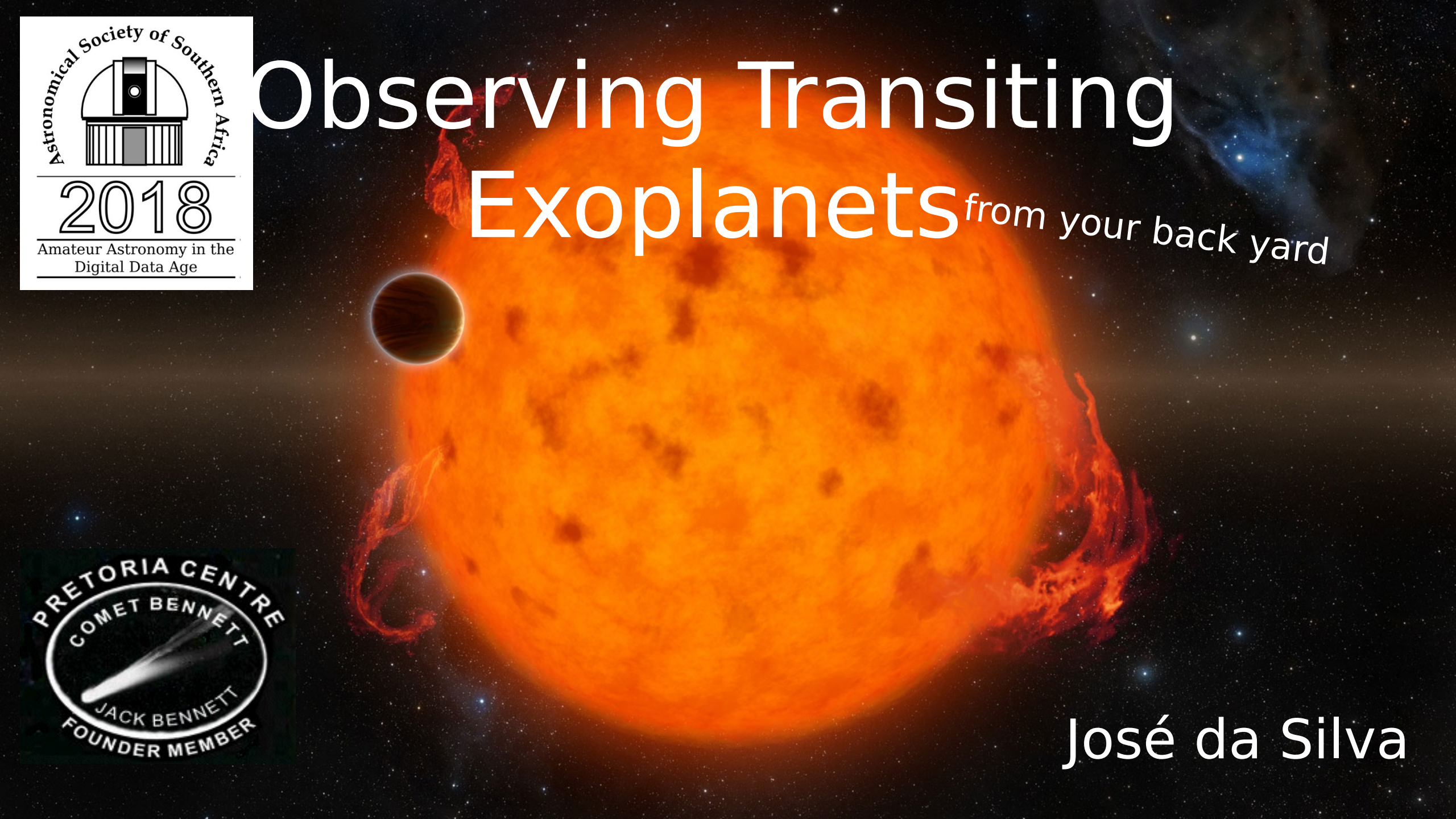
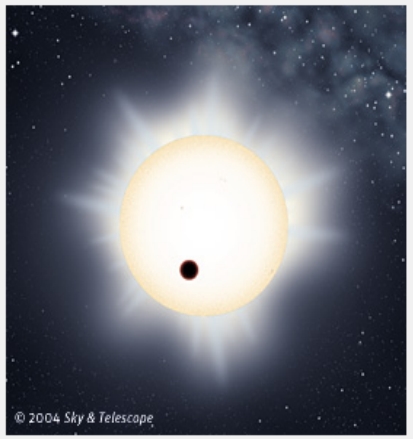


Observing Transiting Exoplanets *from your back yard*

José da Silva

Amateur Detects Exoplanet Transit

By: **Robert Naeye** | September 3, 2004



This artist conception depicts a Jupiter-size planet transiting its host star at a close distance. Astronomers know of six stars that are transited by exoplanets; two have been detected by amateurs, including the recently discovered planet TrES-1.
S&T illustration by Steven A. Simpson.

On August 24th, a team of professional astronomers announced the discovery of TrES-1, an extrasolar planet that transits its host star. Just 8 days later, an amateur astronomer from Landen, Belgium detected a transit of the same planet. The discovery highlights the growing capabilities of amateur astronomers and proves that amateur astronomers can, in principle, discover an exoplanet by the transit method.

Tonny Vanmunster used a Celestron C-14 telescope and an SBIG ST-7XME CCD camera (without filters) at his private CBA Belgium Observatory to detect the TrES-1 transit. The telescope rested on an Astro-Physics AP1200 GTO mount. The planet began crossing the star's disk at 21 hours, 13 minutes Universal Time on September 1st, just when the transit was predicted to commence. The event lasted about 3 hours and ended right on cue. The star's brightness dipped by about 0.03 magnitude during the transit, or roughly 3 percent. Using software he wrote himself, Vanmunster monitored the progress of the transit in real time on his computer.

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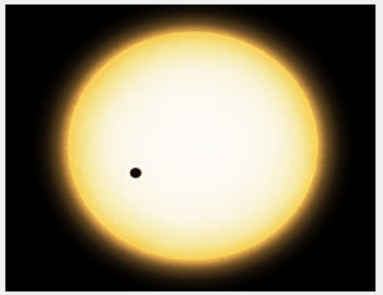
Amateur Detects New Transiting Exoplanet

By: **Robert Naeye** | July 7, 2005



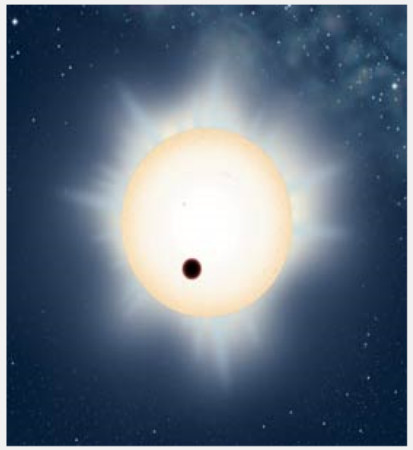
This artist's rendition shows the size of HD 149026b as it crosses the face of its Sunlike star. It blocks only 1/300 of the star's light, barely enough to be detectable by amateur astronomers.
Painting by Lynette Cook.

A day before an international team announced a new transiting planet orbiting the star HD 149026 on June 30th, California amateur astronomer Ron Bissinger detected a partial transit of that planet. He also detected partial transits during the next two opportunities, allowing him to produce a composite light curve of an entire event. This new find, HD 149026b, is now the third transiting exoplanet detected by amateurs.

"Ron's data are of excellent quality," says professional astronomer Gregory P. Laughlin (University of California, Santa Cruz), who is a member of the team that discovered the new planet. Laughlin has also helped organize the Transitsearch.org network to enable amateurs like Bissinger to detect such events. At the time the planet's discovery was announced, Laughlin predicted that amateurs would detect the transits, but he also noted that this planet was much harder to detect than the other two transiting exoplanets, HD 209458b and TrES-1. The new discovery thus highlights the increasing prowess of amateur

Amateurs Detect Possible Exoplanet Ringlike Structure

By: **Robert Naeye** | January 3, 2005



This artist conception depicts a Jupiter-size

Amateur astronomers may have discovered a ringlike structure around an extrasolar planet. The Hubble Space Telescope will reveal whether the obser
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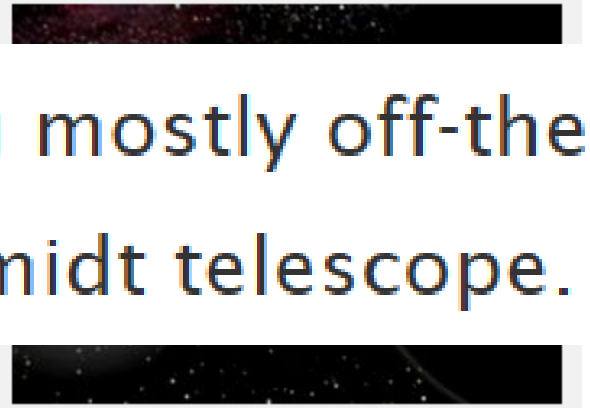
The p
Lyra by a team of professional astronomers led by Roi Alonso (Astrophysical Institute of the Canary Islands) and announced on August 24, 2004. The

Tiny Telescope Finds Big Planet

By: **Robert Naeye** | August 26, 2004



An artist depicts the newly discovered

Until now, all of the 125 or so known extrasolar planets were discovered with large telescopes

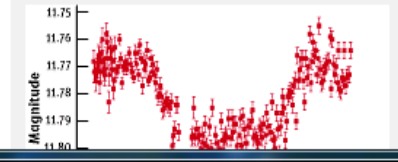
distant star using mostly off-the-shelf equipment and a 4-inch Schmidt telescope. In fact, team

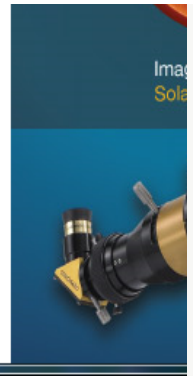
telescope and fine-tuned its optics in the garage of his Colorado home.

team was able to detect the planet with only a 4-inch telescope because it periodically crosses the

transits, which occur once per orbit with clocklike regularity. Many of these amateurs submitted their data to professional astronomers Aaron Price of the American Association of Variable Star Observers (AAVSO), and Greg Laughlin (University of California, Santa Cruz) and Tim Castellano (NASA/Ames Research Centers), who organized Transitsearch.org. Laughlin and Castellano are working with the AAVSO to form a global network of amateurs to observe exoplanet transits.

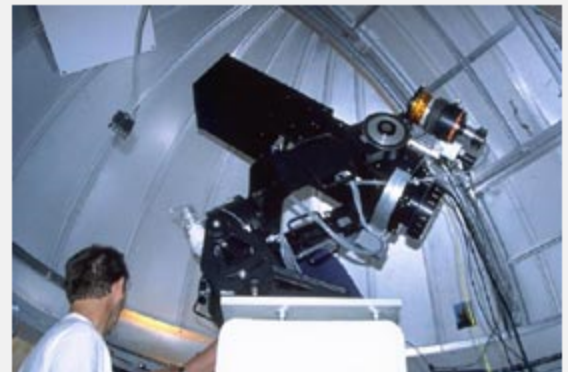
In late September, retired professional astronomer Bruce Gary in Arizona and amateur astronomer Joe Garlitz in Oregon noticed that TrES-1's 12th-magnitude host star apparently brightens shortly before and after each transit. Such effects had not been seen before in other transiting exoplanets. Postings on the





large gaseous object orbiting within just a few million kilometers of its parent star. The planet's existence was betrayed by a slight drop in the star's brightness that occurs whenever the planet crosses directly between it and Earth. The discovery heralds the coming of a new era when small telescopes doing wide-field surveys will pinpoint new exoplanets through similar transits.

Roi Alonso (Astrophysical Institute of the Canaries)



28 Nov 2014 | 18:23 GMT

DIY Exoplanet Detector

You don't need a high-powered telescope to spot the signature of an alien world

By **David Schneider**

Photo: David Schneider

Star Track: The rotation of the Earth causes stars to continuously shift position in the sky. Detecting the subtle signs of the existence of an orbiting exoplanet requires compensating for this shift. To do that, I built my own hinged "barn door" tracker.

Observing Exoplanet Transits With Digital SLR Cameras

Volume 38 number 2 (2010)

Colin Littlefield

Abstract

Using a digital single lens reflex (DSLR) camera, I observed a transit of exoplanet HD 189733 in order to determine the feasibility of using these types of cameras for high-precision photometry. The results were scientifically useful, showing that even though the camera is not explicitly designed for scientific applications, it can nevertheless produce high-quality differential photometry.

Exoplanet Transit Photometry with DSLR

Log in to post comments Last post

2 posts / 0 new

Sun, 01/04/2015 - 11:17 #1

ka5sma

Exoplanet Transit Photometry with DSLR

I recently took images of Exoplanet Tres-5b Transit with my Canon 450D and an orange filter by Optec. I was looking for a "blue blocking" filter becaus it is recommended by Bruce Gary in his book "Exoplanet Observing for Amateurs". This filter clearly blocks the blue wavelengh as it does not start letting light through until around 500nm and it is available in a 48 mm size which is what my set up requires.

My results compared very favorably with the observed/published depth and time of transit figures posted on Exoplanet Transit Database .

Top

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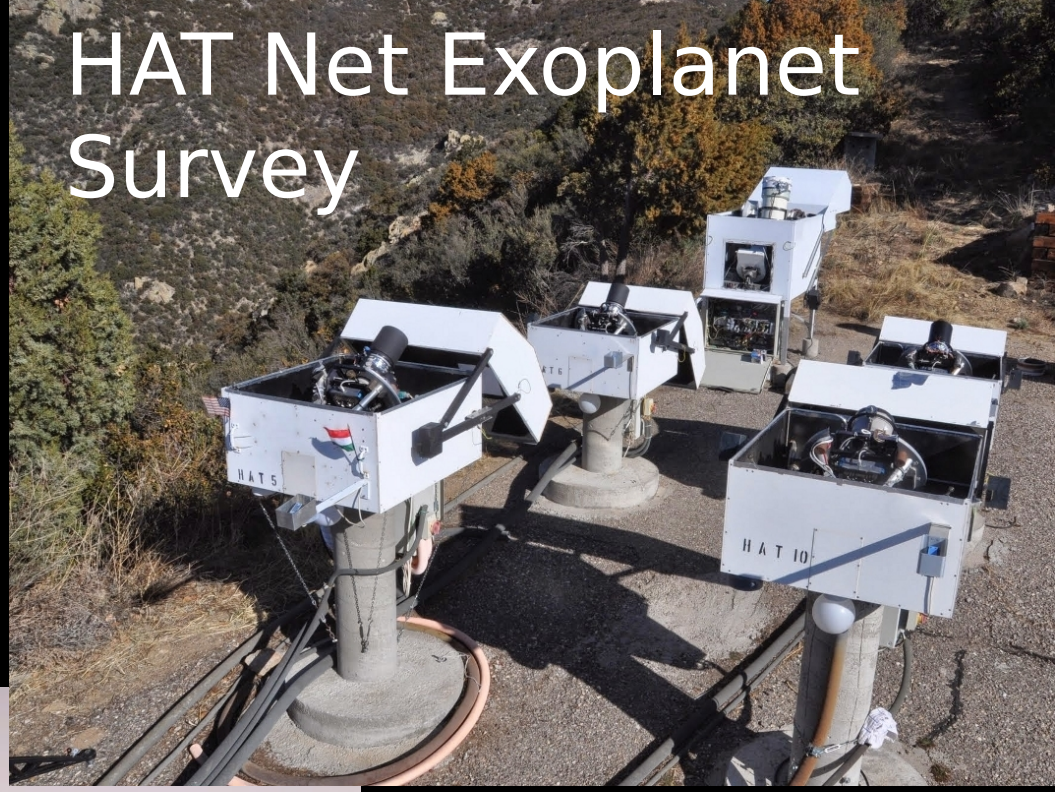
Mon, 01/05/2015 - 15:22 #2

SuperWA
SP



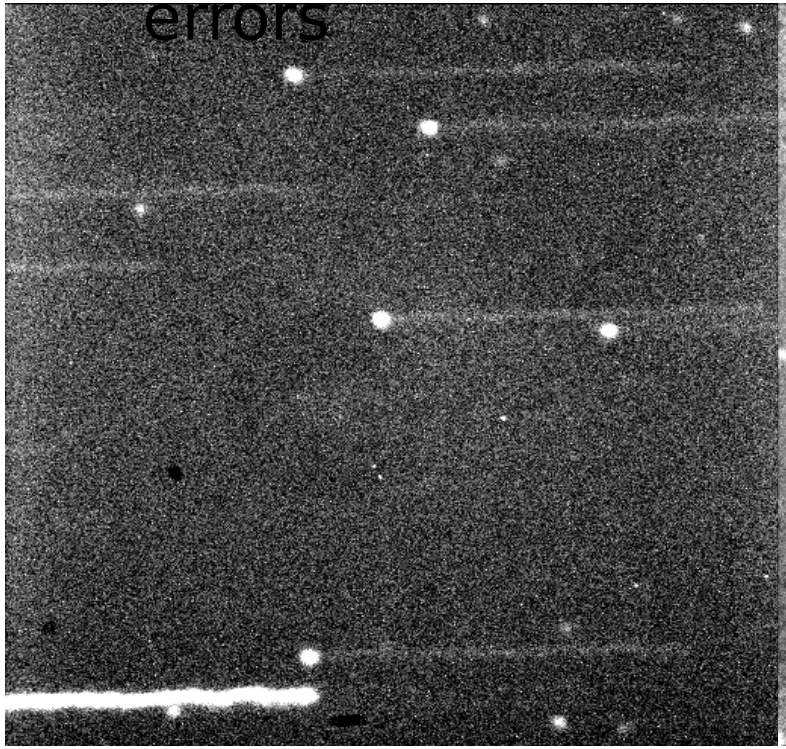
Qatar Exoplanet


CELESTRON
MEADE

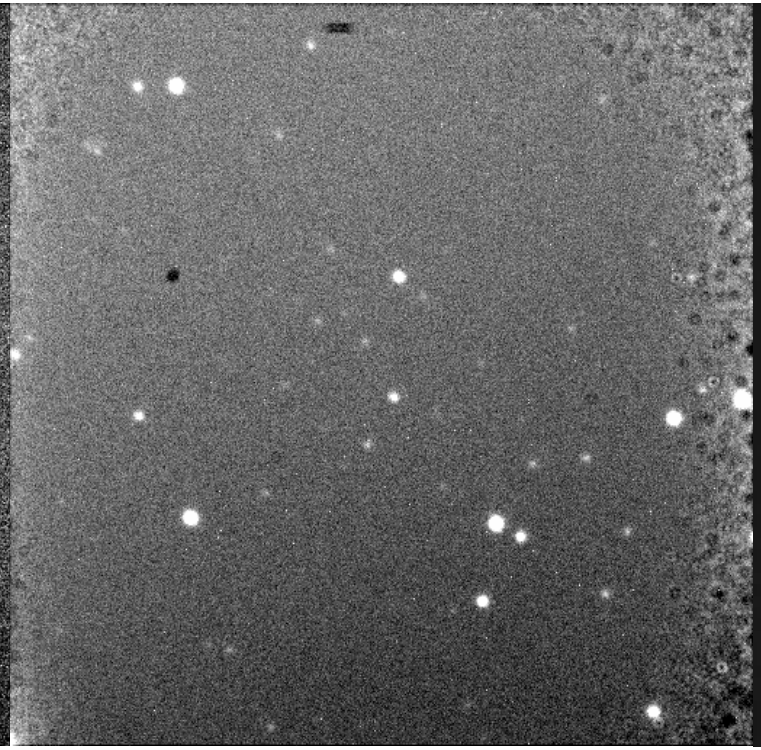

SBIG
ASTRONOMICAL
INSTRUMENTS


MEADE
FLIP-MIRROR SYSTEM
MODEL 644

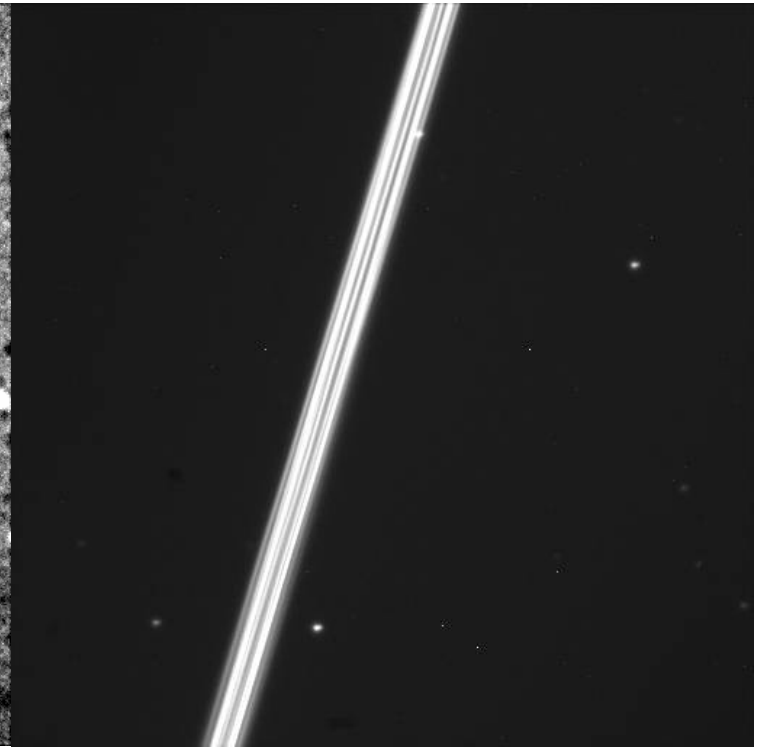
Worm gear errors



Icing



Aircraft



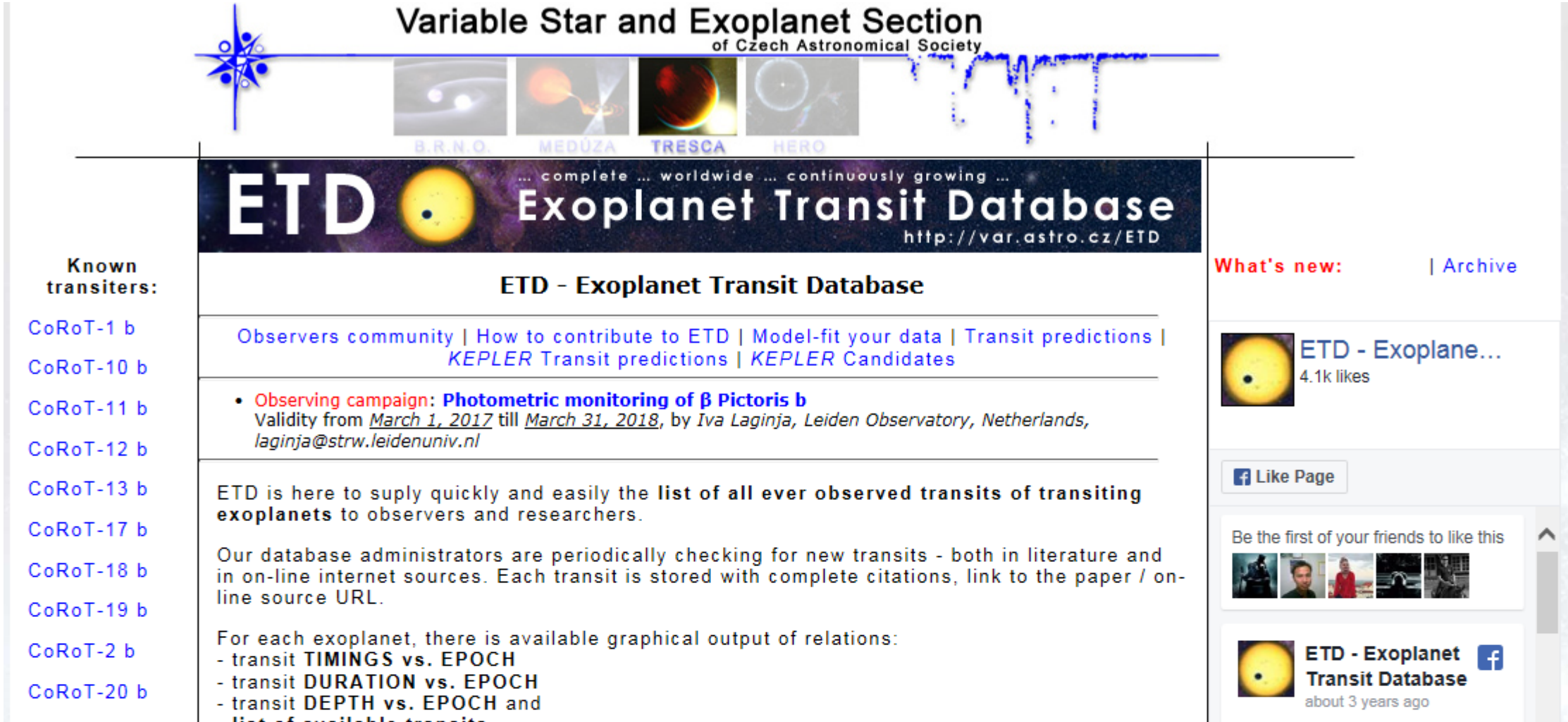
Air Pollution


Learning is a team sport...


