TIC 229452949

Originated 2025 November 27

Updated 2025 November 28

Introduction

Please note that this is the first time an alert of this kind had been circulated so if you have any comments, please help us to climb the learning curve.

While analysing data obtained by the Transiting Exoplanet Survey Satellite (TESS) an object was discovered which might be a new exoplanet. Observations of this object are urgently required to confirm if this might be so.

Observations using blue and red filters would help to determine whether or not this object is an exoplanet or eclipsing binary. A significant difference would indicate the latter.

As this is not an ExoClock object HOPS cannot be used to analyse observations so AstroimageJ is an alternative. Results can then be input to the AAVSO database

A temporary name has been assigned to reflect the involvement of the EXPLORE 2000 project

Object data

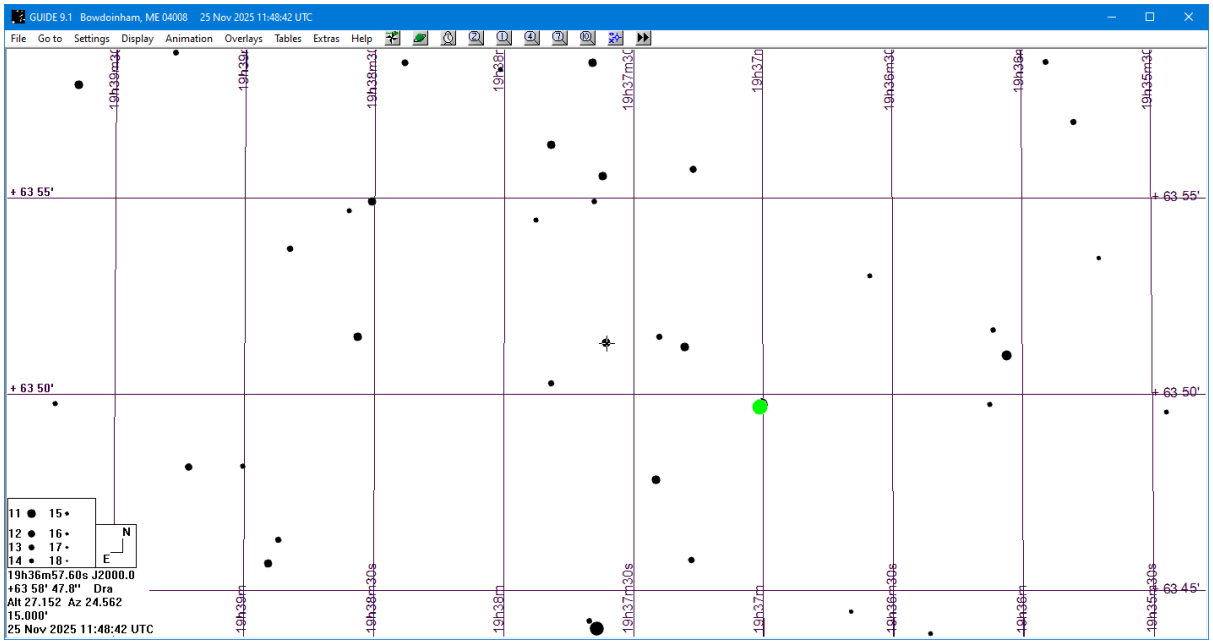
Planet	RA Dec	V mag	Transit Depth (mmag)	Period (days)	Min telescope aperture required
EXPLORE-1b (TIC 229452949)	19:37:36.32 +63:51:22.1	11.27	22.9	6.142697	~6 ins/15 cms

