



The NASA Exoplanet Archive



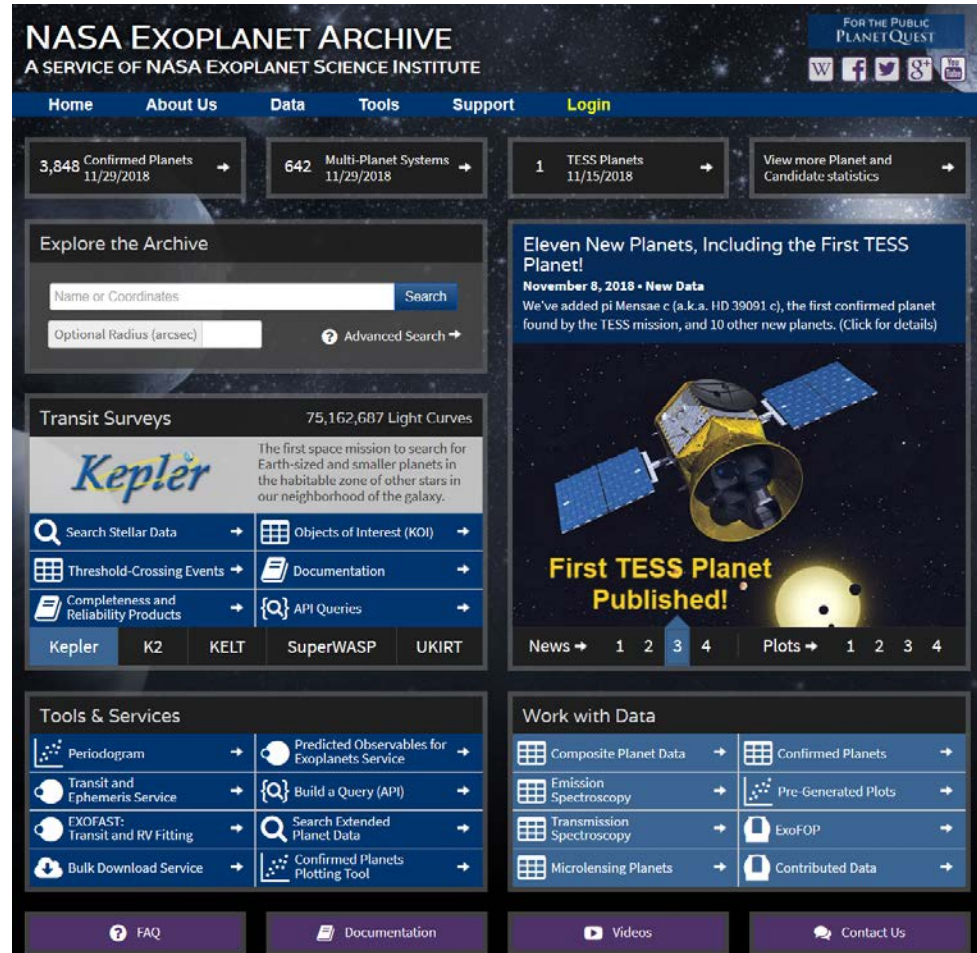
Science Impact & Opportunities
David R. Ciardi
04 December 2018

AstroData2020s
Science Workshop
December 4 - 7, 2018
Pasadena, CA



What is the Exoplanet Archive?

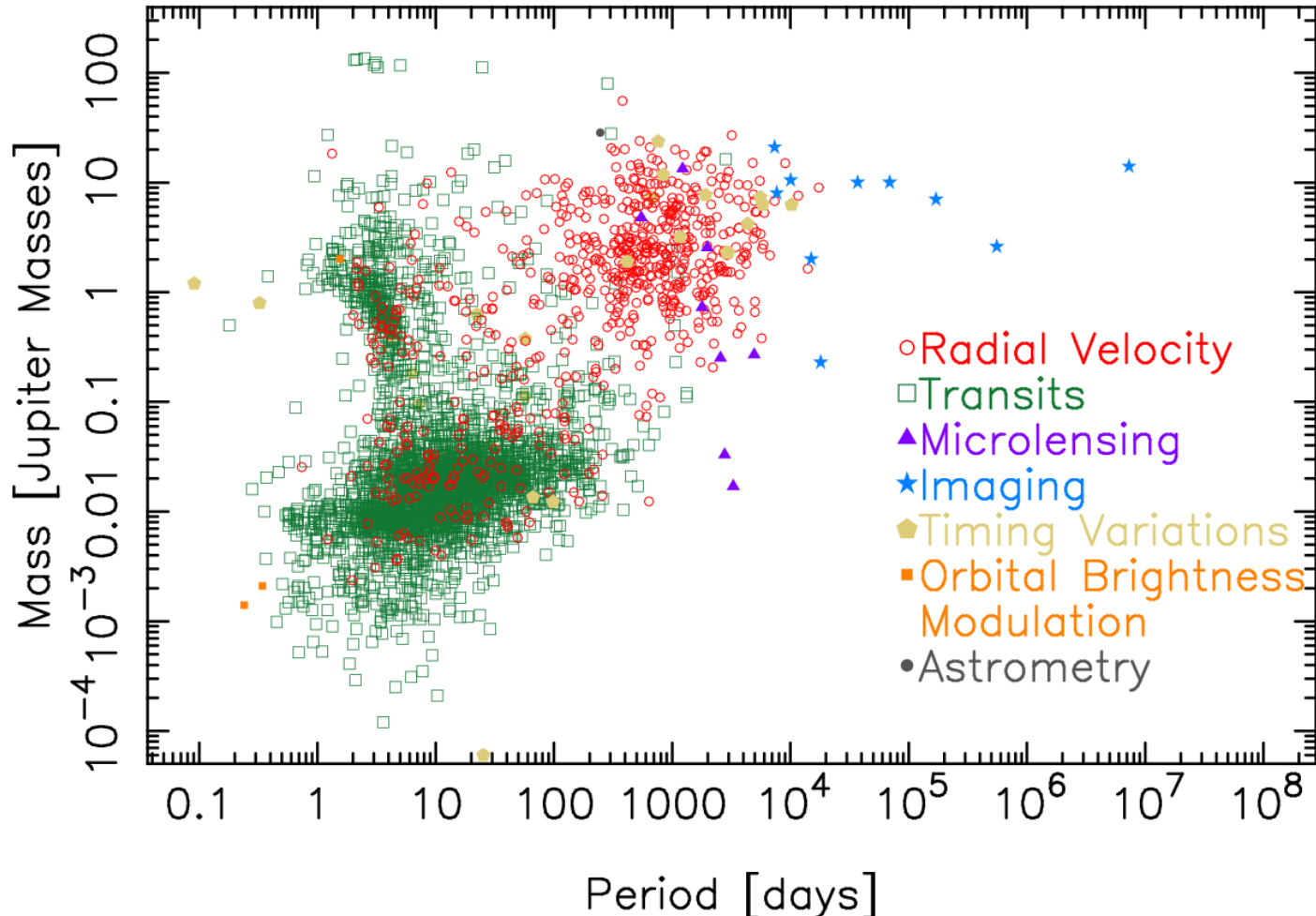
- Primary reference for confirmed exoplanets for NASA and the Exoplanet Exploration Program
- Community source for refereed data on exoplanets and high level data from selected NASA missions
- Tools to explore datasets



