



Las Cumbres Observatory Global Telescope

Observing Asteroids

Finding Asteroids using the Asteroid Portal NEA Planner

Author: Daniel Duggan



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Finding Asteroids

Asteroids are awkward; they don't stay in one place! Not only that, as the Earth rotates, different asteroids are visible from the Earth at different times. You might therefore think that finding the position of an asteroid in the sky might be a difficult task. Fortunately, much of the difficult work has already been done by various groups of people, and it is not as difficult as you might imagine finding the co-ordinates of an asteroid in the sky.

Using the NEA Observation Planner

The NEA (Near Earth Asteroid) Planner, is based on the Spaceguard Priority List. It automatically provides you with lists of asteroids above our observing site and displays graphically when they are visible for observation.

It is available in our Asteroid Portal at <http://portal.faulkes-telescope.com/asteroid/index.php>.

Visit the portal and register (so that you can submit results later).

When you go to the portal, click on NEO target list in the menu on the left hand side and you will see a page that looks like the one below.

Near Earth Asteroid observation planner - FT North

Uses the Spaceguard Priority List

Last update : 2007 May 20, 11:52 UT	Sunset-rise : 04:55 15:48
Predictions for : 2007 May 20, 22:00 UT	Nautical dawn : 05:49 -14:54
JD = 2454240.5	Astronomical dawn : 06:18 -14:24

Note: since the bargraphs below are not calculated with full resolution, dawn / sunset / sunrise may be indicated at slightly different times.

Explanation of colors:

Sun above horizon	■	Sun elevation > -12deg
The following colors appear in darker shades during nautical dawn.		
■ Target elevation < 20deg	■ Target elevation > 25deg	■ Target elevation > 30deg
■ Zenith angle < 10deg	■ Zenith angle < 5deg	

Near the top of the page, you are given the dates between which the asteroids shown below are visible. You are also provided with the times of different "points" in the day as the Sun moves between different altitudes in the sky.

Below that you see a colour code - this explains what the colours mean in the graphs further down the page.

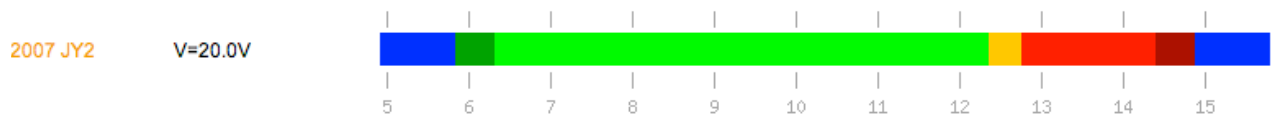
The first list of asteroids you see in the list are **Urgent Targets**. Because many of these are often dim and fast moving, we shall ignore these for this basic project.

Further down you see the **Necessary Targets**. This list is normally much longer so there is more chance you will find a suitable asteroid to observe here.

Choosing an Asteroid

Time

Using this page, finding an asteroid is very easy. Look at one of the coloured graphs next to an asteroid.



First, we need to determine when an asteroid is visible. Assuming you have already booked an observing session, you know what time you wish to observe.

The numbers across the top of this bar, are hours in UT, so 10 is 10:00 UT or 11:00 BST. Below that time, the bar is green - so we know the asteroid is visible at that time.

From the colour code above, we know that green shows us when the asteroid is 30 degrees above the horizon. We cannot observe an asteroid in the yellow or red times, as this is when the asteroid is too close to the horizon.

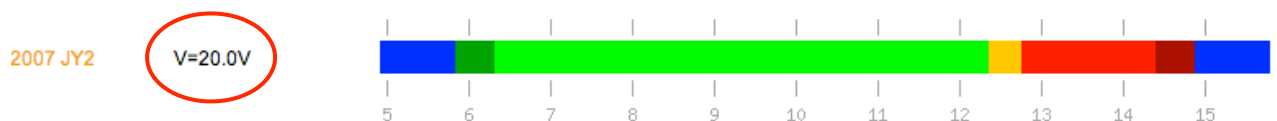
You should go down the list of asteroids and pick out a few "green asteroids" that are visible during your session.

Magnitude

You also need to take into account the magnitude of the asteroid. Magnitude is how bright the asteroid looks - we do not want to choose very bright or very dim asteroids as this will alter your observing procedure slightly.

The magnitude of each asteroid is displayed along-side its name.

Out of the visible asteroids you have chosen, dismiss the ones that have a magnitude that is outside the range of 18-21.



Please Note: One aspect this planner fails to take into account is the Moon offset angle. Therefore we recommend choosing several asteroids that fit the above criteria in case one or some of them are too close to the Moon to observe.

Other Notes

Zenith

In some of the time-graphs you will see, there are grey and black areas when the asteroid passes through the zenith of the observing site.

The zenith is the point directly above an observer. Since the telescope can neither point or track objects close to the zenith, do not pick an asteroid that passes through this area in your session.

Asteroid Ephemeris

When you have picked out a few asteroids, you need to find their co-ordinates in the sky during your observing session so that you know where to point the telescope to observe them.

It is easy to do this - simply click on the name/number of the asteroid you are interested in. It's a good idea to right click on each link and choose 'Open in new window' - this makes it easier to come back to the original page when choosing multiple asteroids.

When you click on a link, the website automatically sends a request to the Minor Planet Ephemeris Service, and you will get a page like the one below:

Minor Planet Ephemeris Service: Query Results

Below are the results of your request from the Minor Planet Center's Minor Planet Ephemeris Service. Ephemerides are for observatory code F65.