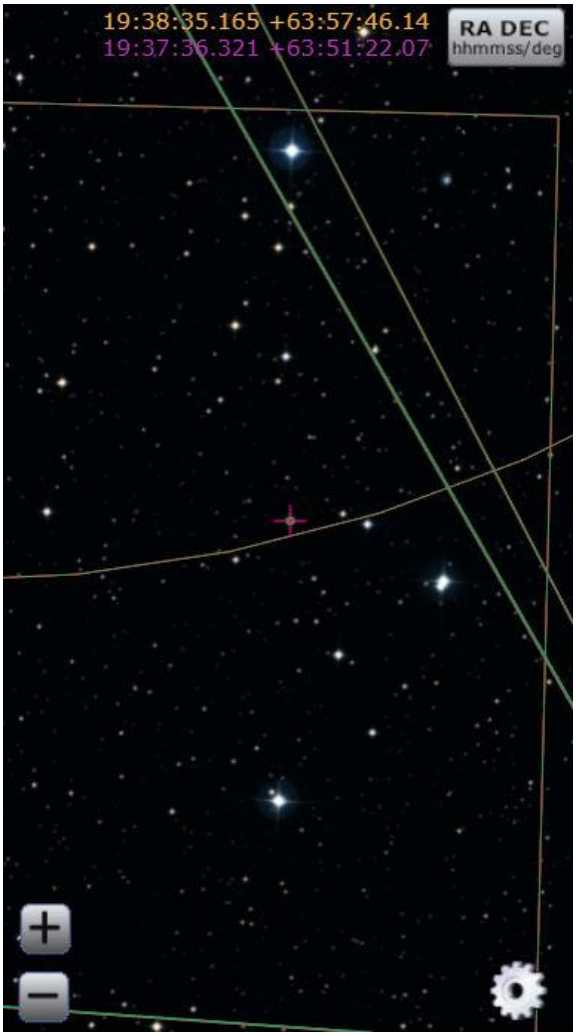
System data

Planet radius (LcTools);	33.32 Earths = 33.32 x 6378 = 212,515 km
Planet radius (Exoplanetpie);	2.8 Jupiters = 2.8 x 71,492 = 200,178 km
Stellar radius;	2.138 Sun = 2.138 x 69,265 = 1,488,615 km
Planet radius;	0.13 stellar radii
Transit Duration (Exoplanetpie);	4.8 hrs

Period (LcTools); 6.142697 days

Finder charts from Guide and MAST. TIC 229452949 is located in the centres of the charts. In the MAST chart the lower RA/Dec line indicates the target coordinates.





Nearby stars of similar magnitude from Vizier. The target star, EXPLORE-1b (TIC 229452949), is at the top of the list.

RA (dig)	Dec (deg)	RA hr min sec	Dec deg min sec	V mag
294.401305	+63.856140	19 37 36.31	+63 51 22.1	11.27
294.354121	+63.798238	19 37 24.99	+63 47 53.7	11.04
294.454919	+63.940472	19 37 49.18	+63 56 25.7	11.15
294.325936	+63.854595	19 37 18.22	+63 51 16.5	11.17
294.628495	+63.916048	19 38 30.84	+63 54 57.8	11.34
294.641363	+63.859002	19 38 33.93	+63 51 32.4	11.35
294.405088	+63.927205	19 37 37.22	+63 55 37.9	11.37

294.319786	+63.763918	19 37 16.75	+63 45 50.1	12.14
294.317899	+63.929952	19 37 16.30	+63 55 47.8	12.37
294.454483	+63.839494	19 37 49.08	+63 50 22.2	12.72
294.349838	+63.859020	19 37 23.96	+63 51 32.5	12.85

Ephemeris

Observers should use the Swarthmore or TESS transit finders to determine times for their location.

Swarthmore example

Target list

Choose ‘Single object with given ephemeris (date and elevation filters below still apply).’

Observatory

Choose ‘Manual coordinate entry’ at end of list then ‘Enter specific latitude/longitude/time zone’

Enter the required data

RA; 19 37 36.31

Dec; +63 51 22.1

BJD of mid transit; 2458689.2919380 (last TESS observation in LcTools)

Period (days); 6.1426970 (from LcTools)

Transit duration (hrs); 4.8 (from Exoplanetpie)

Transit depth (ppt); 22.9 (from LcTools)