The screenshot shows the NASA Exoplanet Archive website. At the top, it reads "NASA EXOPLANET ARCHIVE" and "A SERVICE OF NASA EXOPLANET SCIENCE INSTITUTE". The navigation menu includes Home, About Us, Data, Tools, Support, and Login. Key statistics are displayed: 3,848 Confirmed Planets (11/29/2018), 642 Multi-Planet Systems (11/29/2018), and 1 TESS Planets (11/15/2018). A search bar is available for exploring the archive. A featured section highlights "Eleven New Planets, Including the First TESS Planet!" with a date of November 8, 2018. Below this, there is a section for "Transit Surveys" with 75,162,687 Light Curves, featuring the Kepler mission. A "Tools & Services" section lists various data processing and analysis tools. A "Work with Data" section provides options for downloading and analyzing planet data. The footer includes links for FAQ, Documentation, Videos, and Contact Us.

Carefully Curated Archive is essential for Single Planet and Demographic Studies

03 Oct 2018
 exoplanetarchive.ipac.caltech.edu





Confirmed Exoplanets and Extended Table of Parameters

Select Columns Download Table Plot Table View Documentation User Preferences ⚠ Data may not be self-consistent if drawn from multiple sources. (Learn more)

Composite Planet Data

Planet Name	Discovery Method	Year of Discovery	Orbital Period [days]	Orbital Period Reference	Orbit Semi-Major Axis [AU]	Orbit Semi-Major Axis Reference	Eccentricity	Eccentricity Reference	Planet Mass or M*sin(i) [Earth mass]	Planet Mass or M*sin(i) Provenance	Planet Mass Reference
gam Lib c	Radial Velocity	2018	964.6±3.1	Takarada et al. 2018	2.17±0.10	Takarada et al. 2018	0.057 ^{+0.034} _{-0.032}	Takarada et al. 2018	1456 ⁺¹⁴³ ₋₁₃₇	Msini	Takarada et al.
gam Cep b	Radial Velocity	2003	903.3±1.5	Endl et al. 2011	2.05±0.06	Endl et al. 2011	0.049±0.034	Endl et al. 2011	587.96±50.85	Msini	Endl et al. 2011
gam 1 Leo b	Radial Velocity	2009	428.5±1.25	Han et al. 2010	1.19±0.02	Han et al. 2010	0.144±0.046	Han et al. 2010	2790.430±317.81	Msini	Han et al. 2010
eps Tau b	Radial Velocity	2006	594.9±5.3	Sato et al. 2007	1.93±0.03	Sato et al. 2007	0.151±0.023	Sato et al. 2007	2415.406±63.563	Msini	Sato et al. 2007
eps Eri b	Radial Velocity	2000	2502±10	Benedict et al. 2006	3.39±0.36	Benedict et al. 2006	0.702±0.039	Benedict et al. 2006	493±76	Mass	Benedict et al. 2006
eps CrB b	Radial Velocity	2012	417.9±0.5	Lee et al. 2012	1.3	Lee et al. 2012	0.11±0.03	Lee et al. 2012	2129±95	Msini	Lee et al. 2012
bet UMi b	Radial Velocity	2014	522.3±2.7	Lee et al. 2014	1.4±0.1	Lee et al. 2014	0.19±0.02	Lee et al. 2014	1938.7±317.8	Msini	Lee et al. 2014
bet Pic b	Imaging	2008	7665.0 ^{+7300.0} _{-730.0}	Nielsen et al. 2014	9.10 ^{+5.30} _{-0.50}	Nielsen et al. 2014	0.080 ^{+0.320} _{-0.090}	Nielsen et al. 2014	3496±536	Mass	Snellen & Brice
bet Cnc b	Radial Velocity	2014	605.2±4.0	Lee et al. 2014	1.7±0.1	Lee et al. 2014	0.08±0.02	Lee et al. 2014	2479.0±254.3	Msini	Lee et al. 2014
alf Tau b	Radial Velocity	2015	628.96±0.90	Hatzes et al. 2015	1.46±0.27	Hatzes et al. 2015	0.10±0.05	Hatzes et al. 2015	2056±168	Msini	Hatzes et al. 2015
alf Ari b	Radial Velocity	2010	380.8±0.3	Lee et al. 2011	1.2	Lee et al. 2011	0.25±0.03	Lee et al. 2011	572.070±63.563	Msini	Lee et al. 2011
YZ Cet b	Radial Velocity	2017	1.96876±0.00021	Astudillo-Defru et al. 2017	0.01557±0.00052	Astudillo-Defru et al. 2017	0.0±0.1	Astudillo-Defru et al. 2017	0.75±0.13	Msini	Astudillo-Defru et al. 2017
YZ Cet c	Radial Velocity	2017	3.06008±0.00022	Astudillo-Defru et al. 2017	0.02090±0.00070	Astudillo-Defru et al. 2017	0.040±0.110	Astudillo-Defru et al. 2017	0.980±0.140	Msini	Astudillo-Defru et al. 2017
YZ Cet d	Radial Velocity	2017	4.65627±0.00042	Astudillo-Defru et al. 2017	0.02764±0.00093	Astudillo-Defru et al. 2017	0.129±0.096	Astudillo-Defru et al. 2017	1.14±0.17	Msini	Astudillo-Defru et al. 2017
XO-6 b	Transit	2016	3.7650007±0.0000081	Crouzet et al. 2017	0.0815±0.0077	Crouzet et al. 2017	0	Crouzet et al. 2017	<1398	Mass	Crouzet et al. 2017
XO-5 b	Transit	2008	4.1877558±0.0000006	Smith 2015	0.0515±0.0005	Smith 2015	0	Smith 2015	378.20±9.53	Mass	Smith 2015
XO-4 b	Transit	2008	4.125080±0.000004	Stassun et al. 2017	0.05475 ^{+0.00097} _{-0.00082}	Southworth 2010	0.0	Stassun et al. 2017	451±60	Mass	Stassun et al. 2017
XO-3 b	Transit	2007	3.19154±0.00014	Stassun et al. 2017	0.04529±0.00073	Southworth 2010	0.29±0.00	Stassun et al. 2017	2317±378	Mass	Stassun et al. 2017
XO-2 S b	Radial Velocity	2014	18.15700±0.03400	Stassun et al. 2017	0.13±0.00	Stassun et al. 2017	0.18±0.04	Stassun et al. 2017	83±13	Msini	Stassun et al. 2017
XO-2 S c	Radial Velocity	2014	120.80±0.34	Desidera et al. 2014	0.4756±0.0087	Desidera et al. 2014	0.1528 ^{+0.0094} _{-0.0098}	Desidera et al. 2014	435.409±16.844	Msini	Desidera et al. 2014
XO-2 N b	Transit	2007	2.61585922±0.00000028	Damasso et al. 2015	0.03673±0.00064	Damasso et al. 2015	<0.006	Damasso et al. 2015	189.737±6.674	Mass	Damasso et al. 2015
XO-1 b	Transit	2006	3.941530±0.000027	Stassun et al. 2017	0.0488±0.0005	McCullough et al. 2006	0.0	Stassun et al. 2017	264±41	Mass	Stassun et al. 2017
Wolf 503 b	Transit	2018	6.00118 ^{+0.00008} _{-0.00011}	Peterson et al. 2018	0.0571±0.0020	Peterson et al. 2018		Peterson et al. 2018	4.78	M-R relations	Calculated via
Wolf 1061 b	Radial Velocity	2015	4.8869±0.0005	Astudillo-Defru et al. 2017	0.0375 ^{+0.0012} _{-0.0013}	Astudillo-Defru et al. 2017	0.15 ^{+0.13} _{-0.10}	Astudillo-Defru et al. 2017	1.91 ^{+0.26} _{-0.25}	Msini	Astudillo-Defru et al. 2017
Wolf 1061 c	Radial Velocity	2015	17.8719±0.0059	Astudillo-Defru et al. 2017	0.0890 ^{+0.0029} _{-0.0031}	Astudillo-Defru et al. 2017	0.11 ^{+0.10} _{-0.07}	Astudillo-Defru et al. 2017	3.41 ^{+0.43} _{-0.41}	Msini	Astudillo-Defru et al. 2017
Wolf 1061 d	Radial Velocity	2015	217.21 ^{+0.55} _{-0.52}	Astudillo-Defru et al. 2017	0.470 ^{+0.015} _{-0.017}	Astudillo-Defru et al. 2017	0.55 ^{+0.08} _{-0.09}	Astudillo-Defru et al. 2017	7.70 ^{+1.12} _{-1.06}	Msini	Astudillo-Defru et al. 2017
WTS-2 b	Transit	2014	1.01870680±0.00000055	Birkby et al. 2014	0.01855±0.00062	Birkby et al. 2014	0	Birkby et al. 2014	356±51	Mass	Birkby et al. 2014
WTS-1 b	Transit	2012	3.352057 ^{+0.000013} _{-0.000015}	Cappetta et al. 2012	0.047±0.001	Cappetta et al. 2012	<0.1	Cappetta et al. 2012	1274.4±111.24	Mass	Cappetta et al. 2012