UNIGA

Exoplanet Transit Database

http://var2.astro.cz/ETD/



215	WASP-127 b	Sex	1	2015-08	2015-08	27. Jul 2016 (582)
216	WASP-129 b	Cen	1	2015-01	2015-01	05. May 2016 (665)
217	WASP-13 b	Lyn	23	2008-01	2015-03	18. Aug 2015 (925)
218	WASP-130 b	Cen	1	2014-09	2014-09	17. Apr 2016 (683)
219	WASP-131 b	Cen	1	2014-09	2014-09	17. Apr 2016 (683)
220	WASP-132 b	Lup	1	2014-02	2014-02	17. Apr 2016 (683)
221	WASP-133 b	Mic	1	2015-04	2015-04	05. May 2016 (665)
222	WASP-136 b	Cet	1	2014-04	2014-04	27. Jul 2016 (582)
223	WASP-138 b	Cet	2	2015-10	2016-10	27. Dec 2016 (428)
224	WASP-139 b	Eri	1	2015-06	2015-06	17. Apr 2016 (683)
225	WASP-14 b	Boo	44	2007-12	2016-03	28. Apr 2016 (671)
226	WASP-140 b	Eri	2	2014-09	2017-01	12. Jan 2017 (412)
227	WASP-141 b	Eri	1	2014-12	2014-12	17. Apr 2016 (683)
228	WASP-142 b	Hya	1	2014-12	2014-12	17. Apr 2016 (683)
229	WASP-15 b	Cen	7	2008-04	2016-07	27. Aug 2016 (550)
230	WASP-151 b	Psc	1	2016-12	2016-12	07. Nov 2017 (113)
231	WASP-153 b	Lyr	1	2004-05	2004-05	07. Nov 2017 (113)
232	WASP-156 b	Cet	1	2008-07	2008-07	07. Nov 2017 (113)
233	WASP-157 b	Vir	1	2015-08	2015-08	18. Mar 2016 (713)
234	WASP-16 b	Vir	16	2008-04	2016-06	27. Aug 2016 (551)
235	WASP-167 b	Cen	1	2013-10	2013-10	14. Jun 2017 (259)
236	WASP-17 b	Sco	23	2006-06	2016-06	27. Aug 2016 (551)
237	WASP-18 b	Phe	13	2007-04	2011-10	24. Oct 2011 (2320)
238	WASP-19 b	Vel	26	2008-11	2016-12	12. Jan 2017 (412)
239	WASP-2 b	Del	122	2006-09	2016-09	27. Dec 2016 (428)
240	WASP-20 b	Cet	1	2014-09	2014-09	29. Oct 2014 (1218)
241	WASP-21 b	Peg	17	2008-10	2016-10	27. Dec 2016 (428)
242	WASP-22 b	Eri	1	2008-11	2008-11	12. Apr 2010 (2880)
243	WASP-23 b	Pup	6	2010-05	2016-12	12. Jan 2017 (412)
244	WASP-24 b	Vir	27	2009-08	2016-07	27. Aug 2016 (551)
245	WASP-25 b	Hya	7	2010-03	2016-05	27. Aug 2016 (551)
246	WASP-26 b	Cet	8	2009-10	2016-10	27. Dec 2016 (428)
247	WASP-28 b	Psc	19	2009-10	2016-10	27. Dec 2016 (428)
248	WASP-29 b	Phe	2	2007-05	2010-09	03. Oct 2011 (2341)
249	WASP-3 b	Lyr	152	2007-02	2016-08	27. Aug 2016 (550)
250	WASP-31 b	Crt	8	2009-12	2016-03	18. Mar 2016 (712)
251	WASP-32 b	Psc	23	2009-11	2016-10	27. Dec 2016 (428)
252	WASP-33 b	And	146	2007-03	2016-12	12. Jan 2017 (412)
253	WASP-34 b	Crt	5	2008-06	2011-06	29. Jun 2011 (2436)
254	WASP-35 b	Eri	12	2010-11	2016-01	08. Feb 2016 (751)

ETD Exoplanet Transit Database

... complete ... worldwide ... continuously growing ...

http://var.astro.cz/ETD

Known transiters:

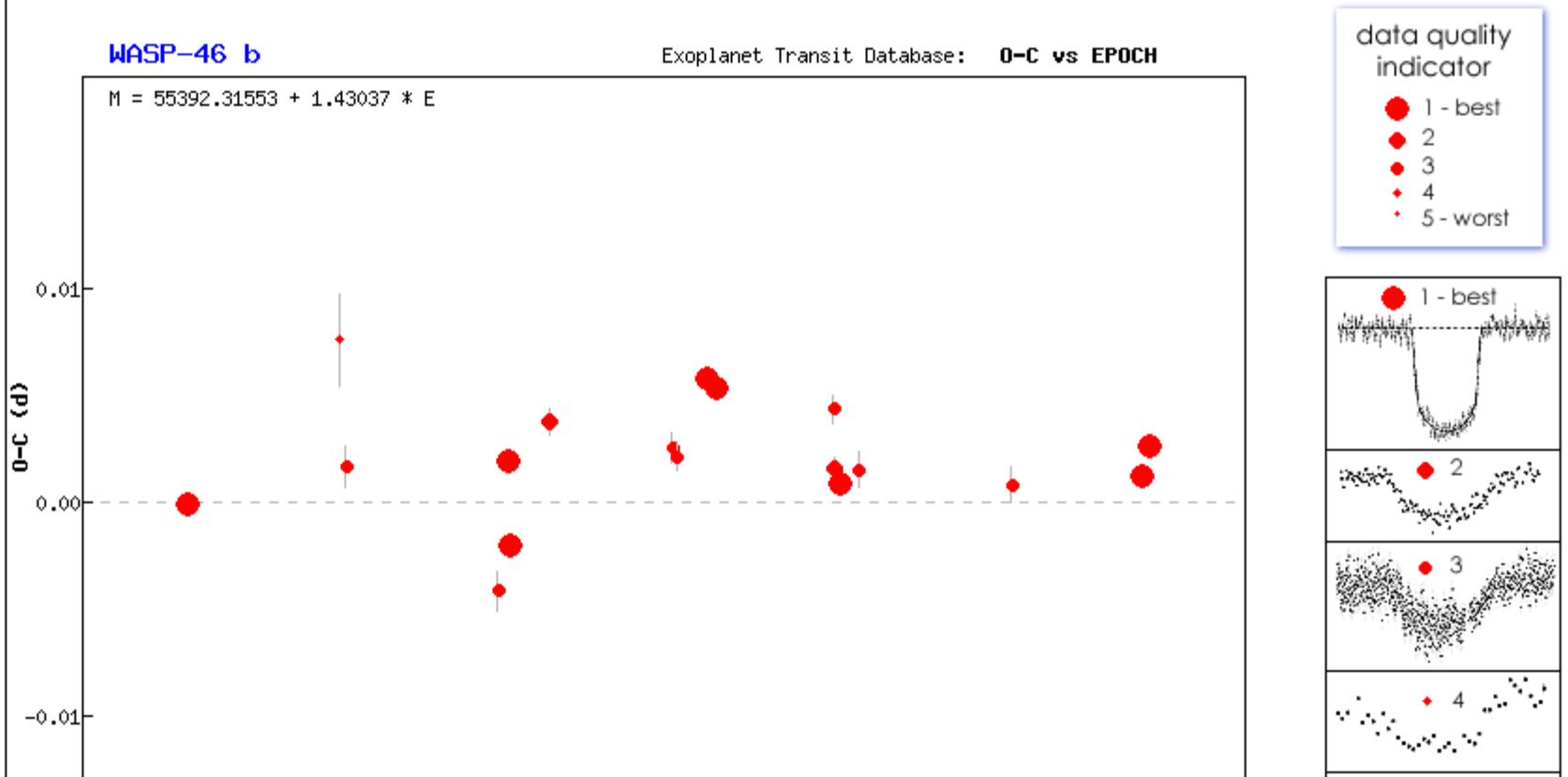
- CoRoT-1 b
- CoRoT-10 b
- CoRoT-11 b
- CoRoT-12 b
- CoRoT-13 b
- CoRoT-17 b
- CoRoT-18 b
- CoRoT-19 b
- CoRoT-2 b
- CoRoT-20 b
- CoRoT-3 b
- CoRoT-4 b
- CoRoT-5 b
- CoRoT-6 b
- CoRoT-8 b
- CoRoT-9 b
- EPIC 218916923 b
- EPIC 228735255 b
- EPIC-203771098 b
- EPIC-203771098 c
- EPIC-210957318 b

	OBJECT	CONST	# OF DATA	TIME SPAN FROM - TILL		LAST CHANGES (DAYS) Red if less than 1 week ago
1	WASP-46 b	Ind	19	2010-07	2016-08	*27. Aug 2016 (550)*

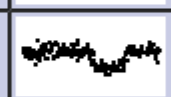
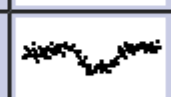
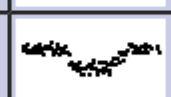
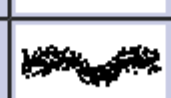
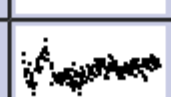
RA	DE	PERIOD (d)	EPOCH	V (mag)	DEPTH (mag)	DURATION (min)
21 14 56.86	-55 52 18.1	1.43037	2455392.31553	12.9	**0.0204**	100.4

> Show transit predictions for next 365 days

Plot user data ...



HAT-P-49 b
HAT-P-5 b
HAT-P-50 b
HAT-P-51 b
HAT-P-52 b
HAT-P-53 b
HAT-P-54 b
HAT-P-55 b
HAT-P-56 b
HAT-P-57 b
HAT-P-6 b
HAT-P-65 b
HAT-P-66 b
HAT-P-67 b
HAT-P-7 b
HAT-P-8 b
HAT-P-9 b
HATS-1 b
HATS-11 b
HATS-12 b
HATS-18 b
HATS-19 b
HATS-20 b
HATS-21 b
HATS-22 b

	+/- 0.00083								TRESCA	
15	**56895.63537** +/- 0.0003	1051	0.0010	99.7 +/- 1.3	27.4 +/- 3.2	I	1		***Eduardo Fernández-Lajús, Romina P. Di Sisto*** TRESCA	2015-07-22
14	**56895.63537** +/- 0.0003	1051	0.0010	99.7 +/- 1.3	27.4 +/- 3.2	I	1		***Eduardo Fernández-Lajús, Romina P. Di Sisto*** TRESCA	2015-07-22
13	**56885.62348** +/- 0.00049	1044	0.0017	91.1 +/- 2.1	23.4 +/- 0.8	Clear	2		***Mašek M., Hoňková K., Juryšek J.*** TRESCA	2014-08-25
12	**56882.76549** +/- 0.00065	1042	0.0044	89.9 +/- 2.7	23.9 +/- 1.2	Clear	3		***Mašek M., Hoňková K., Juryšek J.*** TRESCA	2014-08-20
11	**56609.56583** +/- 0.00027	851	0.0054	97.6 +/- 1.1	20.8 +/- 0.4	Clear	1		***Schneiter M,, Villarreal C., Colazo C.*** TRESCA	2014-02-06
10	**56589.54108** +/- 0.00031	837	0.0059	99.3 +/- 1.3	21.9 +/- 0.5	Clear	1		***Schneiter M,, Villarreal C., Colazo C.*** TRESCA	2014-02-06
9	**56520.87966** +/- 0.00067	789	0.0022	94.4 +/- 2.9	23.6 +/- 1.1	Clear	3		***Evans P.*** TRESCA	2013-08-21
8	**56510.86748** +/- 0.00067	782	0.0026	99.2 +/- 2.8	23 +/- 0.9	Clear	3		***Evans P.*** TRESCA	2013-08-09
7	**56227.65544** +/- 0.00062	584	0.0038	102.4 +/- 2.6	23.4 +/- 0.9	Clear	2		***Colazo C. A.*** TRESCA	2012-11-05
6	**56134.67559** +/- 0.00016	519	-0.0020	95.8 +/- 0.7	21.7 +/- 0.3	Clear	1		***Schneiter M, Colazo C.*** TRESCA	2012-07-26
5	**56130.38846** +/- 0.00042	516	0.0020	103.1 +/- 1.8	23.8 +/- 0.6	R	1		***Sauer T.*** TRESCA	2012-07-26
4	**56108.92681** +/- 0.00091	501	-0.0041	102.6 +/- 3.8	23.2 +/- 1.3	Clear	3		***Evans P.*** TRESCA	2012-07-13
3	**55757.06159** +/- 0.00098	255	0.0017	91.2 +/- 4.2	23.7 +/- 1.5	I	3		***Curtis I.*** TRESCA	2011-07-26
2	**55742.76385** +/- 0.00212	245	0.0077	102 +/- 8.5	15.6 +/- 2	B	4		***De Pree, Makely, gruber*** TRESCA	2011-07-25
1	**55392.31553** +/- 0.0002	0	0.0000	+/-	+/-		1		***D. R. Anderson et al., 2011*** D. R. Anderson et al., 2011	* 2011-05-17

CoRoT-1 b
CoRoT-10 b
CoRoT-11 b
CoRoT-12 b
CoRoT-13 b
CoRoT-17 b
CoRoT-18 b
CoRoT-19 b
CoRoT-2 b
CoRoT-20 b
CoRoT-3 b
CoRoT-4 b
CoRoT-5 b
CoRoT-6 b
CoRoT-8 b
CoRoT-9 b
EPIC 218916923 b
EPIC 228735255 b
EPIC-203771098 b
EPIC-203771098 c
EPIC-210957318 b
EPIC-211089792 b

Observers community | How to contribute to ETD | Model-fit your data | Transit predictions | *KEPLER* Transit predictions | *KEPLER* Candidates

Your ELONGITUDE (in deg): 33.9 *0° - 360°*
Your LATITUDE (in deg): -18.4 *90° - 0° - -90°* submit

Available predictions: (UT evening date)

2018-02- 27, 28,
2018-03- 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30,

User defined time span: From: YYYY-MM-DD Till: YYYY-MM-DD Show

Transits predictions for ELONGITUDE: 33.9° and LATITUDE: -18.4°

OBJECT		BEGIN (UT/h,A)	CENTER (DD.MM. UT/h,A)	END (UT/h,A)	D (min)	V (MAG)	DEPTH (MAG)	Elements Coords
WASP-35 b	Eri	15:18 77°,N	**09.03. 16:50** **68°,NW**	18:22 48°,W	184	10.95	0.0194	55531.47907+3.161575*E RA: 05 04 19.56 DE: -06 13 47.2
HAT-P-50 b	CMi	15:18 35°,NE	**09.03. 17:08** **55°,NE**	18:59 59°,N	220.46	11.762	0.0065	56285.90993+3.1220109*E RA: 07 52 15.2 DE: +12 08 21.9
WASP-121 b	Pup	17:34 70°,S	**09.03. 19:01** **64°,SW**	20:28 49°,SW	173.23	10.44	0.0167	56635.70832+1.2749255*E RA: 07 10 24.0 DE: -39 05 50.6
WASP-13 b	Lyn	17:09 25°,NE	**09.03. 19:06** **37°,N**	21:02 36°,N	233	10.51	0.0087	54491.6161+4.35298*E RA: 09 20 24.71 DE: +33 52 57.0
WASP-43 b	Sex	18:43 58°,E	**09.03. 19:17** **66°,E**	19:52 73°,NE	69.5	12.4	0.0289	55528.86774+0.813475*E RA: 10 19 38.01 DE: -09 48 21.9
HATS-51 b	CMa	17:57 77°,SW	**09.03. 19:37** **58°,SW**	21:17 36°,SW	199.3	12.471	0.0110	57042.00405+3.3488702*E RA: 06 51 23.40 DE: -29 03 31.0
WASP-82 b	Ori	17:20 55°,NW	**09.03. 19:49** **22°,W**	22:19 -14°,W	299.09	10.1	0.0068	56157.9898+2.705782*E RA: 04 50 38.56 DE: +01 53 38.1
KELT-4A b		18:40	**09.03. 20:24**	22:08	207.76	9.98	0.0127	56193.2915+2.9895936*E

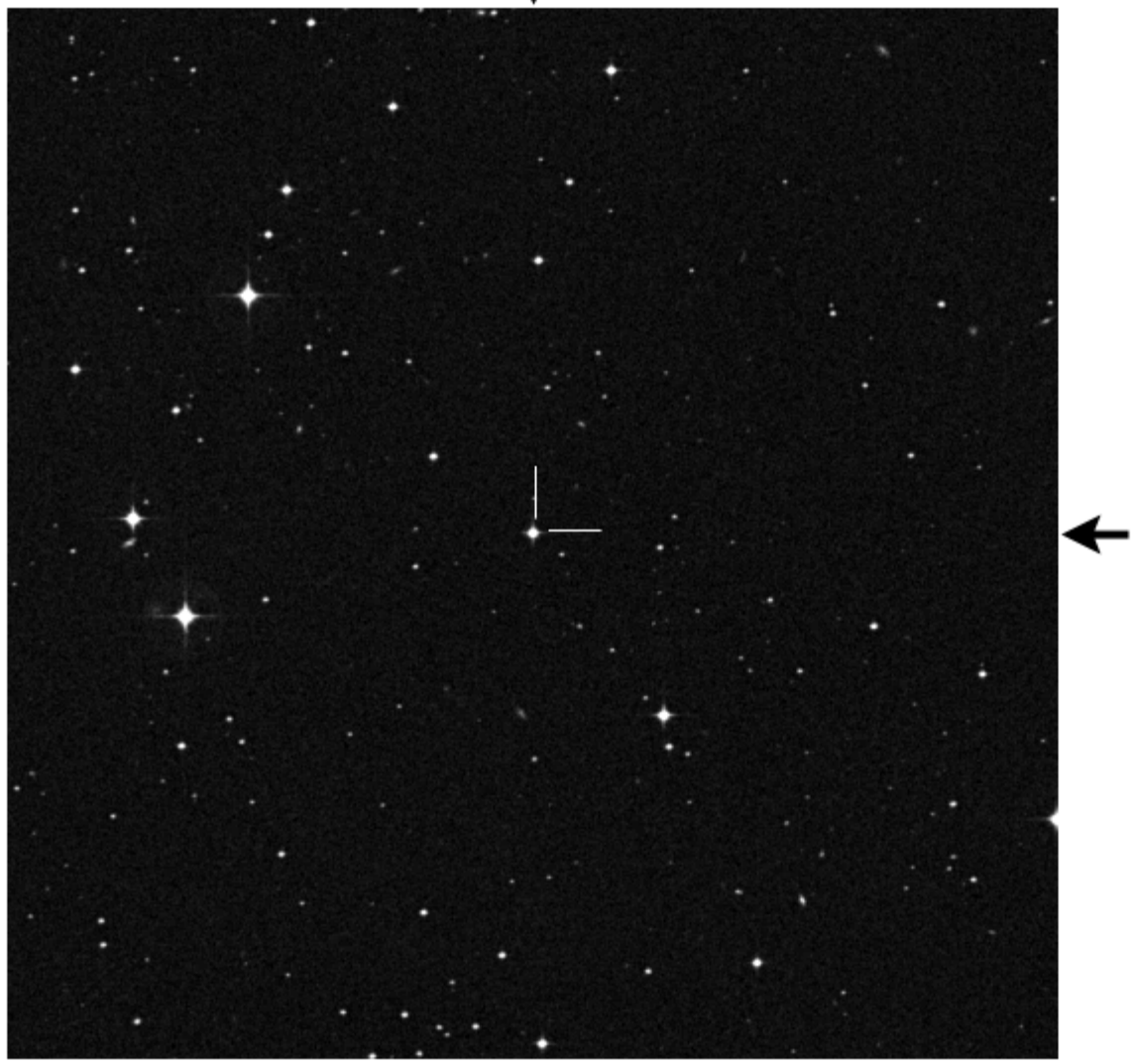
Current statistics:
(1. 3. 2018)

# of objects: **326**
# of transits: **6742**

DQ	# of transits
1	1527
2	1089
3	2605

CoRoT-12 b
CoRoT-13 b
CoRoT-17 b
CoRoT-18 b
CoRoT-19 b
CoRoT-2 b
CoRoT-20 b
CoRoT-3 b
CoRoT-4 b
CoRoT-5 b
CoRoT-6 b
CoRoT-8 b
CoRoT-9 b
EPIC 218916923 b
EPIC 228735255 b
EPIC-203771098 b
EPIC-203771098 c
EPIC-210957318 b
EPIC-211089792 b
EPIC-212110888 b
GJ1214 b

RA (J2000): **10 19 38.01**, DE (J2000): **-09 48 21.9**,
V = **12.4 mag**, dV = **0.0289 mag**, duration = **69.5 minutes**
Per = 0.813475 **d**, T0(HJD) = 2455528.86774 compute



15' x 15' image from the Digitized Sky Survey at the STScI Archive.

Your ELONGITUDE (in deg): 33.9 *0° - 360°* submit

Current statistics:
(1. 3. 2018)

# of objects: **326**
# of transits: **6742**

DQ	# of transits
1	1527
2	1089
3	2605
4	800
5	712

The STScI Digitized Sky Survey

https://archive.stsci.edu/cgi-bin/dss_fo

The STScI Digitized Sky Survey

NOTE: To obtain target coordinates for **HST Phase 2 proposals**, select the HST Phase 2 (GSC2) survey option.

[*New!* | Help | FAQ | © | Acknowledging DSS | Other DSS Sites | Archive | STScI]

Get an Object's Coordinates

Object name wasp46b × GET COORDINATES Clear

Get coordinates from ◉ SIMBAD ○ NED

Retrieve an Image

Retrieve from

- POSS2/UKSTU Red
- POSS2/UKSTU Blue
- POSS2/UKSTU IR
- POSS1 Red
- POSS1 Blue
- Quick-V
- HST Phase 2 (GSC2)

(detailed information about the Surveys)

RA Dec J2000

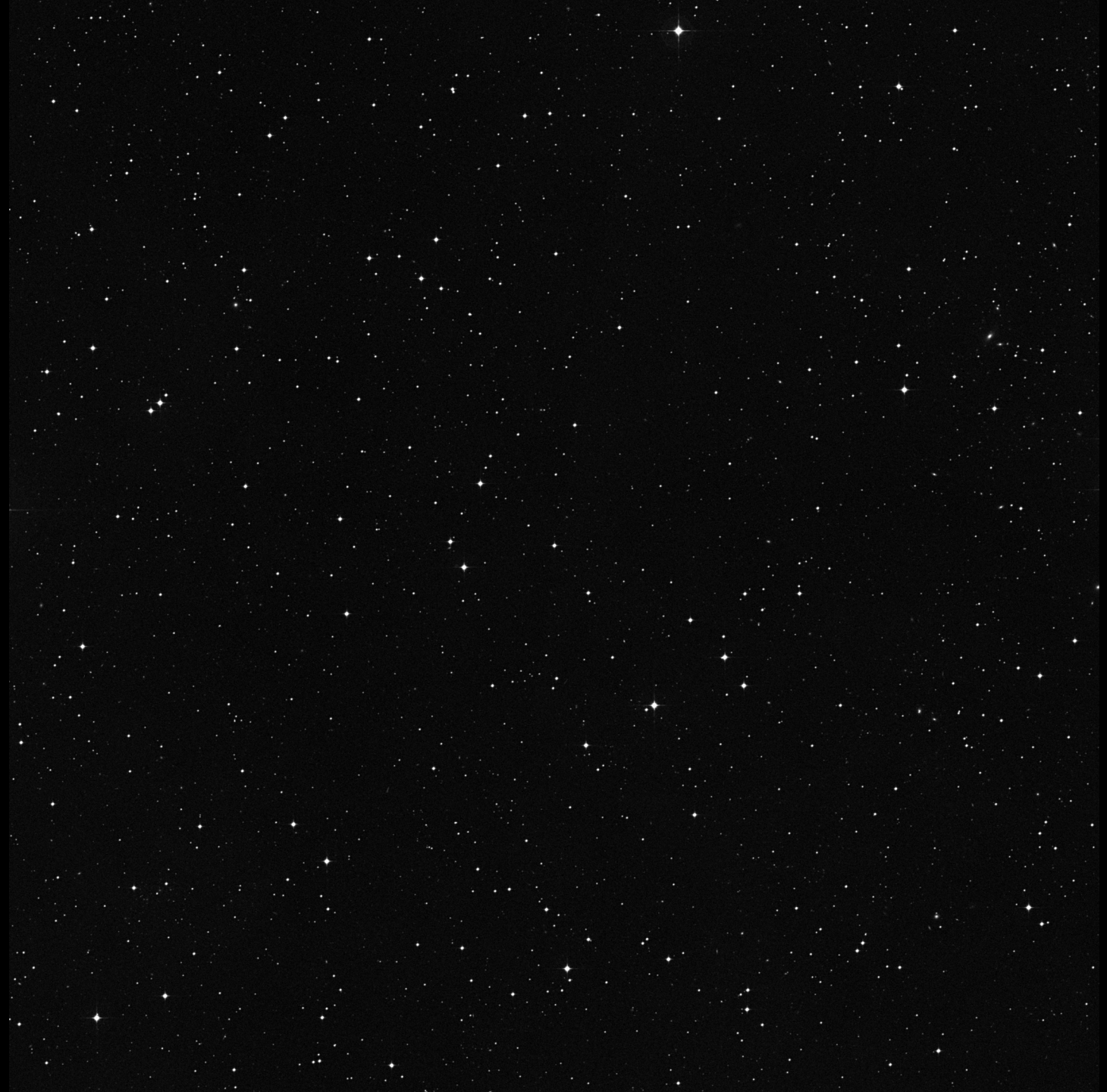
Height 15.0 (max: 60.0) Width 15.0 (max: 60.0) **arcminutes**

File format FITS Compression (FITS only) None

☐ **Save file to disk (instead of displaying)**

HST Field of View Overlay (1st generation GIF only): NONE

Roll angle (V3):



60’

GJ436 b
HAT-P-1 b
HAT-P-10/WASP-11 b
HAT-P-11 b
HAT-P-12 b
HAT-P-13 b
HAT-P-14 b
HAT-P-15 b
HAT-P-16 b
HAT-P-17 b
HAT-P-18 b
HAT-P-19 b
HAT-P-2 b
HAT-P-20 b
HAT-P-21 b
HAT-P-22 b
HAT-P-23 b
HAT-P-24 b
HAT-P-25 b
HAT-P-26 b
HAT-P-27/WASP-40 b
HAT-P-28 b
HAT-P-29 b
HAT-P-3 b

Transits predictions for NEXT 365 days.
ELONGITUDE: 33.9° and LATITUDE: -18.4°

Transit occurs below 20° in the sky. | During the daylight. | Observable.

Tmid (HJD)	BEGIN (UT/h,A)	CENTER (DD.MM. UT/h,A)	END (UT/h,A)
2458179.169	01.03 15:29 (5°,E)	01.03. 16:03 (13°,E)	01.03 16:38 (21°,E)
2458179.983	02.03 11:00 (-54°,SE)	02.03. 11:35 (-47°,SE)	02.03 12:09 (-40°,SE)
2458180.796	03.03 6:31 (-40°,SW)	03.03. 7:06 (-47°,SW)	03.03 7:41 (-53°,SW)
2458181.610	04.03 2:03 (21°,W)	04.03. 2:37 (12°,W)	04.03 3:12 (4°,W)
2458182.423	04.03 21:34 (79°,NW)	**04.03. 22:09 (73°,NW)**	04.03 22:44 (65°,W)
2458183.237	05.03 17:06 (31°,E)	**05.03. 17:40 (39°,E)**	05.03 18:15 (48°,E)
2458184.050	06.03 12:37 (-30°,E)	06.03. 13:12 (-23°,E)	06.03 13:46 (-15°,E)
2458184.864	07.03 8:08 (-60°,SW)	07.03. 8:43 (-62°,S)	07.03 9:18 (-63°,S)
2458185.677	08.03 3:40 (-6°,W)	08.03. 4:15 (-14°,W)	08.03 4:49 (-22°,W)
2458186.491	08.03 23:11 (56°,W)	**08.03. 23:46 (47°,W)**	09.03 0:21 (40°,W)
2458187.304	09.03 18:43 (58°,E)	**09.03. 19:17 (66°,E)**	09.03 19:52 (73°,NE)
2458188.118	10.03 14:14 (-5°,E)	10.03. 14:49 (4°,E)	10.03 15:23 (12°,E)
2458188.931	11.03 9:45 (-59°,SE)	11.03. 10:20 (-55°,SE)	11.03 10:55 (-48°,SE)
2458189.744	12.03 5:17 (-32°,SW)	12.03. 5:52 (-39°,SW)	12.03 6:26 (-46°,SW)
2458190.558	13.03 0:48 (30°,W)	**13.03. 1:23 (22°,W)**	13.03 1:58 (13°,W)
2458191.371	13.03 20:20 (80°,N)	**13.03. 20:54 (79°,NW)**	13.03 21:29 (74°,NW)
2458192.185	14.03 15:51 (22°,E)	14.03. 16:26 (30°,E)	14.03 17:00 (38°,E)
2458192.998	15.03 11:22 (-40°,SE)	15.03. 11:57 (-32°,SE)	15.03 12:32 (-24°,E)
2458193.812	16.03 6:54 (-54°,SW)	16.03. 7:29 (-59°,SW)	16.03 8:03 (-62°,S)
2458194.625	17.03 2:25 (3°,W)	17.03. 3:00 (-5°,W)	17.03 3:35 (-13°,W)
2458195.439	17.03 21:57 (64°,W)	**17.03. 22:31 (57°,W)**	17.03 23:06 (49°,W)
2458196.252	18.03 17:28 (49°,E)	**18.03. 18:03 (57°,E)**	18.03 18:38 (65°,E)
2458197.066	19.03 12:59 (-14°,E)	19.03. 13:34 (-6°,E)	19.03 14:09 (2°,E)
2458197.879	20.03 8:31 (-63°,S)	20.03. 9:06 (-60°,SE)	20.03 9:40 (-55°,SE)
2458198.693	21.03 4:02 (-23°,W)	21.03. 4:37 (-31°,W)	21.03 5:12 (-38°,SW)
2458199.506	21.03 23:34 (38°,W)	**22.03. 0:08 (31°,W)**	22.03 0:43 (23°,W)
2458200.320	22.03 19:05 (74°,NE)	**22.03. 19:40 (79°,NE)**	22.03 20:15 (80°,N)
2458201.133	23.03 14:36 (13°,E)	23.03. 15:11 (21°,E)	23.03 15:46 (29°,E)
2458201.947	24.03 10:08 (-48°,SE)	24.03. 10:43 (-41°,SE)	24.03 11:17 (-33°,SE)

Known transiters:

CoRoT-1 b
CoRoT-10 b
CoRoT-11 b
CoRoT-12 b
CoRoT-13 b
CoRoT-17 b
CoRoT-18 b
CoRoT-19 b
CoRoT-2 b
CoRoT-20 b
CoRoT-3 b
CoRoT-4 b
CoRoT-5 b
CoRoT-6 b
CoRoT-8 b
CoRoT-9 b
EPIC 218916923 b
EPIC 228735255 b
EPIC-203771098 b

ETD - Exoplanet Transit Database

Observers community | How to contribute to ETD | Model-fit your data | Transit predictions | KEPLER Transit predictions | KEPLER Candidates

step 1 / 5

INSTRUCTION: In the first step, just select an exoplanet and load data file with observation. Also select if data are in geocentric or heliocentric JD and specify, if brightness is given in MAG or FLUX. Both geocentric and heliocentric JD must be computed from COORDINATED UNIVERSAL TIME (UTC) with leap seconds included (common time in your PC / notebook).