Target name; TIC 229452949

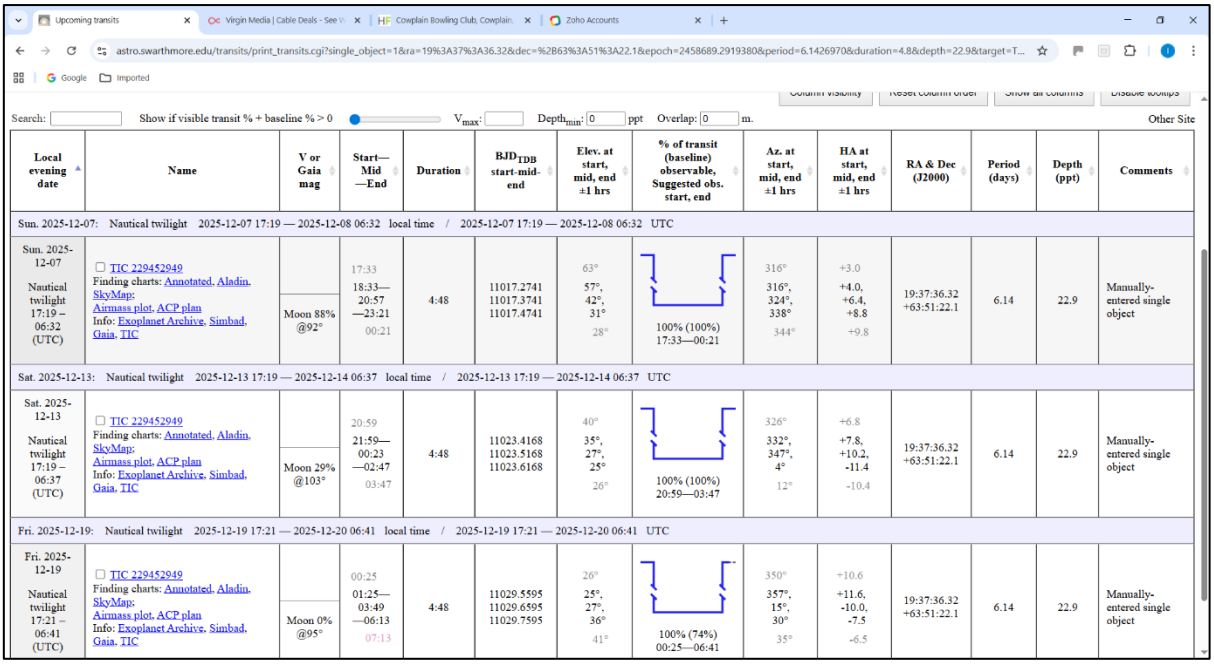
Select; ‘Use observatory’s local time’

Enter Your observatory location and time zone

Enter elevation constraints – suggest 20 plus ‘And’

