

Outline

- Construction by Pulsar in 2021 Feb
- Exo Planets, photometry and astrometry
- **The occultation challenge...**
- SLIDE show – deep sky and comets.

Breaking ground in Feb 2022



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1 x 1 x 0.9 m hole
2 cu m of concrete
in all...

Base will be 6" thick

Conduit for power.



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2021
Feb
23

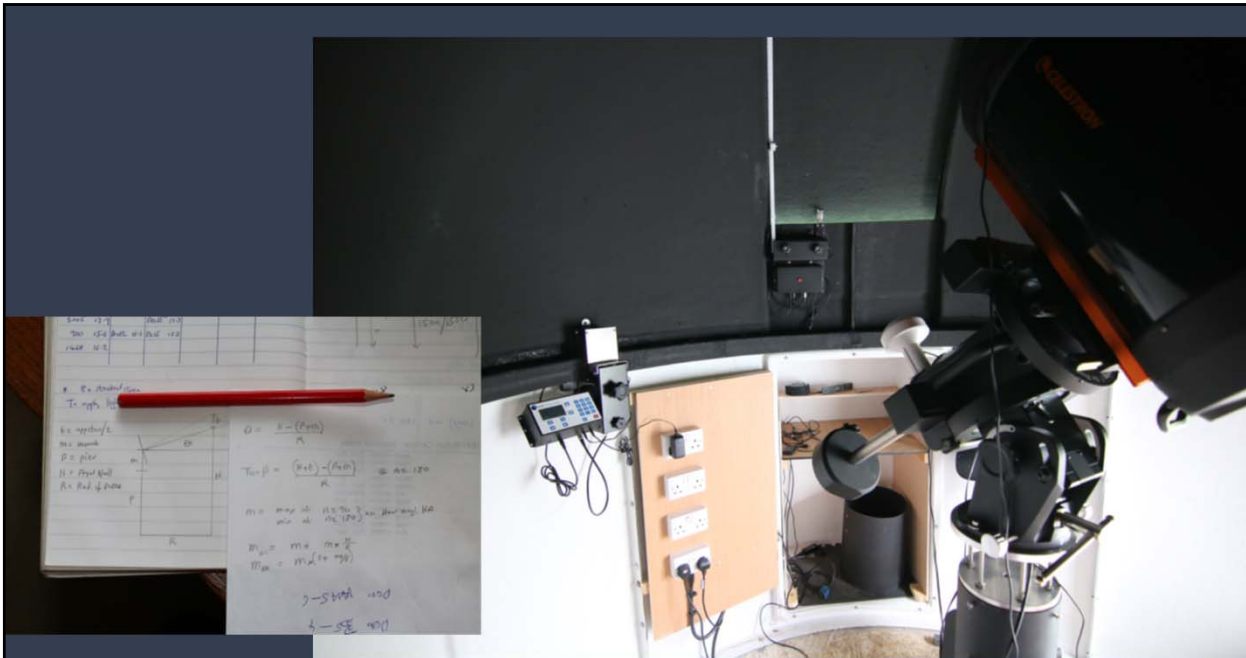
Covid
precautions



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Finally: C11 in 2022 in the observatory with auto guiding.
bought on But-n-Sell in Nov 2019



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2020 – Pre Observatory with C11 The Covid setup !
with QHY174m GPS for occultations (C11 xlt bought in Nov 2019)