Choose exoplanet WASP-43 b Sex

Data file with observation: Browse...

Required 3 columns: JD, MAG, ERROR. Other columns are ignored. Columns must be separated by space or TAB.

JD format: (•) geocentric ( ) heliocentric *(both based on UTC)*

Brightness column: (•) in magnitudes ( ) in flux

Continue >

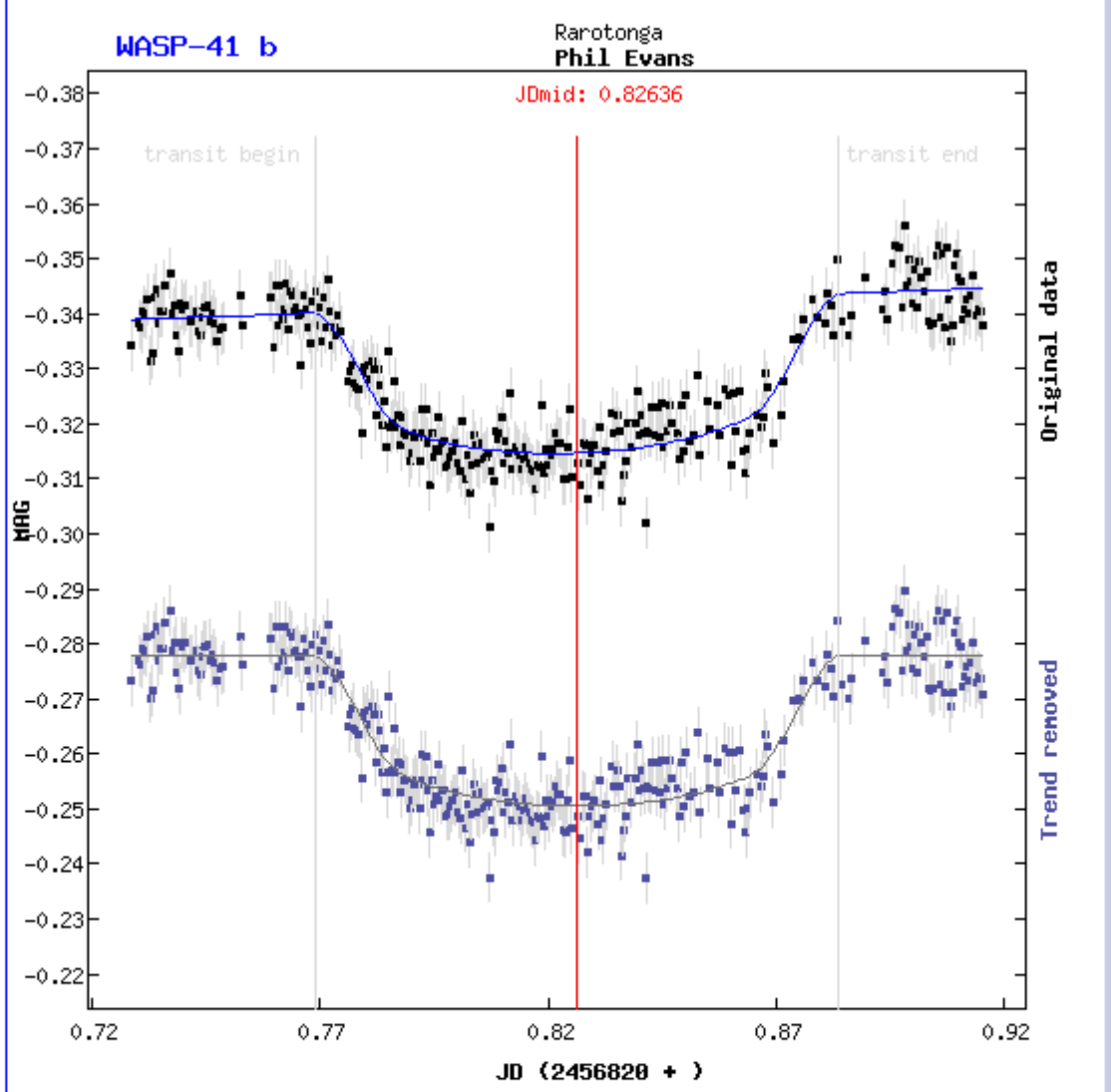
Model light curve fitting procedure: ***O.Pejcha, 2008*** *(read description).*
Database and web interface: ***L. Brat, 2008***

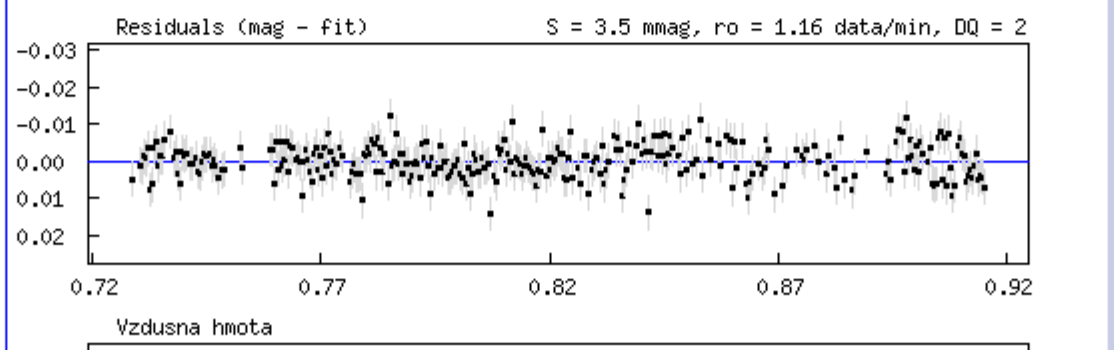
Credit & Contact

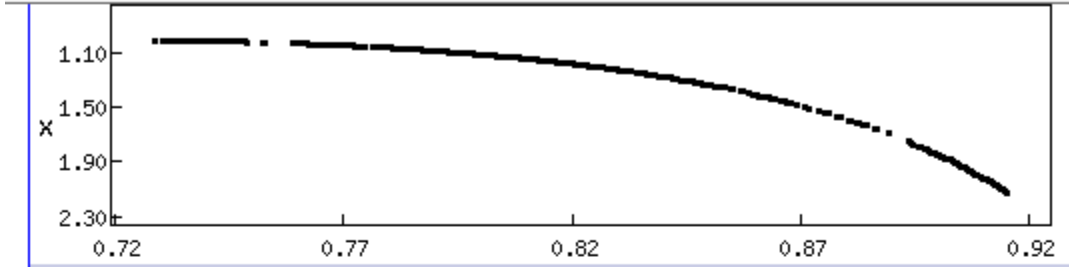
What's new: | Archive

Current statistics:
(1. 3. 2018)

# of objects: **326**







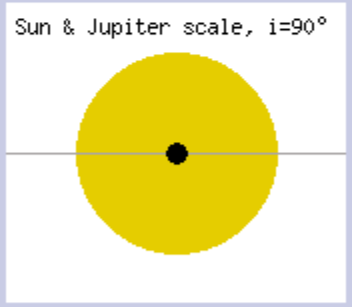
Střed tranzitu JDmid:	2456820.82362 +/- 0.00058
Střed tranzitu HJDmid:	2456820.82636 +/- 0.00058 (helcor = **0.00274**)
Střed tranzitu - UT:	2014-06-12 07:46:00
Délka tranzitu:	165.6 +/- 2.1 minut
Hloubka poklesu:	0.0272 +/- 0.0006 mag
Submitted data:	**heliocentric based on UTC**

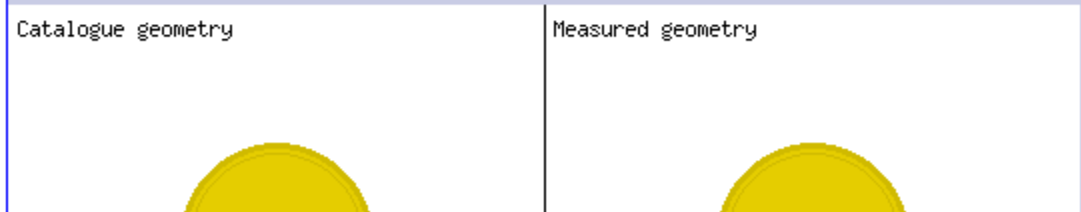
Identifikační mapka:

Zobrazit tranzit v ETD

Změřená geometrie systému

katalogové údaje		*změřené parametry*
R_p:	1.21 +/- 0.07 R_{Jup}	**1.397** $^{+0.015}_{-0.015}$ R_{Jup}
R_*:	0.91 +/- 0.05 R_{Sun}	*fixed, errors included in i*
A:	0.0403 +/- 0.0005 AU	*fixed, errors included in i*
Per:	3.052394 days	*fixed*
i :	87.3 +/- 1 °	**88.30** $^{+0.44\|1.70}_{-0.35\|1.51}$ °





Satellite

Westall Private Observatory

Equipment: Celestron 9.25 SCT (0.235 m, CCD SBIG ST8XME)
Observer: Ken Westall
Address: 304 Cherry Laurel Dr, Clayton, NC, 27527, USA

PEST

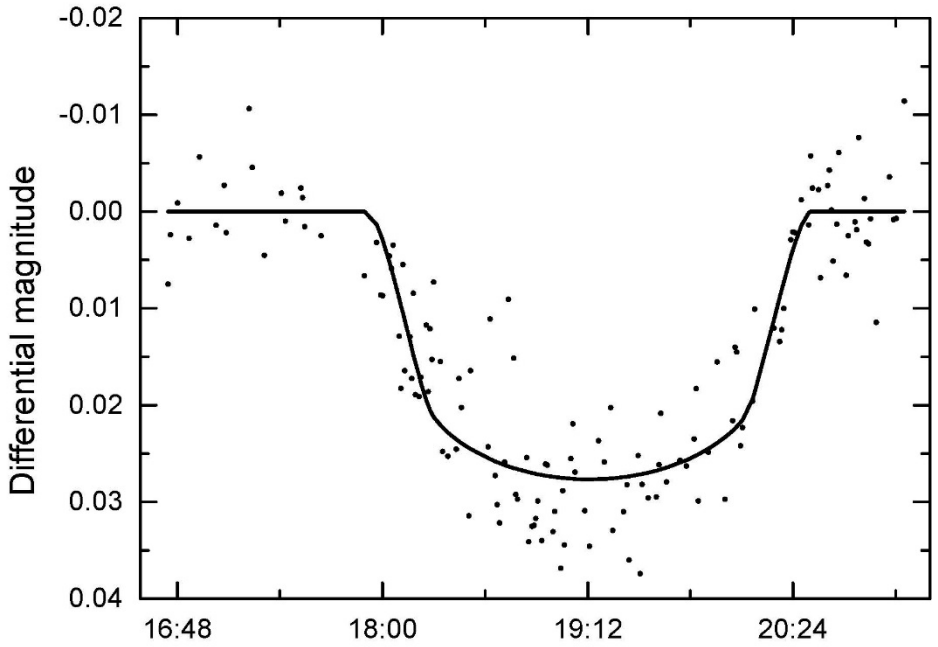
Equipment: 12" Meade LX200GPS, CCD SBIG ST8XME
Observer: TG Tan

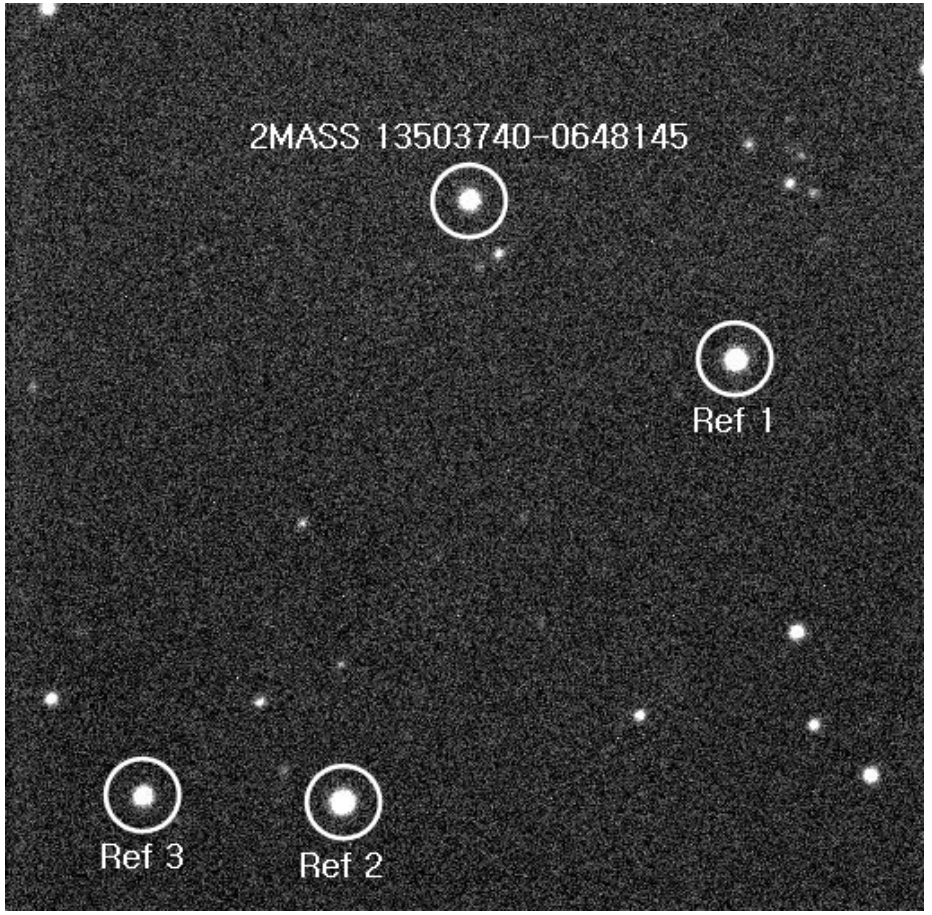
Station list

- Štefánik observa., ETD admin
- ALTAN Observa., ETD admin
- ABObservatory
- ABT Metius
- Abweiler observatory
- Acton Sky Portal
- Adam Büchner (mobile kit)
- AGO Modra (MPC 118)
- Allegheny Observatory
- Alnair observator
- Ambacht observatory
- Andrea Di Antonio@observa
- Apricot Backyard Observatory
- Astrofels Observatory
- Astronomical Centre di Montecatini Val D Cecina
- Astronomical Observatory, University of Sier
- ATA@F.Fuligni observatory D06
- Ay-sur-Moselle (mobile kit)
- A&M Commerce Obserservatory
- Bavarian Public

Capturing images

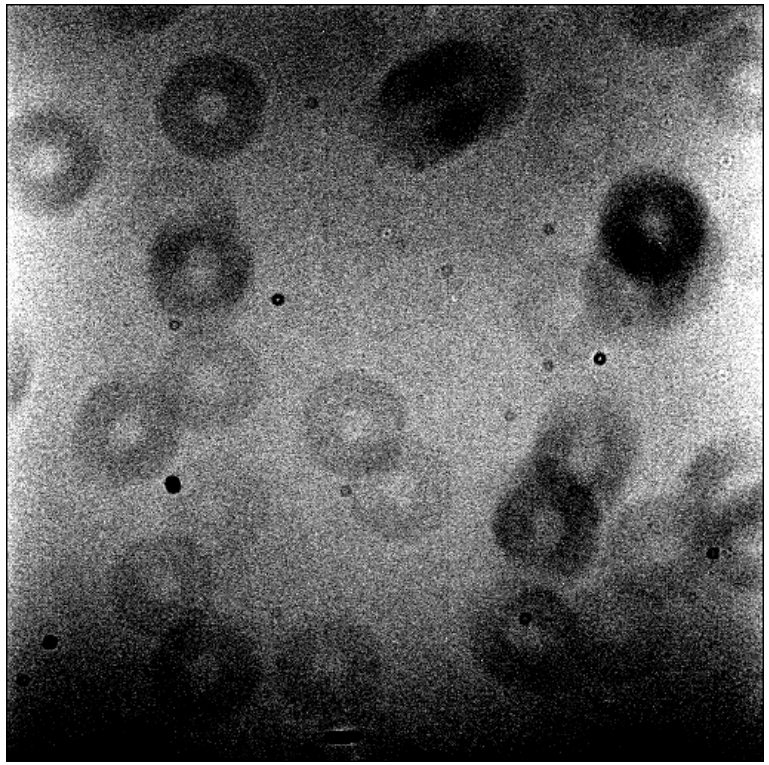
- Start 1 hour before transit (after Astronomical Twilight)
- Take as many pictures as you can
- Finish 1 hour after transit

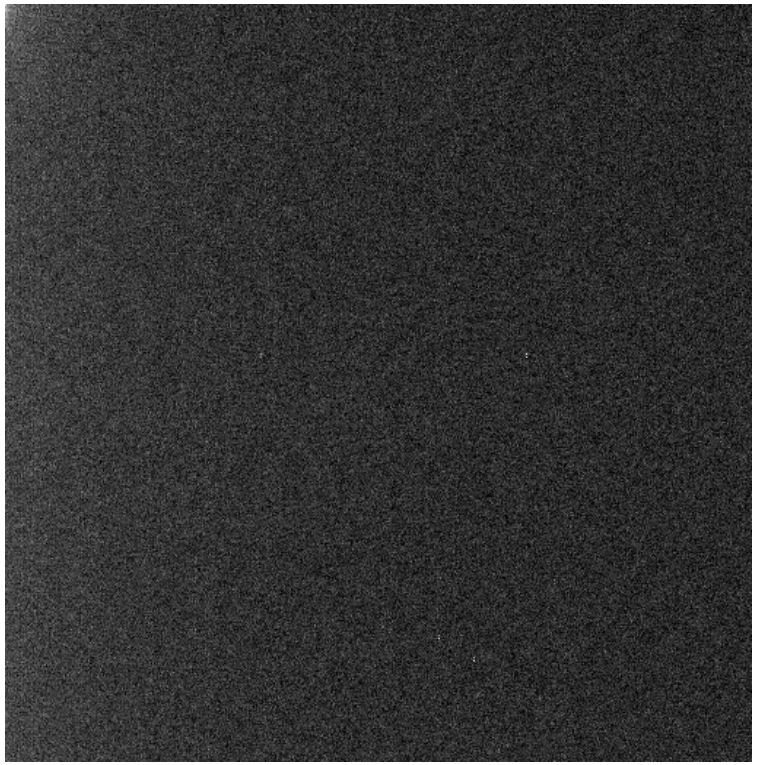




Capturing images

- Sky flats – used to remove variations in pixel sensitivity and effects of dust (20 images)
  NB: Any length of time but do not exceed CCD response
- Dark frames – used to remove thermal noise from an image (20 images)
  NB: Same length of time as star pictures
- Bias frames – used to remove electronic noise from the instrument (20 images)
  NB: Zero time



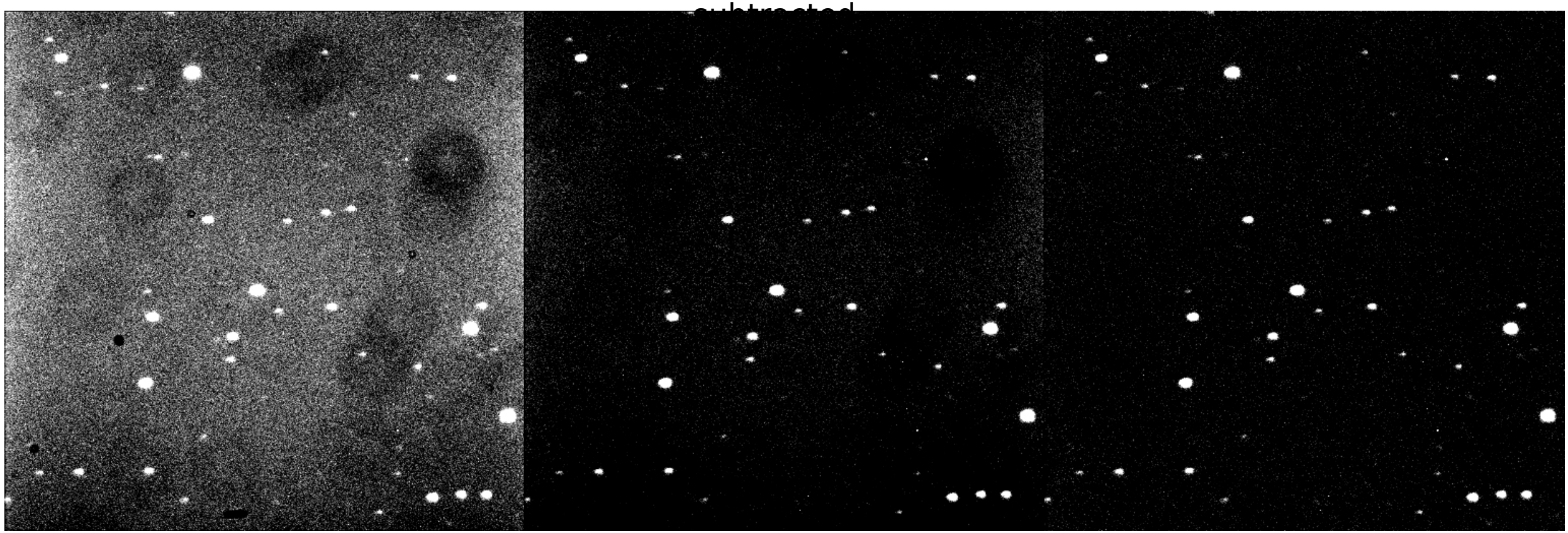


Reduced image (WASP 41b)

RAW

Dark subtracted

Final



Aperture Photometry Tool, v. 2.4.9

APT File Edit View Tools Help

Open Image | FITS Header | Thumbnail | About & Help | Exit

Lower bound of stretch (D.N.): +2641.1

Upper bound of stretch (D.N.): +3223.9

Stretch to Bounds | 0.3%/99.7% | Image Histogram

Adjust stretch min. (percentile of set range):

0 20 40 60 80 100

Adjust stretch max. (percentile of set range):

0 20 40 60 80 100

Linear Stretch

Stretch-Type Toggle

Dynamic range (x100):

0 100 200 300 400 500

Click on Big Button on Right to Change Aperture Attributes & Photometry Radii:

10/10/0->Alter

Aperture Slice | Source Scatter | Sky Scatter | Hide Aperture

Curve of Growth | Radial Profile | Sky Histogram | Color-Table Toggle

VALUES UNDER CURSOR

Pixel (X, Y) = 61, 5

(R.A., Dec.) = N/A, N/A

Pixel value = +2806.7 D.N.

APERTURE MEASUREMENTS

Aperture (X, Y) = 186 61 Snap

Centroid (X, Y) = 186.07, 60.67

Centroid (R.A., Dec.) = N/A, N/A

Counts in aperture = +1.353e+06 D.N.

APERTURE-PHOTOMETRY RESULTS

Photometry data units: D.N.