Showing records 22 to 51 of 3848 (3848 total)

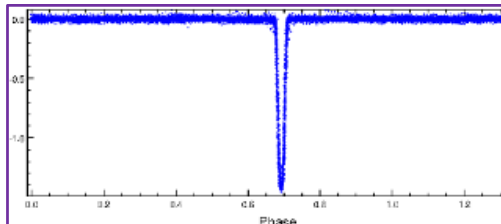
Clear Checked Check All Reset Filters

~4000 Planetary Systems with an average of 3 solutions per planet

“No single solution is like any other solution.”

Kepler Mission Products

- KOI Table (all releases)
- Kepler Astrophysical Positional Probabilities Table
- Kepler Astrophysical False Positive Probabilities Table
- Kepler Certified False Positives Table
- Kepler Completeness and Reliability Products
- Kepler DV Light Curves
- Kepler Names Table
- Kepler Stellar Table
- Kepler Threshold-Crossing Events



Cumulative KOI Data (No_Row_ID)		Q1-Q17 DR25 Done (No_Row_ID)		Q1-Q17 DR24 Done (No_Row_ID)		Q1-Q16 Done (No_Row_ID)		Q1-Q12 Done	
KepID	KOI Name	Kepler Name	Exoplanet Archive Disposition	Disposition Using Kepler Data	Disposition Score	Not Transit-Like False Flag	Stellar Eclipse False Positive Flag	Centroid Offset False Positive Flag	Ephemeris Match Indicate Contamination False Positive Flag
10797460	K00752.01	Kepler-227 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10797460	K00752.02	Kepler-227 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10811496	K00753.01	Kepler-227 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10848459	K00754.01	Kepler-227 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10854555	K00755.01	Kepler-227 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10872983	K00756.01	Kepler-227 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10872983	K00756.02	Kepler-227 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10872983	K00756.03	Kepler-227 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
6721123	K00114.01	Kepler-11 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10910878	K00757.01	Kepler-227 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
11445443	K00001.01	Kepler-1 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
1066592	K00002.01	Kepler-1 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
6922244	K00010.01	Kepler-10 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10984090	K00112.02	Kepler-11 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10419211	K00742.01	Kepler-7 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10464078	K00743.01	Kepler-7 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10480982	K00744.01	Kepler-7 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0
10485250	K00745.01	Kepler-7 b	CONFIRMED	CANDIDATE	1.0000	0	0	0	0

Q1-Q17 DR25 TCE				
KepID	Planet Number	Rogue Flag	Orbital Period (days)	Transit Probability (%)
2304168	2	0	431.719±0.0118025	219.2
2204235	1	0	0.570607±5.55192e-05	132.0
2304566	1	0	0.68848±4.75278e-05	131.8
2304320	1	0	16.5408±4.28677e-05	133.9
2202395	2	0	0.520497±8.65423e-05	133.9
2203102	10	0	480.481±0.0209531	134.4
2203902	1	0	3.70856±2.14884e-05	134.4
2303365	1	0	0.52069±1.35563e-05	131.7
2304904	1	0	0.84526±3.12723e-05	131.5
2305255	1	0	24.5684±0.0019119	155.9
757099	1	0	0.72393±2.19143e-05	131.6
892376	1	0	607.711±0.0088225	202.6
757450	1	0	8.88492±1.21522e-06	134.4
892376	2	0	1.02188±8.7182e-06	131.8
892376	4	0	405.727±0.011170	499.0
892376	3	0	85.741e-1	182.8
892376	5	0	126.081±0.00299118	201.6
892376	1	0	5.09259±3.04998e-05	133.4
892376	6	0	64.517±e-1	183.0
892667	1	0	2.26201±2.81783e-05	132.1
893507	2	0	302.046±0.00238118	286.9
893507	1	1	380.787±0.00387104	401.9
893507	3	1	300.228±0.00730964	320.4
893507	4	0	285.254±0.00485145	251.5
893507	5	0	308.893±0.00387659	271.8
893507	7	0	318.782±0.00424325	427.3
893507	6	0	279.221±0.00724037	368.7
893547	4	0	397.411±0.0105865	523.1