- C11
- EQ6 pro
- EQmod
- QHY174m-GPS
- Setup for occultations

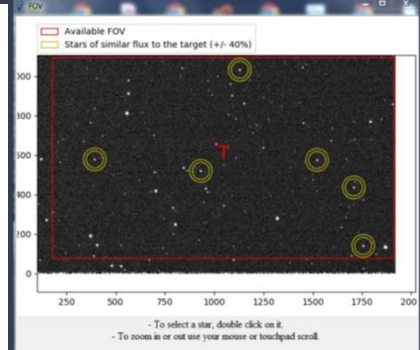
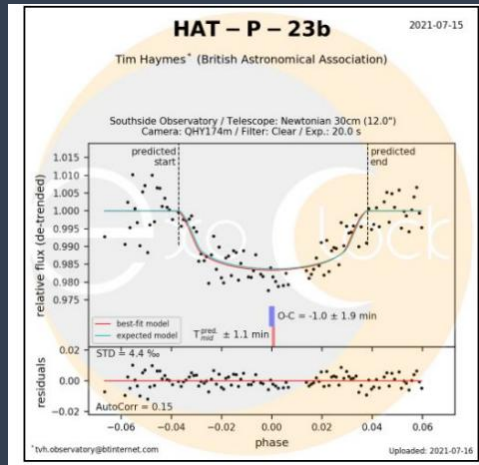
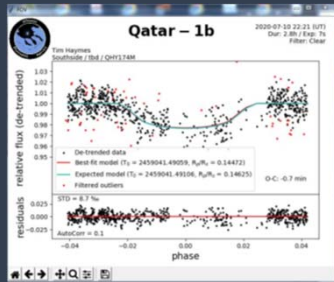


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EXOCLOCK - extra solar planet transits difficult without autoguiding. 2020-October



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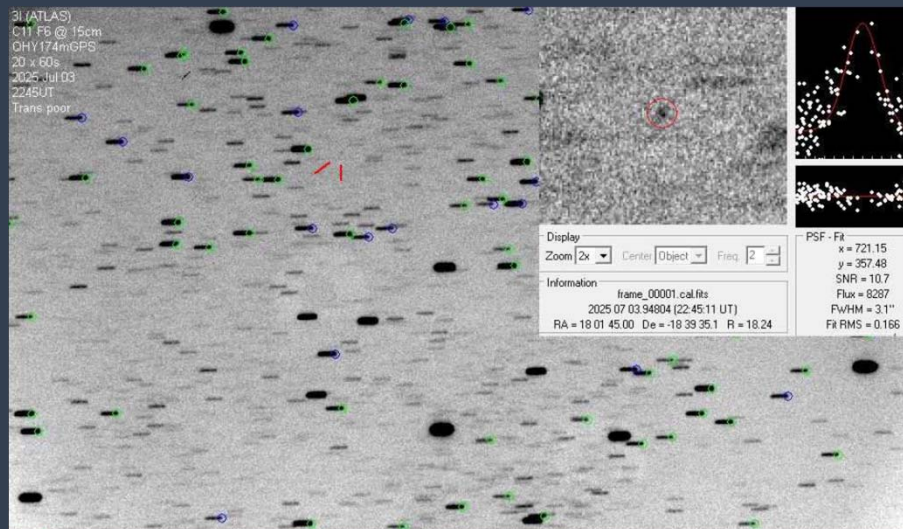
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Asteroid identification and measurement. 3I ATLAS

- 20 min
- Mag 18

Aperture reduced to 6" by dome wall.

Astrometry requires paired observations.



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Observing: Mission 29P, quiescent at mag17

2025 Nov 30, 0535

C11 at F5.8

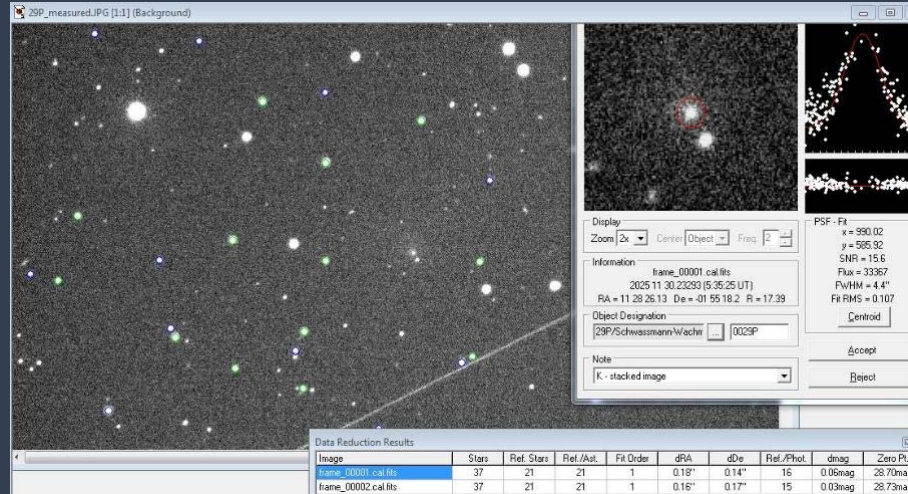
QHY174m GPS

5 x 60s stack
(dark and flat corr.)