Sky background (model) = +2756.1 (B)

Sky scale, sigma = +41.139, +41.124

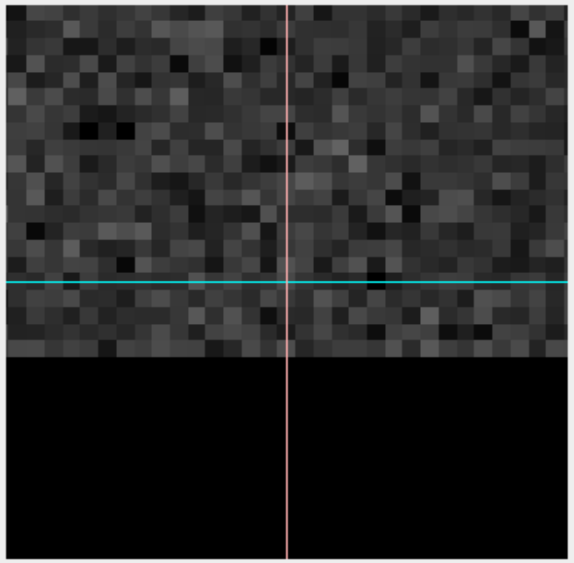
Source intensity (sky subtracted) = +482473

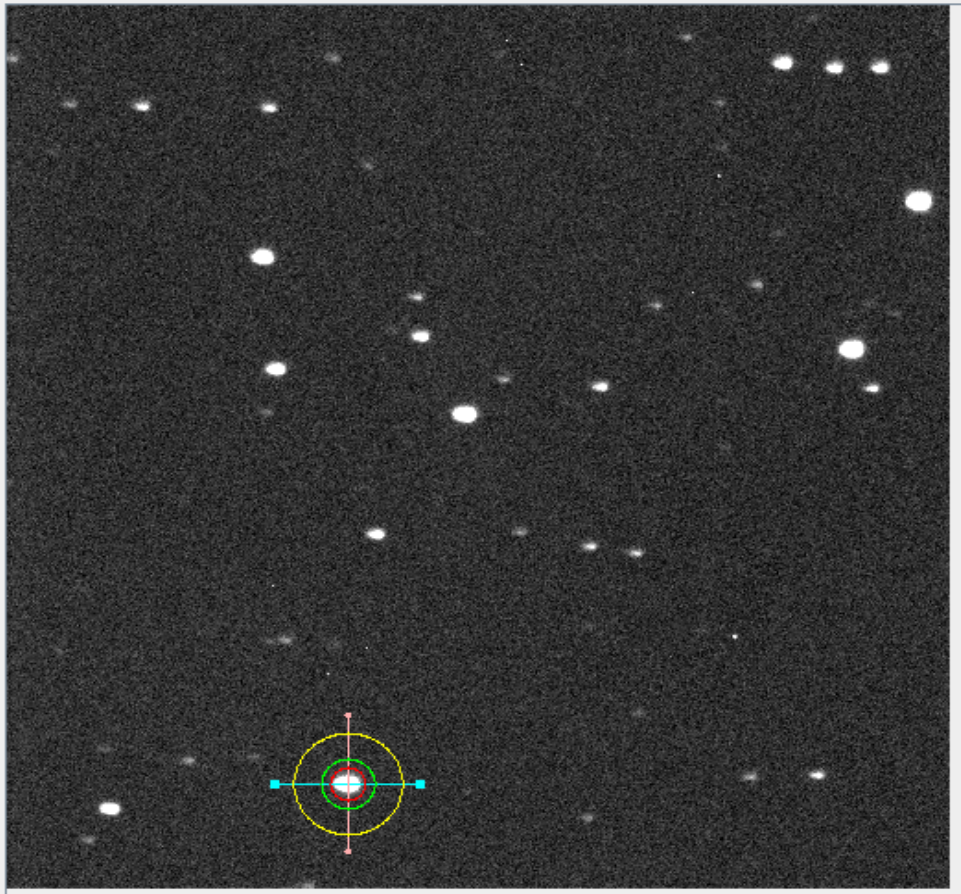
Source uncertainty = +1068.7

Magnitude (dimensionless) = -14.2087

Mag. uncertainty (dimensionless) = +0.0024

Magnify Image [1] 5x 10x 20x





More Settings | Recompute Photometry

Save Results | List Results | Plot Results

Blink | Refresh 1 | Refresh 2

Source List | Pick/Zap | Screenshot

Magnify: 1x 5x 10x 20x Find Aperture

Image: [1] Untitled204.fit [1:1] (primary image)

Reference stars

	A	B	C	D	E	F	G	H	I	J	K	L
1	Image	T (JD)	WASP41b	Ref3	Ref4	Ref5	Ref6	Ref7		W41-5		LINE
2	204	2456787.18435185	-14.2107	-13.591	-12.2416	-14.0218	-12.9595	-14.1894		-0.1889		-0.1789
3	205	2456787.18488425	-14.2128	-13.6093	-12.2493	-14.0264	-12.9642	-14.1964		-0.1864		-0.1789
4	206	2456787.18539351	-14.226	-13.6135	-12.2546	-14.037	-12.9643	-14.1977		-0.189		-0.1789
5	209	2456787.18674768	-14.199	-13.606	-12.2269	-14.031	-12.9681	-14.1932		-0.168		-0.1789
6	214	2456787.18909722	-14.21	-13.6195	-12.2264	-14.0366	-12.9752	-14.2114		-0.1734		-0.1789
7	215	2456787.18954861	-14.2176	-13.6241	-12.249	-14.0408	-12.9632	-14.2137		-0.1768		-0.1789
8	218	2456787.19086805	-14.2207	-13.6382	-12.2568	-14.0488	-12.9684	-14.2261		-0.1719		-0.1789
9	223	2456787.19356481	-14.238	-13.6491	-12.2653	-14.0665	-13.0022	-14.2333		-0.1715		-0.1789
10	225	2456787.19447916	-14.2393	-13.6402	-12.2831	-14.0638	-12.9914	-14.2338		-0.1755		-0.1789
11	228	2456787.19584490	-14.2402	-13.6498	-12.2628	-14.0654	-12.9919	-14.2469		-0.1748		-0.1789
12	229	2456787.19629629	-14.2431	-13.6457	-12.2518	-14.0667	-12.9954	-14.2435		-0.1764		-0.1789
13	230	2456787.19674768	-14.2397	-13.6372	-12.2488	-14.0611	-12.9846	-14.24		-0.1786		-0.1789
14	231	2456787.19723379	-14.2341	-13.6444	-12.2785	-14.0604	-12.9877	-14.2388		-0.1737		-0.1789
15	234	2456787.19831018	-14.2467	-13.649	-12.2693	-14.0674	-13.0043	-14.2427		-0.1793		-0.1789
16	235	2456787.19878472	-14.2402	-13.6484	-12.2704	-14.0739	-13.0027	-14.244		-0.1663		-0.1789
17	238	2456787.20009259	-14.2335	-13.6532	-12.2452	-14.0733	-13.0088	-14.2447		-0.1602		-0.1789
18	239	2456787.20055555	-14.2431	-13.6553	-12.2737	-14.067	-12.9911	-14.2442		-0.1761		-0.1789
19	240	2456787.20112268	-14.239	-13.6602	-12.2713	-14.0689	-12.9884	-14.257		-0.1701		-0.1789
20	244	2456787.20287037	-14.2426	-13.662	-12.3006	-14.0732	-13.0244	-14.2503		-0.1694		-0.1789
21	246	2456787.20378472	-14.2419	-13.6614	-12.306	-14.072	-13.0114	-14.2525		-0.1699		-0.1789
22	249	2456787.20508101	-14.2349	-13.6534	-12.2599	-14.0811	-12.9984	-14.2494		-0.1538		-0.1789
23	250	2456787.20557870	-14.2353	-13.6634	-12.2867	-14.0761	-13.0037	-14.2531		-0.1592		-0.1789
24	251	2456787.20603009	-14.2345	-13.6651	-12.2776	-14.083	-13.0001	-14.2528		-0.1515		-0.1789
25	252	2456787.20651620	-14.2419	-13.6598	-12.276	-14.0811	-13.0186	-14.2564		-0.1608		-0.1789
26	258	2456787.20914351	-14.2315	-13.6604	-12.2941	-14.0753	-12.9974	-14.2581		-0.1562		-0.1789
27	259	2456787.20958333	-14.2372	-13.6603	-12.2665	-14.0851	-12.9975	-14.2601		-0.1521		-0.1789
28	261	2456787.21048611	-14.2355	-13.6647	-12.2958	-14.0803	-12.9955	-14.2587		-0.1552		-0.1789
29	264	2456787.21177083	-14.2315	-13.6644	-12.2794	-14.0811	-13.0073	-14.2531		-0.1504		-0.1789
30	265	2456787.21221064	-14.2348	-13.661	-12.2843	-14.0745	-13.0094	-14.2524		-0.1603		-0.1789
31	266	2456787.21266203	-14.2333	-13.6603	-12.2914	-14.0761	-13.02	-14.2573		-0.1572		-0.1789
32	267	2456787.21311342	-14.2411	-13.6602	-12.3021	-14.0843	-13.003	-14.2542		-0.1568		-0.1789
33	269	2456787.21399305	-14.2381	-13.6637	-12.2975	-14.0855	-12.9989	-14.26		-0.1526		-0.1789
34	270	2456787.21445601	-14.2381	-13.6645	-12.2698	-14.0822	-13.0002	-14.2593		-0.1559		-0.1789
35	271	2456787.21489583	-14.2424	-13.6638	-12.2824	-14.08	-12.9977	-14.2584		-0.1624		-0.1789
36	276	2456787.21699074	-14.2403	-13.6747	-12.2788	-14.0867	-13.0266	-14.261		-0.1536		-0.1789
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42	287	2456787.22180555	-14.2374	-13.6612	-12.2703	-14.0918	-13.0073	-14.259		-0.1456		-0.1789
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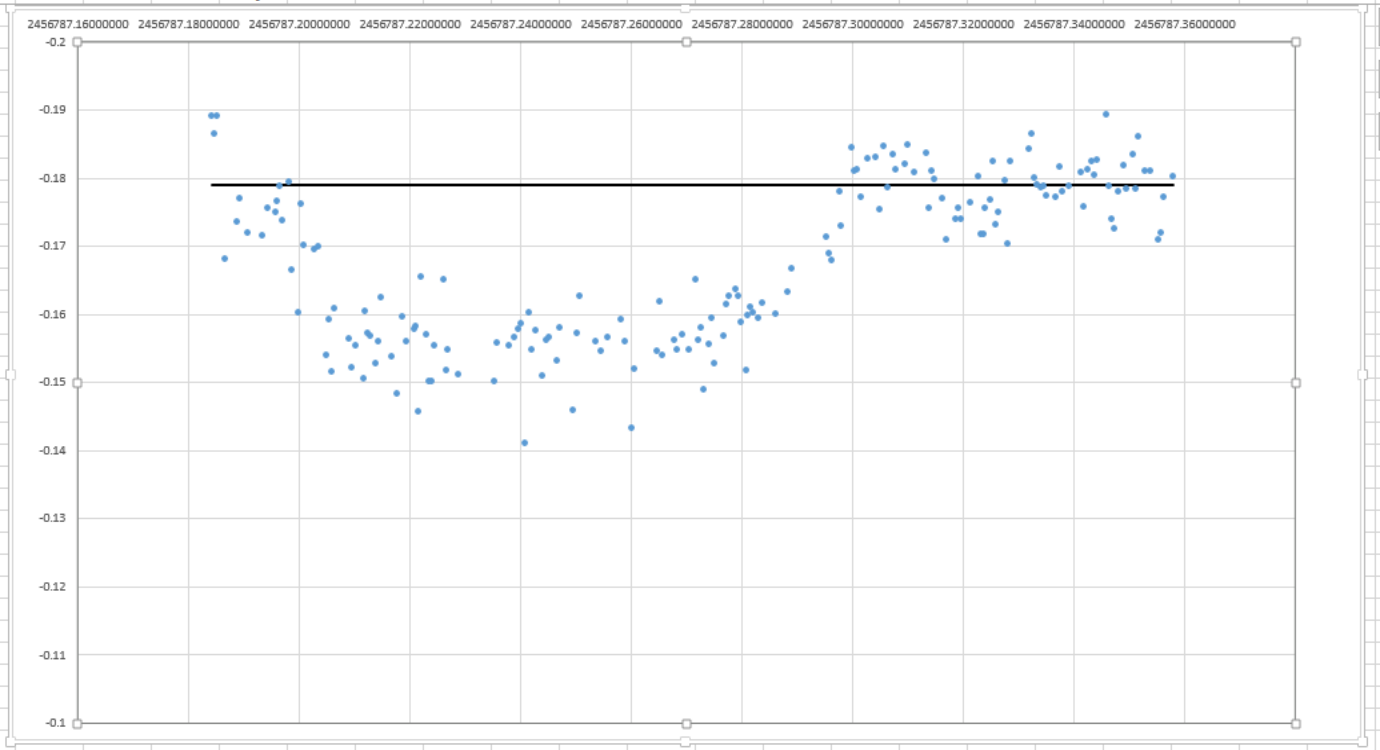

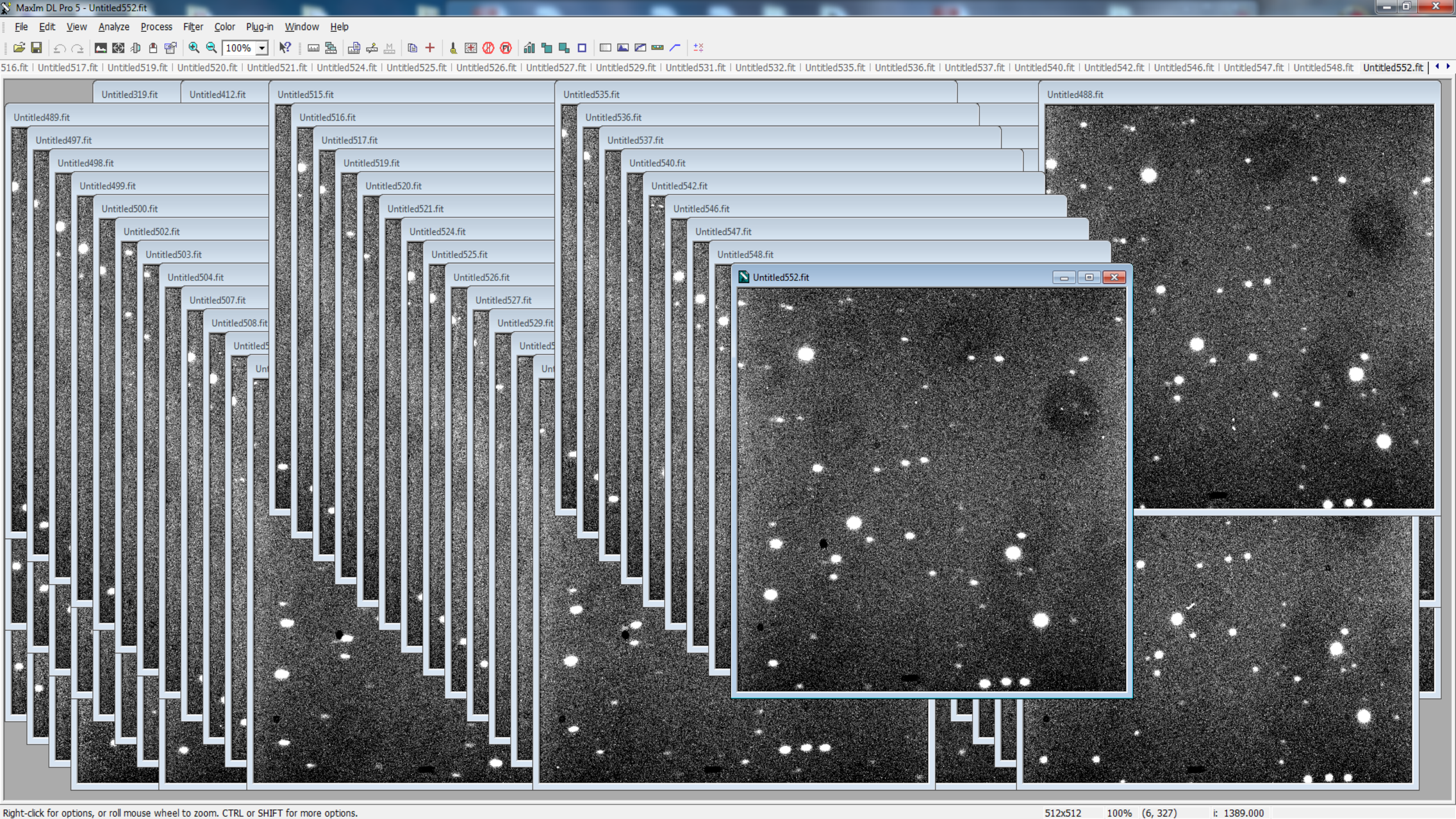
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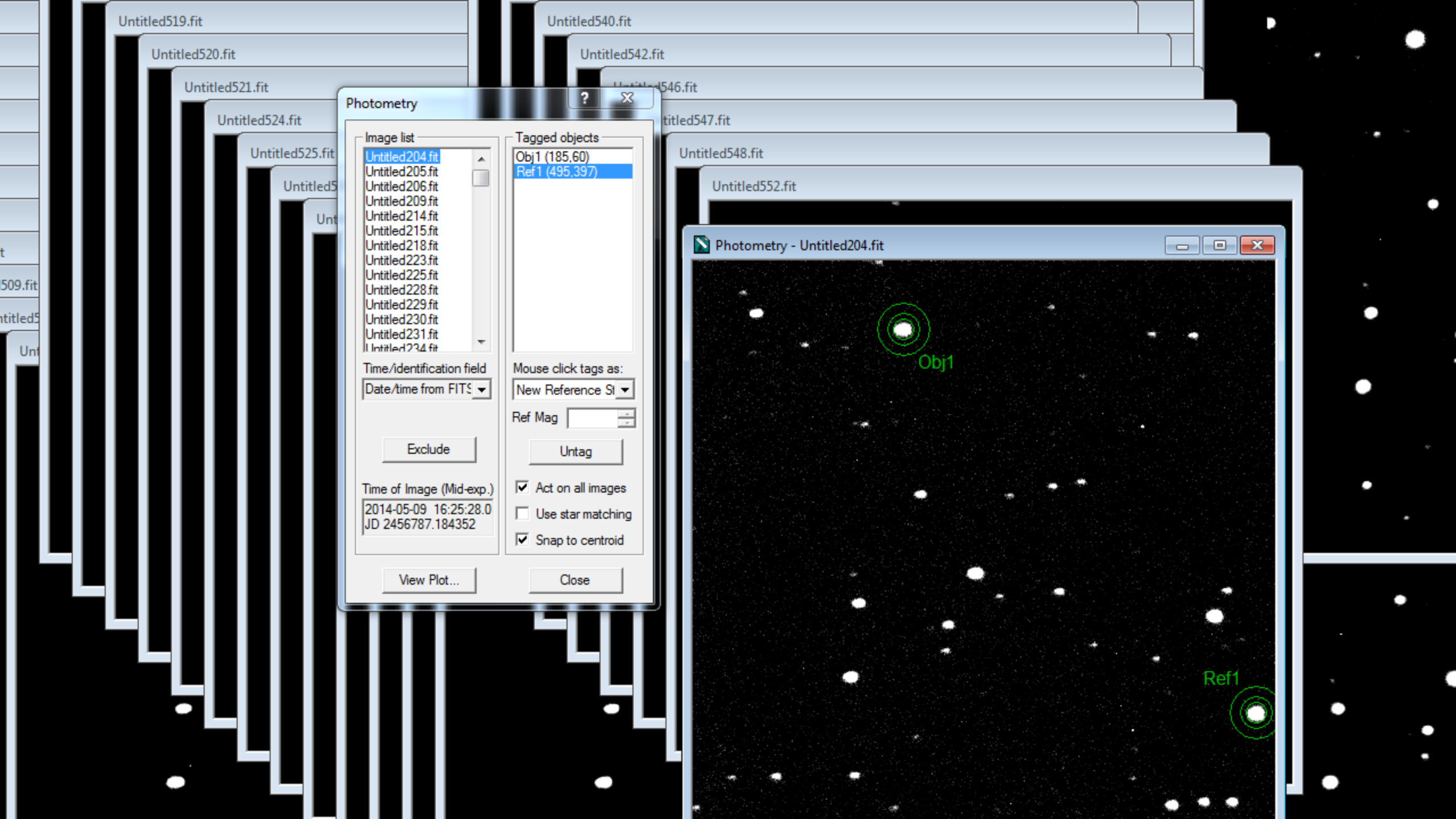
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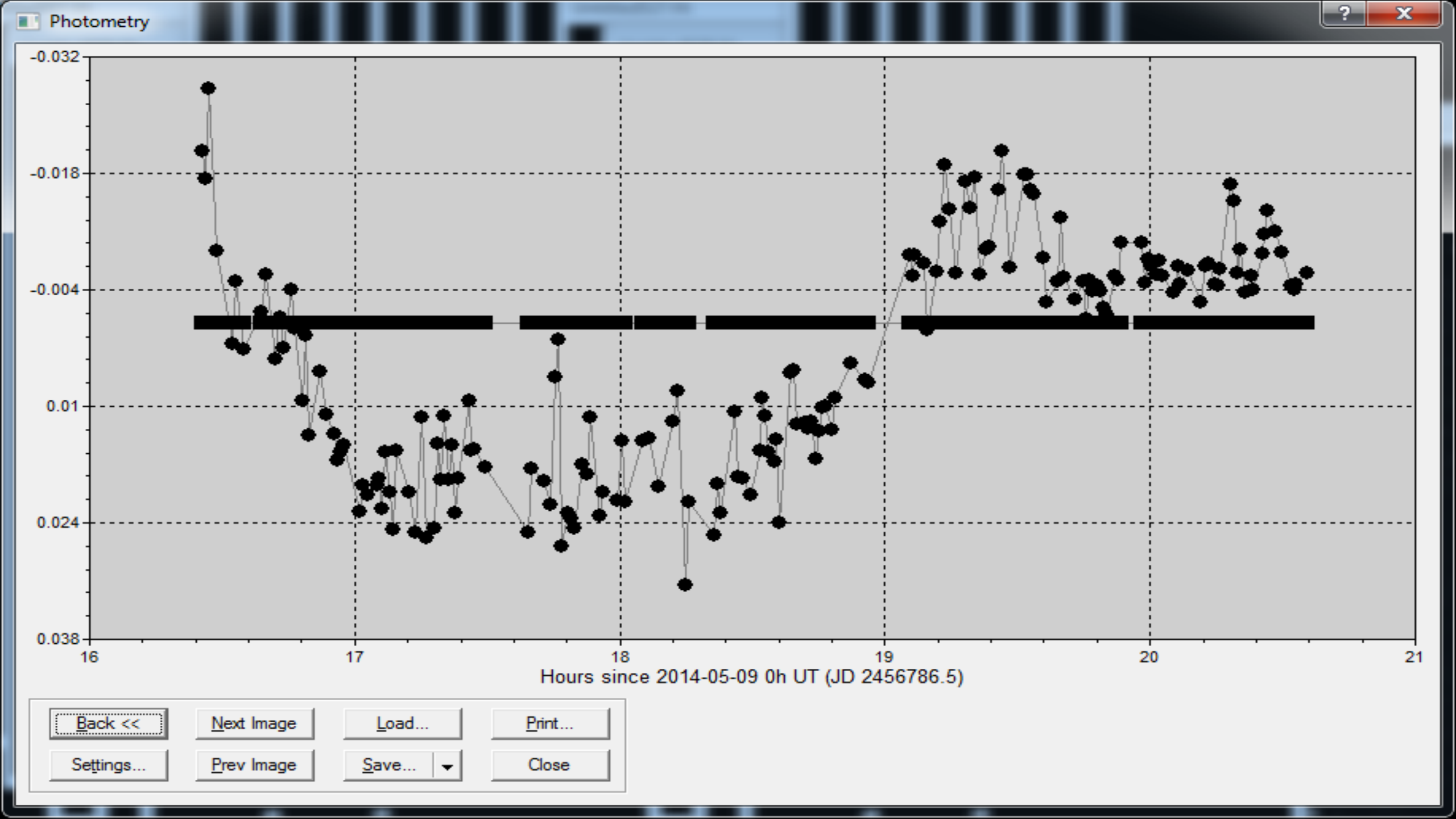
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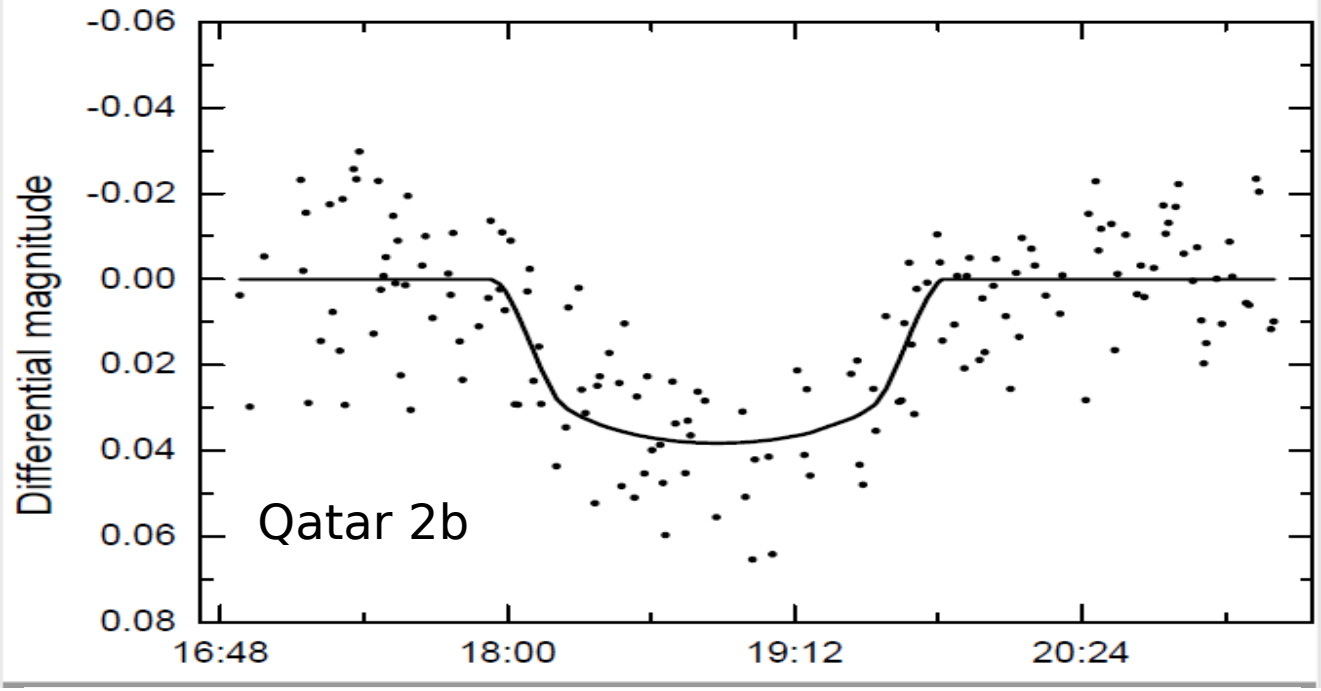
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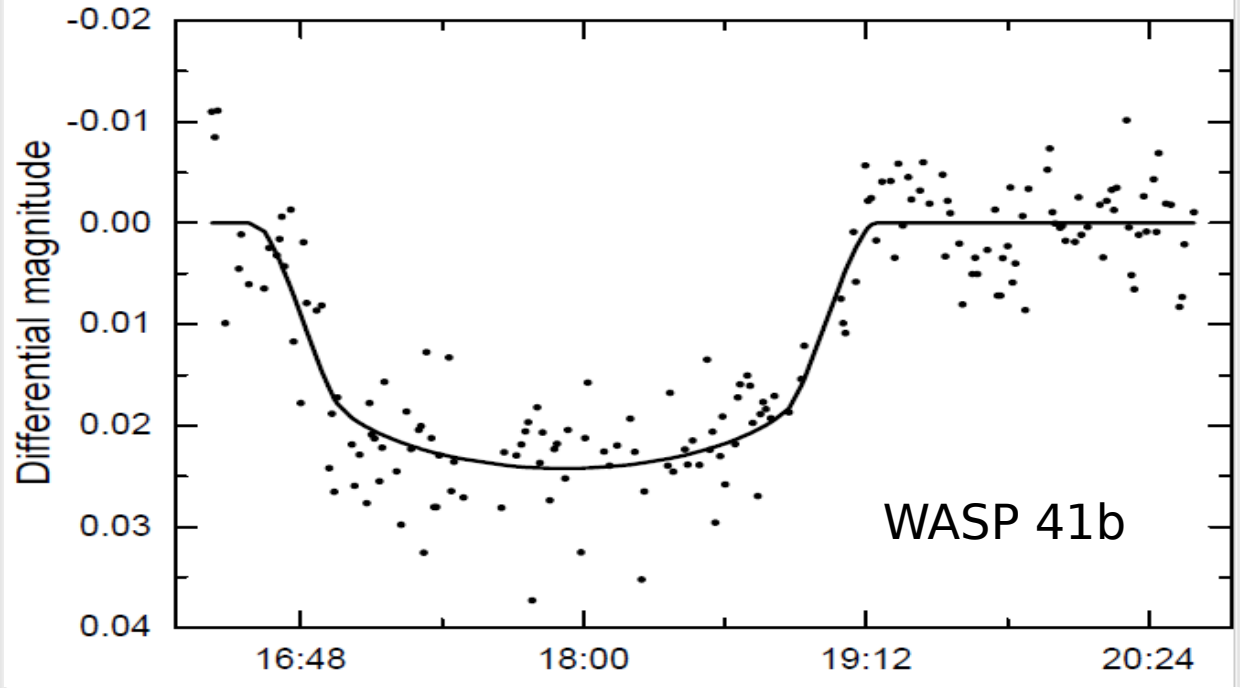
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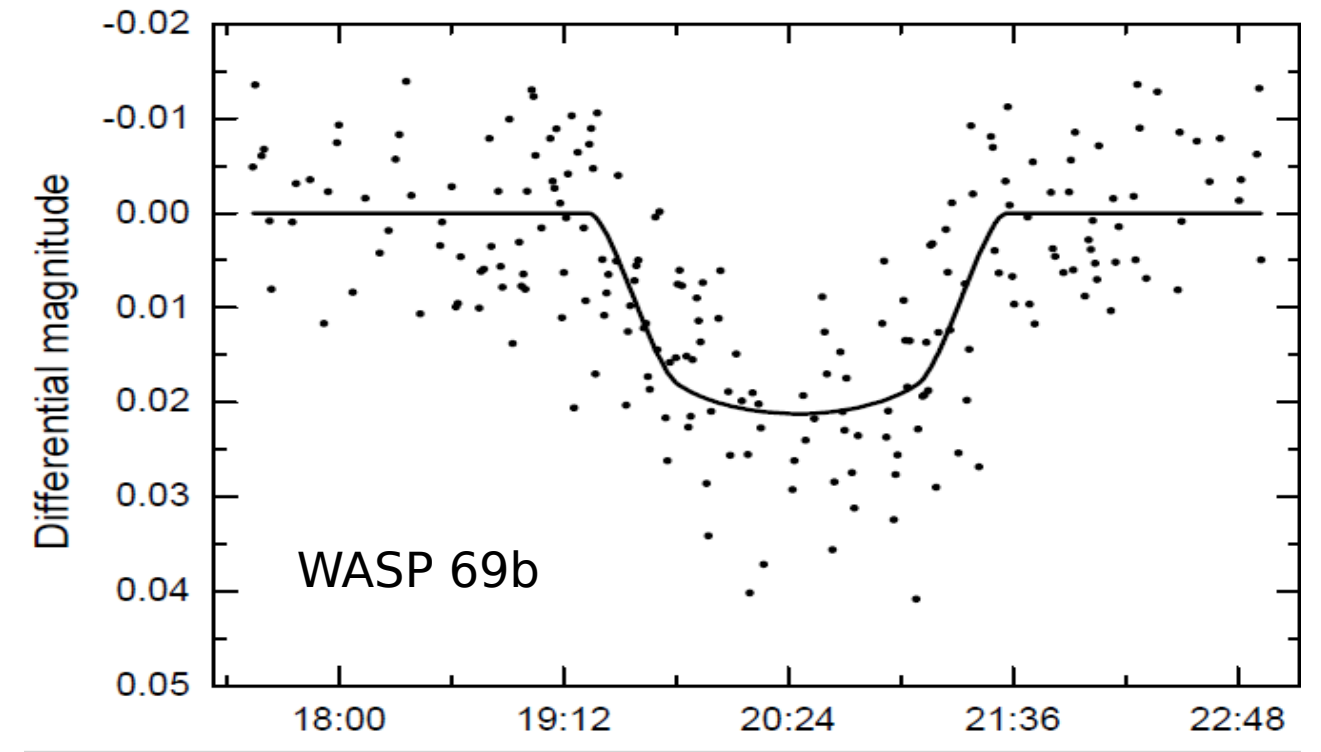
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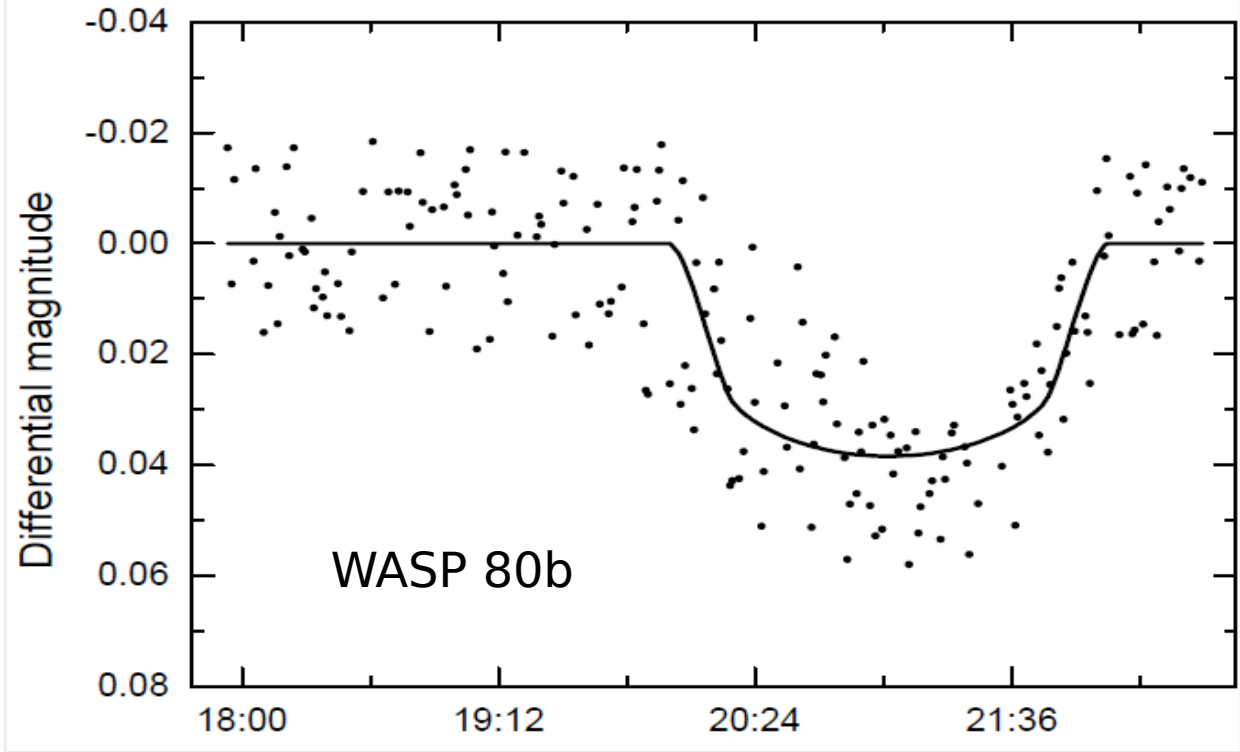
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WASP 80b