DR 25 Completeness				
Product	Description	Data type	Data link	Documentation
Pipeline Completeness Contours	Per-target detection contour calculations	Python code	GitHub repository	Data Product Description (KSCI-19111-002)
Robust RMS CDDP	Combined differential photometric precision (CDDP) RMS per transit duration	14 columns in Kepler stellar table	Stellar table search	Stellar table columns
Duty Cycle	Fraction of data cadences with valid data	Column in Kepler stellar table	Stellar table search	Stellar table columns
Data Span	Time in days between first and last valid cadence	Column in Kepler stellar table	Stellar table search	Stellar table columns
MES Threshold	Multiple Event Statistic (MES) threshold for each searched transit duration	14 columns in Kepler stellar table	Stellar table search	Stellar table columns
Planet Detection Metrics	Window Function and One-sigma Depth Function	One FITS file per product, per star	wget download script	Data product description (KSCI-19101-002)

DR 25 Reliability				
Product	Description	Data type	Data link	Documentation
Follow-up Observing Products	Observational data and parameters gathered by Kepler follow-up observing program (FOP) team	Various	ExoFOP web site	ExoFOP web site
Kepler Certified False Positive Table	Additional scrutiny and certification of false positives. This table covers all KOIs and is not delivery-specific.	Table of supporting information	Interactive Table	Interactive Table Columns Definitions Kepler False Positive Table Description (KSCI-15093) Table Update Log (PDF)
Astrophysical False Positive Probabilities	Information on the results of running an automated transit false-positive-probability (FPP) calculating procedure on all KOIs.	Table of supporting information	Interactive Table	Interactive Table Column Definitions Kepler Astrophysical False Positive Probabilities Table Description
Astrophysical Positional Probabilities	Information on the possibility of the transit signal arising from an astrophysical source other than the target star	Table of supporting information	Interactive table APP Reports (1 GB tar file)	Interactive Table Column Definitions Planet Reliability Metrics: Astrophysical Positional Probabilities (KSCI-19108) Table Update Log (PDF)

K2 Mission and Community Products

- K2 Planets
- K2 Targets
- K2 Candidates
- K2 Names
- K2 Light Curves

K2 Targets (No_Row_ID)									
EPIC Number	2MASS Name	K2 Campaign	Object Type	RA [sexagesimal]	Dec [sexagesimal]	K2 Proposal Identifiers	Distance [pc]	Effective Temperature [K]	Stellar Radius [Solar radii]
211301456	2MASS J08535318+0952299	5	STAR	08h53m53.19s	+09d52m30.0s	GO5007_LC; GO5033_LC; GO5104_LC		6393±127	1.382
211301689	2MASS J08552615+0952467	5	STAR	08h55m26.15s	+09d52m46.8s	GO5020_LC		3856 ⁺⁹⁰ ₋₇₆	50.736
211303326	211301456	2		08h49m22.68s	+09d54m53.6s	GO5020_LC; GO5104_LC		4583 ⁺⁷² ₋₅₀	11.549
211304198	211301456	2		08h55m30.60s	+09d56m00.1s	GO5007_LC; GO5029_LC; GO5033_LC; GO5104_LC		5712±135	0.996
211304376	211301456	2		08h51m27.84s	+09d56m14.2s	GO5007_LC; GO5033_LC		5913 ⁺¹¹⁷ ₋₁₄₀	1.224
211304446	211301456	2		08h54m06.19s	+09d56m19.6s	GO5007_LC; GO5020_LC; GO5029_LC; GO5033_LC		4937 ⁺⁷⁷ ₋₈₇	3.433
211305143	211301456	2		08h39m04.30s	+09d57m13.2s	GO5007_LC; GO5029_LC; GO5033_LC; GO5060_LC		5696 ⁺²⁰¹ ₋₁₈₈	1.299
211305171	211301456	2		08h51m03.45s	+09d57m14.9s	GO5020_LC; GO5096_LC; GO5104_LC		5071±123	9.154
211305461	211301456	2		08h39m27.06s	+09d57m36.9s	GO5020_LC; GO5104_LC		4651 ⁺⁵² ₋₇₄	10.390
211305487	211301456	2		08h42m00.34s	+09d57m39.4s	GO5020_LC; GO5104_LC		5201±83	4.492
211306307	211301456	2		08h35m55.22s	+09d58m39.5s	GO5020_LC; GO5104_LC		4132 ⁺⁶⁸ ₋₈₉	37.313
211306754	211301456	2		08h40m55.14s	+09d59m11.9s	GO5007_LC; GO5029_LC; GO5033_LC; GO5104_LC		5417 ⁺⁸⁷ ₋₁₃₁	0.874
211306930	211301456	2		08h41m07.94s	+09d59m27.8s	GO5007_LC; GO5029_LC; GO5033_LC; GO5104_LC		5981±120	1.176
211307091	2MASS J08260902+0959396	5	STAR	08h26m09.02s	+09d59m39.5s	GO5007_LC; GO5029_LC; GO5052_LC; GO5104_LC		5734 ⁺¹¹³ ₋₈₈	0.939
211307165	2MASS J08363785+0959446	5	STAR	08h36m37.86s	+09d59m44.6s	GO5007_LC; GO5033_LC; GO5104_LC		6737 ⁺²¹⁵ ₋₂₂₀	1.593
211307406	2MASS J08405478+1000007	5	STAR	08h40m54.80s	+10d00m00.8s	GO5033_LC		6635±160	1.687
211307604	2MASS J08354116+1000158	5	STAR	08h35m41.15s	+10d00m15.8s	GO5007_LC; GO5033_LC		6350 ⁺¹⁵³ ₋₁₅₁	1.685
211307639	2MASS J08322527+1000179	5	STAR	08h32m25.27s	+10d00m17.9s	GO5007_LC; GO5029_LC; GO5033_LC; GO5104_LC		5709±170	1.004
211307827	2MASS J08240849+1000320	5	STAR	08h24m08.50s	+10d00m32.1s	GO5020_LC; GO5104_LC		4793 ⁺⁵⁷ ₋₇₆	10.547

