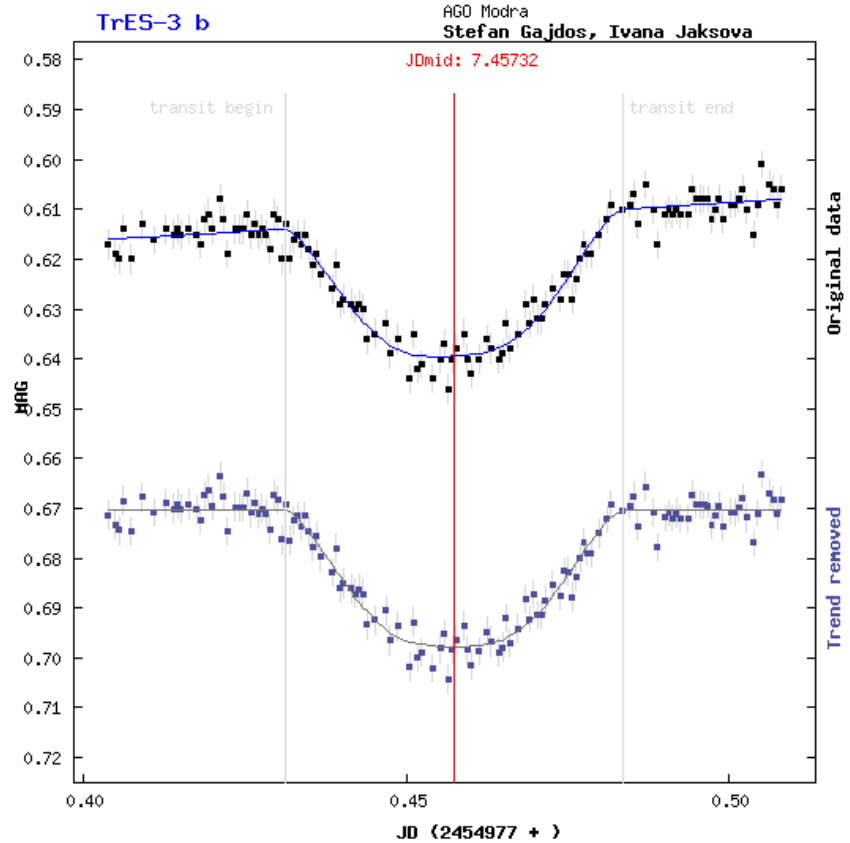


TrES-3b

<http://var2.astro.cz/EN/tresca/transit-detail.php?id=1269648158>

TrES-3 b (Her)

RA (J2000): 17 52 07, DE (J2000): +37 32 46,
V = 12.4 mag, dV = 0.029 mag, duration = 77.4 minutes
Per = d, T0(HJD) =