What information can you get from the light curve?

Table 3. Parameters obtained for WASP-41b in comparison with literature.

Parameter	Symbol	1st Transit	2nd Transit	Maxted et al. (2011)
Orbital period	P	3.053556 days	3.053556 days	3.052401 days
Planet/star area ratio	$(R_p/R_*)^2$	0.0221	0.0251	0.0186
Transit duration	t_T	0.111 days	0.109 days	0.108 days
Impact parameter	b	0.50 R_*	0.54 R_*	0.40 R_*
Stellar density	ρ_*	1.38 $\rho_\odot$	1.36 $\rho_\odot$	1.27 $\rho_\odot$
Stellar mass	M_*	0.79 $M_\odot$	0.80 $M_\odot$	0.93 $M_\odot$
Stellar radius	R_*	0.83 $R_\odot$	0.84 $R_\odot$	0.90 $R_\odot$
Orbital semi-major axis	a	0.0382 AU	0.0383 AU	0.0402 AU
Orbital inclination	i	88.7°	89.7°	87.7°
Planet radius	R_p	1.21 R_J	1.29 R_J	1.20 R_J

Table 4. Parameters obtained for Qatar-2b in comparison with literature.

Parameter	Symbol	Transit	Bryan et al. (2012)
Orbital period	P	-	1.3371182 days
Planet/star area ratio	$(R_p/R_*)^2$	0.03461	0.02725
Transit duration	t_T	0.07822 days	0.07540 days
Impact parameter	b	0.23 R_*	0.19 R_*
Stellar density	ρ_*	1.85 $\rho_\odot$	1.59 $\rho_\odot$ [a]
Stellar mass	M_*	0.645 $M_\odot$	0.740 $M_\odot$
Stellar radius	R_*	0.704 $R_\odot$	0.776 $R_\odot$ [a]
Orbital semi-major axis	a	0.02054 AU	0.02149 AU
Orbital inclination	i	87.91°	88.30°
Planet radius	R_p	1.277 R_J	1.254 R_J [a]

[a] Updated by Mancini et al. (2014).

THE ASTROPHYSICAL JOURNAL, 585:1038–1055, 2003 March 10

A UNIQUE SOLUTION OF PLANET AND STAR PARAMETERS FROM AN EXTRASOLAR PLANET TRANSIT LIGHT CURVE

S. SEAGER[1,2] AND G. MALLÉN-ORNELAS[3,4]

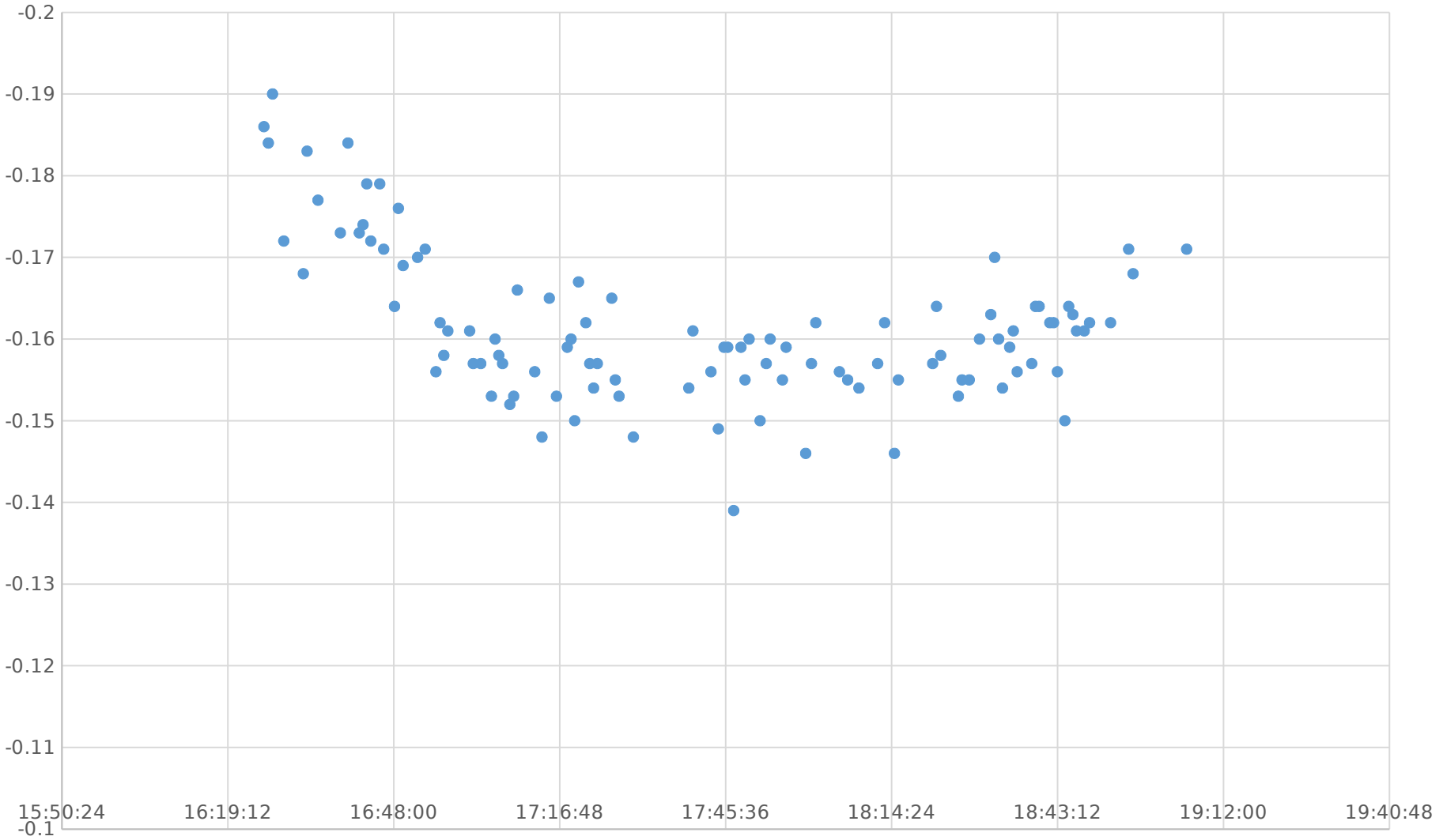
Received 2002 June 11; accepted 2002 November 13

ABSTRACT

There is a unique solution of the planet and star parameters from a planet transit light curve with two or more transits if the planet has a circular orbit and the light curve is observed in a bandpass where limb darkening is negligible. The existence of this unique solution is very useful for current planet transit surveys for several reasons. First, there is an analytic solution that allows a quick parameter estimate, in particular of R_p. Second, the stellar density can be uniquely derived from the transit light curve alone. The stellar density can then be used to immediately rule out a giant star (and hence a much larger than planetary companion) and can also be used to put an upper limit on the stellar and planet radius even considering slightly evolved stars. Third, the presence of an additional fully blended star that contaminates an eclipsing system to mimic a planet transit can be largely ruled out from the transit light curve given a spectral type for the central star. Fourth, the period can be estimated from a single-transit light curve and a measured spectral type. All of these applications can be used to select the best planet transit candidates for mass determination by radial velocity follow-up. To use these applications in practice, the photometric precision and time sampling of the light curve must be high (better than 0.005 mag precision and 5 minute time sampling for a two-transit light curve).

Subject headings: binaries: eclipsing — planetary systems — techniques: photometric

WASP 41b - Canon EOS 550D DSLR



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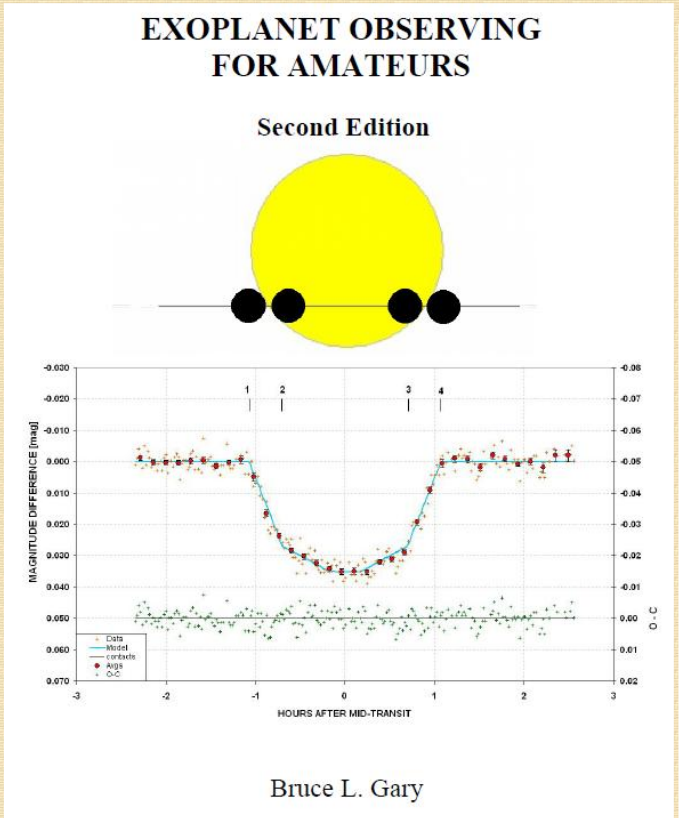
Exoplanet Observing for A...

Exoplanet Transit Photometry ...

"EXOPLANET OBSERVING FOR AMATEURS: SECOND EDITION"

This book was originally for sale exclusively by Adirondack Astronomy, but since they are now "out of business" the unsold books were sent to Starizona for sale by them. A free download of the book's PDF-document file is available (see below).



EXOPLANET OBSERVING FOR AMATEURS

As the number of known "bright transiting exoplanets" undergoes dramatic growth so will the need for amateurs capable of measuring exoplanet transit light curves. This book is meant to help the amateur with CCD experience produce high precision light curves. It is conceivable that an amateur could discover the presence of an Earth-like exoplanet in the same solar system as the known transiting exoplanet. This could be done either by searching for small anomalies in mid-transit times or by noting small brightness fades occurring between the known transits.

The observing demands for these searches are great, with precisions ~20 times better than for typical variable star observing. However, with a telescope aperture of 10 inches or more, a CCD, and lots of patience while learning observing and image analysis skills, it's possible for amateurs to make significant contributions to exoplanet studies and possibly make that big discovery of an Earth-like exoplanet.

It's ironic that amateur telescopes are close to optimum for the task of measuring exoplanet light curves. Large telescopes have field-of-view problems for being so small that too few bright stars (with the right color) are available to serve as reference stars. Although the optimum size telescope for exoplanet observing may have an aperture between 20 and 40 inches, most exoplanets can be observed adequately with apertures between 10 and 14 inches.

Every increment of improvement requires a disproportionate amount of effort. This is especially true for any user of amateur hardware. After all, professionals don't have to worry about such things as telescope tubes shrinking as the night cools, requiring frequent focus adjustments, or image rotation due to imperfect polar alignment. These hardware limitations, plus many others, mean that another amateur is in the best position to help other amateurs.

This book gleans hard-earned lessons from 9 years of floundering with exoplanet observing using several amateur telescopes and many observing and analysis techniques. It promises to smooth the transition to exoplanet observing for any amateur devoted to the journey.

Reductionist Publications bgary1@cis-broadband.com

ISBN 978-0-9798446-3-8

This *Second Edition* has a larger page format (to accomodate pictures and graphs that tend to be wider than they are tall), is 70% longer (253 pages), has more easily understood explanations for more material, includes an expanded glossary (9 pages) and index (10 pages), has more appendices (10), and all pictures and graphs are in color (no center insert of color versions of pictures and graphs, as in the *First Edition*). If you are considering buying the book you should first download a free PDF-document file and review it to see if it's worth the price of a "hard copy."


THANK
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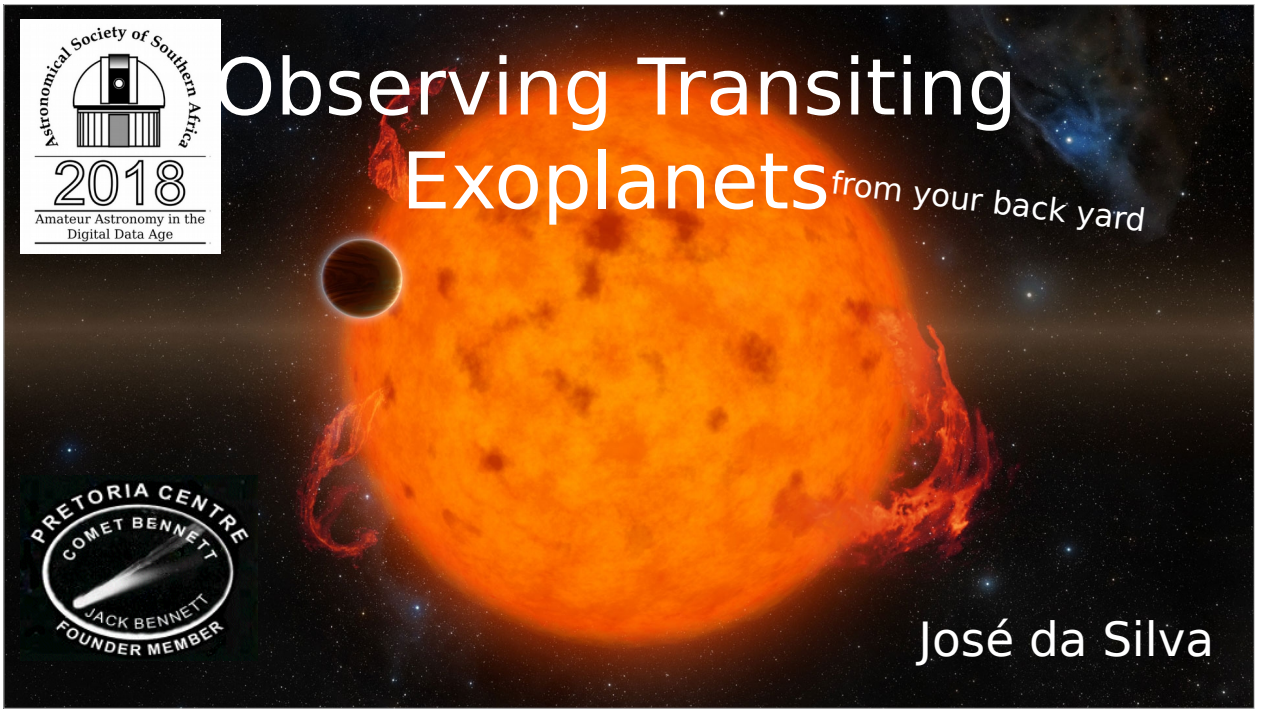
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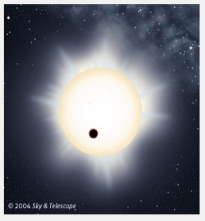
Amateur Detects Exoplanet Transit

By: **Robert Naeye** | September 3, 2004



This artist conception depicts a Jupiter-size planet transiting its host star at a close distance. Astronomers know of six stars that are transited by exoplanets; two have been detected by amateurs, including the recently discovered planet TrES-1.
S&T illustration by Steven A. Simpson.

On August 24th, a team of professional astronomers announced the discovery of TrES-1, an extrasolar planet that transits its host star. Just 8 days later, an amateur astronomer from Landen, Belgium detected a transit of the same planet. The discovery highlights the growing capabilities of amateur astronomers and proves that amateur astronomers can, in principle, discover an exoplanet by the transit method.

Tonny Vanmunster used a Celestron C-14 telescope and an SBIG ST-7XME CCD camera (without filters) at his private CBA Belgium Observatory to detect the TrES-1 transit. The telescope rested on an Astro-Physics AP1200 GTO mount. The planet began crossing the star's disk at 21 hours, 13 minutes Universal Time on September 1st, just when the transit was predicted to commence. The event lasted about 3 hours and ended right on cue. The star's brightness dipped by about 0.03 magnitude during the transit, or roughly 3 percent. Using software he wrote himself, Vanmunster monitored the progress of the transit in real time on his computer.

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Amateur Detects New Transiting Exoplanet

By: **Robert Naeye** | July 7, 2005

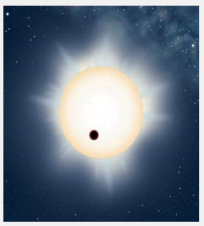
This artist's rendition shows the size of HD 149026b as it crosses the face of its Sunlike star. It blocks only 1/300 of the star's light, barely enough to be detectable by amateur astronomers.
Painting by Lynette Cook.

A day before an international team announced a new transiting planet orbiting the star HD 149026 on June 30th, California amateur astronomer Ron Bissinger detected a partial transit of that planet. He also detected partial transits during the next two opportunities, allowing him to produce a composite light curve of an entire event. This new find, HD 149026b, is now the third transiting exoplanet detected by amateurs.

"Ron's data are of excellent quality," says professional astronomer Gregory P. Laughlin (University of California, Santa Cruz), who is a member of the team that discovered the new planet. Laughlin has also helped organize the Transitsearch.org network to enable amateurs like Bissinger to detect such events. At the time the planet's discovery was announced, Laughlin predicted that amateurs would detect the transits, but he also noted that this planet was much harder to detect than the other two transiting exoplanets, HD 209458b and TrES-1. The new discovery thus highlights the increasing prowess of amateur

Amateurs Detect Possible Exoplanet Ringlike Structure

By: **Robert Naeye** | January 3, 2005



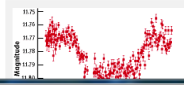
This artist conception depicts a Jupiter-size

Amateur astronomers may have discovered a ringlike structure around an extrasolar planet. The Hubble Space Telescope will reveal whether the obse disco error collal of an data, resea

The Lyra by a team of professional astronomers led by Roi Alonso (Astrophysical Institute of the Canary Islands) and announced on August 24, 2004. The team was able to detect the planet with only a 4-inch telescope because it periodically crosses the

transits, which occur once per orbit with clocklike regularity. Many of these amateurs submitted their data to professional astronomers Aaron Price of the American Association of Variable Star Observers (AAVSO), and Greg Laughlin (University of California, Santa Cruz) and Tim Castellano (NASA/Ames Research Centers), who organized Transitsearch.org. Laughlin and Castellano are working with the AAVSO to form a global network of amateurs to observe exoplanet transits.

In late September, retired professional astronomer Bruce Cary in Arizona and amateur astronomer Joe Garlitz in Oregon noticed that TrES-1's 12th-magnitude host star apparently brightens shortly before and after each transit. Such effects had not been seen before in other transiting exoplanets. Postings on the

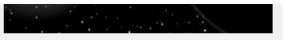


Tiny Telescope Finds Big Planet

By: **Robert Naeye** | August 26, 2004

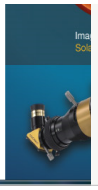
Until now, all of the 125 or so known extrasolar planets were discovered with large telescopes

distant star using mostly off-the-shelf equipment and a 4-inch Schmidt telescope. In fact, team



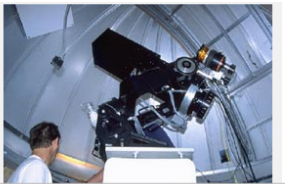
An artist depicts the newly discovered

telescope and fine-tuned its optics in the garage of his Colorado home.



large gaseous object orbiting within just a few million kilometers of its parent star. The planet's existence was betrayed by a slight drop in the star's brightness that occurs whenever the planet crosses directly between it and Earth. The discovery heralds the coming of a new era when small telescopes doing wide-field surveys will pinpoint new exoplanets through similar transits.

Roi Alonso (Astrophysical Institute of the Canaries)



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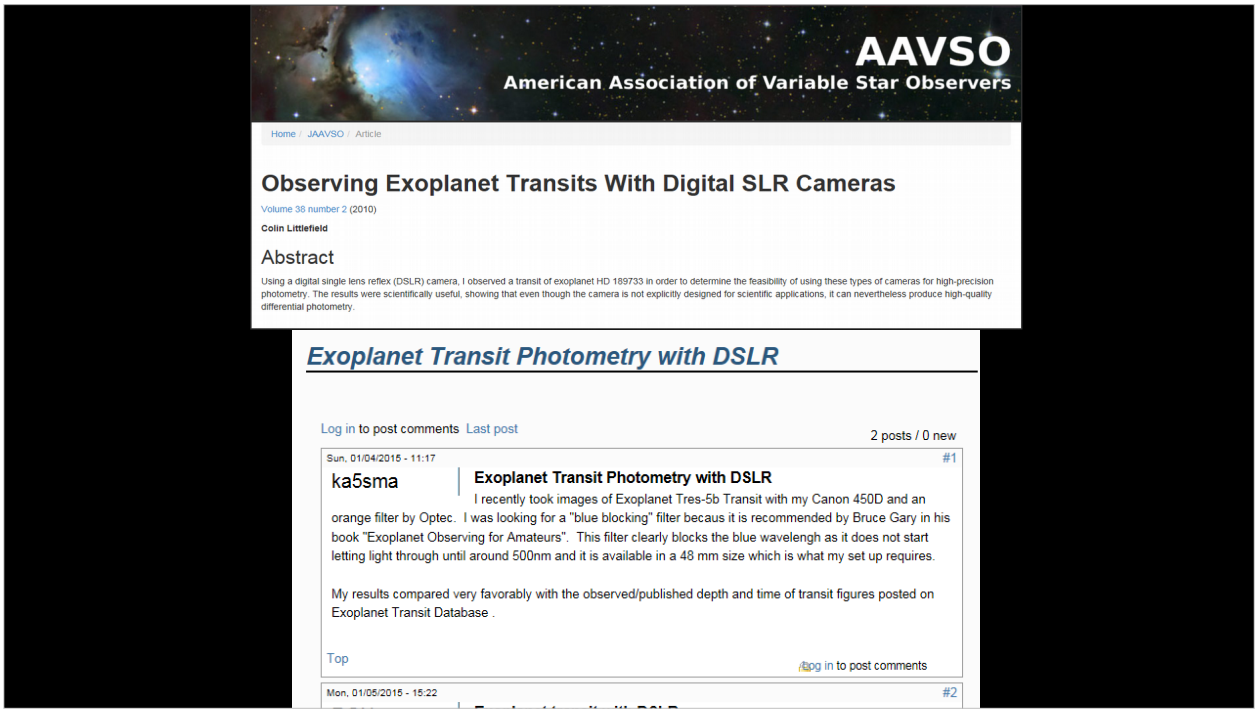
DIY Exoplanet Detector

You don't need a high-powered telescope to spot the signature of an alien world

By **David Schneider**

Photo: David Schneider

Star Track: The rotation of the Earth causes stars to continuously shift position in the sky. Detecting the subtle signs of the existence of an orbiting exoplanet requires compensating for this shift. To do that, I built my own hinged "barn door" tracker.



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Observing Exoplanet Transits With Digital SLR Cameras

Volume 38 number 2 (2010)

Colin Littlefield

Abstract

Using a digital single lens reflex (DSLR) camera, I observed a transit of exoplanet HD 189733 in order to determine the feasibility of using these types of cameras for high-precision photometry. The results were scientifically useful, showing that even though the camera is not explicitly designed for scientific applications, it can nevertheless produce high-quality differential photometry.