211301456

Stellar Overview

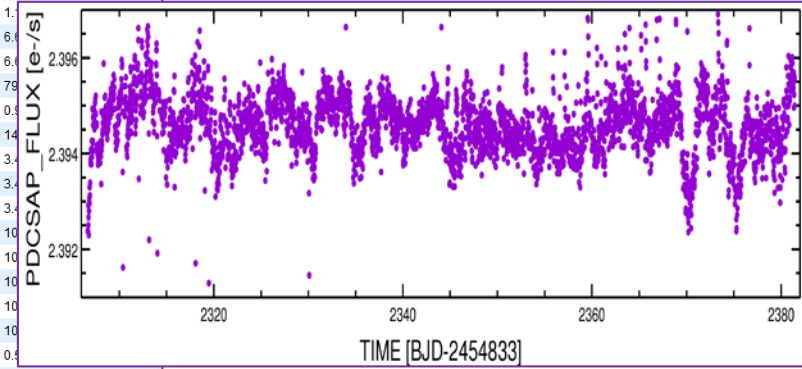
K2 Time Series and Periodogram

K2 Time Series Download (a WGET-based shell script)

ExoFOP-K2

Transit Prediction Service

K2 Candidates					
EPIC Name	Candidate Name	Planet Name	Reference Disposition	Reference Link	Exoplanet Archive Disposition
EPIC 201126503	EPIC 201126503		CANDIDATE	Vanderburg et al. 2016	CANDIDATE
EPIC 201155177	EPIC 201155177	K2-42 b	CONFIRMED	Crossfield et al. 2016	CONFIRMED
EPIC 201155177	EPIC 201155177	K2-42 b	CANDIDATE	Vanderburg et al. 2016	CONFIRMED
EPIC 201176672	EPIC 201176672		CANDIDATE	Crossfield et al. 2016	CANDIDATE
EPIC 201182911	EPIC 201182911		CANDIDATE	Vanderburg et al. 2016	CANDIDATE
EPIC 201197348	EPIC 201197348		CANDIDATE	Vanderburg et al. 2016	CANDIDATE
EPIC 201205469	EPIC 201205469	K2-43 b	CONFIRMED	Crossfield et al. 2016	CONFIRMED
EPIC 201205469	EPIC 201205469	K2-43 b	CONFIRMED	Dressing et al. 2017	CONFIRMED
EPIC 201205469	EPIC 201205469	K2-43 b	CANDIDATE	Vanderburg et al. 2016	CONFIRMED
EPIC 201208431	EPIC 201208431	K2-4 b	CONFIRMED	Montet et al. 2015	CONFIRMED
EPIC 201208431	EPIC 201208431	K2-4 b	CANDIDATE	Barros et al. 2016	CONFIRMED
EPIC 201208431	EPIC 201208431	K2-4 b	CONFIRMED	Dressing et al. 2017	CONFIRMED
EPIC 201208431	EPIC 201208431	K2-4 b	CANDIDATE	Vanderburg et al. 2016	CONFIRMED
EPIC 201208431	EPIC 201208431	K2-4 b	CONFIRMED	Crossfield et al. 2016	CONFIRMED
EPIC 201231940	EPIC 201231940		CANDIDATE	Vanderburg et al. 2016	CANDIDATE
EPIC 201238110	EPIC 201238110		CANDIDATE	Vanderburg et al. 2016	CANDIDATE
EPIC 201238163	EPIC 201238163		CANDIDATE	Vanderburg et al. 2016	CANDIDATE
EPIC 201239401	EPIC 201239401		CANDIDATE	Vanderburg et al. 2016	CANDIDATE



Specialized Planet Tables

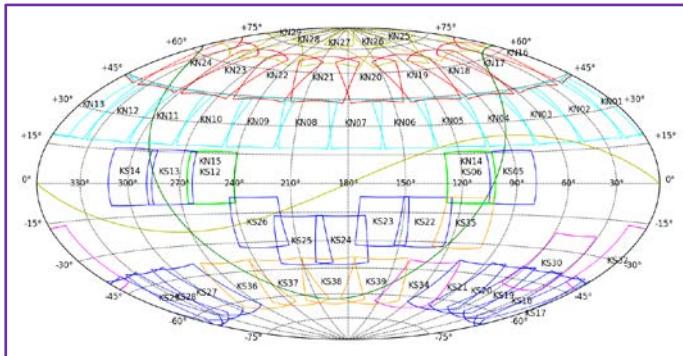
- Emission Spectroscopy
- Transmission Spectroscopy
- Microlensing Planets

Emission Spectroscopy (No_Row_ID)							
Planet Name	Central Wavelength [microns]	Band Width [microns]	Eclipse Depth [percentage]	Brightness temperature [K]	Reference	Facility	
HD 209458 b	1.1510	0.0530	0.0043±0.0016		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
HD 209458 b	1.2040	0.0520	0.0097±0.0015		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
HD 209458 b	1.2560	0.0520	0.0115±0.0015		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
HD 209458 b	1.3080	0.0530	0.0109±0.0015		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
HD 209458 b	1.3610	0.0530	0.0080±0.0015		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
HD 209458 b	1.4140	0.0520	0.0043±0.0015		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
HD 209458 b	1.4660	0.0520	0.0086±0.0015		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
HD 209458 b	1.5180	0.0530	0.0107±0.0017		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
			0.0167±0.0017		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
			0.0170±0.0018		GO3058 - Breedt	Hubble Space Telescope satellite	Wide Field Camera
			0.0176±0.0028		GO3058 - Breedt	Spitzer Space Telescope satellite	Infrared Array Camera
			0.0047±0.0021		GO3058 - Breedt	Spitzer Space Telescope satellite	Infrared Array Camera
			0.103±0.034	3398±302	GO3058 - Breedt	LBT Consortium Large Binocular Telescope	Large Binocular Camera
			0.455±0.100	901 ⁺⁸⁸ ₋₇₂	Triand et al. 2015	Spitzer Space Telescope satellite	Infrared Array Camera
			0.944 ^{+0.084} _{-0.065}	888 ⁺⁵⁸ ₋₅₇	Triand et al. 2015	Spitzer Space Telescope satellite	Infrared Array Camera
			0.0662±0.0113		Buhler et al. 2016	Spitzer Space Telescope satellite	Infrared Array Camera