Measured with
Astrometrica at

R 17.4

UCAC4 catalogue



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Observing: Mission 29P, at mag 14 (Using Astrometrica)

2025 Dec 12, 0449

C11 at F5.8

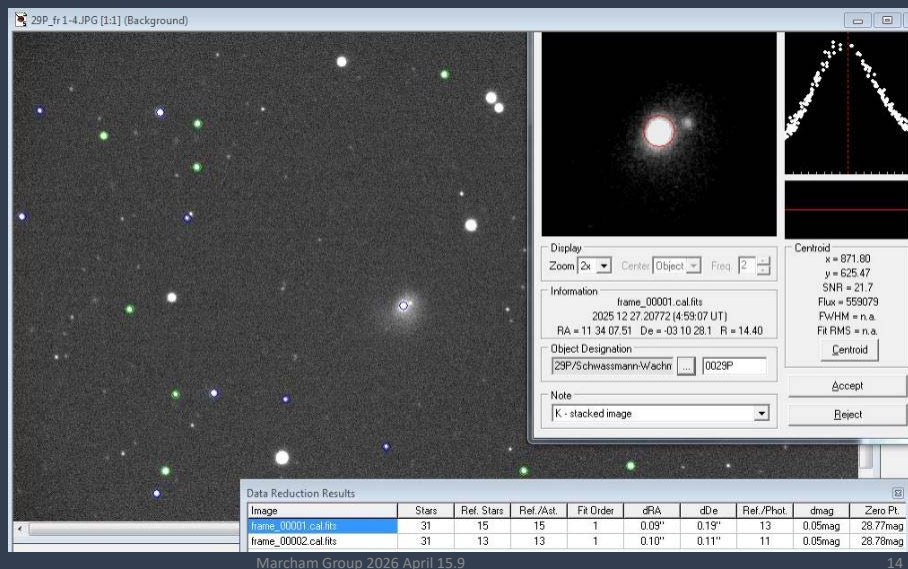
QHY174m GPS

5 x 60s stack
(dark and flat corr.)