Exoplanet Transit Photometry with DSLR

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Sun, 01/04/2015 - 11:17 #1

ka5sma

Exoplanet Transit Photometry with DSLR

I recently took images of Exoplanet Tres-5b Transit with my Canon 450D and an orange filter by Optec. I was looking for a "blue blocking" filter becaus it is recommended by Bruce Gary in his book "Exoplanet Observing for Amateurs". This filter clearly blocks the blue wavelengh as it does not start letting light through until around 500nm and it is available in a 48 mm size which is what my set up requires.

My results compared very favorably with the observed/published depth and time of transit figures posted on Exoplanet Transit Database .

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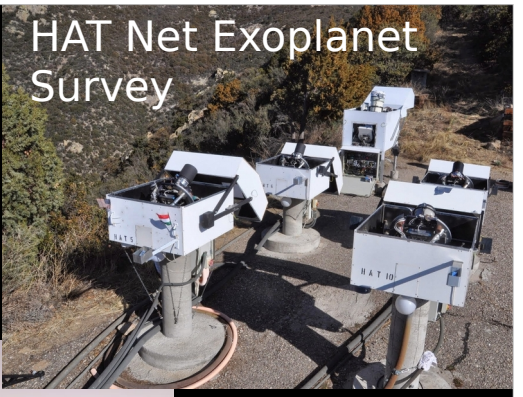
Mon, 01/05/2015 - 15:22 #2

SuperWASP



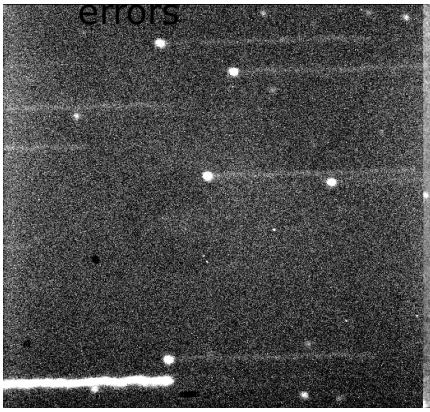
HAT Net Exoplanet Survey

Qatar Exoplanet

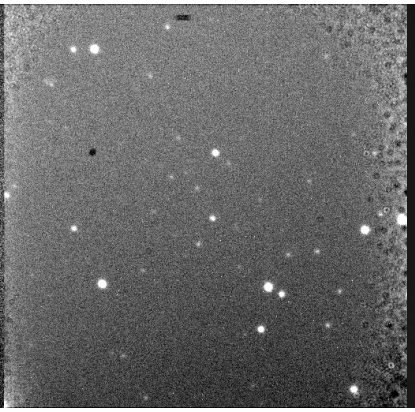

SBIG


MEADE
FLIP-MIRROR SYSTEM
MODEL 644

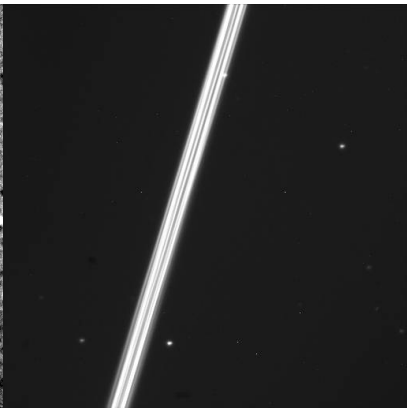
Worm gear errors



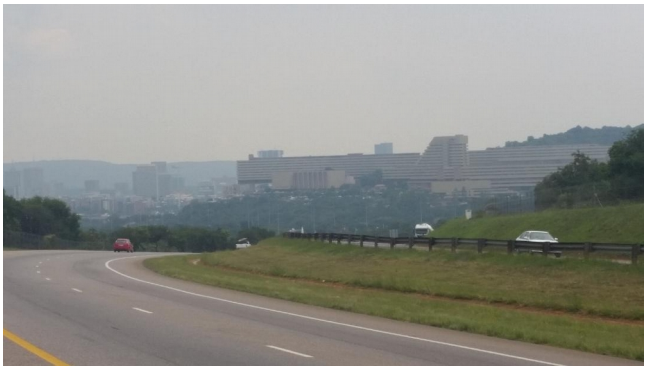
Icing

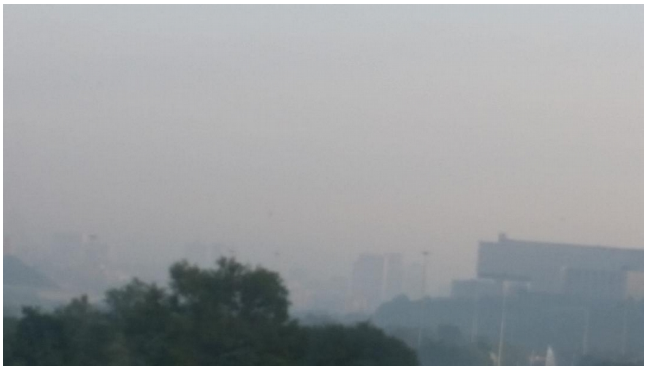


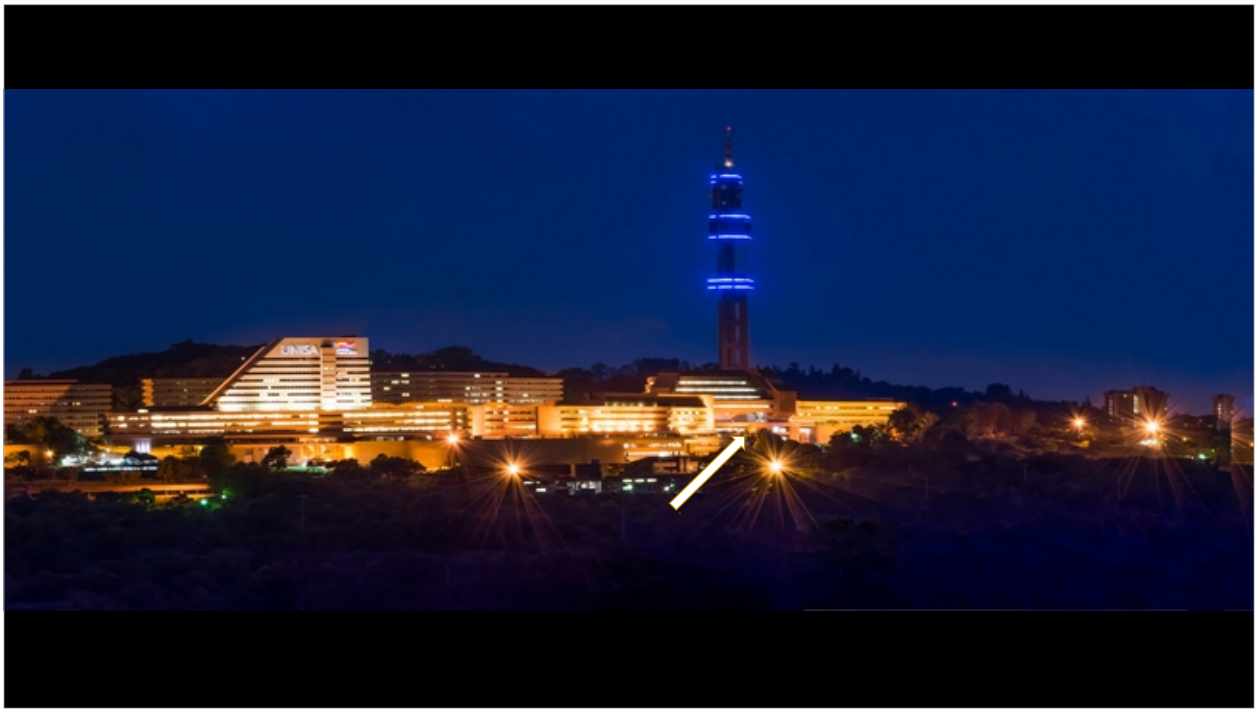
Aircraft



Air Pollution

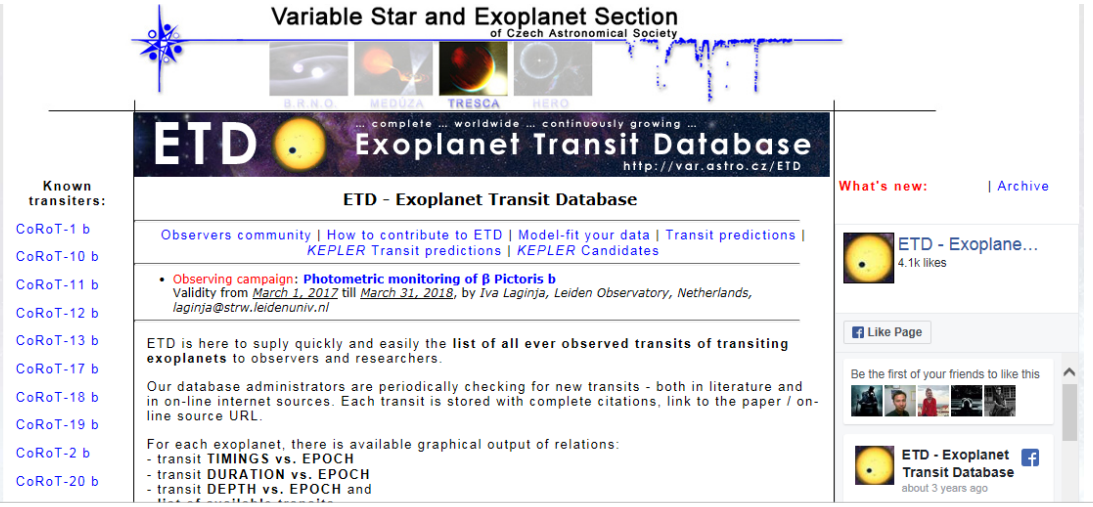


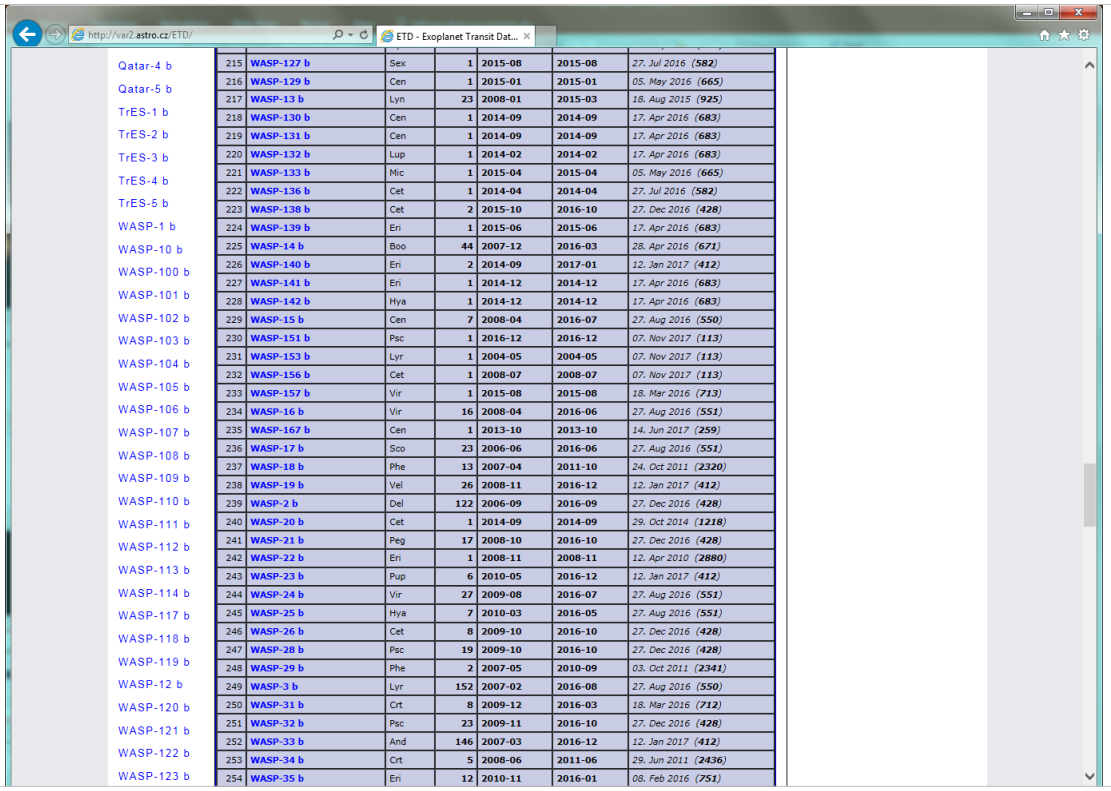




Exoplanet Transit Database

http://var2.astro.cz/ETD/





Qatar-4 b	215	WASP-127 b	Sex	1	2015-08	2015-08	27. Jul 2016 (582)
Qatar-5 b	216	WASP-129 b	Cen	1	2015-01	2015-01	05. May 2016 (665)
TrES-1 b	217	WASP-13 b	Lyn	23	2008-01	2015-03	18. Aug 2015 (925)
TrES-2 b	218	WASP-130 b	Cen	1	2014-09	2014-09	17. Apr 2016 (683)
TrES-3 b	219	WASP-131 b	Cen	1	2014-09	2014-09	17. Apr 2016 (683)
TrES-4 b	220	WASP-132 b	Lup	1	2014-02	2014-02	17. Apr 2016 (683)
TrES-5 b	221	WASP-133 b	Mic	1	2015-04	2015-04	05. May 2016 (665)
WASP-1 b	222	WASP-136 b	Cet	1	2014-04	2014-04	27. Jul 2016 (582)
WASP-10 b	223	WASP-138 b	Cet	2	2015-10	2016-10	27. Dec 2016 (428)
WASP-100 b	224	WASP-139 b	Eri	1	2015-06	2015-06	17. Apr 2016 (683)
WASP-101 b	225	WASP-14 b	Boo	44	2007-12	2016-03	28. Apr 2016 (671)
WASP-102 b	226	WASP-140 b	Eri	2	2014-09	2017-01	12. Jan 2017 (412)
WASP-103 b	227	WASP-141 b	Eri	1	2014-12	2014-12	17. Apr 2016 (683)
WASP-104 b	228	WASP-142 b	Hya	1	2014-12	2014-12	17. Apr 2016 (683)
WASP-105 b	229	WASP-15 b	Cen	7	2008-04	2016-07	27. Aug 2016 (550)
WASP-106 b	230	WASP-151 b	Psc	1	2016-12	2016-12	07. Nov 2017 (113)
WASP-107 b	231	WASP-153 b	Lyr	1	2004-05	2004-05	07. Nov 2017 (113)
WASP-108 b	232	WASP-156 b	Cet	1	2008-07	2008-07	07. Nov 2017 (113)
WASP-109 b	233	WASP-157 b	Vir	1	2015-08	2015-08	18. Mar 2016 (713)
WASP-110 b	234	WASP-16 b	Vir	16	2008-04	2016-06	27. Aug 2016 (551)
WASP-111 b	235	WASP-167 b	Cen	1	2013-10	2013-10	14. Jun 2017 (259)
WASP-112 b	236	WASP-17 b	Sco	23	2006-06	2016-06	27. Aug 2016 (551)
WASP-113 b	237	WASP-18 b	Phe	13	2007-04	2011-10	24. Oct 2011 (2320)
WASP-114 b	238	WASP-19 b	Vel	26	2008-11	2016-12	12. Jan 2017 (412)
WASP-117 b	239	WASP-2 b	Del	122	2006-09	2016-09	27. Dec 2016 (428)
WASP-118 b	240	WASP-20 b	Cet	1	2014-09	2014-09	29. Oct 2014 (1218)
WASP-119 b	241	WASP-21 b	Peg	17	2008-10	2016-10	27. Dec 2016 (428)
WASP-12 b	242	WASP-22 b	Eri	1	2008-11	2008-11	12. Apr 2010 (2880)
WASP-120 b	243	WASP-23 b	Pup	6	2010-05	2016-12	12. Jan 2017 (412)
WASP-121 b	244	WASP-24 b	Vir	27	2009-08	2016-07	27. Aug 2016 (551)
WASP-122 b	245	WASP-25 b	Hya	7	2010-03	2016-05	27. Aug 2016 (551)
WASP-123 b	246	WASP-26 b	Cet	8	2009-10	2016-10	27. Dec 2016 (428)
	247	WASP-28 b	Psc	19	2009-10	2016-10	27. Dec 2016 (428)
	248	WASP-29 b	Phe	2	2007-05	2010-09	03. Oct 2011 (2341)
	249	WASP-3 b	Lyr	152	2007-02	2016-08	27. Aug 2016 (550)
	250	WASP-31 b	Crt	8	2009-12	2016-03	18. Mar 2016 (712)
	251	WASP-32 b	Psc	23	2009-11	2016-10	27. Dec 2016 (428)
	252	WASP-33 b	And	146	2007-03	2016-12	12. Jan 2017 (412)
	253	WASP-34 b	Crt	5	2008-06	2011-06	29. Jun 2011 (2436)
	254	WASP-35 b	Eri	12	2010-11	2016-01	08. Feb 2016 (751)

Known transiters:

- CoRoT-1 b
- CoRoT-10 b
- CoRoT-11 b
- CoRoT-12 b
- CoRoT-13 b
- CoRoT-17 b
- CoRoT-18 b
- CoRoT-19 b
- CoRoT-2 b
- CoRoT-20 b
- CoRoT-3 b
- CoRoT-4 b
- CoRoT-5 b
- CoRoT-6 b
- CoRoT-8 b
- CoRoT-9 b
- EPIC 218916923 b
- EPIC 228735255 b
- EPIC-203771098 b
- EPIC-203771098 c
- EPIC-210957318 b

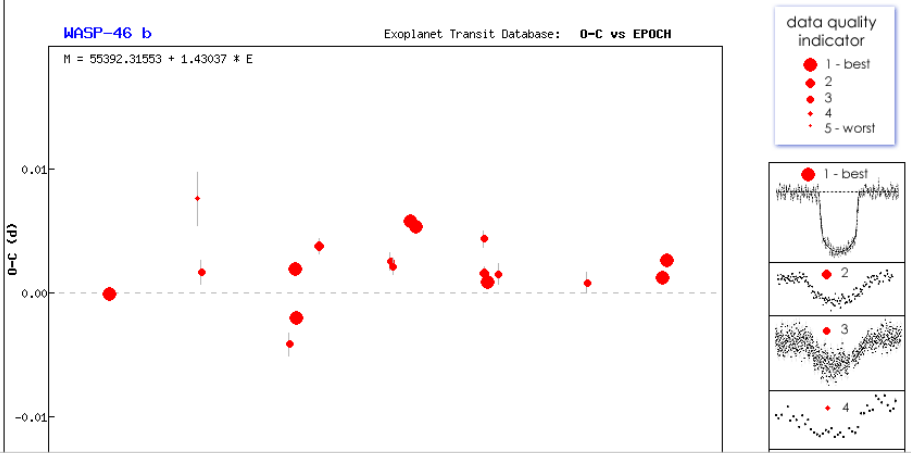
ETD ... complete ... worldwide ... continuously growing ... Exoplanet Transit Database http://var.astro.cz/ETD

	OBJECT	CONST	# OF DATA	TIME SPAN FROM - TILL		LAST CHANGES (DAYS) Red if less than 1 week ago
1	WASP-46 b	Ind	19	2010-07	2016-08	27. Aug 2016 (550)

RA	DE	PERIOD (d)	EPOCH	V (mag)	DEPTH (mag)	DURATION (min)
21 14 56.86	-55 52 18.1	1.43037	2455392.31553	12.9	0.0204	100.4

> Show transit predictions for next 365 days

Plot user data ...



HAT-P-49 b
HAT-P-5 b
HAT-P-50 b
HAT-P-51 b
HAT-P-52 b
HAT-P-53 b
HAT-P-54 b
HAT-P-55 b
HAT-P-56 b
HAT-P-57 b
HAT-P-6 b
HAT-P-65 b
HAT-P-66 b
HAT-P-67 b
HAT-P-7 b
HAT-P-8 b
HAT-P-9 b
HATS-1 b
HATS-11 b
HATS-12 b
HATS-18 b
HATS-19 b
HATS-20 b
HATS-21 b
HATS-22 b

	+/- 0.00083								TRESCA		
15	**56895.63537** +/- 0.0003	1051	0.0010	99.7 +/- 1.3	27.4 +/- 3.2	I	1		***Eduardo Fernández-Lajús, Romina P. Di Sisto*** TRESCA		2015-07-22
14	**56895.63537** +/- 0.0003	1051	0.0010	99.7 +/- 1.3	27.4 +/- 3.2	I	1		***Eduardo Fernández-Lajús, Romina P. Di Sisto*** TRESCA		2015-07-22
13	**56885.62348** +/- 0.00049	1044	0.0017	91.1 +/- 2.1	23.4 +/- 0.8	Clear	2		***Mašek M., Hoňková K., Juryšek J.*** TRESCA		2014-08-25
12	**56882.76549** +/- 0.00065	1042	0.0044	89.9 +/- 2.7	23.9 +/- 1.2	Clear	3		***Mašek M., Hoňková K., Juryšek J.*** TRESCA		2014-08-20
11	**56609.56583** +/- 0.00027	851	0.0054	97.6 +/- 1.1	20.8 +/- 0.4	Clear	1		***Schneiter M,, Villarreal C., Colazo C.*** TRESCA		2014-02-06
10	**56589.54108** +/- 0.00031	837	0.0059	99.3 +/- 1.3	21.9 +/- 0.5	Clear	1		***Schneiter M,, Villarreal C., Colazo C.*** TRESCA		2014-02-06
9	**56520.87966** +/- 0.00067	789	0.0022	94.4 +/- 2.9	23.6 +/- 1.1	Clear	3		***Evans P.*** TRESCA		2013-08-21
8	**56510.86748** +/- 0.00067	782	0.0026	99.2 +/- 2.8	23 +/- 0.9	Clear	3		***Evans P.*** TRESCA		2013-08-09
7	**56227.65544** +/- 0.00062	584	0.0038	102.4 +/- 2.6	23.4 +/- 0.9	Clear	2		***Colazo C. A.*** TRESCA		2012-11-05
6	**56134.67559** +/- 0.00016	519	-0.0020	95.8 +/- 0.7	21.7 +/- 0.3	Clear	1		***Schneiter M, Colazo C.*** TRESCA		2012-07-26
5	**56130.38846** +/- 0.00042	516	0.0020	103.1 +/- 1.8	23.8 +/- 0.6	R	1		***Sauer T.*** TRESCA		2012-07-26
4	**56108.92681** +/- 0.00091	501	-0.0041	102.6 +/- 3.8	23.2 +/- 1.3	Clear	3		***Evans P.*** TRESCA		2012-07-13
3	**55757.06159** +/- 0.00098	255	0.0017	91.2 +/- 4.2	23.7 +/- 1.5	I	3		***Curtis I.*** TRESCA		2011-07-26
2	**55742.76385** +/- 0.00212	245	0.0077	102 +/- 8.5	15.6 +/- 2	B	4		***De Pree, Makely, gruber*** TRESCA		2011-07-25
1	**55392.31553** +/- 0.0002	0	0.0000	+/-	+/-		1		***D. R. Anderson et al., 2011*** D. R. Anderson et al., 2011	*	2011-05-17

CoRoT-1 b
CoRoT-10 b
CoRoT-11 b
CoRoT-12 b
CoRoT-13 b
CoRoT-17 b
CoRoT-18 b
CoRoT-19 b
CoRoT-2 b
CoRoT-20 b
CoRoT-3 b
CoRoT-4 b
CoRoT-5 b
CoRoT-6 b
CoRoT-8 b
CoRoT-9 b
EPIC 218916923 b
EPIC 228735255 b
EPIC-203771098 b
EPIC-203771098 c
EPIC-210957318 b
EPIC-211089792 b

Observers community | How to contribute to ETD | Model-fit your data | Transit predictions | *KEPLER* Transit predictions | *KEPLER* Candidates

Your ELONGITUDE (in deg): 33.9 *0° - 360°*
Your LATITUDE (in deg): -18.4 *90° - 0° - -90°* submit

Available predictions: (UT evening date)

2018-02- 27, 28,
2018-03- 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30,

User defined time span: From: YYYY-MM-DD Till: YYYY-MM-DD Show

Transits predictions for ELONGITUDE: 33.9° and LATITUDE: -18.4°

OBJECT		BEGIN (UT/h,A)	CENTER (DD.MM. UT/h,A)	END (UT/h,A)	D (min)	V (MAG)	DEPTH (MAG)	Elements Coords
WASP-35 b	Eri	15:18 77°,N	**09.03. 16:50** **68°,NW**	18:22 48°,W	184	10.95	0.0194	55531.47907+3.161575*E RA: 05 04 19.56 DE: -06 13 47.2
HAT-P-50 b	CMi	15:18 35°,NE	**09.03. 17:08** **55°,NE**	18:59 59°,N	220.46	11.762	0.0065	56285.90993+3.1220109*E RA: 07 52 15.2 DE: +12 08 21.9
WASP-121 b	Pup	17:34 70°,S	**09.03. 19:01** **64°,SW**	20:28 49°,SW	173.23	10.44	0.0167	56635.70832+1.2749255*E RA: 07 10 24.0 DE: -39 05 50.6
WASP-13 b	Lyn	17:09 25°,NE	**09.03. 19:06** **37°,N**	21:02 36°,N	233	10.51	0.0087	54491.6161+4.35298*E RA: 09 20 24.71 DE: +33 52 57.0
WASP-43 b	Sex	18:43 58°,E	**09.03. 19:17** **66°,E**	19:52 73°,NE	69.5	12.4	0.0289	55528.86774+0.813475*E RA: 10 19 38.01 DE: -09 48 21.9
HATS-51 b	CMa	17:57 77°,SW	**09.03. 19:37** **58°,SW**	21:17 36°,SW	199.3	12.471	0.0110	57042.00405+3.3488702*E RA: 06 51 23.40 DE: -29 03 31.0
WASP-82 b	Ori	17:20 55°,NW	**09.03. 19:49** **22°,W**	22:19 -14°,W	299.09	10.1	0.0068	56157.9898+2.705782*E RA: 04 50 38.56 DE: +01 53 38.1
KELT-4A b		18:40	**09.03. 20:24**	22:08	207.76	9.98	0.0127	56193.2915+2.9895936*E

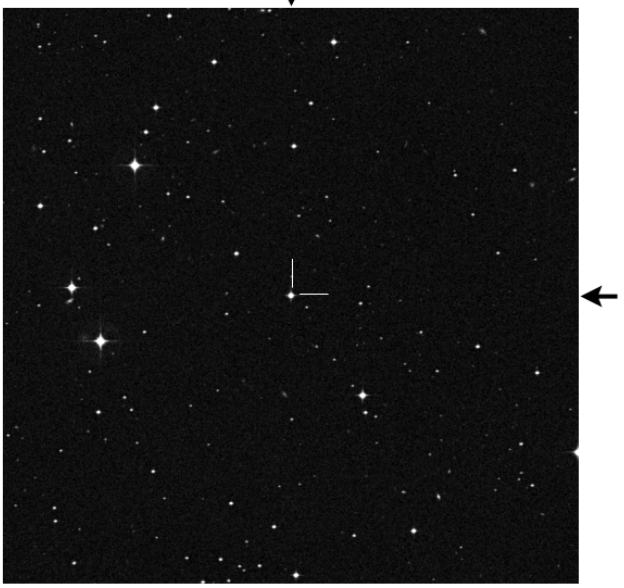
Current statistics:
(1. 3. 2018)

# of objects: **326**
# of transits: **6742**

DQ	# of transits
1	1527
2	1089
3	2605

- CoRoT-12 b
- CoRoT-13 b
- CoRoT-17 b
- CoRoT-18 b
- CoRoT-19 b
- CoRoT-2 b
- CoRoT-20 b
- CoRoT-3 b
- CoRoT-4 b
- CoRoT-5 b
- CoRoT-6 b
- CoRoT-8 b
- CoRoT-9 b
- EPIC 218916923 b
- EPIC 228735255 b
- EPIC-203771098 b
- EPIC-203771098 c
- EPIC-210957318 b
- EPIC-211089792 b
- EPIC-212110888 b
- GJ1214 b

RA (J2000): **10 19 38.01**, DE (J2000): **-09 48 21.9**,
V = **12.4 mag**, dV = **0.0289 mag**, duration = **69.5 minutes**
Per = 0.813475 **d**, T0(HJD) = 2455528.86774 compute



15' x 15' image from the Digitized Sky Survey at the STScI Archive.