Transit Spectroscopy						
Planet Name	Central Wavelength [microns]	Band Width [microns]	Transit Depth [percentage]	Transit Mid-Point [BJD]	Reference	Facility
HD 97658 b	1.17000	0.02100	0.0930±0.0019	2456665.46678±0.00032	Knutson et al. 2014	Hubble Space Telescope satellite
HD 97658 b	1.18800	0.01800	0.0927±0.0017	2456665.46678±0.00032	Knutson et al. 2014	Hubble Space Telescope satellite
HD 97658 b	1.20700	0.01900	0.0924±0.0018	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.22600	0.01900	0.0911±0.0017	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.24500	0.01900	0.0906±0.0018	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.26400	0.01900	0.0949±0.0016	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.28300	0.01900	0.0965±0.0017	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.30100	0.01800	0.0967±0.0018	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.32000	0.01900	0.0960±0.0019	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.33900	0.01900	0.0947±0.0022	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.35800	0.01900	0.0945±0.0023	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.37700	0.01900	0.0932±0.0026	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.39600	0.01900	0.0923±0.0018	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.41500	0.01900	0.0926±0.0028	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.43300	0.01800	0.0984±0.0024	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.45200	0.01900	0.0948±0.0022	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.47100	0.01900	0.0966±0.0020	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.49000	0.01900	0.0949±0.0020	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.50900	0.01900	0.0969±0.0024	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.52800	0.01900	0.0975±0.0019	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.54600	0.01800	0.0952±0.0018	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.56500	0.01900	0.0943±0.0025	2456665.46678±0.00032	Knutson et al.	
HD 97658 b	1.58400	0.11400	0.0970±0.0021	2456665.46678±0.00032	Knutson et al.	

Microlensing									
Planet Name	ADS Reference link	Source crossing time [day]	Einstein crossing time [day]	Time of closest projected separation [day]	Angular Einstein radius [mas]	Angular projected separation	Source-lens relative proper motion [mas/year]	Source angular radius [microarcseconds]	Angular radius [microarcseconds]
MOA 2011-BLG-028L b	Skowron et al. 2016		34.20±0.74	2455673.81±0.1E 0.337±0.053			3.59±0.58	6.08±0.65	
MOA 2011-BLG-028L b	Skowron et al. 2016		34.26±0.67	2455673.788±0.0 0.337±0.053			3.59±0.58	6.08±0.65	
MOA 2011-BLG-028L b	Skowron et al. 2016		34.2±1.3	2455673.74±0.3 0.337±0.053			3.59±0.58	6.08±0.65	
MOA 2011-BLG-028L b	Skowron et al. 2016		34.45±0.55	2455673.687±0.0 0.337±0.053			3.59±0.58	6.08±0.65	
MOA 2011-BLG-028L b	Skowron et al. 2016		33.91±0.26	2455673.707±0.0 0.337±0.053			3.59±0.58	6.08±0.65	
MOA 2011-BLG-028L b	Skowron et al. 2016		34.19±0.45	2455673.694±0.0 0.337±0.053			3.59±0.58	6.08±0.65	
MOA 2011-BLG-028L b	Skowron et al. 2016		34.07±0.68	2455673.82±0.0 0.337±0.053			3.59±0.58	6.08±0.65	
MOA 2011-BLG-028L b	Skowron et al. 2016		34.20±0.74	2455673.81±0.1E 0.337±0.053			3.59±0.58	6.08±0.65	
MOA 2010-BLG-353L b	Rattenbury et al. 2015			2455381.24±0.0E 0.187±0.089		-0.79±0.08		3.97±0.89	
MOA 2010-BLG-353L b	Rattenbury et al. 2015			2455381.24±0.0E 0.187±0.089		-0.79±0.08		3.97±0.89	
OGLE 2005-BLG-169L b	Gould et al. 2006		43±4		1.00±0.22	0.00124	8.4±1.7	0.44±0.04	
OGLE 2003-BLG-235L b	Bennett et al. 2006	0.059±0.007			0.55±0.07		3.3±0.4	0.53±0.04	
OGLE 2012-BLG-0724L b	Hirao et al. 2016		13.3556±0.8479	2456071.0381±0.0 0.239±0.028		0.008383±0.000E 6.52±0.87		0.336±0.025	
OGLE 2012-BLG-0724L b	Hirao et al. 2016		13.3556±0.8479	2456071.0381±0.0 0.239±0.028		0.008383±0.000E 6.52±0.87		0.336±0.025	
OGLE 2015-BLG-0954L b	Shin et al. 2016	0.0111±0.0003	37.53±0.87	2457165.220±0.0 1.89		-0.0568±0.0017	18.4	0.56	
OGLE 2015-BLG-0954L b	Shin et al. 2016	0.0111±0.0003	36.96±1.10	2457165.223±0.0 1.89		-0.0580±0.0021	18.4	0.56	
OGLE 2012-BLG-0563L b	Fukui et al. 2015		77.5±2.2	2456069.0279±0.1 1.36 ^{+0.14} _{-0.12}		0.001405±0.000E 6.4 ^{+0.6} _{-0.5}		0.446±0.023	
OGLE 2012-BLG-0563L b	Fukui et al. 2015		77.7±2.1	2456069.0281±0.1 1.36 ^{+0.14} _{-0.12}		0.001403±0.000E 6.4 ^{+0.6} _{-0.5}		0.446±0.023	
MOA 2010-BLG-328L b	Furusawa et al. 2013		62.9±0.3	2455378.723±0.0		-0.0722±0.0005			
MOA 2010-BLG-328L b	Furusawa et al. 2013		57.2±0.3	2455378.641±0.0		0.0816±0.0005			

- UKIRT Microlensing Survey
- KELT-North Light Curves
- SuperWASP Light Curves
- CoRoT Light Curves
- Variety of Contributed Datasets
 - Radial Velocity Time Series (1072)
 - Photometric Time Series (1186)
 - Microlensing Time Series (248)
 - Spectra (4116)
 - Transit surveys (41 million)



Search UKIRT Time Series

This release of the 2015–2016 UKIRT microlensing survey data contains roughly 18 million targets, all observed exclusively in *H*-band. To visually estimate the number of targets returned by a search, see the UKIRT Microlensing Survey Figures page. Use the **Count Only** button above to determine the exact number of targets that meet the search criteria.

Up to 100,000 results will display in the web browser. Results between 100,000 and 5 million must be downloaded by wget script; >5 million requires a bulk download.

Many thanks to the UKIRT facility and the UKIRT Microlensing Team for making these data available.

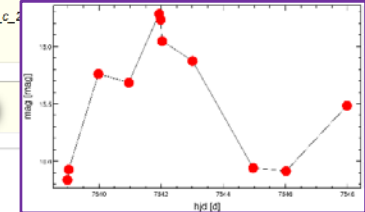
Time Series Lookup

Enter a UKIRT source ID to view its time series, or to generate a download script for all related time series files.