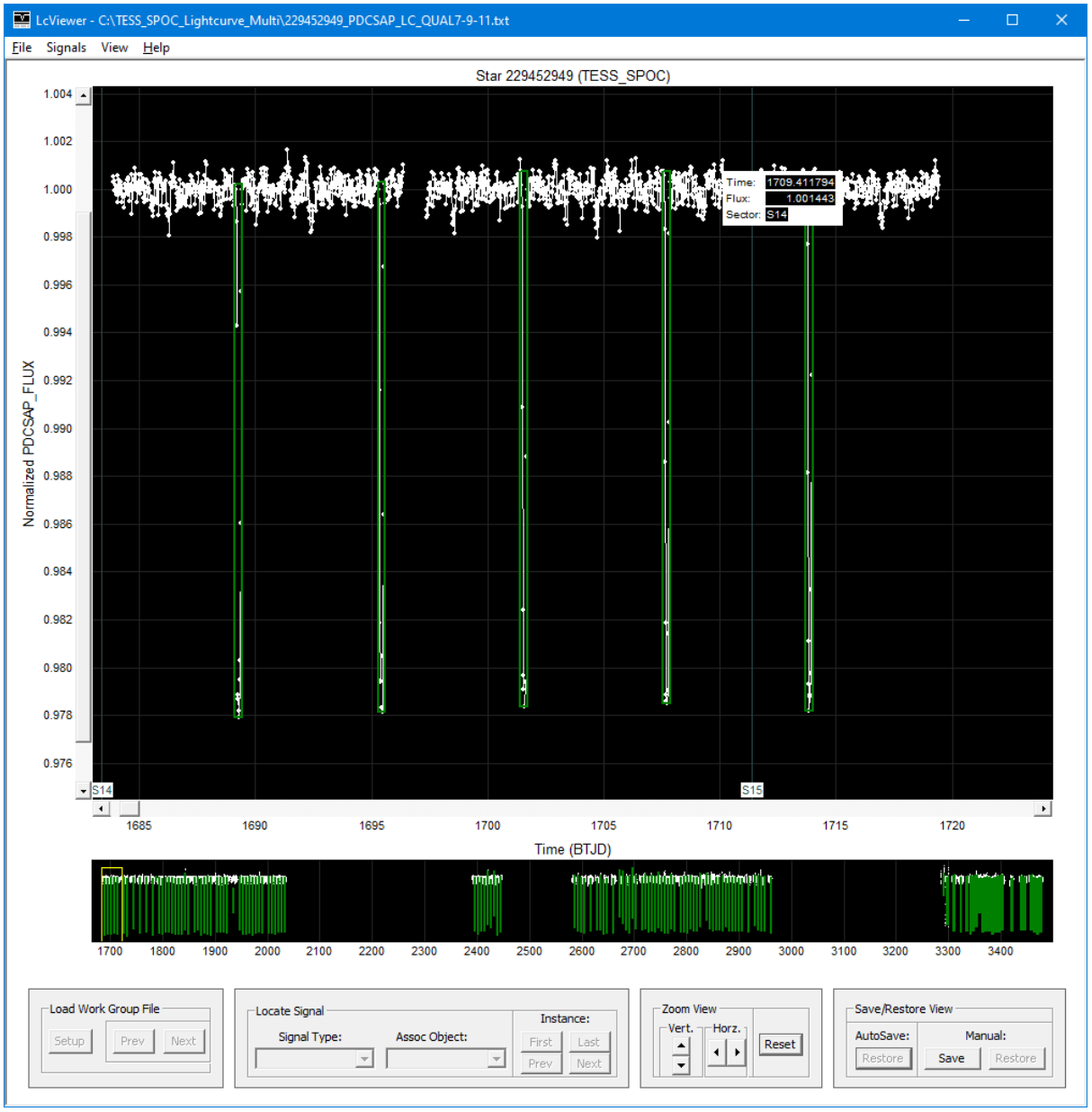
Submit

Screen shot of results below

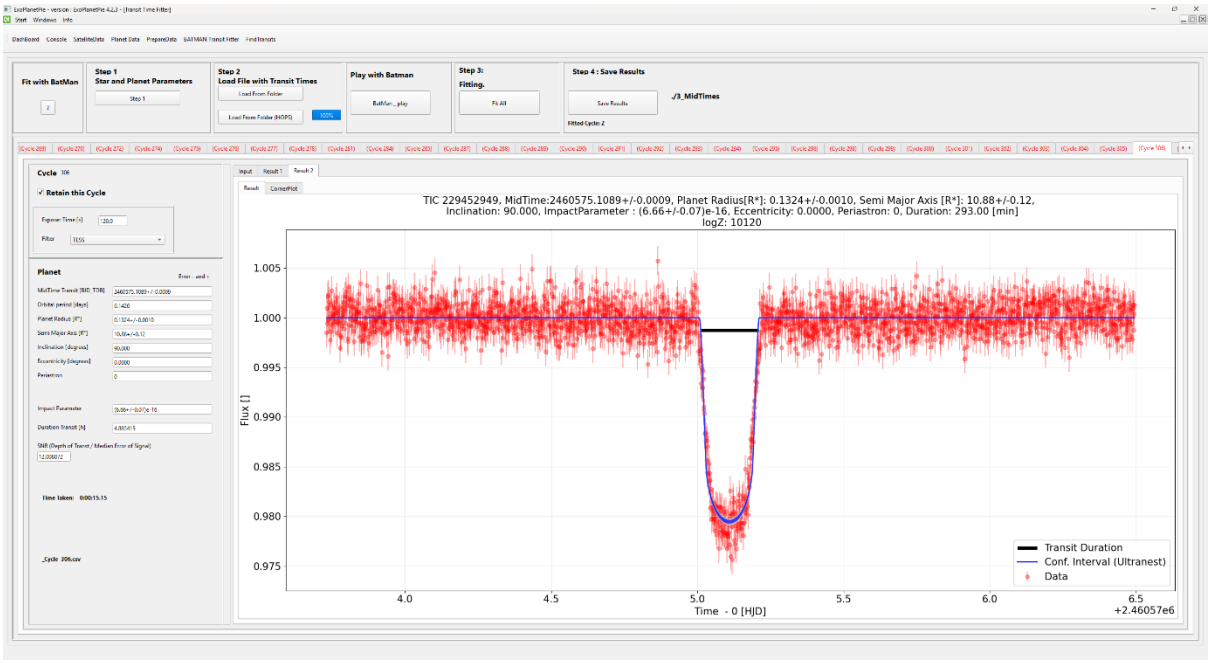


Search: Show if visible transit % + baseline % > 0 V_{max}: $Depth_{min}$: 0 ppt Overlap: 0 m. Other Site

Local evening date	Name	V or Gaia mag	Start—Mid—End	Duration	BJD_{TDB} start-mid-end	Elev. at start, mid, end ±1 hrs	% of transit (baseline) observable, Suggested obs. start, end	Az. at start, mid, end ±1 hrs	HA at start, mid, end ±1 hrs	RA & Dec (J2000)	Period (days)	Depth (ppt)	Comments
Sun. 2025-12-07: Nautical twilight 2025-12-07 17:19 — 2025-12-08 06:32 local time / 2025-12-07 17:19 — 2025-12-08 06:32 UTC													
Sun. 2025-12-07 Nautical twilight 17:19 – 06:32 (UTC)	☐ TIC 229452949 Finding charts: Annotated, Aladin, SkyMap; Airmass plot, ACP plan Info: Exoplanet Archive, Simbad, Gaia, TIC	Moon 88% @92°	17:33 18:33—20:57—23:21 00:21	4:48	11017.2741 11017.3741 11017.4741	63° 57°, 42°, 31° 28°	100% (100%) 17:33—00:21	316° 316°, 324°, 338° 344°	+3.0 +4.0, +6.4, +8.8 +9.8	19:37:36.32 +63:51:22.1	6.14	22.9	Manually-entered single object
Sat. 2025-12-13: Nautical twilight 2025-12-13 17:19 — 2025-12-14 06:37 local time / 2025-12-13 17:19 — 2025-12-14 06:37 UTC													