Your ELONGITUDE (in deg): 33.9 *0° - 360°* submit

Like Page

ETD - Exoplanet Transit Database
about 3 years ago

Dear observers, Exoplanet Transit Database is back on-line!

You can use all its features as usually. Sorry for long shutdown.
http://var2.astro.cz/ETD

ETD - Exoplanet Tr
Observers community |...

Current statistics:
(1. 3. 2018)

# of objects: **326**
# of transits: **6742**

DQ	# of transits
1	1527
2	1089
3	2605
4	800
5	712

The STScI Digitized Sky Survey

ps://archive.stsci.edu/cgi-bin/dss_fo

The STScI Digitized Sky Survey

NOTE: To obtain target coordinates for **HST Phase 2 proposals**, select the HST Phase 2 (GSC2) survey option.

[*New!* | Help | FAQ | © | Acknowledging DSS | Other DSS Sites | Archive | STScI]

Get an Object's Coordinates

Object name wasp46b × GET COORDINATES Clear

Get coordinates from ◉ SIMBAD ○ NED

Retrieve an Image

Retrieve from

POSS2/UKSTU Red
POSS2/UKSTU Blue
POSS2/UKSTU IR
POSS1 Red
POSS1 Blue
Quick-V
HST Phase 2 (GSC2)

(detailed information about the Surveys)

RA Dec J2000

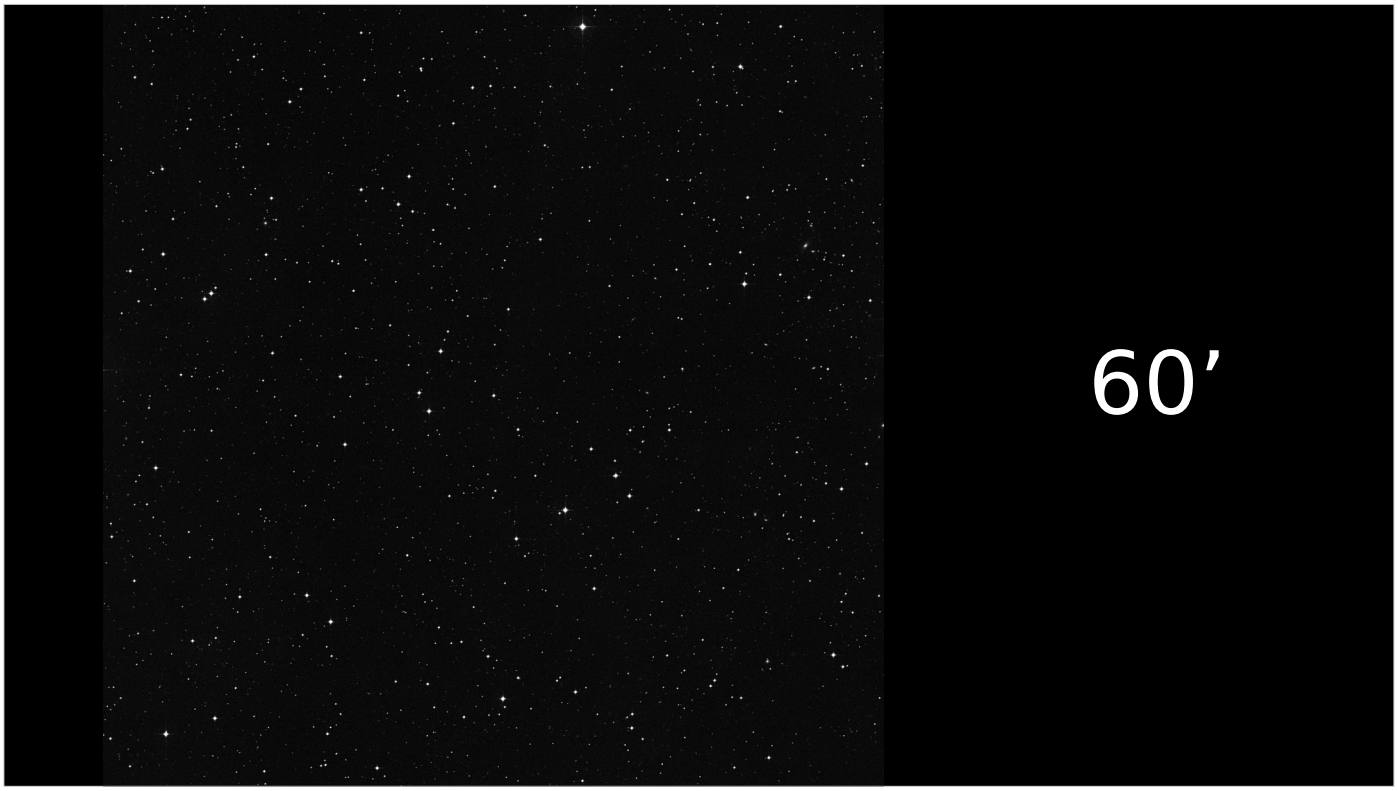
Height 15.0 (max: 60.0) Width 15.0 (max: 60.0) arcminutes

File format FITS Compression (FITS only) None

☐ Save file to disk (instead of displaying)

HST Field of View Overlay (1st generation GIF only): NONE

Roll angle (V3):


60’

GJ436 b

HAT-P-1 b

HAT-P-10/WASP-11 b

HAT-P-11 b

HAT-P-12 b

HAT-P-13 b

HAT-P-14 b

HAT-P-15 b

HAT-P-16 b

HAT-P-17 b

HAT-P-18 b

HAT-P-19 b

HAT-P-2 b

HAT-P-20 b

HAT-P-21 b

HAT-P-22 b

HAT-P-23 b

HAT-P-24 b

HAT-P-25 b

HAT-P-26 b

HAT-P-27/WASP-40 b

HAT-P-28 b

HAT-P-29 b

HAT-P-3 b

Transits predictions for NEXT 365 days.
ELONGITUDE: 33.9° and LATITUDE: -18.4°

Transit occurs below 20° in the sky. | During the daylight. | Observable.

Tmid (HJD)	BEGIN (UT/h,A)	CENTER (DD.MM. UT/h,A)	END (UT/h,A)
2458179.169	01.03 15:29 (5°,E)	01.03. 16:03 (13°,E)	01.03 16:38 (21°,E)
2458179.983	02.03 11:00 (-54°,SE)	02.03. 11:35 (-47°,SE)	02.03 12:09 (-40°,SE)
2458180.796	03.03 6:31 (-40°,SW)	03.03. 7:06 (-47°,SW)	03.03 7:41 (-53°,SW)
2458181.610	04.03 2:03 (21°,W)	04.03. 2:37 (12°,W)	04.03 3:12 (4°,W)
2458182.423	04.03 21:34 (79°,NW)	04.03. 22:09 (73°,NW)	04.03 22:44 (65°,W)
2458183.237	05.03 17:06 (31°,E)	05.03. 17:40 (39°,E)	05.03 18:15 (48°,E)
2458184.050	06.03 12:37 (-30°,E)	06.03. 13:12 (-23°,E)	06.03 13:46 (-15°,E)
2458184.864	07.03 8:08 (-60°,SW)	07.03. 8:43 (-62°,S)	07.03 9:18 (-63°,S)
2458185.677	08.03 3:40 (-6°,W)	08.03. 4:15 (-14°,W)	08.03 4:49 (-22°,W)
2458186.491	08.03 23:11 (56°,W)	08.03. 23:46 (47°,W)	09.03 0:21 (40°,W)
2458187.304	09.03 18:43 (58°,E)	09.03. 19:17 (66°,E)	09.03 19:52 (73°,NE)
2458188.118	10.03 14:14 (-5°,E)	10.03. 14:49 (4°,E)	10.03 15:23 (12°,E)
2458188.931	11.03 9:45 (-59°,SE)	11.03. 10:20 (-55°,SE)	11.03 10:55 (-48°,SE)
2458189.744	12.03 5:17 (-32°,SW)	12.03. 5:52 (-39°,SW)	12.03 6:26 (-46°,SW)
2458190.558	13.03 0:48 (30°,W)	13.03. 1:23 (22°,W)	13.03 1:58 (13°,W)
2458191.371	13.03 20:20 (80°,N)	13.03. 20:54 (79°,NW)	13.03 21:29 (74°,NW)
2458192.185	14.03 15:51 (22°,E)	14.03. 16:26 (30°,E)	14.03 17:00 (38°,E)
2458192.998	15.03 11:22 (-40°,SE)	15.03. 11:57 (-32°,SE)	15.03 12:32 (-24°,E)
2458193.812	16.03 6:54 (-54°,SW)	16.03. 7:29 (-59°,SW)	16.03 8:03 (-62°,S)
2458194.625	17.03 2:25 (3°,W)	17.03. 3:00 (-5°,W)	17.03 3:35 (-13°,W)
2458195.439	17.03 21:57 (64°,W)	17.03. 22:31 (57°,W)	17.03 23:06 (49°,W)
2458196.252	18.03 17:28 (49°,E)	18.03. 18:03 (57°,E)	18.03 18:38 (65°,E)
2458197.066	19.03 12:59 (-14°,E)	19.03. 13:34 (-6°,E)	19.03 14:09 (2°,E)
2458197.879	20.03 8:31 (-63°,S)	20.03. 9:06 (-60°,SE)	20.03 9:40 (-55°,SE)
2458198.693	21.03 4:02 (-23°,W)	21.03. 4:37 (-31°,W)	21.03 5:12 (-38°,SW)
2458199.506	21.03 23:34 (38°,W)	22.03. 0:08 (31°,W)	22.03 0:43 (23°,W)
2458200.320	22.03 19:05 (74°,NE)	22.03. 19:40 (79°,NE)	22.03 20:15 (80°,N)
2458201.133	23.03 14:36 (13°,E)	23.03. 15:11 (21°,E)	23.03 15:46 (29°,E)
2458201.947	24.03 10:08 (-48°,SE)	24.03. 10:43 (-41°,SE)	24.03 11:17 (-33°,SE)

Known transiters:

- CoRoT-1 b
- CoRoT-10 b
- CoRoT-11 b
- CoRoT-12 b
- CoRoT-13 b
- CoRoT-17 b
- CoRoT-18 b
- CoRoT-19 b
- CoRoT-2 b
- CoRoT-20 b
- CoRoT-3 b
- CoRoT-4 b
- CoRoT-5 b
- CoRoT-6 b
- CoRoT-8 b
- CoRoT-9 b
- EPIC 218916923 b
- EPIC 228735255 b
- EPIC-203771098 b

ETD - Exoplanet Transit Database

Observers community | How to contribute to ETD | Model-fit your data | Transit predictions | KEPLER Transit predictions | KEPLER Candidates

step 1 / 5

INSTRUCTION: In the first step, just select an exoplanet and load data file with observation. Also select if data are in geocentric or heliocentric JD and specify, if brightness is given in MAG or FLUX. Both geocentric and heliocentric JD must be computed from COORDINATED UNIVERSAL TIME (UTC) with leap seconds included (common time in your PC / notebook).

Choose exoplanet WASP-43 b Sex

Data file with observation: Browse...

Required 3 columns: JD, MAG, ERROR. Other columns are ignored. Columns must be separated by space or TAB.

JD format: geocentric heliocentric *(both based on UTC)*

Brightness column: in magnitudes in flux

Continue >

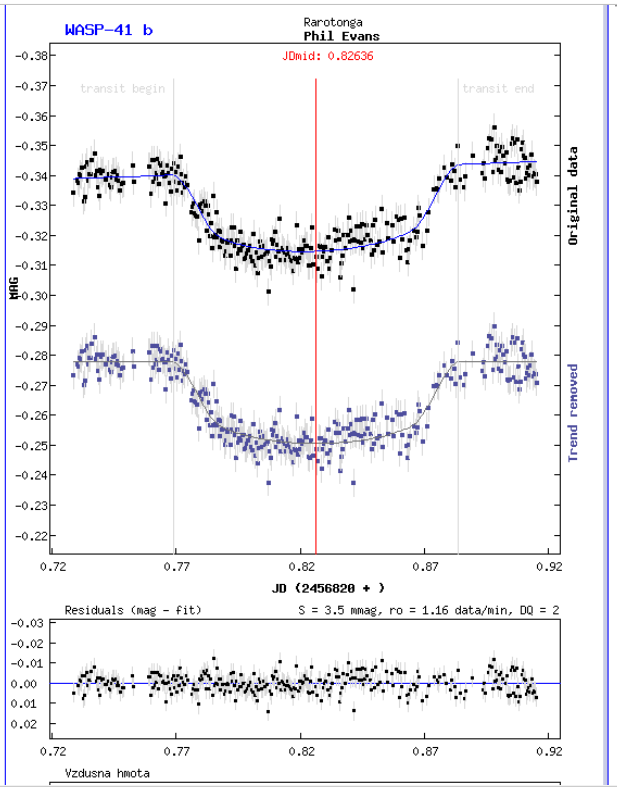
Model light curve fitting procedure: ***O.Pejcha, 2008*** *(read description).*
Database and web interface: ***L. Brat, 2008***

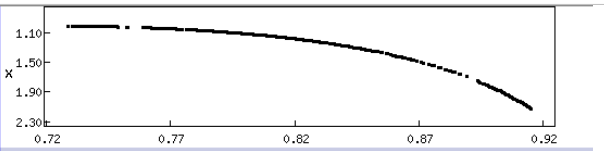
Credit & Contact

What's new: | Archive

Current statistics:
(1. 3. 2018)

# of objects: **326**





Střed tranzitu JDmid:	2456820.82362 +/- 0.00058	
Střed tranzitu HJDmid:	2456820.82636 +/- 0.00058	(helcor = **0.00274**)
Střed tranzitu - UT:	2014-06-12 07:46:00	
Délka tranzitu:	165.6 +/- 2.1	minut
Hloubka poklesu:	0.0272 +/- 0.0006	mag
Submitted data:	**heliocentric based on UTC**	

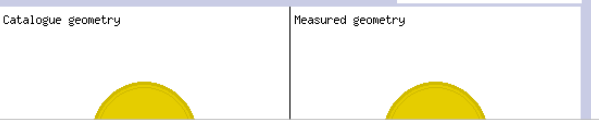
Identifikační mapka:

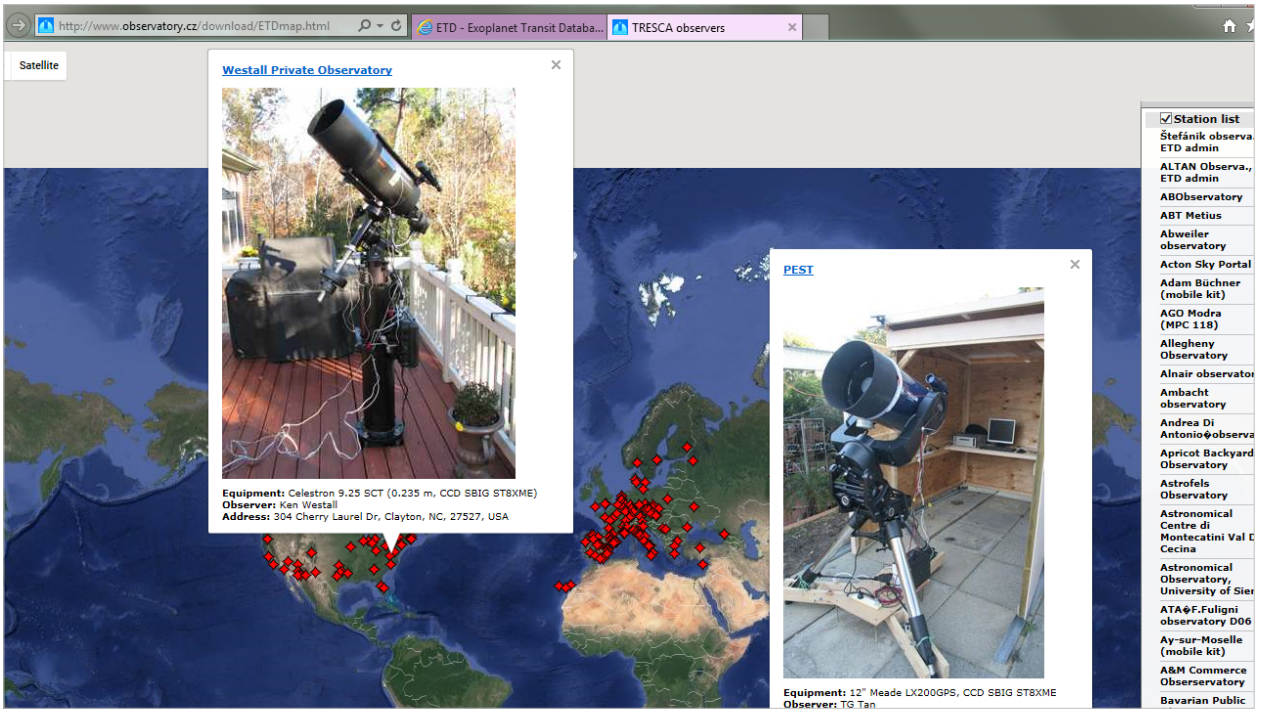
Zobrazit tranzit v ETD

Změřená geometrie systému

	katalogové údaje	*změřené parametry*
R_p:	1.21 +/- 0.07 R_{Jup}	**1.397** $^{+0.015}_{-0.015}$ R_{Jup}
R-:	0.91 +/- 0.05 R_{Sun}	*fixed, errors included in i*
A:	0.0403 +/- 0.0005 AU	*fixed, errors included in i*
Per:	3.052394 days	*fixed*
i :	87.3 +/- 1 °	**88.30** $^{+0.44|1.70}_{-0.35|1.51}$ °

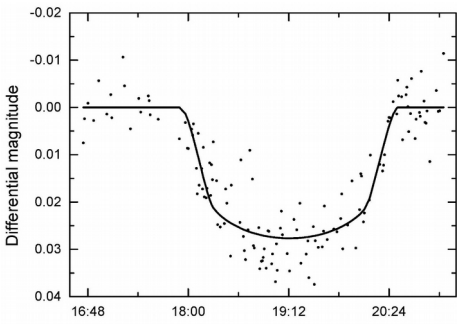
Sun & Jupiter scale, i=90°

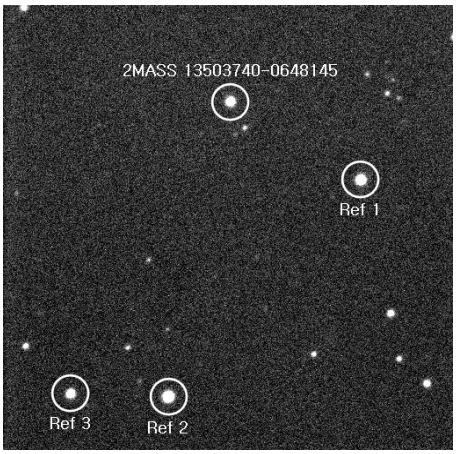



http://www.observatory.cz/download/ETDmap.html
ETD - Exoplanet Transit Databa...
TRESCA observers
Satellite
Westall Private Observatory
Equipment: Celestron 9.25 SCT (0.235 m, CCD SBIG ST8XME)
Observer: Ken Westall
Address: 304 Cherry Laurel Dr, Clayton, NC, 27527, USA
PEST
Equipment: 12" Meade LX200GPS, CCD SBIG ST8XME
Observer: TG Tan
Station list
Štefánik observa
ETD admin
ALTAN Observa.,
ETD admin
ABObservatory
ABT Metius
Abweiler observatory
Acton Sky Portal
Adam Büchner (mobile kit)
AGO Modra (MPC 118)
Allegheny Observatory
Alnair observator
Ambacht observatory
Andrea Di Antonio@observa
Apricot Backyard Observatory
Astrofels Observatory
Astronomical Centre di Montecatini Val D
Cecina
Astronomical Observatory, University of Sier
ATA@F.Fuligni observatory D06
Ay-sur-Moselle (mobile kit)
A&M Commerce Obserservatory
Bavarian Public

Capturing images

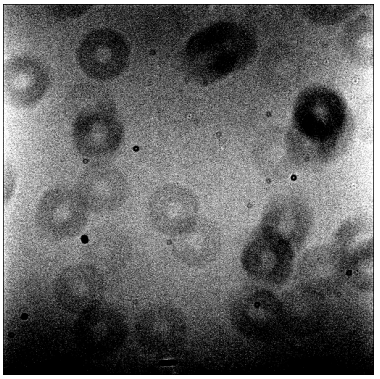
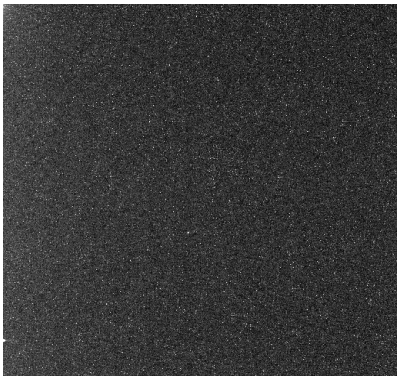
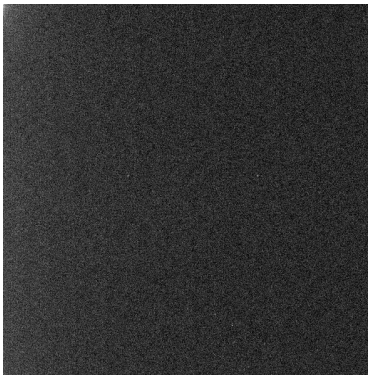
- Start 1 hour before transit (after Astronomical Twilight)
- Take as many pictures as you can
- Finish 1 hour after transit



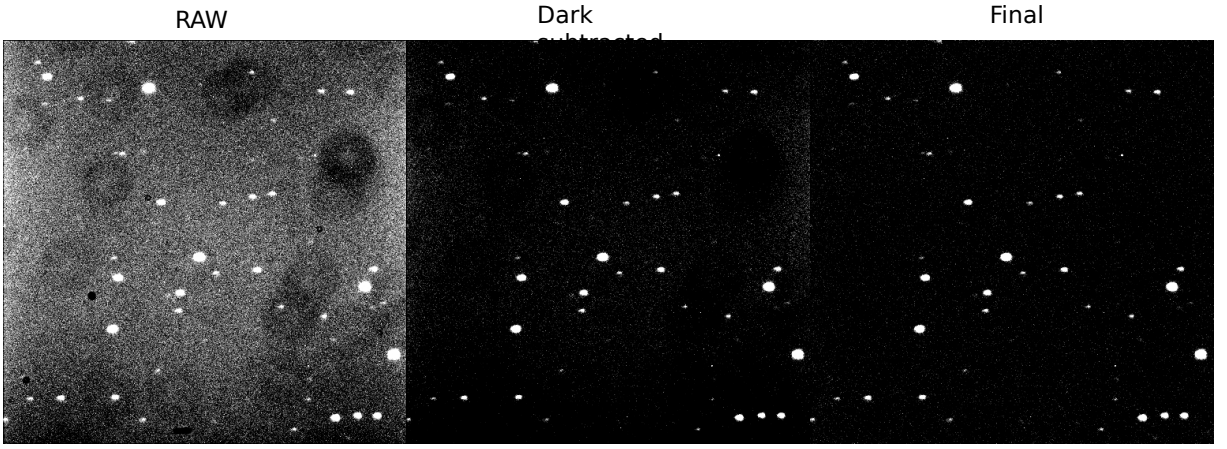


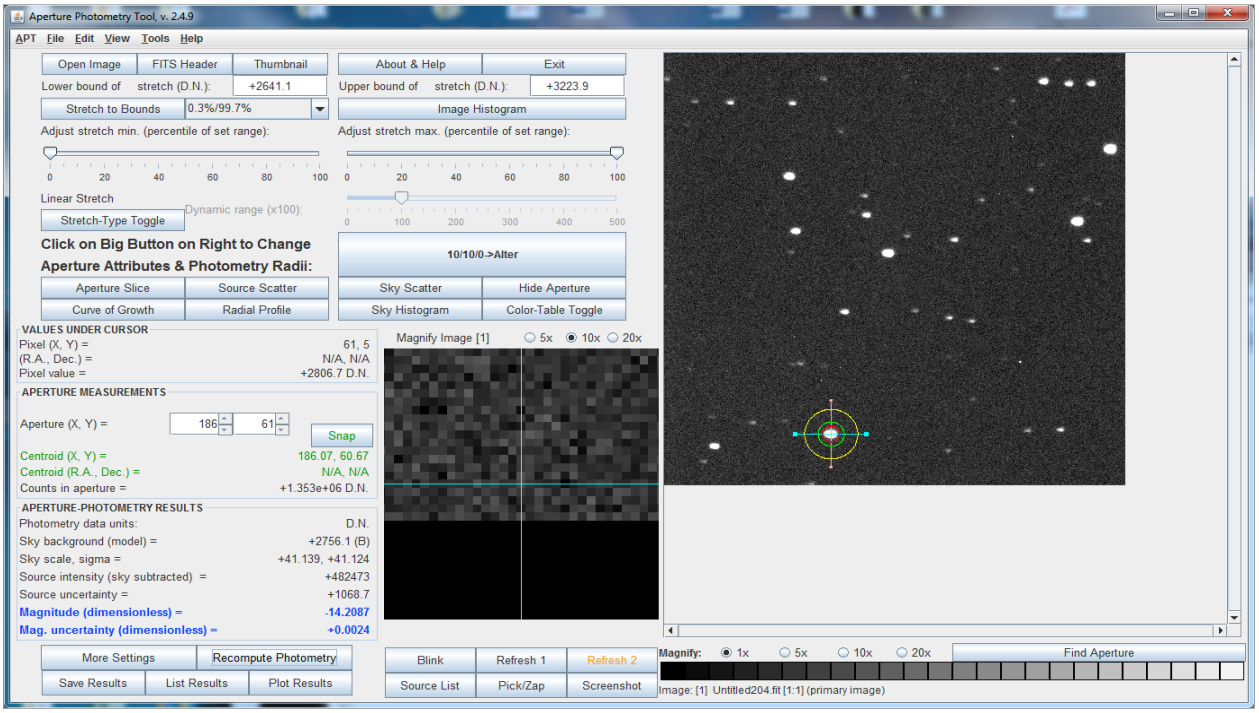
Capturing images

- Sky flats – used to remove variations in pixel sensitivity and effects of dust (20 images)
  NB: Any length of time but do not exceed CCD response
- Dark frames – used to remove thermal noise from an image (20 images)
  NB: Same length of time as star pictures
- Bias frames – used to remove electronic noise from the instrument (20 images)
  NB: Zero time

Reduced image (WASP 41b)