(Sample ID: *ukirt_c...*)

Source ID

[Download](#)



[Submit Search](#)

[Count Only](#)

Include location search around coordinates / object names

Single Location

Radius (arcsec): 30

List Upload:

Include column values

Description

Source ID

Survey Year

Time Series Data

Dataset	Description	Download File	wget File Creation Date
AMATEUR	The Exoplanet Archive serves 540 light curves for stars currently known to host exoplanets. These light curves of exoplanet transits were obtained by amateur astronomers from around the world. A more detailed summary of these data is available here. (25 MB)	wget_AMATEUR.bat	2018-02-05
HIPPARCOS	The Exoplanet Archive serves 125005 light curves as released by the Hipparcos mission. (2 GB)	wget_HIPPARCOS.bat	2018-02-05
PHOTOMETRIC	The Exoplanet Archive serves 646 published light curves for stars currently known to host exoplanets. The majority of these light curves are known transiting exoplanets and exoplanets detected by microlensing. (167 MB)	wget_PHOTOMETRIC.bat	2018-02-05
MICROLENSING	The Exoplanet Archive serves 248 microlensing light curves of stars currently known to host exoplanets. (13 MB)	wget_MICROLENSING.bat	2018-02-05
RADIAL	The Exoplanet Archive serves 1072 published radial velocity curves for stars currently known to host exoplanets. (3 MB)	wget_RADIAL.bat	2018-02-05
OPTICAL	The Exoplanet Archive serves 1876 high-resolution optical spectra of planet host and not planet host stars. These spectra have been mostly provided by the NZK Consortium, the M2K program, and the California Planet Search team. (23 GB)	wget_OPTICAL.bat	2018-02-05
OPTICAL_NZK	The Exoplanet Archive serves 305 high-resolution optical spectra of planet host and not planet host stars, as provided by the NZK Consortium. (2 GB)	wget_OPTICAL_NZK.bat	2018-02-05
OPTICAL_M2K	The Exoplanet Archive serves 146 high-resolution optical spectra of planet host and not planet host stars, as provided by the M-to-K Project (M-to-K Project should link to M-to-K Project). (1 GB)	wget_OPTICAL_M2K.bat	2018-02-05
OPTICAL_CPS	The Exoplanet Archive serves 1403 high-resolution optical spectra of planet host and not planet host stars, as provided by the California Planet Survey. (18 GB)	wget_OPTICAL_CPS.bat	2018-02-05
OPTICAL_USJ	The Exoplanet Archive serves 16 Keck HIRES optical spectra of planet host and not planet host stars, as provided by J. Johnson. (7 MB)	wget_OPTICAL_USJ.bat	2018-02-05
OPTICAL_HET	The Exoplanet Archive serves 6 HET optical spectra of planet host and not planet host stars, as provided by C. Bondar. (7 MB)	wget_OPTICAL_HET.bat	2018-02-05
INFRARED	The Exoplanet Archive serves 364 infrared spectra of planet host and not planet host stars as observed by the Infrared Spectrograph (IRS) on board of the Spitzer Space Telescope. (7 MB)	wget_INFRARED.bat	2018-02-05

Type	Start Time	End Time	Number of Data Points	Wavelength
AXA	2455036.610513	2455036.724933	94	
AXA	2455064.747896	2455064.925596	247	
AXA	2455068.304053	2455068.642683	449	
AXA	2455075.278007	2455075.648417	491	
AXA	2455082.281029	2455082.678839	258	
AXA	2454786.324507	2454786.482177	247	
AXA	2454666.462426	2454666.660466	600	
AXA	2454712.278109	2454712.463619	775	
AXA	2455082.380849	2455082.625019	323	
AXA	2454754.679969	2454754.769529	322	
PLC	2453234.605566	2453239.090017	236506	Opt
PLC	2452791.268864	2452826.718234	548	775.6nm
PLC	2452791.268864	2452826.718234	548	677.9nm
PLC	2452791.268864	2452826.718234	548	580.2nm
PLC	2452763.055640	2452816.180836	504	539.8nm
PLC	2452763.055640	2452816.180836	504	484.9nm
PLC	2452763.055640	2452816.180836	504	430.0nm
PLC	2452763.055640	2452816.180836	504	375.0nm
PLC	2452791.268864	2452826.718234	548	320.1nm
PLC	2452791.268864	2452826.718234	548	970.8nm
PLC	2452791.268864	2452826.718234	548	873.2nm
PLC	2453344.646621	2453549.323390	2392	
PLC	2453234.605566	2453248.108018	114521	
RVC	2451341.119826	2452604.940903	64	Optical Spectra
RVC	2451341.120000	2452575.730000	51	Optical Spectra
RVC	2452072.274035	2452548.244008	268	F550W (HST FGS)
RVC	2451341.120000	2453370.698800	85	Optical Spectra

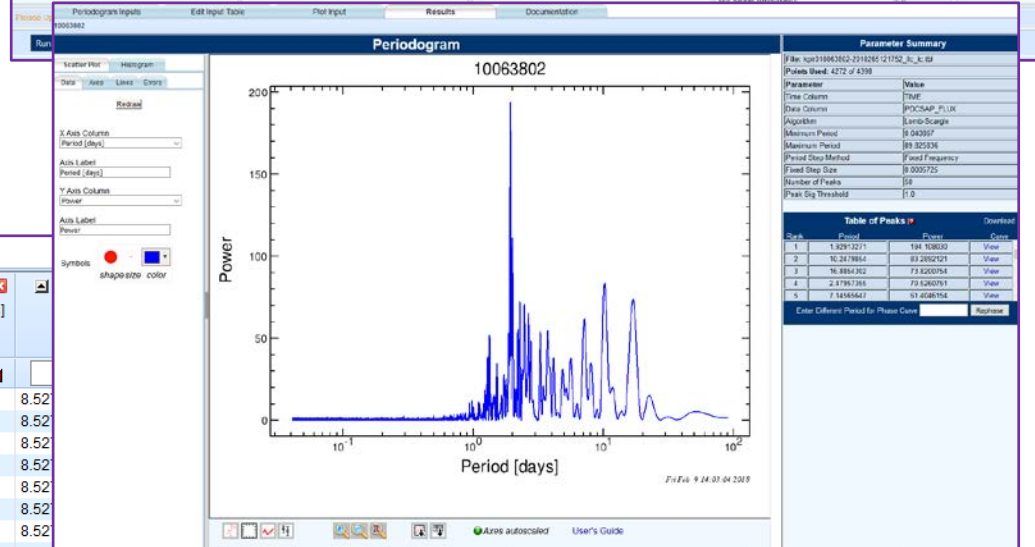
Instrument	Filter	Time Series Viewer	Download	Reference
MIPS24 (Spitzer)	Photometry	Time Series Viewer	Download	Richardson et al. 2006
Optical (MOST)	Photometry	Time Series Viewer	Download	Bowen et al. 2006
CCD - MOST	Photometry	Time Series Viewer	Download	
HIRES - 10m Keck	Gas Cell Absorption (Iodine)	Time Series Viewer	Download	Butler et al. 2006
HIRES - 10m Keck	Gas Cell Absorption (Iodine)	Time Series Viewer	Download	Wittenmyer et al. 2005
FGS - HST	Photometry	Time Series Viewer	Download	Wittenmyer et al. 2005
HIRES - 10m Keck	Gas Cell Absorption (Iodine)	Time Series Viewer	Download	Lafolin et al. 2005