Measured with
Astrometrica at

R 14.4

UCAC4 catalogue



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Comet 29P

2022 Dec 26.9

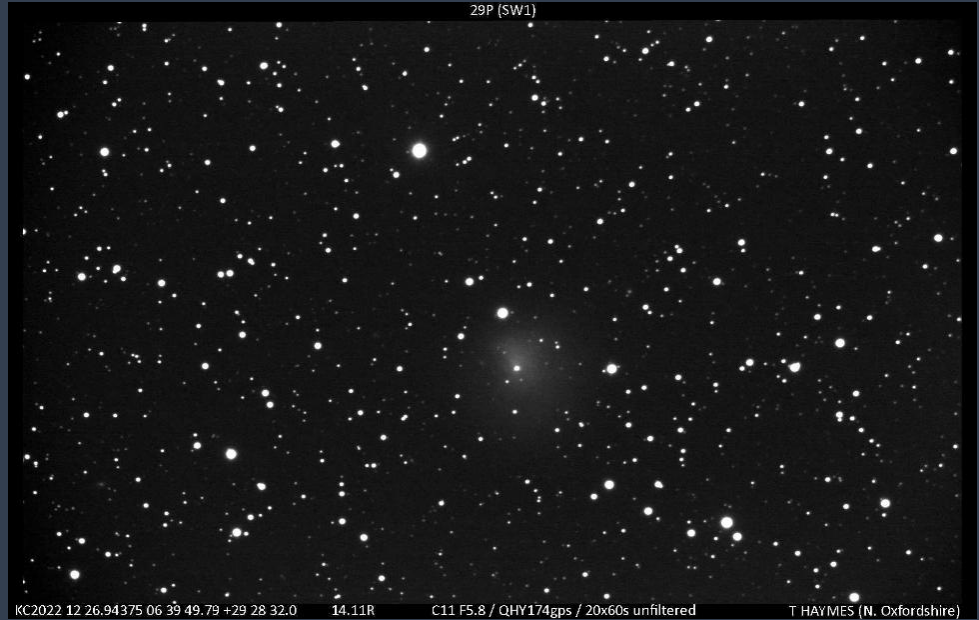
C11 at F5.8

QHY174m GPS

20 x 60s stack
(dark and flat corr.)

R 14.11

RA 06 39 49.70
DE +29 28 32.0



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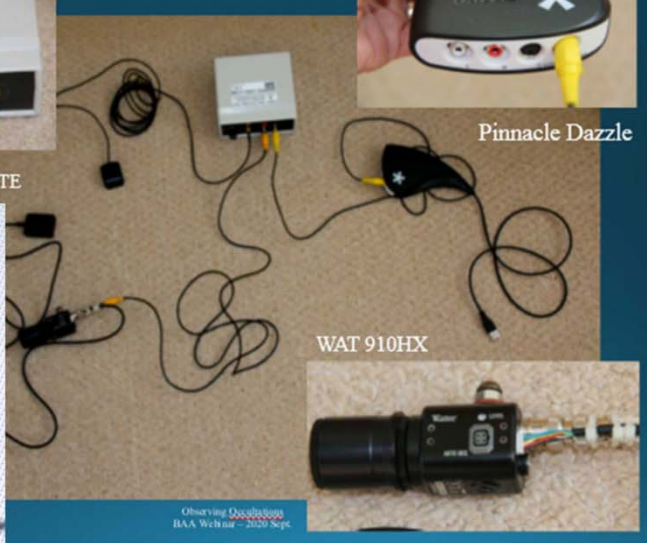
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Occultations with integrating Video

“EAA”

Video timing



Observing Occultations
BAA Webinar - 2020 Sept.

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Mobile setup in 2024 for an asteroid occultation by Video. 20cm F/4 and WAT910HX



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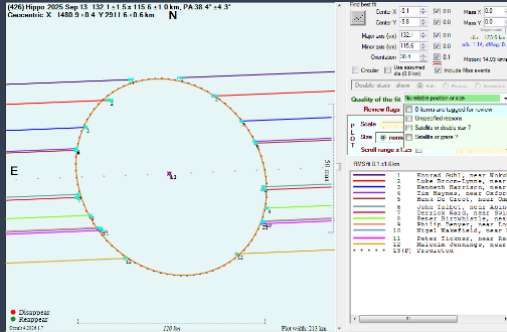
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A Reminder: We are recording the star during an asteroid occultation not the asteroid

- but there are exceptions

Observer POSITION (Google Earth)

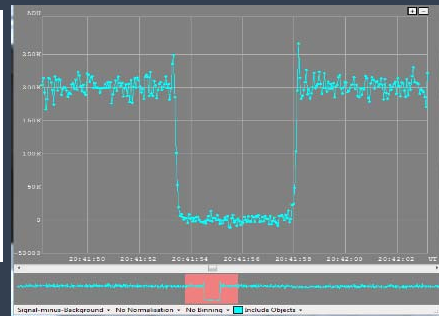


TIME (GPS, NTP)



TIMEBOX II for NTP calibration via GPS

Brightness (photometry) from SER



(65244) lanwong
on 2024-02-23.9,
Observer: Haymes

diam 14km
durn. 4.6s
C11, 50ms exp

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Unexpected diffraction recorded