Aperture Photometry Tool, v. 2.4.9
APT File Edit View Tools Help
Open Image
FITS Header
Thumbnail
About & Help
Exit
Lower bound of stretch (D.N.):
+2641.1
Upper bound of stretch (D.N.):
+3223.9
Stretch to Bounds
0.3%/99.7%
Image Histogram
Adjust stretch min. (percentile of set range):
Adjust stretch max. (percentile of set range):
Linear Stretch
Stretch-Type Toggle
Dynamic range (x100):
Click on Big Button on Right to Change Aperture Attributes & Photometry Radii:
10/10/0->Alter
Aperture Slice
Source Scatter
Sky Scatter
Hide Aperture
Curve of Growth
Radial Profile
Sky Histogram
Color-Table Toggle
VALUES UNDER CURSOR
Pixel (X, Y) = 61, 5
(R.A., Dec.) = N/A, N/A
Pixel value = +2806.7 D.N.
APERTURE MEASUREMENTS
Aperture (X, Y) = 186 61
Snap
Centroid (X, Y) = 186.07, 60.67
Centroid (R.A., Dec.) = N/A, N/A
Counts in aperture = +1.353e+06 D.N.
APERTURE-PHOTOMETRY RESULTS
Photometry data units: D.N.
Sky background (model) = +2756.1 (B)
Sky scale, sigma = +41.139, +41.124
Source intensity (sky subtracted) = +482473
Source uncertainty = +1068.7
Magnitude (dimensionless) = -14.2087
Mag. uncertainty (dimensionless) = +0.0024
Magnify Image [1] 5x 10x 20x
More Settings
Recompute Photometry
Save Results
List Results
Plot Results
Blink
Refresh 1
Refresh 2
Source List
Pick/Zap
Screenshot
Magnify: 1x 5x 10x 20x
Find Aperture
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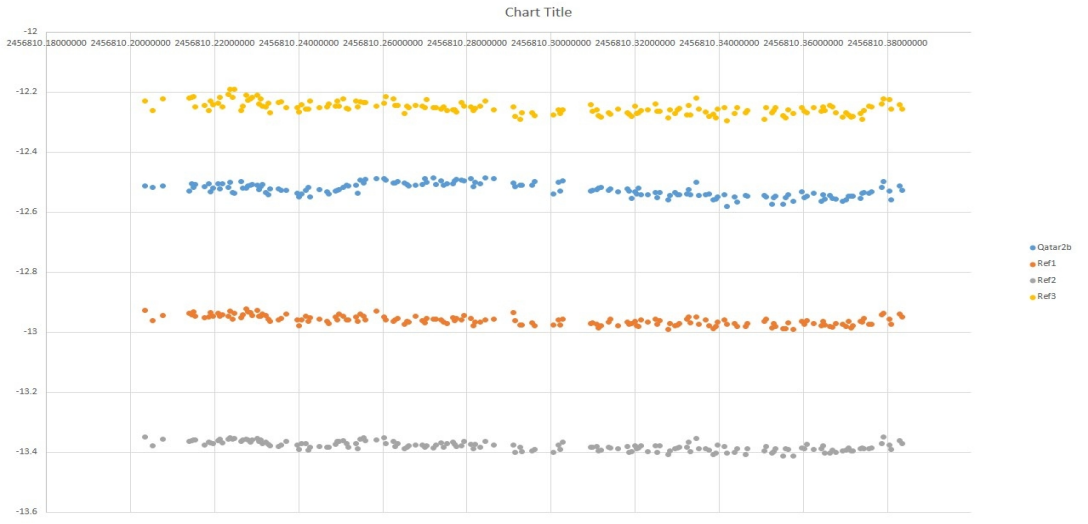
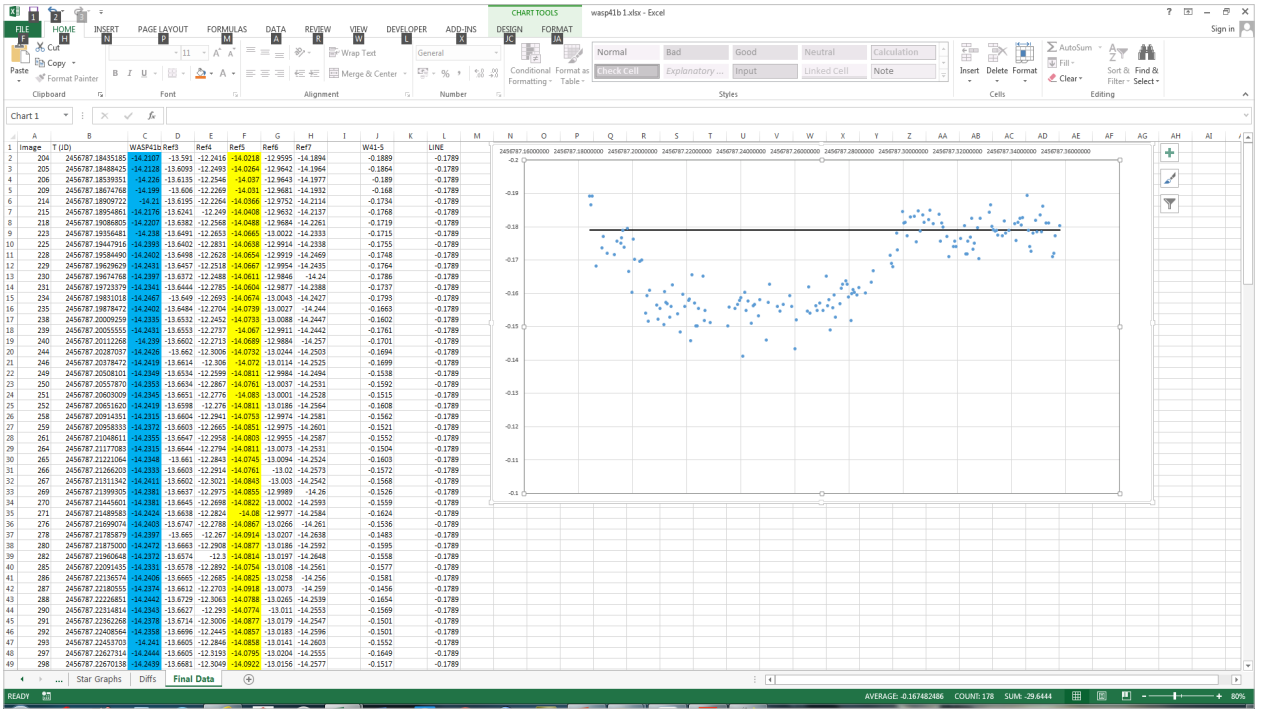
Reference stars




wasp41b 1.xlsx - Excel
CHART TOOLS
Chart 1
Image
T (JD)
WASP41b Ref3
Ref4
Ref5
Ref6
Ref7
W41-S
LINE
Star Graphs
Diffs
Final Data
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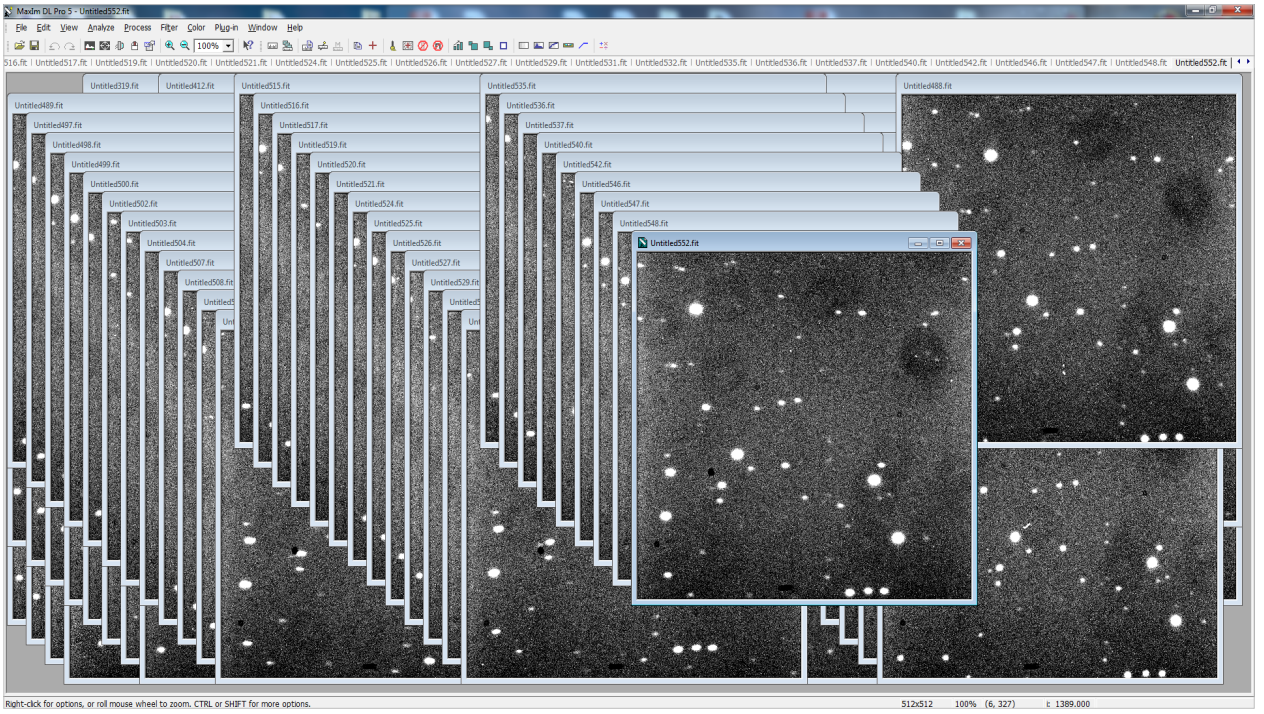
SUM: -29.6444
80%


MaxIm DL Pro 5 - Untitled552.fit
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Untitled552.fit
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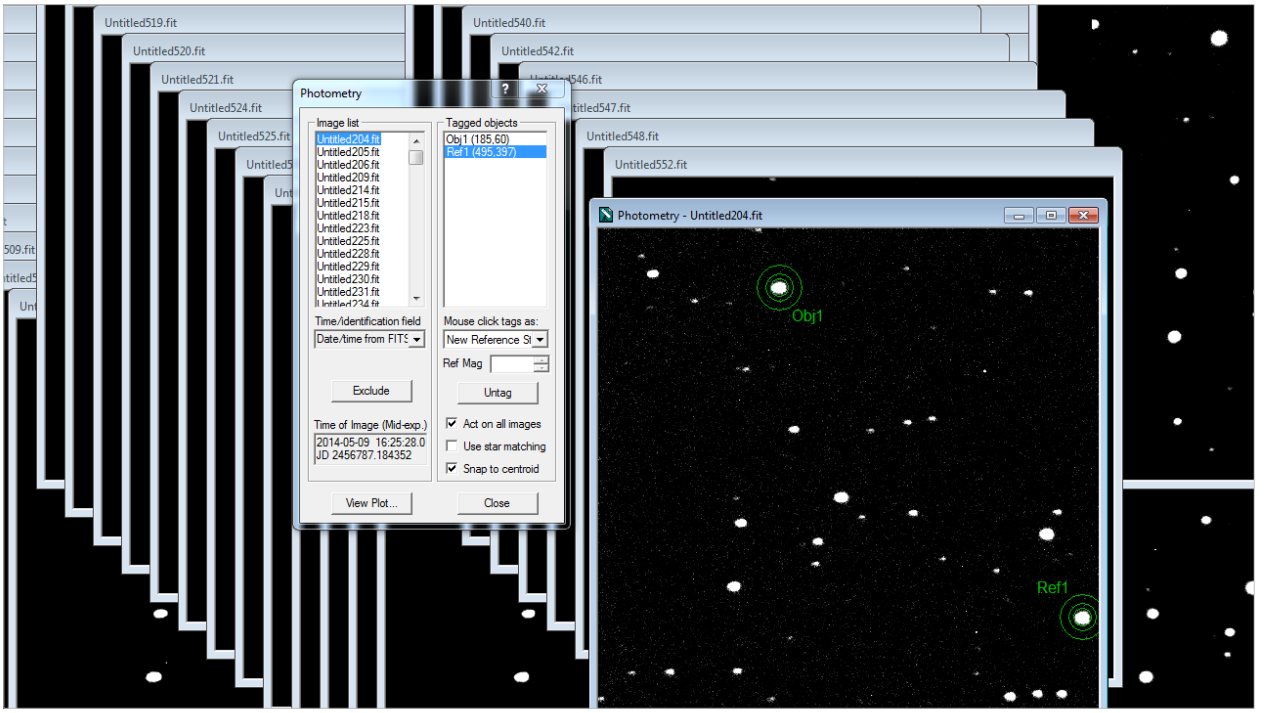
512x512 100% (6, 327)


Untitled519.fit
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Photometry
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Untitled228.fit
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Untitled230.fit
Untitled231.fit
Tagged objects
Obj1 (185,60)
Ref1 (495,397)
Time/identification field
Date/time from FITS
Exclude
Time of Image (Mid-exp.)
2014-05-09 16:25:28.0
JD 2456787.184352
Mouse click tags as:
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Ref Mag
Untag
Act on all images
Use star matching
Snap to centroid
View Plot...
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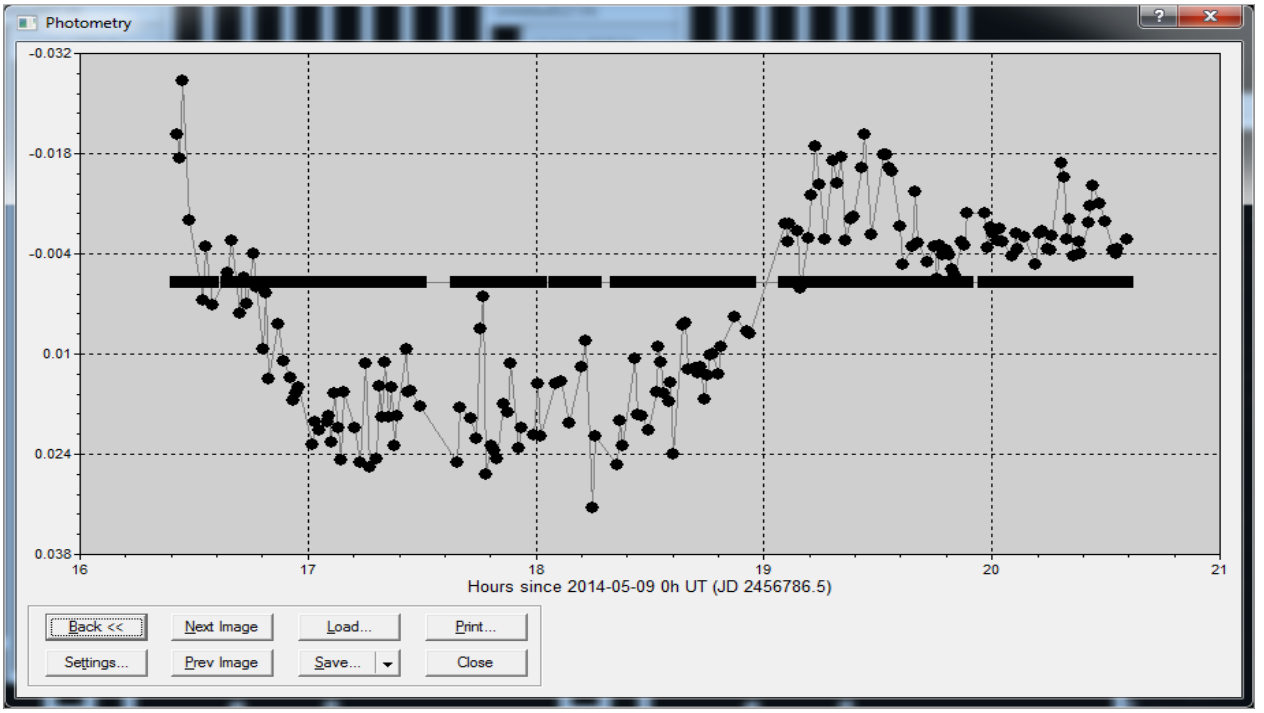
Photometry - Untitled204.fit
Obj1
Ref1


Photometry
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0.01
0.024
0.038
16
17
18
19
20
21
Hours since 2014-05-09 0h UT (JD 2456786.5)
Back <<
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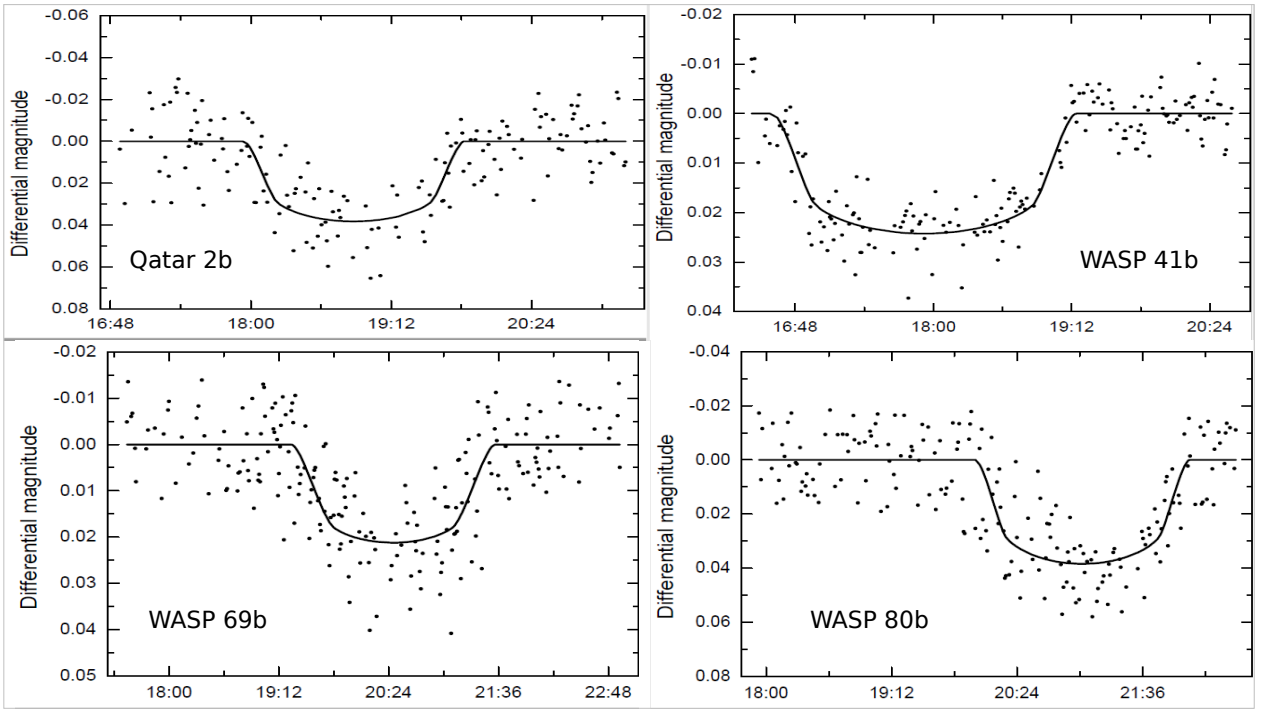
Load...
Print...
Settings...
Prev Image
Save...
Close


Differential magnitude
Qatar 2b
16:48
18:00
19:12
20:24
Differential magnitude
WASP 41b
16:48
18:00
19:12
20:24
Differential magnitude
WASP 69b
18:00
19:12
20:24
21:36
22:48
Differential magnitude
WASP 80b
18:00
19:12
20:24
21:36

What information can you get from the light curve?

Table 3. Parameters obtained for WASP-41b in comparison with literature.

Parameter	Symbol	1st Transit	2nd Transit	Maxted et al. (2011)
Orbital period	P	3.053556 days	3.053556 days	3.052401 days
Planet/star area ratio	$(R_p/R_*)^2$	0.0221	0.0251	0.0186
Transit duration	t_T	0.111 days	0.109 days	0.108 days
Impact parameter	b	0.50 R_*	0.54 R_*	0.40 R_*
Stellar density	ρ_*	1.38 $\rho_\odot$	1.36 $\rho_\odot$	1.27 $\rho_\odot$
Stellar mass	M_*	0.79 $M_\odot$	0.80 $M_\odot$	0.93 $M_\odot$
Stellar radius	R_*	0.83 $R_\odot$	0.84 $R_\odot$	0.90 $R_\odot$
Orbital semi-major axis	a	0.0382 AU	0.0383 AU	0.0402 AU
Orbital inclination	i	88.7°	89.7°	87.7°
Planet radius	R_p	1.21 R_J	1.29 R_J	1.20 R_J

Table 4. Parameters obtained for Qatar-2b in comparison with literature.

Parameter	Symbol	Transit	Bryan et al. (2012)
Orbital period	P	-	1.3371182 days
Planet/star area ratio	$(R_p/R_*)^2$	0.03461	0.02725
Transit duration	t_T	0.07822 days	0.07540 days
Impact parameter	b	0.23 R_*	0.19 R_*
Stellar density	ρ_*	1.85 $\rho_\odot$	1.59 $\rho_\odot$ [a]
Stellar mass	M_*	0.645 $M_\odot$	0.740 $M_\odot$
Stellar radius	R_*	0.704 $R_\odot$	0.776 $R_\odot$ [a]
Orbital semi-major axis	a	0.02054 AU	0.02149 AU
Orbital inclination	i	87.91°	88.30°
Planet radius	R_p	1.277 R_J	1.254 R_J [a]

[a] Updated by Mancini et al. (2014).

THE ASTROPHYSICAL JOURNAL, 585:1038–1055, 2003 March 10

A UNIQUE SOLUTION OF PLANET AND STAR PARAMETERS FROM AN EXTRASOLAR PLANET TRANSIT LIGHT CURVE

S. SEAGER[1,2] AND G. MALLÉN-ORNELAS[3,4]

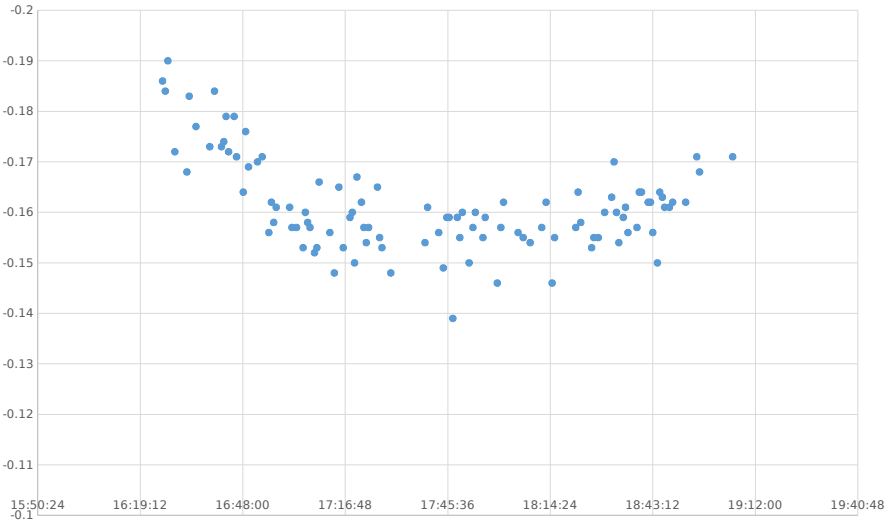
Received 2002 June 11; accepted 2002 November 13

ABSTRACT

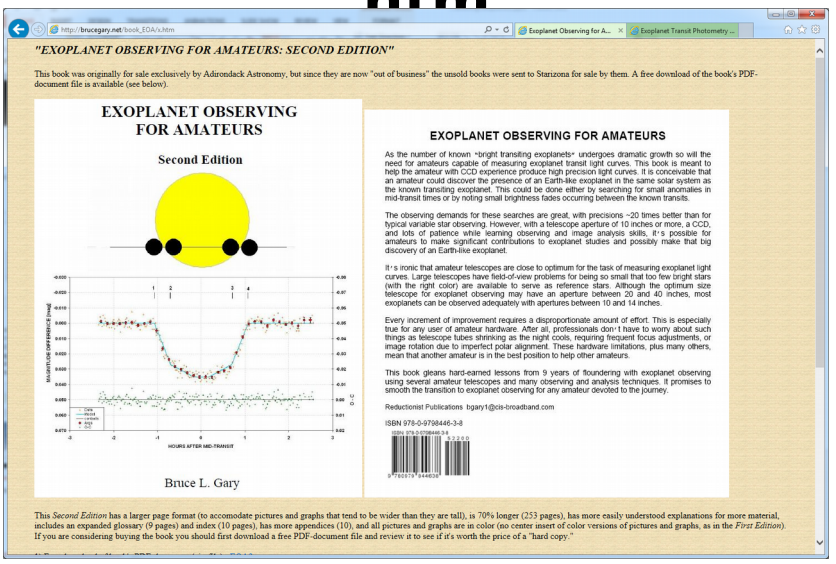
There is a unique solution of the planet and star parameters from a planet transit light curve with two or more transits if the planet has a circular orbit and the light curve is observed in a bandpass where limb darkening is negligible. The existence of this unique solution is very useful for current planet transit surveys for several reasons. First, there is an analytic solution that allows a quick parameter estimate, in particular of R_p. Second, the stellar density can be uniquely derived from the transit light curve alone. The stellar density can then be used to immediately rule out a giant star (and hence a much larger than planetary companion) and can also be used to put an upper limit on the stellar and planet radius even considering slightly evolved stars. Third, the presence of an additional fully blended star that contaminates an eclipsing system to mimic a planet transit can be largely ruled out from the transit light curve given a spectral type for the central star. Fourth, the period can be estimated from a single-transit light curve and a measured spectral type. All of these applications can be used to select the best planet transit candidates for mass determination by radial velocity follow-up. To use these applications in practice, the photometric precision and time sampling of the light curve must be high (better than 0.005 mag precision and 5 minute time sampling for a two-transit light curve).

Subject headings: binaries: eclipsing — planetary systems — techniques: photometric

WASP 41b - Canon EOS 550D DSLR



http://brucegary.net/book_EOA/x.htm



"EXOPLANET OBSERVING FOR AMATEURS: SECOND EDITION"

This book was originally for sale exclusively by Adirondack Astronomy, but since they are now "out of business" the unsold books were sent to Starizona for sale by them. A free download of the book's PDF-document file is available (see below).

EXOPLANET OBSERVING FOR AMATEURS

Second Edition

Bruce L. Gary

EXOPLANET OBSERVING FOR AMATEURS

As the number of known "bright transiting exoplanets" undergoes dramatic growth so will the need for amateurs capable of measuring exoplanet transit light curves. This book is meant to help the amateur with CCD experience produce high precision light curves. It is conceivable that an amateur could discover the presence of an Earth-like exoplanet in the same solar system as the known transiting exoplanet. This could be done either by searching for small anomalies in mid-transit times or by noting small brightness fades occurring between the known transits.

The observing demands for these searches are great, with precisions ~20 times better than for typical variable star observing. However, with a telescope aperture of 10 inches or more, a CCD, and lots of patience while learning observing and image analysis skills, it's possible for amateurs to make significant contributions to exoplanet studies and possibly make that big discovery of an Earth-like exoplanet.

It's ironic that amateur telescopes are close to optimum for the task of measuring exoplanet light curves. Large telescopes have field-of-view problems for being so small that too few bright stars (with the right color) are available to serve as reference stars. Although the optimum size telescope for exoplanet observing may have an aperture between 20 and 40 inches, most exoplanets can be observed adequately with apertures between 10 and 14 inches.

Every increment of improvement requires a disproportionate amount of effort. This is especially true for any user of amateur hardware. After all, professionals don't have to worry about such things as telescope tubes shrinking as the night cools, requiring frequent focus adjustments, or image rotation due to imperfect polar alignment. These hardware limitations, plus many others, mean that another amateur is in the best position to help other amateurs.

This book gleans hard-earned lessons from 9 years of floundering with exoplanet observing using several amateur telescopes and many observing and analysis techniques. It promises to smooth the transition to exoplanet observing for any amateur devoted to the journey.

Reductionist Publications bgary1@cis-broadband.com

ISBN 978-0-9798446-3-8

This *Second Edition* has a larger page format (to accomodate pictures and graphs that tend to be wider than they are tall), is 70% longer (253 pages), has more easily understood explanations for more material, includes an expanded glossary (9 pages) and index (10 pages), has more appendices (10), and all pictures and graphs are in color (no center insert of color versions of pictures and graphs, as in the *First Edition*). If you are considering buying the book you should first download a free PDF-document file and review it to see if it's worth the price of a "hard copy."


THANK
YOU