You have selected suppression of ephemeris data when objects are below, or the sun is above, your local horizon.

2006 UF17

[Display all designations for this object](#)

Perturbed ephemeris below is based on 12-day-arc elements from [MPEC 2006-V11](#). Last observed on 2006 Oct. 31.

[Further observations?](#) PHA: Desirable at first ephemeris date

Date	K06U17F			Delta	r	El.	Ph.	V	Sky Motion		Object		Sun	Moon	Dist.	Alt.	Uncertainty info	
	UT	R.A. (J2000)	Decl.						"/min	P.A.	Azi.	Alt.					Alt.	Phase
2006 11 08 110800	02 16 56.5	+12 33 27	0.432	1.419	170.3	6.7	20.9	1.58	262.7	075	+66	-75	0.89	049	+65		16 067.8	Map / Offsets
2006 11 08 111300	02 16 56.0	+12 33 26	0.432	1.419	170.3	6.8	20.9	1.58	262.7	076	+65	-74	0.89	049	+66		16 067.8	Map / Offsets
2006 11 08 111800	02 16 55.5	+12 33 25	0.432	1.419	170.3	6.8	20.9	1.58	262.7	077	+63	-73	0.89	049	+67		16 067.8	Map / Offsets
2006 11 08 112300	02 16 54.9	+12 33 24	0.432	1.419	170.3	6.8	20.9	1.57	262.7	078	+62	-72	0.89	049	+68		16 067.8	Map / Offsets
2006 11 08 112800	02 16 54.4	+12 33 23	0.433	1.419	170.3	6.8	20.9	1.57	262.7	078	+61	-71	0.89	049	+69		16 067.8	Map / Offsets
2006 11 08 113300	02 16 53.9	+12 33 22	0.433	1.419	170.3	6.8	20.9	1.57	262.7	079	+60	-70	0.89	049	+70		16 067.8	Map / Offsets
2006 11 08 113800	02 16 53.3	+12 33 21	0.433	1.419	170.3	6.8	20.9	1.57	262.6	080	+59	-68	0.89	049	+71		16 067.7	Map / Offsets
2006 11 08 114300	02 16 52.8	+12 33 20	0.433	1.419	170.3	6.8	20.9	1.57	262.6	081	+58	-67	0.89	049	+72		16 067.7	Map / Offsets
2006 11 08 114800	02 16 52.3	+12 33 19	0.433	1.419	170.3	6.8	20.9	1.57	262.6	082	+56	-66	0.89	050	+73		16 067.7	Map / Offsets
2006 11 08 115300	02 16 51.7	+12 33 18	0.433	1.419	170.3	6.8	20.9	1.57	262.6	082	+55	-65	0.89	050	+74		16 067.7	Map / Offsets
2006 11 08 115800	02 16 51.2	+12 33 17	0.433	1.419	170.3	6.8	21.0	1.57	262.6	083	+54	-64	0.89	050	+75		16 067.7	Map / Offsets
2006 11 08 120300	02 16 50.7	+12 33 16	0.433	1.419	170.3	6.8	21.0	1.56	262.6	084	+53	-63	0.89	050	+76		16 067.7	Map / Offsets
2006 11 08 120800	02 16 50.1	+12 33 15	0.433	1.419	170.2	6.8	21.0	1.56	262.5	084	+52	-61	0.89	050	+77		16 067.7	Map / Offsets
2006 11 08 121300	02 16 49.6	+12 33 14	0.433	1.419	170.2	6.8	21.0	1.56	262.5	085	+51	-60	0.89	050	+78		16 067.7	Map / Offsets
2006 11 08 121800	02 16 49.1	+12 33 13	0.433	1.419	170.2	6.8	21.0	1.56	262.5	085	+49	-59	0.89	050	+79		16 067.7	Map / Offsets
2006 11 08 122300	02 16 48.6	+12 33 12	0.433	1.419	170.2	6.8	21.0	1.56	262.5	086	+48	-58	0.88	050	+79		16 067.7	Map / Offsets
2006 11 08 122800	02 16 48.0	+12 33 11	0.433	1.420	170.2	6.8	21.0	1.56	262.5	086	+47	-57	0.88	050	+80		16 067.6	Map / Offsets
2006 11 08 123300	02 16 47.5	+12 33 10	0.433	1.420	170.2	6.8	21.0	1.55	262.5	087	+46	-56	0.88	050	+81		16 067.6	Map / Offsets
2006 11 08 123800	02 16 47.0	+12 33 09	0.433	1.420	170.2	6.8	21.0	1.55	262.4	087	+45	-54	0.88	050	+81		16 067.6	Map / Offsets

The important information here is the Right Ascension and Declination of the asteroid at the given times.

Look for the time of your observing session and read across to get the correct RA and Dec.

Observing Notes

Just like any other observing session, you need to plan your filters and exposure times.

Exposure Time

We have developed a quick look-up table for asteroids:

Magnitude	Exposure Time in Seconds
<10	Avoid imaging if possible
10-13	20
14-16	30
16-18	60
18-20	90
>20	Please ask for advice as other factors may influence your observations

Filters

The best filter option to use when imaging asteroids is the **clear** option, i.e., no filter. This allows more light to hit the CCD per unit time than using a filter and allows you to have slighter shorter exposure times.

Please Note: If you are unable to book an observing session there are example data sets available on the Faulkes Telescope Project for you to use. However, you cannot submit results obtained from these files to the MPC.