(65244) lanwong on 2024-02-23.9

TYC 1297-218-1 Mr 9.4

Diam. 14km
durn. 4.6s

Observer: Haymes

C11 xlt F/5.8
QHY174m GPS
SER 50ms exp

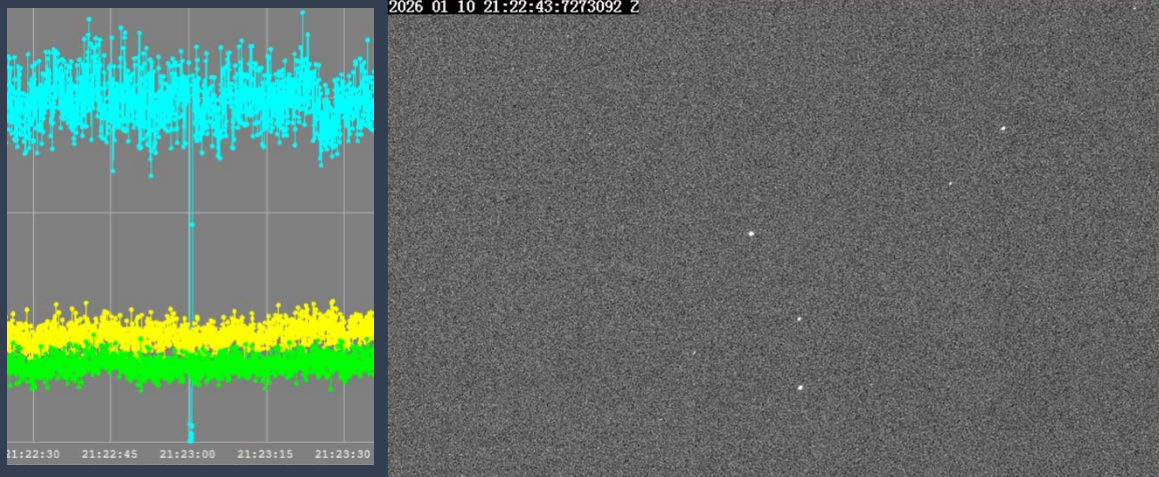


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Deep Occultation of TYC 1367-01864-1 magnitude 9 by asteroid (77671) 2001 MD13



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Method summary. What's possible:

- Driven telescope recorded with 8bit video or CMOS.
- PC Time displayed on the video frames. (SharpCap 4.1)
- Un-driven telescope where a drifting target star is recorded by video. (known as "pre-point")
- Video displayed, but timed with a stopwatch (no time display or recording) – can only be done via 8-bit video and no computer.

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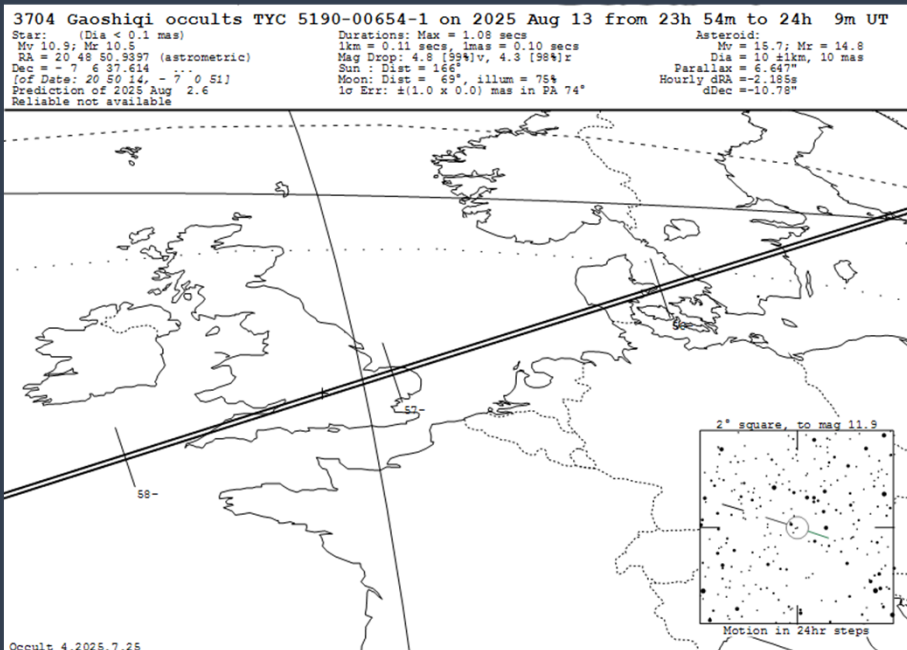
Typical equipment and How-Too