Sat. 2025-12-13 Nautical twilight 17:19 – 06:37 (UTC)	☐ TIC 229452949 Finding charts: Annotated, Aladin, SkyMap; Airmass plot, ACP plan Info: Exoplanet Archive, Simbad, Gaia, TIC	Moon 29% @103°	20:59 21:59—00:23—02:47 03:47	4:48	11023.4168 11023.5168 11023.6168	40° 35°, 27°, 25° 26°	100% (100%) 20:59—03:47	326° 332°, 347°, 4° 12°	+6.8 +7.8, +10.2, -11.4 -10.4	19:37:36.32 +63:51:22.1	6.14	22.9	Manually-entered single object
Fri. 2025-12-19: Nautical twilight 2025-12-19 17:21 — 2025-12-20 06:41 local time / 2025-12-19 17:21 — 2025-12-20 06:41 UTC													
Fri. 2025-12-19 Nautical twilight 17:21 – 06:41 (UTC)	☐ TIC 229452949 Finding charts: Annotated, Aladin, SkyMap; Airmass plot, ACP plan Info: Exoplanet Archive, Simbad, Gaia, TIC	Moon 0% @95°	00:25 01:25—03:49—06:13 07:13	4:48	11029.5595 11029.6595 11029.7595	26° 25°, 27°, 36° 41°	100% (74%) 00:25—06:41	350° 357°, 15°, 30° 35°	+10.6 +11.6, -10.0, -7.5 -6.5	19:37:36.32 +63:51:22.1	6.14	22.9	Manually-entered single object



LcTools chart showing multiple transits



ExoPlanetPie chart by Pieter Vulysteke showing a single transit