Tools to Work with the Content

- Periodogram and Phase tool
- Transit Prediction
- ExoFAST Transit and RV Fitter
- Predicted Observables

The screenshot shows the EXOFAST software interface with several panels:

- Transit File Options:** Select Band, Band, Upload Transit File, Current Transit File.
- Radial Velocity File Options:** RV File Name Lookup, Upload Radial Velocity File, Current Radial Velocity File.
- Period and Settings Inputs:** Period Parameters (Minimum, Maximum, Peak), Apply Settings (Fit Type, Force Circular Orbit, etc.).
- Prior and Prior Width Inputs:** Planet Name, Planet Name, Upload Prior Parameter File, Prior Parameters (Transit Midpoint, Ratio of Planet to Stellar Radius, etc.).



Planet Name	RA [sexagesimal]	Dec [sexagesimal]	Phase	Period [days]
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.25	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.00	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.75	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.50	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.75	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.00	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.75	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.50	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.25	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.00	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.75	5.287897870
Kepler-1004b	19h49m26.23s	49d47m51.18s	0.50	5.287897870

Transit Midpoint	0.009413	06/22/2018 07:22	2458291.80731	1.15
Transit Midpoint	0.009425	06/26/2018 06:33	2458295.77323	1.21
Transit Midpoint	0.009437	06/30/2018 05:44	2458299.73916	1.30
Transit Midpoint	0.009437	07/04/2018 04:55	2458303.70508	1.42
Transit Midpoint	0.009449	07/08/2018 04:06	2458307.67100	1.57



Kepler

8,214 stars
2,323 confirmed planets

[Go to ExoFOP-Kepler >>](#)



K2

354,720 targets
379 confirmed planets

[Go to ExoFOP-K2 >>](#)



K2 Campaign 9

Microlensing survey
627 events

[Go to ExoFOP-K2C9 >>](#)



TESS

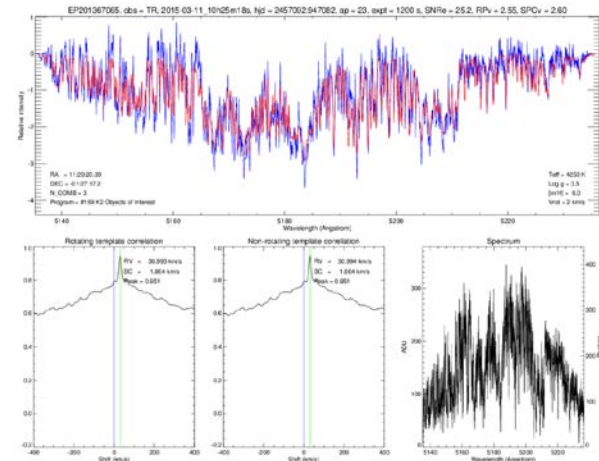
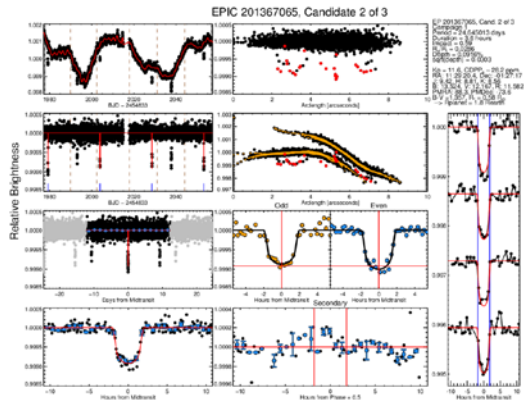
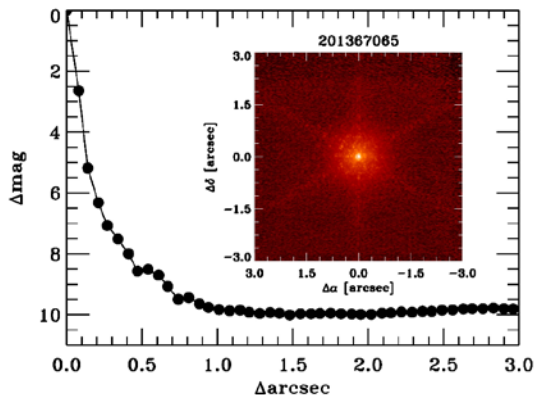
472,643,161 targets
(Candidate Target List:
3,805,509)

[Go to ExoFOP-TESS >>](#)

- ExoFOP is a web service developed and operated by NExSci originally for the Kepler Follow-Up Observation Program:
- Expanded when Kepler transitioned into the Extended Mission and then K2 ... and then TESS
- ‘Sand-box’ for the community to share data and information regarding follow-up observations to help facilitate the efficient and effective use of community telescope resources

ExoFOP is Different ...

- Free form environment for the community to share
 - Observations made
 - Data (e.g., Files and parameters)
 - Notes/thoughts
 - Results
- But ... it is not a vetted archive like the Exoplanet Archive
- K2 Community: 500,000+ files; TESS: already 5000+files



- Integrating *very* disparate data sets for use by the users?
 - Mission data are more structured with strict quality control
 - Literature data are published but with less quality control
 - User loaded (ExoFOP) data are freeform with little (zero) quality control
- Data Inhomogeneity
 - No body publishes data in the same way
 - Conflicting Results
- What data goes with which targets?
 - [1 to Many] AND [Many to 1]
- Astrophysical hierarchy of systems
 - Planet orbits Star ... or in Binary ... Triple ... or the System
 - Satellite orbits Planet that orbits Star
 - Single Planet; No Star
 - Target Status:
 - Confirmed, validated, candidate, retracted, reinstated ... retracted ... reinstated ...
 - Low mass star ... Brown Dwarf ... Planet

Science Opportunities in the 2020s

- Science goals require that users be able to put together data from different sources and contexts
- Demographics & completing the exoplanet census
 - Combining data from various sources to understand planets individually and in bulk
- Characterizing the planets (e.g., bulk and atmosphere composition)
 - Requires knowledge of the stars and planet properties (e.g., masses, radii, orbits)
 - Studies spanning demographics of stellar hosts
- Break-Out Session: (Time Domain)
 - Help define these science goals and how the archives can support the needs of the community
 - What do you want to discuss ? !
 - We can take this in a completely different direction if you wish