- 6" to 8" aperture (15 to 20cm or more) F4 to F6 (Newt./ SCT)
- Driven mount with goto helps (a Dob is possible)
- CMOS USB3 camera
- Exposure: Depending on conditions: 0.05 to 0.2sec. (20 to 5 fps)
- PC with clock synchronised to UT (+/- 10ms) (W10/11) [Care needed]
- Recording software: SharpCap 4.1 is recommended.
- Analysis software **TANGRA** by Hiristo Pavlov – to get preliminary timing.
- Occultation Predictions from your **coordinator** for Mag. 9 – 11 stars. And friendly advice !

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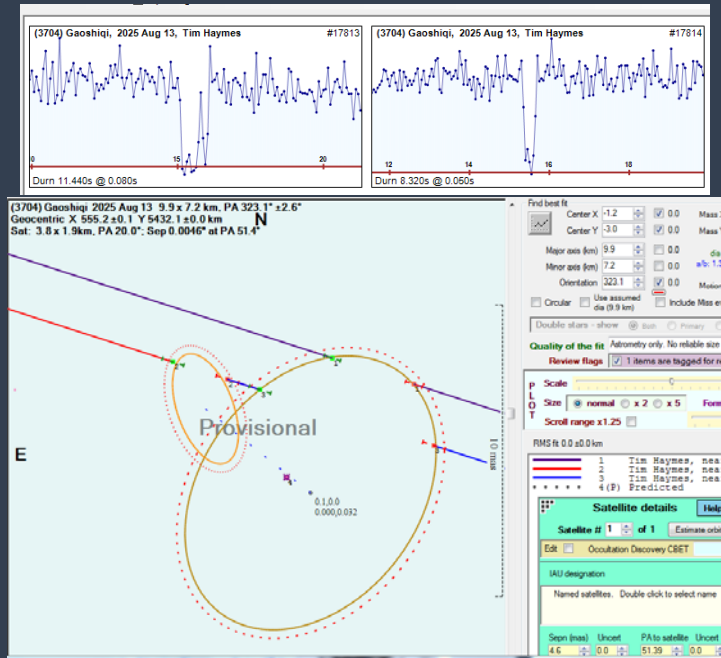
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“Peanut” shape or graze recorded by Tim Haymes, 2025 Aug 13

Analysis with Tangra and Occult softwares

- Observed of (3704) Gaosheqi with:
- 6” F2.8 Newt (Mobile)
- And C11 at Home

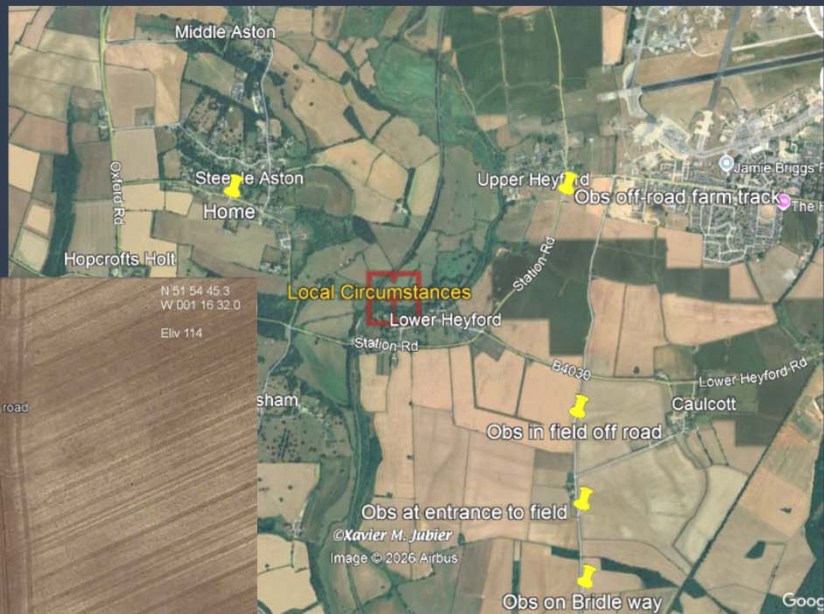


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A near-by field entry off-Rd was used to set up and make an interesting observation with a 6” scope and video.