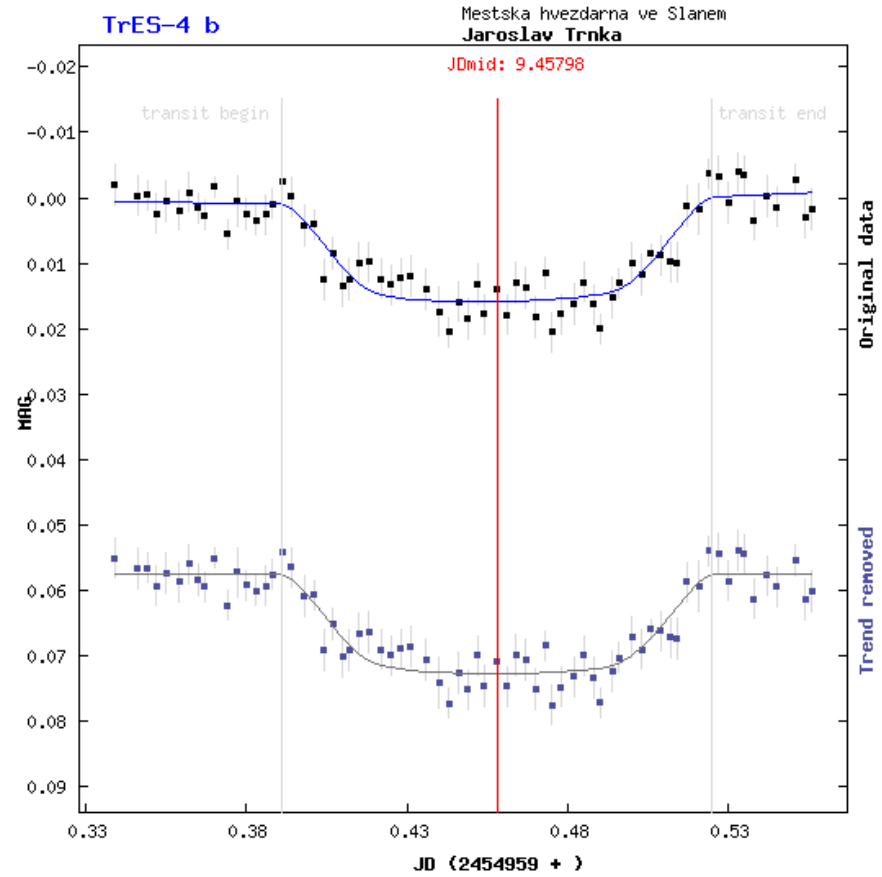
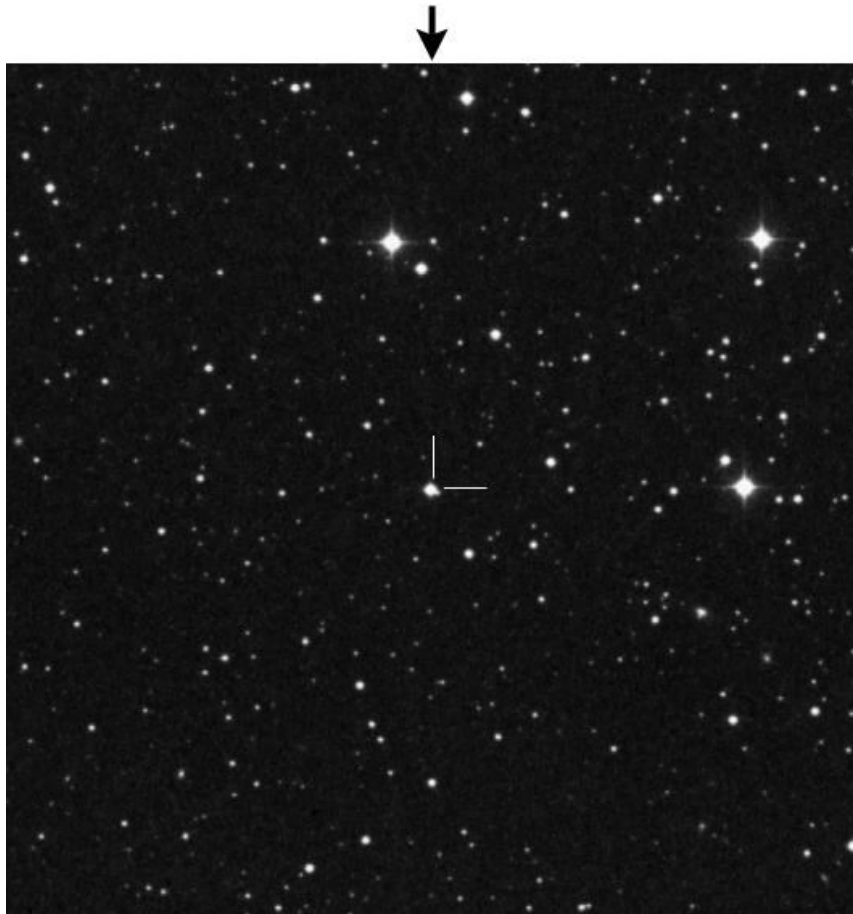


TrES-4b

<http://var2.astro.cz/EN/tresca/transit-detail.php?id=1241750888>

TrES-4 b (Her)

RA (J2000): 17 53 13.05, DE (J2000): +37 12 42.8,
V = 11.3 mag, dV = 0.011 mag, duration = 216 minutes
Per = d, T0(HJD) =



Worlds of the Sky
 THE TRANSIT OF THE EXTRA-SOLAR PLANET GJ436b ON THE WEB
 2010 FEBRUARY 20

You are in: [OAB homepage](#) -> Worlds of the Sky Project

Informations about the project "Worlds of the Sky" to the italian web site
<http://www.crabnebula.it/web/>

»Insert a new record

Edit	Fits	Data	Time	Name	e-mail	notes
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Project promoters

ARCHIVIO CURVE DI LUCE DEI TRANSITI EXTRASOLARI

L'Osservatorio di Brera ha preparato un archivio per la raccolta dei dati e delle immagini riguardanti i transiti dei pianeti extrasolari:

<http://www.brera.inaf.it/interroga/dbServer?cmd=xo3b>

Il dr Stefano Covino dell'Osservatorio di Brera così annuncia la creazione di questa archivio che sarà a disposizione di tutti, professionisti ed amatori:

Abbiamo messo a punto un database dove si possono memorizzare le informazioni (dati e risultati) riguardanti le osservazioni del transito del pianeta extra-solare che vogliamo seguire. E' possibile memorizzare file FITS o insiemi di file FITS compressi (zip), come anche file di testo o insiemi di file di testo compressi. I risultati della fotometria possono essere comunicati con qualunque formato desideriate ma incoraggiamo l'uso del formato esteso dell'AVVSO (<http://www.aavso.org/observing/submit/extended.shtml>). I dati raccolti saranno disponibili a chiunque ne faccia richiesta e la gestione sarà dell'organizzazione dell'evento "Terre del Cielo". Contattate l'organizzazione per ogni possibile uso di questi dati. Per accedere al database è necessario registrarsi mandando un e-mail a Angelo Angeletti (angelo.angeletti@virgilio.it), Stefano Covino (stefano.covino@brera.inaf.it), Rodolfo Calanca (rodolfo.calanca@gmail.com) e Paolo D'Avanzo (paolo.davanzo@brera.inaf.it).

Worlds of the Sky
 THE TRANSIT OF THE EXTRA-SOLAR PLANET GJ436b ON THE WEB
 2010 FEBRUARY 20

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»Insert a new record

Edit	Fits	Data	Time	Name	e-mail	notes
			2010-02-16 21:16:27			

Project promoters

VERY IMPORTANT: DATABASE EXTRASOLAR TRANSIT LIGHT CURVE

Brera Astronomical Observatory have prepared a database to collect all the available information (data and results) about the extra-solar planet transit. You can upload FITS files, set of zipped FITS files, text files and set of zipped text files:

<http://www.brera.inaf.it/interroga/dbServer?cmd=xo3b>

Results of your photometry can be communicated following any format you like. We anyway encourage you to follow the AVVSO extended format (<http://www.aavso.org/observing/submit/extended.shtml>).

The finally collected data will be available to everybody and managed by the "**TERRE DEL CIELO - WORLDS OF THE SKY**" organization. You can freely refer to them for any possible use.

In order to access the database you need to register sending an e-mail to Angelo Angeletti (angelo.angeletti@virgilio.it), Stefano Covino (stefano.covino@brera.inaf.it), Rodolfo Calanca (rodolfo.calanca@gmail.com) and Paolo D'Avanzo (paolo.davanzo@brera.inaf.it).

An initiative promoted by: BRERA and PALERMO INAF ASTRONOMICAL OBSERVATORIES - ITALY
EAN web community
CRAB NEBULA Astronomical Association
webzine L'ASTROFILO
SKYLIVE no-profit Association
Bareket Observatory - Israel



LINK UTILI PER IL PROGETTO "TERRE DEL CIELO"

- Il sito dell'Osservatorio INAF di Brera: www.mi.astro.it
- Il sito dell'Osservatorio INAF di Palermo: www.astropa.unipa.it
- Il sito dell'Associazione Crab Nebula: www.crabnebula.it
- Il sito SKYLIVE: www.skylive.it
- Il sito dell'Osservatorio di Monte Agliale (Lucca): www.oama.it
- Il sito della webzine L'ASTROFILO: www.astropublishing.com
- I risultati dell'ultimo ns. progetto sugli extrasolari www.crabnebula.it/rc/Coelum_articoli/Coelum_n_116_pp_44-45.pdf
- Angelo Angeletti parla dei transiti negli Atti del 1° Convegno EAN, da p. 36: www.crabnebula.it/rc/ATTI_CONVEGNO_CERVAREZZA.pdf
- Procedure per la ricerca dei pianeti extrasolare, articolo su Coelum di R. Calanca: www.crabnebula.it/rc/Coelum_articoli/Coelum_n_113_pp_32-37.pdf
- Un manuale utile, scritto a molte mani: www.crabnebula.it/web/XO-2b/ita/03ita_TUTORIAL.pdf
- Un documento sintetico sui metodi di ripresa dei transiti di R. Calanca: http://astrofilicatanesi.it/ricerca/esopianeti/n_05-calanca.pdf
- Un sito di notevole interesse (Associazione Astrofili Catanesi), nel quale troviamo numerose curve di luce di transiti: <http://astrofilicatanesi.it/esopianeti.php>
- Moltissime ed utilissime informazioni sui pianeti in transito nel sito della Czech Astronomical society: <http://var2.astro.cz/ETD/index.php>
- Da consultare anche la pagina dell'AAVSO sugli extrasolari: www.aavso.org/observing/programs/ccd/transitsearch.shtml
- Assolutamente da consultare il tutorial di Bruce Gary: http://brucegary.net/tutorial_exoplanet/
- L'articolo di R. Calanca sul numero di aprile 2010 di L'ASTROFILO: "Osservare pianeti extrasolari col 114": www.astropublishing.com/