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73	Mar-17	2336	(398705)	2012 XM46		UCAC4 542-050953	T Haymes (Steeple Aston)	Negative	#12841	
74	Mar-18	1848	(228535)	2001 VL55		UCAC4 549-022414	P Tickner (Reading)	Negative	#12997	
75	Mar-18	2016	(51878)	2001 PP46	8	UCAC4 476-025583	T Haymes (Steeple Aston)	0.55	#12930	
76	Mar-18	2155	(8444)	Popovich		UCAC4 440-054368	T Haymes (Steeple Aston)	Negative	#12931	Both observers mid path
77							P Denyer (London)	Negative	#13012	
78	Mar-18	2255	(336504)	2008 WQ85			N Wakefield (Failand Obs)	Negative	#12981	
79	Mar-19	2314	(98755)	2000 YF58		UCAC4 534-050951	S Kidd (Stevenage)	Negative	#12992	
80	Mar-20	0311	(381898)	2010 BM46		HIP 54134	D Ward (Swindon)	Negative	#13048	
81	Mar-20	2220	(16)	Psyche	249	UCAC4 553-013033	W Stewart (Ravensmoor)	9.60	#13107	
82	Mar-20	0325	(116777)	2004 EJ22		UCAC4 404-063931	D Ward (Swindon)	Negative	#13047	
83	Mar-20	2104	(173720)	2001 QZ182	6	UCAC4 580-015589	S Kidd (Stevenage)	0.31	#12966	
84	Mar-23	0216	(208347)	2001 QP333		HIP 59108	P Tickner (Reading)	Negative	#12998	
85	Mar-23						N Wakefield (Failand Obs)	Negative	#13003	
86	Mar-23						D Ward (Swindon)	Negative	#13049	
87	Mar-25	2221	(80888)	1999 KW14	10	UCAC4 641-047040	T Haymes (Steeple Aston)	1.17	#13067	(80888) =>
88	Mar-25	2228	(242360)	2004 BV145		TYC 1369-02006-1	D Ward (Swindon)	Negative	#13078	
89	Mar-25	2253	(911)	Agamemnon		J113250.8-073206.8	T Haymes (Steeple Aston)	Negative	#13073	from 2-sigma
90	Mar-28	1932	(398)	Admete		UCAC4 563-007913	P Denyer (Hornchurch)	Negative	#13109	
91	Mar-28	2006	(146)	Lucina	137	UCAC4 605-032784	S Kidd (Stevenage)	5.16	#13104	dm 0.2
92	Mar-28	2225	(2376)	Martynov	41	UCAC4 544-048709	S Kidd (Stevenage)	0.54	#13108	
93	Mar-29	0424	(2258)	Viipuri	26	UCAC4 329-085410	S Kidd (Stevenage)	5.30	#13110	
94	Mar-29	2124	(408)	Fama	38	UCAC4 576-018525	S Kidd (Stevenage)	2.16	#13131	
95	Apr-05	2342	(64149)	2001 TC41	4	UCAC4 571-039673	S Kidd (Stevenage)	0.25	#13257	
96	Apr-06	2114	(48826)	1997 WQ54		TYC 1862-00274-1	M Jennings (Hamsay Green)	Negative	#13285	
97	Apr-06	2308	(238728)	2005 GU86		TYC 5544-00486-1	M Jennings (Hamsay Green)	Negative	#13286	
98	Apr-05						W Stewart (Ravensmoor)	Negative	#13384	
99	Apr-07	2020	(1108)	Demeter	27	UCAC4 424-033971	P Denyer (Hornchurch)	1.14	#13378	
100	Apr-07	2035	(97311)	1999 XB198	5	J125729.94+075046.6	D Ward (Swindon)	0.40	#13323	
101	Apr-07	2052	(282331)	2002 UK35		UCA4 472-041908	P Denyer (Hornchurch)	Negative	#13326	
102	Apr-08	0025	(23103)	1999 XK169	14	UCAC4 521-044178	S Kidd (Stevenage)	0.73	#13319	
103	Apr-09	2124	(83239)	2001 RH51	4		W Stewart (Ravensmoor)	0.24	#13382	
104	Apr-12	2026	(355268)	2007 PH47			P Denyer (Hornchurch)	Negative	#13412	

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Current UK observer distribution 2024-6

I am looking for local observers to join this network.

Local Astronomical groups can assist by observing asteroid occultations, and provide good scientific coverage of asteroid shapes.

My Observatory is the base station.

Contact the coordinator who will advise and send predictions.

Tvh.observatory@btinternet.com



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C/2020 F3 (NEOWISE) on 2020 Jul 10, 105mm lens, 4 sec iso 800



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C/2020 F3 (NEOWISE) on 2020 Jul 20, 105mm lens, 12 x 25s sec iso 800



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C/2021 A1 (Leonard) on 2021 Dec 09, 60Da, 200mm lens (4x30s)

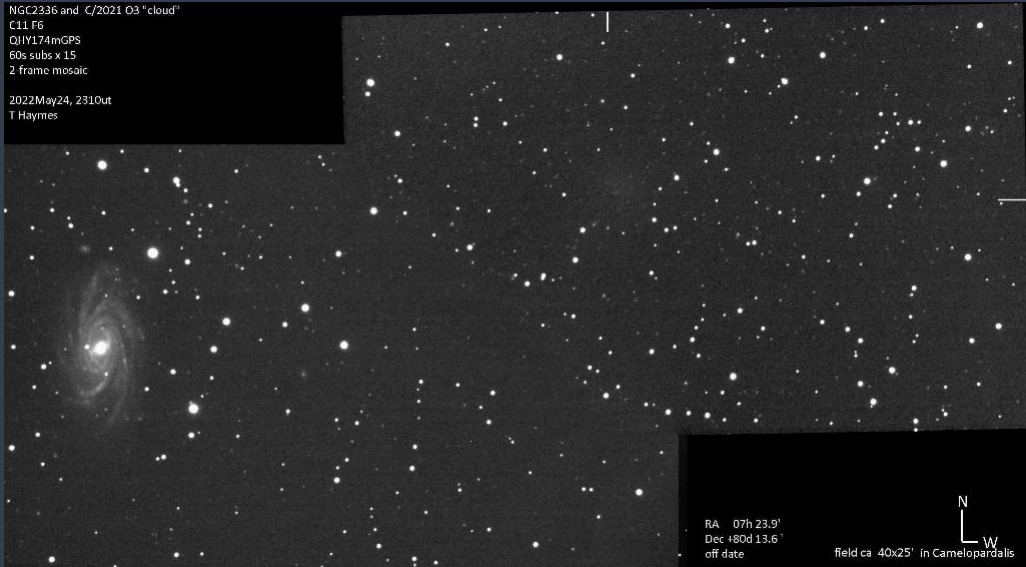


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C/2021 O3 break-up and NGC2336 C11 QHY174 60s x 15



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C/ 2022 E3 (ZTF) on 2023-Jan 24.0



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C/2023 A3 (Tsuchinshan-ATLAS) on 2024 Oct 19, 105mm lens (12x15s)



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12P on 2024 Mar22.9 200mm lens



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C/2025 A6 (Lemmon) and Space X launch on 2025 Oct 29.9



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C/2025 K1 (ZTF) on 2025-Nov 17.0 – break up



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LRGB imaging - Then and Now

M66 in Leo in 2008
30cm F/4 Meade DSI pro 2 min

in 2023
C11 F5.8, QHY174 RGB 60s 4R+4G+4B = 12min



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M90 in Vir in 2008
30cm F/4 Meade DSI pro 2 min

and in 2023
C11 F5.8, QHY174 LRGB 30s 10L+8+8+8 = 17min



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Ha 12nm
ATIK 428ex
200mm lens
7x 2 min



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